FI Joint Venture Pty Ltd

Yogi - Magnetite Project
Environmental Management Plan

March 2020

Document amendment

Version	Author	Reviewer	Date	Change
A	N Barratt S Nind	R Lupton	10/7/2019	
B	N Barratt S Nind A Imbergamo	M Brook	25/10/2019	Amendments per comments received from the WA Environmental Protection Authority and the Commonwealth Department of Environment and Energy
C	N Barratt S Nind A Imbergamo K Frehill	M Brook	18/03/2020	Amendments per comments received from the WA Environmental Protection Authority and the Commonwealth Department of Environment and Energy

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Summary

Proposal title	Yogi Magnetite Project
Proponent	FI Joint Venture Pty Ltd (FIJV)
Ministerial Statement	To be advised
Purpose of this EMP	The purpose of the Environmental Management Plan (EMP) is to support the implementation of the Yogi Magnetite Project. The EMP will also support the approval given under the *Environment Protection and Biodiversity Act 1999* (EPBC Act), EPBC 2017-8124, if an approval is granted. This EMP has been developed in accordance with the *Instructions on how to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans* (EPA 2018a).
Key Environmental Factors and Objectives	
Flora and Vegetation	*To protect flora and vegetation so that biological diversity and ecological integrity are maintained.*
Landforms	*To maintain the variety and integrity of significant physical landforms so that environmental values are protected.*
Subterranean Fauna	*To protect subterranean fauna so that biological diversity and ecological integrity are maintained.*
Terrestrial Environmental Quality	*To maintain the quality of land and soils so that environmental values are protected.*
Terrestrial Fauna	*To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.*
Inland waters	*To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.*
Air Quality	*To maintain air quality and minimise emissions so that environmental values are protected.*
Social Surroundings	*To protect social surroundings from significant harm.*
Condition clauses	
To be advised	
Key provisions in the Plan	
• Demarcate all clearing areas prior to clearing using a hand held GPS accurate to 5 m, so that “No Go” zones are clearly delineated and noted by project workers. • Maintain an internal clearing permit system. • Implement a biannual weed monitoring and targeted spraying program following completion of land clearing activities and during operations and closure activities. • Development of induction records to notify staff of significant aspects of the Proposal, including rare flora and heritage sites. • Monthly environmental compliance inspection to ensure management measures such as spill kits, dust, disturbance to priority flora and aboriginal heritage sites. • Waste rock dumps (WRD) to be designed to include drainage management in order to capture and monitor runoff from the waste rock dumps to avoid runoff discharging into watercourses.	

- Ongoing monitoring to be undertaken to evaluate potential for waste rock to generate acid mine drainage. This will include surface water monitoring and groundwater bore monitoring.
- Prior to clearing, areas of the granitic formation and BIF Ridgeline (all suitable habitat) will be targeted searched for Western Spiny-tailed Skink colonies. These areas will be demarcated and logged on the project's GIS database. The proposed site layout will be revised to avoid these areas to allow the skink to forage and maintain sufficient connectivity to the surrounding habitats. Where colonies of Western Spiny-tailed Skinks are present, and avoidance is not appropriate, these animals will be relocated to new sites. A targeted survey has been undertaken and six potential relocation site have been identified. Based on the results of the targeted survey, relocation management measures have been developed for this species (Appendix D).
- Conduct a risk assessment to identify high risk areas, including areas where conservation significant fauna species and habitat have been identified and potential impacts to guide site design.

1. Context, scope and rationale

This Environmental Management Plan (EMP) has been prepared by GHD Pty Ltd on behalf of FI Joint Venture Pty Ltd (FIJV) to support the implementation of the Yogi Magnetite Project. The EMP will also support the approval given under the Environment Protection and Biodiversity Act 1999 (EPBC Act), EPBC 2017-8124, if an approval is granted. This EMP has been developed in accordance with the *Instructions on how to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans* (EPA 2018a).

In accordance with the EPA (2018) instructions, this EMP includes the following sections:

- Section 1.1- the Proposal that this EMP addresses
- Section 1.2 - Key environmental factors (Table 1-3)
- Section 1.3 - The condition requirements applicable to the Proposal
- Section 1.4 - The rationale and approach underlying this EMP.

Sections 2 outlines the EMP provisions for each key environmental factor. Adaptive management, incident reporting and stakeholder consultation are detailed in Section 3, 4 and 5.

1.1 The Proposal

FIJV proposes to construct and operate a magnetite iron ore project (Yogi Mine Project, the Proposal) approximately 225 km east-northeast of Geraldton and 15 km northeast of Yalgoo in Mid-West, Western Australia (Figure 1). Alongside this, the Proposal also includes the construction of a magnetite slurry pipeline and a water pipeline to Geraldton Port and a gas supply pipeline from the Dampier to Bunbury Natural Gas Pipeline to the Mine Development Envelope (MDE).

Yogi Magnetite Project (the Proposal) is currently under assessment by the Environmental Protection Authority (EPA) (Assessment Number 2154). The Proposal has a maximum Disturbance Footprint of 1,730 ha (of which 1,530 ha is in the MDE and 200 ha in the PDE). The summary of the proposal is detailed in Table 1-1 and Table 1-2.

Table 1-1 Summary of proposal

Proposal title	Yogi Mine Project
Proponent Name	FI Joint-Venture Pty Ltd
Proponent Activities	Mine construction and operation

Proposal title	Yogi Mine Project
Short Description	Yogi Mine The Proposal is to construct and operate an open-cut mine referred to as the Yogi Mine Project and will include construction of all relevant mining infrastructure (such as haul roads, processing plant, dry processing waste facility (DPWF), run mine pad, crusher, electricity generation, fuel storage site, treated ore stockpile pad, crusher, explosive warehouse and general onsite buildings). Mining of magnetite will occur below groundwater and will include open cut mine operation. The operation will involve clearing and topsoil stockpiling, overburden drilling and blasting, followed by removal of material by truck. Pipeline Corridor The Proposal also includes construction of a pipeline corridor for a slurry pipeline, water pipeline and gas pipeline. The gas pipeline will supply gas from the Dampier to Bunbury Gas Pipeline Network to the Yogi Mine. The slurry and water pipeline will extend from the Mid-West Ports to the Yogi Mine. The water pipeline will supply water from the Port Dewatering Plant to the Yogi mine for re-use in the processing plant.

Table 1-2 Key proposal characteristics for the Yogi Mine Project

Physical Elements	Location	Proposed extent
Mine Development Envelope Including Mine Pit, Mining overburden and Waste Facilities, Dry Processing Waste Facility, Mine and Processing Support Infrastructure and Corridors	Figure 1	Clearing of no more than 1,530 ha within an 8,230 ha Development Envelope
Pipeline Development Envelope Including Magnetite Slurry Pipeline, Water Pipeline, and gas pipeline	Figure 1	Clearing of no more than 200 ha within the 76,800 ha
Operational Elements	**Details**	
Groundwater Abstraction (Water demand)	Up to 5 gigalitres per annum (GLpa) from water supply borefield	
Mine site dewatering	Up to 5 GLpa (to be used for processing)	
Power	70 MW to be supplied by onsite Gas Power Station	
Gas Supply	Gas to be supplied to the power station via a buried steel pipeline at a rate of 23 TJ/day	
Overburden/ Waste Rock	Disposal of up to 800 million tonnes (over the life of the project)	
Ore Processing Waste	Disposal of up to 80 million m^3 of dry processing waste (over the project life)	
Ore transport	Ore will be transported as a slurry in the new slurry pipeline proposed to be constructed between Yogi Mine and Geraldton Port.	

1.2 Key Environmental Factors

The Preliminary Key Environmental Factors identified by the EPA at the referral stage are Flora and Vegetation, Subterranean Fauna, Terrestrial Environmental Quality, Terrestrial Fauna, Inland Waters Environmental Quality, Air Quality and Social Surroundings. A summary of the factors is included below. Residual impacts will be managed via the management measures detailed in Section 2.

Table 1-3 Summary of environmental impact assessment of preliminary key environmental factors

Flora and vegetation	
EPA objective	*To protect flora and vegetation so that biological diversity and ecological integrity are maintained.*
Policy and guidance	• Statement of Environmental Principles, Factors and Objectives (EPA 2018b) • Environmental Factor Guideline: Flora and Vegetation (EPA 2016a) • Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016a)
Project activities	• Clearing of native vegetation • Vegetation clearing and topsoil • Ore transport • Use of explosives
Potential impacts	• Loss of vegetation and flora through clearing, including conservation significant vegetation and flora • Dust generation during construction and operations • Introduction and spread of environmental weeds • Increased edge effect • Habitat loss and fragmentation from vegetation clearing • Alteration of fire regimes • Decline of species abundance and diversity • Alteration to surface and groundwater flows and quality
Residual impacts	The following residual impacts are considered to be of minor significance at both local and regional scale: • 1,530 ha of native vegetation will be cleared within the MDE and 200 ha within the Pipeline Development Envelope (PDE). • The impact of weeds on flora and vegetation is assessed to be low following implementation of the weed control measures outlined above and in the EMP. • Edge effect will be minimised in the MDE by keeping infrastructure together, and avoiding clearing in new, discrete areas. There is anticipated to be increased edge effects, however their significant is estimated to be low as the vegetation and flora present onsite are well represented in the local area and region. • There will be some fragmentation of flora and vegetation, however it is not assessed as significant as the vegetation and flora present onsite are well represented in the local area and region. Rehabilitation will create new ecological linkages between remnant and newly established flora and vegetation communities post-disturbance. • Weed management, construction of firebreaks and hot work permits will reduce the risk of fires caused by the proposal such that there impact is assessed as low.

