DEVELOPMENT APPLICATION

AUSTRALIAN VANADIUM PROJECT: PROPOSED VANADIUM PROCESSING FACILITY

LOTS 40 & 41 GERALDTON-MT MAGNET ROAD, TENINDEWA

PREPARED FOR AUSTRALIAN VANADIUM LTD

UPDATED AND CONSOLIDATED DECEMBER 2023

landinsights
PLANNING DESIGN ENVIRONMENT

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executive summary

APPLICANT:	Australian Vanadium Limited C/O Land Insights PO Box 289 Mount Lawley WA 6929 Ph: 9271 8506 Email: admin@landinsights.com.au
OWNER:	Wyalong Pastoral Co Pty Ltd
SITE DETAILS:	Lots 40 and 41 on Deposited Plan 28736 Geraldton-Mt Magnet Road, Tenindewa
LOCAL GOVERNMENT:	City of Greater Geraldton
DATE:	December 2023

This application seeks Development Approval from the WAPC under Part 17 of the Planning and Development Act 2005 for the development of a Vanadium Processing Facility, comprising:

- Processing Plant
- Materials storage and laydown areas
- Internal access roads, including two new site entrances
- Solar power generation facility
- Evaporation ponds.

The estimated cost of development is $450 million, with construction expected to commence within 18-24 months of approval being received.

In summary, the project:

- Is recognised as being of significance by both the Federal and State governments
- Comprises a significant investment into the City of Greater Geraldton that will have significant economic benefit to the city and the broader region
- Will create up to an estimated 400 jobs during construction, and 125 jobs thereafter
- Will be subject to further consideration and approvals from the Department of Water and Environmental Regulation, and the Environmental Protection Authority.

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1.0 introduction

1.1 BACKGROUND AND PURPOSE

This application seeks Development Approval from the WAPC under Part 17 of the Planning and Development Act 2005 for the development of a Vanadium Processing Facility, comprising:

- Processing Plant
- Materials storage and laydown areas
- Internal access roads, including two new site entrances
- Evaporation ponds.

Vanadium concentrate will be processed on the site, with the concentrate being trucked in from the Australian Vanadium Mine near Meekatharra. Once processed, the end products will be trucked to Geraldton and Fremantle for export. The nature of the application is explained further in Chapter 2 of this report.

1.2 ABOUT AVL LIMITED

Australian Vanadium Limited (AVL) is an emerging vanadium producer focused on The Australian Vanadium Project (the Project) in Western Australia. The company has been listed on the ASX since 2007, with the Project as its primary asset. Vanadium is mainly used to strengthen steel, with growing demand from the battery market. Vanadium's use in master alloys for defence and aerospace applications makes it a critical mineral.

An Australian invention, the Vanadium Redox Flow Battery (VRFB) is set to play a vital role in the battery revolution. AVL's strategy is underpinned by the steel market which has increasing demand for vanadium, whilst securing the long-term viability of the Project by delivering products to both the steel and battery markets. AVL's vision is to supply its high-grade product to battery makers worldwide, a market expected to grow significantly on the back of increased renewable energy generation. Through its 100% owned subsidiary, VSUN Energy, AVL is developing the VRFB market in Australia.

AVL and VSUN Energy are both members of the Future Battery Industries Cooperative Research Centre and are engaged with the WA Government Future Battery Industry Strategy and the Federal Government's Critical Minerals Facilitation Office. The project was awarded Major Project Status by the Federal Government in September 2019 and Lead Agency Status by the State Government in 2020.

The AVL vanadium project comprises two proposed facilities:

- Mining Facility - mining and primary processing of the ore to produce vanadium concentrate. Mining operations will occur primarily within tenement M51/878 which is located within the Shire of Meekatharra. Approvals for this facility are being secured, and this element of the project is not part of this current application.
- Processing Facility - processing of the vanadium concentrate to obtain an iron-titanium co-product for exportation to overseas market and vanadium pentoxide which is the final product. The processing facility is subject to this current application.

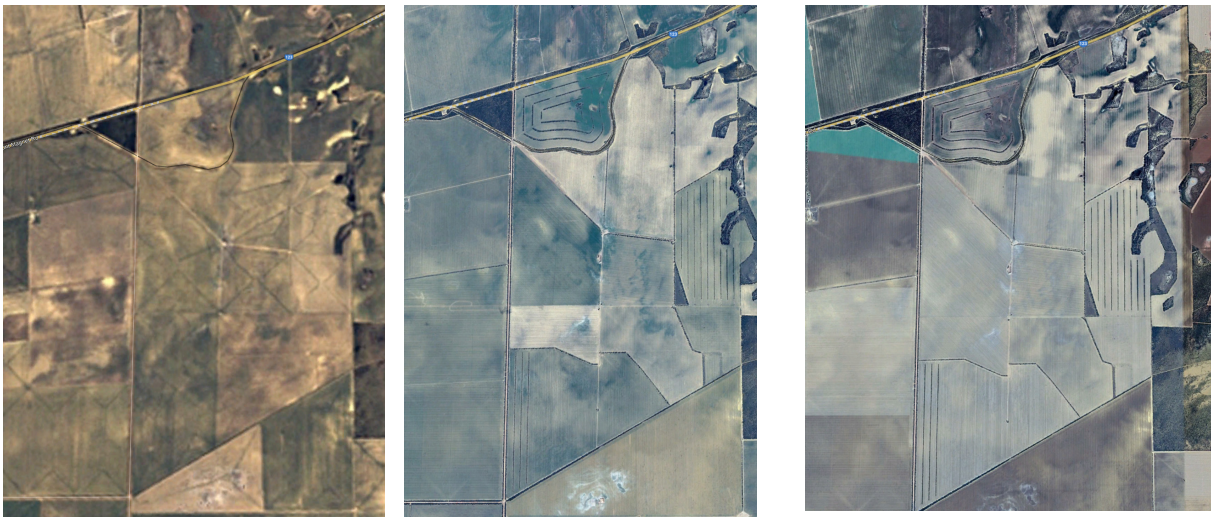
1.3 SITE DESCRIPTION

LOCATION

The proposal is located on Lots 40 and 41 on DP28736 on the Geraldton-Mt Magnet Road, Tenindewa ("the site"). The site is approximately 65km east of Geraldton and approximately 35km south-west of Mullewa and comprises an area of around 1 870 hectares.

HISTORICAL & CURRENT USE

The site has been used for agricultural purposes (namely extensive cropping) for several decades and has been cleared at some period prior to 1985. The use of the site for cropping will cease once construction of the processing plant commences, however it is envisaged that the southern portion of the site (largely across Lot 41) will still be managed for cropping.



1985 2013 2018

Source: Google Earth

SURROUNDING USE

The site is largely surrounded by cleared agricultural land used for cropping. Reserve 41885, known as Indarra Spring Nature Reserve, abuts the eastern boundary of Lot 41. The Management Order for this reserve sits with the Conservation Commission of WA. The purpose of this reserve is Conservation of Flora and Fauna. Reserve R24185 is located west of Lot 40, adjacent to Erangy Springs Road & Geraldton-Mt Magnet Road, also with the purpose of Conservation of Flora and Fauna.

TENURE

Tenure details are included in Table 1.1 – Title Details and a copy of the certificate of titles is attached (Appendix A).

Table 1.1 – Title Details

Lot Number	Volume	Folio	Plan/ Diagram	Registered Proprietor
40 & 41	2216	19	DP28736	Wyalong Pastoral Co Pty Ltd

A site context and site plan are shown on Figures 1.1-1.3.

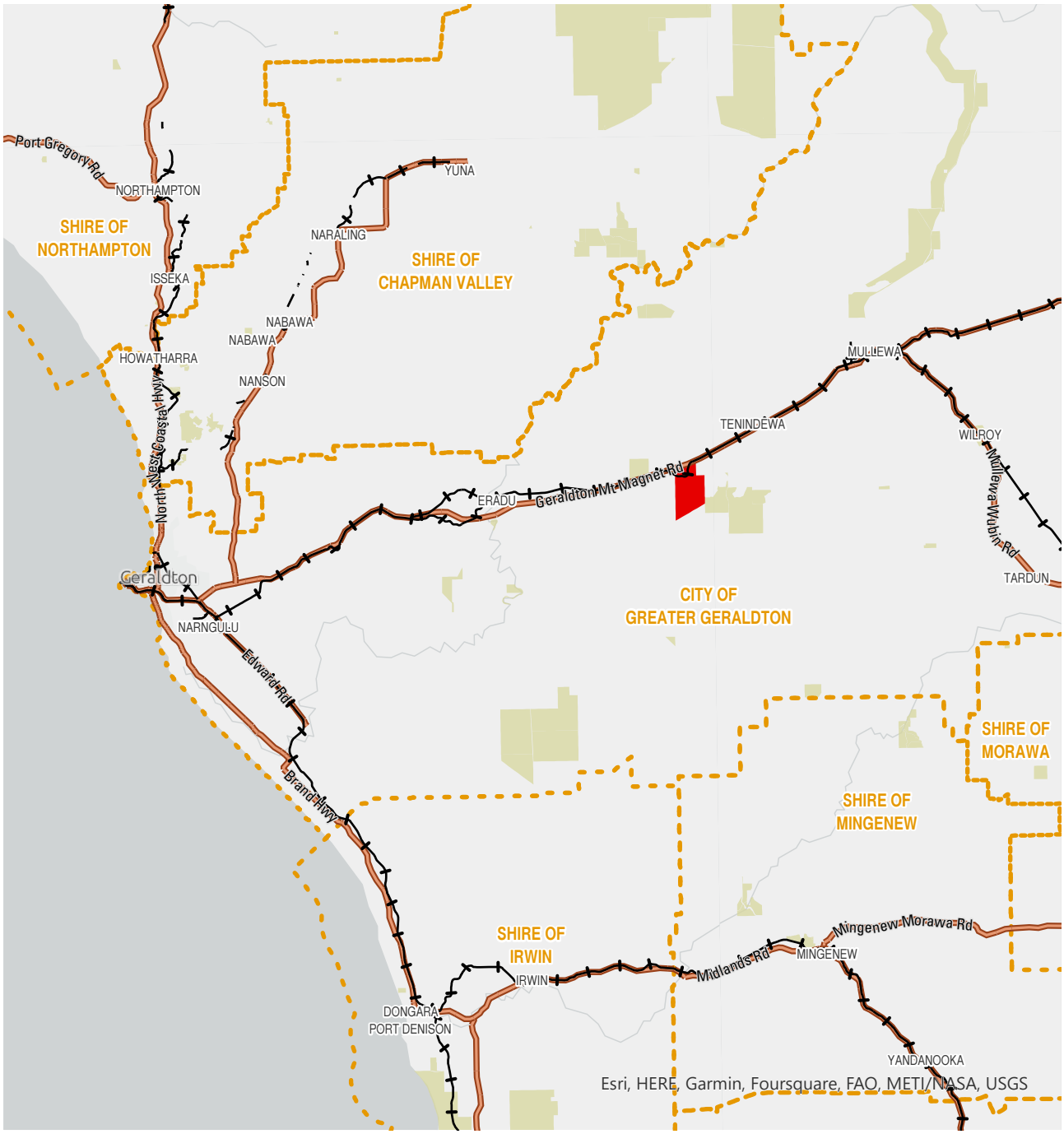
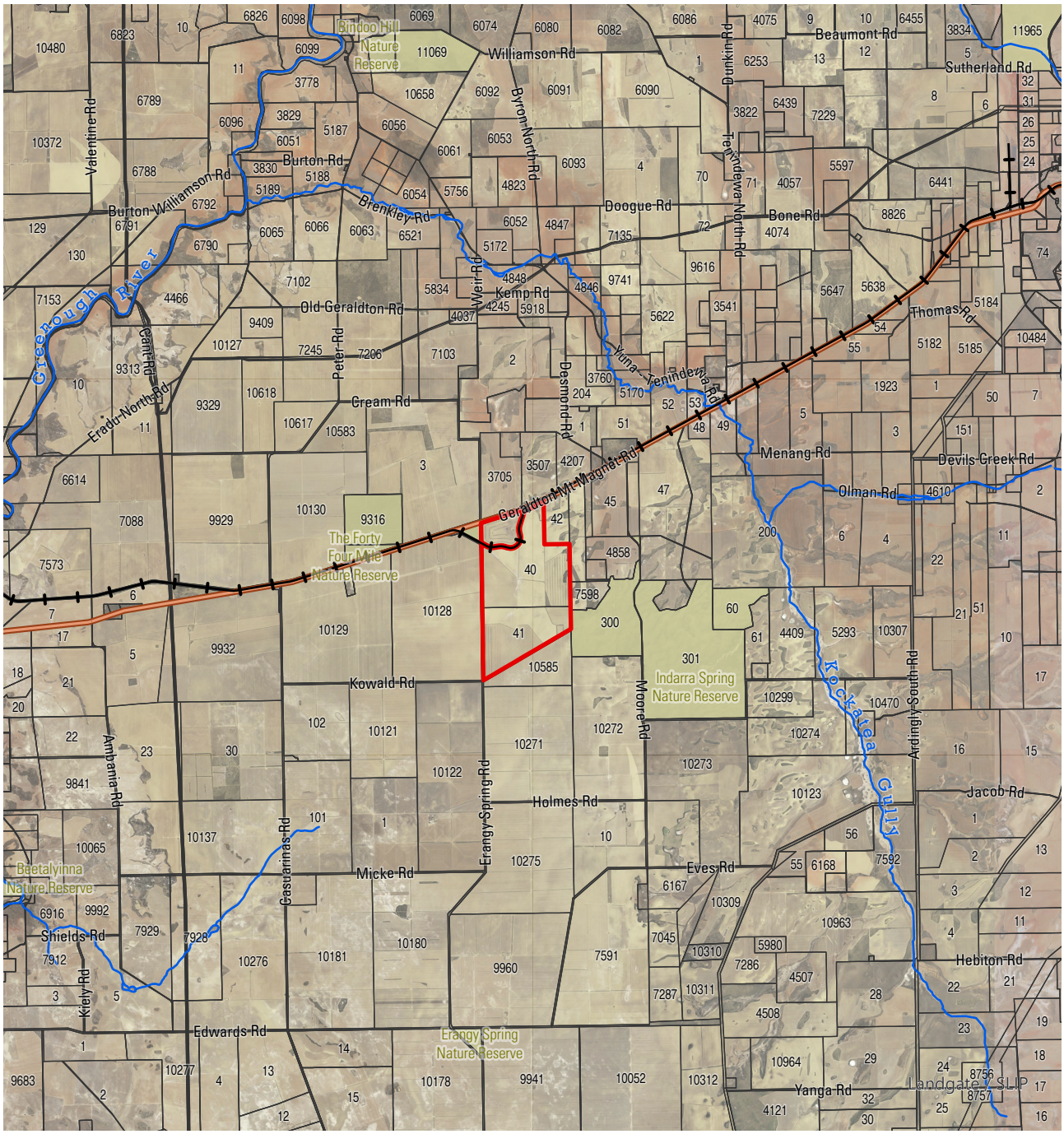


