SECTION 38 REFERRAL

SUPPORTING INFORMATION

BIDAMINNA PROJECT

9 November 2022

PREPARED FOR IMAGE RESOURCES NL

BY PRESTON CONSULTING PTY LTD

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DOCUMENT CONTROL

Document Title	Section 38 Referral Supporting Information – Bidaminna Project		
Document Number	IMA-BID-S38-01		
Revision Number	1		9/11/2022
Status	FINAL		
Author	Phoebe Ranford – Consultant, Preston Consulting Pty Ltd	Signature	9/11/2022
Checked	Gavin Edwards – Director, Preston Consulting Pty Ltd	Signature	9/11/2022
Authorisation	Todd Colton – Chief Operating Officer, Image Resources NL	Signature	9/11/2022

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1 PART A: PROPOSAL DESCRIPTION

1.1 SUMMARY OF THE PROPOSAL

Table 1: Summary of the proposal

Proposal Title	Bidaminna Project
Proponent Name	Image Resources NL
Short Description	Image Resources NL is seeking to develop a mineral sands project, located approximately 15 km southwest of Regan's Ford in the Wheatbelt region of Western Australia (WA). The Proposal includes dredge mining with the progressive development of a dredge pond, processing facilities, groundwater bores and water management infrastructure, temporary waste dumps, solar drying ponds and associated infrastructure (power supply, accommodation, communications, workshop, laydown, offices etc.).

1.2 PROPOSAL DESCRIPTION

Image Resources NL (Image) are planning to develop the Bidaminna Project (the Proposal) a mineral sands mine located approximately 100 kilometres (km) northwest of Perth and 15km southwest of Regan's Ford in the Wheatbelt region of WA (Figure 1). The Proposal will be developed within a Mine Development Envelope (MDE; Figure 2) and an External Infrastructure Envelope which will include additional external infrastructure such as water bores, power supply, pipelines and accommodation (Figure 3).

Image propose to develop a mine dredge pond, processing plant, solar drying ponds and supporting infrastructure over an estimated mine life of ten years. Mining and progressive rehabilitation is planned in stages using dredge mining methods.

Dredge mining will require the removal of overburden by conventional earthmoving equipment, prior to accessing the ore. Overburden will initially be stockpiled external to the mine path until there is sufficient capacity in the dredge pond to allow progressive backfill. Ore will be excavated by a dredger that will be floated on a dredge pond. The dredge pond will be progressively filled and rehabilitated to pre-mining profile with the pre-existing land use reinstated as mining advances. Where feasible, disturbance will be minimised by utilising the backfilled mine footprint to locate supporting infrastructure prior to commencing rehabilitation.

Dredge mining delivers the slurried ore direct to the feed preparation plant before being pumped to the wet concentrator plant (WCP). The WCP recovers the contained heavy minerals via gravity separation, producing sand tails and clay fines as waste products. Following dewatering using a cyclone, sand tails may initially require temporary storage in a tailings storage facility, however, will be returned to the dredge pond once sufficient capacity is available. Clay fines will be pumped to solar drying ponds before being returned to the mine path. The final product will be a heavy mineral concentrate (HMC) that will be stacked on a drainage pad outside the WCP, where it will be allowed to drain and dry for a short period of time prior to being transported by trucks off site for export using existing port facilities.

Water supply is targeted to be sourced from within the MDE however external supply may be required from the External Infrastructure Envelope (to be determined once groundwater investigations are complete).

Power supply will be sourced from onsite generation (approximately 10 Megawatt (MW)), external power lines, renewable energy or a hybrid of options.

1.3 PROPOSAL CONTENT

The Proposal will predominantly be developed within a MDE with a total area of approximately 1,950 hectares (ha). External infrastructure will be developed within the External Infrastructure Envelope with a total area of 75 ha. The location of disturbance within the External Infrastructure Envelope will be determined following water supply and power supply investigations. The External Infrastructure Envelope intersects the Moore River National Park however any disturbance will be limited to within the existing cleared transmission corridor (no clearing of vegetation).

The boundaries of the MDE and the External Infrastructure Envelope are shown in Figure 2 and Figure 3, respectively, and described in Table 2. The physical and operational elements of the Proposal are described in Table 2.

Table 2: Location and proposed extent of physical and operational elements.

Proposal Element	Location / Description	Maximum extent, capacity or range
Physical Elements		
Mine Development Envelope – dredge pond, temporary waste dumps, temporary tailings storage facility, processing facilities, solar drying ponds and supporting infrastructure.	Figure 2	Disturbance of approximately 950 ha within the 1,950 ha MDE.
External Infrastructure - may include transport infrastructure upgrades, power supply, groundwater abstraction bores and pipeline corridors.	Figure 3	Disturbance of up to 50 ha within a 75 ha Development Envelope.
Construction Elements		
Groundwater abstraction	Yarragadee, Leederville, and / or Lesueur	Abstraction of approximately one Gigalitre (GL) from one or more borefields.
Operational Elements		
Heavy Mineral Concentrate production	N/A	Production of approximately 300 kt per annum of HMC
Mining method	Figure 2	Dredge mining with progressive backfill to pre-mining levels and rehabilitation.
Groundwater abstraction	Yarragadee, Leederville and / or Lesueur	Abstraction of approximately 6 GL / year from one or more borefields.
Power generation	Onsite generation, external powerlines,	Approximately 10 MW

	renewable energy or a hybrid of both	
Greenhouse Gas Emissions		
Construction		
Scope 1	Land use change – vegetation clearing: approximately 22 kt CO_2-e Plant, equipment: Approximately 8 kt CO_2-e Power generation: less than 1 kt CO_2-e Maximum of: 31 kt CO_2-e	
Scope 2	Power generation: Approximately 1 kt CO2-e (if external source utilised)	
Operation		
Scope 1	Land use change – vegetation clearing: less than 35 kt CO_2-e/yr Plant, equipment: Less than 9 kt CO_2-e/yr Power generation: Less than 45 kt CO_2-e/yr Maximum of: 89 kt CO_2-e/yr Maximum over life of Proposal:890 kt CO_2-e	
Scope 2	Power generation: Less than 45 kt CO2-e/yr (if external source utilised)	
Rehabilitation		
Rehabilitation and closure will be progressive. The mine pond will be progressively filled and rehabilitated to pre-mining profile with the pre-existing land use reinstated as mining advances.		
Commissioning		
Commissioning of the processing facility to be undertaken subject to operational limits above.		
Decommissioning		
Removal of all process related infrastructure within 12 months of cessation of operations (excluding periods of care and maintenance).		
Other elements which affect extent of effects on the environment		
Proposal time	Maximum project life	Approximately 12 years
	Construction phase	Approximately 1 year
	Operations phase	Approximated 10 years
	Decommissioning phase	Approximately 1 year

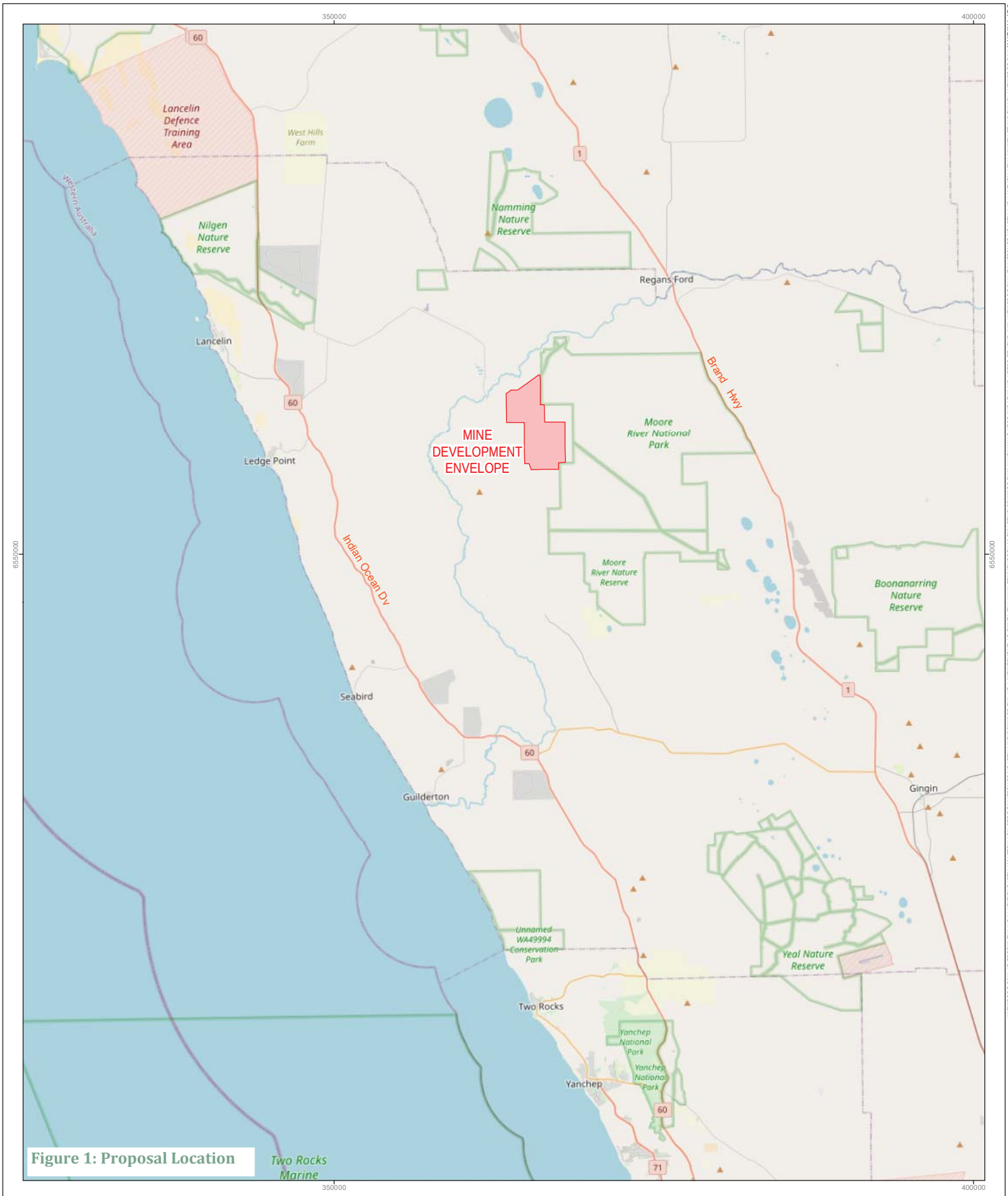

Figure 1: Proposal Location

Preston Consulting

CREATED	JOB	DATE	REVISION
ENVIRONMAPS	PC2900273	21/06/2022	0

IMAGE RESOURCES NL

0 2.5 5 10 km

Scale: 1:400,000 @ A4

N

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS

LOCALITY

Legend

Mine Development Envelope

Source: Open Source World Topo

ENVIRONMAPS Environmental Mapping Solutions t: 0406 590 006 | www.environmaps.com.au