	• Dust impacts to flora and vegetation are anticipated to be minimal given the management measures proposed. • The vegetation and flora present onsite are well represented in the local area and region and their removal is not assessed to impact species abundance and diversity. • Due to the absence of GDE and riparian vegetation within the MDE and PDE, and the depth of groundwater below ground level, impacts to flora and vegetation due to changes in groundwater quality and flow changes are considered low.
Landforms	
EPA objective	*To maintain the variety and integrity of significant physical landforms so that environmental values are protected.*
Policy and guidance	• Statement of Environmental Principles, Factors and Objectives (EPA 2018b) • Environmental Factor Guideline: Landforms (EPA 2016b)
Project activities	• Ore transport • Use of explosives
Potential impacts	• Alteration to landform structure (either temporary or permanent) • Alteration to ecological function of the landform (either temporary or permanent) • Impacts on environmental values of the landform (either temporary or permanent)
Residual impacts	The following residual impacts are considered to be of minor significance at both local and regional scale: • Some permanent impacts to the BIF landform structure would occur from mine construction and operations given that the BIF is located on the western portion of the MDE where the ore body located and the mine pit is proposed. • However, ground disturbance will be rehabilitated and landforms established in the location of the BIF (i.e. overburden facility) will be rehabilitated to reflect regional BIF topography. • Temporary alteration to the ecological function may occur due to the removal of Yalgoo BIF itself, including conservation flora and fauna habitat. • Permanent impacts to the environmental values of the BIF landform may occur due to alteration of the landform structure and the removal of the Yalgoo BIF PEC, including conservation flora and fauna habitat.
Subterranean Fauna	
EPA objective	*To protect subterranean fauna so that biological diversity and ecological integrity are maintained.*
Policy and guidance	• Statement of Environmental Principles, Factors and Objectives (EPA 2018b) • Environmental Factor Guideline Subterranean Fauna (EPA 2016c) • Technical Guidance Terrestrial Subterranean Fauna Surveys (EPA 2016d)
Project activities	• Clearing of habitat • Ore transport • Use of explosives
Potential impacts	• Loss or degradation of habitat or species population from construction and operations • Loss of potential habitat and species populations due to: • Abstraction of groundwater

	• Changes to hydrological regimes and water quality • Groundwater contamination • Loss of food/nutrient sources
Residual impacts	• Some permanent loss of potential subterranean fauna habitat will occur from mine construction and operations. However, subterranean fauna species are not restricted to the mine area and only a minor portion of the geological unit will be removed (96.5% remaining). • Abstraction of Groundwater will be localised to the immediate vicinity of the mine pit area and the paleochannel area. • Changes to the hydrological regimes and water quality are expected to be minimal and only in the immediate vicinity of the proposal. • With implementation of appropriate environmental management subterranean fauna values are unlikely to be affected by groundwater contamination • The development of the proposal is unlikely to affect the overall supply of food/nutrients to subterranean fauna communities.
Terrestrial Environmental Quality	
EPA objective	*To maintain the quality of land and soils so that environmental values are protected.*
Policy and guidance	• Statement of Environmental Principles, Factors and Objectives (EPA 2018b) • Environmental Factor Guideline Terrestrial Environmental Quality (EPA 2016e) • Guidance Statement 6 – Rehabilitation of Terrestrial Ecosystems (EPA 2006)
Project activities	• Construction of the trenches through ephemeral watercourses
Potential impacts	• Soil acidification as a result of disturbance of soil • Contamination of soils as a result of Acid and Metalliferous Drainage • Contamination of soils through spillage of reagents, chemicals, hydrocarbons
Residual impacts	• Soil acidification is unlikely from the construction of the trenches through ephemeral watercourses. With the application of standard management techniques. • AMD is considered unlikely based on the low sulfur content of the ore and waste material. However, despite the low likelihood proactive management measures will be applied to ensure appropriate monitoring and does not affect Terrestrial Environmental Quality values. • Soil contamination from spills is unlikely to result in significant environmental impacts.
Terrestrial Fauna	
EPA objective	*To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.*
Policy and guidance	• Statement of Environmental Principles, Factors and Objectives (EPA 2018b) • Environmental Factor Guideline: Terrestrial Fauna (EPA 2016f) • Technical Guidance Terrestrial Fauna Surveys (EPA 2016g) • Technical Guidance Sampling methods for terrestrial vertebrate fauna (EPA 2016h) • Technical Guidance: Sampling of short range endemic invertebrate fauna (EPA 2016i)
Project activities	• Dewatering

	• Blasting • Groundwater abstraction • Use of explosives • Overburden/waste rock handling • Ore transport • Vegetation clearing and topsoil
Potential impacts	• Loss of fauna habitat as a result of clearing vegetation. • Displacement and death of fauna • Habitat fragmentation • Habitat degradation from introduction and spread of environmental weeds • Alteration of fire regimes • Introduction and spread of feral animals
Residual impacts	• Clearing of 1,530 ha of fauna habitat and 18.49% of fauna habitat within the MDE. Removed fauna habitats will be re-established as part of rehabilitation during operations and closure in disturbed areas and new permanent landforms. There may be some permanent loss of habitat such as the loss of 311.98 ha of BIF Ridgeline and up to 198.93 ha of granitic formations. • Fauna habitat will be rehabilitated following completion of works within that area, indicating that the habitat loss period will vary according to completion of works, and successful rehabilitation. • Adjacent vegetation within the buffer of the Mine and PDE should remain intact with little or no disturbance allowing ecosystem processes to continue both at local and regional scale. • While the vegetation of the MDE plays a role in providing fauna habitat, none of the vegetation types that are affected in development of the Proposal are known to provide habitat critical to the maintenance of fauna species. The proposed development has been designed to minimise impacts to the granitic formations and BIF ridgeline, which are considered to be the most significant of habitats from a SRE fauna utilisation and refuge perspective. The impact on the riparian vegetation is restricted to creek crossings, with remaining riparian vegetation undisturbed. The residual impact to riparian vegetation is considered to be minor. • Rehabilitation will establish habitat for fauna species post-disturbance to restore ecological linkage for some species. • Whilst the vegetation communities on rehabilitated surfaces are unlikely to be similar to those removed, the resulting habitats will be generally used by fauna species present. Some permanent landforms may provide new habitat for fauna species post-closure. • Implementation of the proposed management measures will reduce direct impacts to fauna. • Impacts to fauna due to light, dust and noise are anticipated to be limited to the short term, and not expected to impact on the ability of terrestrial fauna to persist long term. As such, the residual impacts are considered negligible. • Weed management, construction of firebreaks and hot work permits will reduce the risk of fires caused by the proposal. • Given there is currently no management of feral animals in the local area, the management of feral animals during operations may actually reduce the number of feral animals in the local area. This is likely to counterbalance the proposal's potential to provide improved access by feral predators into the area.

	• Impacts to fauna due to introduction of weeds are not assessed to be significant as the management measures are anticipated to adequately manage this issue, and not expected to impact on the ability of terrestrial fauna to persist long term. As such, the residual impacts are considered negligible.
Inland waters	
EPA Objective	*To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.*
Policy and guidance	• Statement of Environmental Principles, Factors and Objectives (EPA 2018b) • Environmental Factor Guideline Inland Waters (EPA 2018c)
Project activities	• Surface water diversions • Dewatering groundwater for mining activities. • Drawdown
Potential impacts	• Alteration to surface water flows as a result of mining and infrastructure construction and operations, including potentially altering natural erosion and deposition patterns which could increase the surface water turbidity • Alteration of the hydrology of the area from groundwater abstraction • Impacts to inland wetland communities or groundwater dependent ecosystems as a result of groundwater drawdown • Contamination of surface water associated with Acid and Metalliferous Drainage • Groundwater contamination from Acid and Metalliferous Drainage • Impacts to inland wetland communities or groundwater dependent ecosystems as a result of groundwater drawdown and changes to groundwater quality
Residual impacts	There is potential for significant surface water – groundwater interactions within the vicinity of the proposed mine site due to its location within an alluvial floodplain and the presence of ephemeral surface water drainage systems with flood-out zones, and paleo-drainage channels.
Air Quality	
EPA Objective	*To maintain air quality and minimise emissions so that environmental values are protected.*
Policy and guidance	• Statement of Environmental Principles, Factors and Objectives (EPA 2018b) • Environmental Factor Guideline Air Quality (EPA 2016j)
Project activities	• Ore processing
Potential impacts	• Dust generation • Pollutant emissions from mining and power generation activities • Ore processing • Post –closure rehabilitation • Greenhouse gas emissions
Residual impacts	• Any changes in dust deposition is expected to be limited to the immediate vicinity of the mine and roads. The MDE is currently an active pastoral station, with dust generated as a result of cattle and vehicle movement. The mining operation are not expected to result in a measurable change to vegetation health in the wider region. • The majority of airborne particulates likely to originate from the proposed operations are greater than PM10 and are more associated with nuisance rather than public health impacts. The larger particles tend to settle back to the ground within a short range (less than 300 m) from the source.

	• Post-closure rehabilitation will be adequately planned to ensure that there are no significant impacts to air quality. • Greenhouse gas emissions from the Proposal are anticipated to contribute to the overall global warming of the earth, with GHG emissions presently mainly attributed to power generation (70%). • It is recommended that opportunities for reducing greenhouse gas emissions during the life of the Proposal should be investigated.
Social Surroundings	
EPA Objective	*To protect social surroundings from significant harm.*
Policy and guidance	• Statement of Environmental Principles, Factors and Objectives (EPA 2018b) • Environmental Factor Guideline Social Surroundings (EPA 2016k) • Guidance for the Assessment of Environmental Factors, Assessment of Aboriginal Heritage No. 41 (EPA 2004)
Project activities	• Dewatering • Blasting • Groundwater abstraction • Use of explosives • Overburden/waste rock handling • Ore transport • Vegetation clearing and topsoil • surface water diversions
Potential impacts	• Loss/disturbance to Aboriginal or European heritage sites • Activities may occur in areas of Native Title • Negative impacts to pastoral lease operations and any tourism activities in the Development Envelope • Impacts to amenity values (including visual landscape, visual aesthetics values and recreational tourism) associated with the Pipeline corridor
Residual impacts	This Proposal is expected to result in permanent changes to local landforms, specifically the BIF range. This could potentially affect the visual amenity at potentially sensitive receptors. However, visual impacts associated with additional permanent changes to local landforms as a result of this Proposal are not expected to be particularly prominent as the nearest sensitive receptor is approximately 16 km away. From the Mine Development Envelope there is limited accessibility and distance of the Proposal from potentially sensitive viewpoints. Much of the Pipeline development envelope lies within an already altered landscape given the pipeline is proposed to follow closely the existing Dampier-Bunbury Natural Gas Pipeline and the proximity of the Proposal to the existing Mount Magnet Road and other surrounding land uses (pastoral). Views of the Proposal from potentially sensitive viewpoints are also expected to be obscured by local topography and existing vegetation. As such, visual impacts are expected to be limited.