Figure 1.1 - Site Location



Cadastre

Site Location

State Road

Rail Line

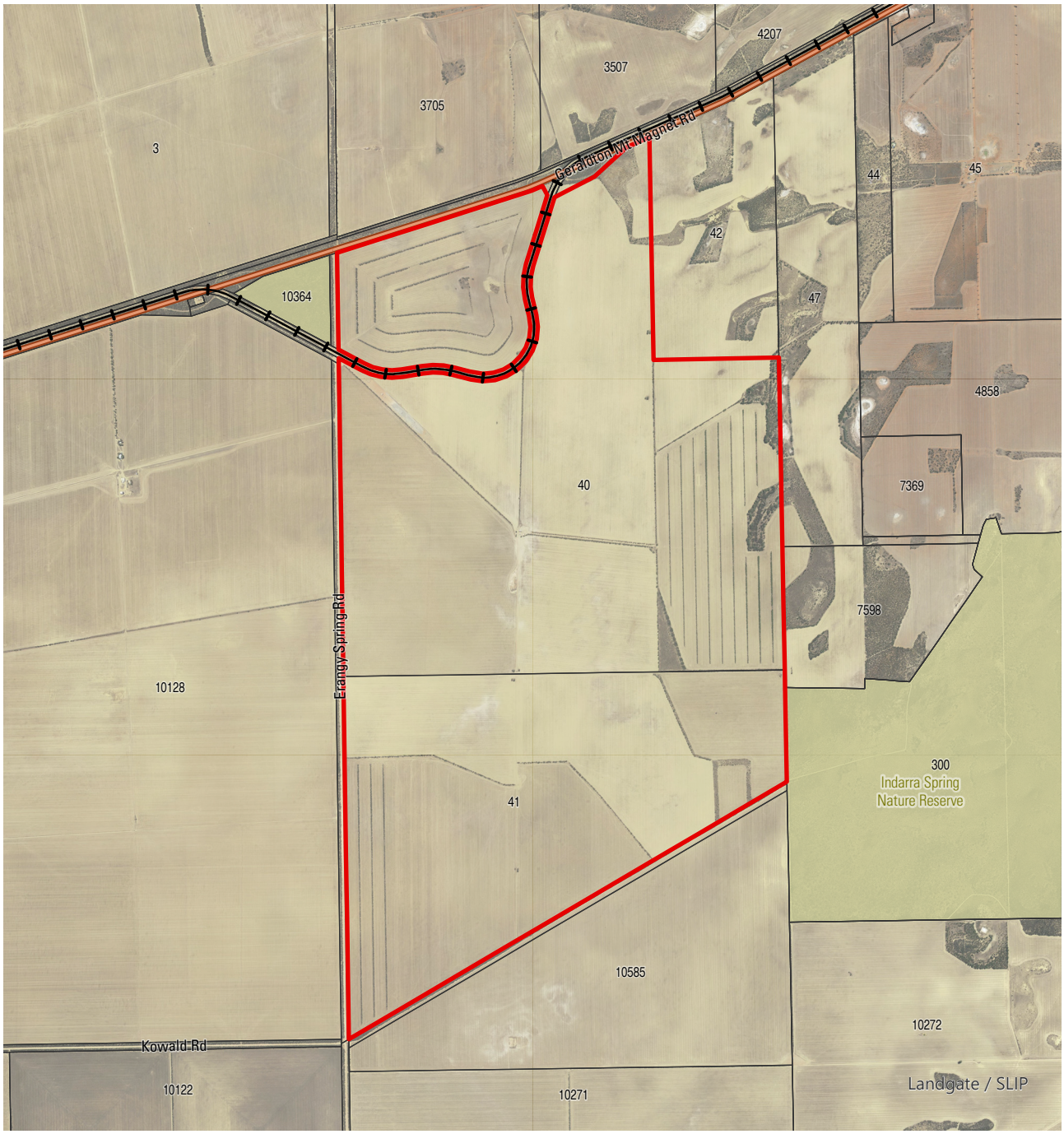
DBCA - Legislated Lands and Waters

Scale: 1:250,000

N

0 5 10 km

Figure 1.2 - Site Context



Cadastre

Site Location

State Road

Rail Line

DBCA - Legislated Lands and Waters

N

Scale: 1:50,000

0 1 2 km

Figure 1.3 - Site Aerial

1.4 THE NEED FOR THE DEVELOPMENT

The AVL project has been planned over several years. As stated in Section 1.2 the project comprises two parts, namely the mining and concentrating component, and the processing plant component. The location of the mining component is fixed in Meekatharra, however consideration has been given to the most appropriate location to develop the processing facility component. Options considered included:

- Co-location at the Meekatharra site
- Location close to the Geraldton Port in an existing industrial area
- Location at a mid-way point.

In considering access to suitable land, services and transport, coupled with costing factors, it has been determined that a location between the mining operation and the Geraldton Port is most suited for the processing facility. A big part of this consideration was access to the Dampier-Bunbury gas pipeline, the potential to accept alternative concentrate and slag feedstocks and the maximisation of future solar and wind power generation. Once this was determined, AVL spent considerable resources over the next 12 months identifying a suitable site that has good road (and potential good future rail) access to the Geraldton Port and which is appropriately serviced. This is discussed further in Section 2.2.

1.5 MAJOR PROJECT STATUS

The project was awarded Major Project Status in 2019, recognising the project's national strategic significance due to:

- Economic growth of the Australian vanadium market for steel and battery markets
- Economic growth for the Mid-West region through direct and indirect jobs including opportunities for regional and national suppliers
- Significant new job creation for the Mid-West region of Australia
- Vanadium being on the critical minerals list for Australia and the US
- The project was also granted WA Lead Agency Status by the Western Australian Government in April 2020.

1.6 OTHER APPROVALS

In order to facilitate the development on the site several other applications for approval are being sought in addition to this current Development Application, as outlined in Table 1.2 – Other approvals that have, or are, being sought:

Table 1.2 – Other approvals that have, or are, being sought

Approval being sought	Matters to be addressed
Formal referral under Part IV of Environmental Protection Act 1986	Water abstraction from deep groundwater aquifer Power generation, including greenhouse gas emissions Air emissions Flora and fauna
Works Approval under Part V of the Environmental Protection Act 1986	Construction of processing facility and power plant. Construction of hazardous materials storage areas
Licence under Part V of the Environmental Protection Act 1986	Operation of processing facility
Groundwater licence under the Rights in Water and Irrigation Act 1914	Groundwater abstraction and use.
Amendment of the City of Greater Geraldton Local Planning Scheme No. 1	Permissibility of the Industry land use on the site.

Where relevant, applications for these other approvals have been, or will be, lodged with the relevant authorities shortly.

STATUS OF OTHER APPROVALS

REFERRAL UNDER PART IV OF ENVIRONMENTAL PROTECTION ACT 1986

The processing plant was referred (April 2022) under s.38 of the Environmental Protection Act 1986 (EP Act) to the Environmental Protection Authority (EPA). To support the referral, AVL prepared an environmental referral report (with supporting technical documents) addressing relevant EPA factors.

The proposal was advertised for public comment from May to June 2022. No submissions were received and in July 2022 the EPA determined that there would be no formal assessment required under Part IV of the EP Act. They advised that all necessary construction and operating approvals can be managed via Department of Water and Environmental Regulation (DWER) Works Approval, Clearing Permits and Licensing processes.

AMENDMENT OF THE CITY OF GREATER GERALDTON LOCAL PLANNING SCHEME NO. 1

The City of Greater Geraldton resolved to initiate an amendment to their Local Planning Scheme No.1 in April 2023. The amendment was forwarded to the WAPC, who provided comments in August 2023 on the form and content of the amendment. The amendment documentation has been updated and will be advertised for comment shortly. The amendment, once finalised, will rezone a portion of the site for *General Industry.*

GROUNDWATER LICENCE UNDER THE RIGHTS IN WATER AND IRRIGATION ACT 1914

A groundwater licence for the abstraction of water has been issued by the Department of Water and Environmental Regulation.

1.7 STAKEHOLDER ENGAGEMENT

KEY STAKEHOLDERS

The project is of State Significance and there are several stakeholders that AVL are liaising with to progress both its mining and processing components. Key stakeholders engaged to date are identified in Table 1.3 – Key stakeholders below.

Table 1.3 – Key stakeholders

Stakeholder Group	Stakeholder	Area of Interest
Federal Government	Northern Australian Infrastructure Fund	• Potential source of finance

Stakeholder Group	Stakeholder	Area of Interest
State Government	Department of Biodiversity, Conservation and Attractions (DBCA)	• Administers the Biodiversity Conservation Act 2016 • Flora, fauna and ecological communities conservation
	Department of Mines, Industry Regulation and Safety (DMIRS)	• Lead Agency for the Proposal • Administers the Mining Act, Mining Rehabilitation Fund Act 2012 and associated regulations • Mining Proposals, Mine Closure Plan, Programs of Work • Tenement conditions • Closure and rehabilitation • Safety
	Department of Planning, Lands and Heritage (DPLH)	• Assessment of the Development Application • Progression of the Scheme Amendment • Aboriginal heritage • Crown land administration • Heritage, cultural and archaeological sites
	Environmental Protection Authority Services	• Environmental impact assessment support to the EPA
	Department of Water and Environmental Regulation (DWER)	• Administers the EP Act Part V • Regulates water use • Groundwater quality and quantity
	Department of Jobs, Tourism, Science and Innovation (JTSI)	• Support to Lead Agency for the Proposal • Job creation
	Main Roads WA (MRWA)	• Use of public highways and main roads • Heavy vehicle movements
Local Government	Shire of Greater Geraldton	• Road use • Advice on Development Application and Local Planning Framework • Advice on progressing a Local Scheme Amendment

ONGOING CONSULTATION

There has been a significant amount of engagement with landowners, key government stakeholders and the broader community over the past 18 months.

The following stakeholder engagement has been

undertaken regarding this proposal:

- Meetings and discussion with all nearby landowners
- Preliminary and ongoing engagement with the EPA
- Ongoing briefing and engagement with DWER
- Early-stage discussions occurred with the City of Greater Geraldton throughout 2019 and 2020, and moving into 2021
- Early-stage briefings have been held with local, state and federal government parties in the Geraldton region
- Early-stage briefings have been held with local agencies such as the Mid-West Development Commission and the Mid-West Chamber of Commerce and Industry
- Ongoing discussions with MEEDAC (Midwest Employment and Economic Development Aboriginal Corporation) and the National Indigenous Australians Agency
- Australian Industry Participation, Department of Industry, Science, Energy & Resources
- Mid-West Ports Authority, Perth and Geraldton
- Mid West Development Commission
- Adjoining Landowners
- Member for Geraldton (Hon Lara Dalton)
- Member for Agricultural Region (Hon Sandra Carr).

SPECIFIC PRE-LODGEMENT CONSULTATION

To provide context relevant to this Development Application several meetings and discussions have been held, as detailed in Table 1.4 – Pre-lodgement Consultation.

Table 1.4 – Pre-lodgement Consultation

Date	Stakeholder	Comment
November 2021	DPLH/WAPC	*Intent to Lodge* meeting to discuss the project, determine whether it meets the requirements of a 'significant proposal' and to discuss timelines.
November/ December 2021	City of Greater Geraldton	Preliminary discussions regarding the proposed Development Application. Further discussions regarding a future potential amendment to the City's Local Planning Scheme and what form that will take.
November/ December 2021	DWER/EPA Service Unit	Discussion regarding AVL's intent to lodge a formal referral under s38 of the *Environmental Protection Act 1986*. Discussions regarding the form and nature of the referral.
November/ December 2021	Main Roads WA (Perth and Geraldton)	Discussions regarding the requirements for a Traffic Impact Statement.
May 2022	EPA	s38 Referral.
2022	DPLH and City of Greater Geraldton	Progressing Scheme Amendment.
2022	DWER	Groundwater Abstraction Licensing.
2023	Natural Gas Provider	Ongoing discussion regarding provision of gas services to the site.

DEVELOPMENT ASSESSMENT FORUM

The DPLH facilitated a Development Assessment Forum (DAF) on in February 2022 with the purpose of allowing for introductory discussions and to identify any key issues with the proposal, and providing an opportunity for the Applicant to provide an overview of the project and allows the relevant government agencies to ask questions and to provide high level comments on the project. The intent of the DAF is to work collaboratively to solve the competing challenges of the project.

A range of matters were discussed with the DAF and all technical matters have been considered further in the intervening period.