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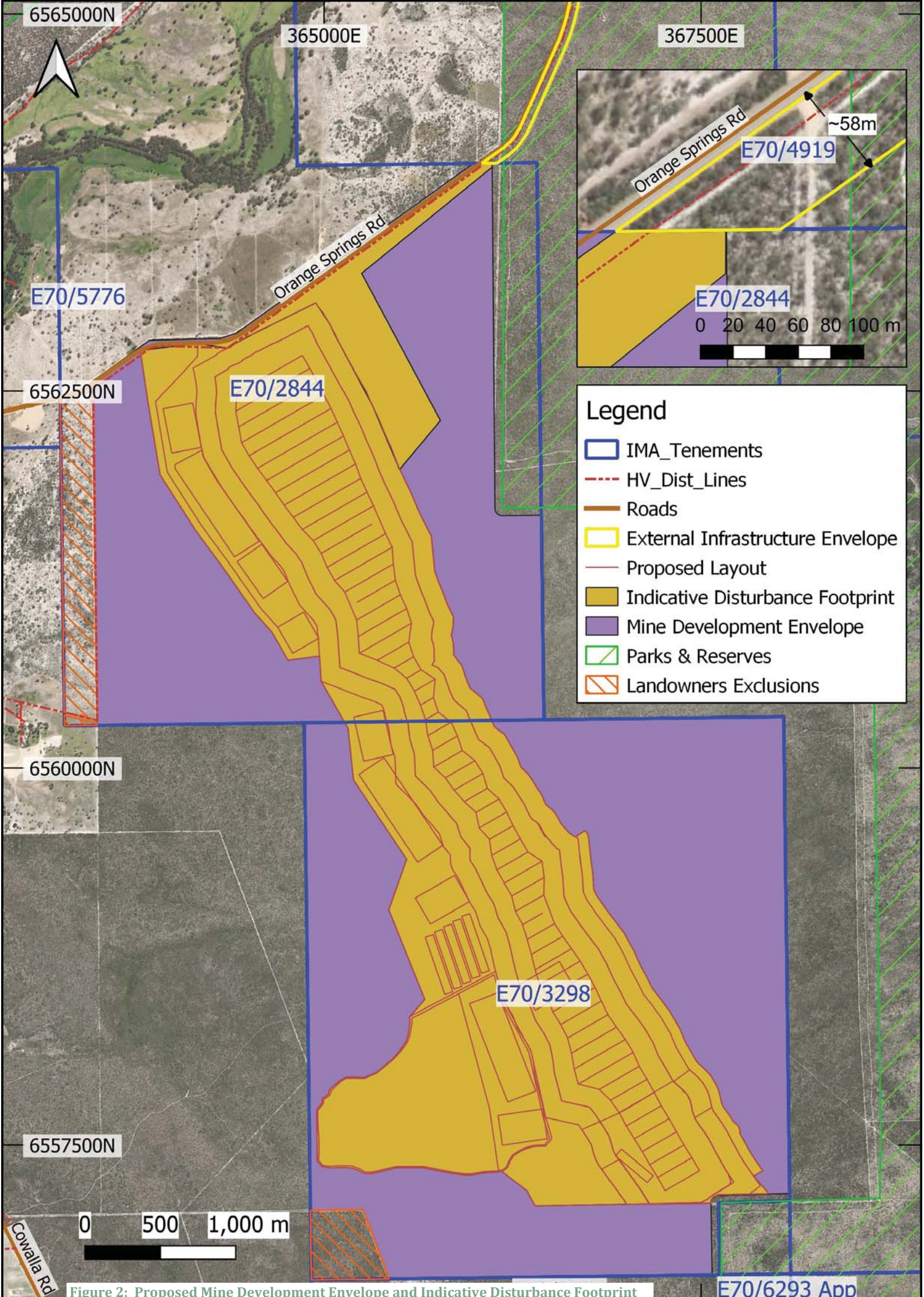

Figure 2: Proposed Mine Development Envelope and Indicative Disturbance Footprint

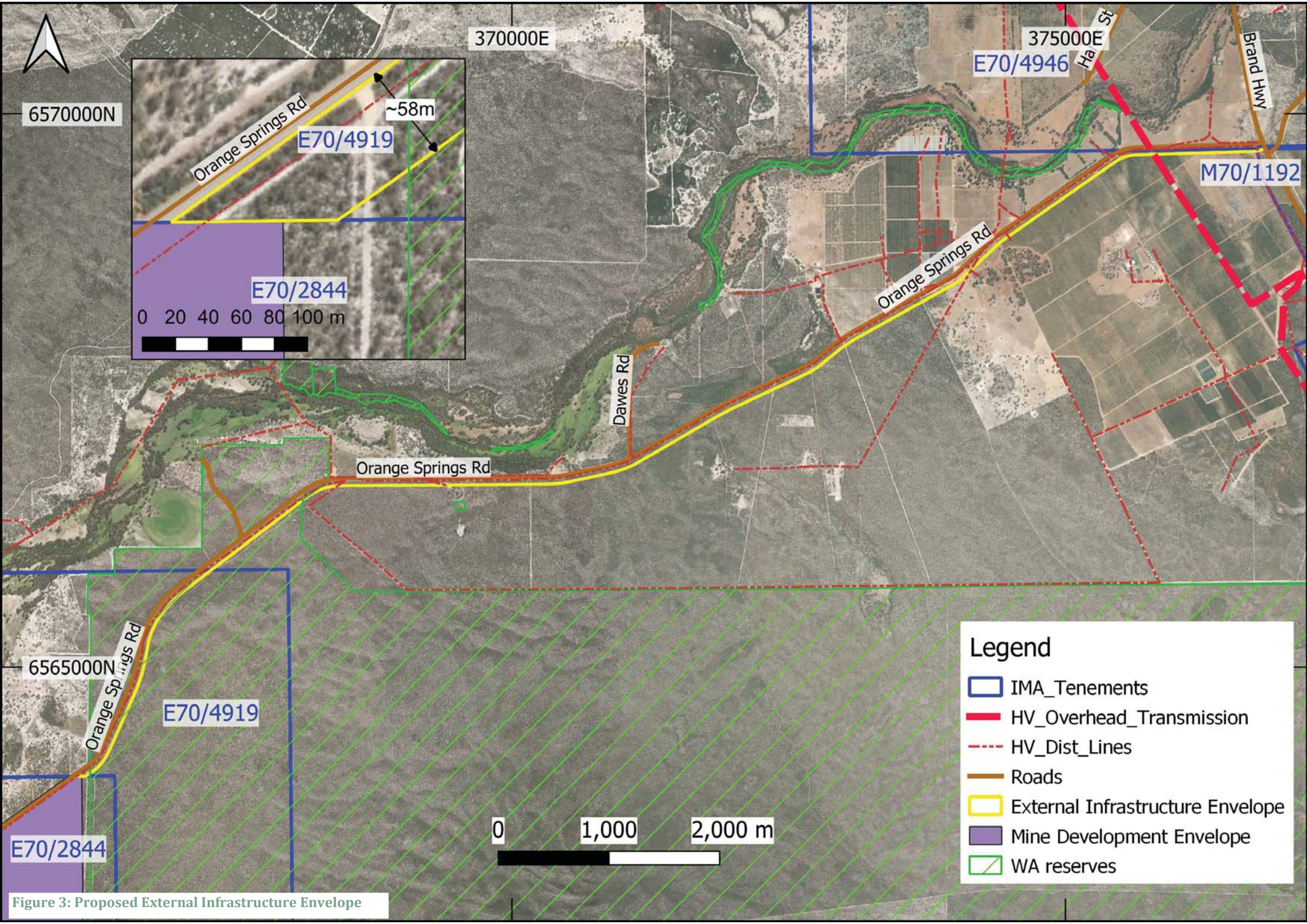

Figure 3: Proposed External Infrastructure Envelope

2 PART B: ENVIRONMENTAL IMPACTS

2.1 PRELIMINARY KEY ENVIRONMENTAL FACTORS

The *Statement of Environmental Principles, Factors and Objectives* (Environmental Protection Authority (EPA), 2021a) provides a list of potential Key Environmental Factors to consider for environmental impact assessment (EIA). Table 3 - Table 8 list the preliminary Key Environmental Factors that have been identified as potentially requiring assessment from initial baseline surveys, project planning and consultation processes. Table 3 - Table 8

also identify the relevant baseline environmental information for the receiving environment, Proposal activities, mitigation measures, impacts and underlying assumptions. Information provided in Table 3 - Table 8 has been sourced from reference materials as listed.

