Atlas Project Prescribed Premise Licence- Supporting Documentation

Licensee: Image Resources NL

Premises: Atlas Project Munbinea Road NAMBUNG WA 6521

[redacted]

Contents

List of Tables

List of Figures

1. Introduction

Image Resources NL (Image) is seeking an Environmental Licence under Part V of the Environmental Protection Act, 1986 to operate a mineral sands mine (the Project). The Project is in the Wheatbelt region of Western Australia (WA), approximately 170 kilometres (km) north of Perth and 18 km east of Cervantes, see Figure 1. The Atlas Project (or "the Project") occurs on Unallocated Crown Land, public road reserves and within tenure issued under the Mining Act.

Image has developed the open cut mine pit, processing plant, solar drying cells and supporting infrastructure (power supply, communications, workshop, laydown, and offices). The Project has an estimated mine life of approximately three years. Mining and progressive rehabilitation is planned in stages using conventional dry mineral sands mining techniques.

2. Purpose and Scope

The Licence application Supporting Documentation is provided in conjunction with a Licence Application Form. A Works Approval (W6831/2023/1) to construct and develop the mine and processing infrastructure was approved on 03/07/2024 and an amendment approved 24/03/2025.

The Project will be classified as a Prescribed Premises under Category 8 (minerals sands mining or processing) of Schedule 1 of the *Environmental Protection Regulations, 1987*. The proposed activities that are to be licensed under these categories are mining and ore processing with processed ore returned to the pit following removal of the target heavy minerals.

This document includes the attachments as required by the Department of Water and Environmental Regulation (DWER) *Application form: Works Approval / Licence / Renewal / Amendment / Registration v13, April 2020 (DWER, 2022*). As per the application form the following attachments must be submitted to support the works approval application:

- Attachment 1A, 1B & 1C (Occupier Status, Australian Securities and Investment
- Commission (ASIC) company extracts, Authorisation to act as representative of the Occupier);
- Attachment 2 (Premises map);
- Attachment 3A & 3B (Proposed activities);
- Attachment 5 (Other approvals and consultation);
- Attachment 6A (Emissions and discharges);
- Attachment 7 (Siting and location); and
- [redacted]

5. Attachment 2- Premises Maps

Figure 1 provides an overview of the Project area and location of the Prescribed Premises.

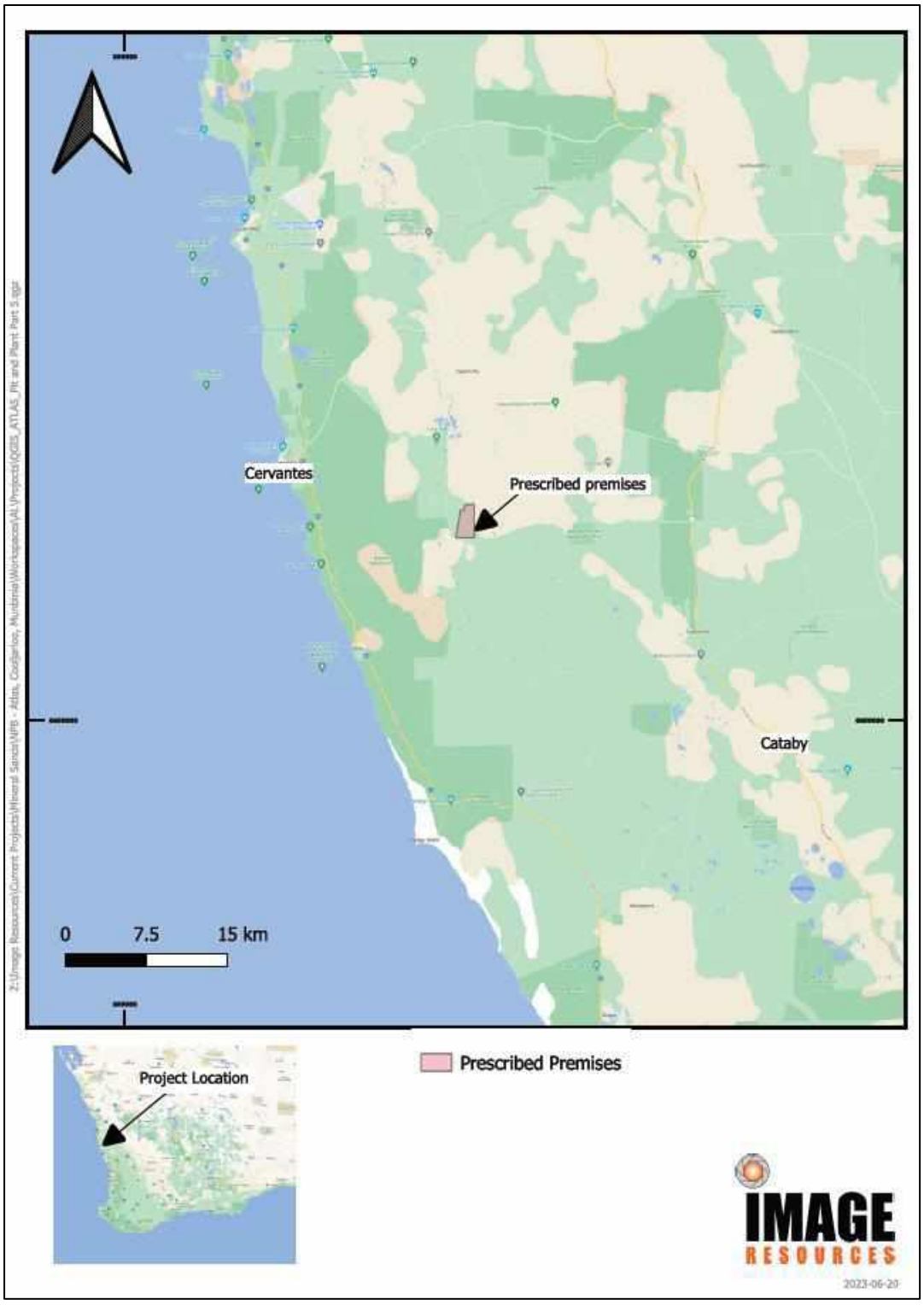

Figure 1- Prescribed Premise Boundary Regional Context

Figure 2 shows the location of commissioned mining infrastructure.

