Section 3

Consultation, Issue Identification and Prioritisation

PREAMBLE

This section describes how the environmental issues assessed in the Environmental Assessment were identified and prioritised. In summary:

(i) *a comprehensive list of all relevant environmental issues was assembled through consultation with the local community and local and State government agencies, completion of preliminary environmental studies and a review of relevant legislation, planning documents and environmental guidelines;*

(ii) *a review of the Project design and local environment was undertaken to identify risk sources and potential environmental impacts for each environmental issue;*

(iii) *an analysis of unmitigated risk for each potential environmental impact was then completed with a risk rating assigned to each impact based on likelihood and consequence of occurrence; and*

(iv) *through a review of the allocated risk ratings and the frequency with which each issue was identified, the relative priority of each issue was determined, with this priority used to provide an order of assessment and breadth of coverage within Section 4.*

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3.1 INTRODUCTION

In order to undertake a comprehensive *Environmental Assessment* of the Project, appropriate emphasis needs to be placed on those issues likely to be of greatest significance to the local environment, neighbouring landowners and the wider community. To ensure this has occurred, a program of community and government consultation and a review of environmental planning documentation was undertaken to identify relevant environmental issues and potential impacts. This was followed by an analysis of the risk posed by each potential impact in order to prioritise the assessment of the identified environmental issues within the *Environmental Assessment*.

It should be noted that the Proponent has demonstrated a commitment to open communication with the local community since discovery of mineralisation at Tomingley. An initial open community meeting held to inform the community of the exploration and feasibility study progress was held at the Tomingley Memorial Hall on 26 June 2003.

3.2 CONSULTATION

3.2.1 Community Consultation

3.2.1.1 Introduction

Community consultation associated with the current application comprised the following components described in the following subsections.

- An initial community information session – April 2009 (see Section 3.2.1.2).
- A second community information session – February 2011 (see Section 3.2.1.3).
- Targeted community consultation, focusing particularly on those residents of Tomingley expected to receive noise emissions higher than the relevant criteria (see Section 3.2.1.4).
- Aboriginal community consultation (see Section 3.2.1.5).

In addition, the Proponent has maintained an open and transparent relationship with the community surrounding the Mine Site with a range of formal and informal discussions held with individual community members and the Aboriginal community since the initial 2003 community meeting.

3.2.1.2 First Community Information Session

The first community information session was held at the Tomingley Community Hall on 20 April 2009 from 7:00pm to 8:45pm. Information about the session was distributed prior to the meeting by letter drop to Tomingley residents and immediate neighbours of the Mine Site. The session was attended by approximately 80 community members, including a number of representatives of Narromine and Parkes Shire Councils.

During the session, Mr Ian Chalmers, Managing Director of Alkane Resources Ltd, gave an overview of the Project as it was then understood. Following the presentation, an opportunity was provided to ask questions and provide comments. **Table 3.1** presents an overview of the issues raised at the session and where each is addressed in this document. In addition to the issues and questions raised by the community, representatives of both Narromine and Parkes Shire Councils expressed general support for the Project and commended the Proponent on the community consultation that had previously been undertaken.

Table 3.1
Initial Community Information Session – Issues Raised

Issue Raised	EA Section(s)
Hours of Operation	2.11.2
Visual and light pollution	4.8.3
Noise impacts	4.2.3 to 4.2.7
Use of cyanide and associated environmental impacts	2.6.3.3, 2.6.4 & 4.5.7.3.3
Dust emissions from the Project	4.9.4 to 4.9.8
Power supply	2.10.3.1
Third party access to water supply pipeline	2.2.2.2
Surface water flows.	4.3.3 to 4.3.6

3.2.1.3 Second Community Information Session

During the initial community information session, a commitment was made to hold a second information session once the required environmental studies had been completed. This session was held at the Tomingley Community Hall on 11 February 2011. Similar issues to the first meeting were discussed, however, management of noise on the Mine Site was presented to the community in greater detail.

3.2.1.4 Targeted Community Consultation

At the second community information session, attendees were asked to complete a registration form, including a check box identifying whether they would like to be contacted to arrange a time for further individual consultation in relation to the Project. In addition, registration forms were left at the Crossroads Hotel in Tomingley with contact details of the Proponent and their consultants for interested parties to similarly request further consultation. 51 registration forms were completed at the second information session, of which 18 requested that they be contacted for further individual consultation.

Following the second information session, R.W. Corkery & Co Pty Limited telephoned all those who requested to be contacted, as well as those residents whose properties were predicted to experience noise levels in excess of the relevant noise criteria. A range of days and times were offered, including evenings and weekends. Not all those who originally requested to be consulted took up the offer.

- The following individuals were consulted individually during the targeted consultation program. Dates and times of the meetings are presented in parentheses Dot Stewart (9:00am, Friday 18 February 2011).
- Christine Cox and Barry Unger (10:00am, Saturday 19 February 2011).
- Chris Sonter (11:00am, Saturday 19 February 2011).
- John and Diana Hopkins (1:00pm, Tuesday 22 February 2011).
- Peter and Helen Laffey (9am, Wednesday 23 February 2011).
- Christine Peckham (4:00pm, Tuesday 22 February 2011).
- Ben Rees (6:30pm, Tuesday 22 February 2011).
- Wes and Sally Boucher (7:00pm, Tuesday 22 February 2011).

Table 3.2 presents the issues raised during the targeted consultation and where each issue is addressed.

Table 3.2
Targeted Consultation – Issues Raised

Issue Raised	EA Section(s)
Noise impacts and management measures	4.2.3 to 4.2.7
Visual amenity impacts – direct and indirect (night-time light spill)	4.8.3
Dust and associated impacts	4.9.4 to 4.9.8
Revegetation, screen plantings and species selection	2.14.4
Avifauna-related impacts	4.5.8
Property values and general loss of amenity	4.14.3
Mine Site security fencing	2.13.1
Modifications to surface water flows and flooding patterns	4.3.5
Community contributions and sponsorship	2.12
Ongoing community consultation protocols and operation/membership of the Community Consultative Committee	4.14.2
Noise and dust monitoring.	4.2.7 and 4.9.8

During the targeted consultation, the Proponent made the following commitments which are reproduced in the draft Statement of Commitments presented in Section 5.

- Undertake a detailed survey prior to construction of amenity bunding north of the Caloma Open Cut and adjust surface water management structure design to ensure no significant changes to current flooding patterns (Commitment 5.1).
- Construct perimeter security fence as early as possible during construction operations to limit the potential for inadvertent or unauthorised access to the operational sections of the Mine Site (Commitment 2.4).
- Cooperate with surrounding landholders with early establishment of screen plantings (Commitment 7.25).
- Share flora, fauna and heritage survey information with interested stakeholders (Commitment 7.27).
- Develop specific community consultation protocols for individuals surrounding the Mine Site (Commitments 17.1 to 17.4).
- Ensure regular consultation with surrounding community to provide an overview of Project status, monitoring results and forward plans (Commitments 17.1 to 17.4).
- Establish a Community Consultative Committee with members drawn from the surrounding community and Parkes and Narromine Shire Councils (Commitment 17.1).

3.2.1.5 Aboriginal Community Consultation

Consultation with the registered Aboriginal stakeholders and other relevant members of the Aboriginal community is described in detail in Section 4.6.3. In summary, the Proponent consulted with the following organisations and individuals during preparation of the *Environmental Assessment* and associated documentation.

- Narromine LALC (NLALC);
- Peak Hill LALC (PHLALC);
- Little Burning Mountain Aboriginal Corp (LBMAC);
- Mooka Traditional Owner Corporation (MTOC);
- Wiradjuri Council of Elders (WCE);
- Trevor Robinson (individual);
- Peter Peckham (individual);
- the Bogan River Peak Hill Wiradjuri Aboriginal Corporation (BPHWAC); and
- Bulgandramine Youth Development Aboriginal Corporation (BYDAC).

Consultation with the local Aboriginal community included the following.

- Advertisement for expressions of interest in participating in the cultural heritage assessment for the Tomingley Gold Project as required by the *Interim Community Consultation Requirements for Applicants* (DEC, 2005a), the active consultation guidelines at the time of initial consultation.
- Exchange of letters and written documentation, including a draft of the Aboriginal Heritage Assessment, outlining the Project and the results and recommendations arising from the heritage assessment.
- A series of meetings on 9 September 2010, 14 September 2010 and 17 September 2010, held to discuss specific Aboriginal site management issues, as well as ongoing protocols for consultation and negotiations between the Proponent and the Aboriginal community. These meetings led to the establishment of the Peak Hill Wiradjuri Reference Group, a representative group of six registered Aboriginal organisations, and the signing of a Community Engagement Protocol (on 15 June 2010).
- A range of one-on-one and community meetings with the Upper Bogan River Wiradjuri community on 27 July 2009, 5 August 2009, 9 September 2009, 17 September 2009, 18 February 2011, 22 February 2011 and 23 February 2011. These meetings were principally to discuss the results of the Aboriginal heritage survey and identify appropriate management measures for sites of Aboriginal heritage significance that would be disturbed by the Project.
- A range of informal discussions between representatives of the Proponent and members of the Aboriginal community regarding potential community development projects.