1.3 Condition requirements

The Proposal is currently being assessed by the EPA and a Ministerial Statement and associated conditions are yet to be issued.

1.4 Rationale and approach

1.4.1 Survey findings

The findings for the surveys undertaken for the Proposal are included in Table 1-4.

Table 1-4 Recent survey findings per aspect

Aspect	Title and Consultant	Description of findings
Flora and vegetation	Pipeline Corridor Flora and Fauna Assessment GHD (2020a)	Detailed and targeted vegetation and flora surveys completed on 6-14 August and 9-13 October 2018. The purpose of the survey was to verify the desktop assessment, identify and describe the dominant vegetation types, assess vegetation condition and identify and record vascular flora present. Targeted searches for conservation significant vegetation and flora taxa were also completed. The vegetation condition within the MDE was rated from Excellent to Very Good, with cleared areas (i.e. Yalgoo-Mt Magnet Road) (0.41%) not rated. The majority (93.70%) of vegetation throughout the MDE was rated as Excellent. One Priority Ecological Community (PEC) was identified within the MDE during the field survey, the Yalgoo (Gnows Nest/Wolla Wolla and Woolgah-Wadgingarra) vegetation complexes (banded ironstone formation) listed as Priority 1 by the Department of Biodiversity Conservation and Attractions (DBCA). There is 1,041.09 ha (12.65%) of the Yalgoo vegetation complexes PEC within the MDE. Three DBCA Priority-listed flora species were recorded within the MDE during the GHD field survey, *Acacia subsessilis* (Priority 3), *A. speckii* (Priority 4) and *Dodonaea amplisemina* (Priority 4) (GHD 2020a).
	Flora and Vegetation Assessment GHD (2019)	Reconnaissance vegetation and flora survey completed from 26-30 November 2018. The purpose of the survey was to identify and describe the dominant vegetation types, assess vegetation condition and identify and record vascular flora present. Opportunistic searches for conservation significant vegetation and flora taxa were also completed. Thirty-five relevés were conducted throughout the survey area, supplemented by photo reference sites and traversing areas by vehicle and foot. The vegetation condition within the eastern portion of the PDE was rated from Excellent to Very Good with cleared areas not rated. The majority of vegetation was in Excellent condition. The Eucalypt Woodlands of the WA Wheatbelt PEC was recorded from six separate patches within the eastern portion of the PDE during the GHD field survey. Three DBCA Priority-listed flora species were recorded during the GHD field survey, *Philotheca nutans* (Priority 1), *Dicrastylis linearifolia* (Priority 3) and *Acacia speckii* (Priority 4)
	Western Pipeline Flora and Fauna Desktop Assessment, (GHD 2020b)	The desktop assessment reviewed publically available information (government databases) to determine the previously recorded flora and vegetation values in the western portion of the PDE. The study area included a 40 km buffer of the western portion of the PDE. No wetlands (RAMSA or of National importance, DBCA managed lands, ESAs, TECs/PECs intersect the western portion of the PDE. Nine 'avoidance areas' have been identified based on the prevalence of conservation significant flora and fauna and the priority status within certain areas of the western PDE.

Aspect	Title and Consultant	Description of findings
Subterranean fauna	Dual Phase Survey for Subterranean Fauna for the Yogi Magnetite Project, Yalgoo, Western Australia Invertebrate Solutions (February 2020)	A desktop assessment was completed to identify the presence of troglofauna and stygofauna in the MDE and surrounding area through a search of the of the Western Australian Museum database. Suitable geological characteristics that would support subterranean fauna were also identified through the desktop review of geological, geotechnical and hydrogeological information available for the study area. A detailed (Level 2) phase 1 survey was completed between August and October 2018 of the relevant project tenements and in areas outside the project tenements. The detailed (Level 2) phase 2 survey was completed in November 2019, sampling a mixture of previously sampled bores and additional bores which were drilled for water exploration purposes in April 2019. Troglofauna survey retrieved 28 litter traps in suitable groundwater bores in the phase 1 survey and 26 traps in 18 previously sampled bores in phase 2. The dual phase survey retrieved a total of 54 the 62 traps deployed, with 8 traps irretrievable. The phase 1 stygofauna survey sampled 22 groundwater bores and the phase 2 survey sampled a total of 23 bores (a mixture of previously sampled bores and additional bores which were drilled for water exploration purposes). A total of 45 stygofauna samples were undertaken in the two surveys. The survey methods used for stygofauna included using a net that was dropped to the base of the bore and pulled through the water column several times.
Terrestrial Fauna	Yogi Magnetite Project, Fauna Assessment (GHD 2020c)	A total of 153 vertebrate fauna species, including 27 mammals, 83 birds, 39 reptiles and four amphibian species were recorded in the Level 1 and Level 2 surveys conducted by GHD (2020c). The following two conservation significant species were recorded in the project area: Western Spiny-tailed Skink (*Egernia stokesii* subsp. *badia*) and Long-tailed dunnart (*Sminthopsis longicaudata*). The following three conservation significant species were identified to potentially be within the project area: Gilled Slender Bluetongue (*Cyclodomorphous branchialis*); Peregrine Falcon (*Falco peregrinus*); and Forked-tailed Swift (*Apus pacificus*).
Inland waters: Surface water	Surface Water Assessment GHD 2019	The proposed mine site is intersected by two non-perennial significant streams, the Western Primary Watercourse (WPW) which traverses the western side of the envelope, and the Eastern Primary Watercourse (EPW) along the eastern side of the envelope. These watercourses divide the mine site into two distinct catchment areas. There is potential for significant surface water – groundwater interactions within the vicinity of the proposed mine site due to its location within an alluvial floodplain and the presence of ephemeral surface water drainage systems with flood-out zones, and paleo-drainage channels. The site creeks are all ephemeral and will drain to groundwater. Elevated chromium and nickel concentrations (in excess of adopted ANZECC ISQG guidelines) were reported in some sediments along the western extent of the mining tenement

Aspect	Title and Consultant	Description of findings
		and downstream sampling locations, potentially indicative of naturally elevated background sediment concentrations related to local geology. Two opportunistic water quality samples from WPW were collected from standing pools observed during site investigations. The samples identified that some total metal and metalloid values are elevated which may be a result of naturally elevated background concentrations. The exceedance of filtered chromium and copper in water samples above guideline values (ANZECC 95%) indicates that bioavailable forms are present in water at levels which are of concern to some freshwater species.
Inland Waters: Groundwater	Groundwater modelling	A groundwater model was developed to assess the availability of groundwater from the mine pit and borefield. In assessing the availability of water the extent of groundwater drawdown was also determined.

1.4.2 Key assumptions and uncertainties

Key assumptions and uncertainties are detailed in Table 1-5.

Table 1-5 Key Assumptions and uncertainties

Aspect	Assumptions and uncertainties
Flora and vegetation	It is assumed that the surveys undertaken have accurately identified and mapped vegetation associations, and identified Priority flora and populations within the Proposal area and surrounds. It is also assumed that the previous assessment of impacts on flora and vegetation associated with the Proposal are correct, and are typically considered to be minor on a local and regional scale.
Landforms	It is assumed that reference documents are correct, specifically *Strategic Review of the Banded Iron Formation Ranges of the Midwest and Goldfields* (DEC & DoIR 2007) and *Flora and vegetation of the banded iron formations of the Yilgarn Craton (Markey and Dillion 2011)*: the Booylgoo Range correctly identified the and mapped the landforms within the project area.
Subterranean fauna	Species were identified to the lowest practical taxonomic level, taking into consideration that the taxonomic framework of many invertebrate groups is incomplete and often in need of substantial revision to enable accurate identification. Insufficient information exists for many invertebrate species due to specimens being juvenile, the wrong sex to allow identification, damaged, or inadequate taxonomic frameworks, precluding identification. Field surveys for subterranean fauna require multiple seasonal surveys to fully record all species that may be present in an area and additional surveys at different times of the year may record additional species. The following limitations are recognised with regard to the subterranean fauna studies completed to date: • Due to the absence of vertical bores within the mining pit void no troglofauna scrape sampling was able to be undertaken.

Aspect	Assumptions and uncertainties
	• No systematic core photos of the site were available for examination to assist in the determination of subterranean fauna habitat presence and/or extent (Invertebrate Solutions 2020).
Terrestrial environmental quality	The findings of the Material Characterisation Assessment (GHD 2019c) have formed the basis for the rationale and management approach adopted for the EMP. It is assumed that the recommendations outlined with the assessment have accurately identified the activities which require key management focus.
Terrestrial Fauna	The findings of the fauna surveys completed to date have formed the basis for the rationale and management approach adopted for the EMP. It is assumed that the surveys undertaken have accurately identified and mapped fauna habitat and recorded fauna occurrences.
Inland waters - Groundwater	The hydrogeological assessment provides a preliminary understanding of baseline conditions, however as the design of the Project components is progressed, and operations and monitoring commences, variations may arise which will allow substantial improvement in the understanding of potential Project impacts. Key uncertainties include: • The presented conceptual model and its parameterisation is considered valid for the scale of assessment • Groundwater flow at a regional scale can be approximated with porous flow characteristics • The mining plan is based on uniform progressive deepening of the mining pit over its pitshell footprint at a rate of 6 m per 6 months of mining, to maximum mining depth of 125 m AHD. The varying surface of the final pit base is honoured by this assessment (ranging between 125 to 200 m AHD).
Inland waters - Surface Water	The surface water assessment provides a preliminary understanding of baseline conditions, however as the design of the Project components is progressed, and operations and monitoring commences, variations may arise which will allow substantial improvement in the understanding of potential Project impacts. Key uncertainties include: • The surface water assessment was completed based on the Mine Layout plan as of 24 October 2017. The surface water assessment is considered to be preliminary and adaptive and will require review and updating if the Mine Layout changes and as mining progresses. Further, the surface water assessment precedes any environmental, health or operational risk assessments. The setting of surface water management triggers, thresholds and interventions as a result of such risk assessments may also necessitate review of this plan. • Surface water and sediment monitoring locations were selected based on the proposed Project and Mine Layout, to provide continuity between pre-development, operation and closure. The proposed monitoring plan will require review and updating if the Mine Layout changes. • Baseline water quality data is limited to two opportunistic grab samples, both of which were from standing water. Further

Aspect	Assumptions and uncertainties
	characterisation of surface water is required to assess background water quality conditions
Air Quality	All parameters used in the model and other relevant data are based on best estimates using information provided by FIJV. The meteorological data used and derived in this assessment is representative of the meteorology at the Project site.
Social surrounds	It is assumed that the Due diligence risk assessment undertaken (Brad Goode & Associates 2019) within the Yalgoo and an infrastructure corridor has accurately identified and mapped the Aboriginal registered sites with the project area. It is also assumed that data taken from the Aboriginal Heritage Inquiry System and the State heritage register (Inherit) was up-to-date and correct at time of enquiry.