Figure 2- Prescribed Premise Boundary Local Context

Figure 3- Map depicting the groundwater monitoring bore locations and air quality monitoring location within the prescribed premise boundary

6. Part 4: Proposed Activities

6.1. Project Overview

The Atlas Project is located approximately 170 kilometres (km) north of Perth and 18 km east of Cervantes. Image has constructed an open pit mineral sands mine, processing plant and supporting infrastructure for the dry mining and processing ore at a nominal rate of 350tph (24 hrs. x 365 days) operation at approximately 85% utilisation (7,446hr / annum).

The Project will process the ore onsite using a Wet Concentrator Plant (WCP) to produce heavy mineral concentrate ("HMC") at a nominal production rate of 20tph (dependent on ore grade). HMC will be transported to Geraldton to be loaded onto a ship. The Life of Mine (LoM) is expected to be approximately three years.

In August 2024 clearing began and construction followed. Construction has been completed, with a Construction Compliance Report submitted to DWER on 11th March 2025. The site is currently operating under the Time Limited Operations conditions of W6831/2023/1.

6.1.1. Key Infrastructure and Equipment

See Figure 2 for reference to the below key infrastructure

- Feed Preparation Plant (FPP):
- Wet Concentrator Plant (WCP)
- Process Water Pond (PWP)
- Solar Drying Ponds (SDP)
- Run of Mine (ROM)
- Heavy Metal Concentrate (HMC)
- PASS Treatment Pad
- Vehicle Washdown
- Workshop
- Earthen bund
- Air Quality Monitoring system

6.1.2. Processes and Operations

Mining:

- Topsoil is removed and stockpiled adjacent to the mine path before being return as a part of the rehabilitation process;
- Overburden is removed from the mine path in the pit and transported to a overburden stockpile until there is sufficient mine voids available to allow for direct return progressively backfilling the pit for rehabilitation.
- Ore is mined from the pit and transported via using conventional earthmoving equipment
- Mining will occur across three blocks moving approximately south to north over the three-year project life with progressive rehabilitation occurring as areas become available.

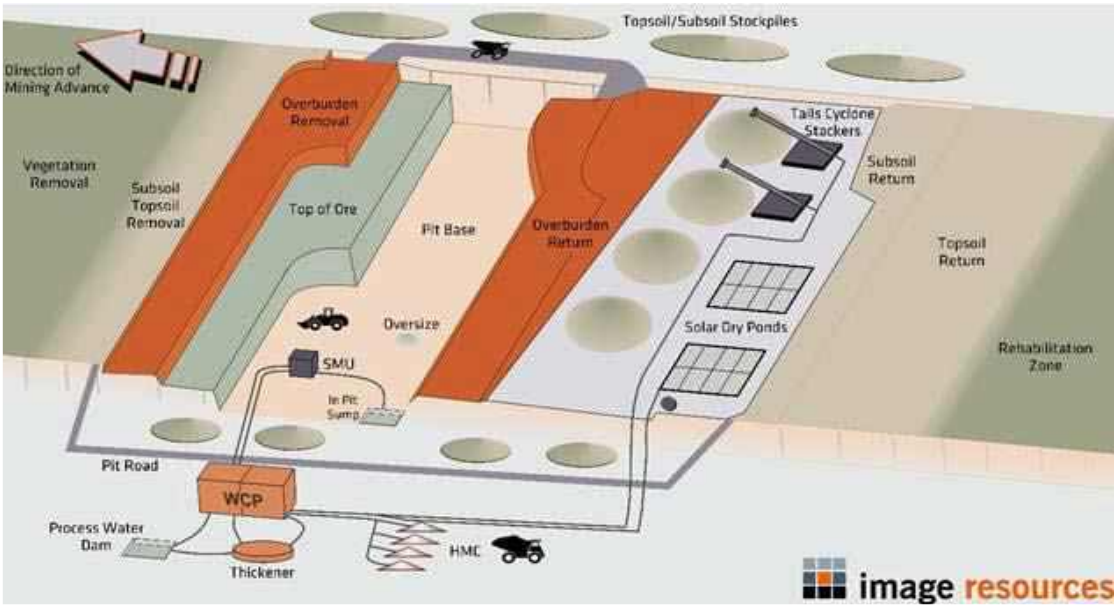

Figure 4- Ore Processing and Mining circuit

Ore Processing

- Stage 1 Feed Preparation Plant
    - Ore is delivered to an FPP
    - Ore is screened. Any overburden material nominally >2 mm oversize is returned to the mine void.
    - A scrubber and trommel will be used to eliminate any nominal >2 mm material from the slurry.
    - Oversize material will be stockpiled adjacent to the FPP before being returned as backfill to the mining void.
    - Water is added to the screened ore to form a slurry for pumping to the WCP.
- Stage 2- Wet Concentrator Plant
    - The screened slurry is pumped from the FPP to the WCP where the slurried ore is fed to a series of cyclones and spirals for wet gravity processing to separate heavy mineral (HM) in the form of ilmenite, leucoxene, rutile and zircon, from the remaining tailings sands and clays.
    - The slurry passes through deslime circuit cyclones to separate the finer materials which are pumped through to the tails and water management circuit.
    - The sand with the heavy minerals passes through the Constant Density Tank which provides steady-state feed to the gravity spiral circuits.
    - The slurry passes through a spiral circuit and an up current classifier, to further clean the slurry and separate the overburden material from the HM.
    - The resulting HMC is stockpiled and allowed to drain before being transported offsite.

