Battler Gold Project Environmental Referral Supporting Document

Prepared for IMD Gold Mines Ltd Prepared by Bioscope Environmental Consulting Pty Ltd 22 April 2016







Revision History

Date	Version	Author	Reviewer	Purpose
30 March 2016	0	S. Robinson	J. Hickey	Draft report, for client
				review and input
22 April 2016	1	S. Robinson	J. Hickey	Final

Cover Photograph

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Limitations

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The methodology adopted and sources of information used by Bioscope Environmental are outlined in this report. Bioscope Environmental has made no independent verification of this information beyond the agreed scope of works and Bioscope Environmental assumes no responsibility for any inaccuracies or omissions. No indications were found during our investigations that information contained in this report as provided to Bioscope Environmental was false.

This report was prepared in November 2015 to April 2016, and is based on the information reviewed at the time of preparation. Bioscope disclaims responsibility for any changes that may have occurred after this time.

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EXECUTIVE SUMMARY

The Battler gold mine is located approximately 14 kilometres (km) south-southeast of Southern Cross and 22 km north-northwest of Marvel Loch, Western Australia. The mine has a long history of gold prospecting, exploration, mining and ore processing, and is currently not rehabilitated. The site contains old shafts, a pit, stockpiles, a small heap leach pad and exploration disturbance.

IMD Gold Mines Ltd (IMD or the Company) is currently procuring the mine from Black Oak Minerals Limited (Receivers and Managers Appointed) (In Liquidation) (BOK). The company proposes to:

- Expand the existing open pit to mine up to 165,000 tonnes (t) of gold ore and 3,200,000t of waste rock using conventional drill and blast, load and haul techniques.
- Dewater the mine pit prior to commencement of mining to remove any water remaining in the existing void and continue dewatering during mining to maintain dry mining conditions. Mine water will be stored on-site using a purpose built facility for use in dust suppression. The remaining water will be lost through seepage and evaporation. Expected dewatering quantities are estimated at 150,000 KL over the life of the project.
- Crush ore onsite using a mobile crushing plant.
- Utilise waste rock for site construction purposes, with excess material being disposed of in Waste Rock Landforms (WRLs) to be developed to the west and north east of the pit.
- Develop topsoil and vegetation storage stockpiles.
- Develop supporting mine infrastructure comprising haul roads, site office, crib room and amenities, explosives magazine, and generator(s) for power generation.
- Transport the gold ore to a third party processing plant. Processing of the ore is not part of this Proposal as it will be conducted by a third party. No tailings disposal will occur at Battler.

It is proposed that mining, construction and closure activities occur seven days a week (at times) over a 13 month period.

Gazetted public roads provide access to the Project Area. The Southern Cross – Marvel Loch Road provides the main site access route and is accessible via Great Eastern Highway. Both the Southern Cross – Marvel Loch Road and the Great Eastern Highway will be used to transport ore from the Battler Project to the third party plant for processing.

Subject to approval timing, site works are proposed to commence at the beginning of the third quarter of 2016. The Proposal has a eleven month construction and operational life. Rehabilitation and closure works will be conducted following the cessation of mining and will allow the old workings onsite to be closed to current standards.

IMD has elected to submit an Environmental Referral to the Environmental Protection Authority (EPA) under s38 of the *Environmental Protection Act 1986* (EP Act) due to the potential impact of the Project on Amenity, Human Health (noise), and Flora and Vegetation (Chart ES-1).





The Project is located less than 1,000 m from the nearest sensitive receptors (three residences on an adjacent farm). Background noise studies showed the site to have a quiet rural character, therefore the Amenity and Human Health factors were considered to be potentially significant factors. Modelling shows that without mitigation, these sensitive receptors could be exposed to noise levels that would constitute a significant impact. To address this, a number of options were investigated including the opportunity for the residents to live away from the mine during its life. Following consultation with the farm residents, this option has been selected. As the farmhouses will not have residents, these dwellings are no longer considered to be sensitive receptors.

The values of Flora and Vegetation that may be impacted by the Project include the presence of the Priority 1 flora species *Hydrocotyle corynophora* and *Goodenia heatheriana* within IMD's tenements and the mine's location within the Great Western Woodlands. Both of these values may be considered to be significant by sectors of the public and therefore may be of public interest.

The footprint proposed for clearing comprises eucalypt woodlands and *Acacia* shrublands. Four vegetation units have been identified at the site comprising *Eucalyptus longicornis* dominated woodland, *Eucalyptus salubris* dominated woodland, *Eucalyptus loxophleba* and *Acacia acuminata* drainage shrubland, and Mixed *Eucalyptus* and *Acacia acuminata* shrubland. It is estimated that 9.44ha of the project area has been disturbed through previous gold prospecting, exploration, mining and ore processing activities at the site. An additional 36.14 ha will be cleared to allow development of the pit expansion, WRLs and supporting infrastructure.

This Environmental Referral Supporting Document (ERSD) provides additional information to assist the EPA in determining if the Proposal requires formal assessment under Part IV of the EP Act. This ERSD has been prepared in accordance with the EPA's Environmental Assessment Guideline (EAG) for environmental factors and objectives (EAG 8) and application of a significance framework in the environmental impact assessment process (EAG 9).

Following assessment of the significance of Proposal implementation in relation to relevant environmental factors, IMD has concluded that the environmental factors can be managed outside of the Part IV process. The impact to these factors can be reduced to be not significant by using the environmental management measures developed for the Proposal, with implementation managed through environmental regulation by the Department of Mines and Petroleum (DMP), Department of Environmental Regulation (DER) and Department of Water (DoW) with input from the Department of Parks and Wildlife (DPaW) (see Chart ES-1 and Table ES-1).







Chart ES-1: Significance of Environmental Factors





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Environmental	Key Environmental	Proposed Management	Predicted Residual	Regulatory Management	Does the Proposal Meet
Factor	Characteristics	Measures	Environmental Impacts	Processes	the EPA's Objectives?
Flora and Vegetation	 The project is located just within the western portion of the Great Western Woodlands. Approximately 9.44 ha of the mine site have already been cleared. Remaining vegetation comprises: Eucalyptus longicornis dominated woodland. Eucalyptus salubris dominated woodland. Eucalyptus loxophleba and Acacia acuminata drainage shrubland. Mixed Eucalyptus and Acacia acuminata shrubland. 	Maximise use of existing cleared areas for mine development. Limit ground disturbance and clearing of vegetation to designated areas and access routes. Minimise clearing of Priority Flora. Maintain 50 m exclusion area around <i>Hydrocotyle corynophora</i> (P1). Prevent direct impacts to <i>Hydrocotyle corynophora</i> (P1) by designing the layout of the project to avoid direct impacts to the population and to avoid adverse changes to surface water drainage. Restrict clearing during strong winds to reduce dust generation and soil loss.	 Clearing of up to 35.52 ha of native vegetation including: 33.04 ha Eucalyptus longicornis dominated woodland (54.62% of local area mapped). 1.96 ha Eucalyptus salubris dominated woodland (4.28% of local area mapped). 0.25 ha Eucalyptus loxophleba and Acacia acuminata drainage shrubland (34% of local area mapped). 0.27 ha Mixed Eucalyptus and Acacia acuminata shrubland (13.5% of local area mapped). 8.37 ha of the area to be used is already cleared or mining impacted area. 	Mining Proposal (DMP) Mine Closure Plan (DMP) Native Vegetation Clearing Permit (DMP)	The EPA's objective is to maintain representation, diversity, viability and ecological function at the species, population and community level. Although there are impacts to the local representation of the flora and vegetation, these are unlikely to be considered locally or regionally significant, therefore this objective will be met.

Table ES-1: Environmental Factors Summary





Environmental Factor	Key Environmental Characteristics	Proposed Management Measures	Predicted Residual Environmental Impacts	Regulatory Management Processes	Does the Proposal Meet the EPA's Objectives?
Flora and	The Eucalypt Woodlands of	Implement vehicle hygiene	Potential for localised loss		
Vegetation	the Western Australian	measures.	of condition of vegetation		
(cont.)	Wheatbelt ecological		due to:		
	community Threatened	Avoid saline water	 dust generation, 		
	Ecological Community (TEC)	overspray during dust	erosion and		
	as listed under the	suppression activities.	sedimentation;		
	Environment Protection and		• changes in drainage		
	Biodiversity Conservation	Design topographical	patterns;		
	Act 1999 is located	changes such that surface	 increased weed 		
	approximately 10 km west	hydrology to off site	infestations;		
	of the project.	priority flora are not	• saline water overspray		
	Priority Ecological	affected.	during dust		
	Communities (PECs)		suppression; and		
	occurring in the region	Stockpile cleared	• accidental bushfires,		
	comprise:	vegetation and topsoil for	should these occur.		
	Red Morrell Woodlands	use in rehabilitation.			
	of the Wheatbelt.	Regulate vehicle speed	No known PECs will be		
	 Parker Range 	limits to reduce dust	impacted.		
	Vegetation Complex (35	generation.	Gnephosis intonsa (P3)		
	km southeast of		(2,030 individuals, 3.7% of		
	Battler).	Implement fire	locally mapped individuals)		
		management procedures	and Lepidosperma aff.		
		consistent with the DPaW	fimbriatum (Species of		
		fire management plan for	Interest) (17 individuals,		
		the Great Western	1% of locally mapped		
		Woodlands.	individuals) are likely to be		
			directly impacted by the		
		Conduct rehabilitation.	project.		