2.0 The proposal

2.1 OVERVIEW

The proposal comprises the processing component of the Australian Vanadium Project operation.

In summary, the proposal includes:

- Processing Plant
- Materials storage and laydown areas
- Internal access roads, including two new site entrances
- Evaporation ponds
- Power generation (solar)
- Temporary workers accommodation.

An overview of the proposed plant layout is below. Full plans are at Appendix B.

2.2 JUSTIFICATION

The Proposal aligns with Australian and Western Australian government strategies to increase development of the critical and battery minerals sector, including downstream processing within Australia. Vanadium demand is strong and is forecast to increase. The Proposal targets an extensive high-grade vanadium deposit in a region with a long mining history, and has broad support from federal, state, and local government. The Proposal has been optimised to reduce environmental impacts and enhance regional residential employment opportunities and economic sustainability of the project.

The Proposal is timely and led by a team experienced in vanadium mining and processing projects. Successful delivery of the Proposal will provide regional employment opportunities during construction and operations and provide vanadium in a supply-constrained market.

2.3 ALTERNATIVES CONSIDERED

During the early planning processes for the Proposal, the initial base case design included a downstream processing plant located at the mine site in Meekatharra. As project feasibility and design processes proceeded, it became apparent that relocating the processing facility closer to Geraldton resulted in several benefits to the project overall. These benefits included:

- Reduced water demand at mine site, where good quality water resources are scarce
- Relocation of the power and gas-intensive downstream processing plant close to an existing gas pipeline, eliminating the need for a new gas pipeline to the mine site, resulting in reduced land disturbance
- Increased ability to utilise renewable energy at mine site due to the energy requirements being largely electrical
- Reduced construction requirements at the more remote mine site, resulting in decreased road transport for construction, leading to reduced safety risks and greenhouse gas emissions from construction transport
- Relocating part of the workforce from a mine site to a location near a major regional town, leading to reduced fly-in fly-out workforce and increased regional residential employment opportunities
- Proximity to the Dampier-Bunbury Natural Gas Pipeline to enable efficient connection of the proposed power generation facility to natural gas
- Efficient Road Access to a major road network within close proximity to the Geraldton Port
- Reduced operating costs leading to increased economic sustainability of operations
- Significantly reduce transport costs associated with a number of reagents and consumables required for the Processing facility
- Relocation of iron-titanium (FeTi) co-product production closer to an export port, increasing economic feasibility of selling the FeTi co-product rather than stockpiling it as a 'waste' at the mine site, leading to increased waste minimisation.
- Providing opportunities for the Processing facility to receive alternative concentrates from other vanadium mines in Western Australia and receive suitable waste slags from other parts of Australia and/or South East Asia.

2.4 COMPONENTS OF THE PROJECT

There are three main components of the project, explained below. Plans and elevations are provided at Appendix B. The processing plant has been designed for an operational lifespan of at least 25 years.

PROCESSING PLANT

The processing plant is designed to consistently generate above 12,000 tonnes of V2O5 flake (98.5% w/w) per annum. The vanadium concentrate arriving at the processing site will either be directly tipped into the concentrate feed bins or into the concentrate stockpile which will be a designed facility for temporary storage until it is fed to the processing plant via a front-end loader and hopper arrangement. Handling of the vanadium concentrate will occur in the concentrate handling area and downstream processing will involve the following processes:

- Pelletising
- Roasting
- Leaching (generation of the washed co-product iron-titanium)
- Desilication
- Precipitation
- Barren solution treatment
- Vanadium pentoxide production (generation of final end product – vanadium pentoxide solid flakes).

Raw material inputs during processing includes soda ash, organic binder, vanadium concentrate, reagents such as ammonium sulphate, sulphuric acid and caustic soda, and raw water to produce the washed co-product iron-titanium and end product vanadium pentoxide flake. All reagents will be stored in one of three hydrocarbon and chemical storage areas. The processing of the vanadium concentrate will generate liquid and solid waste which will be stored in contained engineered facilities.

Additional equipment such as a reverse osmosis system, potable water system, fire suppression system, cooling water system and a gland seal water system are also expected to be required.

HEAVY VEHICLE ACCESS AND MATERIALS STORAGE

A new access from Geraldton-Mt Magnet Road will be constructed for the sole use of haulage heavy vehicles. These vehicles will transport vanadium concentrate from the mine site near Meekatharra and side tip into feed hoppers at the Processing plant. There will be a minimum storage area on the site to allow for delays in transport and for a consistent feed into the plant.

The trucks will enter the site from the Geraldton-Mt Magent Road, travel internally via a new haulage road to the processing plant, where they will side tip into two feed hoppers. Once empty, the trucks will be loaded with the washed co-product iron titanium, before exiting and turning left back onto the Geraldton-Mt Magnet Road.

A separate main entrance to the site will be constructed off Erangy Spring Road. Haul trucks will not use this entrance, however it will be used by other heavy vehicles (maximum double road trains) to and from Geraldton, along with light vehicles.

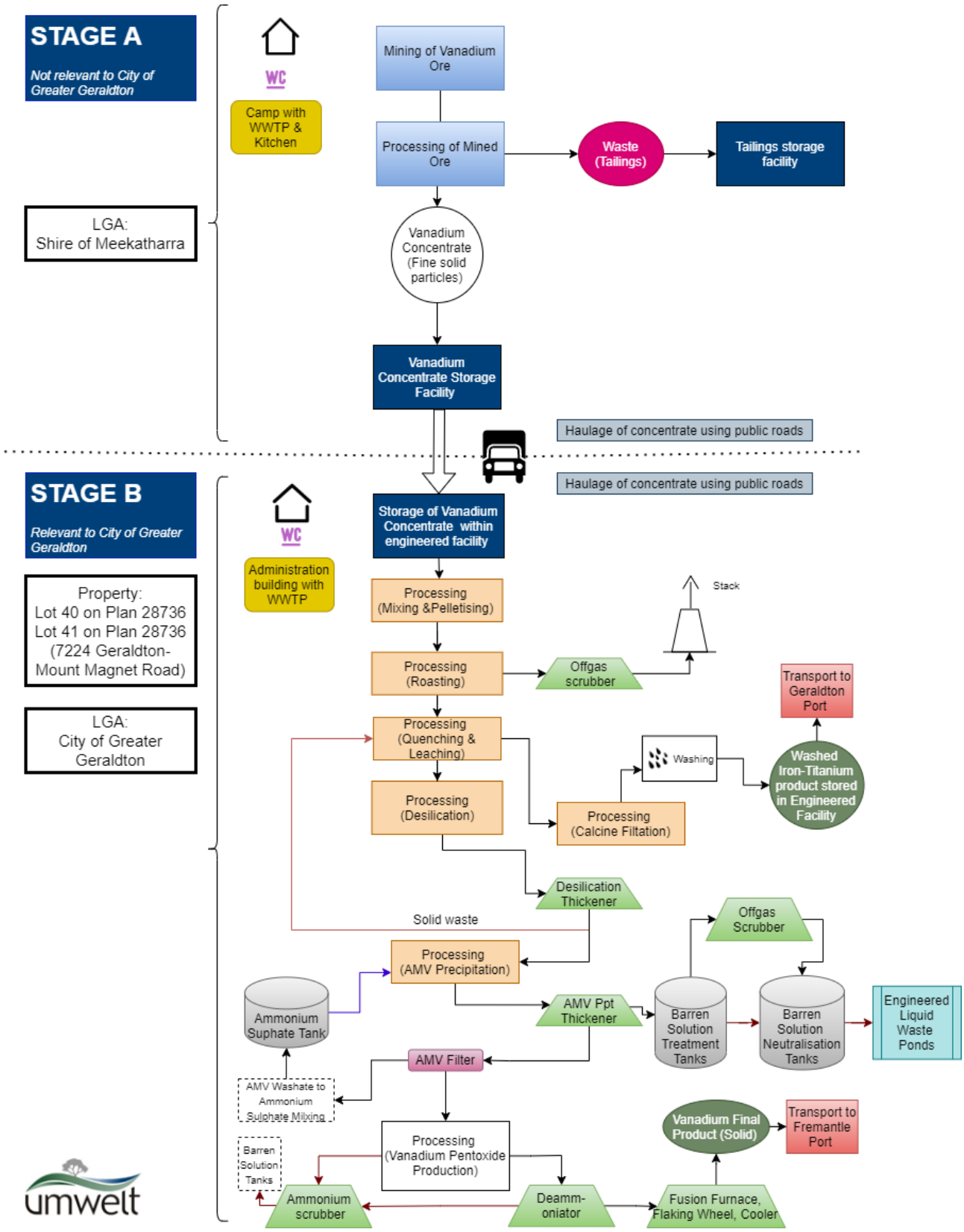
EVAPORATION PONDS

A series of lined evaporation ponds will be constructed to the east and south-east of the processing plant. These ponds will contain treated processing solution from the plant, with the water evaporated away over time. The residual solids and salts will be contained in the lined ponds. Regular environmental monitoring will be undertaken as part of the operational environmental licence to confirm the integrity of the ponds and minimise the risk of leaks or spills.

The figure below provides a summarised representation of the processes involved.

SOLAR POWER GENERATION

A 15-20MW solar power generation facility will be established on the site to complement the use of gas. AVL are initially targeting 35% renewable energy power generation for the project. As stated earlier, this may increase over time if a Vanadium Redox battery is constructed on the property (subject to a future application).



Source: Umwelt

2.5 CONSTRUCTION

Construction will commence once all approvals have been secured, and any pre-construction conditions cleared by relevant agencies. It is anticipated that the site construction will take up to 24 months, including testing, commissioning and ramp up.

During the construction phase, it is estimated that 400 people will be directly employed on the project at its peak, however provision has been made for a workforce of up to 600 people should the need arise (for instance, to recover lost construction time due to unforseen delays). Some temporary development on site will be required during the construction phase of the project. This includes the development of a construction compound, likely comprising:

- 24x12 metre main office
- Several 12x3 metre toilet blocks
- Several 12x6 metre crib rooms
- First Aid office
- 12x6 metre office kitchen
- Meeting rooms
- 2-3 water tanks, approximately 5000L
- Visitor car park
- Construction/Worker car park
- Undercover area with tables for rest breaks

The construction workforce will be housed locally in either Mullewa, Geraldton or surrounding areas. AVL aims to source and house the construction and operational workforce in the local region as much as possible. However, due to the large number of specialist workers required in the peak of construction, this may not be feasible. The approach for accommodating the construction workforce will be reviewed as part of project early works. Any construction camp built on site will accommodate the minimum number of workers possible.

TEMPORARY WORKERS ACCOMMODATION

A temporary workers camp will be located on the site, away from the construction and development areas. It will be built to accommodate a maximum of 400 workers and require management and staff to operate. It will be removed and the area remediated upon completion of construction and commissioning and handover to operations. Total time on site will be in the order of 24 months.

The village and construction camp will be designed in accordance with the latest editions of the relevant Australian Standards, Building Code Australia (BCA), local and state government regulations as well as relevant project developed specifications and design criteria. The design and supply of buildings includes:

- 4-person ensuite air-conditioned accommodation units
- Kitchen complete with cooking equipment, benches, cooler, freezer and cold storage
- Dining Room complete with tables and chairs and serving area with air-conditioning
- Male and Female ablutions
- Camp administration office with first aid room
- Camp security offices
- Hazardous chemical container
- Maintenance Shed
- Wet and dry recreation complex
- Internet café
- Laundry rooms
- Sewage treatment plant
- Sports courts, swimming pool and gymnasium with equipment

2.6 OPERATIONS

Once operational, the processing facility itself will be largely autonomous. Employees will be required for ongoing maintenance and site management, transportation, administration and support. The project will employ approximately 125 people during operations. In addition, there will be people accessing the site including:

- An average of 22 drivers per day delivering vanadium concentrate
- An average of 7 drivers per day delivering reagents, consumables and other goods

A Traffic Impact Statement has been prepared for the project, which found that access arrangements are generally suitable for the development proposed. A copy of the report is at Appendix C.

2.7 INFRASTRUCTURE REQUIREMENTS

POWER

There is no distributed power service provided to the site. It is therefore proposed to construct a stand-alone power plant to service the site. The proposed power plant will be a hybrid gas and renewable power plant, with installed power capacity of 11.5MW. Provision is being made for the future installation of Vanadium Redox Flow Batteries, however this is not proposed in the initial stage of the project. At a starting level of 35% renewable energy, the annual average gas power contribution will be the equivalent of 65% of the installed 11.5MW.

The size, nature and output of the power plant is being refined by AVL. Details of the power plant emissions and controls will be provided to DWER as part of the Works Approval application, which is required prior to commencing construction.

AVL are in ongoing discussion with the natural gas provider, who has committed to the provision of a supply to the site. The provider is responsible for connecting the site to the gas pipeline, and it currently finalising a connection alignment.

WATER

It is proposed to abstract groundwater for use within the facility. The water will be taken from a deep aquifer (over 200m below ground level) and initial studies have concluded that the abstraction will not impact on any superficial aquifer that may be used elsewhere in the locality.

Water from the deep aquifer is brackish and will be treated via reverse osmosis prior to use.

ACCESS

There will be two access points to the site – one for haulage Heavy Vehicles (HHVs) and one for services Heavy Vehicles (maximum Double Road Train) and Light Vehicles (LVs). Two access points are proposed for the following reasons:

- HHVs deliver product to two distinct locations at the processing plant
- Separation of LVs and 60 m haulage HVs for safety.

A Traffic Impact Statement has been prepared for the project, which found that access arrangements are generally suitable for the development proposed. A copy of the report is at Appendix C.

3.0 SDAU/COVID recovery provision

ECONOMIC CONTRIBUTION

The project was awarded Major Project Status in 2019, which recognised the project's national strategic significance due to:

1. Economic growth of the Australian vanadium market for steel and redox battery markets
2. Economic growth for the Mid-West region through direct and indirect jobs including opportunities for regional and national suppliers
3. Significant new job creation for the Mid-West region of Australia
4. Vanadium being on the critical minerals list for Australia and the US.