Figure 5- Overview of the Processing Plant

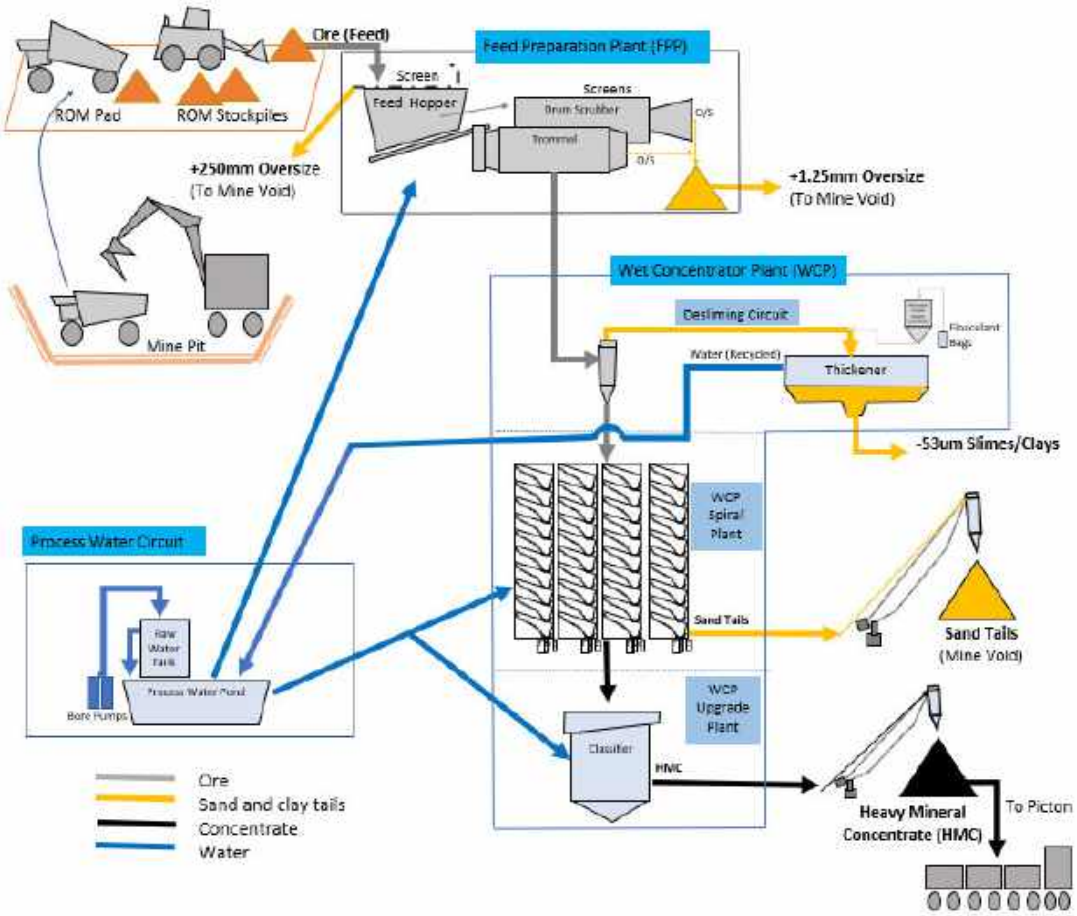

Figure 6- Processing Flowchart

6.1.3. Locations of Material Storage and return

Return of WCP Products:

- Sand Tails: deposited in the mine void either to the pit floor or on top of backfilled overburden using tailings cyclone stackers.
- Clay fines: from the thickener underflow are pumped to Solar Drying Ponds either within the pit shell or off path. Once the clay fines are dried, they are returned to the mine void. Two Solar Drying Ponds have been constructed to a depth of 2.5m on path within the pitshell with a 0.5m freeboard available and two Solar Drying Ponds may be constructed off path in the future if required. The Solar Drying Ponds measure approx. 320 x 160m. Further on path ponds may also be required. After drying, the clay fines will be mixed with the coarse sand tailings and used in upper layers of the returned soil profile. Approximately 0.4-0.65Mtpa of clay fines are expected to be generated over the LoM.
- Co-disposal: of the clay fines and sand tails is also being utilized and returned to the mine void. Co-disposal involves combining sand tailings and clay fines as they are pumped into the pit, reducing the need for Solar Drying Ponds and improving the subsoil profile which increases the likelihood of rehabilitation success. To the extent that Co-disposal proves effective, the need for separate return of sand tails and clay fines is avoided.

Backfilling mine void:

- In addition to the return of WCP products, overburden and oversized material will be returned to the mine void as backfill behind the advancing mine face.
- Initially there will be a requirement to stockpile overburden until the mining void is established but the mining aims to return as much overburden to the mining void as possible once the mining face has advanced.

Figure 7- Overview of the Atlas Pit, Tailings Stacker and Co-Disposal Tailings

6.2. Prescribed Premises Category

This Licence application is to obtain part V of the EP Act for operation of the processing plant and mining operations, that includes sand and clay tailings. Table 1 shows the relevant details of the prescribed premise categories relevant under Schedule 1 of the *Environmental Protection Regulation, 1987*.

Table 1- Prescribed Premise Licence Category and Design Capacity

Category	Category Capacity	Design capacity	Estimated throughput
8- Mineral sands mining or processing: premises on which mineral sands ore is mined, screened, separated or otherwise processed.	3.1 million tonnes of ore per year	350tph (24 hrs. x 365 days)	operation at 90% utilisation (7884hr / annum)

7. Attachment 5: Other Approvals and Consultation

7.1. Other Approvals

PART IV ENVIRONMENTAL PROTECTION ACT 1986 (WA)

The Project was approved under Part IV of the *Environmental Protection Act, 1986* (EP Act) via Ministerial Statement 1220 (MS1220) on 22nd May 2024. Please see Appendix X for statement.

PART V ENVIRONMENTAL PROTECTION ACT 1986 (WA)

A Works Approval (W6833/2023/1) has been approved for the construction of the wastewater treatment plant at the Atlas Accommodation Village. The accommodation village was constructed to the south of the Project on freehold land, separate to the Project's mining operations.

A Works Approval (W6831/2023/1) was approved for the construction of the Atlas mining and processing on 3rd July 2024. An amendment to this approval was received on 24th March 2025.

MINING ACT 1986 (WA)

The Mining Proposal submitted to the Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) has also been approved 19th July 2024, a copy of the Mining Proposal can be referred to in Appendix 13.5.

WORK HEALTH AND SAFETY (MINES) REGULATIONS 2022

The Radiation Management Plan Version 2.2– Atlas Operations was submitted to DEMIRS April 2025 and includes details of environmental monitoring for radiation on site.

SECTION 5C RIGHTS IN WATER AND IRRIGATION ACT 1914

Licences to abstract water from the Yarragadee Aquifer (GWL210993) and dewatering from the Superficial Aquifer have been received from DWER.