The above consultation resulted in the following.

- Establishment of a formal (documented) Community Engagement Protocol between the Proponent and six registered organisations of Peak Hill Upper Bogan River Wiradjuri (signed 15 June 2010).
- Engagement of Traditional Owners (men and women) in physical cultural heritage survey work for the Mine Site, Electricity Transmission Line Route and Narromine-Tomingley Water Supply Pipeline Route.
- Design of management measures to ensure that identified items of Aboriginal heritage significance, including the identified carved tree, are appropriately managed.
- Identification of the potential to discover additional sites of Aboriginal heritage significance within the proposed areas of disturbance.
- A commitment by the Proponent to ensure that appropriate community programs would be developed and implemented to ensure that benefits for the Aboriginal community associated with the Project continue beyond the life of the Project.

The principal issue of concern raised during consultation with the Aboriginal community was the management of items of Aboriginal heritage significance and access to any socio-economic benefits that may flow from the Project.

3.2.1.6 Additional Community Consultation

In addition to the information sessions and targeted consultation, the Proponent undertook the following consultation with the community.

- Informal discussions have been held with Project neighbours and residents within Tomingley. The Proponent has maintained an "open door" policy for the community and has ensured that community questions or issues are responded to as soon as practicable once raised.
- The Proponent hosted a display in the respective pavilions at the Peak Hill and Narromine Shows in August and September 2009 and 2010. Those displays were staffed by employees of the Proponent and provided an opportunity for members of the wider community to ask questions and receive information in relation to the Project.
- The Proponent has consulted with all the landholders that would be impacted by an easement for the Electricity Transmission line. Appropriate compensation to individual landholders has been calculated by a licensed valuer.

3.2.2 Government Agency Consultation

3.2.2.1 Introduction

The Proponent has undertaken a range of consultation with government agencies in relation to the Project, including the following.

- A Conceptual Project Development Plan Meeting.
- A Planning Focus Meeting.
- Targeted consultation and negotiation.

3.2.2.2 Conceptual Project Development Plan Meeting

A Conceptual Project Development Plan was presented to Industry and Investment NSW at their Sydney offices on 18 April 2009. Issues identified at that meeting, and where they are addressed in this document, are presented in **Table 3.3**.

Table 3.3
CPDP Meeting – Issues Raised

Issue Raised	EA Section(s)
Existing and proposed mineral authority boundaries	1.3.1
Final landform	2.14.4
Open cut design	2.4.2 & 2.4.3
Mining techniques	2.4.3 & 2.4.4
Safety and security issues	2.13
Narromine Local Environment Plan 1997 and land zoning	1.1
Current and final land use	4.14.3.1

3.2.2.3 Planning Focus Meeting

A Planning Focus Meeting was held for the Project on 12 August 2009 at the Tomingley Memorial Hall. The meeting was attended by representatives of the following government agencies.

- The Department of Planning & Infrastructure (DP&I) (as the then Department of Planning).
- The Department of Trade and Investment, Regional Infrastructure and Services (DTIRIS) (as the then Industry & Investment NSW).
- The NSW Office of Environment and Heritage (OEH) (as the then Department of Environment, Climate Change and Water).
- The NSW Office of Water (NOW).
- Central West Catchment Management Authority (Central West CMA).
- Land and Property Management Authority (LPMA).
- Roads and Traffic Authority (RTA).
- Narromine Shire Council.
- Parkes Shire Council

During the meeting, Mr Ian Chalmers gave an overview of the Project, as it was then understood and the attendees inspected the Mine Site. The meeting concluded with the various government agencies providing verbal advice in relation to their requirements for the *Environmental Assessment*. Formal written requirements were provided to the Department of Planning following the meeting. These, together with the Director-General's Requirements (DGRs), were provided by Department of Planning to the Proponent on 9 September 2009.

Following a review of the Project during 2010, the Project, as it was presented at the planning focus meeting, was amended to include the Caloma Two Open Cut, the Wyoming One Underground and revised layouts for Waste Rock Emplacements Two and Three. As a result, a *Preliminary Environmental Assessment – Addendum* was prepared and provided to the above government agencies on 22 December 2010, with a request to provide revised Director-General's Requirements. Revised requirements were provided by the following agencies.

- OEH (as DECCW) (23 December 2010).
- DTIRIS (as I&I NSW) (14 January 2011).

A précis of the requirements and where each required address in the document are presented in **Tables A2-1** to **A2-3** of **Appendix 2**.

3.2.2.4 Targeted Consultation and Negotiation

Additional consultation with the following government agencies and organisations has also been undertaken.

NSW Office of Water (Dubbo)

The following consultation was undertaken with NSW Office of Water (NOW) in relation to the Project.

- Water supply bores.
  - 21 January 2009. Sue Hamilton, Janette Nestor, Jerry Smit (NOW) met with Mike Sutherland (of the Proponent), James Morrow (The Impax Group) and Stuart Boland on 21 January 2009 to discuss issues surrounding subdivision of a Water Access Licence (WAL) held by Mr Boland in relation to his property "Woodlands" and location of the proposed water supply bores for the Project.
  - 21 January 2009. Sue Hamilton, Janette Nestor (NOW), Bill Caton, Allister Rodgers (Aboriginal Elders) met with Mike Sutherland (of the Proponent), James Morrow (The Impax Group) and Stuart Boland at the proposed bore site on "Woodlands" on 21 January 2009 and agreed on a site for the proposed production bore.
  - 18 September 2009. Sue Hamilton (NOW), Ian Chalmers, Mike Sutherland (of the Proponent), James Morrow (The Impax Group), James Ryan, Mark Campbell, Hari Haridharan (NOW) met to discuss water supply from Zone 6 of the Lower Macquarie aquifer. A 14 day pump test to confirm sustainable yield was to be undertaken.
  - It is noted that subdivision of the WAL licence and construction of the proposed bore(s) does not form a component of this application.

- Groundwater assessment
  - 16 December 2010. Sue Hamilton, Tim Baker, Hari Haridharan NOW), James Morrow (The Impax Group), Mike Sutherland, David Meates, Terry Ranstead (of the Proponent) and Mitchell Bland (RWC) held a teleconference to discuss the groundwater assessment undertaken to date and what, given the extensive geological information held by the Proponent, would be an appropriate assessment pathway for the groundwater assessment.
  - 25 January 2011. Sue Hamilton (NOW) provided the Proponent with a review of the groundwater assessment discussed in December 2010. In this preliminary review, clarification was sought in regard to the following issues.
    - The occurrence and characteristics of alluvial sediments on the Mine Site.
    - Monitoring bore details including, locations, water level data, testing, casing diameter, bore logs, and licencing details.
    - The occurrence of previous mine workings and analysis as to impact of these on dewatering.
    - Additional air-lift testing of bores.
    - Additional information on exploration hole data (>100m below surface).
    - Model development and methods.

Roads and Traffic Authority (RTA)

Phil Standen, Jeff Hall, Fiona Nobes, Mark Arrow (RTA) and Michael Sutherland (of the Proponent) met in Parkes on 27 August 2009 to discuss the proposed Newell Highway Underpass, roadworks and Works Approval Deed. A Works Authority Deed was negotiated following that meeting.

Essential Energy (EE) (previously Country Energy)

Brendan Brewer (EE) and Michael Sutherland (of the Proponent) met at Peak Hill sub-station on 29 January 2009 to discuss electricity transmission line route to the Mine Site. A High Voltage Connection Application, together with all fees, to Country Energy for the Project was made on 6 March 2009.

On 28 February 2011, Michael Sutherland (of the Proponent) contacted Brendan Brewer to provide EE with an update as to the status of the Project and discuss the assessment of the proposed electricity transmission line under the EP&A Act. To that point, the assessment of the proposed electricity transmission line had been incorporated into the application for project approval under Part 3A of the EP&A Act. Advice was provided by Brendan Brewer (EE) by email on 2 March 2011 suggesting that in order for EE to own and operate the electricity transmission line, the line will have to be obtained, approved and built in accordance with EE's policies and procedures, i.e. under Part 5 of the EP&A Act. Based on this advice, the Proponent has commenced the preparation of a separate application under Part 5 of the EP&A Act for the construction and operation of the proposed electricity transmission line between Peak Hill and the Mine Site.

Narromine Shire Council (NSC)

A number of meetings were held with Narromine Shire Council in relation to the Project, including the following.

- Vas Roberts (NSC) and Michael Sutherland (of the Proponent) met to discuss subdivision of a 33.5ha parcel of "Dunoon" on 13 February 2009.
- NSC convened a meeting at Tomingley School to discuss *Regional Land Use Strategy* and in particular building restrictions within the village due to historic mining. Michael Sutherland attended the meeting.
- Michael Sutherland provided a Project update to Narromine Shire Councillors on 20 April 2010 in Narromine Council Chambers.

Land and Property Management Authority

Greg Campbell of the Land and Property Management Authority and Mike Sutherland met to discuss road closures within the Mine Site on 21 July 2010.

