

BARRICK AUSTRALIA LIMITED E42 MODIFICATION

E42 Modification Overview and Preliminary Assessment



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1 INTRODUCTION

1.1 PURPOSE OF THIS DOCUMENT

This document provides a description of the proposed modification to the Cowal Gold Mine and is a component of a request for the Minister for Planning's approval (Modification Request) pursuant to Section 75W of Part 3A of the *Environmental Planning and Assessment Act, 1979* (EP&A Act). Barrick Australia Limited (Barrick) is the owner and operator of the Cowal Gold Mine.

Development Consent for the Cowal Gold Mine was issued by the Minister for Urban Affairs and Planning in 1999 under Part 4 of the EP&A Act. In accordance with Clause 8J(8)(a) of the *Environmental Planning and Assessment Regulation, 2000* (EP&A Regulation), the currently approved Cowal Gold Mine would satisfy the requirements to qualify as a Major Project Part 3A of the EP&A Act and, therefore, an application for approval under Section 75W of the EP&A Act is considered appropriate.

Consistent with *Steps in the Assessment and Approval of Major Projects under Part 3A* (the Draft Major Project Guideline) (DIPNR, 2005a), this E42 Modification Overview and Preliminary Assessment provides the information outlined in Table 1.

Table 1
Draft Major Project Guideline Requirements – Reference Summary

Draft Major Project Guideline Requirement*	Modification Request Reference
Information to confirm that the project is a project to which Part 3A of the EP&A Act applies.	Section 2
Information to confirm whether a Concept Plan will be required or authorised by the Minister.	Not applicable
A description of the modification and any ancillary components.	Section 1.3
The location and a map identifying the site.	Section 1.3.1 and Figure 1
The capital investment value and other relevant information in relation to parameters set out in the <i>State Environmental Planning Policy (SEPP) (Major Projects), 2005</i> (Major Projects SEPP) for determining whether Part 3A of the EP&A Act applies to the E42 Modification.	Sections 1.3.2 and 1.3.4
The planning provisions applying to the site.	Section 2
The views of other agencies, local council or the community if known.	Section 3
Any other approvals required. In particular, if a licence from the Department of Environment and Climate Change (DECC) is required under the <i>Protection of the Environment Operations Act, 1997</i> (POEO Act).	Section 2.1
Justification as to why the project should be considered to be a major project under Part 3A of the EP&A Act, taking into consideration the relevant criteria.	Section 2
A Preliminary Assessment to identify the likely environmental issues.	Section 4

*Adapted from DIPNR (2005a).

The Preliminary Assessment (Section 4) identifies key environmental assessment issues, and provides a brief analysis of the likely extent and nature of potential impacts and the level and scope to be undertaken for the Environmental Assessment (EA) for the proposed modification.

The Preliminary Assessment has been undertaken consistent with the draft *Guideline: What is the Level and Scope of Assessment for Major Projects? Preliminary Assessment* (the Draft Preliminary Assessment Guideline) (DIPNR, 2005b).

1.2 BACKGROUND

The Cowal Gold Mine is owned by Barrick and is located approximately 38 kilometres (km) north-east of West Wyalong, New South Wales (NSW) (Figure 1).

The Minister for Urban Affairs and Planning granted Development Consent (DA 14/98) for the Cowal Gold Mine, subject to conditions, on 26 February 1999. The Development Consent has been modified on four occasions *viz.* 11 August 2003, 22 December 2003, 4 August 2004 and 23 August 2006.

Construction commenced on 12 January 2004. Mining operations commenced in April 2005 and ore processing commenced in April 2006.

1.3 DESCRIPTION OF PROPOSED MODIFICATION

Barrick is proposing to modify a number of components of the Cowal Gold Mine. The proposed modification to the Cowal Gold Mine (herein referred to as the E42 Modification) is described in further detail below.

1.3.1 Location

The area of land to which the Development Consent is relevant includes Mining Lease (ML) 1535, water supply pipeline and borefield shown on Figure 1 and described in Table 2.