Table 3: Potential impacts on Flora and Vegetation

EPA requirements	Response
EPA Policy and guidance – What have you considered and how have you applied them in relation to this factor?	**EPA Objective:** To protect flora and vegetation so that biological diversity and ecological integrity are maintained. **Key EPA Documents** Statement of Environmental Principles, Factors and Objectives (EPA, 2021a). EIA (Part IV Divisions 1 and 2) Administrative Procedures (EPA, 2021b). EIA (Part IV Divisions 1 and 2) Procedures Manual (EPA, 2021c). **Relevant EPA Factor Guidelines** Environmental Factor Guideline - Flora and Vegetation (EPA, 2016a). **Relevant EPA Technical Guidance** Technical Guidance – Flora and Vegetation Surveys for EIA (EPA, 2016b). Guidance Statement 6 – Rehabilitation of Terrestrial Ecosystems (EPA, 2006). Environmental Protection Bulletin 20 – Protection of naturally vegetated areas through planning and development (EPA, 2013). Checklist for documents submitted for EIA of proposals that have the potential to significantly impact on Sea and Land factors (EPA, 2016c). **Application of policies and guidance** This Section 38 Referral has been prepared by utilising the advice contained within the 'Key EPA Documents' listed above. Key EPA documents and Factor Guidelines for Flora and Vegetation were used during the refinement of the Proposal design to minimise disturbance of flora and vegetation and determine mitigation strategies for the Proposal.
Consultation – Outline the outcomes of consultation in relation to the potential environmental impacts.	Image has had pre-referral discussions with the Department of Climate Change, Energy, the Environment and Water (DCCEEW) and the EPA at Department of Water and Environmental Regulation (DWER) and their comments have been incorporated into this Section 38 Referral where applicable. Image has consulted with environmental consultants including Preston Consulting Pty Ltd (Preston Consulting), and Brian Morgan (Consultant Botanist) regarding the potential impacts on this factor. The outcomes of this consultation have led to the current design of the Proposal, which provides flexibility to minimise direct impacts to this factor.

EPA requirements	Response
Receiving environment - Describe the current condition of the receiving environment in relation to this factor.	A detailed flora and vegetation survey was carried out by Brian Morgan in November 2021 and May 2022 with results expected late 2022. Desktop searches were conducted of the MDE using Department of Biodiversity, Conservation and Attractions (DBCA) databases to determine the baseline flora and vegetation values, to be confirmed by the results of the detailed survey in September 2022. The following information has been sourced from the desktop searches: • The Proposal lies within an area of the Drummond Botanical Sub-district mapped by Beard (1981) as 'Banksia low woodland on white sand of coastal plain with numerous patches of heath in swamps'. • The majority of the MDE is comprised of remnant native vegetation. • No Threatened Flora have previously been recorded within the MDE. • Two Threatened Flora species were identified approximately 9 km east of the MDE: o *Darwinia carnea* (Endangered). o *Darwinia acerosa* (Endangered). • Three Priority flora species were previously recorded in the MDE: o *Allocasuarina grevilleoides* (Priority 3). o *Leucopogon* sp. Yanchep (M. Hislop 1986) (Priority 3). o *Calothamnus pachystachyus* (Priority 4). • The MDE is mapped as including: o Endangered *'Banksia attenuata* woodland over species rich dense shrublands' Threatened Ecological Community (TEC; *Environment Protection and Biodiversity Conservation Act 1999*(EPBC Act)). o Priority 3 'Banksia Dominated Woodlands of the Swan Coastal Plain Interim Biogeographic Regionalisation of Australia (IBRA) Region' Priority Ecological Community (PEC; *Biodiversity Conservation Act 2016* (BC Act)).
Proposal activities – Describe the proposal activities that have the potential to impact the environment**.**	• Vegetation clearing, resulting in the direct disturbance of up to 950 ha of native flora and vegetation, which includes: o Banksia Woodlands TEC/PEC. o Priority flora. o Other significant flora (if present). • Vehicle traffic and earthmoving equipment may introduce or spread weeds or dieback. • Alterations to groundwater regimes resulting in a reduction in the health of downstream vegetation and groundwater-dependant vegetation (GDVs). • Mining activities that may result in indirect impacts such as sedimentation, dust and spillages.
Mitigation - Describe the measures proposed to manage and mitigate the potential environmental impacts.	• Minimise clearing by locating infrastructure on the future mine path footprint or on cleared farmland outside the MDE. • Clearing is to be conducted on an as-needed basis, followed by progressive rehabilitation of cleared areas as soon as is practicable. • Provide flexibility in the MDE to allow significant flora and Banksia Woodlands TEC/PEC disturbance to be avoided or minimised. • The mine path will be progressively backfilled as the mine progresses, allowing for continuous rehabilitation. • Stockpile cleared vegetation and topsoil from the Banksia Woodlands TEC/PEC separately to other cleared areas to contain seedbank. • Incorporate impacted significant flora and Banksia Woodlands TEC/PEC key species into rehabilitation. • Implement Ground Disturbance Permit system. • The introduction and spread of weeds will be minimised through strict operational hygiene practices. • A dieback survey, risk assessment and management plan will be implemented to determine risks associated with the Proposal and to guide development management actions. • Implement industry-standard controls for dust, sedimentation and spillages.

EPA requirements	Response
Impacts - Assess the impacts of the proposal and review the residual impacts against the EPA objective.	Vegetation clearing may be considered significant due to impacts to remnant vegetation, significant flora and the Banksia Woodlands TEC/PEC. Offsets are expected to be required to ensure that the EPA's objective for this factor can be met (further investigations to be conducted during EIA). The remaining impacts are expected to be able to meet the EPA's objective for this factor given that: • There may be localised indirect impacts to downstream vegetation associated with alterations groundwater levels, however impacts are likely to be limited to a small area given that levels are to be maintained for the operation of the dredge. • Unintentional indirect impacts on vegetation are expected to be rare and if they occur the impacts will be short-term and restricted in size.
Assumptions - Describe any assumptions critical to your assessment e.g. particular mitigation measures or regulatory conditions.	• There will be a number of significant flora species and individuals that cannot be avoided. • Clearing within the Banksia Woodlands TEC/PEC will be required.

Table 4: Potential impacts to Terrestrial Environment Quality

EPA requirements	Response
EPA Policy and guidance – What have you considered and how have you applied them in relation to this factor?	**EPA Objective:** To maintain the quality of land and soils so that environmental values are protected. **Key EPA Documents** Statement of Environmental Principles, Factors and Objectives (EPA, 2021a). EIA (Part IV Divisions 1 and 2) Administrative Procedures (EPA, 2021b). EIA (Part IV Divisions 1 and 2) Procedures Manual (EPA, 2021c). **Relevant EPA Factor Guidelines** Environmental Factor Guideline - Terrestrial Environment Quality (EPA, 2016d). **Application of Policies and Guidance** This Section 38 Referral has been prepared by utilising the advice contained within the 'Key EPA Documents' listed above. Terrestrial Environmental Quality investigations will be conducted in accordance with the guidance identified above.
Consultation – Outline the outcomes of consultation in relation to the potential environmental impacts.	Image has had pre-referral discussions with the DCCEEW and the EPA at DWER and their comments have been incorporated into this Section 38 Referral where applicable. Image has consulted with environmental consultants including Preston Consulting and Mine Earth regarding characterisation requirements and potential impacts on this factor.
Receiving environment - Describe the current condition of the receiving environment in relation to this factor.	Mine Earth is currently undertaking baseline soil and landform assessments of the MDE with results expected in late 2022. The following relevant information has been sourced from publicly available information, to be confirmed by baseline results in late 2022: • A search of the Australian Soil Resource Information System database indicates an extremely low probability of Acid Sulphate Soils (ASS) occurring within the MDE (Commonwealth Scientific and Industrial Research Organisation; CSIRO, 2020). Examples of land units that are considered an ASS risk (dampland areas) are however present within the MDE. • The MDE is located within the Bassendean soil landscape system which is characterised by sand dunes and sandplains with pale deep sand, semi-wet and wet soil (DPIRD, 2019). • The Bassendean Dunes have low relief with minor variations in topography, which translate to variable depth to the water table (Salama *et al.* 2005). • The Bassendean sands consists of low hills of siliceous sand interspersed with poorly drained areas including both seasonal and permanent swamps. This dune system originated along a coastline, perhaps as calcareous sand, but leaching has continued for so long that all carbonate has been lost and the steep relief so characteristic of beach dunes has been modified (Salama *et al.* 2005).
Proposal activities – Describe the proposal activities that have the potential to impact the environment**.**	• Mining, resulting in a direct disturbance to soil quality and structure, soil contamination resulting from disturbance of potential ASS, or erosion and sedimentation. • Disposal of waste material resulting in potential leaching of contaminating materials. • Leaks or spillages of hydrocarbons resulting in soil contamination.
Mitigation - Describe the measures proposed to manage and mitigate the potential environmental impacts.	• Conduct ASS sampling to determine the presence / absence of ASS. • Develop and implement an ASS management plan if ASS is present on site and cannot be avoided. • Conduct waste material characterisation assessments and implement appropriate waste disposal and handling methods if required, as part of *Mining Act 1978* (Mining Act) and Part V *Environmental Protection Act 1986* (EP Act) approval processes. • Develop and implement a soils and waste management plan. • Implement industry-standard controls for sedimentation and hydrocarbon storage and handling.

EPA requirements	Response
	• Utilise existing disturbance where practicable to minimise vegetation clearing. • Clearing is to be conducted on an as-needed basis, followed by progressive rehabilitation of cleared areas as soon as is practicable. • Avoid and/or minimise risk of increased erosion and sedimentation through the implementation of surface water drainage and runoff plans.
Impacts - Assess the impacts of the proposal and review the residual impacts against the EPA objective.	Expected to be able to meet the EPA's objective for this factor given that: • Potential impacts associated with waste materials will be mitigated and regulated under the Mining Act and Part V of the EP Act. • Soil contamination resulting from disturbance of ASS (if present) during can be mitigated using industry-standard treatment controls.
Assumptions - Describe any assumptions critical to your assessment e.g. particular mitigation measures or regulatory conditions.	It has been assumed that industry-standard controls for waste material leachate and ASS are suitable in this case.

Table 5: Potential impacts to Terrestrial Fauna

EPA requirements	Response
EPA Policy and guidance – What have you considered and how have you applied them in relation to this factor?	**EPA Objective:** To protect terrestrial fauna so that biological diversity and ecological integrity are maintained. **Key EPA Documents** Statement of Environmental Principles, Factors, Objectives and Aims of EIA (EPA, 2021a). EIA (Part IV Divisions 1 and 2) Administrative Procedures (EPA, 2021b). EIA (Part IV Divisions 1 and 2) Procedures Manual (EPA, 2021c). **Relevant EPA Factor Guidelines** Environmental Factor Guideline - Terrestrial Fauna (EPA, 2016e). **Relevant EPA Technical Guidance** Technical Guidance – Sampling of short-range endemic (SRE) invertebrate fauna (EPA, 2016f). Technical Guidance – Terrestrial vertebrate fauna surveys (EPA, 2020a). **Application of Policies and Guidance** This Section 38 Referral has been prepared by utilising the advice contained within the 'Key EPA Documents' listed above. Key EPA documents and Factor Guidelines for Terrestrial Fauna were used during the refinement of the Proposal design to minimise disturbance of fauna and determine mitigation strategies for the Proposal.
Consultation – Outline the outcomes of consultation in relation to the potential environmental impacts.	Image has had pre-referral discussions with the DCCEEW and the EPA at DWER and their comments have been incorporated into this Section 38 Referral where applicable. Image has consulted with environmental consultants including Preston Consulting and Spectrum Ecology Pty Ltd (Spectrum) regarding survey requirements and potential impacts on this factor.