Commonwealth Department of Sustainability, Environment, Water, Populations and Communities (DSEWPaC)

The Project has not been referred to DSEPWPaC, and no additional consultation undertaken, on the basis that the proposed activities do not represent a controlled action likely to result in significant impact to any matter of national environmental significance (see Section 4.5.8.5).

3.3 REVIEW OF PLANNING LEGISLATION AND ENVIRONMENTAL GUIDELINES

3.3.1 Introduction

A number of planning instruments apply to the Project. These planning instruments were reviewed to identify any environmental aspects requiring consideration in the *Environmental Assessment*. In addition, the DGRs identified a number of guideline documents to be referenced / reviewed during the preparation of the *Environmental Assessment* (**Appendix 2**).

A brief summary of each relevant planning instrument is provided in Sections 3.3.2 to 3.3.4. The application and relevance of planning instruments related to specific environmental issues have been assessed in the relevant specialist consultant assessments. Section 3.3.5 briefly outlines the approach taken to referencing and reviewing environmental guideline documents.

3.3.2 State Planning Issues

3.3.2.1 State Environmental Planning Policy (Major Development) 2005

Clause 6 of the State Environmental Planning Policy (Major Development) 2005 (Major Development SEPP) identifies that development of the kind specified in Schedule 1 of the SEPP is declared to be a 'Major Project'. Paragraph 5(1)(b) of Schedule 1 identifies development for the purposes of mining-related works with a capital cost of more than $30 million as development to which the Major Development SEPP applies. The Proponent estimates that the capital cost for the Tomingley Gold Project would exceed $30 million and as a result, the Project requires assessment and determination under Part 3A of the *Environmental Planning and Assessment Act 1979*.

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

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 (Mining SEPP) was gazetted on 17 February 2007, in recognition of the importance to New South Wales of mining, petroleum production and extractive industries. The aims of the Mining SEPP are 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.

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

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."

Part 3 of the Mining SEPP sets out a number of matters that must be considered when determining an application for project approval for a mining project. **Table 3.4** presents a summary of each element requiring consideration and a reference to the section in this *Environmental Assessment* where each element is addressed.

3.3.2.3 State Environmental Planning Policy (Infrastructure) 2007

The State Environmental Planning Policy (Infrastructure) 2007 (Infrastructure SEPP) identifies, amongst other things, the matters to be considered in the assessment of development adjacent to particular types of infrastructure.

Electricity Infrastructure

Clause 45 of the Infrastructure SEPP identifies that where development would be carried out within or immediately adjacent to an easement for electricity purposes, the determining authority must give written notice to the electricity supply authority, inviting comments about potential safety risks and take into consideration any response received. The Proponent notes that the Project would require the relocation of a 22kV power transmission line that passes through the footprint of the proposed Caloma and Caloma Two Open Cuts and construction of an electricity sub transmission line (**Figure 2.1**). As a result, the determining authority would be required to consult with Country Energy in relation to the Project.

The Proponent has undertaken discussions with Essential Energy in relation to both the construction of the proposed transmission line and the relocation of the distribution line (see Section 3.2.2.4).

The Proponent submitted a Connection Inquiry to Country Energy (now Essential Energy) on 16 June 2008. A Connection Investigation Agreement has been negotiated between Essential Energy and the Proponent.

Pipeline Infrastructure

Clause 55 of the Infrastructure SEPP identifies that where development would be carried out within or immediately adjacent to a licensed gas pipeline, the consent authority must:

a. be satisfied that the potential safety risks or risks to the integrity of the pipeline that are associated with the development or modification to which the application relates have been identified, and

b. take those risks into consideration.

The alignment of the proposed Tomingley - Narromine Water Pipeline crosses a Natural Gas Pipeline operated by East Australia Pipeline Limited (a wholly owned subsidiary of the Australian Pipeline Trust [APA Group]) approximately 500m southwest of the "Woodlands" front gate. This high-pressure gas pipeline is buried (at a depth of between 70cm and 150cm) between the Mitchell Highway and the Main Western Railway.

Table 3.4
Application of SEPP (Mining, Petroleum Production and Extractive Industries) 2007

Page 1 of 2

Relevant SEPP Clause	Description	EA Section
12: Compatibility with other land uses	Consideration is given to: - the existing uses and approved uses of land in the vicinity of the development; - the potential impact on the preferred land uses (as considered by the consent authority) in the vicinity of the development; and - any ways in which the development may be incompatible with any of those existing, approved or preferred land uses. The respective public benefits of the development and the existing, approved or preferred land uses are evaluated and compared. Measures proposed to avoid or minimise any incompatibility are considered.	4.14.3.1
13: Compatibility with mining, petroleum production or extractive industry	Consideration is given to whether the development is likely to have a significant impact on current or future mining, petroleum production or extractive industry and ways in which the development may be incompatible. Measures taken by the applicant to avoid or minimise any incompatibility are considered. The public benefits of the development and any existing or approved mining, petroleum production or extractive industry must be evaluated and compared.	NR[1] NR[1] 4.14.3.2
14: Natural resource and environmental management	Consideration is given to ensuring that the development is undertaken in an environmentally responsible manner, including conditions to ensure: - impacts on significant water resources, including surface and groundwater resources, are avoided or minimised; - impacts on threatened species and biodiversity are avoided or minimised; and - greenhouse gas emissions are minimised and an assessment of the greenhouse gas emissions (including downstream emissions) of the development is provided.	4.3.5 & 4.4.7 4.5.6 4.9.7.2
15: Resource recovery	The efficiency of resource recovery, including the reuse or recycling of material and minimisation of the creation of waste, is considered.	2.5, 2.7 & 2.8

Table 3.4 (Cont'd)
Application of SEPP (Mining, Petroleum Production and Extractive Industries) 2007

Relevant SEPP Clause	Description	EA Section
16: Transportation	The following transport related issued are considered.	
	- The transport of some or all of the materials from the site by means other than public road.	2.9.3.4
	- Limitation of the number of truck movements that occur on roads within residential areas or roads near to schools.	4.11.4
	- The preparation of a code of conduct for the transport of materials on public roads.	4.11.4.8
17: Rehabilitation	The rehabilitation of the land affected by the development is considered including:	
	- the preparation of a plan that identifies the proposed end use and landform of the land once rehabilitated;	**Figure 2.18**
	- the appropriate management of development generated waste;	2.14.6
	- remediation of any soil contaminated by the development; and	2.14.6
	- the steps to be taken to ensure that the state of the land does not jeopardize public safety, while being rehabilitated or at the completion of rehabilitation.	2.13.1 & 2.14.6
Note 1: NR = Not relevant.		

The Proponent has consulted with the APA Group (Young Control Office) regarding the proposed works. APA Group noted that no specific licence is required to cross the gas pipeline, however, inspection of the detailed construction design and methodology by APA Group personnel would be required. In addition, supervision of the construction works in the vicinity of the pipeline by APA Group personnel would also be a requirement.

Road Infrastructure

Clause 101 of the Infrastructure SEPP identifies that where a development has a frontage to a classified road, development consent must not be granted unless the consent authority is satisfied that:

- vehicular access to the land is provided by a road other than the classified road;
- the safety, efficiency and ongoing operation of the classified road will not be adversely affected by the design of the vehicular access to the land, the emission of smoke or dust from the development or the nature, volume or frequency of vehicles using the classified road to gain access to the land; and
- the development is of a type that is not sensitive to adverse impacts from the classified road.

The Newell Highway is defined as a classified road. Access to the Mine Site, with the exception of emergency access, would be via Tomingley West Road which is not a classified road. In addition, the Project would, with the exception of required diversions during construction of the underpass, not result in adverse impacts on the operation of the Newell Highway. Similarly, the Newell Highway would not result in adverse impacts on the operation of the Project.

Telecommunication Infrastructure

Clause 115 of the Infrastructure SEPP identifies that development for the purposes of telecommunications facilities, may be carried out by any person with consent on any land. The Project would require relocation of a number of telecommunication cables, including a fibre optic cable operated by NextGen (see Section 2.2.8).

Railway Infrastructure

Finally, Clause 86 of the Infrastructure SEPP identifies that the determining authority for any development which involves the penetration of ground of more than 2m within a rail corridor must within give written notice within 7 days of the application to the chief executive officer of the rail authority for the rail corridor and take into consideration any response that is received within 21 days after the notice is given. The Project would require a horizontal borehole to be drilled under the Main Western Railway (controlled by ARTC) to accommodate the proposed water pipeline.

3.3.2.4 State Environmental Planning Policy (Rural Lands) 2008

The aims of State Environmental Planning Policy (Rural Lands) 2008 (Rural Lands SEPP), as considered relevant to the Project, are to:

> *(a) facilitate the orderly and economic use and development of rural lands for rural and related purposes; ……..*
>
> *(c) implement measures designed to reduce land use conflicts;*
>
> *(d) identify State significant agricultural land for the purpose of ensuring the ongoing viability of agriculture on that land, having regard to social, economic and environmental considerations; ……..*

Specifically, and as described in Clause 12, the Rural Lands SEPP aims to provide for the protection of agricultural land:

> *i) that is of State or regional agricultural significance, and*
>
> *ii) that may be subject to demand for uses that are not compatible with agriculture, and*
>
> *iii) if the protection will result in a public benefit.*

The Project is considered with respect to these aims.