7.2. Consultation

The Image stakeholder consultation strategy through the Environmental Impact Assessment has identified key external stakeholders and determined how they may be impacted by the Project.

Commonwealth, State and Local Government authorities have been briefed on the Project in its entirety to ensure any issues, concerns or suggestions are identified and, where appropriate, addressed or responded to by Image.

The following Government Stakeholders have been consulted:

- Commonwealth Authorities:
    - Department of Climate Change, Energy, the Environment and Water;
- State Authorities
    - Department of Biodiversity, Conservation and Attractions;
    - Department of Mines, Industry Regulation and Safety;
    - DWER (EPA Services and Water); and
    - Water Corporation.
- Local Authorities
    - Shire of Dandaragan.

Image recognises that individuals, companies, and communities may also be interested in the potential impacts of the Project. The following corporate and community stakeholders were deemed to be relevant to this Project:

- South-West Aboriginal Land and Sea Council;
- Local NGOs, community groups and Yued Traditional Owners; and
- Private Land Holders (including local communities; particularly the town of Cervantes).

Image have had a number of engagements with DWER regarding the progress of the Project. In relation to the Part V approvals, and separate to Part V approvals for the Waste Water Treatment Plant at the village, Image and our consultants have been in frequent contact with Officers and Managers to progress submission and granting of the initial Works Approval achieved in July 2024. A Works Approval amendment application was submitted in November 2024 and approved in March 2025 following various discussions and meetings with Officers and Managers, particularly in relation to understanding DWER's interpretation of noise impacts.

8. Emissions, Discharges and Waste

Table 2

Source of emission or discharge	Volume and frequency	Proposed controls
Noise		
Lloyd George Acoustics Environmental Noise Assessment (LGA, April 2025) identified the following significant noise emitting equipment used on site are expected to include: • Mining Fleet • WCP • FPP • HMC Haul trucks **LGA (April,2025) is attached in Appendix 13.4** **To date there has been no stakeholder complaints about noise during construction and operations.**	Noise levels from the equipment listed are provided in detail in Table 3-2 of LGA (2025). Noise emissions are expected to be emitted 24 hours a day, 7 days a week during mining The noise levels expected at both receptors for the Project are detailed in Section 4 of LGA (2022). All nearby sensitive receptors are more than 450m from any commercial or industrial uses including the pit development.	**Management Controls:** • The modelling indicates that compliance with the *Environmental Protection (Noise) Regulations 1997* should be achieved at all times. • HMC Truck haulage has been analysed and demonstrated to comply on the basis of 3 trucks arriving and exiting the site. • Equipment reversing alarms has been fitted with broadband signal in-lieu of a tonal 'beep' so the tonal noise doesn't travel at high levels. • Speed limits are imposed on vehicles on site • Broadband startup alarms at the FPP and WCP • Progressive rehabilitation and backfill of the pit from the south will provide a buffer to sensitive receptors as the pit progresses North. Currently the pit face is 500m north of the southern pit boundary and is advancing at ~100m /month. • Private agreements with local landowners have been established. **Monitoring** • Noise monitoring will be undertaken adjacent to sensitive receptor locations if a noise complaint is received from a sensitive receptor. **Incidents:** Any complaints of noise at receiver locations will be logged internally and investigated to determine the cause. Remedial actions will be taken as appropriate.
Contaminated or potentially contaminated stormwater		
The unintentional contamination of stormwater may occur as a result of: • Leaks or spillages of hydrocarbons or chemicals • Sediment loading from the overtopping or breach of a solar drying pond, or unmanaged stormwater runoff • Acidification during the storage, handling or treatment of Acid Sulfate Soils (ASS)	Stormwater runoff is expected to be minimal due to the sandy soils at the Project and its location at the upper reaches of the catchment (MWES, 2023d) Fuel will be stored onsite in self-bunded tanks located in a designated area adjacent to the Processing Plant. Other hydrocarbons and chemicals will not be stored on site in large quantities. Land features which are considered to be an ASS risk are present within the Project area i.e. wetlands, creeklines and high groundwater table areas (DER, 2015). Acidification will only occur if these soils are exposed to oxygen resulting in sulfuric acid being formed. This Potential ASS was predominantly identified in the overburden and the ore and associated product were deemed to be of low risk. A copy of this report has been provided in Appendix 13.11 for reference.	• Hydrocarbons and chemicals will be stored in bunded facilities compliant with AS 1940-2004 • All bunded facilities will be fitted with spill kits • Fuel will be stored in self-bunded tanks • Refuelling facilities will be located on a concrete pad sloped to an underground sealed sump • Service vehicles will be fitted with spill kits • Any spills will be controlled, contained and cleaned up in accordance with Image's Spill Management Procedure • Solar drying ponds will be managed such that a minimum 500 mm freeboard is maintained at all times • Cleared areas will either drain to a sediment sump or the mine pit. • Sediment sumps will be of sufficient size to be able to contain the initial flush from a significant rainfall event. As noted, the presence of sandy soils are expected to result in high infiltration and minimal runoff therefore overflow is not expected at the sediment sumps • The disturbance of Potential ASS material will be staged to minimise the time it is exposed to oxygen