Receiving environment - Describe the current condition of the receiving environment in relation to this factor.	The following information on the receiving environment has been sourced from the Detailed Fauna Assessment undertaken by Spectrum Ecology (2022; Appendix 1):
	• Four fauna habitats have been mapped within the Study Area:
	  ○ Banksia Woodland (1,567.4 ha or 79.6%).
	  ○ Dune Crests (225.2 ha or 11.4%).
	  ○ Seasonal Damplands (156.6 ha or 8%).
	  ○ Parkland Cleared Woodland (19.24 ha or 1%).
	• Desktop searches identified 51 significant vertebrate fauna species with the potential of occurring in the Study Area. One species (Carnaby's Cockatoo), has been recorded within the Study Area on two occasions. Of the remaining species, one was considered to have a high likelihood of occurring within the Study Area:
	  ○ Western Brush Wallaby (*Notamacropus Irma*) - Priority 4.
	• Five species were considered to have a medium likelihood of occurring:
	  ○ Western Swamp Tortoise (*Pseudemydura umbrina*) – Critically Endangered (EPBC Act and BC Act).
	  ○ Western Quoll (*Dasyurus geoffroii*) – Vulnerable (EPBC Act and BC Act).
	  ○ Fork-tailed Swift (*Apus pacificus*) – Migratory (EPBC Act and BC Act).
	  ○ Peregrine Falcon (*Falco peregrinus*) – Specially Protected (BC Act).
	  ○ Quenda (*Isoodon fusciventer*) – Priority 4.
	• Desktop searches identified five significant invertebrate fauna species with the potential of occurring in the Study Area. One species (Bothriembryontid Land Snail (Moore River)) was considered to have a high likelihood of occurring, three were considered to have a medium likelihood of occurring within the Study:
	  ○ Woolybush Bee (*Hylaeus globuliferus*) –Priority 3.
	  ○ A short-tongued bee (*Leioproctus contrarius*) –Priority 3.
	  ○ Graceful Sun-moth (*Synemon gratiosa*) –Priority 4.

EPA requirements	Response
	• A literature review of the WA Museum Invertebrate Database identified 13 potential SRE species from the region surrounding the Study Area. This comprised of nine Arachnids (a mite, seven spiders and a scorpion), two Diplopods (millipedes), one Isopod (wood lice) and one Gastropod (snail). • During the detailed fauna assessment survey work, 94 vertebrate fauna species were recorded within the Study Area including 18 mammals (five introduced), 55 birds, 16 reptiles and five amphibians. Evidence of one significant vertebrate fauna species was recorded in Study Area: ○ Carnaby's Cockatoo (*Zanda latirostris*) - Endangered (EPBC Act and BC Act). • A total of 21 invertebrate species were collected, one of which is a Priority 1 listed species (*Bothriembryon perbesus*), 18 are potential SRE invertebrates due to lack of taxonomic or geographic resolution and two are widespread. • The MDE was identified as having very high quality foraging habitat for Carnaby's Cockatoo. Evidence of foraging was recorded in the MDE and the species has been well documented using similar habitats across the surrounding region. • No known favoured tree species for Carnaby's Cockatoo breeding were recorded in the MDE. Area searches identified 45 trees with a potential to become breeding trees (DBH >500 mm). No trees had suitable hollows for Carnaby's Cockatoo however eight had hollows forming. • The MDE is not known for Carnaby's Cockatoo roosting or nesting, the closest roosting site is approximately 14.5 km from the MDE and the closest known breeding site is approximately 16.5 km from the MDE.

Proposal activities – Describe the proposal activities that have the potential to impact the environment**.**	• Up to 950 ha of disturbance within the MDE and up to 50 ha of disturbance for external infrastructure, resulting in fauna habitat loss and/or fragmentation, including the direct disturbance of:
	  ○ Carnaby's Black Cockatoo potential foraging habitat and potential future nesting trees.
	  ○ Habitat utilised by other significant fauna and SREs.
	• Vehicle traffic and earthmoving equipment may introduce or spread weeds or dieback.
	• Alterations to groundwater regimes resulting in a reduction in the health of downgradient and groundwater-dependant fauna habitats.
	• Mining activities that may result in:
	  ○ The introduction of feral fauna;
	  ○ Indirect impacts to fauna behaviour from noise and light; and
	  ○ Indirect impacts to fauna habitat such as sedimentation, dust and spillages.

Mitigation - Describe the measures proposed to manage and mitigate the potential environmental impacts.	• Avoid and/or minimise disturbance of any significant fauna habitat. • Provide flexibility within the MDE to allow significant fauna habitat disturbance to be avoided or minimised. • Implement industry-standard controls for sedimentation and hydrocarbon storage and handling. • Minimise clearing by locating infrastructure on the future mine path footprint or on cleared farmland and utilising existing access tracks and disturbance where practicable. • Clearing is to be conducted on an as-needed basis, followed by progressive rehabilitation of cleared areas as soon as is practicable. • The mine path will be progressively backfilled as the mine progresses, allowing for continuous rehabilitation. • Stockpile cleared vegetation and topsoil from Carnaby's Black Cockatoo foraging habitat separately to other cleared areas to contain seedbank of food species. • Incorporate impacted Carnaby's Black Cockatoo food species into rehabilitation. • Implement Ground Disturbance Permit system. • The introduction and spread of weeds will be minimised through strict operational hygiene practices.

EPA requirements	Response
	• A dieback survey, risk assessment and management plan will be implemented to determine risks associated with the Proposal and to guide development management actions. • Manage groundwater drawdown to minimise impacts to SRE habitat. • Implement industry-standard controls for dust, waste management, sedimentation and spillages.
Impacts - Assess the impacts of the proposal and review the residual impacts against the EPA objective.	The clearing and progressive rehabilitation of Carnaby's Black Cockatoo foraging habitat may be considered significant due to the conservation status of this species and the decline in available habitat within its range. Offsets are expected to be required to ensure that the EPA's objective for this factor can be met (further investigations to be conducted during EIA). The remaining impacts are expected to be able to meet the EPA's objective for this factor given that: • The disturbance of general fauna habitat is not expected to be significant as habitats are well represented by comparable habitats within the surrounding remnant bushland and conservation estate. • Indirect impacts are expected to be able to be managed to a low level of impact by using design and management controls.
Assumptions - Describe any assumptions critical to your assessment e.g. particular mitigation measures or regulatory conditions.	• Clearing and progressive rehabilitation of Carnaby's Black Cockatoo foraging habitat will be required.

Table 6: Potential impacts to Inland Waters

EPA requirements	Response
EPA Policy and guidance - What have you considered and how have you applied them in relation to this factor?	**EPA Objective:** To maintain the hydrological regimes of groundwater and surface water so that environmental values are protected. **Key EPA Documents** Statement of Environmental Principles, Factors and Objectives (EPA, 2021a). EIA (Part IV Divisions 1 and 2) Administrative Procedures (EPA, 2021b). EIA (Part IV Divisions 1 and 2) Procedures Manual (EPA, 2021c). **Relevant EPA Factor Guidelines** Environmental Factor Guideline – Inland Waters (EPA, 2018). **Application of Policies and Guidance** This Section 38 Referral has been prepared by utilising the advice contained within the 'Key EPA Documents' listed above. Key EPA documents and Factor Guidelines for Inland Waters were used during the refinement of the Proposal design to minimise disturbance of fauna and determine mitigation strategies for the Proposal.
Consultation – Outline the outcomes of consultation in relation to the potential environmental impacts.	Image has had pre-referral discussions with the DCCEEW and the EPA at DWER and their comments have been incorporated into this Section 38 Referral where applicable. Image has consulted with environmental consultants including Preston Consulting and MWES Consulting regarding investigation requirements and potential impacts on this factor.
Receiving environment - Describe the current condition of the receiving environment in relation to this factor.	Surface water and groundwater assessments are being carried out by MWES Consulting. The groundwater assessment is currently underway with initial results expected late 2022. Groundwater information on the receiving environment has been sourced from publicly available databases, to be confirmed by the results of groundwater assessments. The surface water information on the receiving environment has been sourced from a Surface Water Assessment undertaken by MWES Consulting (2021; Appendix 2): • The groundwater formations below the MDE comprise the Superficial Aquifer, Leederville and the Yarragadee. ○ The Yarragadee Formation, around 10 - 15 m below ground level, is a multilayered, relatively transmissive aquifer with inter-beds of sand, clay and mudstone. The water is slightly saline in this aquifer. • Geomorphic wetlands have been digitally mapped by DBCA over the Swan Coastal Plain, including the two 'Damplands' which intersect the northern and southern sections of the MDE. The Damplands have been allocated to the Conservation Management Category which is described as 'Wetlands which support a high level of attributes and functions.' (DBCA, 2017). The site survey however identified that the areas mapped as Dampland were found to have no particular hydrological characteristics. • Moore River is located north of the MDE and flows east to west into the Guilderton estuary. • The majority of streamflow past the MDE originates from the middle of the Moore River catchment. Apart from the Moore River, surface drainage features are poorly developed or absent in the vicinity of the MDE. • Surface drainage is limited by the coarse sandy substrates, low surface gradients and incoherent landform which is partitioned by dunes at a variety of orientations. • Field inspection confirmed the absence of any indication of concentrated surface water flow across the site. • The MDE is elevated and well drained, the site is not prone to flooding from Moore River. • The MDE is approximately 16.3 km to the east of the Seaview Park Reserve Public Drinking Water Source Area.