- The land that would be affected by the Project (including the water pipeline) has not been identified as State or regional significant agricultural land by *Schedule 2* of the Rural Lands SEPP.
- The Project would require a relatively small proportion of the agricultural land in the locality and, as demonstrated at numerous other mine sites where agricultural activities are undertaken concurrently within mining, would not be incompatible with continued agricultural land use on and surrounding the Project Site.
- The protection of the land that is the subject of the Project would not provide any public benefit. In fact, the employment and local economic stimulus that would be generated by the Project would be of far greater public benefit than the current grazing.

As a result, the Rural Lands SEPP is not considered further in this document.

3.3.2.5 State Environmental Planning Policy No. 33 – Hazardous and Offensive Development

Hazardous and offensive industries, and potentially hazardous and offensive industries, relate to industries that, without the implementation of appropriate impact minimisation measures, would, or potentially would, pose a significant risk in relation to the locality, to human health, life or property, or to the biophysical environment.

In accordance with State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (SEPP 33), the hazardous materials to be held or used with the Project Site are required to be identified and classified in accordance with the risk screening method contained within the *Appendix 4* of *Applying SEPP 33 Consultation Draft July 2008* (DoP, 2008b). Hazardous materials are defined within that document as substances falling within the classification of the *Australian Code for the Transportation of Dangerous Goods by Road and Rail* (Dangerous Goods Code) (Department of Infrastructure, Transport, Regional Development and Local Government, 2009).

The Proponent notes that the potentially hazardous goods that would be used or stored within the Mine Site would include the following.

- Diesel and other hydrocarbons that would be stored and used in accordance with a comprehensive *Hydrocarbon Management Plan*.
- Liquid Petroleum Gas that would be stored on the Mine Site and used in the gas-fired heater of the elution column of the processing plant.
- Reagents, including sodium cyanide, caustic soda and hydrochloric acid, to be used within the processing plant. These materials would be transported, stored, used and disposed of in accordance with industry best practice and a *Reagent Management Plan*.

Appendix 3 presents a risk screening undertaken in accordance with the requirements of the above document. That risk screening indicates that the Project may be potentially hazardous based on the use, storage and transportation of sodium cyanide. As a result, a preliminary hazard analysis (PHA) has been undertaken and is also presented in **Appendix 3**.

The completion of the PHA identified that with the preparation of material and incident specific reagent and emergency management plans, implementation of effective communication and training, construction and use of appropriate structures or equipment to store or transport the materials and strict enforcement of restricted access to areas of potentially hazardous material storage, the risk associated with the transport, storage and use of the sodium cyanide would be tolerable, i.e. the associated risk would be acceptably low.

3.3.2.6 State Environmental Planning Policy No. 44 – Koala Habitat Protection

The Narromine and Parkes Local Government Areas (LGA) are identified in Schedule 1 of State Environmental Planning Policy No. 44 – Koala Habitat Protection SEPP 44) as LGA's that could provide habitat for Koalas. SEPP 44 requires an investigation be carried out to determine if core or potential Koala habitat is present on the areas of the Project Site likely to be disturbed. Core Koala habitat comprises land with a resident population of Koalas whereas potential Koala habitat comprises land with native vegetation with known Koala feed trees constituting at least 15% of the total number of trees present on a site. A review of previous recordings of Koala occurrence and local vegetation completed by OzArk (OzArk, 2011b) has confirmed that the Tomingley Narromine Water Pipeline represents potential Koala habitat for dispersing or transient individuals. Section 4.8.5.5 reviews the Project against Clauses 7, 8 and 9 of SEPP 44.

3.3.2.7 State Environmental Planning Policy No. 55 – Remediation of Land

State Environmental Planning Policy No. 55 – Remediation of Land (SEPP 55) requires that consent for any development cannot be granted unless the consent authority has considered whether the land is contaminated. If the land is contaminated, the consent authority must be satisfied that:

(a) the land is suitable in its contaminated state (or would be suitable, after remediation) for the purpose for which the development is proposed to be carried out; and/or

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

The prior land use history of the Mine Site is one primarily of agricultural operations and mineral exploration, neither of which is likely to result in contamination of the land. As a result, the Proponent is satisfied that no contaminated land occurs on the Project Site. SEPP 55 is therefore not considered further in this document.

3.3.3 Regional Planning Issues

3.3.3.1 Regional Planning Policies

No regional planning policies apply to the Project Site.

3.3.3.2 Regional Planning Guidelines

The Central West Catchment Management Authority (Central West CMA) *Catchment Action Plan 2006 – 2016* (CAP 2006 – 2016) represents a regional strategy document which should be considered in the planning and assessment of any development within the area managed by the Central West CMA. The CAP 2006 – 2016 is the strategic document that outlines the direction for actions within the catchment over the 10 year period 2006 to 2016. It sets the framework for this by specifying catchment and management targets that address key natural resource management issues in the catchment. **Plate 3.1** provides a one page summary of these targets (as issued by the Central West CMA).

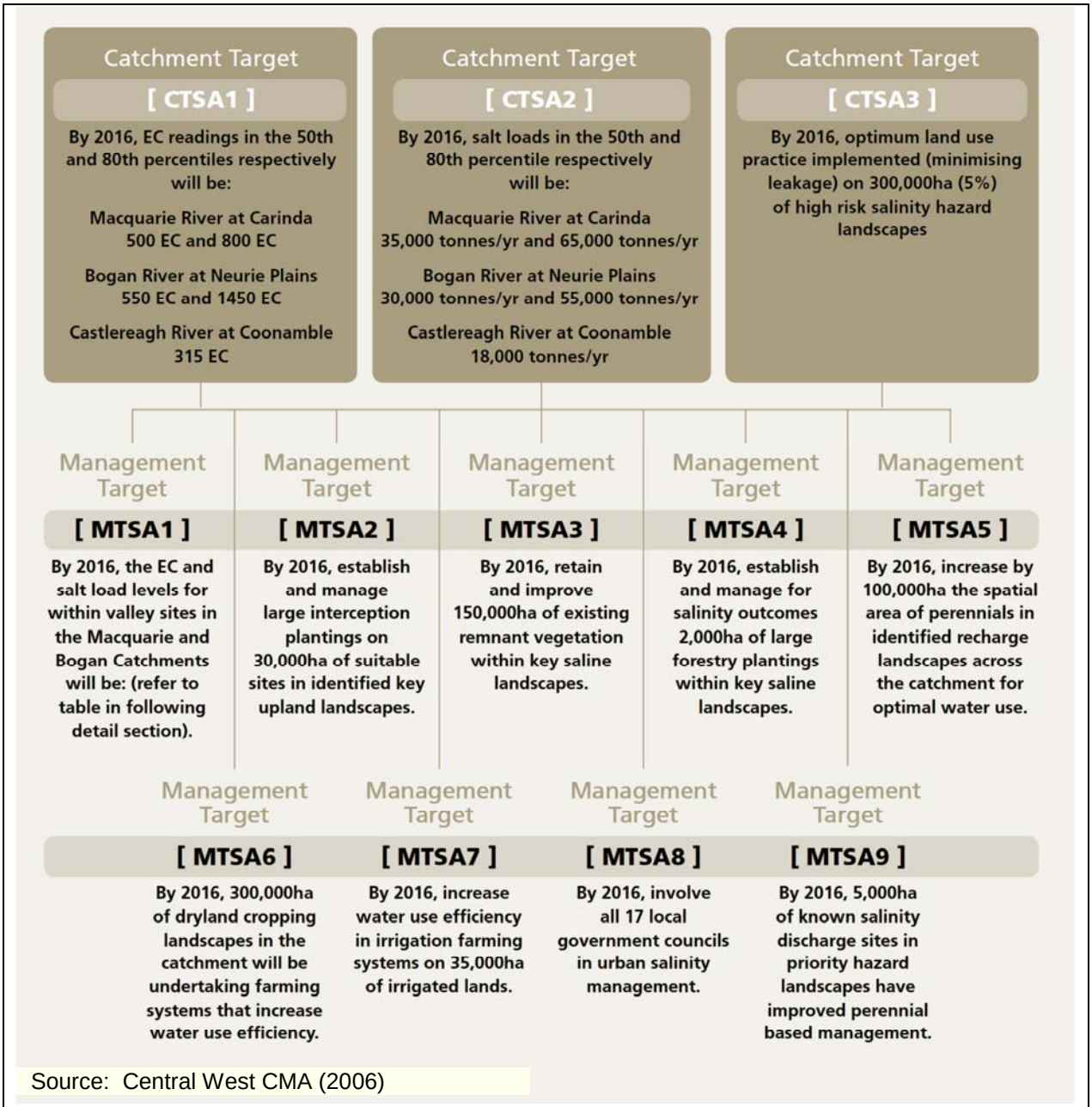
3.3.4 Local Planning Issues

3.3.4.1 Local Environment Plans

The Mine Site and Tomingley-Narromine Water Pipeline route occur within the Narromine Local Government Area (LGA). The permissibility of Project is therefore governed by the *Narromine Local Environment Plan 1997* ("Narromine LEP").