Progression from Major Project Status to recognition of the strategic importance of the project by the awarding of the MMI grant by the Federal Government

The project was also granted WA Lead Agency Status by the Western Australian Government in April 2020. This enables fast-tracking of relevant DMIRS related approvals.

The project will provide a significant economic boost to the local and regional economy of the Geraldton-Mid West region. The capital expenditure of the processing plant component of the project is $450m. During construction there will be 400 direct construction jobs (over a 2-year period), and 125 permanent employees once operational.

ONGOING BENEFIT

Total royalties paid to the Western Australian government are estimated to be approximately $304 million (for vanadium and FeTi co-products). The total revenue over the minimum 25-year life of the project is estimated to be $9 billion. AVL's has a strong commitment to local industry and services participation. AVL is registered with the Australian Industry Participation Authority (part of the WA Department of Industry, Science and Resources) with an approved plan in place.

CONSTRUCTION READINESS

The project is expected to have funding in place by the end of Q3/Q4 2024, with a commencement time-line for construction to start early 2025 (subject to all relevant approvals). Environmental approvals will be required prior to commencing construction, which may extend beyond the target commencement date. As such, a minimum timeframe of 24 months for the substantial commencement of development is sought.

3.1 SIGNIFICANCE OF PROJECT

Section 275(6) of the Planning and Development Act 2005 outlines matters the WAPC should have regard to when considering and determining significant development applications. These are considered in Table 3.1 - Significance of project below.

Table 3.1 - Significance of project

Clause		Comment
a)	the purpose and intent of any planning scheme that has effect in the locality to which the development application relates	The site is zoned *Rural* in the City of Greater Geraldton Local Planning Scheme No. 1 (LPS1). Following discussion with the City of Greater Geraldton, the proposed use is *Industry*, which is not permitted under the LPS1. The City of Greater Geraldton has initiated an amendment to Local Planning Scheme No.1 to rezone a portion of the site to *General Industry* in order to facilitate the project. The amendment is progressing concurrently with this Development Application. We are seeking the WAPC's discretion in considering the application within this context.
b)	the need to ensure the orderly and proper planning, and the preservation of amenity, of that locality	As stated above, the City of Greater Geraldton has initiated an amendment to Local Planning Scheme No.1 to rezone a portion of the site to *General Industry* in order to facilitate the project. The amendment is progressing concurrently with this Development Application. It should also be noted that there has been significant consultation with adjoining landowners in the locality.
c)	the need to facilitate development in response to the economic effects of the COVID-19 pandemic	As stated above the project has Commonwealth Major Project Status and WA Lead Agency Status. The processing facility represents a $450 million investment into the region, with significant local job creation opportunity.
d)	any relevant State planning policies and any other relevant policies of the Commission	The project has been reviewed against State Planning Policies and other relevant policies. No significant planning policy constraints were identified. This is discussed further in Chapter 4 of this report.

4.0 Planning framework

4.1 STATE FRAMEWORK

STATE PLANNING STRATEGY 2050

The State Planning Strategy 2050 (SPS) provides a "credible State strategic context and basis for the integration and coordination of land-use planning and development across state, regional and local jurisdictions". It achieves this by identifying five key issues of strategic importance to the ongoing growth of Western Australia, namely:

- Economic Development
- Physical Infrastructure
- Social Infrastructure
- Environment
- Security.

Within this context, the Resources Economy is seen as critically important, with the SRS objective in this regard being

> **To maintain and grow Western Australia as the destination of choice for responsible exploration and development of resources**

The SRS identifies several approaches to realise the objective. Those of relevance to this current application are addressed in Table 4.1 - State Planning Strategy - Approach to the resource economy below.

Table 4.1 - State Planning Strategy - Approach to the resource economy

SRS Approach	Relevance to project
Project Facilitation Effective, transparent, timely and efficient administrative and regulatory systems	The project has received **WA Lead Agency Status** with DMIRS assisting in the facilitation of all major approvals pathways. This current SDAU application will assist with the facilitation of the project.
Strategic industrial lands Project-ready industrial land to meet the demands of the resources sector	The City of Greater Geraldton Local Planning Strategy has identified a need for additional industrial land outside of the current Narngulu Industrial Area. This project is proposed within an area that could be considered for future industrial development, with this project as a catalyst for further investigation. The site is well serviced and is in close proximity to Geraldton. This matter will be progressed further with the City of Greater Geraldton during 2022.
Downstream processing Strong downstream processing industries, particularly in the low volume, high value, high technology Critical Minerals sector	The project proposes downstream processing to produce a high purity Vanadium (99% V2O5) product, a high-value critical mineral product for export which can also be used to boost VRFB production in Australia.
Exploration and resource development New discoveries of world-class resources continue to be made and developed in Western Australia	The Australian Vanadium Project is one of the most advanced vanadium projects currently being developed in the world.

MID WEST REGIONAL PLANNING AND INFRASTRUCTURE FRAMEWORK

Building on the State Planning Strategy 2050, the Mid West Regional Planning and Infrastructure Framework (the Framework) adopts the following objective:

In order to contribute to a whole-of-government approach to strong and healthy regional communities, the Framework objectives are to:

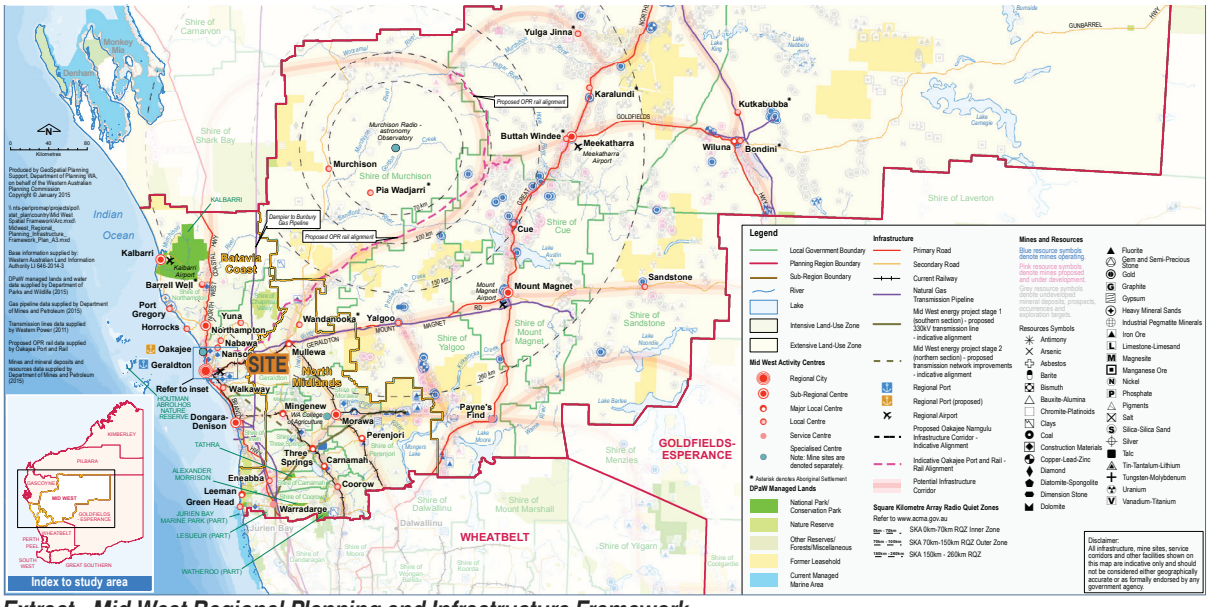
- provide the regional context for land-use planning in the Mid West;
- provide an overview of major regional issues facing the Mid West including economic, social, cultural and environmental matters;
- identify the priority actions required to enable comprehensive regional and sub-regional planning; and
- indicate regional infrastructure projects that are considered significant from the region's perspective to facilitate further economic and population growth in the Mid West.

The framework recognises that mining is the Mid West Region's most valuable sector and that there is a need for additional industrial land to support the industry. At the time the document was published, Oakajee Port and Industrial Estate were identified as the preferred site to accommodate value-adding downstream processing of local minerals, however the timing on this combined port and industrial land development is now unknown, but likely to be beyond the construction timeframe of this project.

The framework also identified the need for other localities in the region to have sufficient industrial land to support the mining and agriculture industries. The framework also identified several economic and regional infrastructure development strategies, focusing on a whole-of-government approach to support the infrastructure requirements of, and encourage the diversification of, the Mid West regional economy.

The processing facility proposed as part of this application is consistent with the objectives and guidance within the framework by virtue of:

- the introduction of a significant minerals downsteam processing facility within the region
- diversification of the regional economy by introducing a new industry
- consolidating the importance of the Geraldton Port for minerals export
- providing significant employment opportunities within the region, both during construction and operational phases.



Extract - Mid West Regional Planning and Infrastructure Framework

WESTERN AUSTRALIA'S MINERAL AND PETROLEUM RESOURCES DEVELOPMENT STRATEGY

The strategy was released in September 2021 and recognises that the resources sector dominated the State's export earnings and "provides substantial direct and indirect employment, supports downstream and service industries, and delivers essential revenue to both the State and Commonwealth governments".

The strategy identifies 6 Strategic Priorities, including Strategic Priority 3: An industry that is efficiently and effectively regulated.

In meeting this strategic priority, a key Government action is "Amendment of Planning Legislation to cut red tape for significant development proposals". This action specifically references the temporary Development Application pathway of the State Development Assessment Unit, and its role in being able to consider and support minerals-based projects of State or Regional Significance.

The current project is clearly of significance, given its Major Project Status and Lead Agency Status, and therefore should be supported within the SDAU approvals pathway.

STATE PLANNING POLICY

Table 4.2 - State Planning Policy Response addresses State Planning Policies relevant to the project.

Table 4.2 - State Planning Policy Response

State Planning Policy	Response
SPP1 – State Planning Framework	The State Planning Framework was prepared by the WAPC in 2017. It sets out the key principles relating to environment, community, economy, infrastructure, regional development and governance to guide the way in which future planning decisions are made. More specifically, the Framework identifies relevant policies and strategies used by the Commission in making decisions. The various planning policies and strategies identified in this section are recognised under SPP1.
SPP 2.0 – Environment and Natural Resources Policy	State Planning Policy 2.0 was prepared by the WAPC in 2003. It aims to integrate environment and natural resource management with broader land use planning and to protect, conserve and enhance the natural environment. Mineral production is referenced within Policy Measure 5.7 which states that "*mineral resources, petroleum resources and basic raw materials are important natural resource assets and are a vital part of the economy".* This principle is recognised in the regional planning strategies referenced earlier in this chapter. The economic consideration of the project is considerable in terms of benefit to the State, along with employment opportunity. The project is being referred to the Environmental Protection Authority, and will also be subject to a future Works Approval and Licence. The remaining principles of the SPP2.0 will be addressed via these processes.

State Planning Policy	Response
SPP 2.5 – Rural Planning	The intent of SPP2.5 is to "protect and preserve Western Australia's rural land assets due to the importance of their economic, natural resource, food production, environmental and landscape values". Clause 5.5 of the policy seeks to promote economic development opportunities, with the WAPC to balance the need for economic opportunity with the protection of the State's primary production and natural resource assets. In regards to this proposal, the economic opportunity of the project is significant. As will be outlined in the subsequent chapter of this report, the site is located on marginal cropping land, and the removal of a portion of the site for the proposed vanadium processing facility will not impact surrounding agricultural land uses. The policy also requires that land use conflict is avoided. In this instance it is not considered that there will be any land use conflict. Surrounding agricultural landowners have been consulted about the project and have not objected to it proceeding. The technical nature of the project and its potential for land use conflict will also be considered in more detail as part of the environmental approvals process.
SPP 2.9 – Water Resources (inc draft)	The objectives of this policy are to: 1. protect, conserve and enhance water resources that are identified as having significant economic, social, cultural and/or environmental values; 2. assist in ensuring the availability of suitable water resources to maintain essential requirements for human and all other biological life with attention to maintaining or improving the quality and quantity of water resources; and 3. promote and assist in the management and sustainable use of water resources. A draft revision of SPP2.9 was released in August 2021 and contains an updated set of policy provisions. The intent of the policies is to ensure that planning/development considers water resource management at the appropriate time. In this instance, there are limited surface water and groundwater resources available on the site. It is proposed to use groundwater for the project, with it being drawn from the deep, brackish aquifer. The majority of the other groundwater users in the vicinity use the shallower superficial aquifer, and thus should not be impacted by the project in any way. All water used in the processing of vanadium will be managed and retained on site. Management of water will be subject to further review as part of the environmental approvals process.
SPP3.7 – Planning in Bushfire Prone Areas	State Planning Policy 3.7 – Planning in Bushfire Prone Areas was prepared by the WAPC in 2015. It provides the foundation for land use planning to address bushfire risk management in Western Australia and to inform and guide decision-makers, referral agencies and landowners to help achieve acceptable bushfire protection outcomes. It applies to development in designated bushfire prone areas. The latest DPLH mapping identifies *Bushfire Prone Areas* in some areas of the site, namely on and adjoining areas of remnant vegetation. A Bush Fire Management Plan (and Bush Fire Attack Level assessment) has been prepared for the site in accordance with SPP 3.7 and is attached at Appendix D.