EPA requirements	Response

Proposal activities – Describe the proposal activities that have the potential to impact the environment.	• Mining has the potential to:
	  ○ Result in flooding or erosion;
	  ○ Impact the downstream water quality and hydrological impacts of the Moore River.
	  ○ Require the disturbance of ASS.
	• Supplementing water levels to allow a dredging operation has the potential to affect groundwater quality and / or levels within the superficial aquifer, which could subsequently affect the hydrology of surface water expressions such as wetlands or pools.
	• Abstraction of groundwater for water supply.
	• Disposal of waste material resulting in potential leaching of contaminating materials into the underlying groundwater or spills into surface waters.
	• Leaks or spillages of hydrocarbons resulting in groundwater or surface water contamination.

Mitigation - Describe the measures proposed to manage and mitigate the potential environmental impacts.	• Complete hydrological and hydrogeological assessments to assess impacts related to the Proposal and inform management strategies. • Develop and implement surface water and groundwater management plans. • Water abstraction and dredge water supplementation managed in accordance with 5C water licences applied for under the *Rights in Water and Irrigation Act 1914*. • Clearing is to be conducted on an as-needed basis to minimise erosion and sedimentation, followed by progressive rehabilitation of cleared areas as soon as is practicable. • Avoid and/or minimise risk of increased erosion and sedimentation through the implementation of surface water drainage and runoff plans. • The mine path will be progressively backfilled as the mine progresses, allowing for continuous rehabilitation of drainage systems. • Manage groundwater drawdown and / or dredging water supplementation to minimise impacts to surface water expressions. • Conduct ASS sampling to determine the presence / absence of ASS. • Develop and implement an ASS management plan if ASS is present on site and cannot be avoided. • Conduct waste material characterisation assessments and implement appropriate waste disposal and handling methods if required, as part of Mining Act and Part V EP Act approval processes. • Implement industry-standard controls for sedimentation and spillages.
Impacts - Assess the impacts of the proposal and review the residual impacts against the EPA objective.	The Proposal will require the implementation of engineering controls to ensure that impacts associated with dredging and drainage line alterations are minimised. These controls will be investigated through the EIA phase of the Proposal. The remaining impacts are expected to be able to meet the EPA's objective for this factor given that: • Potential impacts associated with erosion, sedimentation and waste materials will be mitigated and regulated under the Mining Act and Part V of the EP Act. • Soil contamination resulting from disturbance of ASS (if present) during mining is able to be mitigated using industry-standard treatment controls.
Assumptions - Describe any assumptions critical to your assessment e.g. particular mitigation measures or regulatory conditions.	• Industry-standard controls for waste material leachate and ASS are suitable in this case.

Table 7: Potential impacts to Social Surroundings

EPA requirements	Response
EPA Policy and guidance – What have you considered and how have you applied them in relation to this factor?	**EPA Objectives**: To protect social surroundings from significant harm. **Key EPA Documents** Statement of Environmental Principles, Factors and Objectives (EPA, 2021a). EIA (Part IV Divisions 1 and 2) Administrative Procedures (EPA, 2021b); and EIA (Part IV Divisions 1 and 2) Procedures Manual (EPA, 2021c). **Relevant EPA Factor Guidelines** Environmental Factor Guideline – Social Surroundings (EPA, 2016g). **Application of Policies and Guidance** This Section 38 Referral has been prepared by utilising the advice contained within the 'Key EPA Documents' listed above. The Environmental Factor Guideline - Social Surroundings (EPA, 2016g) was used during the refinement of the Proposal design.
Consultation – Outline the outcomes of consultation in relation to the potential environmental impacts.	Image has had pre-referral discussions with the DCCEEW and the EPA at DWER and their comments have been incorporated into this Section 38 Referral where applicable. Image has consulted with local landholders on an ongoing basis. Image have previously consulted with the Yued Native Title Claimant Group (Yued). Image has consulted with heritage consultants Horizon Heritage and Terra Rosa regarding investigation requirements and potential impacts on this factor.
Receiving environment - Describe the current condition of the receiving environment in relation to this factor.	The following information on the receiving environment has been sourced from a Desktop Assessment of Aboriginal Heritage Values and Traditional Uses completed by Horizon Heritage (2021, Appendix 3): • The Proposal lies within traditional land held by the Yued 'Noongar' People. • A search of the Aboriginal Heritage Enquiry System indicated that one known registered Aboriginal heritage site extends onto the northern section of the MDE. The site name is Gingin Brook Waggyl Site. The register lists the site type as historical, mythological, camp, hunting place, plant resource and a water source. • The site file and site boundary have access restrictions. • The agricultural land use portion around Moore River, north of the MDE has been highly disturbed from its original natural environment. • The MDE area remains in a predominantly natural environment and has some potential for surface expressions of in situ cultural material (artefacts) or sites. • The Moore River located north of the MDE is an important landscape feature connected with Yued Noongar Waugal mythological associations. • The Moore River has intrinsic spiritual and ceremonial importance and is considered to form the basis of the underlying wellbeing of the Yued Noongar people. • The MDE has the potential to have flora and fauna resources that could be used by Yued Noongar people as traditional bush tucker and bush medicine. • Astrotourism is a growing market in the region, taking advantage of wide, open spaces and low levels of light pollution. • The MDE intersects one freehold lot, predominantly made up of remnant native vegetation. • Two local residences are located approximately 1-2 km from the MDE.
Proposal activities – Describe the proposal activities that have the potential to impact the environment**.**	• Restrictions in recreational uses of the area. • Groundwater abstraction resulting in a loss of external user water supply. • Mining and haulage operations resulting in noise, light and dust emissions on sensitive receptors. • Increased light emissions impacting astrotourism opportunities in the local area. • Potential unavoidable disturbance of Aboriginal heritage sites if present (remaining surveys yet to be completed).

EPA requirements	Response
	• Disturbance or indirect impacts to areas utilised by the Traditional Owners for cultural purposes, bush tucker or medicine.
Mitigation - Describe the measures proposed to manage and mitigate the potential environmental impacts.	• Landholder consultation and agreements to ensure the Proposal does not significantly impact existing land uses or users of local roads. • Minimise the adverse visual impact of stationary lighting intensity through the appropriate selection and positioning of lighting fittings. • Development of a Social Cultural Heritage Management Plan with the Yued People. • Onsite Aboriginal heritage surveys are to be conducted and significant sites avoided if practicable. • Approval will be sought under Section 18 of the *Aboriginal Cultural Heritage Act 2021* if significant sites cannot be avoided. • Bush tucker and medicine information will be incorporated into mine planning if required to allow avoidance and minimisation of impacts. • Continued consultation with the Traditional Owners regarding the minimisation of impacts to traditional uses of the area.
Impacts - Assess the impacts of the proposal and review the residual impacts against the EPA objective.	Impacts to current recreational uses of the area are expected to be minimal as the area is not extensively used. There may be potential noise, dust and light impacts on local landholders that will need to be carefully managed, acknowledging the lack of similar current sources. There may be some areas of Aboriginal cultural value or heritage sites that will require disturbance or may be indirectly impacted (to be determined pending heritage surveys and consultation). Impacts to bush tucker and medicine will be considered in consultation with the Yued People.
Assumptions - Describe any assumptions critical to your assessment e.g. particular mitigation measures or regulatory conditions.	Aboriginal heritage surveys have not been completed across all areas of the MDE and as such the assessment has taken a conservative assumption that some sites will occur and will either be disturbed or be indirectly impacted.

Table 8: Potential impacts to Human Health

EPA requirements	Response
EPA Policy and guidance – What have you considered and how have you applied them in relation to this factor?	**EPA Objectives**: To protect human health from significant harm. **Key EPA Documents** Statement of Environmental Principles, Factors and Objectives (EPA, 2021a). EIA (Part IV Divisions 1 and 2) Administrative Procedures (EPA, 2021b). EIA (Part IV Divisions 1 and 2) Procedures Manual (EPA, 2021c). **Relevant EPA Factor Guidelines** Environmental Factor Guideline – Human Health (EPA, 2016h). **Other Relevant Guidance** Safety Guide on Management of Naturally Occurring Radioactive Material (NORM) (Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), 2008). ARPANSA Code of Practice and Safety Guide for Radiation protection and radioactive waste management in mining and mineral processing (ARPANSA, 2005). Application of the Concepts of Exclusion, Exemption and Clearance (International Atomic Energy Agency (IAEA), 2004). **Application of Policies and Guidance** The Environmental Factor Guideline - Human Health (EPA, 2016h) will be utilised during the assessment. Radiation investigations have been scoped and are being conducted in accordance with the guidance identified above.
Consultation – Outline the outcomes of consultation in relation to the potential environmental impacts.	Image has had pre-referral discussions with the DCCEEW and the EPA at DWER and their comments have been incorporated into this Section 38 Referral where applicable. Image has consulted with Preston Consulting and Calytrix Consulting regarding investigation requirements and potential impacts on this factor.
Receiving environment - Describe the current condition of the receiving environment in relation to this factor.	The following information on the receiving environment has been sourced from drilling, compositing and analysis conducted by Image in 2017-2019: • The current Bidaminna Ore Resource contains 2.2% heavy mineral, including 5.1% zircon, 48% ilmenite, 36% leucoxene and 4.4% rutile. • The naturally occurring radionuclides, thorium, uranium and their decay products in secular equilibrium (as no chemical or thermal processing of minerals will take place), will be concentrated in the product.

Proposal activities – Describe the proposal activities that have the potential to impact the environment**.**	• Excavation, haulage and stockpiling of HMC potentially resulting in:
	  ○ Contamination of air, soils, sediments, surface or groundwater by radionuclides.
	  ○ Gamma radiation exposure from potential build-up of salts.
	  ○ Radiation exposure to members of the public on the rehabilitated landform.
	  ○ Radiation exposure during transport.