Table 2
Formal Particulars of Land Subject to the Development Consent

Lot/DP	Landholder
Part Lot 2 DP 530299	Barrick
Part Lot 23 DP 753097	Barrick
Part Lot 24 DP 753097	Barrick
Part Lot 25 DP 753097	Barrick
Lot 45 DP 753083	Barrick
Lot 7 DP 753083	Barrick
Lot 3 DP 753083	Barrick
Part Lot 11 DP 753083	Barrick
Part Lot 12 DP 753083	Barrick
Lot 4 DP 753083	Barrick
Lot 9 DP 753083	Barrick
Lot 44 DP 753083	Barrick
Lot 10 DP 753083	Barrick
Part Lot 38 DP 39733	Barrick
Part Lot 37 DP 39733	Crown
Part of former Travelling Stock Reserve 17085	Crown
Former Game Reserve 509	Crown
Crown Land adjacent to Burcher Road	Crown
Lot 18 DP 753097	I.W. Low
Lot 44 DP 42918	B. Mattiske
Lot 45 DP 42918	Crown
Lot 46 DP 42918	B. Mattiske

Table 2 (Continued)
Formal Particulars of Land Subject to the Development Consent

Lot/DP	Landholder
Lot 47 DP 42918	Crown
Part of Lot 91 DP 753077	A. Fuge and M. Fuge
Various public roads	Forbes Shire Council
Crown Road Reserves	Crown

All components of the E42 Modification would be located within the area to which the Development Consent is relevant.

The ML 1535 area encompasses approximately 2,650 hectares (ha) and is centred within a larger exploration licence (EL) (EL 5616) also held by Barrick. Approximately 4,600 ha of Barrick-owned land is situated within Lake Cowal. Lake Cowal is an ephemeral lake fed by its major tributary, Bland Creek, and by large, but infrequent, south-westerly flood flows from the Lachlan River near Jemalong Weir. The current landuse of Barrick-owned land is mining, grazing and cropping.

Crown land within ML 1535 includes part of former Travelling Stock Reserve 17085 and former Game Reserve 509.

ML 1535 is located on lands designated Zone 1(a) (General Use Zone) under the *Bland Local Environment Plan 1993*.

1.3.2 Modification Summary

Table 3 provides a comparative summary of the key approved Cowal Gold Mine components and the proposed E42 Modification.

Table 3
Approved Cowal Gold Mine and E42 Modification

Development Component	Approved Cowal Gold Mine	E42 Modification
Proponent	Barrick.	No change.
Tenement Status	Barrick is the current holder of ML 1535 and EL 5616. The ML area encompasses approximately 2,650 ha.	No change.
Mining	Open pit mine producing a total of approximately 2.7 million ounces (Moz) of gold from some 76 million tonnes (Mt) of ore. Gold extracted from the ore using a conventional carbon-in-leach cyanide leaching circuit.	Open pit mine with an optimal increased production total of approximately 3.5 Moz of gold from 129 Mt of ore. No change to the gold extraction methods.
Life of Mine	13 year operational life composed of an eight year mining and processing phase followed by a five year mineral processing phase.	Increased operational mine life of 20 years (from commencement of works associated with the E42 Modification), composed of a 14 year mining and mineral processing phase followed by an six year mineral processing phase.
Ore Processing	Ore processing rate of up to 6.9 million tonnes per annum (Mtpa).	Increased ore processing rate of up to 7.5 Mtpa.
Open Pit	Open pit area of approximately 70 ha. Final pit with a surface area approximately 1,000 metres (m) long, 850 m wide and 325 m deep.	Increased open pit area to approximately 130 ha. Final pit with an increased surface area to approximately 1,250 m long, 1,350 m wide and 440 m deep.