The Mine Site is zoned Zone 1(a) under the Narromine LEP (**Figure 1.2**). Clause 9 of the Narromine LEP identifies that the objectives of Zone 1(a) (General Rural) are as follows.

- *"to provide for an area of open rural character comprising agriculture, other primary industries and development consistent with a rural location,*



Source: Central West CMA (2006)

Plate 3.1
CENTRAL WEST CMA CATCHMENT ACTION PLAN 2006 – 2016 TARGETS

- *to prevent the development of prime agricultural land for purposes other than agriculture,*
- *to facilitate farm adjustments and encourage amalgamations of land to increase holding size,*
- *to provide for development of land for non-agricultural purposes in accordance with the need for that development if the development is not detrimental to productive and sustainable agriculture,*
- *to encourage the development of intensive agriculture enterprises which meet sustainable natural resource management principles,*

- *to protect agricultural enterprises from operational restraints caused by land use conflicts, especially those arising from pressure to maintain a level of amenity more appropriate for residential and hobby farming,*
- *to provide for dwelling-houses on holdings where such a use is justified considering the economic, environmental and socially sustainable nature of agriculture on the holdings,*
- *to permit supporting and compatible value-adding industries within the zone where not detrimental to existing or potential agricultural activities."*

Mining is permissible with consent within 1(a) zone.

Narromine Shire Council is currently working with Department of Planning and four adjoining Councils on Western Council's Sub Regional Land Use Strategy (GHD, 2009). This document acknowledges the Tomingley Gold Project and identifies several actions for Narromine Shire Council to facilitate this development within the Local Environment Plan.

The Tomingley-Narromine Water Pipeline route primarily occurs within road reserves, with minor sections of the route occurring within railway reserves or, in the northern and southern-most sections, within private land. The entire route is zoned Zone 1(a) under the Narromine LEP. Construction of infrastructure is permissible with consent within this zone.

3.3.4.2 Development Control Plans

There are no development control plans that apply to the Project.

3.3.4.3 Other Local Planning Issues

The Proponent expects to negotiate an agreement with Narromine Shire Council to contribute to the maintenance (and upgrade) of Tomingley West Road , which would be used by Project-related traffic. All other roads used to access the Mine Site are State roads and not subject to contribution requirements under the EP&A Act.

3.3.5 Environmental Guidelines

The DGRs require that in assessing the identified key assessment requirements, reference be made to one or more guideline documents. In addition, a number of the government agencies consulted in relation to the Project required reference to other environment guideline documents. **Table A2.2** of **Appendix 2** identifies each of these guidelines and identifies the relevant section of the *Environmental Assessment* or part of the *Specialist Consultant Studies Compendium* where they are considered and/or addressed.

3.4 IDENTIFICATION OF ENVIRONMENTAL ISSUES

Based on the results of the consultation undertaken and a review of relevant planning instruments and environmental guidelines, together with the preliminary results of the specialist consultant studies, the following issues of relevance to the Project have been identified.

- Air Quality.
- Aboriginal Heritage.
- Blasting/vibration.

- Biodiversity.
- Groundwater.
- Hazards (including Land Contamination, Waste Management and Bushfire).
- Noise.
- Socio-economic Climate (including Land Use).
- Soil and Land Capability.
- Surface Water/Erosion and Sedimentation.
- Traffic.
- Visual Amenity.

3.5 ANALYSIS OF ENVIRONMENTAL RISK AND ISSUE PRIORITISATION

3.5.1 Analysis of Environmental Risk

On identification of the environmental issues associated with the Project, a review of the Project design, the local environment and other factors was undertaken to identify the sources of potential environmental impacts and the risk associated with each. This sub-section presents an analysis of risk associated with each environmental issue in accordance with Australian Standards HB 203:2006 and AS/NZS 4360:2004 and through consideration of the likelihood and potential consequence(s) of the environmental impacts.

Risk is the chance of something happening that will have an impact upon the objectives or the task, which in this case is development and operation of the Project without impact on the local environment. Risk is measured in terms of consequence (severity) and likelihood (probability) of the event happening. For each identified environmental issue, the potential environmental impacts have been allocated a risk rating based on the potential consequences and likelihood of occurrence.

The allocation of a consequence rating was based on the definitions contained in **Table 3.5**. It is noted that the assigned consequence rating represents the highest level applicable, ie. if a potential impact is assigned a level of 4 - Major based on impact to the environment and 2 - Minor based on area of impact, the consequence level assigned would be 4 - Major.

The likelihood or probability of each impact occurring was then rated according to the definitions contained in **Table 3.6**.

The risk associated with each environmental impact was assessed without the inclusion of any operational controls or safeguards in place and is based on the qualitative assessment of consequence and likelihood, a risk ranking of either; low, medium, high or extreme was assigned to each potential impact based on the matrix presented in **Table 3.7**.

The four risk rankings are defined as follows.

Low (L): requiring a basic assessment of proposed controls and residual impacts. Any residual impacts are unlikely to have any major impact on the local environment or stakeholders.

Moderate (M): requiring a medium level assessment of proposed controls and residual impacts. It is unlikely to preclude the development of the Project but may result in impacts deemed unacceptable to some local or government stakeholders.

High (H): requiring in-depth assessment and high level documentation of the proposed controls and mitigation measures. Ultimately, this level of risk may preclude the development of the Project.

Extreme (E): requiring in-depth assessment and high level documentation of the proposed controls and mitigation measures and possible preparation of a specialised management plan. Unless considered to be adequately managed by the controls and/or management plan, this level of risk is likely to preclude the development of the Project

Table 3.5
Qualitative Consequence Rating

Level	Descriptor	Description
5	Catastrophic	• Massive and permanent detrimental impacts on the environment. • Very large area of impact. • Massive remediation costs. • Reportable to government agencies. • Large fines and prosecution resulting in potential closure of operation. • Severe injuries or death.
4	Major	• Extensive and/or permanent detrimental impacts on the environment. • Large area of impact. • Very large remediation costs. • Reportable to government agencies. • Possible prosecution and fine. • Serious injuries requiring medical treatment.
3	Moderate	• Substantial temporary or minor long term adverse impact to the environment. • Moderately large area of impact. • Moderate remediation costs. • Reportable to government agencies. • Further action may be requested by government agency. • Injuries requiring medical treatment.
2	Minor	• Minor detrimental impact on the environment. • Affects a small area. • Minimal remediation costs. • Reportable to internal management only. • No operational constraints posed. • Minor injuries which would require basic first aid treatment.
1	Insignificant	• Negligible and temporary detrimental impact on the environment. • Affects an isolated area. • No remediation costs. • Reportable to internal management only. • No operational constraints posed. • No injuries or health impacts.
Source: modified after HB 203:2006 (Standards Australia, 2006) - Table 4(B)		

Table 3.6
Qualitative Likelihood Rating

Level	Descriptor	Description
A	Almost Certain	Is expected to occur in most circumstances.
B	Likely	Will probably occur in most circumstances.
C	Possible	Could occur.
D	Unlikely	Could occur but not expected.
E	Rare	Occurs only in exceptional circumstances.
Source: HB 203:2006 (Standards Australia, 2006) - Table 4(A)		

Table 3.7
Risk Rating Matrix

Likelihood	Consequences				
	Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
A (Almost Certain)	H	H	E	E	E
B (Likely)	M	H	H	E	E
C (Possible)	L	M	H	E	E
D (Unlikely)	L	L	M	H	E
E (Rare)	L	L	M	H	H
Note: Rating modified after HB 203:2006 (Standards Australia, 2006) - Table 4(C)					

Table 3.8 provides an overview of risk sources and potential environmental impacts associated with the Project. This information is provided to inform the risk analysis presented in **Table 3.9.**

Table 3.9 provides an assessment of the unmitigated risk, namely the risk level in the absence of management and mitigation measures identified in Section 4, for each potential environmental impact identified in **Table 3.8**. The assessment of risk is based on the classifications and definitions provided in **Table 3.5** to **Table 3.7**. Where appropriate, and to provide a more realistic assessment of the risks posed by the various environmental issues, the environmental impacts have, in places, been further defined using either a level, range or scale of impact providing for the various circumstances which may apply. **Table 6.2** in Section 6.2.1 provides an analysis of risk following the implementation of the proposed management and mitigation measures.

3.5.2 Issue Prioritisation

Based on the issues identified and the risk ratings allocated to the potential environmental impacts of these, and a review of the issues considered 'key assessment requirements' of the DGRs, the following order of priority of environmental issues has been determined. This order of priority provides for the order of assessment in Section 4.