Mitigation - Describe the measures proposed to manage and mitigate the potential environmental impacts.	• Access to the mine site and processing areas will be restricted and managed by Image. • The only tailings that will be generated on site in the course of mining and processing of the heavy mineral sands ore will be sand, clay fines, and oversize. • The HMC will not be used on site in any way – it will be produced and exported. • The HMC will not be stored on site for an extended period. The HMC will be stacked on a drainage pad outside the WCP, where it will be allowed to drain and dry for a short period of time prior to being transported off site for export. • Mining and processing of ore will be managed in accordance with a Radioactive Ores – Mining and/or Processing License from the Radiological Council of WA. • Monitoring and management of radiation levels will be managed in accordance with the *Radiation Safety Act 1975* (WA) and the Mines Safety and Inspection Regulations 1995 (WA).

EPA requirements	Response
Impacts - Assess the impacts of the proposal and review the residual impacts against the EPA objective.	Potential radiation exposure associated with the Proposal is expected to be similar to Image's Boonanarring Project and Atlas Project. The highest measured radiation exposure at the Boonanarring Project was 0.83 mSv/year, which is less than the limit of the exposure for the members of the general public and only 4% of the limit of the exposure for workers (Calytrix Consulting, 2020).
Assumptions - Describe any assumptions critical to your assessment e.g. particular mitigation measures or regulatory conditions.	Potential radiation associated with mineral sands mining will be managed in accordance with relevant guidelines and codes of practice published by the ARPANSA and subject to control under Part 16 of the Mines Safety and Inspection Regulations 1995. The site will also be registered with the Radiological Council WA under Section 28 of the *Radiation Safety Act 1975* (WA).

2.2 Other Environmental Factors

Image has determined that the Proposal is unlikely to significantly impact the following Key Environmental Factors (noting that Sea theme factors were not included).

- Subterranean fauna
- Landforms;
- Greenhouse Gas (GHG) Emissions; and
- Air Quality.

Subterranean Fauna: Bestiolas Consulting undertook a subterranean desktop fauna study to evaluate impacts to subterranean fauna as a result of the Proposal (Bestiolas Consulting, 2022; Appendix 4).

There were no records of any stygofauna or troglofauna species from within or near the MDE in any of the searched Federal and State government databases. The closest published records of stygofauna occurring to the Project were from the extensive cave systems formed in the Tamala Limestone, located in the Yanchep National Park, approximately 50 km to the south. The closest record of troglofauna to the Proposal was 85 km to the northwest within Tamala Limestone caves in the Jurien karst area. The troglofauna desktop studies concluded that the Bassendean Sand and Guildford Clays do not represent prospective troglofauna habitat due to insufficient interstitial space present for habitat connectivity and resource recharge.

The subterranean fauna desktop study has indicated that the MDE is highly unlikely to provide prospective habitat for subterranean fauna. The findings indicate that stygofauna and troglofauna do not represent an environmental factor for future regulatory approvals of the Proposal in accordance with EPA guidelines. Further stygofauna assessments will be conducted within groundwater source areas to provide further information on the subterranean fauna values outside the MDE.

Landforms: Landforms is not expected to be a Key Environmental Factor for the Proposal as no unique landforms occur within the MDE and progressive backfilling and rehabilitation to a pre-mining profile and land use will occur over the mine life.

Greenhouse Gases: Greenhouse Gas is not expected to be a Key Environmental Factor as greenhouse gas emissions from the Proposal are not expected to exceed the 100,000 t CO_2-e per annum threshold for Scope 1 emissions stated in the Environmental Factor Guideline –

Greenhouse Gas Emissions (EPA, 2020b). Feasibility studies are currently being conducted into renewable energy sources for the Proposal however, as these are currently not fully progressed the use of onsite diesel generators has been assumed to estimate the maximum Scope 1 emissions for the Proposal. Using the National Greenhouse and Energy Reporting Emissions and Energy Threshold Calculator, estimates of Scope 1 emissions have been calculated based on fuel consumption estimates derived from Boonanarring's annual reporting results and standard equipment specifications. Maximum annual Scope 1 emissions for the Proposal including mining fleet, dredge operation and onsite power generation have been estimated at 89,000 t CO_2-e. Greenhouse Gas emissions for the Proposal are therefore not expected to exceed 100,000 t CO_2-e per annum threshold.

Air Quality: Air Quality is not expected to be a Key Environmental Factor for the Proposal as power supply requirements are low and the processing method does not produce significant air emissions. There are also minimal existing air pollutant sources in the area. Dust will be considered and assessed as part of the Social Surroundings factor.

2.3 HOLISTIC IMPACT ASSESSMENT

The Proposal lies within the range of the Carnaby's Black Cockatoo (Endangered: BC Act and EPBC Act), and Banksia Woodlands of the Swan Coastal Plain TEC / PEC and three significant flora species were identified within the MDE. Impacts associated with the clearing of native vegetation therefore extends across multiple Key Environmental Factors (Flora and Vegetation, Terrestrial Fauna and Social Surroundings at a minimum) and several other linkages exist between factors.

Given the above, Image will incorporate extensive avoidance and mitigation measures into the Proposal design and operation processes, the key measures being the adoption of a progressive mining and immediate rehabilitation approach.

There are some potential impacts that require management and monitoring to ensure that the impacts are not significant. Many of these potential impacts are adequately regulated under other legislation:

- Slurry spills and leaks and process plant emission swill be regulated under Part V of the EP Act;
- Mine design, and general environmental management will be regulated through a Mining Proposal assess under the Mining Act; and
- Closure and rehabilitation will be regulated through a Mine Closure Plan (MCP) assessed under the Mining Act.

There are some potential impacts that are limited in the Proposal Content Document, including:

- Limits on total permanent disturbance within the MDE; and
- A limit on groundwater abstraction volumes.

During EIA, Image will consider and assess all potential direct and indirect impacts from the Proposal to relevant, interconnected key environmental factors. The mitigation hierarchy (avoid, minimise, rehabilitate and offset) will be applied to the Proposal to address each potential impact. The significance of the impacts will be assessed once the mitigation hierarchy has been applied, significant residual impacts will be addressed through management (the preparation and implementation of Environmental Management Plans) or counterbalanced with offsets.

2.4 CUMULATIVE IMPACT ASSESSMENT

The Proposal occurs in a region that has been impacted and altered by agriculture, resources and infrastructure. In preparation for EIA, Image will include a cumulative impact assessment to assess the Proposal's contribution to impacts on relevant environmental values. The activities, boundaries and values relevant for the cumulative impact assessment in relation to each Key Environmental factor are summarised in Table 9.

Table 9: Cumulative Impact Assessment

Activities	Environmental values	Relevant factors	Boundaries
Clearing of native vegetation	Native vegetation	Flora and Vegetation	Cumulative impacts on native vegetation will be assessed by reviewing the remaining extent of each affected pre-European vegetation association and broader IBRA sub-regions. In addition, the remaining native vegetation extents within various buffers from the Proposal boundary (10 km, 15 km and 20 km) will be reviewed. A review of impacts from other proposals and historic clearing within the local and regional extents of the Banksia Woodlands of the Swan Coastal Plain TEC/PEC and Threatened and Priority Flora records.
	State-wide Pre-European extent	Flora and Vegetation	
	Banksia Woodlands of the Swan Coastal Plain TEC/PEC	Flora and Vegetation	
	Priority and Threatened flora and Significant flora habitat	Flora and Vegetation	
	Significant fauna habitat	Terrestrial Fauna	
	Carnaby's Black Cockatoo Foraging Habitat	Terrestrial Fauna	As above, plus a review of impacts from other proposals and historic clearing within a 12 km radius of the Proposal boundaries (likely maximum local range of roosting Carnaby's Black Cockatoo).
Abstraction of groundwater from the Yarragadee, Lesueur or Leederville aquifers.	The Yarragadee aquifer Lesueur or Leederville	Inland Waters	Impacts from other proposals within the North Moore River Park subarea (part of the greater Gingin Groundwater Area) defined by DWER in the Gingin Groundwater Area Allocation Plan (Department of Water, 2015).
	Groundwater Dependent Ecosystems (GDE)	Flora and Vegetation Inland Waters	Cumulative impacts on GDEs will be assessed by reviewing other proposals that may impact GDEs within various buffers from the Proposal boundary (10 km, 15 km and 20 km).
Mining (excavation, ore handling, processing and export)	Amenity (Dust)	Social Surroundings	If the Proposal is likely to result in dust or noise above background levels at the nearest sensitive receptors then an assessment will be conducted to determine what other air pollution and noise impacts could be affecting that receptor. The Proposal's contribution to those cumulative impacts will then be assessed.
	Amenity (Noise)	Social Surroundings	
	Economic (Light spill)	Social Surroundings	Light emissions will be reviewed against the cumulative emissions within the Shire of Gingin to determine the contribution made by the Proposal.

2.5 CONSULTATION

Image has a Consultation Strategy which identifies key external stakeholders and determines how they will be impacted by the Proposal and what influence they have over its implementation.

Image has had pre-referral discussions with the DCCEEW and the EPA regarding the Bidaminna Project and their comments have been incorporated into this Referral where applicable.

Image have also commenced consultation with Local, State and Commonwealth Governments, Aboriginal Groups with a connection to the Proposal lands and corporate and community stakeholders.

In preparation of this referral Image has consulted with environmental consultants regarding the potential impacts to the Key Environmental Factors.

3 PART C: OTHER APPROVALS AND REGULATION

The relevant Decision Making Authorities (DMAs) identified by Image are listed in Table 10. Additional DMAs may be identified during the EPA's assessment of the Proposal.