Table 3 (Continued)
Approved Cowal Gold Mine and E42 Modification

Development Component	Approved Cowal Gold Mine	E42 Modification
Waste rock emplacement	<p>Approximately 128 Mt of mined waste rock. Waste rock emplacements constructed to a relative level (RL) of 1,243 m (northern emplacement) and 1,223 m (perimeter and southern emplacements).</p> <p>Northern, perimeter and southern waste rock emplacements cover an area of approximately 315 ha.</p>	<p>Increase in the total quantity of mined waste rock produced to approximately 184 Mt.</p> <p>Increase in the height and footprint of the northern waste rock emplacement to a final RL of 1,255 m and area of approximately 320 ha.</p> <p>Increase in the height of the southern waste rock emplacement to a final RL of 1,255 m.</p> <p>Increase in the total waste rock emplacement area to approximately 500 ha.</p>
Tailings storage	<p>Approximately 76 Mt of tailings produced over the life of the mine. Tailings stored in two tailings storage facilities located approximately 3.5 km west of the Lake Cowal shoreline.</p> <p>Northern and southern tailings storage facilities constructed to a RL of 1,233.5 m and 1,241.5 m, respectively.</p> <p>The tailings storage facilities cover an area of approximately 350 ha.</p>	<p>Increase in the volume of tailings to be produced over the life of the mine to approximately 140 Mt.</p> <p>Increase in the height of the northern and southern tailings storage facilities to RL 1,252 m and 1,256 m, respectively.</p> <p>No change to the total storage area or location of the tailings storages facilities.</p>
Process plant and infrastructure	The process plant and associated infrastructure cover an area of approximately 25 ha.	No change.
Run-of-mine (ROM) pad	Situated immediately north of the process plant area, the ROM ore stockpile pad covers an area of approximately 5 ha.	No change.
Low grade ore stockpile	The low grade ore stockpile adjoins the western side of the ROM pad, extending over an area of approximately 35 ha.	Increase in the size of the low grade ore stockpile, to extend over an area of approximately 60 ha.
Power supply	Electricity to the site via a 132 kilovolt (kV) transmission line from Temora, approximately 90 km south of the Cowal Gold Mine area.	No change.
Water Supply	<p>Water supply requirements are met through the use of waters from the following sources:</p> <ol style="list-style-type: none"> 1. Tailings storage facilities. 2. Contained water storages within the ML. 3. Open pit dewatering borefield; 4. Lachlan River water entitlements supplied via the Jemalong irrigation channel. 5. Bland Creek Palaeochannel borefield. 	No change to the current water supply arrangements except where augmentation sources are identified as being available.
Site Access Road	Site access road following existing roads from West Wyalong to the Project area.	No change.
Employment	Approximately 200 personnel during the mining and processing phase. At the completion of mining, employee numbers decline to about 90.	Approximately 315 personnel during the mining and processing phase.
Hours of Operation	Mine operations 24 hours per day, seven days a week.	No change.

The conceptual general arrangement for the E42 Modification is shown on Figure 2.

1.3.3 Proponent

The registered and principal office for Barrick is:

Barrick Australia Limited
Level 10/2 Mill Street
PERTH WA 6000

The contact details for the Cowal Gold Mine are:

Barrick Australia Limited
PO Box 210
WEST WYALONG NSW 2671

Telephone: (02) 6975 4700

1.3.4 Capital Investment

The estimated total capital cost over the anticipated life of the Cowal Gold Mine, including the E42 Modification, is approximately AUD \$750 million (M).

2 PLANNING PROVISIONS AND PROJECT APPROVAL CONSIDERATIONS

Existing Development Consent

As stated in Section 1.2, Barrick currently holds a Development Consent for the Cowal Gold Mine. The Development Consent has been modified on four occasions viz. 11 August 2003, 22 December 2003, 4 August 2004 and 23 August 2006.

Proposed Modification to the Development Consent

The EP&A Act and EP&A Regulation set the framework for planning and environmental assessment in NSW. Part 3A of the EP&A Act commenced on 1 August 2005 (i.e. after the Development Consent for the Cowal Gold Mine was granted) and provides an approval process that is particularly adopted for major projects in NSW. Modification of the Development Consent is sought under Section 75W of Part 3A of the EP&A Act. The Development Consent, if so modified, would not become an approval under Part 3A of the EP&A Act.

Section 75W of the EP&A Act relevantly states:

75W Modification of Minister's approval

(1) *In this section:*

Minister's approval means an approval to carry out a project under this Part, and includes an approval of a concept plan.

modification of approval means changing the terms of a Minister's approval, including:

- (a) *revoking or varying a condition of the approval or imposing an additional condition of the approval, and*
 - (b) *changing the terms of any determination made by the Minister under Division 3 in connection with the approval.*
- (2) *The proponent may request the Minister to modify the Minister's approval for a project. The Minister's approval for a modification is not required if the project as modified will be consistent with the existing approval under this Part.*
- (3) *The request for the Minister's approval is to be lodged with the Director-General. The Director-General may notify the proponent of environmental assessment requirements with respect to the proposed modification that the proponent must comply with before the matter will be considered by the Minister.*
- (4) *The Minister may modify the approval (with or without conditions) or disapprove of the modification.*

....