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Environmental Factor	Key Environmental Characteristics	Proposed Management Measures	Predicted Residual Environmental Impacts	Regulatory Management Processes	Does the Proposal Meet the EPA's Objectives?
Flora and Vegetation (cont.)	Five Priority flora species were recorded within the survey area. The species that occur within the project area are Goodenia heatheriana (P1), Hydrocotyle corynophora (P1), Phlematospermum eremaeum (P3), Gnephosis intonsa (P3) and one species of interest, Lepidosperma aff. fimbriatum.				
Landforms	The tenements occur within the Southern Cross Greenstone Belt, a tract of slightly to strongly metamorphosed rocks that were initially widespread mafic and ultramafic volcanics, sedimentary rocks and more restricted felsic volcanics.	Design WRLs to ensure rehabilitation as visually congruent as practicable with adjacent areas. Implement progressive rehabilitation. Waste characterisation data will be used to inform closure design.	Development of a pit void and WRLs. No change to landscape values of the region.	Mining Proposal (DMP) Mine Closure Plan (DMP)	The EPA's objective is to maintain the variety, integrity, ecological functions and environmental values of landforms. The project area does not form a unique part of the broader landscape. The addition of WRLs is similar to those found in the general area, therefore this objective will be met





Environmental Factor	Key Environmental Characteristics	Proposed Management Measures	Predicted Residual Environmental Impacts	Regulatory Management Processes	Does the Proposal Meet the EPA's Objectives?
Landforms (cont.)	The site lies within the Southern Cross soil landscape zone within the Kalgoorlie Province. This landscape zone is distinguished by calcareous or red and grey earthy loams and alkaline sandy duplexes with some yellow sandy earths and deep yellow sands. Preliminary testing has identified that limited PAF material is expected to be encountered during pit excavations.	Clear and stockpile topsoil and subsoil for use in rehabilitation. Limit topsoil stockpiles to 2 m high. Avoid use of saline water for dust suppression where topsoil is being cleared and stockpiled. Implement surface water management on WRLs.			
Subterranean Fauna	Project is hosted in an ultramafic, mafic and sediment rock suite within the eastern part of the Southern Cross Greenstone Belt. Bennelongia has advised the impact on any subterranean fauna is likely to be low.	No specific management measures are expected at this time, but will be reassessed during the desktop risk assessment.	Groundwater drawdown due to pit dewatering may impact on stygofauna, but the severity of impact is likely to be low. Mine pit excavation may impact on troglofauna, but the severity of impact is likely to be low.	Mining Proposal (DMP)	The EPA's objective is to maintain representation, diversity, viability and ecological function at the species, population and assemblage level. The short project timeline and the relatively small pit size suggest that impacts will be low and this objective will be met.





Environmental	Key Environmental Characteristics	Proposed Management Measures	Predicted Residual	Regulatory Management	Does the Proposal Meet
Factor	characteristics		Environmental Impacts	Processes	the EPA's Objectives?
Terrestrial	The specific components of	Waste rock will be disposed	After closure of the project,	Mining Proposal (DMP)	The EPA's objective is to
Environmental	the environment are as	to WRLs that will be	there is expected to be		maintain the quality of
Quality	described previously. The	rehabilitated after	limited contamination of	Mine Closure Plan (DMP)	land and soils so that the
	mine is a brownfields site,	cessation of mining.	the area, and that through		environment values, both
	with 9.4 ha of existing mine		the closure planning	Native Vegetation Clearing	ecological and social, are
	workings.	Remove previous workings	process, the proponent will	Permit (DMP)	protected.
		from M77/166, M77/1025	satisfy the requirement		
		and M77/1044 and	that premises are	Works Approval and	This objective will be met
		rehabilitate to the standard	decommissioned and	Licencing (DER)	by the management
		agreed to with	rehabilitated in an		measures proposed and
		stakeholders.	ecologically sustainable	Dangerous Goods Licence	undertaking closure to the
			manner.	(DMP)	requirements of the DMP.
		Reuse and recycle			
		materials and water where			
		practicable.			
		Store and use reagents in			
		accordance with relevant			
		Material Safety Data Sheets			
		and Standards.			
		Chang budge og hoge in solf			
		Store nydrocarbons in self-			
		bunded tanks.			





Environmental Factor	Key Environmental Characteristics	Proposed Management Measures	Predicted Residual Environmental Impacts	Regulatory Management Processes	Does the Proposal Meet the EPA's Objectives?
Terrestrial		Bioremediation of any			
Environmental		hydrocarbon contaminated			
Quality (cont.)		soils.			
		levelow out on insident			
		Implement an incident			
		reporting system to ensure			
		compliance and to improve			
		performance.			
		Rehabilitate historical			
		shafts and associated			
		disturbances within the			
		tenements (M77/166,			
		M77/1025 and M77/1044)			
		on a progressive basis.			
Terrestrial	Five threatened species of	Clear vegetation from	Loss of animals unable to	Mining Proposal (DMP)	The EPA's objective is to
Fauna	fauna and two migratory	cleared to uncleared areas	move away during the		maintain representation,
	species of birds were	where practicable to	clearing process.	Mine Closure Plan (DMP)	diversity, viability and
	identified under the EPBC	provide fauna escape			ecological function at the
	Act as potentially occurring	routes.	Potential for localised	Native Vegetation Clearing	species, population and
	in the project area.		impact on fauna	Permit (DMP)	assemblage level.
			assemblages due noise,		
			vibration, dust, vehicle		The Project is considered
			movements, accidental		unlikely to significantly
			bushfires, etc.		impact fauna, based on
					the species that use the
					area, and the amount of
					clearing proposed.





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Environmental Factor	Key Environmental Characteristics	Proposed Management Measures	Predicted Residual Environmental Impacts	Regulatory Management Processes	Does the Proposal Meet the EPA's Objectives?
Terrestrial Fauna (cont.)	In addition, eight Schedule species listed under the WA <i>Wildlife Conservation Act</i> 1950 and eight priority species listed on DPaW's Priority Fauna List potentially occur in the project area.	Regulate vehicle speed limits to reduce dust generation on roads and the potential for collisions with fauna. Ensure excavations have fauna egress points. Fence ponds to exclude fauna and install fauna egress matting.	The risk assessment undertaken in 2011 suggests where animals cannot relocate to adjacent congruent habitats, the regional impact of these losses would not be significant.		
Hydrological Processes	Groundwater is expected to be 40 to 50 mbgl and iscomparatively poor quality water (brackish to hypersaline) contained in fractured rock systems. Field observations suggest the current surface water regime is already modified from the baseline, with historical WRLs and stockpiles generating sheet flows and open shallow excavations capturing both rainfall and surface runoff.	Divert clean stormwater runoff around the mine pit, workshops and other infrastructure. Rehabilitate pit access roads and make inaccessible to prevent human access.	Localised changes in sheet flow patterns. Localised and short term groundwater drawdown due to pit dewatering and water supply.	Mining Proposal (DMP) Mine Closure Plan (DMP) Works Approval and Licencing (DER) Water Licencing (DoW) Dangerous Goods Licence (DMP)	The EPA's objective is to maintain the hydrological regimes of groundwater and surface water so that existing and potential uses, including ecosystem maintenance, are protected.





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	Table ES-1 (cont.)				
Environmental Factor	Key Environmental Characteristics	Proposed Management Measures	Predicted Residual Environmental Impacts	Regulatory Management Processes	Does the Proposal Meet the EPA's Objectives?
Hydrological Processes (cont.)	A hydrological assessment is currently being undertaken to determine the likely impact to the surface water environment and potential mitigation measures that may be implemented to reduce these impact. Surface water drainage is poorly defined and reliant on episodic rain events. The nearest surface water feature is a stream in farmland approximately 1 km south of the site.	Install pit abandonment bunds to deter public and animal access. See also management measures for Terrestrial Environmental Quality. Install surface drainage around the evaporation pond to capture any losses to prevent damage to downstream environments.	Formation of pit lake which may become more saline over time, may attract members of the public, and may attract fauna, resulting in increased grazing pressures in localised areas.		The Project has been designed to minimise changes to surface water drainage. Groundwater does not appear to support any groundwater dependent ecosystems or significant human use. Therefore, this objective can be met.
Inland Waters Environmental Quality	Refer to hydrological process. The quality of groundwater is yet to be assessed, but preliminary data indicate that it is relatively poor (brackish to hypersaline).	Refer to discussion on management measures for Flora and Vegetation, Subterranean Fauna, Terrestrial Fauna and Hydrological Processes.	Refer to discussion on impacts on Flora and Vegetation, Subterranean Fauna, Terrestrial Fauna and Hydrological Processes.	Mining Proposal (DMP) Mine Closure Plan (DMP) Works Approval and Licencing (DER) Water Licencing (DoW) Dangerous Goods Licence (DMP)	The EPA's objective is to maintain the quality of groundwater and surface water, sediment and biota so that the environmental values, both ecological and social, are protected. See Hydrological Processes. The site is on a catchment divide and impacts in the Project area are unlikely to affect any wetlands in the region.





Environmental Factor	Key Environmental Characteristics	Proposed Management Measures	Predicted Residual Environmental Impacts	Regulatory Management Processes	Does the Proposal Meet the EPA's Objectives?
Air Quality and Atmospheric Gases	The local area is characterised by native vegetation, farming activities and mining activities of adjacent operators.	Water mine haul roads, processing area roads and ore and waste stockpiles.	Minor dust generation. Limited greenhouse gas emissions from power generation.	Mining Proposal (DMP) Works Approval and Licencing (DER)	The EPA's objective is to maintain air quality for the protection of the environment, human health and amenity, and to minimise the emission of greenhouse and other atmospheric gases through the application of best practice. The objective will be met through implementation of the management measures.
Amenity	Although the site has been previously disturbed, the area is a quiet rural area with nearby residents. Ambient noise measurements show that the nearest sensitive receptor is a farm house and property approximately 200 m to the west of the Project area.	Relocate local residents such that those dwellings are no longer sensitive receptors. Actively manage dust. Schedule and conduct blasting and crushing operations only during specified times.	Noise from fixed and mobile plant, and blasting, and vibration from blasting at levels within Environmental Protection (Noise) Regulations 1997. Western WRL likely to be visible from Southern Cross – Marvel Loch Road, resulting in localised visual impact.	Mining Proposal (DMP) Works Approval and Licencing (DER) Compliance with Environmental Protection (Noise) Regulations 1997 Mine Closure Plan (DMP)	The EPA's objective is to ensure that historical and cultural associations, and natural heritage, are not adversely affected. If management measures are followed, this objective will be met.