1.4.3 Management approach

This EMP has been developed to address the key environmental factors (and relevant EPA environmental objective) of Flora and Vegetation, Subterranean Fauna, Terrestrial Environmental Quality, Terrestrial Fauna, Inland Waters, Air Quality and Social Surrounding.

A systematic approach was utilised where the potential impacts of the project were assessed, and mitigation measures applied (GHD, 2019). Based on this assessment, residual impacts were identified and these will be subject to this EMP. Both outcome based and management based provisions are included in this EMP.

1.4.4 Rationale for choice of provisions

Both outcomes based and management based provisions are utilised in this EMP, taking into account that some aspects will have measurable outcomes, while others will be procedure driven to manage residual impacts.

2. EMP provisions

The EMP will be utilised for the management of environmental commitments on site during construction and operation. Mine closure will be managed as per the Mine Closure Plan.

Communication during the construction and operations phase will occur on a daily, weekly or as-needed basis with relevant staff, project managers or external stakeholders.

All construction and operation personnel and sub-contractors will undergo an induction, which includes information on the importance of the environmental approvals conditions and the requirements to enable environmental outcomes to be achieved. They will be advised of their responsibilities with regard to the *Environment Protection and Biodiversity Conservation Act 1999*, *Environmental Protection Act 1986,* the *Wildlife Conservation Act 1950* and *Conservation and Land Management Act 1984*, including project approval and contractual requirements. A record of inductions will be kept by the Construction Manager or equivalent.

Regular toolbox meetings will be used to reinforce messages on environmental protection, to relay new information and to encourage and celebrate positive outcomes.

Reporting as per the ministerial conditions will be undertaken for the project at designated intervals.

2.1 Flora and vegetation

Proposal activity: Clearing of native vegetation			
EPA Objective: *To protect flora and vegetation so that biological diversity and ecological integrity are maintained*			
Key environmental value: Loss of conservation significant vegetation and communities			
Key impacts and risks: Loss of vegetation and flora through clearing, including conservation significant vegetation and flora Introduction and spread of environmental weeds Habitat loss and fragmentation from vegetation clearing Decline of species abundance and diversity			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
No clearing of native vegetation outside of the proposal area. Reduce disturbance to Priority Flora	Demarcate all clearing areas prior to clearing using a hand held GPS accurate to 5 m, so that “No Go” zones are clearly delineated and noted by project workers. Maintain an internal clearing permit system.	Site walkover to confirm proposal area clearing boundaries against approved plans. Post clearing visual assessment to ensure correct area was cleared. Assessment may utilise GPS handheld to check clearing boundaries. Internal clearing permit system	Pre-clearance inspection. (Any variations between pegged clearing area and approved plans to be investigated and resolved prior to clearing.) Post clearing inspections. Internal clearing permit system
Generation of dust outside the appropriate parameters	Vehicles are restricted to designated routes, where dust control measures are undertaken. Dust suppression, including use of water carts on access roads, to be implemented during all Proposal phases.	Dust will be visually monitored daily by the construction supervisor or representative. Dust suppression and dust control measures will be visually inspected in the monthly environmental compliance inspection.	Reporting on exceedance of management targets Inspection report
Minimise the introduction of environmental weeds	Vehicles and mining equipment access to be limited to designated roads/access tracks and cleared areas.	Bi-annual weed monitoring program	Bi-annual weed monitoring report

Proposal activity: Clearing of native vegetation			
EPA Objective: *To protect flora and vegetation so that biological diversity and ecological integrity are maintained*			
Key environmental value: Loss of conservation significant vegetation and communities			
Key impacts and risks: Loss of vegetation and flora through clearing, including conservation significant vegetation and flora Introduction and spread of environmental weeds Habitat loss and fragmentation from vegetation clearing Decline of species abundance and diversity			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
	Implement a biannual weed monitoring and targeted spraying program following completion of land clearing activities and during operations and closure activities. Continued biannual weed monitoring and targeted spraying program along the pipeline route to minimise existing weed populations and reduce potential spread into adjacent land. Weeds and seeds inspections to be completed prior to plant arriving on site. Plant, machinery, equipment, tools and footwear will be cleaned down prior to arrival and prior to departure from the site. Clean down will consist of brushing, gouging, scraping and/or water blasting to remove any compacted soil or plant matter. Weedy topsoil and mulch will either be treated prior to reuse, buried at least 1.5 m under fill or disposed of appropriately offsite.	Monitoring to occur at sites within the MDE, in areas where weeds have been previously recorded or where there is high potential for weed spread (e.g. nearby roads and tracks, overburden heaps). Monitoring parameters to include weed diversity and abundance (% cover). Monitoring to occur bi-annual preferably with one sampling event during the growing season.	Weed and Seeds certificates
Minimise the impacts of edge effects	Vehicles restricted to designated routes, where dust control measures are undertaken. Progressive rehabilitation undertaken in areas where mining operations have been completed.	Biannual weed inspection and spraying program. Rehabilitation will be monitored yearly	Weed spraying records Mine Closure Plan

Proposal activity: Clearing of native vegetation			
EPA Objective: *To protect flora and vegetation so that biological diversity and ecological integrity are maintained*			
Key environmental value: Loss of conservation significant vegetation and communities			
Key impacts and risks: Loss of vegetation and flora through clearing, including conservation significant vegetation and flora Introduction and spread of environmental weeds Habitat loss and fragmentation from vegetation clearing Decline of species abundance and diversity			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
Minimise habitat loss and fragmentation	FIJV will undertake progressive rehabilitation in areas where mining operations have been completed. For land based operations this will involve rehabilitation of disturbed areas.	Rehabilitation will be monitored yearly	Mine Closure Plan
Reduce risk of altered fire regimes	Site induction to include information on prevention and management of fires. All machinery and vehicles to undertake clearing activities will be fitted with firefighting equipment. A Hot Work Permit system will be implemented. Firefighting equipment will be located on site and emergency personnel will be trained in fire response.		Hot work permit record system Training records for firefighting
Minimise decline of species abundance and diversity	Significant flora and vegetation will be mapped on site using a coloured peg system and avoided where possible during clearing (see Figure 2). Ensure staff and contractors are aware of the location of significant flora and vegetation on site, and their responsibility to ensure they are protected. Section of haul road traversing BIF landform deviated and narrowed to avoid and reduce impact of the Yalgoo vegetation complexes BIF PEC (P1) and individuals of *Acacia subsessilis* (P3) and *A. speckii* (P4).	Inspection of the clearing area prior to clearing	Incident reporting as required. Induction records

Proposal activity: Clearing of native vegetation			
EPA Objective: *To protect flora and vegetation so that biological diversity and ecological integrity are maintained*			
Key environmental value: Loss of conservation significant vegetation and communities			
Key impacts and risks: Loss of vegetation and flora through clearing, including conservation significant vegetation and flora Introduction and spread of environmental weeds Habitat loss and fragmentation from vegetation clearing Decline of species abundance and diversity			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
Minimise alteration to surface and groundwater flows and quality	Local drainage will be considered when constructing new haul roads and access tracks. Disturbance to watercourses will be minimised to that required to achieve safe mine design and asset protection. Spill kits will be available at all locations where a spill of hydrocarbons or chemicals could occur. Spill kits will be present in all utility or construction vehicles on site. Spill kits will be regularly checked during the monthly environmental compliance inspection to ensure kits are stocked. Spills will be cleaned up within 24 hours of occurrence and an incident report logged. Maintenance work to be undertaken on appropriate hardstand areas to prevent spills infiltrating into soils. Chemicals used on-site to be stored in an appropriate manner in accordance with MSDS. MSDS to be on site adjacent to chemical storage. Undertaking refuelling of mobile fleet in accordance with appropriate procedures.	Monthly environmental compliance inspection	Monthly inspection report

2.2 Landforms

Proposal activity: Clearing of native vegetation			
EPA Objective: To maintain the variety and integrity of significant physical landforms so that environmental values are protected.			
Key environmental values: landform structure and ecological function			
Key impacts and risks: Alteration to landform structure (either temporary or permanent) Alteration to ecological function of the landform (either temporary or permanent) Impacts on environmental values of the landform (either temporary or permanent)			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
Minimise any alterations to landform structure	Progressive rehabilitation of disturbed areas will be undertaken in accordance with the Mine Closure Plan so that site landscape will reflect regional topography.		Incident reporting as required.
Minimise any alteration to ecological function of the landform	Disturbance footprint designed to reduce clearing of and disturbance to Yalgoo BIF PEC (Priority 1) (Figure 3) as well as conservation significant flora and fauna. Progressive rehabilitation of disturbed areas will be undertaken in accordance with the Mine Closure Plan so that native vegetation is re-established.	Clearing inspections	Incident reporting as required
Successful rehabilitation and topsoil management of landforms	Top soil will be stockpiled for use in revegetation. Following the replacement of weed and dieback free topsoil direct seeding with native species will be undertaken: • Where possible, tube stock will be used in rehabilitation to increase the likelihood of establishment and retain the genetic integrity of the area • Seeding will be undertaken in the optimal season, identified by restoration practitioners, specific to the suite of species selected. Rate of seed application will be determined in consultation with revegetation/restoration practitioners and/or qualified ecologist • Fertiliser, containing nitrogen and phosphorus, will be used to encourage the growth of native seedlings at a rate determined by a revegetation/restoration practitioner • Use of fertilisers in revegetation will be tested prior to broad-scale application to determine the effect on native and weed species abundance local to the area. • Review mine plan to determine landform dimensions at end of mine life.	In accordance with Mine Closure Plan	Mine Closure Plan