1. Noise.
2. Surface Water/Erosion and Sedimentation.
3. Groundwater.
4. Biodiversity.
5. Aboriginal Heritage.

6. Non-Aboriginal Heritage
7. Visual Amenity.
8. Air Quality.
9. Blasting.
10. Traffic.
11. Soil and Land Capability.
12. Hazards (including Waste Management, Land Contamination and Bushfire).
13. Socio-economic Climate (including Land Use).

It is noted that the inclusion of "Socio-economic Setting" at N^{o} 13 is not a direct consequence of the environmental risk analysis. Rather, it is included at N^{o} 13 to enable all other issues to be considered prior to the consideration of the socio-economic setting as this issue invariably is inter-related with many of the preceding issues. It is also noted that the issues associated with "Land Use" and "Land Contamination and Waste Management" are considered as part of the assessment of other issues such as water resources, soils, hazards and socio-economic setting.

The sources of potential environmental impacts nominated as having an associated high or extreme risk are discussed within relevant subsections within Section 4. All other issues generally allocated a "moderate" or "low" level of priority, have been addressed to the level considered appropriate throughout the *Environmental Assessment*.

Table 3.8
Risk Sources and Potential Environmental Impacts

Environmental Issue	Risk Source (s)	Receptor/Surrounding Environment	Potential Consequences	Potential Environmental Impacts
Groundwater	• Pollution of groundwater due to leaching of contaminants from the RSF. • Pollution of groundwater due to hydrocarbon leaks or spills.	• Local aquifer(s), including alluvial and fractured rock aquifers. • Surrounding landholders utilising bores or pumps.	• Decreased groundwater quality. • Detrimental impact on beneficial uses of groundwater.	• Reduced groundwater quality leading to reduction in beneficial uses of the water and therefore availability to existing groundwater users.
	• Reduction of groundwater levels due to mining intercepting aquifers.	• Local aquifer(s), including alluvial and fractured rock aquifers. • Groundwater bores of adjoining land owners (if within area of impact). • Groundwater dependent ecosystems (if present).	• Reduction in the quantity of water stored in local aquifer(s). • Decrease in availability of groundwater to adjoining land owners and/or groundwater dependent ecosystems.	• Reduction in the volume of water contained within the affected groundwater aquifer (drawdown of water table). • Reduced yields of local groundwater bores. • Reduced viability of groundwater dependent ecosystems.
	• Reduction in contribution to surface water flows.	• Local streams, and springs.	• Changes to local hydrological regime and surface flows.	• Reduced surface flows to Gundong and other creek catchments of the Bogan River. • Reduced viability of groundwater dependent ecosystems.
Surface Water/Flooding/ Erosion and Sedimentation	• Reduction in environmental flows as a result of on-site capture of water.	• Downstream water users. • Local flora and fauna.	• Reduced flows to downstream water users. • Reduced availability of water to local flora and fauna	• Reduced availability of water to downstream users. • Reduced environmental flows. • Stress to, and possible reduction in viability of native vegetation. • Degradation of aquatic habitats.
	• Discharge of dirty, saline or contaminated water.	• Local creeks and tributaries. • Soils and vegetation.	• Decreased water quality. • Contamination of soil resources.	• Pollution of downstream waters. • Stress to, and possible mortality of flora and/or fauna. • Reduced soil quality and associated reduction in viability of productive post-mining land use.
	• Discharge of contaminated water containing cyanide from the RSF.	• Local and regional catchment ecosystem.	• Introduction of a toxic compound to the environment. • Contamination of soil and water resources.	• Pollution of downstream waters. • Stress to, and possible mortality of flora and/or fauna. • Reduced soil quality and associated reduction in viability of productive post-mining land use.
	• Changes to hydrology of creeks and drainage lines.	• Local creeks and drainage lines.	• Reduced flows. • Changed alignment of hydrological flow.	• Reduced environmental flows within the Bogan River catchment. • Increased erosion potential resultant from changed alignment of flow. • Reduction in the quality of aquatic habitat.
	• Changes to the flood regimes of Gundong Creek.	• Gundong Creek and associated communities and ecosystems.	• Changes to frequency or intensity of local flooding.	• Increased erosion potential within Gundong Creek catchment. • Changes to vegetation community structure and habitat value. • Reduced viability of land uses on affected properties as a result of changes to flooding regime.
	• Erosive actions of water in undisturbed sections of the Mine Site • Erosive actions of water on disturbed sections of the Mine Site, including waste rock emplacement batters, prior to rehabilitation operations.	• Mine Site soils.	• Loss of soil resource.	• Excessive soil erosion. • Sedimentation of surrounding drainage lines and land. • Reduced success of Mine Site rehabilitation.
Biodiversity (Flora and Fauna)	• Direct impacts on native flora and fauna - clearing of vegetation.	• Vegetation within Project Site and area of influence. • Threatened species, populations and endangered ecological communities identified, known to occur, or considered as potentially occurring within the Project Site.	• Removal of habitat. • Removal/mortality of threatened species, populations and endangered ecological communities from the Project Site. • Reduction in the potential for future immigration of threatened species, populations and endangered ecological communities to the Project Site.	• Loss of, or alteration to, existing habitats. • Removal or mortality of individual species. • Local or regional reduction in distribution of threatened species, populations and endangered ecological communities. • Possible local extinction of threatened species, populations and endangered ecological communities.
	• Direct impacts on native flora and fauna - road kill.	• Local fauna.	• Injury / mortality of fauna.	• Mortality of individual species. • Local or regional reduction in distribution of threatened species, populations and endangered ecological communities.

Table 3.8 (Cont'd)
Risk Sources and Potential Environmental Impacts

Environmental Issue	Risk Source (s)	Receptor/Surrounding Environment	Potential Consequences	Potential Environmental Impacts
Biodiversity (Flora and Fauna) (Cont'd)	• Direct impacts on native fauna - pooling of contaminated water on the RSF.	• Local fauna (particularly avifauna).	• Ingestion of process water (containing cyanide) by local fauna and avifauna.	• Mortality of individual species. • Local or regional reduction in distribution of threatened species, populations and endangered ecological communities.
	• Indirect impacts on flora, fauna and fauna habitat, e.g. noise, dust etc.	• Local flora and fauna.	• Reduction in habitat quality.	• Alteration to, existing habitats. • Local or regional reduction in distribution of threatened species, populations and endangered ecological communities.
Aboriginal Heritage	• Removal or destruction of known Aboriginal sites and/or artefacts within the Project footprint (including Tomingley Narromine Water Pipeline route)	• Local archaeological setting.	• Damage or destruction of Aboriginal artefacts or site.	• Damage or destruction of Aboriginal artefacts.
	• Removal or destruction of currently unidentified Aboriginal sites and/or artefacts due to Project Site extraction and associated activities.	• Local archaeological setting.	• Damage or destruction of Aboriginal artefacts or site.	• Damage or destruction of Aboriginal artefacts.
European Heritage	• Removal or destruction of sites of heritage significance due to Project activities.	• Local archaeological setting.	• Loss or damage to heritage sites.	• Destruction of items of heritage significance.
Noise	• Increased noise levels resulting from operation of mobile equipment, crushing and screening equipment and product transportation.	• Surrounding residents, land owners and native fauna.	• Decreased amenity. • Impacts on the health and well-being of local residents. • Decreased land values. • Detrimental effects on local fauna	• Increased noise levels associated with Project activities (≤5dBA above noise criteria) causing annoyance, distractions, i.e. amenity impacts. • Increased noise levels associated with Project activities (>5dBA above noise criteria) causing more significant amenity impacts. • Sleep disturbance as a result of maximum noise levels. • Increased noise levels associated with the Project leading to impacts on local fauna assemblage.
Blasting	• Ground vibration from mine blasting. • Airblast Overpressure from mine blasting (air vibration) •	• Houses and building structures in Tomingley. • Newell Highway. • Historic underground mine workings. • Surrounding landowners. • Livestock. • Other infrastructure and equipment.	• Damage to residences, buildings and other structures. • Reduced local amenity. • Local livestock losses during breeding (lambing/foaling/calving).	• Structural damage to buildings, structures and other infrastructure, e.g. telecommunication cables. • Subsidence of land in the village of Tomingley (as a consequence of collapse / subsidence of historic Tomingley Mine workings). • Nuisance/amenity impacts on surrounding landowners / residents. • Loss of income to livestock producers. • Disrupted communication services.
	• Fugitive fly rock from blasting.	• Houses and building structures in Tomingley. • Newell Highway. • Mine Site personnel and general public.	• Injury or damage caused by fly rock. • Disruption to traffic on the Newell Highway.	• Personal injury. • Disrupted traffic on the Newell Highway.
Air Quality – Dust, Odour and Greenhouse Gas	• Dust generation resulting from: – vehicle movements on unsealed roads; – fixed plant, including crushing operations; – blasting operations; and – wind action on disturbed areas, overburden emplacements and stockpiles.	• Surrounding residences and buildings. • Surrounding native vegetation. • Local residents. • Newell Highway	• Increased deposited and suspended particulates. • Health-related complaints. • Reduced visual amenity. • Reduced visibility for highway traffic	• Nuisance/amenity impacts from dust deposited on window sills, cars, surfaces etc. • Adverse health impacts (if PM_{10} levels are excessive). • Stress of native vegetation, and indirect impacts on fauna habitat. • Reduced road safety.
	• Greenhouse gas emissions.	• Local and global air-shed	• Increased greenhouse and other gas emissions.	• Increased contribution to greenhouse effect.
Traffic and Transport (off site)	• Road construction activities, e.g. entrance to the Mine Site and Newell Highway Underpass.	• Local landforms and road network. • Local and highway traffic.	• Impacts associated with road construction (noise, dust, ecology, heritage etc.). • Alterations to contours which can impact surface water flows during flooding (particularly down Tomingley West Road). • Minor traffic delays during construction of intersection and underpass.	• See "*air pollution*", "*flora and fauna protection*" and "*noise*" and "*Aboriginal heritage*" above. • Temporary inconvenience to commuters (if delayed for road works). • Change to existing floodways