Environmental Factor	Key Environmental Characteristics	Proposed Management Measures	Predicted Residual Environmental Impacts	Regulatory Management Processes	Does the Proposal Meet the EPA's Objectives?
Amenity (cont.)	The area currently is a woodland with remnants of previous disturbance.	Design WRLs to ensure rehabilitated landforms will be as visually congruent as practicable with adjacent areas.	Localised visual impacts due to Project lighting at night.		
		Rehabilitation of WRLs. Use of directional lighting or light shields where necessary.			
Heritage	A previous study has not found ethnographic sites and advised that no further consultation was needed for the site. A search of the Heritage Register has returned no results for the Battler site. There is evidence of	Ensure contractors and staff are aware of obligations under the <i>Aboriginal Heritage Act</i> <i>1972,</i> including the requirement to report any potential heritage sites discovered during construction and operation of the proposed Project.	No disturbance to Aboriginal heritage sites.	Mining Proposal (DMP) Compliance with the <i>Aboriginal Heritage Act</i> 1972	The EPA's objective is to ensure that historical and cultural associations, and natural heritage, are not adversely affected. This objective will be met by implementing proposed management measures.
	previous mining activities on the tenement, but these are not considered to be of heritage value.				





Table ES-1 (cont.) Environmental **Key Environmental Proposed Management** Predicted Residual **Regulatory Management** Does the Proposal Meet the EPA's Objectives? Factor Characteristics Measures **Environmental Impacts** Processes Human Health As for Amenity. As for Amenity. As for Amenity. Mining Proposal (DMP) The EPA's objective is to (noise and ensure that human health vibration) Works Approval and is not adversely affected. Licencing (DER) This objective can be met through undertaking the Compliance with **Environmental Protection** proposed management (Noise) Regulations 1997 measures. Offsets Not applicable. Not applicable. The EPA's objective is to Not required. Not applicable. counterbalance any significant residual environmental impacts or uncertainty through the application of offsets. Not Applicable. Rehabilitation Progressive rehabilitation Mining Proposal (DMP) The EPA's objective is to The site is not in pristine Not applicable. and ensure that premises are condition, nor does it and closure of disturbed appear to hold significant Mine Closure Plan (DMP) decommissioned and Decommissioning areas. heritage value. rehabilitated in an ecologically sustainable manner. This objective can be met



through the Mine Closure

Plan process.



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Section 1.0 - INTRODUCTION

The Battler gold mine is located approximately 14 kilometres (km) south-southeast of Southern Cross and 22 km north-northwest of Marvel Loch, Western Australia (Figure 1-1). The mine occurs at the junction of Marvel Loch – Southern Cross Road and Glendower Road, and has been disturbed extensively due to its long history of gold prospecting, exploration, mining and ore processing (Figure 1-2).

IMD Gold Mines Ltd (IMD or the Company) is currently procuring the mine from Black Oak Minerals Limited (Receivers and Managers Appointed) (In Liquidation). The company now proposes to:

- Expand the existing open pit to mine up to 165,000 tonnes (t) of gold ore and 3,200,000 t of waste rock using conventional drill and blast, load and haul techniques.
- Dewater the mine pit prior to commencement of mining to remove any water remaining in the existing void and during mining to maintain dry mining conditions. Mine water will be stored onsite using a purpose built facility for use in dust suppression. The remaining water will be lost through seepage and evaporation. Expected dewatering quantities are estimated at 150,000 KL over the life of the project.
- Crush ore onsite using a mobile crushing plant.
- Utilise waste rock for site construction purposes, with excess material being disposed of in Waste Rock Landforms (WRLs) to be developed to the west and north east of the pit.
- Develop topsoil and vegetation storage stockpiles.
- Develop supporting mine infrastructure comprising haul roads, site office, crib room and amenities, explosives magazine, generator(s) for power generation, and turkeys nest and/or water dam.
- Transport the gold ore to a third party processing plant. Processing of the ore is not part of this Proposal as it will be conducted by a third party. No tailings disposal will occur at Battler.

The proposed site layout is provided in Figure 1-3.

It is proposed that mining, construction and closure activities occur seven days a week (at times) over a 13 month period.

Subject to approval timing, site works are proposed to commence at the start of the third quarter of 2016. The Proposal includes 11 months of construction and operational life. Rehabilitation and closure works will be conducted following the cessation of mining and will allow for the closure of the old shafts, pit, stockpiles and heap leach facility to current standards.

A Mining Proposal (MP), Mine Closure Plan (MCP) and other environmental approval applications are being prepared for this Proposal. IMD has elected to submit an Environmental Referral to the Environmental Protection Authority (EPA) under s38 of the *Environmental Protection Act 1986* primarily due to the Flora and Vegetation values associated with the site and the potential for the project to have Amenity (noise) and Human Health (noise) impacts on a neighbouring farm. The





vegetation and flora values that were identified for the site are that the site is contained within the Great Western Woodlands, which is a region of interest to environmental and other groups, and the presence of Priority 1 flora species *Hydrocotyle corynophora* and *Goodenia heatheriana* whichhave recently been recorded in the local area. During preliminary assessment of the project, a neighbouring farmhouse was identified as a sensitive receptor for noise, and it is considered likely that management measures be required such that the project is compliant with Environmental Protection (Noise) Regulations 1997.

The purpose of this Environmental Referral Supporting Document (ERSD) is to support the Environmental Referral by providing more information on:

- The Proposal and its Proponent (Section 2).
- The Proposal's environmental setting (Section 3).
- Stakeholder engagement conducted to date in relation to this Proposal (Section 4).
- The outcomes of IMD's assessment of relevant environmental factors (Section 5).
- The significance of the assessed environmental factors (Section 6).





Section 2.0 - THE PROPOSAL

2.1 The Proponent

IMD's contact details are provided below:

Company Name:	IMD Gold Mines Ltd
ABN:	16 605 374 856
Address:	125 Royal Street, East Perth
Telephone:	0400 744 282

2.2 Mining Tenure and Existing Disturbance

The proposed Project will be developed on the *Mining Act 1950* tenure listed in Table 2-1. IMD will access to these tenements through the rights attached to the sale of these tenements, which are currently being progressed. These tenements are held by Black Oak Minerals Limited (Receivers and Managers Appointed) (In Liquidation).

Tenement	Area	Status		Proposed Facilities
Number		Granted	Expiry	
M77/166	51.42	27 Oct 1987	26 Oct 2029	Pit, WRL, roads, support infrastructure, ROM, Topsoil Stockpiles, Evaporation Pond.
M77/1025	4.00	18 Oct 2002	17 Oct 2023	WRL, Road
M77/1044	4.80	24 Sept 2003	23 Sept 2024	Pit, support infrastructure
L77/224	2.00	25 Aug 2011	24 Aug 2032	Road

Table 2-1: Battler Gold Project Mining Tenure

It is possible that mining operations have been conducted at Battler on a periodic basis for around 105 years with an 1911 *West Australian* newspaper article making reference to the site's previous mine name of Agamemnon. Small scale prospecting and exploration has occurred at the site from time to time, along with open pit and underground mining operations. It is understood that a small heap leach facility operated in the 1980s and the most recent exploration drilling occurred in 2010-2011. However, no mine site records have been maintained.

As a result of previous prospecting, exploration, mining and ore processing operations at Battler, these tenements have been disturbed extensively. Existing disturbances cover an area of 9.44 ha and include:

- an open pit (Plate 2-1);
- abandoned shafts (Plate 2-2 and Plate 2-3) and other underground workings;
- waste rock, low grade and mineralised waste stockpiles (Plate 2-4 to Plate 2-6);
- a small heap leach facility (Plate 2-7 and Plate 2-8);
- exploration costeans and sumps (Plate 2-9 and Plate 2-10).





2.3 Key Proposal Characteristics

IMD proposes to develop the Proposal as an open pit mining operation. Key Proposal characteristics are provided in Table 2-2. The Proposal layout is provided as Figure 1-3.

Table 2-2: Key Characteristics of the Battler Gold Project

Proposal Title		Battler Gold Project		
Proponent Name		IMD Gold Mines Ltd		
Short Description		The proposal comprises re-opening and redevelopment of the Battler Gold Mine. It is proposed that 165,000 t of gold ore and 3,200,000 t of waste will be mined over a 11 month period along with estimated 150,000 KL of mine dewatering. Two WRLs will be developed along with support infrastructure (comprising a site office, crib room and water holding facility).		
Physical Elements				
Element	Location	Proposed Extent Authorised		
1. Open Pit Mine	Figure 1-3	Clearing no more than 5.01 ha within a 61.5 ha envelope.		
2. Waste Rock Landforms	Figure 1-3	Clearing no more than 17.66 ha within a 61.5 ha envelope.		
3. Topsoil stockpiles	Figure 1-3	Clearing no more than 2.72 ha within a 61.5 ha envelope.		
4. Evaporation Pond	Figure 1-3	Clearing no more than 6.16 ha within a 61.5 ha envelope.		
 Supporting infrastructure (office, crib room, roads, generator) 	Figure 1-3	Clearing no more than 12.33 ha within a 61.5 ha envelope.		
Operational Elements				
1. Waste Rock Disposal	Figure 1-3	Disposal of up to 3,200,000 t of waste rock.		
2. Dewatering	Figure 1-3	Dewatering quantities are estimated to be 150,000 KL over the life of the project. It will be used in dust suppression or lost through evaporation.		