State Planning Policy	Response
SPP4.1 – State Industrial Interface (inc draft)	The SPP recognises the need for appropriate buffers to industry, infrastructure and other land uses – both to provide for the safety and amenity of surrounding land, but also to protect those industrial/infrastructure uses from the encroachment of other, incompatible land uses. The SPP recognises there is a nexus between planning and environmental policy and that the EPA (DWER) has a central role to play in the consideration of buffer areas. In this instance, the environmental review has indicated that the separation distances for the project are acceptable. This will be considered further as part of the environmental approvals process.
SPP 5.4 – Road and Rail Noise	SPP 5.4 applies to the preparation and assessment of planning instruments, including region and local planning schemes; planning strategies, structure plans; subdivision and development proposals in Western Australia, where there is proposed: a) noise-sensitive land-use within the policy's trigger distance of a transport corridor as specified in Table 1; b) new or major upgrades of roads as specified in Table 1 and maps (Schedule 1, 2 and 3); or c) new railways or major upgrades of railways as specified in maps (Schedule 1, 2 and 3); or any other works that increase capacity for rail vehicle storage or movement and will result in an increased level of noise. In the case of this application, the project is not considered a 'noise sensitive land use'. It also does not involve new or major road/rail upgrades. As such, the provisions of SPP5.4 do not apply.

GERALDTON REGION PLAN

The Geraldton Region Plan was adopted in 1999 and remains a current plan, albeit to some extent superseded by the documents discussed above. Of relevance to this project, it is stated that

> *It is suggested that the area's natural resources could support a range of heavy industries at some time in the future. This view is supported by the paper, A Heavy Industry Policy (Dover Consultants, 1994) which identifies Geraldton as one of five industrial "gateways" for the State.*

This project could potentially provide the catalyst for the establishment of an industrial hub. Any such proposal would however be subject to an amendment to the City's Local Planning Strategy and future scheme amendments. Further discussions with the city will be taking place in 2022 regarding this.

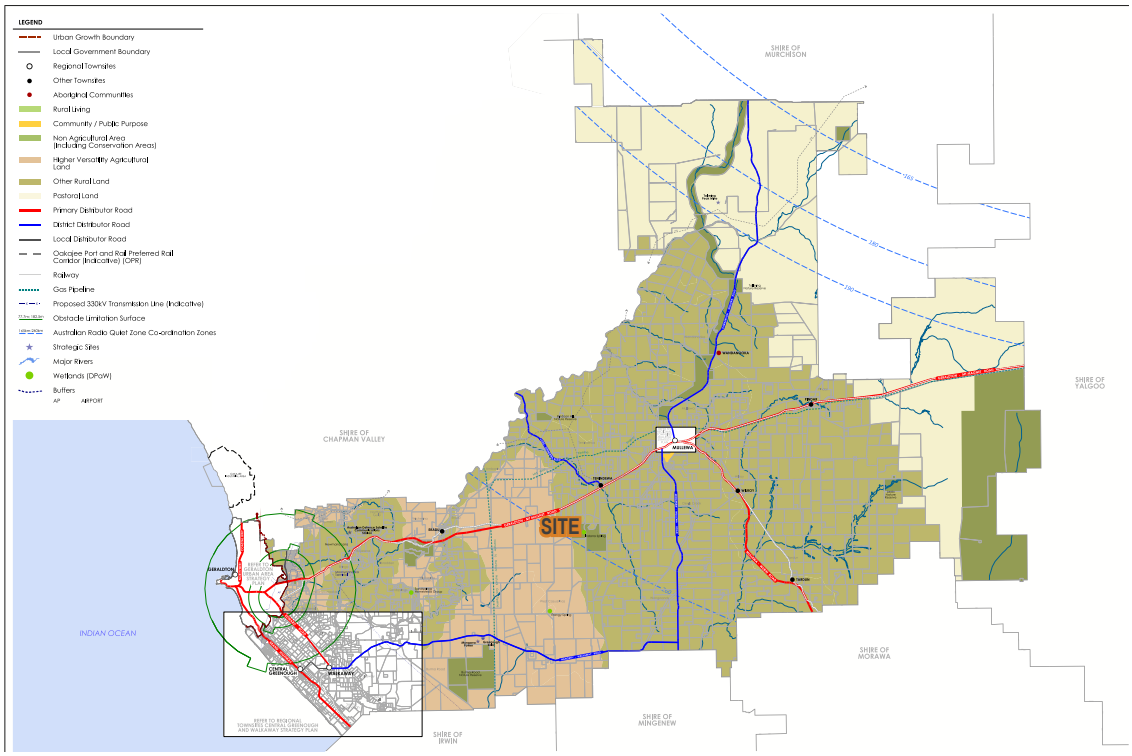
4.2 LOCAL FRAMEWORK

CITY OF GREATER GERALDTON LOCAL PLANNING STRATEGY

The Local Planning Strategy was endorsed by the WAPC in 2015. It brought together the previous strategies of Geraldton, Mullewa and Greenough. The Strategy identifies the site largely as 'other rural land' (ie, not Higher Versatility Agricultural Land, which is the other rural classification in the LPS). The Local Planning Strategy identified a presumption against expansion of gazetted townsites, including Tenindewa, other than Mullewa to ensure that appropriate services and facilities can be provided.

The Local Planning Strategy also identifies a range of Development Investigation Areas. DIA9 (Eradu) was identified in the LPS to consider industrial development opportunities for land near the convergence of the Geraldton-Mt Magnet Road, the Mullewa-Geraldton rail line and the Dampier-Bunbury Natural Gas Pipeline. To date there has been no interest in progressing the Eradu DIA, and, following preliminary discussions with the City of Greater Geraldton, there could be some opportunity to consider amending the Local Planning Strategy to relocate the DIA to Tenindewa, using the proposed processing facility as the catalyst for further consideration of surrounding land uses. Any such change to the Local Planning Strategy would need to have the support of Council and would need to follow normal procedures.

Extract: City of Greater Geraldton Local Planning Strategy



CITY OF GREATER GERALDTON LOCAL PLANNING SCHEME NO. 1

The site is zoned Rural in the City of Greater Geraldton Local Planning Scheme No. 1 (LPS1). The proposed processing facility is defined as Industry, which is not permitted under the LPS1 within the Rural zone. We will be seeking the WAPC's discretion in considering the application within this context.

As discussed earlier, a concurrent process is underway to initiate an amendment to the City's LPS1 to ensure that Industry is a permissible use on the site. At the time of writing, the City had initiated an amendment to rezone a portion of the site General Industry. It is anticipated that the amendment will be advertised for comment in the coming month.

INDUSTRIAL DEVELOPMENT LOCAL PLANNING POLICY

The City adopted the Industrial Development Local Planning Policy in December 2015. The policy largely deals with amenity issues associated with industrial developments, including:

- Built form
- Landscaping
- Car parking
- Retaining
- Relaxation of scheme provisions
- Site upgrading
- Factory units
- Emissions
- Strata subdivision.

The proposal is isolated and located on a large property, approximately 1km from the Geraldton-Mt Magnet Road. Where relevant, the key issues have been addressed by the proposal or in the accompanying Environmental Review report.

5.0 Site conditions

5.1 BACKGROUND

Information within this section has been sourced from the ***Preliminary Environmental Impact Assessment for Tenindewa Processing Facility Briefing Note*** prepared by Umwelt, supplemented by publicly available information and site-specific investigation.

Please refer to Appendix E for a complete copy of the Briefing Note.

5.2 LANDSCAPE AND VISUAL AMENITY

Lot 40 sits at approximately 250m AHD, while lot 41 sits higher in the landscape at around 290m AHD. The Indarra Spring Nature Reserve to the east generally sits lower in the landscape at around 190m AHD (refer to Figure 5.1). The land immediately adjacent to the highway rises, which along with the railway cutting and existing vegetation, creates a visual screen. The layout of the proposed processing plant has been carefully designed, and agreed with the landowner, with the intent of minimising visual impact. As a result of this, it is deliberately located in the lowest portion of the site.

An analysis of viewshed has been undertaken to determine visibility of the proposal from the adjoining Geraldton-Mt Magnet Road, using a representation of existing vegetation along the road, existing topography data and an accurate 3d model of the processing facility as it will be located on the site. Camera locations for the visual assessment were positioned as shown on Figure 5.1 over.

POTENTIAL IMPACTS

Taking into account the existing vegetation along the road reserve, the 1km setback of the proposed facility and the limited public viewing locations, it is not considered that the proposed structures would have any meaningful impact upon the visual amenity of the adjoining rural areas, however it is acknowledged that the plant will not be completely screened.

MITIGATION MEASURES

Vegetation along the road corridor will be retained to ensure the visual screen is maintained. Vegetation screening is proposed along Erangy Springs Road, with another band internally (as depicted on the plans).