Source of emission or discharge	Volume and frequency	Proposed controls
		• Potential ASS will be managed as outlined in Section 5 of the Soil and Mine Waste Management Plan (Mine Earth 2022) • Strategic reburial of Potential ASS will be considered for oversize material within the mine pit areas and will be undertaken in conjunction with soil neutralisation methods where required • Designated Potential ASS storage areas will be progressively installed within the mine pit to ensure that all stormwater is contained • Identified Potential ASS will be deposited at the base of each mining area immediately following the excavation of ore. • Rapid groundwater recovery in the basal section of these areas will result in the development of a reducing environment, thus preventing the oxidation of ASS **Monitoring:** • Hydrocarbon and chemical storage areas will be inspected on a regular basis • Spill kits will be inspected on a regular basis and replenished as required • Regular in-pit soil screening of material will be undertaken, when necessary, based on reconciliation of mine operations with mine scheduling (e.g. visual identification of Potential ASS material) • Tailings sand will be screen tested if it is to be used as growth medium during rehabilitation • Clay fines (slimes) will be screen tested • Routine water monitoring (including pH) will be conducted at numerous locations around site including process water dams, solar drying ponds and within the processing plant • Selected monitoring bores (I01B, I03B, I04B, 106B and I08B) will be regularly monitored for a range of parameters • If ASS have been treated, then soil screening will be conducted to test the effectiveness of soil neutralisation
Dust		
Ramboll (2022a) conducted an Air Quality Impact Assessment (Appendix 6). As part of the assessment the following operations of the Atlas Project were identified as potential dust sources: - Stripping of topsoil; - Dozing activities; - Front-end load (FEL) operations; - Excavation and removal of overburden and ore; -Pits backfill process; Topsoil, overburden and ore transfers; - Overburden, topsoil, ore and HMC stockpiles; -Wind erosion of exposed areas; -Recovering clay fines from solar drying ponds; -Truck loading and unloading; and -Haulage of HMC, ore and overburden.	Ramboll (2022a) provides maximum predicted concentrations at key receptors in Section 6 when two adjoining residences were considered likely to be occupied. These residences will no longer occupied during operations. The maximum predicted 24-hour average PM10 concentration for the day shift scenario in isolation is 5.6 µg/m3 at Receptor 3 (R3) and 11.8 µg/m3 for the double shift scenario in isolation, occurring at Receptor 2 (R2). These values are below the criteria of 50 µg/m3, representing 11% and 24% of the criteria respectively. The maximum predicted 24-hour average PM2.5 concentration for the day shift scenario in isolation is 2.4 µg/m3 at R3 and 4.7 µg/m3 at R2 for the double shift scenario. These values are below the criteria of 25 µg/m3, representing 10% and 19% of the criteria respectively. The maximum predicted annual average PM10 concentration for the day shift scenario in isolation is 0.8 µg/m3 and 1.8 µg/m3 for the double shift scenario in isolation, both occurring at R2. These values are below the criteria of 25 µg/m3, representing 3% and 7% of the criteria respectively. The maximum predicted annual average PM2.5 concentration for the day shift scenario in isolation is 0.3 µg/m3 and 0.7 µg/m3 double shift scenario in isolation at R2. These values are below the criteria of 8 µg/m3, representing 3% and 8% of the criteria respectively.	**Management:** • Dust generation will be minimised using the following controls • Vegetation or ground cover in the area will be retained where appropriate or progressively rehabilitated • Implementation of compaction, grading and watering of the area while pre-works operations occur where appropriate to control lift-off • Water cart will make regular passes along the excavation area. • Stockpiles and open areas will be covered, chemically stabilised and or watered, to prevent uplift from wind erosion if required. • All unloading of material including truck dumping and stockpile maintenance will be subject to regular watering where visible dust is generated. • All haul roads should be well maintained, and an environmentally friendly suppressant applied periodically as required. • Dust generated for haulage on roads outside the tenement will be controlled by reducing speed when passing through sensitive receptors' locations and by ensuring the road is well maintained.

Source of emission or discharge	Volume and frequency	Proposed controls
		Monitoring: • PM10 dust monitoring will be undertaken every 6 days for a 24-hour period in accordance with the AS/NZS 3580.9.6
Waste and leachate		
The processing of the ore is primarily **physical separation and does not require** any toxic chemical additives (a non-toxic flocculent is used). General waste will be stored in appropriate bins and taken offsite for disposal therefore no emissions are expected. Potential contamination from waste and leachate at the Project is limited to leachate from Potential ASS storage or treatment areas	Land features which are considered to be an ASS risk are present within the Project area i.e. wetlands, creeklines and high groundwater table areas (DER, 2015). Acidification will only occur if these soils are exposed to oxygen resulting in sulfuric acid being formed This Potential ASS was predominantly identified in the overburden and the ore and associated product were deemed to be of low risk. A copy of this report has been provided in Appendix 12.11 for reference.	• Potential ASS will be managed as required. Section 5 of the Soil and Mine Waste Management Plan (Mine Earth 2022) • Strategic reburial of Potential ASS will be considered for oversize material within the mine pit areas and will be undertaken in conjunction with soil neutralisation methods where required • Designated Potential ASS storage areas will be progressively installed within the mine pit to ensure that all stormwater is contained • Identified Potential ASS will be deposited at the base of each mining area immediately following the excavation of ore. • Rapid groundwater recovery in the basal section of these areas will result in the development of a reducing environment, thus preventing the oxidation of ASS **Monitoring:** • Regular in-pit soil screening of material will be undertaken, when necessary, based on reconciliation of mine operations with mine scheduling (e.g. visual identification of Potential ASS material) • Tailings sand will be screen tested if it is to be used as growth medium during rehabilitation • Clay fines (slimes) will be screen tested • Routine water monitoring (including pH) will be conducted at numerous locations around site including process water dams, solar drying ponds and within the processing plant • If ASS have been treated, then soil screening will be conducted to test the effectiveness of soil neutralisation • A groundwater monitoring program has commenced in accordance with the GOS (MWES 2023a) approved by both EPA and DWER under the RIWI Act licence approvals.

9. Attachment 6A: Emissions and Discharges

10. Part 10 Siting and Location

The Project is located approximately 18 km southeast of Cervantes (12 km east of Indian Ocean Drive and 21 km west of Brand Highway, in the Wheatbelt region of WA. The land comprising the Mining Lease (M) 70/1305 is mostly remnant vegetation, apart from the northern section which comprises degraded/cleared land.

10.1. Sensitive land uses

The Traditional Owners of the Project area are the Yued people. The Project lies within the Yued Native Title (1997) determination area. Image have engaged Yued representatives to conduct several Aboriginal heritage surveys of the Project area and no Registered or Other Aboriginal Heritage sites have been recorded within, or in proximity to, the Prescribed Premises.

The Prescribed Premises is located on Unallocated Crown Land (UCL) and road reserve.

10.2. Nearby Environmentally sensitive Receptors and Aspects

Two sensitive receptors are identified #2269 Wongonderrah Road and #3121 Munbinea Road, both are within 5 km of the Project (Table 4; Figure 2). All receptors are primarily working farm properties. #2269 Wongonderrah Road has been purchased by Image and the Munbinea Road property Image have a land holder agreement with.