2.4 Proposal Description

2.4.1 Site Preparation

Topsoil and vegetation cleared from new disturbance areas such as the WRLs will be stockpiled for respreading during site rehabilitation. Material will be stockpiled at the locations indicated on Figure 1-3.

2.4.2 Mining Operations

The existing open pit will be expanded to cover an area of 5.1 ha and reach a maximum depth of 95 m. Conventional drill and blast, load and haul mining techniques will be used. It is proposed that mining occur up to seven days a week over an eleven month period.

Turbid water occurs in the existing mine void following seasonal rainfall and surface runoff into the pit, but it is understood that the void is usually dry during summer and autumn. Any water remaining in the pit at the start of site works will be pumped out to allow dry mining conditions. The water will be stored on-site for use in dust suppression.

Groundwater levels in the Project area occur between 40 to 50 m below the ground surface. On this basis, pit dewatering is planned for pit development and will occur throughout the project to maintain dry mining conditions. Mine water will be stored on-site using a purpose built facility for use in dust suppression and the remaining balance will be lost through seepage and evaporation. Expected dewatering quantities are estimated at 150,000 kL over the life of the project.

Up to 165,000 t of gold-bearing ore will be extracted (Table 2-2). The ore will be stockpiled on a Run of Mine (ROM) pad before being transported along the Marvel Loch-Southern Cross Road and Great Eastern Highway to Coolgardie for toll processing. Processing of the ore at Coolgardie is not part of this Proposal as it will be conducted by a third party. No tailings disposal will occur at Battler.

It is anticipated that 3,200,000 t of waste rock will be disposed to two Waste Rock Landforms (WRLs). The rehabilitated WRLs are anticipated to comprise:

- Western WRL
 - o 14 32° batter slopes angles;
 - o 2.28 Mt capacity; and
 - o 23 m maximum height.
- North Eastern WRL
 - o 32° Batter slope angles ;
 - o 1.26 Mt capacity; and
 - o 20 m maximum height.





2.4.3 Mine Infrastructure

Mine infrastructure to be developed at Battler comprises:

- ROM pad;
- haul roads;
- onsite mobile crusher;
- site office;
- crib room and amenities;
- generator(s) for power generation at the office area; and
- Water storage and evaporation facility.

Aspects of mine infrastructure that will be a part of the project, but not necessarily to be developed at the site, include staff accommodation, water supply and waste disposal. It is expected that the workforce will be accommodated in Southern Cross. The non potable water supply is expected to come from dewatering activities onsite, whilst potable water supplies will be trucked to the site. Waste disposal is expected to occur off site at appropriate facilities.

2.4.4 Access

Gazetted public roads provide access to the Project Area. The Marvel Loch – Southern Cross Road provides the main site access route and is accessed via Great Eastern Highway. Ore from the Battler mine will be transported along the Marvel Loch – Southern Cross Road and Great Eastern Highway to Coolgardie for processing at a third party site.

2.4.5 Rehabilitation and Closure

Given the short operational time of the mine, it is expected that rehabilitation will occur were possible through the operational life, with the majority of works to be undertaken after cessation of mining.

2.4.6 Implementation Schedule

Subject to approval timing, site works are proposed to commence in the third quarter of 2016. The Proposal has an 11 month operational life, including nominally one month for clearing and construction. Rehabilitation and closure works will be conducted following the cessation of mining. Site works for rehabilitation are expected to take approximately one month to complete. Monitoring and maintenance will occur in accordance with specifications in the Mine Closure Plan (MCP).





Section 3.0 - ENVIRONMENTAL SETTING

The Battler Project Area is located within the Southern Cross (COO2) subregion of the Interim Biogeographic Regionalisation of Australia (IBRA), (Department of Sustainability, Environment, Population and Communities [DSEWPaC], 2012). The COO2 subregion has subdued relief, comprising gently undulating uplands that are crossed by broad valleys with bands of low greenstone hills (Cowan et al., 2001) and an arid non-seasonal to semi-arid Mediterranean climate with an annual rainfall of 200 to 300 mm (Beard, 1990). Summers are generally warm, with the highest temperatures recorded in January, while winters are cold with lowest temperatures experienced in July and August.

The Project is located near to the western boundary of the Great Western Woodlands, which cover an area of around 16,000,000 ha (DEC, 2010) (Figure 3-1). The highly varied woodland communities in this area have high biological richness and diversity of eucalypts. The DPaW's management strategy for the Great Western Woodlands is to achieve sustainable outcomes that ensure conservation of biodiversity and cultural values while maintaining economic and social benefits (DEC, 2010).

The Project is within Marda – Diemals Greenstone Belt, a tract of slightly to strongly metamorphosed rocks that were initially widespread mafic and ultramafic volcanics, sedimentary rocks and more restricted felsic volcanics. The Belt extends discontinuously for approximately 400 km, from north of Southern Cross south to Ravensthorpe near the southern coast of Western Australia, with a regional strike trend of NNW. The margins of the greenstone belt are defined by occurrences of gneissic and granitoid igneous rocks. Observation of the scattered outcrops and drill log data show that the site was originally a package of mafic and ultramafic units, with minor carbonaceous shaly sediments, which now metamorphosed to lower amphibolite facies grade. The deposit is a north-northwesterly striking structurally controlled ore body hosted in ultramafic/mafic units that form part of the geological corridor than links the Southern Cross and Marvel Loch ore bodies.

The Project lies within the Southern Cross soil landscape zone within the Kalgoorlie Province (Tille, 2006). Calcareous or red and yellow earthy loams and alkaline sandy duplexes with some yellow sandy earths and deep yellow sands, distinguish this zone. The soils at the site itself have been described as dark greyish-brown to dark reddish brown alkaline earthy sands and gravels. Most of the topsoil from old workings have been stripped.

Groundwater is controlled by local fracture systems that, regionally, have been modified by historical and current mining activities. The groundwater characteristics are yet to be fully elucidated, but, groundwater levels are between 40-50 mbgl and groundwater quality is of poor (brackish to hypersaline) quality. Given the depth to groundwater, it is not expected that there will be vegetation-based Groundwater Dependent Ecosystems. Groundwater drawdown from dewatering activities is expected to be confined to the vicinity of the pit (PSM, pers. comm.).

Field observations suggest the current surface water regime is already modified from an relatively undefined baseline, with historical waste rock mounds generating sheet flow and open shallow excavations capturing both rainfall and surface runoff. A hydrological assessment is currently being undertaken to determine the likely impact to the surface water environment and potential mitigation





measures that may be implemented to reduce these impacts. Due to the mine's existing footprint and location on a minor drainage divide, it seems unlikely that pit excavations and associated earth works will provide additional modification to the current surface water regime in the area. Infrastructure will be considered, where required, in order to divert surface flow back toward natural drainage courses and reduce the impact on the surface water regime (PSM, pers. comm.).

The Battler site is located within the Coolgardie Botanical District of the South Western Interzone (Beard, 1990). This district predominantly consists of Eucalypt woodlands that become open towards more calcareous soils with a cover of saltbush-bluebush.

Two flora surveys have been completed at Battler over the past five years. The most recent work (Western Botanical, 2016) (Appendix A) identified and mapped four vegetation units within the Battler project area. These are *Eucalyptus longicornis* Dominated Woodland, *Eucalyptus salubris* Dominated Woodland, *Eucalyptus loxophleba* and *Acacia acuminata* Drainage Shrubland, and Mixed *Eucalyptus* and *Acacia acuminata* Shrubland (Figure 3-2). A total of 140 flora taxa were recorded during recent survey efforts, comprising 36 families, 92 genera and 140 species. Five Priority Species were identified within the survey area including three Priority 1 and two Priority 3 species. An additional Priority 1 species (*Teucrium* sp. dwarf [R. Davis 8813]) was found outside of Battler, approximately 1 km to the east. One species of interest (due to unresolved taxonomy) is also found at Battler (Figure 3-3). The significant species located within the project area are listed below:

- *Hydrocotyle corynophora* (P1);
- Phlematospermum eremaeum (P3);
- Gnephosis intonsa (P3); and
- Lepidosperma aff. fimbriatum (species of interest).

Of these species listed, *Hydrocotyle corynophora* (P1), is considered to be locally important, since it has not been collected since the type specimen was collected in 1889. To ensure that the area around the locations where it has been identified are protected, a 50 m buffer (exclusion area) was developed and will not be cleared where it intersects with the development envelope. The exclusion area has also been placed over a small area to the south of Glendowner Road that has not been surveyed for flora and vegetation values.

In 2016, three threatened species of fauna and two migratory species of birds identified under the EPBC Act were found to potentially occur in the Project Area. In addition, nine Schedule species listed under the WA *Wildlife Conservation Act 1950* and three priority species listed on the Department of Parks and Wildlife (DPaW) Priority Fauna List were found to potentially occur in the project area. It is considered that these species should be able to move to similar habitats in adjacent areas (Terrestrial Ecosystems, 2016) (Appendix B).

In the broader area, a moderately diverse troglofauna community is known from the Parker Range (Bennelongia, pers. comm.). Preliminary results from the desktop survey by Bennelongia suggests that, given the known geology of the area, the risk of having a significant impact on ant subterranean fauna values is likely to be low (Bennelongia, 2016).