Proposal activity: Clearing of native vegetation			
EPA Objective: To maintain the variety and integrity of significant physical landforms so that environmental values are protected.			
Key environmental values: landform structure and ecological function			
Key impacts and risks: Alteration to landform structure (either temporary or permanent) Alteration to ecological function of the landform (either temporary or permanent) Impacts on environmental values of the landform (either temporary or permanent)			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
Landform stability	Landforms (pit, overburden, waste rock, dry waste) are to be inspected for geotechnical stability and erosional stability. The landforms will be inspected to confirm the integrity of bunds, fencing and indicators of unauthorised entry. The mine site will also be inspected to confirm that land features outside of restricted areas do not present an unacceptable safety risk to persons, stock animals or native fauna, such as the presence of eroded gullies or exposed hazardous materials. Inspections are to include, but are not limited to: • visual inspection • wall and/or slope stability • bund integrity • capping integrity • seepage checks • road condition • erosion impacts	Monthly environmental compliance inspection	Monthly inspection report

2.3 Subterranean fauna

Proposal activity: Clearing of habitat. Use of various hydrocarbons (such as diesel) and other reagents or chemicals. Drawdown of groundwater.			
EPA Objective: *To protect subterranean fauna so that biological diversity and ecological integrity are maintained.*			
Key environmental value: Subterranean ecology and habitat			
Key impacts and risks: Loss or degradation of habitat or species population from construction and operations Loss of potential habitat and species populations due to abstraction of groundwater, changes to hydrological regimes and water quality, groundwater contamination, loss of food/nutrient sources			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
Minimise loss or degradation of habitat	Disturbance footprint designed to reduce disturbance to BIF landform structure. An internal ground disturbance procedures and permitting system will be implemented so that disturbance footprint is adhered to. Conduct clearing in accordance with permit and clearing procedure.	Site walkover to confirm proposal area clearing boundaries against approved plans. Monthly site environmental compliance inspection	Pre-clearance checklist. (Any variations between pegged clearing area and approved plans to be investigated and resolved prior to clearing.)
Minimise risk of contamination of soil and water	Spill kits will be available at all locations where a spill of hydrocarbons or chemicals could occur. Spill kits will be present in all utility or construction vehicles on site. Spill kits will be regularly checked during the monthly environmental compliance inspection to ensure kits are stocked. Spills will be cleaned up within 24 hours of occurrence and an incident report logged. Maintenance work to be undertaken on appropriate hardstand areas to prevent spills infiltrating into soils. Chemicals used on-site to be stored in an appropriate manner in accordance with MSDS. MSDS to be on site adjacent to chemical storage.	Monthly site environmental compliance inspection	Inspection report Incident reports

Proposal activity: Clearing of habitat. Use of various hydrocarbons (such as diesel) and other reagents or chemicals. Drawdown of groundwater.			
EPA Objective: *To protect subterranean fauna so that biological diversity and ecological integrity are maintained.*			
Key environmental value: Subterranean ecology and habitat			
Key impacts and risks: Loss or degradation of habitat or species population from construction and operations Loss of potential habitat and species populations due to abstraction of groundwater, changes to hydrological regimes and water quality, groundwater contamination, loss of food/nutrient sources			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
	Undertaking refuelling of mobile fleet in accordance with appropriate procedures.		
Minimise risk of salinization of groundwater systems caused by changes to surface and subsurface hydrology	The project drawdown cone will be monitored and shall not exceed 5 GLpa.	Monthly monitoring via bores	Monthly reporting
Minimise impacts of vibration	Optimise the amount of explosive used on site so as not to cause undue and excessive vibration impacts. Sequential blasting will be implemented to control vibration impacts.	Monthly site environmental compliance inspection	Inspection report Incident reports

2.4 Terrestrial environmental quality

Proposal activity: Use of various hydrocarbons (such as diesel) and other reagents or chemicals			
EPA Objective: To maintain the quality of land and soils so that environmental values are protected.			
Key environmental value: soil system health and structure			
Key impacts and risks: Soil acidification as a result of disturbance of soil Contamination of soils as a result of Acid and Metalliferous Drainage Contamination of soils through spillage of reagents, chemicals, hydrocarbons			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
Minimise contamination of soils as a result of Acid and Metalliferous drainage	Waste rock dumps (WRD) to be designed to include drainage management in order to capture and monitor runoff from the waste rock dumps to avoid runoff discharging into watercourses. Minimise waste rock handling. Ongoing monitoring to be undertaken to evaluate potential for waste rock to generate acid mine drainage. This will include surface water monitoring and groundwater bore monitoring.	Monitoring of WRD drainage in monthly environmental compliance inspection.	Monthly inspection report Surface water monitoring record Groundwater monitoring record
Minimise the contamination of soils through spillage of reagents chemicals hydrocarbons	Spill kits will be available at all locations where a spill of hydrocarbons or chemicals could occur Spill kits will be present in all utility or construction vehicles on site Spill kits will be regularly checked during the monthly environmental compliance inspection to ensure kits are stocked. Spills will be cleaned up within 24 hours of occurrence and an incident report logged. Maintenance work to be undertaken on appropriate hardstand areas to prevent spills infiltrating into soils.	Monthly environmental compliance inspection	Monthly inspection report

Proposal activity: Use of various hydrocarbons (such as diesel) and other reagents or chemicals			
EPA Objective: To maintain the quality of land and soils so that environmental values are protected.			
Key environmental value: soil system health and structure			
Key impacts and risks: Soil acidification as a result of disturbance of soil Contamination of soils as a result of Acid and Metalliferous Drainage Contamination of soils through spillage of reagents, chemicals, hydrocarbons			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
	Chemicals used on-site to be stored in an appropriate manner in accordance with MSDS. MSDS to be on site adjacent to chemical storage. Undertaking refuelling of mobile fleet in accordance with appropriate procedures.		

2.5 Terrestrial fauna

Proposal activity: Clearing of native vegetation and faunal habitat			
EPA Objective: To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.			
Key environmental value: Biodiversity and threatened fauna			
Key impacts and risks: Loss of up fauna habitat as a result of clearing vegetation. Displacement and death of fauna Habitat fragmentation Habitat degradation from introduction and spread of environmental weeds Introduction and spread of feral animals			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
Minimise habitat loss	Vegetation clearing to be limited to 1,530 ha, with no clearing or mining activities to occur on the BIF ridgeline in excess of the required minimum area. Prior to conducting ground disturbance activities, ensure known locations of environmentally sensitive areas to be retained and protected from disturbance are identified on the ground by appropriate signage, fencing or flagging.	Site walkover to confirm proposal area clearing boundaries against approved plans.	Pre-clearance checklist. (Any variations between pegged clearing area and approved plans to be investigated and resolved prior to clearing.)
	Section of haul road traversing granitic formations and BIF Ridgeline will be deviated and narrowed to avoid and reduce impact to these habitats.	Monthly environmental compliance inspection to include skink habitat and ensure no disturbance outside the approved area.	Monthly inspection report
	Prior to clearing, areas of the granitic formation and BIF ridgeline (all suitable habitat) will be targeted searched for Western Spiny-tailed Skink colonies. These areas will be demarcated and logged on the project's GIS database. The proposed site layout will be revised to avoid these areas to allow the skink to forage and maintain sufficient connectivity to the surrounding habitats. Where colonies of Western Spiny-tailed Skinks are present, and avoidance is not appropriate, these animals will be relocated to new sites. Relocation procedures are provided in Appendix D.	If relocation is required, then relocation management measures have been developed (Appendix D).	Western Spiny-tailed Skink targeted search results Relocation management procedures (if required)

Proposal activity: Clearing of native vegetation and faunal habitat			
EPA Objective: To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.			
Key environmental value: Biodiversity and threatened fauna			
Key impacts and risks: Loss of up fauna habitat as a result of clearing vegetation. Displacement and death of fauna Habitat fragmentation Habitat degradation from introduction and spread of environmental weeds Introduction and spread of feral animals			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
	Sections of the haul road traversing granitic formations and the BIF ridgeline will be deviated and narrowed to avoid and reduce impact to skink habitats. Ensure staff and contractors are provided with appropriate training to ensure conservation significant fauna and associated habitat are protected. Record conservation significant fauna and habitat identified during a targeted fauna survey in a centralised database to ensure that these area can be easily identified during mine planning and proposed works. Develop and establish an internal clearing permit procedure for any required clearing works. Waste dumps and general disturbance areas to be rehabilitated in accordance with the Mine Closure Plan. Rehabilitate cleared areas where mining activities are complete to provide more habitat for fauna. Prior to conducting ground disturbance activities, ensure known locations of environmentally sensitive areas are retained and protected from disturbance by installing appropriate signage, fencing or flagging. Daily inspections of the waste storage facility to determine if fauna are entrapped within.	Monitoring as per Mine Closure Plan Monitoring as per Mine Closure Plan	Risk Assessment Induction records Fauna register records Internal clearing permit system

Proposal activity: Clearing of native vegetation and faunal habitat			
EPA Objective: To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.			
Key environmental value: Biodiversity and threatened fauna			
Key impacts and risks: Loss of up fauna habitat as a result of clearing vegetation. Displacement and death of fauna Habitat fragmentation Habitat degradation from introduction and spread of environmental weeds Introduction and spread of feral animals			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
Minimise habitat fragmentation	Minimise clearing and vegetation disturbance to ensure conservation significant fauna and associated habitat is minimally affected. Conduct clearing in accordance with the permit and clearing procedure (to be developed). Fencing or tape to be in place around areas of fauna habitat outside the approved clearance area. Conduct progressive rehabilitation of disturbed areas, particularly those areas with known conservation significant fauna and associated habitat, in accordance with the Yogi Mine Closure Plan.	Site walkover to confirm proposal area clearing boundaries against approved plans. Monthly environmental compliance inspection	Pre-clearance checklist. Internal clearing permit system Inspection records
Reduce risk of faunal displacement and death	Injured vertebrate fauna will be given to a trained wildlife carer, or if not possible, euthanized humanely in accordance with DPaW standard operating procedure. All observations of conservation significant fauna species will be reported to the site Environmental Superintendent. As part of their on-site induction, all site personnel will be made aware of fauna species that occur in the locality (native and introduced). Vehicles and mining equipment access limited to designated roads/access tracks and cleared areas.	Monthly environmental compliance inspection	Fauna register Inspection records