Table 3.8 (Cont'd)
Risk Sources and Potential Environmental Impacts

Environmental Issue	Risk Source (s)	Receptor/Surrounding Environment	Potential Consequences	Potential Environmental Impacts
Traffic and Transport (off site) (Cont'd)	• Increased traffic levels due to movement of workforce and contractors.	• Local and regional road network. • Existing road users.	• Increased vehicle movements (especially heavy vehicles) on local roads.	• Increased traffic congestion and or traffic delays. • Elevated risk of accident/incident on local roads.
	• Increased heavy vehicle movements.			• Road pavement deterioration.
	• Transportation of oversize of overweight loads.		• Potential damage to the road network due to oversize or overweight loads.	• Road pavement deterioration.
	• Transportation of dangerous or hazardous goods.		• Transport incident involving dangerous or hazardous goods.	• Water or land contamination as a result of a spill of dangerous or hazardous goods.
Visual Amenity	• Changes in visual characteristics of the Mine Site. •	• Surrounding residents. • Highway motorists.	• Clearing of native vegetation and visibility of the Mine Site activities, e.g. earthworks, stockpiles, processing plant. • Mine 'glow'.	• Changes to local visual amenity for the life of the Project. • Unsightly landform at the completion of the Project. • Reduced night time amenity caused by lighting. • Distraction to traffic resulting in accidents/incidents.
Soil Resources	• Reduction in soil quality through poor soil stripping, stockpiling or spreading practices.	• Mine Site soils.	• Structural damage to soils through poor soil management practices. • Reduced biological activity of soils.	• Insufficient soil quantities for rehabilitation. • Reduced soil quality resulting in poor rehabilitation or inability to achieve nominated final land capability.. • Increased erosion hazard compared with original landform
	• Increased erosion or erosion potential of soils.	• See "erosion and sedimentation" above.	• See "erosion and sedimentation" above.	• See "erosion and sedimentation" above.
Rehabilitation and Final Landform	• Temporary and permanent changes to the landform of the Project Site.	• Project Site land surrounding land owners and/or residents.	• Reduced productivity of land for agricultural production. • Alteration to local land use and change to local biodiversity.	• Altered final landform not compatible with activities/lifestyle of adjoining land owners. • Reduced productivity of land for agricultural production as post-mining land use. • Increased local biodiversity.
	• Unstable or eroding final landform.		• Removal of valuable topsoil resources from the rehabilitated landform.	• Increased sedimentation of drainage from the Mine Site. • Reduced stability of the final landform.
Waste Management	• Production of contaminating or polluting materials, eg. waste oils, saline water, tailings, general rubbish.	• Mine Site land and water resources. • Downstream land and water resources. • Local and regional groundwater. • Local waste receival depots	• Contamination of surface water. • Contamination of groundwater. • Contamination of land. • Reduced visual amenity. • Increased pressure on waste management facilities, e.g. landfills.	• Hydrocarbon or other pollutant contamination of surface water. • Hydrocarbon or other pollutant contamination of groundwater. • Contamination of local water and/or soil resources by leaking or spilt residue. • Reduced amenity of Project Site due to poor rubbish, litter management.
	• Acid Mine Drainage from mineralised waste rock		• Contamination of downstream surface water. • Contamination of groundwater. • Contamination of downstream lands.	• Reduced viability of remnant or rehabilitated vegetation. • Stress to, or mortality of local flora and fauna. • Reduced productivity of land.
Land Contamination	• Extraction exposing previously contaminated materials.	• Areas receiving contaminated material (including surface waters).	• Transfer of contaminated materials to non-contaminated areas.	• Transfer of contaminated material. • Surface water contamination.
Bushfire	• Initiation of fire on the Mine Site and spread to adjoining properties.	• Mine Site personnel and equipment. • Mine Site and adjoining land (stock, crops, property).	• Health and safety impacts to project personnel. • Damage to Project Site equipment. • Damage to adjoining properties (including livestock and crops) and/or native vegetation.	• Injury or health impacts on project personnel. • Operational constraint posed by damaged equipment. • Destruction/damage of native vegetation and fauna habitat. • Loss of livestock, crops and property on neighbouring land
Socio-Economic Impacts	• Alteration of social activities or employment due to employment generation and capital expenditure.	• Local community and businesses. • Local Government (mainly NSC and to a lesser extent PSC).	• Reduced unemployment and increased local spending. • Additional population for schools and community services. • Reduced community self-relience (due to Proponent contributions) • Rental opportunities for vacant farm houses	• Increased economic activity and related social impacts attributable to reduced unemployment • Loss of local farm workers and tradespeople to work on the mine. • Increased resilience in local community through diversitfication and capacity building.

Table 3.8 (Cont'd)
Risk Sources and Potential Environmental Impacts

Environmental Issue	Risk Source (s)	Receptor/Surrounding Environment	Potential Consequences	Potential Environmental Impacts
Socio-Economic Impacts (Cont'd)	• Perceived or real impacts on local amenity of neighbouring properties.	• Surrounding property owners.	• Reduced property values. • Increased property values. • Reduced amenity value of landholdings.	• Reduced quality of life (actual or perceived). • Immigration of some workers and families wanting to live closer to the Project.
Source: Modified after HB203:2006 (Standards Australia, 2006) - Table 3				

Table 3.9
Analysis of Unmitigated Environmental Risk

Risk Source	Potential Environmental Impact (Type/Level/Scale provided if applicable)	Consequence of Occurrence if not Mitigated	Likelihood of Occurrence if not Mitigated	Unmitigated Risk Rating
Groundwater				
Pollution of groundwater due to leaching of contaminants from the RSF	Reduced groundwater quality leading to reduction in beneficial uses of the water and therefore availability to existing groundwater users	4	D	H
Pollution of groundwater due to hydrocarbon spills	Contamination requiring minor recovery works.	3	D	M
	Contamination requiring major recovery works.	4	D	H
Reduction of groundwater levels due to mining intercepting aquifers	Reduction in the volume of water contained within the affected groundwater aquifer (drawdown of water table).	2	A	H
	Reduced yields of local groundwater bores.	2	C	M
	Reduced viability of groundwater dependent ecosystems.	2	E	L
Reduction in groundwater bore yields	Reduced yields in the groundwater bores of the Gundong Creek Alluvium.	3	E	M
	Reduced yields in the groundwater bores of the fractured rock aquifers.	2	C	M
Reduction in contribution to surface water flows.	Reduced surface flows to Gundong and other creek catchments of the Bogan River.	2	D	L
	Reduced viability of groundwater dependent ecosystems.	3	E	M
Surface Water / Flooding / Erosion and Sedimentation				
Reduction in environmental flows as a result of on-site capture of water.	Reduced availability of water to downstream users.	2	C	M
	Reduced environmental flows.	2	D	L
	Stress to, and possible reduction in viability of native vegetation.	2	D	L
	Degradation of aquatic habitats.	3	E	M
Discharge of dirty, saline or contaminated water.	Pollution of downstream waters.	3	C	H
	Stress to, and possible mortality of flora and/or fauna.	3	C	H
	Reduced soil quality and associated reduction in viability of productive post-mining land use.	2	C	M
Discharge of contaminated water containing cyanide from the RSF.	Pollution of downstream waters.	3	C	H
	Stress to, and possible mortality of flora and/or fauna.	3	C	H
	Reduced soil quality and associated reduction in viability of productive post-mining land use.	2	C	M