Clause 8J(8) of the EP&A Regulation permits a development consent granted under Part 4 of the EP&A Act to be modified under Section 75W of the EP&A Act as if it were a Part 3A approval, in prescribed circumstances. It relevantly states:

8J Transitional Provisions

...

- (8) *A development consent in force immediately before the commencement of Part 3A of the Act may be modified under section 75W of the Act as if the consent were an approval under that Part, but only if:*
- (a) *the consent was granted with respect to development that would be a project to which Part 3A of the Act applies but for the operation of clause 6 (2) (a) of State Environmental Planning Policy (Major Projects) 2005, and*

- (b) *the Minister approves of the development consent being treated as an approval for the purposes of section 75W of the Act.*

...

Clause 6(1)(a) and Schedule 1 of the Major Projects SEPP identifies development of the following kind to be a project to which Part 3A of the EP&A Act applies:

Group 2 Mining, petroleum production, extractive industries and related industries

5 Mining

- (1) *Development for the purpose of mining that:*

- (c) *has a capital investment value of more than \$30 million or employs 100 or more people ...*

The development application and accompanying 1998 Environmental Impact Statement (EIS) for the Cowal Gold Project indicated that the estimated capital cost of the Project was \$210M and that the Project would employ an estimated 200 people during the operational phase of the Mine. The Cowal Gold Project currently meets these criteria.

Clause 6(1) and (2) of the Major Projects SEPP relevantly states:

- 6(1) *Development that, in the opinion of the Minister, is development of a kind:*

- (a) *that is described in Schedule 1*

is declared to be a project to which Part 3A of the Act applies.

- (2) *However, any such development does not become a project to which Part 3A of the Act applies by the operation of subclause (1) if:*

- (a) *the carrying out of that development has been authorized by a consent that is in force under Part 4 of the Act before development of that kind is declared under subclause (1), or*

From the above, it is clear that, but for clause 6(2)(a) of the Major Projects SEPP, the original Cowal Gold Project would be a project to which Part 3A of the Act applies. On this basis, and having regard to the nature of the E42 Modification, it is clear that the Minister has power under clause 8J(8) of the EP&A Regulation to approve of the Development Consent being treated as an approval for the purposes of section 75W of the Act.

SEPPs

SEPPs other than the Major Projects SEPP mentioned above that may be applicable to the E42 Modification are listed below:

- SEPP 11 – Traffic Generating Developments.
- SEPP 33 – Hazardous and Offensive Development.
- SEPP 44 – Koala Habitat Protection.
- SEPP 55 – Remediation of Land.
- SEPP (Mining, Petroleum Production and Extractive Industries) 2007.

Local and Regional Environmental Plans

Local and regional environmental planning instruments that may be applicable to the E42 Modification are listed below:

- *Bland Local Environmental Plan 1993.*
- *Forbes Local Environmental Plan 1986.*

Water Sharing Plans and other related plans

The *Water Sharing Plan for the Lachlan Regulated River Water Source 2003* may be applicable to the E42 Modification.

The *Lachlan Catchment Management Blue Print* (DLWC, 2003) may also be relevant.

Commonwealth Environmental Protection and Biodiversity Conservation Act, 1999

The Cowal Gold Mine was referred for consideration under the *Environmental Protection and Biodiversity Conservation Act, 1999* (EPBC Act) on 29 August 2001. The Minister for the Environment and Heritage determined that it was not a controlled action on 29 September 2001.

Other Relevant Statutory Provisions

Other Acts that are likely to be applicable include (but are not necessarily limited to):

- *Mining Act, 1992;*
- *National Parks and Wildlife Act, 1974;*
- *Occupational Health and Safety Act, 2000;*
- *Roads Act, 1993;*
- POEO Act;
- *Threatened Species Conservation Act, 1995;*
- *Water Act, 1912; and*
- *Water Management Act, 2000.*

Licences or approvals required under these Acts that are relevant to the Cowal Gold Mine are summarised in Section 2.1.

2.1 CONSENTS, LEASES, LICENCES AND PERMITS

A number of consents, leases, licences and permits relevant to the Cowal Gold Mine may require modification/renewal/revision for the E42 Modification.