Proposal activity: Clearing of native vegetation and faunal habitat			
EPA Objective: To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.			
Key environmental value: Biodiversity and threatened fauna			
Key impacts and risks: Loss of up fauna habitat as a result of clearing vegetation. Displacement and death of fauna Habitat fragmentation Habitat degradation from introduction and spread of environmental weeds Introduction and spread of feral animals			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
	Excavation and trenches will be kept open only a long as needed for the works. Trenches will be checked daily for trapped animals. During initial clearing, machinery will be sat idle for at least half an hour to allow fauna to migrate away from the disturbance area. A fauna spotter will also be employed to watch for fauna to ensure that they can be moved to a safe location. Removal of dead fauna away from edges of roads. Implement appropriate mitigation measures such as speed limit restrictions, right of way for fauna and the prohibition of off-road driving. Where possible, clearing should be undertaken on one front only, to provide an opportunity for the fauna to move out of the proposal area		
Reduce impacts from dust, noise and light emission	Lighting designed to illuminate designated operations areas rather than the surrounding landscape. Dust suppression, including use of water carts on access roads, to be implemented during all Proposal phases	Monthly environmental compliance checklist	Monthly inspection report
Reduce risk of altered fire regimes	Proposal site induction to include information on prevention and management of fires.		Site induction records

Proposal activity: Clearing of native vegetation and faunal habitat			
EPA Objective: To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.			
Key environmental value: Biodiversity and threatened fauna			
Key impacts and risks: Loss of up fauna habitat as a result of clearing vegetation. Displacement and death of fauna Habitat fragmentation Habitat degradation from introduction and spread of environmental weeds Introduction and spread of feral animals			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
	All machinery and vehicles undertaking clearing activities will be fitted with firefighting equipment. A Hot Work Permit system will be implemented. Firefighting equipment will be located on site and emergency personnel will be trained in fire response.	Monthly environmental compliance checklist Monitoring of Hot Works Permits Monitoring of training records	Monthly inspection report
Minimise the introduction of feral animals	No feeding of native or feral animals Putrescible wastes associated with site offices to be stored in bins with lids and transferred to an appropriate facility for disposal. Develop and implement a Feral Animal Program to effectively manage and control feral animals within FIJV controlled sites to minimise impacts on conservation significant fauna		Disposal receipts Feral Animal Program
Prevent attraction of fauna to storage areas of water and food wastes	Food waste will be contained and regularly removed from site and disposed of appropriately. Fauna access to artificial on-site water sources will be prevented. Putrescible wastes associated with site offices to be stored in bins with lids and prior to disposal.	Monthly environmental compliance checklist Monitoring of Hot Works Permits	Monthly inspection report

2.6 Inland waters: Groundwater

Proposal activity: Groundwater drawdown			
EPA Objective: To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.			
Key environmental value: Groundwater availability and quality			
Key impacts and risks: Alteration of the hydrology of the area from groundwater abstraction Impacts to groundwater dependent ecosystems as a result of groundwater drawdown Groundwater contamination from Acid and Metalliferous Drainage			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
Reduce the impacts of drawdown on hydrogeology	The project drawdown cone will be monitored and shall not exceed 5 GLpa.	Monthly monitoring via bores	Monthly reporting
Minimise groundwater contamination	Hazardous materials and waste will be subject to appropriate handling, storage and disposal procedures to avoid any impact on the environment. Monitoring of groundwater will be undertaken throughout mine construction, operations and closure to assess for potential contamination. Spill kits will be available at all locations where a spill of hydrocarbons or chemicals could occur. Spill kits will be present in all utility or construction vehicles on site. Spill kits will be regularly checked during the monthly environmental compliance inspection to ensure kits are stocked. Spills will be cleaned up within 24 hours of occurrence and an incident report logged. Maintenance work to be undertaken on appropriate hardstand areas to prevent spills infiltrating into soils. Chemicals used on-site to be stored in an appropriate manner in accordance with MSDS.	Monthly environmental compliance inspection Groundwater monitoring	Monthly inspection report Groundwater monitoring record

Proposal activity: Groundwater drawdown			
EPA Objective: To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.			
Key environmental value: Groundwater availability and quality			
Key impacts and risks: Alteration of the hydrology of the area from groundwater abstraction Impacts to groundwater dependent ecosystems as a result of groundwater drawdown Groundwater contamination from Acid and Metalliferous Drainage			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
	MSDS to be on site adjacent to chemical storage. Undertaking refuelling of mobile fleet in accordance with appropriate procedures. The control system of the pipeline will monitor the flow into and out of the pipeline on a continuous basis and an alarm will occur if a mismatch in flow is detected indicating that a leak is occurring in the pipeline. Monthly ground patrol inspections will be performed on the pipeline to identify any changes to the integrity of the pipeline, such as the conditions of water crossings, evidence of erosion or land subsidence and indication of leaks and spills. Special patrols will be undertaken after heavy storms or significant events to check for damage to the pipeline. Internal pipeline inspections to monitor the integrity of the pipeline will be performed through intelligent pigging on an as needed basis.	Monthly ground patrol inspections of pipeline	Monthly inspection report
Minimise impacts to groundwater ecosystems as a result of changes to groundwater quality	Hazardous materials and waste will be subject to appropriate handling, storage and disposal procedures to avoid any impact to groundwater dependent ecosystems. Visual inspections of all monitoring locations and equipment shall be completed and documented.	Monthly environmental compliance inspection Groundwater monitoring	Monthly inspection report Groundwater monitoring records

Proposal activity: Groundwater drawdown			
EPA Objective: To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.			
Key environmental value: Groundwater availability and quality			
Key impacts and risks: Alteration of the hydrology of the area from groundwater abstraction Impacts to groundwater dependent ecosystems as a result of groundwater drawdown Groundwater contamination from Acid and Metalliferous Drainage			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
	Monitoring of groundwater quality will be undertaken at on site and off site bores to quantify changes in the groundwater environment. The groundwater monitoring results will be assessed and reported in accordance with legal obligations and commitments.		

2.7 Inland waters: Surface water

Proposal activity: Clearing and ground disturbance			
EPA Objective: To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.			
Key environmental value: Surface water hydrology and ecology			
Key impacts and risks: Alteration to surface water flows as a result of mining and infrastructure construction and operations, including potentially altering natural erosion and deposition patterns which could increase the surface water turbidity Alteration of the hydrology of the area from groundwater abstraction Contamination of surface water associated with Acid and Metalliferous Drainage			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
Minimise any alteration to surface water flows[1] Prevent capture of WPW streamflow into mine pit. Prevent flooding	Avoid interaction with WPW where practicable to minimise impacts on downstream surface water flows and quality. Monitoring of surface water will be undertaken throughout mine construction, operations and closure to assess for potential alteration of flows. Revise mine layout where practicable to locate proposed infrastructure to areas which are less prone to flooding (most applicable to WRF, drainage water pond, and explosives warehouse as their locations are intercepted by the WPW). Undertake design and construction of linear infrastructure corridors (access corridor, water pipeline) with the aim of minimising changes to the hydrology and geomorphology of the rivers and creek lines, and minimise the risk of exposure of dispersive soils. Install appropriate cross-drainage along linear infrastructure corridors (including access routes, haul roads and pipelines) to reduce the impact of the proposed	Site and linear infrastructure inspection following rainfall events Surface water level monitoring (maximum stage heights) at proposed locations for significant rainfall events. Automatic weather station and rain gauge in catchment centroid adjacent proposed mine.	Inspection report Surface water monitoring record Climate monitoring record

[1] Surface water flow parameters collected from hydrological model and during surface water monitoring will assist in development of trigger and threshold criteria

Proposal activity: Clearing and ground disturbance			
EPA Objective: To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.			
Key environmental value: Surface water hydrology and ecology			
Key impacts and risks: Alteration to surface water flows as a result of mining and infrastructure construction and operations, including potentially altering natural erosion and deposition patterns which could increase the surface water turbidity Alteration of the hydrology of the area from groundwater abstraction Contamination of surface water associated with Acid and Metalliferous Drainage			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
	infrastructure on the existing flow paths and sediment deposition during flood events. Pipelines in the PDE will be buried under water crossings to prevent the alteration of surface water flows. Diversion of the waterways will be investigated and suitable bunds constructed. Install rock armour protection from scour and erosion along the edges of causeways. The explosives warehouse, drainage water pond, ore stockpile, processing plant, workshop, and administration at the mine site may need to be raised and/or armoured to avoid erosive or structural impacts to the waste rock as per Mine Closure Plan. Maintain bund at limits of eastern edge of mine pit to a minimum elevation of 1 metre above the estimated 1% AEP flood level. Where irregular flow conditions are observed following an event (e.g. no flow), and are project related, review discharge regime, frequency, timing and hydrological model.		