Table 3.9 (Cont'd)
Analysis of Unmitigated Environmental Risk

Risk Source	Potential Environmental Impact (Type/Level/Scale provided if applicable)	Consequence of Occurrence if not Mitigated	Likelihood of Occurrence if not Mitigated	Unmitigated Risk Rating
Surface Water / Flooding / Erosion and Sedimentation (Cont'd)				
Changes to hydrology of creeks and drainage lines.	Reduced environmental flows within the Bogan River catchment.	1	B	M
	Increased erosion potential resultant from changed alignment of flow.	2	B	H
	Reduction in the quality of aquatic habitat.	3	E	M
Changes to the flood regimes of Gundong Creek.	Increased erosion potential within Gundong Creek catchment.	2	C	M
	Changes to vegetation community structure and habitat value.	2	D	L
	Reduced viability of land uses on affected properties as a result of changes to flooding regime.	2	C	M
Erosive actions of water in undisturbed sections of the Mine Site	Excessive soil erosion.	2	C	M
	Sedimentation of surrounding drainage lines and land.	2	C	M
Erosive actions of water on disturbed sections of the Mine Site, including waste rock emplacement batters, prior to rehabilitation operations.	Excessive soil erosion.	2	C	M
	Sedimentation of surrounding drainage lines and land.	2	C	M
	Reduced success of Mine Site rehabilitation.	3	C	H
Biodiversity (Flora and Fauna)				
Direct impacts on native flora and fauna - clearing of vegetation.	Loss of, or alteration to, existing habitats.	3	A	E
	Removal or mortality of individual species.	3	A	E
	Local or regional reduction in distribution of threatened species, populations and endangered ecological communities.	4	E	H
	Possible local extinction of threatened species, populations and endangered ecological communities.	4	E	H
Direct impacts on native flora and fauna - road kill.	Mortality of individual species.	2	C	M
	Local or regional reduction in distribution of threatened species, populations and endangered ecological communities.	3	D	M
Direct impacts on native fauna - pooling of contaminated water on the RSF.	Mortality of individual species.	3	C	H
	Local or regional reduction in distribution of threatened species, populations and endangered ecological communities.	3	D	M
Indirect impacts on flora, fauna and fauna habitat, e.g. noise, dust etc.	Alteration to existing habitats.	3	D	M
	Local or regional reduction in distribution of threatened species, populations and endangered ecological communities.	3	E	M

Table 3.9 (Cont'd)
Analysis of Unmitigated Environmental Risk

Risk Source	Potential Environmental Impact (Type/Level/Scale provided if applicable)	Consequence of Occurrence if not Mitigated	Likelihood of Occurrence if not Mitigated	Unmitigated Risk Rating
Aboriginal Heritage				
Removal or destruction of known Aboriginal sites and/or artefacts within the Project footprint (including Tomingley Narromine Water Pipeline route)	Damage or destruction of Aboriginal artefacts.	3	B	H
Removal or destruction of currently unidentified Aboriginal sites and/or artefacts due to Project Site extraction and associated activities.	Damage or destruction of Aboriginal artefacts.	3	C	H
European Heritage				
Removal or destruction of sites of heritage significance due to Project activities.	Destruction of items of heritage significance.	1	B	M
Noise				
Increased noise levels resulting from operation of mobile equipment, crushing and screening equipment and product transportation.	Increased noise levels associated with Project activities (≤5dBA above noise criteria) causing annoyance, distractions, i.e. amenity impacts.	2	B	H
	Increased noise levels associated with Project activities (>5dBA above noise criteria) causing more significant amenity impacts.	3	B	H
	Sleep disturbance as a result of maximum noise levels.	3	B	H
	Increased noise levels associated with the Project leading to impacts on local fauna assemblage.	2	C	M
Blasting / Vibration				
Ground vibration from mine blasting. Airblast Overpressure from mine blasting (air vibration)	Structural damage to buildings, structures and other infrastructure, e.g. telecommunication cables.	4	C	E
	Subsidence of land in the village of Tomingley (as a consequence of collapse / subsidence of historic Tomingley Mine workings).	4	D	H
	Nuisance/amenity impacts on surrounding landowners / residents.	2	C	M
	Loss of income to livestock producers.	3	E	M
	Disrupted communication services.	2	D	L
Fugitive fly rock from blasting.	Personal injury.	5	E	H
	Disrupted traffic on the Newell Highway.	3	C	H

Table 3.9 (Cont'd)
Analysis of Unmitigated Environmental Risk

Risk Source	Potential Environmental Impact (Type/Level/Scale provided if applicable)	Consequence of Occurrence if not Mitigated	Likelihood of Occurrence if not Mitigated	Unmitigated Risk Rating
Air Quality – Dust, Odour and Greenhouse Gas				
Dust generation resulting from: - vehicle movements on unsealed roads; - fixed plant, including crushing operations; - blasting operations; and - wind action on disturbed areas, overburden emplacements and stockpiles.	Nuisance/amenity impacts from dust deposited on window sills, cars, surfaces etc.	2	C	H
	Adverse health impacts (if PM_{10} levels are excessive).	3	C	H
	Stress of native vegetation, and indirect impacts on fauna habitat.	2	D	L
	Reduced road safety.	3	E	M
Greenhouse gas emissions.	Increased contribution to greenhouse effect.	2	C	M
Traffic and Transport				
Road construction activities, e.g. entrance to the Mine Site and Newell Highway Underpass.	See "*air pollution*", "*flora and fauna protection*" and "*noise*" and "*Aboriginal heritage*" above.			
	Temporary inconvenience to commuters (if delayed for road works).	2	C	M
	Change to existing floodways	2	C	M
Increased traffic levels due to movement of workforce and contractors.	Increased traffic congestion and or traffic delays.	2	D	L
	Elevated risk of accident/incident on local roads.	4	E	H
Increased heavy vehicle movements.	Road pavement deterioration.	2	C	M
Transportation of oversize of overweight loads.	Road pavement deterioration.	2	C	M
Transportation of dangerous or hazardous goods.	Water or land contamination as a result of a spill of dangerous or hazardous goods.	3	D	M
Visual Amenity				
Changes in visual characteristics of the Mine Site.	Changes to local visual amenity for the life of the Project.	2	A	H
	Unsightly landform at the completion of the Project.	2	A	H
	Reduced night time amenity caused by lighting.	2	C	M
	Distraction to traffic resulting in accidents/incidents.	3	E	M

Table 3.9 (Cont'd)
Analysis of Unmitigated Environmental Risk

Risk Source	Potential Environmental Impact (Type/Level/Scale provided if applicable)	Consequence of Occurrence if not Mitigated	Likelihood of Occurrence if not Mitigated	Unmitigated Risk Rating
Soil Resources				
Reduction in soil quality through poor soil stripping, stockpiling or spreading practices.	Insufficient soil quantities for rehabilitation.	2	D	L
	Reduced soil quality resulting in poor rehabilitation or inability to achieve nominated final land capability.	3	C	H
	Increased erosion hazard compared with original landform.	2	C	M
Increased erosion or erosion potential of soils.	See "erosion and sedimentation" above.			
Hazards - Waste Management				
Production of contaminating or polluting materials, eg. waste oils, saline water, tailings, general rubbish.	Hydrocarbon or other pollutant contamination of surface water.	3	C	H
	Hydrocarbon or other pollutant contamination of groundwater.	3	D	M
	Contamination of local water and/or soil resources by leaking or spilt residue.	3	D	M
	Reduced amenity of Project Site due to poor rubbish, litter management.	2	C	M
Acid Mine Drainage from mineralised waste rock	Reduced viability of remnant or rehabilitated vegetation.	3	E	M
	Stress to, or mortality of local flora and fauna.	3	E	M
	Reduced productivity of land.	3	E	M
Hazards - Land Contamination				
Extraction exposing previously contaminated materials.	Transfer of contaminated material.	3	E	M
	Surface water contamination.	3	E	M
Hazards - Bushfire				
Initiation of fire on the Mine Site and spread to adjoining properties.	Injury or health impacts on project personnel.	4	E	H
	Operational constraint posed by damaged equipment.	3	E	M
	Destruction/damage of native vegetation and fauna habitat.	2	E	M
	Loss of livestock, crops and property on neighbouring land	3	E	M
Socio-Economic Impacts (including Land Use)				
Temporary and permanent changes to the landform of the Project Site.	Altered final landform not compatible with activities/lifestyle of adjoining land owners.	3	C	H
	Reduced productivity of land for agricultural production as post-mining land use.	3	C	H
	Increased local biodiversity.	Positive Impact		
Unstable or eroding final landform.	Increased sedimentation of drainage from the Mine Site.	3	C	H
	Reduced stability of the final landform.	3	D	M

Table 3.9 (Cont'd)
Analysis of Unmitigated Environmental Risk

Risk Source	Potential Environmental Impact (Type/Level/Scale provided if applicable)	Consequence of Occurrence if not Mitigated	Likelihood of Occurrence if not Mitigated	Unmitigated Risk Rating
Socio-Economic Impacts (including Land Use) (cont'd)				
Alteration of social activities or employment due to employment generation and capital expenditure.	Increased economic activity and related social impacts attributable to reduced unemployment	Positive Impact		
	Loss of local farm workers and tradespeople to work on the mine.	2	C	M
	Increased resilience in local community through diversification and capacity building.	Positive Impact		
Perceived or real impacts on local amenity of neighbouring properties.	Reduced quality of life (actual or perceived).	3	C	H
	Immigration of some workers and families wanting to live closer to the Project.	2	C	M

Consequence of Occurrence: 1 = Insignificant; 2 = Minor; 3 = Moderate; 4 = Major; 5 = Catastrophic
Likelihood of Occurrence: A = Almost Certain; B = Likely; C = Possible; D = Unlikely; E = Rare
Risk Rating: E = Extreme; H = High; M = Moderate; L = Low

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