The Shire of Yilgarn encompasses an area of approximately 3,000,000 ha and is centred around the town of Southern Cross, approximately 370 km east of Perth and approximately 14 km north of the Project Area. The Shire of Yilgarn has a population of approximately 1,658 people, with the key areas of employment being agriculture and mining (ABS, 2011).

There is a sensitive receptor adjacent to the mine that comprises four residences on a farm west of Marvel Loch – Southern Cross Road and 550 m west of the proposed pit. In 2010, Lloyd George Acoustics measured ambient noise and found that the residences are exposed to noise that is in keeping with the rural setting with a range of L_{A90} 22- 32 dB (Appendix C). These have been used in the current modelling conducted by Lloyd George Acoustics (Appendix C). These impacts are discussed in Sections 5 and 6.

A previous study found that there were no ethnographic sites that were of concern to mining activities and the report advised that no further consultation with traditional owners was needed for that site (R.J. O'Connor and Associates, 2011). A search of inHerit maintained by the State Heritage Office returned no results for the Battler site. There is evidence of previous mining activities on the tenements. There is not, however, anything of heritage significance on the tenements.





Section 4.0 - STAKEHOLDER ENGAGEMENT

IMD recognise that environmental impact assessment in WA is a public process and that successful project development requires active stakeholder engagement. IMD has begun to consult with key stakeholders, and plans to address all significant issues raised by these stakeholders. Potential identified stakeholders include:

- EPA/OEPA.
- State government departments in Perth and the Goldfields, primarily:
 - o DMP.
 - Department of Parks and Wildlife (DPaW).
 - o Department of Environment and Regulation (DER).
 - o DoW.
 - Department of Health (DoH) (if required).
 - o Department of Aboriginal Affairs (DAA) (if required).
- Local government:
 - o Shire of Yilgarn.
 - o Southern Cross township.
- Non-Government Organisations (NGOs) such as the Conservation Council, Birdlife Australia WA Group, Wilderness Society and Wildflower Society.
- Aboriginal Corporations (Central West Goldfield People [CWGP] and Kalamaia Kubu(d)n [KK]).
- Community members particularly the landholders adjacent to the Project that may be subject to noise from the mine.

Stakeholder engagement undertaken thus far is detailed in Table 4-1 and primarily has involved residents affected by the Proposal and State Decision Making Authorities. As the project progresses through the Mining Proposal and Mine Closure Plan processes, it is envisaged that other stakeholders will be actively engaged or the opportunity to engage will be encouraged.





Table 4-1: Stakeholder Engagement Undertaken for the Battler Gold Project

Date	Description of	Stakeholders	Stakeholder Comments/Issues	Proponent Response/Resolution
	Engagement			
9 November 2015	Meeting with DPaW to discuss the potential adverse impacts to flora by the Battler Gold Project, particularly to	Ken Atkins – DPaW, Manager Species and Communities Branch Anthea Jones - DPaW, Acting Senior Botanist Daniel Coffey – DPaW,	DPaW raised concerns in relation to indirect impacts to Priority Species including surface hydrology changes due to development of the west WRL, and dust impacts from clearing and operations.	There is opportunity within the design phase of the mine to minimise the impact to surface water drainage patterns. Water use onsite (if appropriate) will be directed to dust suppression.
	Hydrocotyle corynophora (P1) as it was only known from one previous type specimen.	Principal Environmental Officer	DPaW asked that infrastructure be designed as to not disturb Priority Flora and species of interest (<i>Lepidosperma</i> aff. <i>fimbratum</i>). No triggers for referral under Part IV of the EP Act were identified by DPaW.	The impact to individuals of Priority Flora and the species of interest (<i>Lepidosperma</i> aff. <i>fimbratum</i>) will be minimised where possible.
11 November 2015	Meeting with DMP to discuss the Project and whether the Project had Part IV referral triggers	Clare Grosser – Team Leader, Operations, Environment.	The four impacts DMP raised concerns about were dust, dewatering, noise and impacts from waste characterisation. The condition of the existing heap leach pad was also raised. The need for a more complete MCP was discussed due to the short mine life. No triggers for referral under Part IV of the EP Act seem apparent at this time.	The impacts raised by the DMP will be addressed during the design phase for the project. Mine closure planning will nominate stability of landforms of primary importance. Local sites will be used to benchmark appropriate completion criteria.
5 February 2016	Visit to adjacent farm residence to discuss the proposal, noise and water.	Local Resident	None raised, at this time.	IMD will continue engaging with the local residents.
10 February 2016	Meeting with the OEPA	Anthony Sutton and Helen Butterworth Office of the EPA	Discussions were held regarding management of noise and other environmental issues outside the of Part IV process. It was recommended that detailed modelling of noise be undertaken before referral of the proposal to the EPA.	Noise modelling has been undertaken, and management measures developed such that the project will comply with Environmental Protection (Noise) Regulations 1997. Dust can be managed under Part V of the EP Act and through the Mining Proposal.





Date	Description of	Stakeholders	Stakeholder Comments/Issues	Proponent Response/Resolution
	Engagement			
Ongoing	Phone calls and	Local Resident	No significant issues were raised and	IMD will remain in contact with this
from 9	meetings to discuss		agreement of intent to relocate was reached.	stakeholder.
March	noise impacts from			
2016	the proposal and			
	potential mitigation.			
15 March	Meeting with the	Emma Bridgemann and Peter	Construction of a noise bund required to	Tonality will be incorporated into the noise
2016	Noise Branch of DER	Popoff-Asotoff, Noise Branch,	protect sensitive receptors will be considered	modelling. IMD accepts that the noise bund
		DER.	to be governed by operational noise limits.	will not be able to be constructed under noise
			Tonality of noise may be a factor to consider.	construction limits.





Section 5.0 - ASSESSMENT OF ENVIRONMENTAL FACTORS

5.1 Principles of Environmental Protection

In 2003, the EP Act was amended to include five principles that guide the users of the Act fulfil the objective of the Act to protect the environment of Western Australia. These principles are outlined in Section 4A of the EP Act and listed in Table 5-1, along with a summary of the way in which IMD has, or proposes to, address these principles in the development and implementation of the Proposal.

EPA Principle of Environmental Protection	Proposal Application
 1. The precautionary principle Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, decisions should be guided by: (a) careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and (b) an assessment of the risk-weighted consequences of various options. 	 A range of documents has been examined and specialists consulted to ensure that the environmental risks associated with the Proposal are understood as much as possible and can be managed in an environmentally acceptable manner. These include: A range of environmental and other studies. These include surveys or studies in relation to: Flora and vegetation (Botanica, 2011 and Western Botanical, 2016 see Appendix A). Ambient Noise Measurements and Modelling (Lloyd George Acoustics, 2011, 2016 see Appendix C) Vertebrate and Short Range Endemic invertebrate fauna (Terrestrial Ecosystems 2011 and 2016, see Appendix B)

Table 5-1: Principles of Environmental Protection





1		
EP	A Principle of Environmental Protection	Project Application
2.	The principle of intergenerational equity The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.	IMD will develop its MCP in consultation with the DMP. The MCP will include closure objectives and completion criteria that address the environmental and social sustainability of the Project Area following cessation of mining.
3.	The principle of the conservation of biological diversity and ecological integrity Conservation of biological diversity and ecological integrity should be a fundamental consideration.	Four Priority Species are located inside the Battler tenements, including two Priority 1 and two Priority 3 species. Two additional Priority 1 species have been recorded in the local area. One species occurs just west of the Battler Project Area and another approximately 1 km to the east. Three threatened species of fauna and two migratory species of birds were identified under the EPBC Act as potentially occurring in the project area. There are nine Schedule species
		listed under the WA <i>Wildlife Conservation Act 1950</i> and three priority species listed on the DPaW's Priority Fauna List that potentially occur in the project area.
		IMD will develop environmental management and mitigation measures to conserve biological diversity and ecological integrity of the Project Area.
		IMD will develop its MCP in consultation with the DMP. The MCP will include closure objectives and completion criteria that address the biological diversity and ecological integrity of the Project Area following cessation of mining.





	Table 5-1 (cont.)			
EPA	Principle of Environmental Protection	Project Application		
4.	Principles relating to improved valuation, pricing and incentive mechanisms	IMD is committed to the minimisation, reuse and recycling of waste materials, where practicable.		
	 (a) Environmental factors should be included in the valuation of assets and services. (b) The "polluter pays" principle – 	IMD will contribute to initiatives that promote production, use and recycling of metals and minerals in a safe and environmentally responsible manner.		
	those who generate pollution and waste should bear the cost of containment, avoidance or abatement.	IMD will minimise fuel consumption during transport of ore by employing the use of an onsite crusher to minimise waste		
	(c) The users of goods and services should pay prices based on the full life cycle costs of providing goods and services, including the use of natural resources and assets, and the ultimate disposal	more energy efficient trucks.		
	 (d) Environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentive structures, including market mechanisms, which enable those best placed to maximise benefits and/or minimise costs to develop their own solutions and response to anvironmental problems. 			
5.	The principle of waste minimisation	IMD is committed to the minimisation, reuse and recycling of waste materials, where practicable.		
	All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.	IMD will use water abstracted from the mine pits during pit dewatering for dust suppression and non-potable uses as much as possible.		

5.2 Assessment of Relevant Environmental Factors

With the exception of the Sea factors (which are not applicable to this Proposal), all the environmental factors identified in EAG 8 (EPA 2013a) and the supporting table to EAG 16 (EPA 2015a) were assessed during the preparation of the Proposal Environmental Referral to the EPA. These factors are listed in Table 5-2 along with the EPA's objectives for these factors and relevant environmental guidance documents. The outcomes of this assessment are provided in Table 5-3.