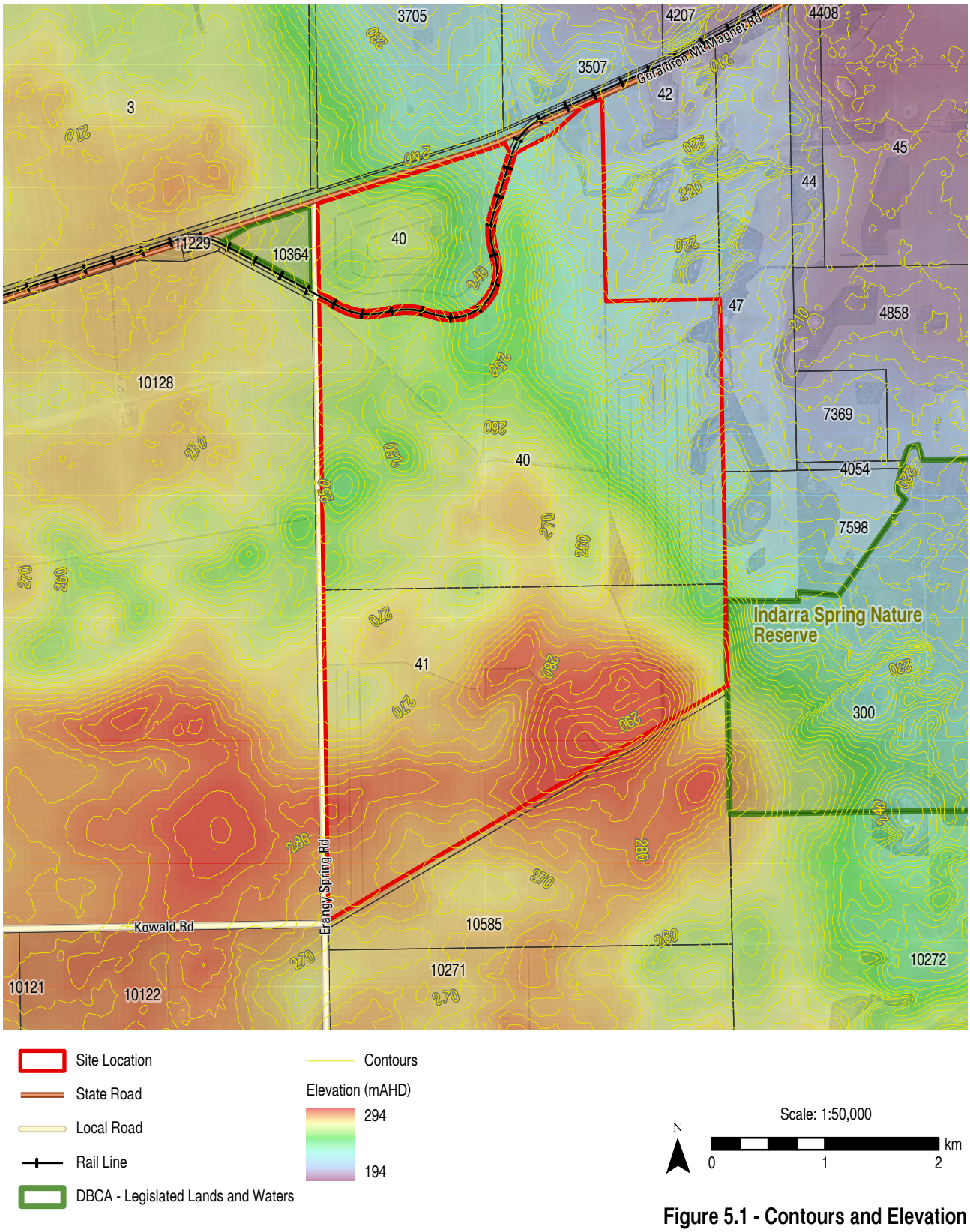


Figure 5.1 - Contours and Elevation

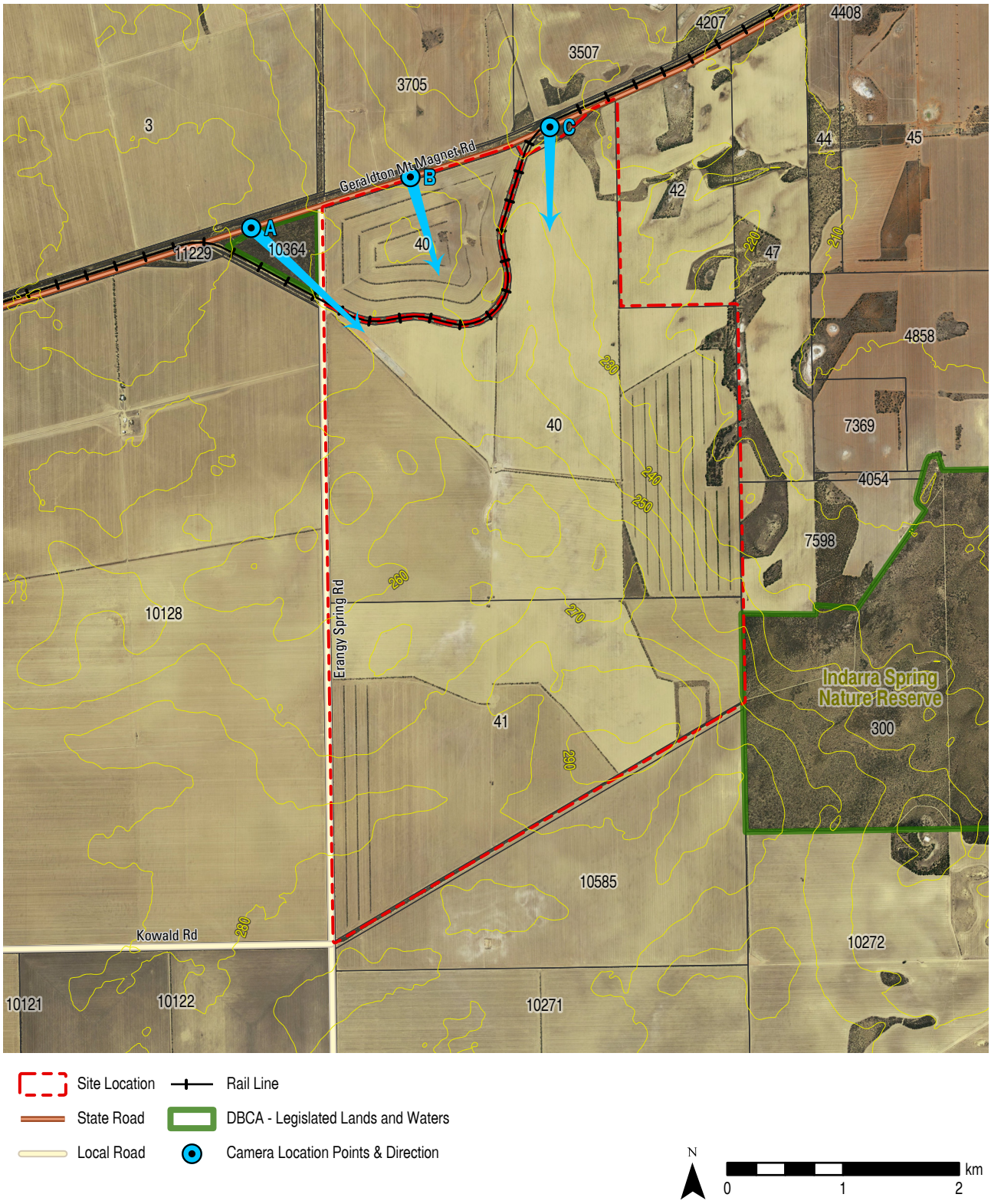
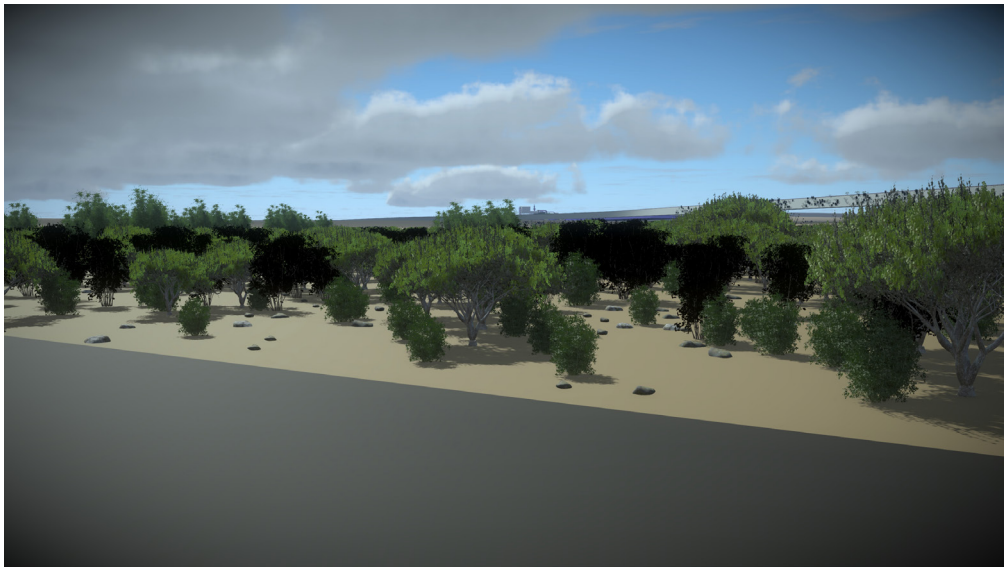
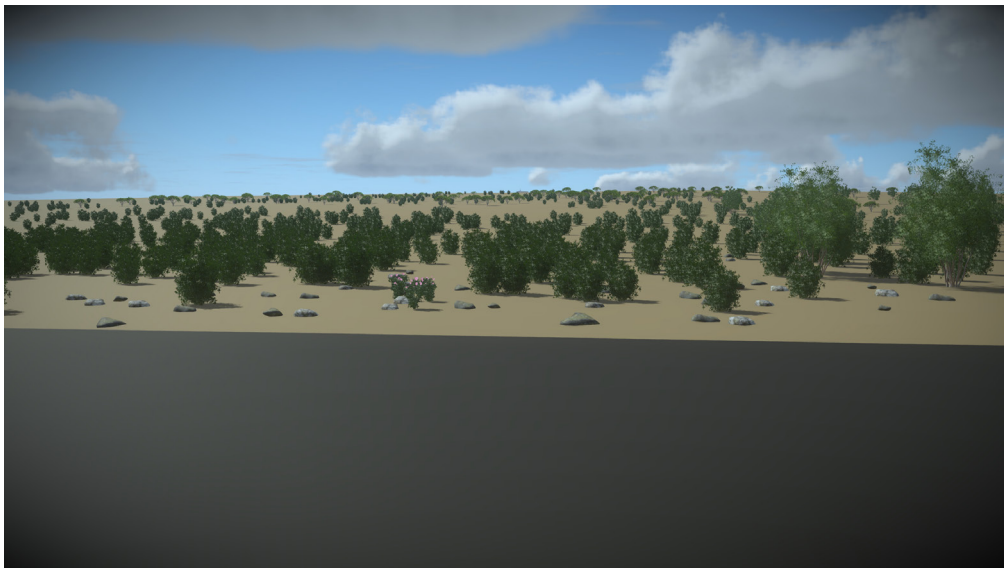


Figure 5.2 - View Analysis Camera Location



Point A



Point B

Point C

5.3 SOILS

The site is located within two Soil-Landscape systems as outlined below:

- Eradu System: Level to gently undulating sandplain. Drainage lines absent with a few soaks. Permian and Mesozoic sediments mainly formed insitu. Yellow deep sand and sandy earth.
- Binnu East System: Gently undulating sandplain with numerous dune ridges. Alluvial valley slopes and sandplain remnants underlain by Permian sediments. Yellow deep sand and sandplain soils.

The extent of each soil-landscape system is shown on Figure 5.3.

While the site has been used for cropping for some time, its capability for agriculture is marginal. The site lies in a transitional zone between high quality deep soils to the west (Eradu System), and alluvial saline soils to the east (Binnu East System). This is reflected in the B1 land capability of the site (only 50-70% of the site with a moderate to high capability for dryland cropping, as opposed to >70% generally west of Erangy Springs Road). It is our contention that the removal of this site from broadscale cropping will not result in the removal of prime agricultural land.

SOIL QUALITIES

The exposed soils Eradu and Binnu-East Soil Landscape systems have a high risk of wind erosion. Appropriate measures to avoid wind erosion will be required following crop removal and during construction.

There is a very low risk of water erosion and waterlogging.

POTENTIAL IMPACTS

Construction and operational activities may potentially impact the soil quality within the project area and at the end of the operations, the use of the soil for agricultural purposes may not be viable.

Exposed soils during the construction phase of the project may be at risk of erosion, particularly during windy periods.

Impacts to terrestrial environmental quality from project implementation may comprise the following:

- Oil leaks during construction activities leading to soil contamination.
- Failure of waste containment infrastructure leading to discharge of hazardous waste to the environment and soil contamination
- Poor weed management hygiene on the site leading to introduction of invasive species
- Poor topsoil stripping and handling practices during construction phase leading to insufficient material for rehabilitating the area.
- During windy days, mineral ore from stockpiles may erode and be deposited on the surrounding environment.
- Loss of soil during windy days due to soil characteristics demonstrating high to extreme potential for wind erosion.

MITIGATION MEASURES

It is expected that risks to terrestrial environmental quality and associated management controls can be managed as part of the DWER Part V approvals. Controls will be implemented to mitigate impacts to terrestrial environmental quality including:

- All heavy equipment must present service log sheets prior coming to site.
- Weed and seed inspection prior entering on site.
- Oil spill kits placed at strategic locations within the site.
- Waste containment infrastructure engineered to account for flooding events. Regular visual inspections of waste containment infrastructure to ensure freeboard level and structural integrity are maintained.
- All environmentally hazardous materials will be stored in facilities designed in accordance with Water Quality Protection Note 26 - Liners for containing pollutants, using synthetic membranes (DoW, 2013) or other appropriate guideline, including suitable bunding and secondary containment.
- Topsoil stripping and handling to occur in accordance with AVL internal topsoil management plan yet to be developed.
- Mineral ore storage and processing area to be equipped with engineering controls to prevent dust emissions. Mineral ore transportation to be undertaken in tarped trucks to prevent emission of mineral ore to the environment and prevent soil contamination due to deposition of the ore on the soil.