Table 3 Sensitive Receptors

Local Residence	Approximate Nearest Distance to Mine Pit (km)	Approximate Distance to Process Plant (km)
#2269 Wongonderrah Road	1.9	2.6
#3121 Munbinea Road	3.5	4.4

Table 4- Environmental Sensitive Receptors

Type/ Classification	Description	Distance and direction to premise boundary	Proposed controls to prevent or mitigate adverse impacts (if applicable)
Environmentally Sensitive Areas	Nambung National Park	~870m west of the premise boundary is the Nambung National Park	
Threatened Ecological Communities	Banksia Woodlands of the Swan Coastal Plain	Within the prescribed premise boundary	Native vegetation clearing and management will be done in accordance with Ministerial Statement MS1220.
Threatened and/or priority fauna	There are 4 significant fauna species: Common Greenshank (*Tringa nebularia*), Black-striped Snake (*Neelaps calonotos*), Western Brush Wallaby (*Notamacropus Irma*) and Carnaby's Cockatoo (*Zanda latirostris*)	Western Brush Wallaby and Black-Striped Snake were recorded on the southern boundary of the prescribed premise.	Threatened and Priority fauna management will be in accordance with Ministerial Statement MS1220
Threatened and/or priority flora	21 Priority species	21 Priority Species are recorded within the Prescribed Premise boundary	Native vegetation clearing and management will be done in accordance with Ministerial Statement MS1220.
Aboriginal and other heritage sites	Lodged Place #40856	~120m West of northern portion of the Prescribed Premise boundary	Native vegetation clearing and management will be done in accordance with Ministerial Statement MS1220.
	Lodged Place #40987	~330m East of Prescribed Premise Boundary	
	Lodged Place #40594	~170m East of Prescribed Premise Boundary	
	Lodged Place #40985	Within the southern portion of the Prescribed Premise boundary.	
	Lodged Place #40986	Within the southern portion of the Prescribed Premise boundary.	
	Lodged Place#40588	Within the southern portion of the Prescribed Premise boundary.	
Public drinking water source areas	Cervantes Water Reserve	4.5km Northwest from Prescribed Premise boundary	All water abstraction is managed under Groundwater Licences. GWL210384(2), GWL210992(1) and GWL210811(1)
Rivers, lakes, oceans, and other bodies of surface water, etc.	Nambung River Catchment	~600m North-west of the prescribed premise boundary.	Comply with the surface water conditions within the Works Approval W6831/2023/1, Surface Water Management Plan
Acid sulfate soils	Potentially Acid Sulfate soils have been identified in potentially occurring within the mine pit.	The project is located within the Swan Coastal Plain ASS risk area.	Works Approval W6831/2023/1, Acid Sulfate Soils Investigation and Management Plan.

10.3. Environmental Siting Context Details

10.3.1. Topography

10.3.2. Climate

The region has a Mediterranean climate with a mean maximum temperature of 15.1 – 34.6°C in summer and 7.1 – 18.8°C in winter. Noongar climatic information describes six seasons which include long hot dry periods from October to April (Kambarang, Birak & Bunuru) with cooler periods in April-May (Djeran) and August-September (Djilba) on either side of a short wet cold period in June-July (Makuru) (Spectrum, 2022a).

The average annual rainfall at this location (Badgingarra Research Station; ID: 009037) is about 537.6 mm, and variable (274 – 785 mm per annum or about 51 – 146 % of average). Most rainfall occurs from May – August (winter) and September – April is dry (summer) (Bureau of Meteorology; BOM, 2022a). Average annual evaporation is approximately 2,400 mm (~300 mm in winter, and ~950 mm/day in summer) (BoM, 2022b). The Badgingarra Research Station was identified as the closest active weather station with monthly records for both rainfall and temperature, data from 2021 is illustrated in Figure 7 (BoM, 2022a).