The date of grant and duration of key approvals and licenses issued by government agencies relevant to the Cowal Gold Mine are provided in Table 4.

**Table 4
Key Consents, Leases, Licences and Permits**

Instrument	Relevant Authority	Date of Grant	Duration of Approval	Variations/ Modifications
Development Consent (DA 14/98)	DoP	26 February 1999	21 years from the date of ML 1535.	Section 96 (1A) approved modifications: August 2003 December 2003 August 2004 August 2006
ML 1535	DPI-MR	13 June 2003	21 years.	Not applicable
Environment Protection Licence (EPL) (No. 11912)	DECC	23 December 2003	Until the licence is surrendered, suspended or revoked. The licence is subject to review every three years.	S 58 Variation Approved: 29/12/2003 21/05/2004 24/09/2004 19/04/2005 17/01/2006
Permit #1361 under section 87(1) of the <i>National Parks and Wildlife Act, 1974</i> (NPW Act)	DECC	23 May 2002	Valid for period of exploration drilling on the lots covered by the permit.	Not applicable
Consent #1467 under section 90 of the NPW Act	DECC	27 November 2002	The approval lapses when the Minister for Mineral Resources acknowledges that satisfactory rehabilitation work has been completed under ML1535 or 18 years after completion of construction works, whichever occurs first.	Not applicable
Permit #1468 under section 87(1) of the NPW Act	DECC	27 October 2003	Same as Consent #1467.	Not applicable
Consent #1680 under section 90 of the NPW Act	DECC	28 July 2003	Same as Consent #1467.	Not applicable
Permit #1681 under section 87(1) of the NPW Act	DECC	28 July 2003	Same as Consent #1467.	Not applicable
Production bore licences #70BL229248	DWE	19 December 2003	18 December 2008.	Not applicable
Production bore licences #70BL229249	DWE	22 December 2003	21 December 2008.	Not applicable
Production bore licences #70BL229250	DWE	22 December 2003	21 December 2008.	Not applicable
Production bore licences #70BL229251	DWE	22 December 2003	21 December 2008.	Not applicable
De-watering bore licences #70BL230205 – #70BL230234	DWE	6 January 2005	5 January 2010.	Not applicable
Monitoring bore licences	DWE	Various	Various.	Not applicable

**Table 4 (Continued)
Key Consents, Leases, Licences and Permits**

Instrument	Relevant Authority	Date of Grant	Duration of Approval	Variations/ Modifications
High Security Title WAL 13749 DNR Reference 70AL603333	DoL, DWE	21 December 2006	Title for allocation of Regulated River Source.	Not applicable
General Security WAL 13748 DNR Reference 70AL603332	DoL, DWE	21 December 2006	Title for allocation of Regulated River Source.	Not applicable

DoP: Department of Planning

DPI-MR: Department of Primary Industries – Mineral Resources

DWE: Department of Water and Energy

DoL: Department of Lands

DECC: Department of Environment and Climate Change

In addition, Barrick has received approval from relevant government authorities for the following environmental management plans and other documents prepared in accordance with the Development Consent conditions:

- Soil Stripping Management Plan (approved August 2003);
- Landscape Management Plan (approved August 2003);
- Bushfire Management Plan (approved August 2003);
- Dust Management Plan (approved August 2003 – addendum approved August 2007);
- Blast Management Plan (approved August 2003);
- Traffic Noise Management Plan (approved August 2003);
- Heritage Management Plan (approved September 2003);
- Compensatory Wetland Management Plan (approved September 2003);
- Erosion and Sediment Control Management Plan (approved September 2003);
- Indigenous Archaeology and Cultural Heritage Management Plan (approved October 2003);
- Flora and Fauna Management Plan (approved October 2003);
- Implementation of the Threatened Species Management Protocol (approved October 2003);
- Land Management Plan (approved October 2003);
- Hazardous Waste and Chemical Management Plan (approved October 2003);
- Site Water Management Plan (approved October 2003 – addendum approved December 2006);
- Monitoring Programme for Detection of any Movement of Lake Protection Bund, Water Storage and Tailings Structures and Pit/Void Walls (approved October 2003);
- Surface Water, Groundwater, Meteorological and Biological Monitoring Programme – Construction Phase (approved December 2003);
- Noise Management Plan (approved November 2004 – addendum approved August 2007);
- Final Hazard Analysis (approved December 2004);
- Fire Safety Study (approved December 2004);

- Hazard and Operability Study (approved December 2004 – supplement completed May 2005);
- Surface Water, Groundwater, Meteorological and Biological Monitoring Programme – Mine Operations (approved April 2005);
- Cyanide Management Plan (approved January 2006); and
- Transport of Hazardous Materials Study (approved January 2006 – addendum approved February 2007).