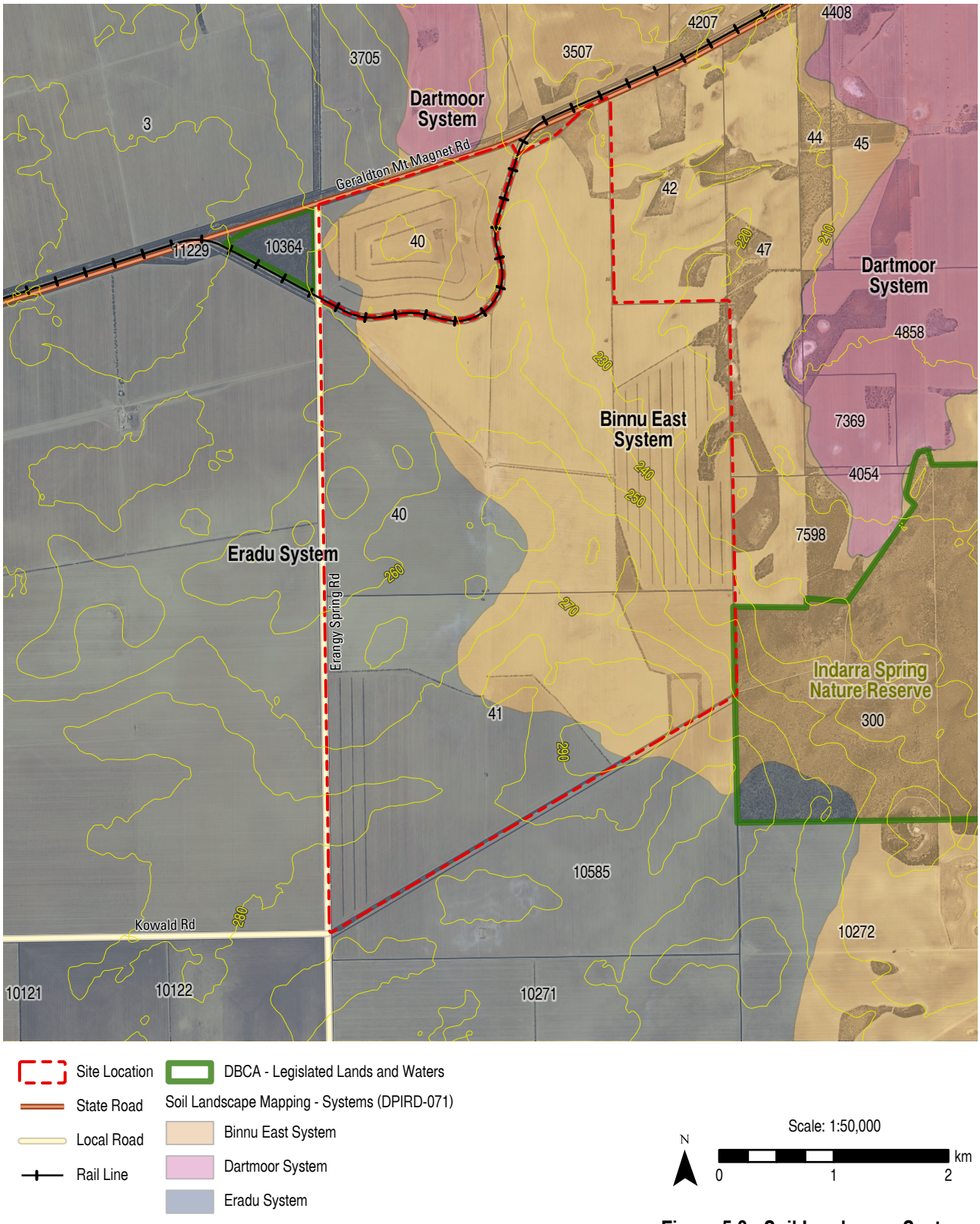


Figure 5.3 - Soil Landscape Systems

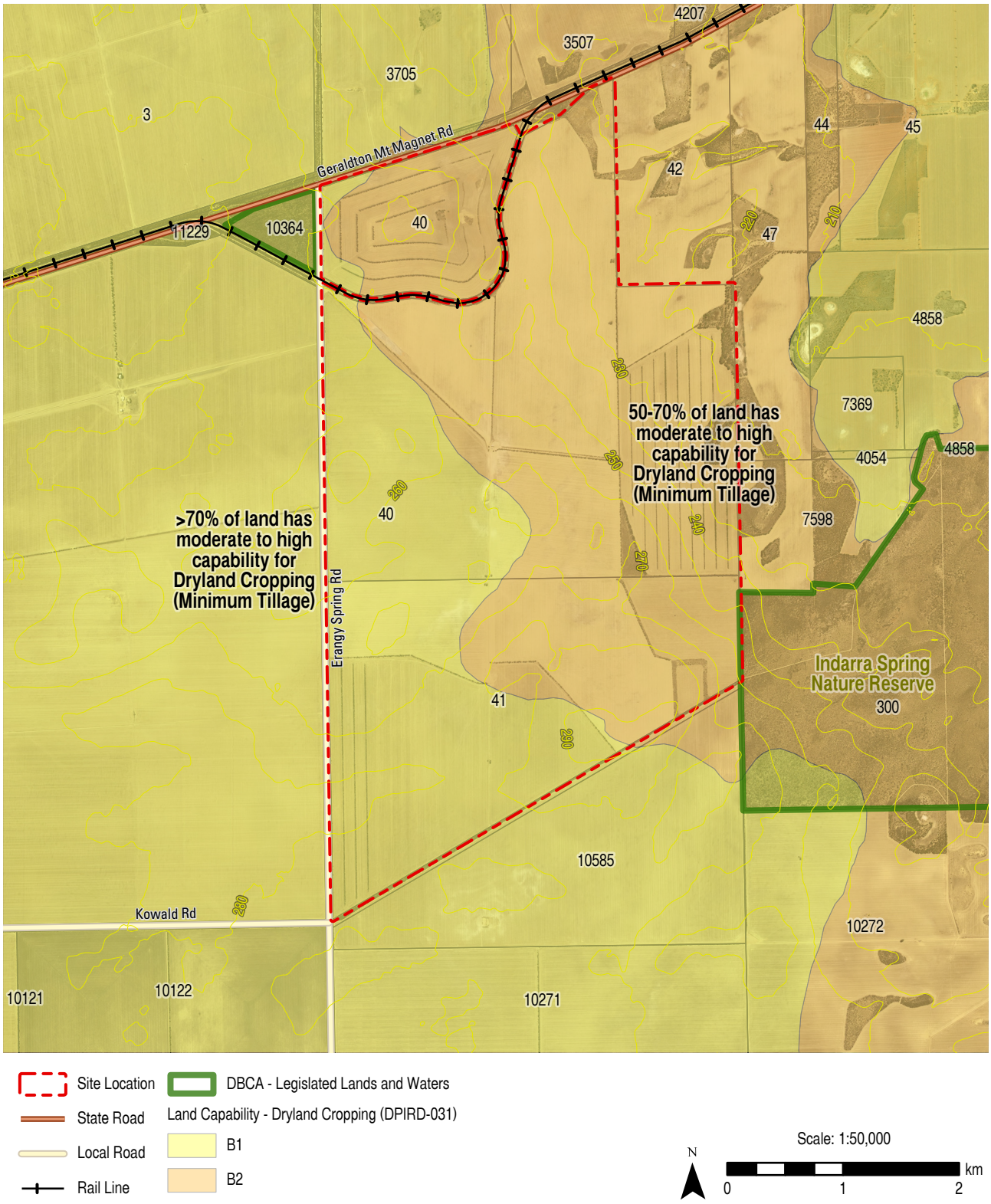


Figure 5.4 - Land Capability; Dryland Cropping

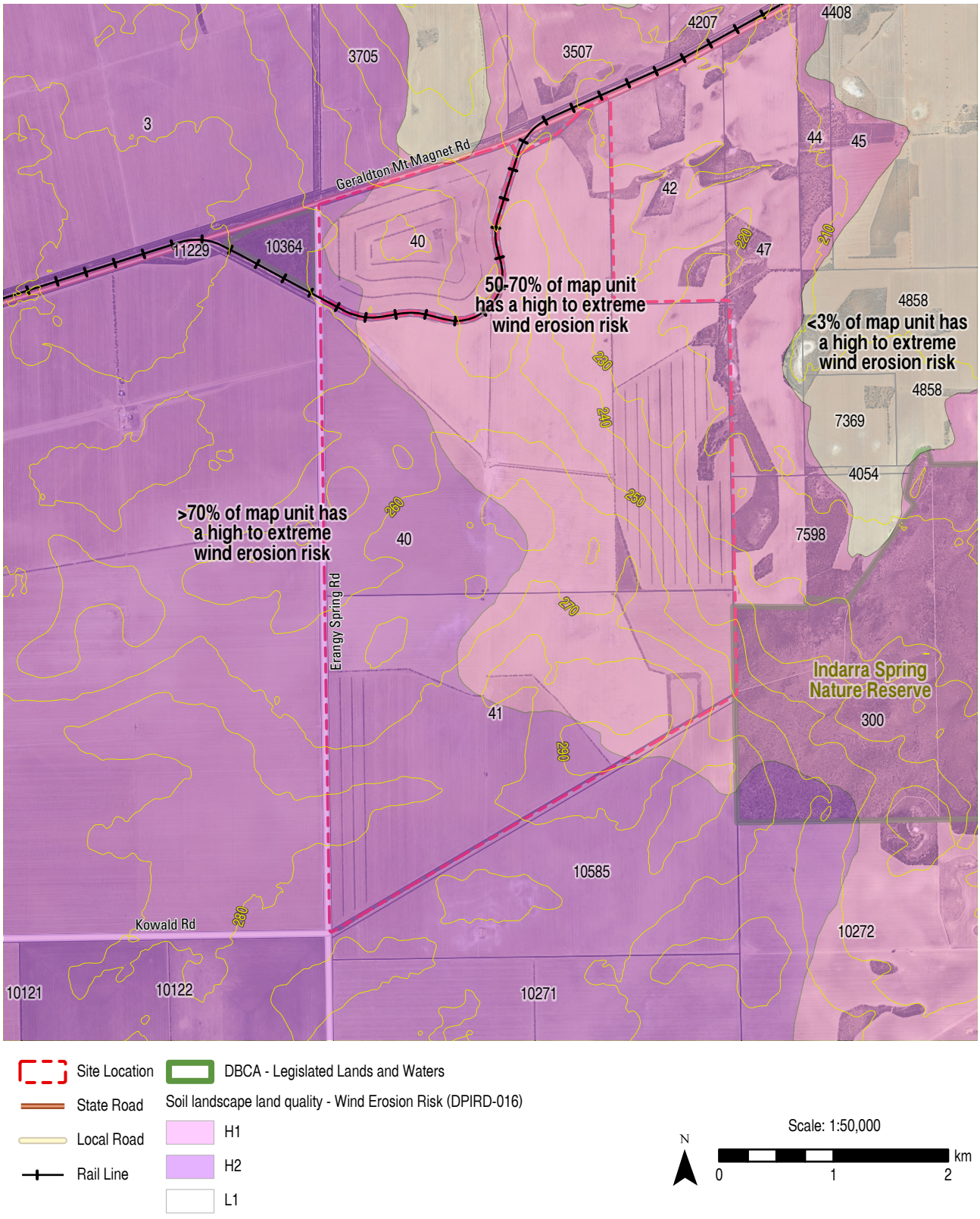


Figure 5.5 - Wind Erosion Risk

5.4 VEGETATION

The site has been historically cleared for rural use. Remnant vegetation on the site is largely restricted to wind belts along internal access tracks, along with a patch of vegetation adjacent to the Geraldton-Mt Magnet Road. Less than 1 % of native vegetation exists on the northern side of the project boundary.

Original vegetation on the site comprised the Yuna System (Scrub-Heath Thicket; Mixed heath with scattered tall shrubs. The project area is located within the Geraldton Sandplains IBRA Region (Code: GS) and Geraldton Hills subregion (Code: GES01) which is characterised by the following (DAWE, 2000):

- Endemic proteaceous scrub-heaths on the sandy earths.
- Extensive, undulating and lateritic sandplain on a mantling Permian to Cretaceous strata.
- Extensive York Gum and Jam woodlands occurring on outwash plains associated drainage.

To identify presence of ecological communities near the project area, the DBCA search for Ecological Communities was requested. The searches did not determine the presence of any Priority and Threatened Ecological communities within 2 km of the project boundary. The closest threatened ecological community, Eucalypt woodlands of the Western Australia Wheatbelt (ID: Wilroy01) is 32 km east.

To identify presence of conservation significant species under the Biodiversity Conservation Act 2016 (BC Act), a DBCA flora search was requested. The DAWE Protected Matters Search Tool (PMST) was also used to identify presence of any protected species as listed under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) that could trigger an EPBC referral or a joint referral.

There have been no historical Clearing Permits issued on the site, although it should be noted that WestNet Rail does have a Purpose Permit for clearing of the rail corridor that runs through the site.

POTENTIAL IMPACTS

The processing plant will be on cleared land, which minimises the amount of native vegetation clearing required.

There is residual native vegetation within the road reserves immediately north of Lot 40 in between the project boundary and the highway. Native vegetation is also present on the northeast section of the project boundary. Establishment of site entry and exit points may require small amounts of native vegetation clearing. As Threatened Flora has been recorded in a nearby road reserve, there is the potential for clearing of Threatened Flora if it is present at locations proposed for the site entry and exit points. However, the area where the Threatened Flora species Styphelia marginata was previously recorded is outside of the project boundary and therefore no direct impact to this location is expected.

Furthermore, there is a risk of accidental clearing of protected flora if land disturbance occurs outside of planned areas. This risk is highest during construction activities.

There may be minor indirect impacts to native vegetation in the adjacent reserves, such as dust emissions.

MITIGATION MEASURES

A targeted flora survey will be undertaken in the appropriate season to check whether any listed species occur in the native vegetation remnants within and adjacent to the development envelope. Any proposed native vegetation clearing will be adjusted where possible to avoid locations of listed flora, particularly Threatened Flora. Appropriate environmental approvals, such as a native vegetation clearing permit, will be sought prior to any clearing of native vegetation.

Management measures will be in place to prevent indirect impacts to the species such as dust suppression activities and clear demarcation of approved disturbance areas to prevent unauthorised clearing and disturbance. Controls to prevent indirect impacts are expected to be managed under the DWER Part V approvals.

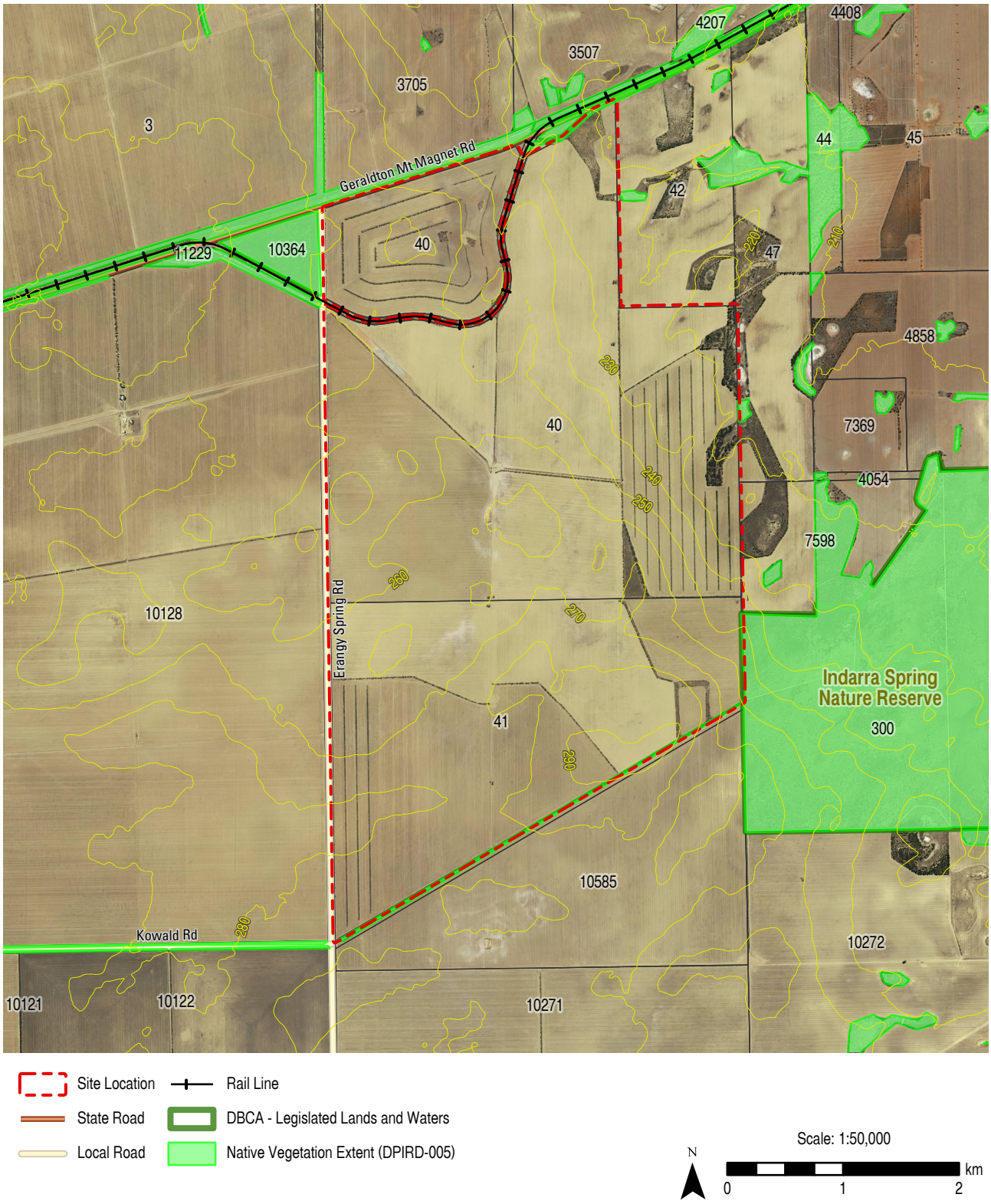


Figure 5.6 - Native Vegetation Extent

5.5 HABITAT AND FAUNA

To identify presence of conservation significant fauna under the Biodiversity Conservation Act 2016 (BC Act), a DBCA fauna search was requested. The DAWE Protected Matters Search Tool (PMST) was also used to identify presence of any protected fauna species as listed under the EPBC Act that could trigger an EPBC referral or a joint referral. Summary of findings have been presented in Table 5.1 - Conservation significant fauna.