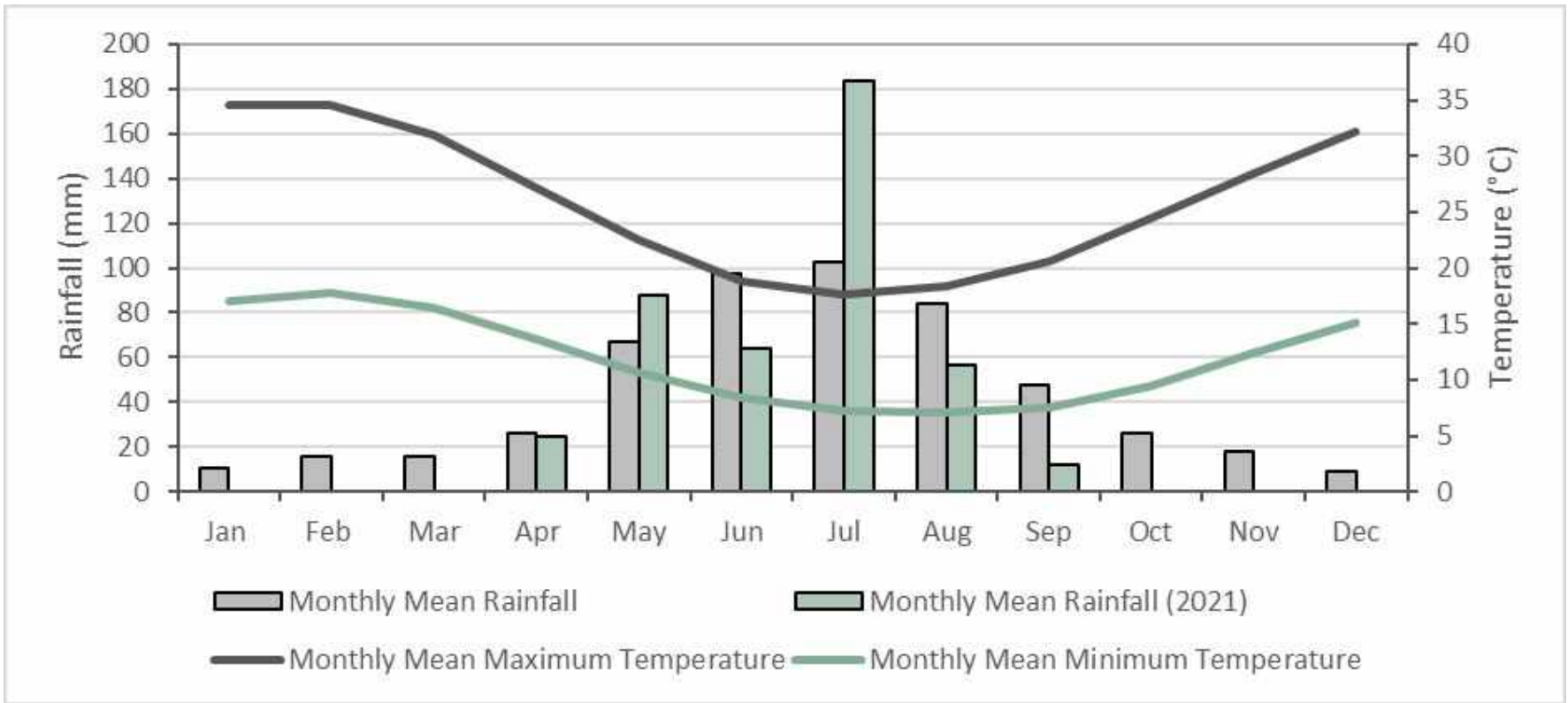

Figure 8- Rainfall and temperature data for Badginarra Research Station (ID 009037)

10.3.3. Geology and Soil Type

The Swan Coastal Plain is the biogeographic coastal plain unit that extends from Dunsborough to just north of Jurien Bay, with its inland margin defined by the Gingin Scarp, Dandaragan Scarp and Darling Scarp (Beard, 1981). The Project lies on the Swan Coastal Plain, near its northernmost extent. The Swan Coastal Plain consists of a series of geomorphological elements which are sub-parallel to the present coastline (McArthur and Bettenay, 1960; Churchward and McArthur, 1980).

Each of these geomorphic elements has distinctive geology, vegetation, topography, and soils. Lowry (1974) mapped two hysiographic units on the coastal plain in the Cervantes region: the westward Coastal Belt that consists of Quaternary dune systems (Quindalup Dune System and Spearwood Dune System) and the eastward Bassendean Dune System.

The DE lies on the Bassendean Dune System (Lowry, 1974). The Bassendean Dune System is composed of leached quartz sand and consists of low dunes with numerous inter-dunal swamps (Lowry, 1974; Beard, 1979). It takes the form of a flat plain ‘behind’ the Coastal Belt, about 60 - 100 m above sea level, sloping gently seaward and drained by small seasonal streams which generally terminate into large swamps or lakes near the coast or, in the case of Nambung River, drains into caves beneath the coastal limestone (Beard, 1979).

The Project site is characterised by four geological layers:

• A thin layer of clean dune sands;

• An underlying discontinuous clayey sand layer with clay and silt fines, in concentrations ranging 10 - 20% in the central region of the AMR and 20 - 25% at the ends of the resource. The concentration of clay and silt fines decreases with depth;

• A third layer of clay and silt fines at the base of the Superficial Aquifer, in concentrations less than 10% (and often less than 5%); and

• The fourth layer, the Mesozoic Yarragadee Formation (sand dominated) and Cattamarra Coal Measures (clay dominated).