Proposal activity: Clearing and ground disturbance			
EPA Objective: To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.			
Key environmental value: Surface water hydrology and ecology			
Key impacts and risks: Alteration to surface water flows as a result of mining and infrastructure construction and operations, including potentially altering natural erosion and deposition patterns which could increase the surface water turbidity Alteration of the hydrology of the area from groundwater abstraction Contamination of surface water associated with Acid and Metalliferous Drainage			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
Minimise surface water quality contamination[2]	Monitoring of the surface water will be undertaken throughout mine construction, operations and closure to assess for potential contamination. All critical infrastructure will need to have the necessary flood protection measures and stormwater will be separated into clean and dirty water diversion channels. This will reduce the likelihood of contamination of downstream waters. Hazardous materials and waste will be subject to appropriate handling, storage and disposal procedures to avoid any impact on the environment. Spill kits will be available at all locations where a spill of hydrocarbons or chemicals could occur. Spill kits will be present in all utility or construction vehicles on site. Spill kits will be regularly checked during the monthly environmental compliance inspection to ensure kits are stocked. Spills will be cleaned up within 24 hours of occurrence and an incident report logged.	Monthly site environmental compliance inspection Surface water quality monitoring at proposed locations during flow events (maximum 2 rounds of samples per year).	Inspection report Incident reports Surface water monitoring record

[2] Surface water quality parameters collected during surface water monitoring will assist in development of trigger and threshold criteria

Proposal activity: Clearing and ground disturbance			
EPA Objective: To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.			
Key environmental value: Surface water hydrology and ecology			
Key impacts and risks: Alteration to surface water flows as a result of mining and infrastructure construction and operations, including potentially altering natural erosion and deposition patterns which could increase the surface water turbidity Alteration of the hydrology of the area from groundwater abstraction Contamination of surface water associated with Acid and Metalliferous Drainage			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
	Maintenance work to be undertaken on appropriate hardstand areas to prevent spills infiltrating into soils. Chemicals used on-site to be stored in an appropriate manner in accordance with MSDS. MSDS to be on site adjacent to chemical storage. Undertaking refuelling of mobile fleet in accordance with appropriate procedures. The control system of the pipeline will monitor the flow into and out of the pipeline on a continuous basis and an alarm will occur if a mismatch in flow is detected indicating that a leak is occurring in the pipeline. Monthly ground patrol inspections will be performed on the pipeline to identify any changes to the integrity of the pipeline, such as the conditions of water crossings, evidence of erosion or land subsidence and indication of leaks and spills. Special patrols will be undertaken after heavy storms or significant events to check for damage to the pipeline. Internal pipeline inspections to monitor the integrity of the pipeline will be performed through intelligent pigging on an as needed basis.	Monthly ground patrol inspections of pipeline	Monthly inspection report

Proposal activity: Clearing and ground disturbance			
EPA Objective: To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.			
Key environmental value: Surface water hydrology and ecology			
Key impacts and risks: Alteration to surface water flows as a result of mining and infrastructure construction and operations, including potentially altering natural erosion and deposition patterns which could increase the surface water turbidity Alteration of the hydrology of the area from groundwater abstraction Contamination of surface water associated with Acid and Metalliferous Drainage			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
Maintain acceptable sediment quality in WPW[3]	Install appropriate cross-drainage along linear infrastructure corridors (including access routes, haul roads and pipelines) to reduce the impact of the proposed infrastructure on the existing flow paths and sediment deposition during flood events. Install rock armour protection from scour and erosion along the edges of causeways. Where dispersive soils are identified, these should be treated or buried under a layer of non-dispersive soil before attempting any further erosion control measures. Where sediment deposition is identified, and are project related, institute improved management of disturbed area runoff, including: • Increased first flush containment capacity • Drainage and bunding measures • Improved vehicle sediment tracking controls	Annual sediment sampling at proposed locations following a significant streamflow events. Composite surface channel samples across main channel.	Sediment monitoring record

[3] Sediment physical and quality parameters collected during dry season sediment sampling will assist in development of trigger and threshold criteria

2.8 Air quality

Proposal activity: Mining and ground disturbance			
EPA Objective: *To maintain air quality and minimise emissions so that environmental values are protected.*			
Key environmental value: Air quality			
Key impacts and risks: Dust generation Pollutant emissions from mining and power generation activities Ore processing Post –closure rehabilitation Greenhouse gas emissions			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
Dust control	Wet down ground ahead of blasting activities. Dust suppressant to be applied on haul roads. Operate water carts on haul roads and open areas during summer. Cease non-essential mining activities during excessively windy conditions. Installation of a dust extraction system with wet scrubber on crushers. Stockpile deposits from crusher through a telescopic chute Sprinklers will be installed on crusher chutes and stockpiles Site management to ensure equipment installed and functioning properly. Conveyors will have dust extraction on transfer stations and be enclosed to prevent dust. Processing plants will have dust extraction systems with bag houses on driers Regular maintenance inspections and repairs will be undertaken on dust extraction ducting and bag houses. Implement loading and unloading procedures to ensure dust emissions from material handling is minimised.	Dust levels to be monitored during environmental compliance checklist Meteorological data will be continuously monitored to avoid excessive dust generation during adverse meteorological conditions (such as undesirable wind direction or excessive wind speeds) where possible. Observations will include rainfall, wind speed, wind direction, temperature, barometric pressure and relative humidity. Where meteorological conditions are anticipated to exacerbate dust	Inspection report

Proposal activity: Mining and ground disturbance			
EPA Objective: *To maintain air quality and minimise emissions so that environmental values are protected.*			
Key environmental value: Air quality			
Key impacts and risks: Dust generation Pollutant emissions from mining and power generation activities Ore processing Post –closure rehabilitation Greenhouse gas emissions			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
	All site traffic is required to adhere to the site speed limit to minimise dust generated by vehicle movement. Vehicle speeds would be limited to 25 km/h on areas on unconsolidated or unsealed soil associated with the project. All employees are educated regarding dust management onsite in reference to licence conditions, including reporting and best dust management practices. Sprinklers on the fine ore stockpiles. Review of daily weather updates from BoM, or a private meteorology service provider, to give warning of likely strong winds to assist with daily management of windblown dust from unconsolidated soil surfaces and material stockpiles. All haulage vehicles are to have their loads covered while transporting material to or from the work area through off-site routes that may have sensitive receptors. Operate water carts during dry, windy conditions and spring (i.e. driest) months All construction and maintenance equipment/vehicles to be operated and maintained to manufacturers' specifications in order to minimise exhaust emissions.	emissions an alert shall be issued. Continuous particulate monitoring will be undertaken using a Tapered Element Oscillating Microbalance (TEOM) to measure real-time particulate concentrations. The TEOM will have an alarm system, which can be configured when trigger levels are exceeded. Corrective actions will then be undertaken to control dust including shutdowns of dust causing machinery or water dust suppression. Dust deposition monitoring will be undertaken through the operational phase with trigger actions as per Table 2-1. Samples will be analysed by an	Induction records Records of meteorological data and dust suppression activities (watering and sprinkler regimes) will be maintained as per incident process. Inspection records

Proposal activity: Mining and ground disturbance			
EPA Objective: *To maintain air quality and minimise emissions so that environmental values are protected.*			
Key environmental value: Air quality			
Key impacts and risks: Dust generation Pollutant emissions from mining and power generation activities Ore processing Post –closure rehabilitation Greenhouse gas emissions			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
	Servicing should be undertaken by competent personnel who can interpret diesel emission monitoring results to minimise emissions following maintenance and repairs. Post-closure landforms are not to be left as bare earth and should be appropriately re-vegetated to reduce dust emissions. An air quality monitoring programme for TSP, PM10 and dust deposition will be implemented to determine ambient dust concentrations. A monitoring station for TSP and PM10 will be located at the Yalgoo township and dust deposition gauges will be located at the boundary of the Site. Monitoring equipment and sampling methods with conform to Australian standards and will be selected prior to commencement of the dust monitoring programme	independent NATA accredited laboratory. Appropriately spaced dust deposition gauges will be installed around the project site boundary (in particular the south-western edge) to monitor dust deposition. Dust deposition gauges will be sampled monthly as part of the Monthly site environmental compliance inspection.	
Stockpile management	Cover finished product stockpiles Sprinklers installed on the fine ore stockpiles Application of dust suppressant to non-active stockpiles	Monthly site environmental compliance inspection	Inspection records
Pollutant emissions from mining and power generation activities	All construction and maintenance equipment/vehicles to be operated and maintained to manufacturers' specifications in order to minimise exhaust emissions.	Service records	

Proposal activity: Mining and ground disturbance			
EPA Objective: *To maintain air quality and minimise emissions so that environmental values are protected.*			
Key environmental value: Air quality			
Key impacts and risks: Dust generation Pollutant emissions from mining and power generation activities Ore processing Post –closure rehabilitation Greenhouse gas emissions			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
	Servicing should be undertaken by competent personnel who can interpret diesel emission monitoring results to minimise emissions following maintenance and repairs. Good maintenance practices will be implemented in an effort to reduce raw exhaust emission levels. Operators should report any equipment issues.		
Post-closure rehabilitation	Post-closure landforms are not to be left as bare earth and should be appropriately re-vegetated to reduce dust emissions. The MCP will be updated prior to closure to ensure that appropriate land formation characteristics are included and revised according to the new landforms.	As per Mine Closure Plan	Mine Closure Plan
Greenhouse gas emissions	Operating the power plant at a suitable efficiency to meet demand and not produce excess electricity. Install energy efficient fittings, fixtures and equipment where appropriate.		