3 STAKEHOLDER CONSULTATION

Barrick conducts regular consultation with community members and other relevant stakeholders regarding operations at the Cowal Gold Mine. A Community Environmental Monitoring Consultative Committee (CEMCC) has been established in accordance with Condition 8.7 of the Development Consent. The CEMCC (consisting of an independent chair and representatives from the community, Lake Cowal Landholders Association, Lake Cowal Environmental Trust [Lake Cowal Foundation], Bland Shire Council and Barrick) meets regularly to discuss activities at the Cowal Gold Mine.

Formal stakeholder consultation (including the local and broader community) for the E42 Modification will commence for the preparation of the EA following lodgement of the Modification Request.

4 PRELIMINARY ASSESSMENT

The following Preliminary Assessment identifies the key potential environmental issues associated with the E42 Modification. This information has been prepared to assist the DoP issuing environmental assessment requirements (also known as Director-General's requirements [DGRs]) for the E42 Modification under Section 75W (3) of the EP&A Act.

A brief description of the likely nature and extent of potential impacts and the level and scope of assessment proposed for the EA is provided for each issue identified.

The assessment has been undertaken consistent with the Draft Preliminary Assessment Guideline (DIPNR, 2005b).

In undertaking this preliminary assessment, Barrick has drawn on:

- experience from key environmental management and impact assessment issues at the Cowal Gold Mine; and
- feedback from regulator and community consultation undertaken for the Cowal Gold Mine.

4.1 ISSUE IDENTIFICATION

The key potential environmental issues identified include:

- groundwater;
- surface water;
- Aboriginal heritage;
- flora;
- fauna;
- noise;
- air quality (including greenhouse gas emissions);
- tailings/waste geochemistry;
- socio-economics; and
- visual amenity.

Other environmental issues that were considered to be relatively low risk relative to the above key issues include non-Aboriginal heritage and road transport.

4.2 ISSUE ANALYSIS

4.2.1 Groundwater

Potential groundwater impacts associated with the E42 Modification would primarily relate to the continued extraction of groundwater for open pit dewatering and the potential effects on quality from leachate associated with the tailings storages and waste emplacements.

The EA will include:

- a revision of the Cowal Gold Mine water balance to account for open pit surface water inflows and alternative water supply sources which may be required; and
- an assessment of potential groundwater impacts associated with the E42 Modification, including potential groundwater impacts associated with the proposed water supply arrangements where relevant.

4.2.2 Surface Water

Potential surface water impacts associated with the E42 Modification would primarily relate to the management of runoff from mine landforms and disturbed areas which could potentially contain sediment, salinity, oil, grease and process reagents.

The EA will include:

- a revision of the Cowal Gold Mine water balance to account for updated surface water supply arrangements (e.g. contributions from the internal catchment contained storages on the ML); and
- an assessment of the potential surface water impacts associated with the E42 Modification, including potential impacts to Lake Cowal hydrology and alternative water supply sources which may be required.

4.2.3 Aboriginal Heritage

Potential impacts on Aboriginal heritage resulting from the E42 Modification include disturbance to places and items within proposed disturbance areas (i.e. waste emplacements, open pit and low grade ore stockpile).

Requirements with respect to potential impacts on Aboriginal heritage at the Cowal Gold Mine are outlined in the existing permits and consents under Section 87 and Section 90 (respectively) of the *National Parks and Wildlife Act, 1974*. These requirements (e.g. consultation with the Aboriginal community and inspection, salvage and collection works) would be followed for the E42 Modification as appropriate and documented in the EA.

4.2.4 Flora

Potential flora impacts associated with the E42 Modification would primarily result from habitat clearance/modification. The EA would include a detailed assessment of the potential impacts of the E42 Modification on flora in accordance with the DECC (formerly the Department of Environment and Conservation [DEC]) *Draft Guidelines for Threatened Species Assessment* (DEC, 2005a).