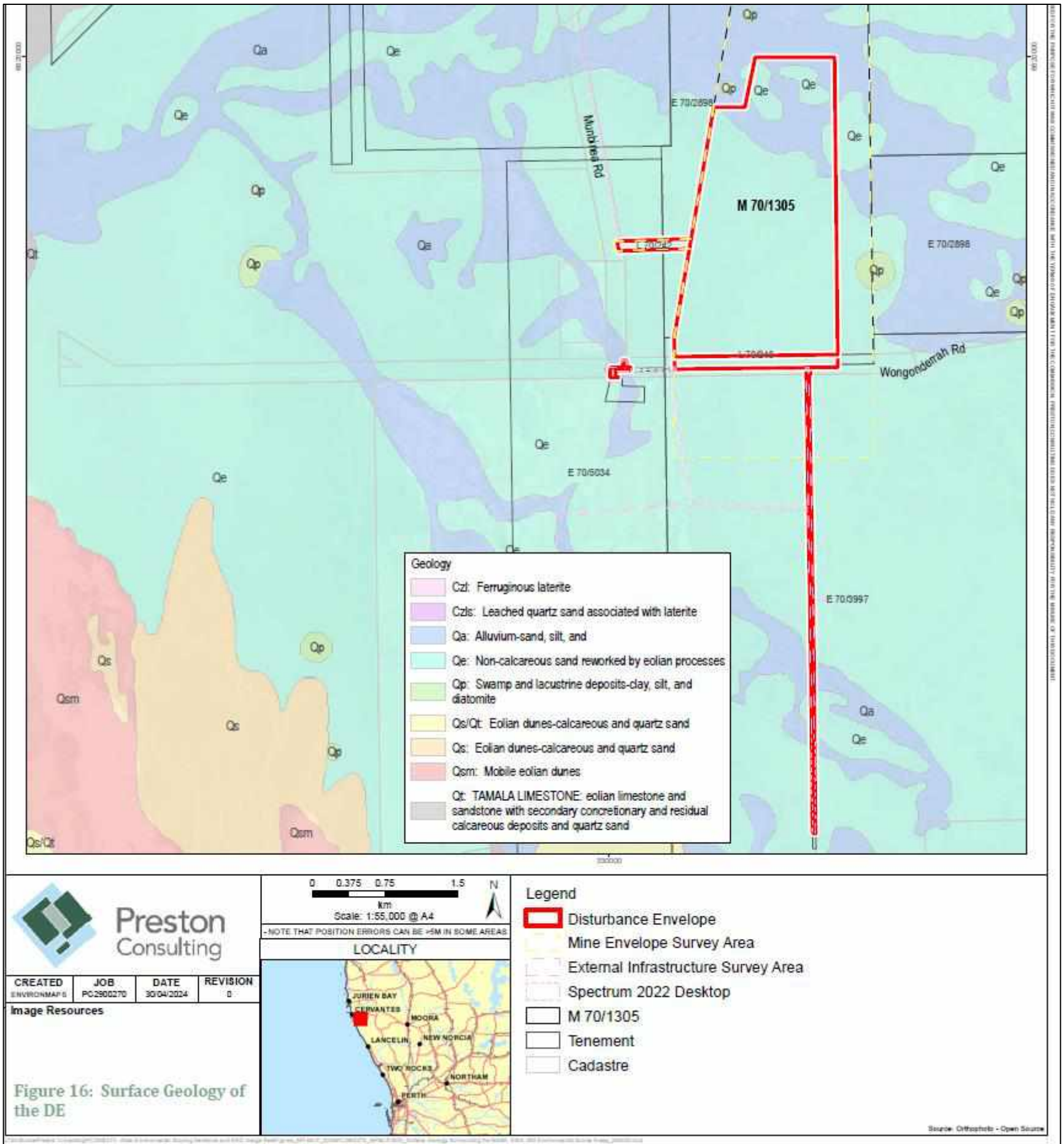

Figure 16: Surface Geology of the DE

Figure 9- Surface Geology of the Atlas Project

10.3.4. Hydrology and Hydrogeology of Premises

The northern section of the Swan Coastal Plain lies west of the Gingin Escarpment and can be divided into two northerly trending physiographic units, the Coastal Foreplain and the Coastal Backplain. The Coastal Foreplain consists of two sand dune systems, the narrow, Holocene, Quindalup Dune System consisting of white, calcareous, fixed and mobile dunes. The sand deposits are referred to as the Safety Bay Sand. The second dune system is the Late Pleistocene Spearwood Dune System comprising thin, aeolian, calcareous sands over a thick calcarenite.

The Project is located in a minor sub-catchment of the Nambung River (the South catchment) which comprises less than 1% of the Nambung River catchment. The catchment is small and relatively flat and there are no substantial natural drainage lines across the DE. Surface water discharge from the sub-catchment occurs rarely in response to extreme and sustained rainfall and comprises an infinitesimal portion of the Nambung River flow. During such events the sub catchment provides a trivial contribution to the Nambung River flow.

11. Attachment 7: Siting and Location

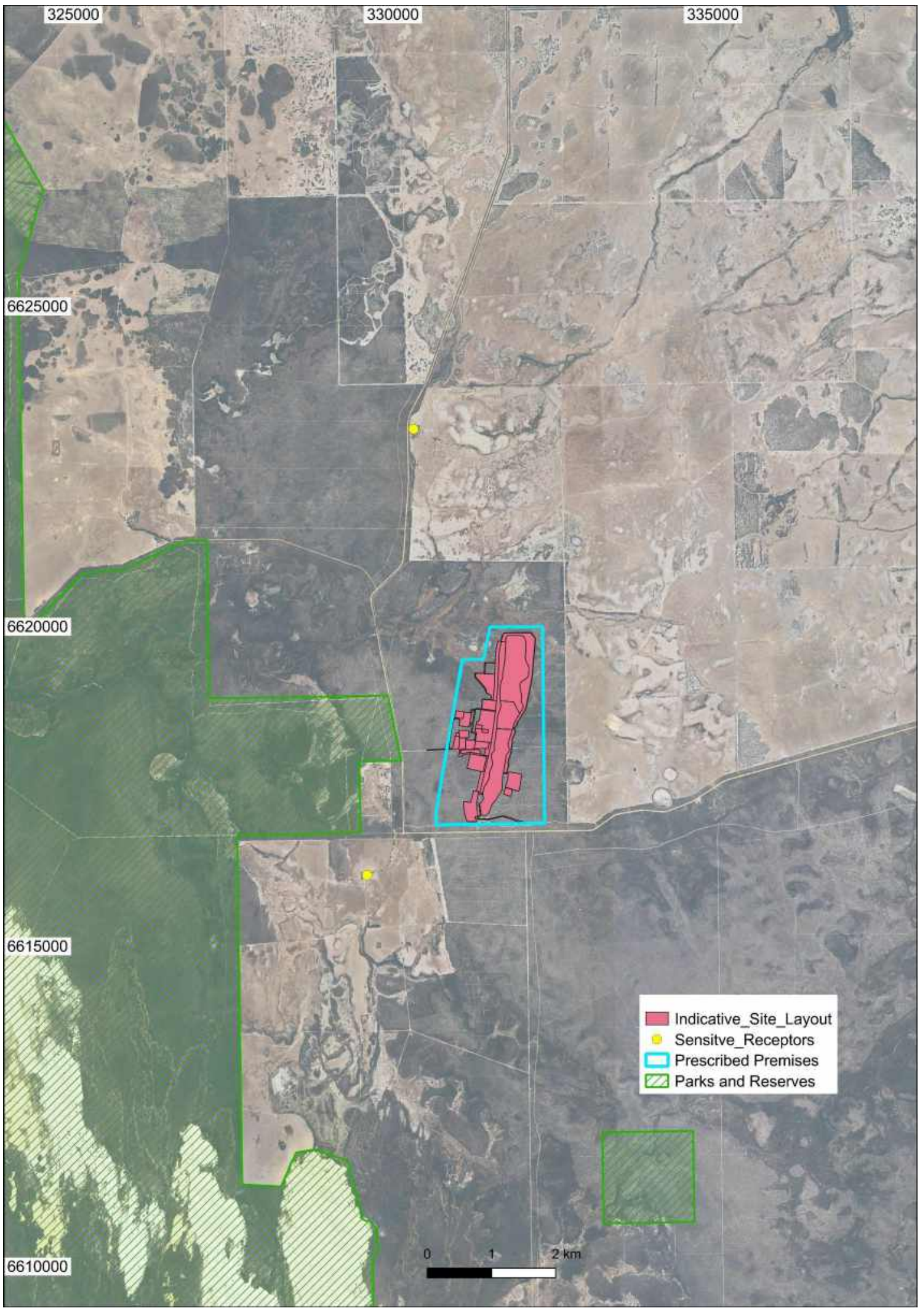

Figure 10- Siting and Location of Sensitive Receptors and Prescribed Premises

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14. Appendices

14.1. Surface Water Management Plan

14.2. Groundwater Operating Strategy

14.3. Environmental Noise Assessment

14.4. Mining Proposal and Mine Closure Plan

14.5. Ministerial Statement

14.6. Works Approvals

14.7. Air Quality Assessment

14.8. Acid Sulphate Soils Management Plan