Theme	Factor	EPA Objective	Environmental Guidance
Land	Flora and Vegetation	To maintain representation, diversity, viability and ecological function at the species,	EPA Position Statement 2: Environmental Protection of Native Vegetation in Western Australia (EPA, 2000).
		population and community level.	EPA Position Statement 3: Terrestrial Biological Surveys as an Element of Biodiversity Protection (EPA, 2002).
			EPA Guidance Statement No. 51: Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (EPA, 2004a).
			Technical Guide – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA and DPaW, 2015).
	Landforms	To maintain the variety, integrity, ecological functions	EPA Guidance Statement No. 6: Rehabilitation of Terrestrial Ecosystems (EPA, 2006).
		and environmental values of landforms.	Guidelines for Preparing Mine Closure Plans (DMP and EPA, 2015).
			Environmental Protection Bulletin No. 23 Guidance on the EPA Landforms Factor (EPA, 2015b).
	Subterranean Fauna	To maintain representation, diversity, viability and ecological function at the species,	Draft EPA Guidance Statement No. 54a: Sampling Methods and Survey Considerations for Subterranean Fauna (EPA, 2007).
		population and assemblage level.	Consideration of subterranean fauna in environmental impact assessment in Western Australia (EAG12) (EPA, 2013c).





Table 5-2 (cont.)

Theme	Factor	EPA Objective	Environmental Guidance
Land (cont.)	Terrestrial Environmental Quality	To maintain the quality of land and soils so that the environment values, both	Leading Practice Sustainable Development Program for the Mining Industry: Managing Acid and Metalliferous Drainage (Department of Industry, Tourism and Resources [DITR], 2007).
		ecological and social, are protected.	Acid Rock Drainage Guide (International Network for Acid Prevention, 2009).
			Australian Water Guidelines for Fresh and Marine Waters (Australian and New Zealand
			Environment Conservation Council and Agricultural and Resource Management Council of
			Australia and New Zealand [ANZECC/ARMCANZ] 2000).
			Water Quality Protection Guidelines (Water and Rivers Commission, 1999).
			Rehabilitation of Terrestrial Ecosystems. EPA Guidance Statement No 6 (EPA, 2006).
	Terrestrial Fauna	To maintain representation, diversity, viability and ecological function at the species,	EPA Position Statement 3: Terrestrial Biological Surveys as an Element of Biodiversity Protection (EPA, 2002).
		population and assemblage level.	Guidance Statement No. 56: Terrestrial Fauna Surveys for Environmental Impact Assessment in Western Australia (EPA, 2004b).
			Guidance Statement No 20: Sampling of Short Range Endemic Invertebrates (SREs) for Environmental Impact Assessment in Western Australia (EPA, 2009).
			Technical Guide - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA and DEC, 2010).





Table 5-2 (cont.)

Theme	Factor	EPA Objective	Environmental Guidance
Water	Hydrological Processes	To maintain the hydrological regimes of groundwater and surface water so that existing	Leading Practice Sustainable Development Program for the Mining Industry: Managing Acid and Metalliferous Drainage (DITR, 2007).
		ecosystem maintenance, are	Acid Rock Drainage Guide (International Network for Acid Prevention, 2009).
		protected.	Australian Water Guidelines for Fresh and Marine Waters (ANZECC/ARMCANZ, 2000).
			Water Quality Protection Guidelines (Water and Rivers Commission, 1999).
	Inland Waters Environmental Quality	To maintain the quality of groundwater and surface water, sediment and biota so that the environmental values, both ecological and social, are protected.	Water Quality Protection Guidelines (Water and Rivers Commission, 1999).
Air	Air Quality and Atmospheric Gases	To maintain air quality for the protection of the environment, human health and amenity, and to minimise the emission of greenhouse and other atmospheric gases through the application of best practice.	EPA Guidance Statement 3: Separation Distance between Industrial and Sensitive Land Uses (EPA, 2005).
People	Amenity	To ensure that impacts to amenity are reduced as low as reasonably practicable.	EPA Environmental Assessment Guideline 13 – Consideration of Environmental Impacts from Noise (EPA, 2014a).
			2005). Visual Landscape Planning in WA (WA Planning Commission and Department of Planning and
			Infrastructure, 2007).





Table 5-2 (cont.)

Theme	Factor	EPA Objective	Environmental Guidance
People	Amenity (cont.)		Guidance Notes for the Reduction of Obtrusive Light (Institute of Lighting Professionals, 2011).
(cont.)	Heritage	To ensure that historical and cultural associations, and natural heritage, are not adversely affected.	EPA Guidance Statement No. 41: Assessment of Aboriginal Heritage (EPA, 2004c).
	Human Health (noise and vibration)	To ensure that human health is not adversely affected.	EPA Environmental Assessment Guideline 13 – Consideration of Environmental Impacts from Noise (EPA, 2014a).
			EPA Guidance Statement 3: Separation Distance between Industrial and Sensitive Land Uses (EPA, 2005).
			Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration (Australian and New Zealand Environment Council, 1990).
Integrating Factors	Offsets	To counterbalance any significant residual	EPA Guidance Statement No. 19: Environmental Offsets - Biodiversity (EPA, 2008a).
		environmental impacts or uncertainty through the	Environmental Protection Bulletin 1: Environmental Offsets - Biodiversity (EPA, 2008b).
		application of offsets.	State Government of Western Australia 2011 Environmental Offsets Policy.
			WA Environmental Offsets Guidelines (EPA, 2014b).
	Rehabilitation and Closure	To ensure that premises are decommissioned and	EPA Guidance Statement No. 6: Rehabilitation of Terrestrial Ecosystems (EPA, 2006).
		rehabilitated in an ecologically sustainable manner.	Guidelines for Preparing Mine Closure Plans (DMP and EPA, 2015).
			Environmental Protection Bulletin No.19: EPA Involvement in Mine Closure (EPA, 2013d).





Environmental	Key Environmental	Proposed Management	Predicted Residual	Regulatory Management	Does the Proposal Meet
Factor	Characteristics	Measures	Environmental Impacts	Processes	the EPA's Objectives?
Flora and Vegetation	 The project is located just within the western portion of the Great Western Woodlands. Approximately 9.44 ha of the mine site have already been cleared. Remaining vegetation comprises: Eucalyptus longicornis dominated woodland. Eucalyptus salubris dominated woodland. Eucalyptus loxophleba and Acacia acuminata drainage shrubland. Mixed Eucalyptus and Acacia acuminata shrubland. 	Maximise use of existing cleared areas for mine development. Limit ground disturbance and clearing of vegetation to designated areas and access routes. Minimise clearing of Priority Flora. Maintain 50 m exclusion area around <i>Hydrocotyle corynophora</i> (P1). Prevent direct impacts to <i>Hydrocotyle corynophora</i> (P1) by designing the layout of the project to avoid direct impacts to the population and to avoid adverse changes to surface water drainage. Restrict clearing during strong winds to reduce dust generation and soil loss.	 Clearing of up to 35.52 ha of native vegetation including: 33.04 ha Eucalyptus longicornis dominated woodland (54.62% of local area mapped). 1.96 ha Eucalyptus salubris dominated woodland (4.28% of local area mapped). 0.25 ha Eucalyptus loxophleba and Acacia acuminata drainage shrubland (34% of local area mapped). 0.27 ha Mixed Eucalyptus and Acacia acuminata shrubland (13.5% of local area mapped). 8.37 ha of the area to be used is already cleared or mining impacted area. 	Mining Proposal (DMP) Mine Closure Plan (DMP) Native Vegetation Clearing Permit (DMP)	The EPA's objective is to maintain representation, diversity, viability and ecological function at the species, population and community level. Although there are impacts to the local representation of the flora and vegetation, these are unlikely to be considered locally or regionally significant, therefore this objective will be met.





Table 5-3	(cont.)
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Environmental	Key Environmental	Proposed Management	Predicted Residual	Regulatory Management	Does the Proposal Meet
Factor	Characteristics	Measures	Environmental Impacts	Processes	the EPA's Objectives?
Flora and Vegetation (cont.)	The Eucalypt Woodlands of the Western Australian Wheatbelt ecological community Threatened Ecological Community (TEC) as listed under the <i>Environment Protection and</i> <i>Biodiversity Conservation</i> <i>Act 1999</i> is located approximately 10 km west of the project. Priority Ecological Communities (PECs) occurring in the region comprise: • Red Morrell Woodlands of the Wheatbelt. • Parker Range Vegetation Complex (35 km southeast of Battler).	Implement vehicle hygiene measures. Avoid saline water overspray during dust suppression activities. Design topographical changes such that surface hydrology to off site priority flora are not affected. Stockpile cleared vegetation and topsoil for use in rehabilitation. Regulate vehicle speed limits to reduce dust generation. Implement fire management procedures consistent with the DPaW fire management plan for the Great Western Woodlands. Conduct rehabilitation.	 Potential for localised loss of condition of vegetation due to: dust generation, erosion and sedimentation; changes in drainage patterns; increased weed infestations; saline water overspray during dust suppression; and accidental bushfires, should these occur. No known PECs will be impacted. Gnephosis intonsa (P3) (2,030 individuals, 3.7% of locally mapped individuals) and <i>Lepidosperma</i> aff. fimbriatum (Species of Interest) (17 individuals, 1% of locally mapped individuals) are likely to be directly impacted by the project.		