4.2.5 Fauna

Potential fauna impacts resulting from the E42 Modification would primarily result from vegetation clearance/modification. The EA would include a detailed assessment of the potential impacts of the E42 Modification on fauna in accordance with the DECC *Draft Guidelines for Threatened Species Assessment* (DEC, 2005a).

4.2.6 Noise

Potential noise emissions from the E42 Modification would be generated by conventional mobile equipment, road traffic and blasting. Changes to the current emission levels are expected due to a proposed increase in the fleet and associated traffic movement increases.

A detailed noise assessment would be conducted as part of the EA in accordance with the *Industrial Noise Policy* (INP) (Environment Protection Authority [EPA], 2000), *Environmental Criteria for Road Traffic Noise* (EPA, 1999) and *Assessing Vibration: A Technical Guideline* (DEC, 2006). The assessment will include identification of applicable operational noise limits and development of suitable mitigation and management measures.

4.2.7 Air Quality

4.2.7.1 Dust Emissions

Potential air quality impacts associated with the E42 Modification would primarily relate to fugitive dust emissions associated with conventional mobile equipment involved in excavation of the mining area, haulage of material around the site, construction of site infrastructure components (e.g. tailings storage facilities) and vegetation clearance. Changes to the current emission levels are expected due to a proposed increase in the fleet and surface disturbance area.

An Air Quality Impact Assessment would be undertaken as part of the EA in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (DEC, 2005b). The assessment would include development of suitable mitigation and management measures.

4.2.7.2 Greenhouse Gas Emissions

The Australian Greenhouse Office (AGO) *Factors and Methods Workbook* (the AGO workbook) (AGO, 2006) provides three "scopes" of emission categories, as described below:

- *Scope 1 covers direct emission from sources within the boundary of an organisation such as fuel combustion and manufacturing processes.*
- *Scope 2 covers indirect emissions from the consumption of purchased electricity, steam or heat produced by another organisation. Scope 2 emissions result from the combustion of fuel to generate electricity, steam or heat and do not include emissions associated with the production of fuel.*
- *Scope 3 includes all other indirect emissions that are a consequence of an organisation's activities but are not from sources owned or controlled by the organisation.*

The AGO workbook (AGO, 2006) also provides a broader definition of Scope 3 emissions, which may include:

- use of products manufactured and sold;
- employees commuting to and from work;
- employee business travel;

- out-sourced activities; and
- transportation of products.

Operation of the E42 Modification would potentially result in a number of direct (i.e. Scope 1) and indirect (i.e. Scopes 2 and 3) emissions. The major direct (i.e. Scope 1) emission would be associated with the combustion of diesel fuel used in diesel powered equipment. In addition, the use of electrically-powered mining equipment would result in indirect (i.e. Scope 2) emissions. Other indirect (i.e. Scope 3) emissions (e.g. employees commuting to work) would also be released as a result of the E42 Modification.

Relevant emission factors from the AGO workbook (AGO, 2006) would be used to estimate the CO₂-equivalent (CO₂-e) emissions. Both direct emissions (i.e. Scope 1) and indirect emissions (i.e. Scopes 2 and 3) would be calculated to provide a conservative estimate of greenhouse gas emissions from the E42 Modification.

4.2.8 Tailings/Waste Rock Geochemistry

Potential geochemical impacts of the E42 Modification would primarily relate to leachate quality associated with the tailings storages and waste emplacements and runoff quality from the waste emplacements.

A geochemical assessment of the E42 Modification will be completed as part of the EA.

4.2.9 Socio-Economics

Potential socio-economic impacts of the E42 Modification would primarily relate to economic effects (both regionally and locally), employment (including both mine workforce and potential flow-on regional employment), population effects and community infrastructure demand. An assessment of the socio-economic impacts of the E42 Modification will be completed as part of the EA.

4.2.10 Visual Amenity

Visual impacts associated with the E42 Modification would primarily relate to the visibility of the major mine landforms (particularly the waste emplacements and tailings storages) from viewpoints in the surrounding catchment.

A visual assessment of the E42 Modification will be completed as part of the EA.

5 REFERENCES

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