Table 10: Decision Making Authorities

Decision-making authority and department (if relevant)	Legislation or Agreement regulating the activity	Approval required and relevant proposal element	Whether and how statutory decision-making process can mitigate impacts on the environment? (Yes/No and summary of reasons Include a separate line item for each relevant impact, and discuss how the EPA's factor objective will be met)		
			Relevant Impact	Relevant Key Environmental Factor and Objective	Can the DMA mitigate impacts and how will the EPA's factor be met
Minister for Environment (Cth)	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)	**s.133 Approval** - required for the assessment of the Proposal's impacts on Matters of National Environmental Significance	Direct impacts to Threatened Fauna (Vehicle Strike)	**Terrestrial Fauna** EPA's objective: *To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.*	No While there is likely to be significant overlap in regulation, the EPBC Act is a Commonwealth Act and as such cannot be relied upon to regulate impacts under WA legislation.
			Clearing of potential Threatened Flora or Fauna habitat	**Flora and Vegetation** EPA's objective: *To protect flora and vegetation so that biological diversity and ecological integrity are maintained.* **Terrestrial Fauna** EPA's objective: *To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.*	
			Environmental impacts associated with the storage and transport of radioactive materials.	**Terrestrial Fauna** EPA's objective: *To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.* **Inland Waters** EPA's objective: *To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.* **Human Health** EPA's objective: *To protect human health from significant harm.*	
Minister for Environment (WA)	Part V of the *Environmental*	**Works Approval** - required for the construction and	Noise emissions	**Social Surroundings** EPA's objective: *To protect social surroundings from significant harm.*	Yes Mineral Sands mining is a prescribed activity under Part V of the EP Act and therefore the design, construction and operation of the mine will be

Decision-making authority and department (if relevant)	Legislation or Agreement regulating the activity	Approval required and relevant proposal element	Whether and how statutory decision-making process can mitigate impacts on the environment? (Yes/No and summary of reasons Include a separate line item for each relevant impact, and discuss how the EPA's factor objective will be met)		
			Relevant Impact	Relevant Key Environmental Factor and Objective	Can the DMA mitigate impacts and how will the EPA's factor be met
Chief Executive Officer (DWER)	*Protection Act 1986* (WA)	commissioning of the WCP and Tailings Storage Facility and disposal of waste material back into the mine path. **Licence** - required for the operation of the WCP and Tailings Storage Facility and disposal of waste material back into the mine path.			regulated under a works approval and licence to ensure noise emissions are minimised and do not result in significant impacts to any sensitive receptors.
			Dust emissions	**Flora and Vegetation** EPA's objective: *To protect flora and vegetation so that biological diversity and ecological integrity are maintained* **Social Surroundings** EPA's objective: *To protect social surroundings from significant harm.*	Yes Mineral Sands mining is a prescribed activity under Part V of the EP Act and therefore the design, construction and operation of the mine will be regulated under a works approval and licence to ensure dust emissions are minimised and do not result in significant impacts to any sensitive receptors. Dust emissions from the WCP and all other aspects of the site are regulated under the *Mining Act 1978* (WA; Mining Act) (refer below) and are not expected to be significant. These emissions are unlikely to require additional regulation under Part IV of the EP Act in order to meet the objective for this factor.
			Disposal of waste material back into mine path and unintentional discharge of potentially contaminated water (stormwater), hydrocarbons, and/or sand slimes	**Inland Waters** EPA's objective: *To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.* **Terrestrial Environmental quality** EPA's objective: *To maintain the quality of land and soils so that environmental values are protected* **Flora and Vegetation** EPA's objective: *To protect flora and vegetation so that biological diversity and ecological integrity are maintained*	Yes The Works Approval and Licence will regulate pollution of land or waters from the disposal of waste material or any spills of slimes or hydrocarbons within the MDE. Leaks and spills from all other aspects of the MDE are regulated under the Mining Act (refer below) and are not expected to be significant. These emissions are unlikely to require additional regulation under Part IV of the EP Act in order to meet the objective for this factor.
Minister for Environment (WA)	*Biodiversity Conservation Act 2016* (WA)	**s.40 approval –** to take flora (where the flora to be	Clearing of potential	**Flora and Vegetation**	Yes Species and ecological communities listed under the BC Act may differ from those listed in other states or territories, or under Commonwealth

Decision-making authority and department (if relevant)	Legislation or Agreement regulating the activity	Approval required and relevant proposal element	Whether and how statutory decision-making process can mitigate impacts on the environment? (Yes/No and summary of reasons Include a separate line item for each relevant impact, and discuss how the EPA's factor objective will be met)		
			Relevant Impact	Relevant Key Environmental Factor and Objective	Can the DMA mitigate impacts and how will the EPA's factor be met
Chief Executive Officer (DBCA)		taken is Threatened flora). **s. 45 approval** – to modify a TEC.	Threatened Flora or TEC.	EPA's objective: To protect flora and vegetation so that biological diversity and ecological integrity are maintained.	legislation. This is due to the different status of ecological communities in the different States and Territories and nationally. The BC Act provides the ability to impose conditions on authorisations to take Threatened species or modify TECs, that mitigate or offset the impact of such actions. DWER and DBCA coordinate assessment processes where a project being assessed under the EP Act involves the taking of a Threatened species or modification of an occurrence of a TEC. In accordance with longstanding agency practice, the assessment processes will be undertaken concurrently with advice being provided on the likelihood of an approval/permit being granted under the EP Act or an authorisation being granted under the BC Act.
Minister for Aboriginal Affairs	*Aboriginal Cultural Heritage Act 2021* (WA; ACH Act)	**Application for a permit under Part 6 of the ACH Act** - required for consent to impact any Aboriginal Heritage sites (if not able to be avoided)	Disturbance of Aboriginal Heritage Sites	**Social Surroundings** EPA's objective: *To protect social surroundings from significant harm.*	Yes. An application for a permit under Part 6 of the ACH Act will assess the significance of the proposed disturbance and determine what mitigation measures are required to obtain consent for any disturbance to Aboriginal Heritage Sites. This consultation and assessment process will meet the EPA's objective for Social Surroundings by protecting registered Aboriginal Heritage sites from significant harm.
			Disturbance or indirect impacts to areas or artefacts of Aboriginal cultural value	**Social Surroundings** EPA's objective: *To protect social surroundings from significant harm.*	No (if avoidance is not possible). If disturbance or indirect impacts within areas or artefacts of significant Aboriginal cultural value cannot be avoided then assessment and potential regulation under Part IV of the EP Act may be required.
Minister for Water Chief Executive Officer (DWER)	*Rights in Water and Irrigation Act 1914* (WA)	**Application for a 26D licence** - required for the construction of a	Abstraction of groundwater from the Yarragadee, Lesueur or	**Inland Waters** EPA's objective: *To maintain the hydrological regimes and quality of*	Yes. A 26D licence ensures that bores are drilled, constructed and maintained appropriately to ensure the aquifer and the groundwater resource is not compromised. A 5C licence regulates the taking of water and assesses the impacts of the abstraction on the environment and other users. A 5C

Decision-making authority and department (if relevant)	Legislation or Agreement regulating the activity	Approval required and relevant proposal element	Whether and how statutory decision-making process can mitigate impacts on the environment? (Yes/No and summary of reasons Include a separate line item for each relevant impact, and discuss how the EPA's factor objective will be met)		
			Relevant Impact	Relevant Key Environmental Factor and Objective	Can the DMA mitigate impacts and how will the EPA's factor be met
		bore to abstract groundwater. **Application for a 5C licence** - required for the abstraction of groundwater	Leederville aquifers.	*groundwater and surface water so that environmental values are protected.*	Licence is only granted if the impacts from the abstraction are shown to be sustainable with minimal environmental impacts or impacts to other users. Licence holders are obligated to comply with their resource allocation and any conditions included in the licence. Licence holders are also required to use water efficiently and responsibly, minimising impacts on the water resource. These licences will ensure the Proposal meets the EPA's objective for Inland Waters by maintaining the hydrological regime of groundwater. Regulation of the potential impacts on the environment from the drilling and abstraction of groundwater is therefore not expected to be required under Part IV of the EP Act.
Minister for Mines and Petroleum Executive Director Resource and Environmental Compliance (Department of Mines, Industry, Regulation and Safety; DMIRS) State Mining Engineer, (DMIRS)	Mining Act	**Approval of a Mining Proposal and Mine Closure Plan (MCP)** - required for any mining related disturbance within Mining Act tenements (i.e. all works apart from road intersection works).	Changes to the stability of the landscape	**Terrestrial Environmental Quality** EPA's objective: *To maintain the quality of land and soils so that environmental values are protected* **Inland Waters** EPA's objective: *To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.* **Flora and Vegetation** EPA's objective: *To protect flora and vegetation so that biological diversity and ecological integrity are maintained* **Terrestrial Fauna** *To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.*	Yes. Approval of a Mining Proposal and MCP will ensure that the Factors defined in DMIRS's Environmental Objectives - Policy and Mining (DMIRS, 2020) are met for the Proposal. A Mining Proposal will be submitted to DMIRS prior to any disturbance at the Proposal and will include auditable outcomes for the key DMIRS factors (Biodiversity, Water Resources, Land and Soils). These outcomes will be defined and approved by DMIRS to ensure that the impacts on the key DMIRS factors are mitigated to an acceptable level. In the context of landscape stability this will include an auditable outcome that the landscape will be safe and stable during mining to prevent slumps or collapsed walls which could have environmental impacts. A MCP must be submitted to DMIRS with the Mining Proposal prior to any disturbance at the Proposal and is required to be revised every three years. It will include auditable closure and rehabilitation outcomes and criteria which will be defined and approved by DMIRS to ensure that impacts on key DMIRS factors are mitigated to an acceptable level. In the context of landscape stability this will include an auditable outcome that the landscape will be safe, stable and non-polluting post-closure to prevent landform subsidence which could have environmental impacts.

Decision-making authority and department (if relevant)	Legislation or Agreement regulating the activity	Approval required and relevant proposal element	Whether and how statutory decision-making process can mitigate impacts on the environment? (Yes/No and summary of reasons Include a separate line item for each relevant impact, and discuss how the EPA's factor objective will be met)		
			Relevant Impact	**Relevant Key Environmental Factor and Objective**	**Can the DMA mitigate impacts and how will the EPA's factor be met**
					The implementation of the Mining Proposal and MCP under the Mining Act is considered suitable to mitigate this impact such that the EPA's objectives can be met. By meeting DMIRS's Factors, the Proposal will also meet the EPA's objectives for the relevant factors. Additional regulation under Part IV of the EP Act is therefore unlikely to be required for this potential impact.
			Clearing of native vegetation	**Flora and Vegetation** EPA's objective: *To protect flora and vegetation so that biological diversity and ecological integrity are maintained* **Terrestrial Fauna** *To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.*	Partially. A Mining Proposal will be submitted to DMIRS prior to any disturbance at the Proposal and will include auditable outcomes for the key DMIRS factor: Biodiversity. These outcomes will include requirements for best-practice topsoil stripping and storage, minimising the clearing footprint and taking accurate records. A MCP must be submitted to DMIRS with the Mining Proposal prior to any disturbance at the Proposal and is required to be revised every three years. It will include auditable closure and rehabilitation outcomes and criteria which will be defined and approved by DMIRS to ensure that cleared areas are rehabilitated to an acceptable level. In the context of vegetation clearing this will include an auditable outcome that the rehabilitated areas will meet specific closure criteria designed to ensure flora, vegetation and fauna values are reinstated. The implementation of the Mining Proposal and MCP under the Mining Act is considered suitable to mitigate rehabilitation and impacts during clearing however, it is not considered suitable to mitigate impacts associated with the loss of vegetation. This is expected to require assessment under Part IV of the EP Act to ensure that the EPA's objectives can be met.