Table 5-3	(cont.)
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Environmental Factor	Key Environmental Characteristics	Proposed Management Measures	Predicted Residual Environmental Impacts	Regulatory Management Processes	Does the Proposal Meet the EPA's Objectives?
Flora and Vegetation (cont.)	Five Priority flora species were recorded within the survey area. The species that occur within the project area are <i>Goodenia</i> <i>heatheriana</i> (P1), <i>Hydrocotyle corynophora</i> (P1), <i>Phlematospermum</i> <i>eremaeum</i> (P3), <i>Gnephosis</i> <i>intonsa</i> (P3) and one species of interest, <i>Lepidosperma</i> aff. <i>fimbriatum</i> .				
Landforms	The tenements occur within the Southern Cross Greenstone Belt, a tract of slightly to strongly metamorphosed rocks that were initially widespread mafic and ultramafic volcanics, sedimentary rocks and more restricted felsic volcanics.	Design WRLs to ensure rehabilitation as visually congruent as practicable with adjacent areas. Implement progressive rehabilitation. Waste characterisation data will be used to inform closure design.	Development of a pit void and WRLs. No change to landscape values of the region.	Mining Proposal (DMP) Mine Closure Plan (DMP)	The EPA's objective is to maintain the variety, integrity, ecological functions and environmental values of landforms. The project area does not form a unique part of the broader landscape. The addition of WRLs is similar to those found in the general area, therefore this objective will be met





Table 5-3 (o	ont.)
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Environmental Factor	Key Environmental Characteristics	Proposed Management Measures	Predicted Residual Environmental Impacts	Regulatory Management Processes	Does the Proposal Meet the EPA's Objectives?
Landforms (cont.)	The site lies within the Southern Cross soil landscape zone within the Kalgoorlie Province. This landscape zone is distinguished by calcareous or red and grey earthy loams and alkaline sandy duplexes with some yellow sandy earths and deep yellow sands. Preliminary testing has identified that limited PAF material is expected to be encountered during pit excavations.	Clear and stockpile topsoil and subsoil for use in rehabilitation. Limit topsoil stockpiles to 2 m high. Avoid use of saline water for dust suppression where topsoil is being cleared and stockpiled. Implement surface water management on WRLs.			
Subterranean Fauna	Project is hosted in an ultramafic, mafic and sediment rock suite within the eastern part of the Southern Cross Greenstone Belt. Bennelongia has advised the impact on any subterranean fauna is likely to be low.	No specific management measures are expected at this time, but will be reassessed during the desktop risk assessment.	Groundwater drawdown due to pit dewatering may impact on stygofauna, but the severity of impact is likely to be low. Mine pit excavation may impact on troglofauna, but the severity of impact is likely to be low.	Mining Proposal (DMP)	The EPA's objective is to maintain representation, diversity, viability and ecological function at the species, population and assemblage level. The short project timeline and the relatively small pit size suggest that impacts will be low and this objective will be met.





Table 5-3 (cont.)

Environmental Factor	Key Environmental Characteristics	Proposed Management Measures	Predicted Residual Environmental Impacts	Regulatory Management Processes	Does the Proposal Meet the EPA's Objectives?
Terrestrial Environmental Quality	The specific components of the environment are as described previously. The mine is a brownfields site, with 9.4 ha of existing mine workings.	Waste rock will be disposed to WRLs that will be rehabilitated after cessation of mining. Remove previous workings from M77/166, M77/1025 and M77/1044 and rehabilitate to the standard agreed to with stakeholders. Reuse and recycle materials and water where practicable. Store and use reagents in accordance with relevant Material Safety Data Sheets and Standards. Store hydrocarbons in self-	After closure of the project, there is expected to be limited contamination of the area, and that through the closure planning process, the proponent will satisfy the requirement that premises are decommissioned and rehabilitated in an ecologically sustainable manner.	Mining Proposal (DMP) Mine Closure Plan (DMP) Native Vegetation Clearing Permit (DMP) Works Approval and Licencing (DER) Dangerous Goods Licence (DMP)	The EPA's objective is to maintain the quality of land and soils so that the environment values, both ecological and social, are protected. This objective will be met by the management measures proposed and undertaking closure to the requirements of the DMP.
		Store hydrocarbons in self- bunded tanks.			





Environmental Factor	Key Environmental Characteristics	Proposed Management Measures	Predicted Residual Environmental Impacts	Regulatory Management Processes	Does the Proposal Meet the EPA's Objectives?
Terrestrial Environmental Quality (cont.)		Bioremediation of any hydrocarbon contaminated soils. Implement an incident reporting system to ensure compliance and to improve performance. Rehabilitate historical shafts and associated disturbances within the			
Terrestrial Fauna	Five threatened species of fauna and two migratory species of birds were identified under the EPBC Act as potentially occurring in the project area.	tenements (M77/166, M77/1025 and M77/1044) on a progressive basis. Clear vegetation from cleared to uncleared areas where practicable to provide fauna escape routes.	Loss of animals unable to move away during the clearing process. Potential for localised impact on fauna assemblages due noise, vibration, dust, vehicle movements, accidental bushfires, etc.	Mining Proposal (DMP) Mine Closure Plan (DMP) Native Vegetation Clearing Permit (DMP)	The EPA's objective is to maintain representation, diversity, viability and ecological function at the species, population and assemblage level. The Project is considered unlikely to significantly impact fauna, based on the species that use the area, and the amount of clearing proposed.

Table 5-3 (cont.)





Table 5-3	(cont.)
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Environmental Factor	Key Environmental Characteristics	Proposed Management Measures	Predicted Residual Environmental Impacts	Regulatory Management Processes	Does the Proposal Meet the EPA's Objectives?
Terrestrial Fauna (cont.)	In addition, eight Schedule species listed under the WA <i>Wildlife Conservation Act</i> <i>1950</i> and eight priority species listed on DPaW's Priority Fauna List potentially occur in the project area.	Regulate vehicle speed limits to reduce dust generation on roads and the potential for collisions with fauna. Ensure excavations have fauna egress points. Fence ponds to exclude fauna and install fauna egress matting.	The risk assessment undertaken in 2011 suggests where animals cannot relocate to adjacent congruent habitats, the regional impact of these losses would not be significant.		
Hydrological Processes	Groundwater is expected to be 40 to 50 mbgl and iscomparatively poor quality water (brackish to hypersaline) contained in fractured rock systems. Field observations suggest the current surface water regime is already modified from the baseline, with historical WRLs and stockpiles generating sheet flows and open shallow excavations capturing both rainfall and surface runoff.	Divert clean stormwater runoff around the mine pit, workshops and other infrastructure. Rehabilitate pit access roads and make inaccessible to prevent human access.	Localised changes in sheet flow patterns. Localised and short term groundwater drawdown due to pit dewatering and water supply.	Mining Proposal (DMP) Mine Closure Plan (DMP) Works Approval and Licencing (DER) Water Licencing (DoW) Dangerous Goods Licence (DMP)	The EPA's objective is to maintain the hydrological regimes of groundwater and surface water so that existing and potential uses, including ecosystem maintenance, are protected.





Table 5-3	(cont.)
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Environmental Factor	Key Environmental Characteristics	Proposed Management Measures	Predicted Residual Environmental Impacts	Regulatory Management Processes	Does the Proposal Meet the EPA's Objectives?
Hydrological Processes (cont.)	A hydrological assessment is currently being undertaken to determine the likely impact to the surface water environment and potential mitigation measures that may be implemented to reduce these impact. Surface water drainage is poorly defined and reliant on episodic rain events. The nearest surface water feature is a stream in farmland approximately 1 km south of the site.	Install pit abandonment bunds to deter public and animal access. See also management measures for Terrestrial Environmental Quality. Install surface drainage around the evaporation pond to capture any losses to prevent damage to downstream environments.	Formation of pit lake which may become more saline over time, may attract members of the public, and may attract fauna, resulting in increased grazing pressures in localised areas.		The Project has been designed to minimise changes to surface water drainage. Groundwater does not appear to support any groundwater dependent ecosystems or significant human use. Therefore, this objective can be met.
Inland Waters Environmental Quality	Refer to hydrological process. The quality of groundwater is yet to be assessed, but preliminary data indicate that it is relatively poor (brackish to hypersaline).	Refer to discussion on management measures for Flora and Vegetation, Subterranean Fauna, Terrestrial Fauna and Hydrological Processes.	Refer to discussion on impacts on Flora and Vegetation, Subterranean Fauna, Terrestrial Fauna and Hydrological Processes.	Mining Proposal (DMP) Mine Closure Plan (DMP) Works Approval and Licencing (DER) Water Licencing (DoW) Dangerous Goods Licence (DMP)	The EPA's objective is to maintain the quality of groundwater and surface water, sediment and biota so that the environmental values, both ecological and social, are protected. See Hydrological Processes. The site is on a catchment divide and impacts in the Project area are unlikely to affect any wetlands in the region.





Table 5-3 (cont.)						
Environmental Factor	Key Environmental Characteristics	Proposed Management Measures	Predicted Residual Environmental Impacts	Regulatory Management Processes	Does the Proposal Meet the EPA's Objectives?	
Air Quality and Atmospheric Gases	The local area is characterised by native vegetation, farming activities and mining activities of adjacent operators.	Water mine haul roads, processing area roads and ore and waste stockpiles.	Minor dust generation. Limited greenhouse gas emissions from power generation.	Mining Proposal (DMP) Works Approval and Licencing (DER)	The EPA's objective is to maintain air quality for the protection of the environment, human health and amenity, and to minimise the emission of greenhouse and other atmospheric gases through the application of best practice. The objective will be met through implementation of the management measures.	
Amenity	Although the site has been previously disturbed, the area is a quiet rural area with nearby residents. Ambient noise measurements show that the nearest sensitive receptor is a farm house and property approximately 200 m to the west of the Project area.	Relocate local residents such that those dwellings are no longer sensitive receptors. Actively manage dust. Schedule and conduct blasting and crushing operations only during specified times.	Noise from fixed and mobile plant, and blasting, and vibration from blasting at levels within Environmental Protection (Noise) Regulations 1997. Western WRL likely to be visible from Southern Cross – Marvel Loch Road, resulting in localised visual impact.	Mining Proposal (DMP) Works Approval and Licencing (DER) Compliance with Environmental Protection (Noise) Regulations 1997 Mine Closure Plan (DMP)	The EPA's objective is to ensure that historical and cultural associations, and natural heritage, are not adversely affected. If management measures are followed, this objective will be met.	