Table 2-1 Dust Trigger Actions

Monitor	Standard operations	Trigger level and response to alert	Responsibility
TEOM (PM10 1-hour average)	<30 µg/m3 Continue work in accordance with dust management procedures	Trigger level >80 µg/m3 • Ensure nominated site personnel are notified. • Review site conditions and monitoring results. • Review operations and consider additional dust mitigation which can be implemented. • Cease activities, if required. • Consider aerial application of dust suppressant. • Spray ore before loading and dumping into haul trucks. • Engage any additional water carts. • Continue or initiate sprinkler operation on stockpile area.	Environmental officer
Meteorological monitor	Continue work in accordance with dust management procedures	Average hourly wind speed >5 m/s and hourly wind direction between 355 and 85 ° • Ensure nominated site personnel notified. • Review site meteorological conditions to determine location wind conditions at the time of any high potential dust event • Review operations schedule (e.g. drilling and blasting) and cease or postpone if required until such time as meteorological conditions are permitting.	Meteorologist, site management
Visual inspection observing nuisance dust OR complaint	No nuisance dust	Implement additional dust mitigation measures including • Engage any additional water carts. • Review operations schedule (e.g. drilling and blasting) and cease or postpone if required until such time as meteorological conditions are permitting. • Continue or initiate sprinkler operation on stockpile area. • Record as the Complaints Form (to be advised within the EMP).	Site management
Dust deposition gauges	Monthly dust deposition below criteria	Monthly dust deposition gauge exceeds 4/m2/month OR one or more incremental monthly values (DDG value less background – the minimum of the monthly DDG) exceeds 2g/m2/month. Review efficiency of dust mitigation measures, and implement additional dust mitigation measures.	Environmental officer and site management

2.9 Social surrounds

Proposal activity: Ground disturbance, clearing and land degradation impacts.			
EPA Objective: To protect social surroundings from significant harm.			
Key environmental value: Pastoral lands, heritage sites and visual amenity of the region.			
Key impacts and risks: Loss/disturbance to Aboriginal or European heritage sites Activities may occur in areas of Native Title Negative impacts to pastoral lease operations and any tourism activities in the Development Envelope Impacts to amenity values (including visual landscape, visual aesthetics values and recreational tourism) associated with the Pipeline corridor			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
Minimise loss/disturbance to Aboriginal or European heritage sites	'Other heritage places' will be flagged on site and avoided where possible. Inductions will include information on sites and aboriginal culture and the requirement not to disturb these sites. Any potential aboriginal materials found on site will be subject to an immediate shutdown of activities and an exclusion zone of 20m. The Environmental Superintendent will be notified, and the Department of Planning, Lands and Heritage (DPLH) will be notified. DPLH will advise further management. An incident report will be lodged.	Monthly environmental compliance inspection Induction records	Incident records
Minimise impacts to pastoral lease operations and adjacent native title areas	Erosion control measures will be incorporated into the design and management of the pipeline corridor to minimise erosion and sedimentation Surface water collected within the pipeline corridor will not be allowed to disperse into the surrounding land The pipeline will be constructed to minimise impacts to livestock and movement across the site (where reasonably practicable) Rehabilitation on pastoral leasehold land will be based on minimising adverse impacts on the viability of the pastoral operation	Monthly environmental compliance inspection As per Mine Closure Plan	Inspection report Mine Closure Plan

Proposal activity: Ground disturbance, clearing and land degradation impacts.			
EPA Objective: To protect social surroundings from significant harm.			
Key environmental value: Pastoral lands, heritage sites and visual amenity of the region.			
Key impacts and risks: Loss/disturbance to Aboriginal or European heritage sites Activities may occur in areas of Native Title Negative impacts to pastoral lease operations and any tourism activities in the Development Envelope Impacts to amenity values (including visual landscape, visual aesthetics values and recreational tourism) associated with the Pipeline corridor			
Management action or Environmental criteria	Management target / Response Action	Monitoring (method, location and timing)	Reporting
	Any land that will not be rehabilitated to its former condition needs to be stabilized, and, where necessary, isolated from the surrounding landscape		
Minimise impacts to amenity values and tourism	Minimise impacts to the BIF ridgeline as low as reasonably practicable. Implement dust management controls to reduce impacts outside the site boundary. Rehabilitate the waste rock dump and remnant ridgeline such that is merges with the surrounding landscape, and appears relatively natural from the Geraldton-Mount Magnet Road. Maintain a Complaints Register. Complaints to be actioned within 24 hours. Commence stakeholder including discussion of the post-mining land use. Conduct a closure risk assessment workshop with targeted stakeholders.	Monthly environmental compliance inspection As per Mine Closure Plan Complaints Register As per Mine Closure Plan	Inspection report Mine Closure Plan Complaints Register Mine Closure Plan

3. Adaptive management

The adaptive management approach aims to reduce impacts by embedding a cycle of monitoring, reporting and implementing change (where required). This document applies the principles of adaptive management through monitoring, corrective actions and implementing changes.

3.1 Monitoring and corrective actions

Internal monitoring of the environmental aspects outlined in this Plan will occur during proposal construction and operation. Any non-conformances or incidents within this Plan will be investigated, rectified or mitigated as soon as possible to ensure minimal ongoing environmental harm. Where relevant, procedures will be amended/updated and inductions and other workforce communication will be undertaken in a timely manner to minimise the risk of re-occurrences.

3.2 Management Plan review

The Plan is intended to be dynamic and may be updated to reflect changes in management practices and the natural environment with time. This will also allow flexibility to adopt new technologies/management measures.

Amendments to management actions will be completed on an as needs basis. This will include revision/amendment of management actions that are not achieving the desired outcomes, monitoring identifying additional impacts and management actions, changes to relevant legislation or improvements to practices to achieve a greater environmental outcome.

4. Incident reporting

4.1.1 Environmental incidents / non-compliance

Environmental incidences and non-compliances will be identified and recorded as soon as possible by the relevant responsible persons. Incidents will be mitigated or rectified where possible within 48 hours of being identified. Non-conformances to this plan will be reported to the Construction Manager or equivalent within 48 hours of identification.

Any non-conformance to this plan is to be reported to EPA Compliance Branch and investigated to determine:

- Why the non-conformance occurred
- What was the environmental harm or alteration of the environment that resulted from the non-conformance
- What changes to project activities and/or management plans is required
- Measures to prevent, control or abate the environmental harm that may have occurred.

4.1.2 Emergency response

Emergency response requirements will be determined by the Construction Manager and the requirements of the Shire.

4.1.3 Reporting

The environmental performance of the construction activities and the identification of auditing requirements will be assessed by FIJV prior to and throughout the construction period. All documents pertaining to environmental management are required to be maintained though a system of document control.

Reporting requirements will be undertaken in accordance with the Ministerial Statement, with annual reporting. If a significant non-conformance with this plan occurs, the regulator will be notified of the non-compliance and subsequent investigation.

5. Stakeholder consultation

In order to undertake effective consultation, a Yogi Magnetite Mine Project Stakeholder Engagement Strategy (SES) was developed by GHD specifically for this proposal (GHD 2018b). This SES was designed to create a methodology for engagement throughout the project planning stages, through to operation. A strategic and holistic approach ensures effective and transparent engagement with stakeholders for the project. This will directly contribute to the success of the project.

The stakeholder engagement process will involve:

- Building stakeholder understanding of the project to contribute to stakeholder acceptance.
- Building trusted relationships with stakeholders to foster tolerance and compromise for the project.
- Strengthening the reputation of FIJV as a positive contributor in their host communities.

To achieve these goals, the objectives of engagement throughout all stages of the project are to:

- Provide clear, objective, and timely information to stakeholders.
- Seek input and feedback from the key stakeholders to inform the project planning and development.

The SES includes processes to manage stakeholders who are critical to the project approval and development process, those potentially impacted directly or indirectly by the proposal, and those not impacted by the proposal but potentially interested in being kept informed of the project activities.

A summary of the consultation undertaken to date in relation to this proposal is provided in Table 5-1. This table provides an overview of the comments and issues raised and FIJV's response to these issues.

Table 5-1 Stakeholder consultation

Stakeholder	Date	Issues/topics raised	Proponent response/outcome
Commonwealth Department of Agriculture, Water and the Environment (DAWE)	2018	Referral of Proposal to the Department under the EPBC Act	Department determined Proposal to be a Controlled Action under EPBC Act
Department of Water and Environmental Regulation (DWER)	2017	Met with DWER EPA Services to discuss referral of project to EPA	DWER EPA Services advised that referral to the EPA was warranted
Department of Mines, Industry Regulation and Safety (DMIRS)	2016	Applications for tenements, changes to tenements	Tenements issued as required
Shire of Yalgoo	2016	Meetings to provide an overview of the project	Shire confirmed the project was compatible with land uses in the Shire
Department of Biodiversity Conservation and Attractions (DBCA)	Pre 2015	Lodgement of priority flora records for historical flora	Priority flora records are now reflected in DBCA databases

Stakeholder	Date	Issues/topics raised	Proponent response/outcome
		surveys (by Ferrowest)	
Carlaminda Station	2016-2017	Ongoing discussions regarding site access	Site access granted for exploration activities
Wagga Wagga Station	2016-2016	Ongoing discussions regarding site access	Site access granted for exploration activities

5.1.1 Ongoing consultation

FIJV will continue to engage with relevant stakeholders throughout the environmental approval process to ensure that all concerns are addressed. This includes decision making authorities, other relevant government authorities, the local community, and environmental non-government organisations. FIJV is committed to building effective relationships and working transparently with all stakeholders.

6. References

Brad Goode & Associates April 2019 *Due diligence risk assessment advice for a mine proposal at Yalgoo and an infrastructure corridor between Yalgoo and Geraldton Western Australia*.

Environmental Protection Agency 2004, *Guidance for the Assessment of Environmental Factors, Assessment of Aboriginal Heritage No. 41*

Environmental Protection Agency 2006, *Guidance Statement 6 – Rehabilitation of Terrestrial Ecosystems*

Environmental Protection Agency 2016a, *Environmental Factor Guideline: Flora and Vegetation*

Environmental Protection Agency 2016b, *Environmental Factor Guideline Landforms*

Environmental Protection Agency 2016c, *Environmental Factor Guideline Subterranean Fauna*

Environmental Protection Agency 2016d, *Technical Guidance Terrestrial Fauna Surveys*

Environmental Protection Agency 2016e, *Environmental Factor Guideline Terrestrial Environmental Quality*

Environmental Protection Agency 2016f, *Environmental Factor Guideline: Terrestrial Fauna*

Environmental Protection Agency 2016g, *Technical Guidance Terrestrial Fauna Surveys*

Environmental Protection Agency 2016h, *Technical Guidance Sampling methods for terrestrial vertebrate fauna*

Environmental Protection Agency 2016i, *Technical Guidance: Sampling of short range endemic invertebrate fauna*

Environmental Protection Agency 2016j, *Environmental Factor Guideline Air Quality*

Environmental Protection Agency 2016k *Environmental Factor Guideline Social Surroundings*

Environmental Protection Agency 2018a, *Environmental Protection Act 1986 Part IV Environmental Management Plans*

Environmental Protection Agency 2018b. *Statement of Environmental Principles, Factors and Objectives*

Environmental Protection Agency 2018c, *Environmental Factor Guideline Inland Waters.*

GHD 2019a, *Flora and Vegetation Assessment*

GHD 2019b, *Surface Water Assessment*

GHD 2019c, *Material characterisation assessment*

Western Australia Invertebrate Solutions 2020 Dual Phase *Survey for Subterranean Fauna for the Yogi Magnetite Project, Yalgoo*