Decision-making authority and department (if relevant)	Legislation or Agreement regulating the activity	Approval required and relevant proposal element	Whether and how statutory decision-making process can mitigate impacts on the environment? (Yes/No and summary of reasons Include a separate line item for each relevant impact, and discuss how the EPA's factor objective will be met)		
			Relevant Impact	**Relevant Key Environmental Factor and Objective**	**Can the DMA mitigate impacts and how will the EPA's factor be met**
			Introduction and spread of weeds	**Flora and Vegetation** EPA's objective: *To protect flora and vegetation so that biological diversity and ecological integrity are maintained*	Yes. The DMIRS Factor: Biodiversity, is relevant to this impact. DMIRS's objective for this factor is to: *Maintain representation, diversity, viability and ecological function at the species, population and community level.* By meeting the objective of DMIRS's Biodiversity Factor, the Proposal will also meet the EPA's objectives for flora and vegetation. Therefore, further assessment of the impact of the introduction and spread of weeds on Flora and Vegetation is not required to be assessed by the EPA.

Decision-making authority and department (if relevant)	Legislation or Agreement regulating the activity	Approval required and relevant proposal element	Whether and how statutory decision-making process can mitigate impacts on the environment? (Yes/No and summary of reasons Include a separate line item for each relevant impact, and discuss how the EPA's factor objective will be met)		
			Relevant Impact	**Relevant Key Environmental Factor and Objective**	**Can the DMA mitigate impacts and how will the EPA's factor be met**
			Alteration to the post mining land use	**Social Surroundings** EPA's objective: *To protect social surroundings from significant harm.*	Yes. The DMIRS Factor: Rehabilitation and Mine Closure, is relevant to this impact. DMIRS's objective for this factor is: *Mining activities are rehabilitated and closed in a manner to make them physically safe to humans and animals, geo-technically stable, geo-chemically non-polluting / non-contaminating, and capable of sustaining an agreed post-mining land use, and without unacceptable liability to the State.* By meeting the objective of DMIRS's Rehabilitation and Mine Closure Factor, the Proposal will also meet the EPA's objectives for social surrounding that are relevant to this impact. Additional regulation under Part IV of the EP Act is therefore unlikely to be required for this potential impact.
	Work Health and Safety (Mines) Act 2020	**Approval of a Radiation Management plan** – required when thorium and uranium ores are mined and when members of the public and employees are likely to be exposed to doses higher than the dose limits set out in the Work Health and Safety (Mines) Regulations (2022).	Radiation exposure to employees and members of the public	**Human Health** EPA's objective: To protect human health from significant harm.	Yes Potential radiation associated with mineral sands mining will be managed in accordance with relevant guidelines and codes of practice published by the Australian Radiation Protection and Nuclear Safety Authority and subject to control under Chapter 10, Division 3 of the Work Health and Safety (Mine) Regulations 2022. The site will also be registered with the Radiological Council WA under Section 28 of the *Radiation Safety Act 1975* (WA). Through the implementation of the Radiation Management Plan the Proposal will also meet the EPA's objective for Human Health. Therefore, further assessment of the impact of radiation exposure to members of the public is not required to be assessed by the EPA.

Decision-making authority and department (if relevant)	Legislation or Agreement regulating the activity	Approval required and relevant proposal element	Whether and how statutory decision-making process can mitigate impacts on the environment? (Yes/No and summary of reasons Include a separate line item for each relevant impact, and discuss how the EPA's factor objective will be met)		
			Relevant Impact	Relevant Key Environmental Factor and Objective	Can the DMA mitigate impacts and how will the EPA's factor be met
Minister for Mines and Petroleum Chief Dangerous	*Dangerous Goods Safety Act 2004* (WA)	**Dangerous Goods Licence** - may be required for the bulk storage of fuel if above specified limits (unlikely)	Contamination of soils, groundwater and surface water (hydrocarbon spills)	**Terrestrial Environmental Quality** EPA's objective: *To maintain the quality of land and soils so that environmental values are protected*	Yes. The storage and management of hydrocarbons will already be regulated under Part V of the EP Act and the Mining Proposal / MCP however, the Dangerous Goods Licence provides additional mitigation for the design and storage of larger volumes of dangerous goods (if large volumes of hydrocarbons (>100,000 L) are required to be stored on site).

Decision-making authority and department (if relevant)	Legislation or Agreement regulating the activity	Approval required and relevant proposal element	Whether and how statutory decision-making process can mitigate impacts on the environment? (Yes/No and summary of reasons Include a separate line item for each relevant impact, and discuss how the EPA's factor objective will be met)		
			Relevant Impact	Relevant Key Environmental Factor and Objective	Can the DMA mitigate impacts and how will the EPA's factor be met
Goods Officer, (DMIRS)			Fire (combustion of stored fuel)	**Inland Waters** EPA's objective: *To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.* **Flora and Vegetation** EPA's objective: *To protect flora and vegetation so that biological diversity and ecological integrity are maintained* **Terrestrial Fauna** EPA's objective: *To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.*	A Dangerous Goods Licence sets standards for the way in which dangerous goods are stored on site. These standards are aimed at ensuring dangerous goods are stored safely and in such a way that will not result in impacts to the environment. A Dangerous Goods Licence ensures potential spills and combustion risks from the Proposal are mitigated. A Dangerous Goods licence (in combination with the Part V and Mining Act approvals) will meet the objectives of the EPA for both factors by minimising the risk of contamination of soils and water, and protecting flora and vegetation, and terrestrial fauna by minimising the risk of fire. Regulation of the potential impacts on the environment from the storage of dangerous goods is therefore not expected to be required under Part IV of the EP Act.
Chief Executive Officer, Shire of Dandaragan	*Local Government Act 1995* (WA) *Planning and Development Act 2006* (WA)	**Planning / Development Approval** - required for the development of works outside of Mining Act tenements	Noise emissions Dust emissions	**Social Surroundings** EPA's objective: *To protect social surroundings from significant harm.*	No. A development approval is only required for works outside of Mining Act tenure. This process considers the impacts from small portions of the Proposal to an extent but does not regulate emissions from the Proposal. Potential impacts including emissions of Noise and Dust are regulated under Part V of the EP Act and are discussed further in the section above.

Decision-making authority and department (if relevant)	Legislation or Agreement regulating the activity	Approval required and relevant proposal element	Whether and how statutory decision-making process can mitigate impacts on the environment? (Yes/No and summary of reasons Include a separate line item for each relevant impact, and discuss how the EPA's factor objective will be met)		
			Relevant Impact	**Relevant Key Environmental Factor and Objective**	**Can the DMA mitigate impacts and how will the EPA's factor be met**
Secretary Radiological Council of Western Australia	*Radiation Safety Act 1975 (WA)*	**Registration with the Radiological Council WA –** required under Section 28 of the *Radiation Safety Act 1975* (WA) for the owner of any premises which is likely to be affected by the passage or use of any radioactive substance.	Radiation exposure to members of the public	**Human Health** EPA's objective: *To protect human health from significant harm.*	Yes The site will be registered with the Radiological Council WA under Section 28 of the *Radiation Safety Act 1975* (WA). Potential radiation associated with mineral sands mining will be managed in accordance with relevant guidelines and codes of practice published by the ARPANSA and subject to control under Part 16 of the Mines Safety and Inspection Regulations 1995. Through the implementation of the Radiation Management Plan the Proposal will also meet the EPA's objective for Human Health. Therefore, further assessment of the impact of radiation exposure to members of the public is not required to be assessed by the EPA.

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GLOSSARY

Term	Definition
ACH Act	*Aboriginal Cultural Heritage Act 2021*
ARPANSA	Australian Radiation Protection and Nuclear Safety Agency
ASS	Acid Sulphate Soils
BC Act	*Biodiversity Conservation Act 2016* (WA)
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DBCA	Department of Biodiversity, Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DE	Development Envelope
DMIRS	Department of Mines, Industry Regulation and Safety
DPIRD	Department of Primary Industries and Regional Development
DWER	Department of Water and Environmental Regulation
EIA	Environmental Impact Assessment
EP Act	*Environmental Protection Act 1986*
EPA	Environmental Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (WA)
ESA	Environmentally Sensitive Area
GDE	Groundwater Dependant Ecosystems
GDV	Groundwater Dependant Vegetation
GHG	Greenhouse Gas
GL	Gigalitre
ha	Hectare
HMC	Heavy Mineral Concentrate
IBRA	Interim Biogeographic Regionalisation of Australia
IAEA	International Atomic Energy Agency
Image	Image Resources NL
km	Kilometre
kt	Kilo-tonnes
ktpa	Kilo-tonnes per annum
MCP	Mine Closure Plan
Mining Act	*Mining Act 1978*
MW	Megawatt
NORM	Naturally Occurring Radioactive Material
PEC	Priority Ecological Community
Preston Consulting	Preston Consulting Pty Ltd
Proposal	The Bidaminna Project
Spectrum	Spectrum Ecology Pty Ltd
SRE	Short Range Endemic
TEC	Threatened Ecological Community
WA	Western Australia
WCP	Wet Concentrator Plant
Yued	Yued Native Title Claimant Group

APPENDICES

The following appendices have been provided electronically:

Appendix 1: Detailed Fauna Assessment V2 (Spectrum, 2022)

Appendix 2: Bidaminna Project Hydrology Report (MWES, 2021)

Appendix 3: Assessment of Aboriginal Heritage Values and Traditional Uses – Bidaminna Project (Horizon Heritage, 2021)

Appendix 4: Subterranean Fauna Desktop Study (Bestiolas, 2022)