Table 5-3	(cont.)
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Environmental Factor	Key Environmental Characteristics	Proposed Management Measures	Predicted Residual Environmental Impacts	Regulatory Management Processes	Does the Proposal Meet the EPA's Objectives?
Amenity (cont.)	The area currently is a woodland with remnants of previous disturbance.	Design WRLs to ensure rehabilitated landforms will be as visually congruent as practicable with adjacent areas. Rehabilitation of WRLs. Use of directional lighting or light shields where necessary.	Localised visual impacts due to Project lighting at night.		
Heritage	A previous study has not found ethnographic sites and advised that no further consultation was needed for the site. A search of the Heritage Register has returned no results for the Battler site. There is evidence of previous mining activities on the tenement, but these are not considered to be of heritage value.	Ensure contractors and staff are aware of obligations under the <i>Aboriginal Heritage Act</i> <i>1972,</i> including the requirement to report any potential heritage sites discovered during construction and operation of the proposed Project.	No disturbance to Aboriginal heritage sites.	Mining Proposal (DMP) Compliance with the <i>Aboriginal Heritage Act</i> 1972	The EPA's objective is to ensure that historical and cultural associations, and natural heritage, are not adversely affected. This objective will be met by implementing proposed management measures.





Table 5-3 (cont.)						
Environmental Factor	Key Environmental Characteristics	Proposed Management Measures	Predicted Residual Environmental Impacts	Regulatory Management Processes	Does the Proposal Meet the EPA's Objectives?	
Human Health (noise and vibration)	As for Amenity.	As for Amenity.	As for Amenity.	Mining Proposal (DMP) Works Approval and Licencing (DER) Compliance with Environmental Protection (Noise) Regulations 1997	The EPA's objective is to ensure that human health is not adversely affected. This objective can be met through undertaking the proposed management measures.	
Offsets	Not applicable.	Not required.	Not applicable.	Not applicable.	The EPA's objective is to counterbalance any significant residual environmental impacts or uncertainty through the application of offsets. Not Applicable.	
Rehabilitation and Decommissioning	The site is not in pristine condition, nor does it appear to hold significant heritage value.	Progressive rehabilitation and closure of disturbed areas.	Not applicable.	Mining Proposal (DMP) Mine Closure Plan (DMP)	The EPA's objective is to ensure that premises are decommissioned and rehabilitated in an ecologically sustainable manner. This objective can be met through the Mine Closure Plan process.	







Section 6.0 - ASSESSMENT OF SIGNIFICANCE OF ENVIRONMENTAL FACTORS

To determine the significance of the environmental factors associated with the Proposal, IMD applied the Significance Framework outlined in EAG 9 (EPA 2013b). In applying the concept of significance, IMD considered both the likely significance of the inherent impacts of the Proposal (i.e. without management or mitigation) and the likely significance of the residual impacts of the Proposal (i.e. following application of management and/or mitigation measures). The residual impacts likely to arise from Proposal implementation are summarised in Table 5-3.

It is noted that mitigation can result from other regulatory processes to which a proposal may be subject. For this Proposal, these include:

- Mining Proposal approval under the *Mining Act 1978*.
- Works Approval and Licence under Part V of the EP Act.
- Groundwater licences under sections 26D and 5C of the *Rights in Water and Irrigation Act 1914*.
- Dangerous Goods Licence under the Dangerous Goods Safety (Storage and Handling of Nonexplosives) Regulations 2007.
- Native Vegetation Clearing Permit under the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (if the Proposal is not subject to formal assessment under Part IV of the EP Act).
- Package water treatment plant installation approval under the Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations 1974.
- Landfill management under the Environmental Protection (Rural Landfill) Regulations 2002.

The key aspects identified in Table 5-3 are Amenity (noise), Human Health (noise), Flora and Vegetation.

6.1 Amenity and Human Health (Noise)

Four farmhouses to the west of Southern Cross-Marvel Loch Road, in an area that been characterised as having relatively low background noise levels consistent with a rural setting (Lloyd George Acoustics, 2011), have been identified as highly sensitive receptors. Ambient noise measurements were made between 15-28 April 2011 and the following levels recorded at the nearest farmhouse to the Project (Appendix C):

- L_{A90} of 26 dB between 7 am and 7 pm Monday to Sunday;
- L_{A90} of 32 dB between 7 pm and 10 pm Monday to Saturday and between 9 am and 10 pm on Sundays and public holidays; and,
- L_{A90} of 22 dB between 10 pm and 7 am Monday to Saturday and between 10 pm and 9 am on Sundays and public holidays.

As these houses are considered highly sensitive receptors, Lloyd George Acoustics conducted a noise assessment of the Project (Appendix C). This modelling did not include the construction and operation of the evaporation pond as this project component was added after completion of modelling, but is





not expected to significant alter the management outcomes. Without mitigation, the levels of noise modelling during peak operations were 56 dB L_{A10} during daytime operations and 51 dB L_{A10} during night-time operations (Figures 6-1 and 6-2). With adjustments made for tonality, the maximum Assessable Noise Level modelled at the most exposed receptor were 61 dB L_{A10} during 6 am to 7 am Monday to Saturday and 7 am to 9 am Sundays and Public Holidays. As the houses as dwellings are considered highly sensitive, these modelled levels are 26 dB greater than the Assigned Noise Levels calculated from the Environmental Protection (Noise) Regulations 1997. Therefore, options to avoid or reduce this impact were investigated.

The options considered included:

- Avoidance of noise through project change. With the short term nature of the project and the equipment maintenance required to maintain noise muffling packs on machinery, it was felt that this option would not provide adequate protection of the sensitive receptors whilst maintaining the viability of the Project.
- 2. Construction of a 15 m noise mitigation bund to the west of the pit. This option was explored further and incorporated into the design of the west WRL, but construction of the bund is considered to be subject to operation noise limits as stated in the Environmental Protection (Noise) Regulations 1997. The construction of this bund could not be designed to be under those limits.
- 3. Offer the owners/residents of the farm an opportunity to live locally, but away from the project, so that the residence would not be a highly sensitive receptor for the project. This has been progressed and a relocation agreement has been developed. Therefore, the farmhouses will no longer be sensitive receptors and IMD will be able to ensure that the project will comply with the Environmental Protection (Noise) Regulations 1997 without harm to local residents. This option will be implemented.

As the farmhouses will not be used as a dwellings during the project, the buildings will be considered to be any area other than a highly sensitive area and subject to a limit of 60 dB. The maximum Assessable Noise Level modelled is 61 dB L_{A10} , which represents a minor exceedance without other mitigation measures. As the western WRL is developed and operational controls are implemented, this limit should be met. Therefore, the EPA's Amenity (Noise) and Human Health (Noise) objectives will be met.

6.2 Flora and Vegetation

The Project will have localised impacts to Priority Flora species. The Project is occurs in the Great Western Woodlands, which are considered to have values held in high regard by sectors of the public. The known impact to Priority Flora is outlined in Table 6-1. Of note, there are no direct impacts from Project Design on *Hydrocotyle corynophora* (P1). On the advice of DPaW, the Project has been designed to minimise changes to surface water drainage to protect this population. IMD has defined exclusion zones that will not be cleared to protect a 50 m buffer around the occurrence of this species.





Species	Priority	Local Numbers Recorded	Number of Plants Directly Impacted	Percentage Reduction of Local Numbers of Plants
Goodenia heatheriana	P1	5,530	0	0
Hemigenia sp. Newdegate (E. Bishop 75)	P1	15	0	0
Hydrocotyle corynophora	P1	2,115	0	0
Gnephosis intonsa	Р3	54,510	2,030	~3.7%
Phlegmatospermum eremaeum	P3	44	0	0
Lepidosperma aff. fimbriatum	Species of Interest	1,635	17	~1%

Table 6-1: Conservation Significant Flora Directly Impacted by the Project

The vegetation units identified by Western Botanical (Appendix A), and that will be directly impacted by the Project, are listed below;

- 33.04 ha of *Eucalyptus longicornis* dominated woodland (54.62% of local area mapped).
- 1.96 ha of *Eucalyptus salubris* dominated woodland (4.28% of local area mapped).
- 0.25 ha of *Eucalyptus loxophleba* and *Acacia acuminata* drainage shrubland (34% of local area mapped).
- 0.27 ha of Mixed *Eucalyptus* and *Acacia acuminata* shrubland (13.5% of local area mapped).

The local extent of these vegetation units will not be reduced significantly, and as the groundwater depth is below 20 m it is unlikely that these units are groundwater dependent.

With the low impact to both flora and vegetation, further management measures to satisfy the EPA's objective can be implemented through the Native Vegetation Clearing Permit system. Residual impacts to vegetation can be mitigated through the MCP process.

6.3 Conclusion

In IMD's assessment, the Battler Gold Project can be managed outside the Part IV process, through the instruments provided under Part V of the *Environmental Protection Act 1986* and the *Mining Act 1978*.





Section 7.0 - REFERENCES

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Figures

















Plates



Plate 2-1 Open Pit partially filled with Rain Water and Runoff



Plate 2-2 Old Shaft



Plate 2-3 Old Shaft







Plate 2-5 Waste Rock Stockpile







Plate 2-7 Heap Leach Site



Plate 2-8 Heap Leach Site (outside of M77/166)



Plate 2-9 Exploration Costean



Plate 2-10 Sump left from Previous Exploration Activities