The DBCA search did not identify any conservation significant fauna species with 3 km of the project boundary. The closest significant species recorded, Yuna broad-blazed slider (Lerista Yuna) listed as Priority 3 under the BC Act, is 4.7 km east of the project.

The DAWE PMST search tool identified eight species that may potentially occur within the project boundary. However, none of these species have been previously recorded within 3 km of the project boundary. Species that could possibly occur have been listed in Table 5.1 - Conservation significant fauna.

Table 5.1 - Conservation significant fauna

Species	BC Act	EPBC Act	Likelihood of presence	Source
Curlew Sandpipe *(Calidris ferruginea)*	CR	CR	May occur	PMST Search
Carnaby's Cockatoo (*Calyptorhynchus latirostris*)	E	E	Likely to occur	PMST Search
Calyptorhynchus latirostris (*Falco hypoleucos*)	V	V	May occur	PMST Search
Malleefowl (*Leipoa ocellata*)	V	V	Likely to occur	PMST Search
Night Parrot (*Pezoporus occidentalis*)	CR	E	May occur	PMST Search
Australian Painted Snip (*Rostratula australis*)	EN	E	May occur	PMST Search
Chuditch (*Dasyurus geoffroii*)	V	V	May occur	PMST Search
Shield-backed Trapdoor Spider (*Idiosoma nigrum*)	E	V	May occur	PMST Search

*Conservation status P1=Priority 1; P2=Priority 2; P3=Priority 3; T=Threatened; E=Endangered; V=Vulnerable; CR =Critically Endangered

POTENTIAL IMPACTS

No direct impacts to conservation significant fauna are expected. The proposed development footprint falls in a largely cleared area and therefore impacts to fauna are low given that limited clearing would be required to support the project. However, fauna may be subject to indirect impacts including:

- Vehicle strikes on main roads and access roads from traffic movement.
- Noise and vibration leading to fauna migration away from the project area into non suitable habitats and predation zones.
- Fauna death by drowning in hazardous waste containment ponds.

Light emissions from operations impacting nocturnal fauna.

MITIGATION MEASURES

Controls to manage indirect impacts to fauna are expected to be managed under the DWER Part V approvals.

5.6 SURFACE WATER RESOURCES

The following water bodies are located near the project area:

- Kockatoa Gully which is a minor river is located at 7.8 km east of the site.
- Greenough river which is a mainstream is located at 16.7 km northeast of the site.

There is an unnamed minor tributary located at 8.9 km southwest of the site.

The site is located within the Greenough River basin catchment area and Greenough River, Tributaries and Catchment sub catchment area within the Indian Ocean division.

POTENTIAL IMPACTS

Given the far location of the river systems, it is unlikely that the rivers will be directly impacted.

Impacts to the Greenough River Basin catchment area can possibly occur if waste containment infrastructure fails or bunds are over-topped. This could occur during large rainfall and flooding events or due to poorly designed, constructed or maintained infrastructure.

MITIGATION MEASURES

All environmentally hazardous materials will be stored in facilities designed in accordance with Water quality protection note 26 - Liners for containing pollutants, using synthetic membranes (DoW, 2013) or other appropriate guideline, including suitable bunding and secondary containment. Design, construction and operation of waste containment infrastructure will be assessed by DWER as part of approval applications under Part V of the EP Act.

5.7 GROUNDWATER RESOURCES

An assessment to determine the groundwater context of the area was undertaken. Outcomes have been summarised below:

- As per the DWER – 083 WRIMS Groundwater Subareas dataset (DataWA, 2021), the project area is located within the Gascoyne groundwater area and Casuarina and Yuna/Eradu subareas.
- As per the DWER – 033 Public Drinking Water Source Areas dataset (DataWA, 2021), the project is not located within any public drinking water source areas.
- Private bores are present within and surrounding the project area. Limited information is available as no sampling has been undertaken thus far but DWER's Water Reporting Portal shows private bores have been installed to a maximum depth of 21.3 m below ground level (mbgl) (DWER, 2021a).

Based on initial investigations carried out by Rockwater in 2021, there is a superficial low salinity aquifer hosted in the Wagina Sandstone occurring at approximately 20 m below ground level. This is what is expected to be used by local farmers. The superficial aquifer is isolated from the deep High Cliff aquifer by a clay aquitard. The deep aquifer occurs at a depth of over 200 m below ground level. The groundwater quality of the deep aquifer was sampled in September 2021, and was brackish (6,850 mg/L total dissolved solids).

POTENTIAL IMPACTS

Based on the above context, risks to the groundwater were assessed. Potential impacts from the project to groundwater include:

- Excess dewatering to support operations is unlikely to impact surrounding vegetation as water abstraction to support operations would occur in the deeper aquifer.
- Groundwater pollution from operations could lead to decline in groundwater quality and groundwater

availability to surrounding land users. Groundwater pollution may occur as follows:

- Mineral concentrate dust deposition on soil surface seeping down to groundwater.
- Poorly designed mineral waste containment infrastructure leading to seepage to groundwater resources.
- Oil leaks from operating machinery on site seeping through groundwater.
- Poorly stored hydrocarbon on site leading to spills and seepage to groundwater.
- Dewatering operations are unlikely to have direct impacts to subterranean fauna. Also, no major excavational works or mining activities will occur within the project area. Although groundwater abstraction will occur, the water source is the deep aquifer, at a depth of over 200 m below ground level. The proposed groundwater abstraction from the deep aquifer is not expected to impact on the superficial aquifer. Therefore, any groundwater drawdown will be below a depth that could provide suitable habitat for stygofauna.

MITIGATION MEASURES

All environmentally hazardous materials will be stored in facilities designed in accordance with Water quality protection note 26 - Liners for containing pollutants, using synthetic membranes (DoW, 2013) or other appropriate guideline, including suitable bunding and secondary containment. Design, construction and operation of waste containment infrastructure will be assessed by DWER as part of approval applications under Part V of the EP Act.

Waste containment infrastructure will be engineered with relevant controls to prevent overflooding and stable embankments. Freeboard and infrastructure integrity monitoring will be undertaken in accordance with the DWER Part V licence conditions to ensure that integrity of the infrastructure is maintained.

All equipment on site will be serviced and checked for hydrocarbon leaks and a service logbook will be maintained as part of AVL document control system. Regular environmental internal inspections and audits will be undertaken targeting hydrocarbon storage areas.

Hydrogeological assessment has been undertaken as part of the application for Groundwater Licence under the Rights in Water and Irrigation Act 1914 (RIWI Act). The assessment provided more information on aquifer reserves and abstraction quantities. Based on the outcomes of the assessment, AVL applied for, and subsequently received, a Groundwater Licence.

5.8 HERITAGE

The Department of Planning, Lands and Heritage (DPLH) Aboriginal Heritage Inquiry System (AHIS) was used to determine the presence of any sites of significance within the project area. AHIS indicates that no heritage surveys were previously undertaken, no registered heritage sites or other heritage sites are present within the project area (DPLH, 2021). The proposed area is largely cleared, and no evidence of Aboriginal sites protected under the AHA has been found during the desktop search.

A search using the Heritage Council Inherit database was used to identify the presence of local heritage sites (Heritage Council, 2021). No local heritage sites were found. The Department of Agriculture, Water and the Environment (DAWE) Australian Heritage Database did not identify the presence of any world, national, Commonwealth, overseas places of historic significance to Australia and places in the register of the national estate within the project footprint (DAWE, 2021).

Therefore, it is unlikely that the project will impact on sites of heritage significance.

5.9 BUSHFIRE RISK

There are no designated bushfire prone areas on the site apart from the buffer associated with the Indarra Nature Reserve (refer Figure 5.7). However, given the nature of the project and its environment, a Bushfire Management Plan has been commissioned and prepared by Bushfire Prone Planning (Refer to Appendix D).

The assessed bushfire risk is considered to be manageable post development works and will be achieved by the identified stakeholders implementing and maintaining the bushfire risk management measures that are presented in the BMP.

It is expected that once development and any applicable landscaping has been completed, indicative BAL Ratings of BAL-29 or less can be achieved for this proposal. Geraldton-Mount Magnet Road and Erangy Spring Road provide access to two different destinations and as sealed or an 'all weather' surface is available to the public at all times and under all weather conditions. Internal access and haulage roads will be required to comply with the Bushfire technical requirements as set out in the Guidelines. A reticulated water supply is not available to the subject site. As such, the technical requirements established by the Guidelines and/or the Local Government can and will be complied with.

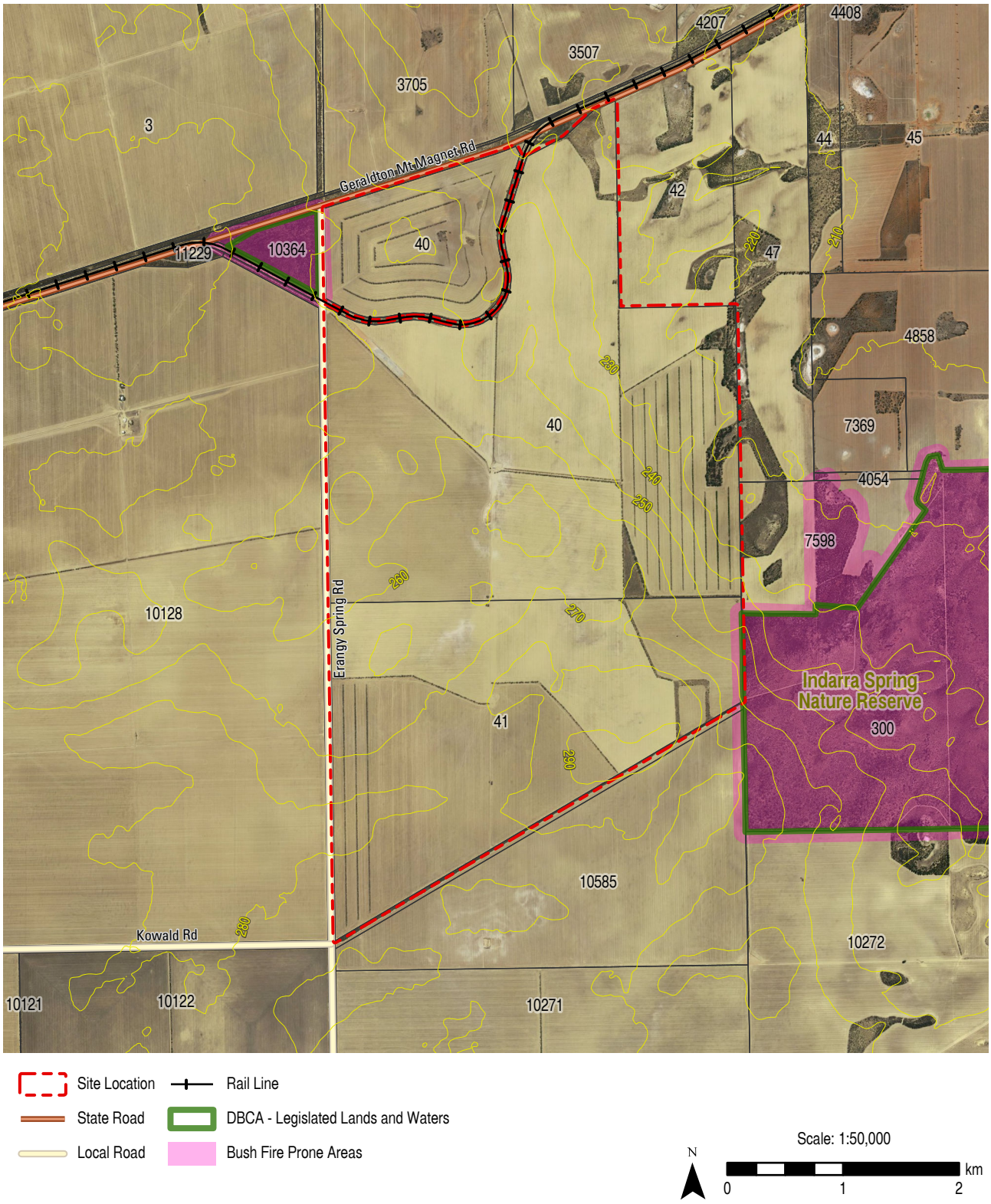


Figure 5.7 - Bushfire Prone Areas

5.10 AMENITY

By using aerial imagery, a search for closest residential properties were undertaken. Outcomes of the search are presented in Table 5.2 - Potential Amenity Impacts below.

Table 5.2 - Potential Amenity Impacts

Type	Social Values	Potential Impacts	Mitigation	Assessment of Residual Impacts
Road Use	Mullewa Town is approximately 25 km northeast of the proposal area.	Increase in road traffic within Mullewa townsite, forecast to comprise an additional: 20 full and 20 empty heavy vehicle movements per day through Mullewa. 27 light vehicle movements per day associated with employees based in Mullewa.	A Traffic Impact Statement has been prepared and submitted with the Development Application to the State Development Assessment Unit. The road network through Mullewa is a major highway and proposed haul trucks are compliant with the existing highway classification. Main Roads WA will review the traffic impact statement and agree road use conditions with AVL.	Traffic data for Geraldton-Mount Magnet Rd east of Mullewa Wubin Rd indicates annual average daily traffic volume for 2022-23 was 432 movements per day (223 heavy vehicles and 209 light vehicles). The forecast traffic movements associated with the proposal would be an 18% increase in heavy vehicle movements per day through Mullewa townsite, compared to 2022-23 data.
	Public road users	Increase in traffic volume along proposed transport routes, forecast to comprise an additional: 20 full and 20 empty heavy vehicle movements per day between Tenindewa and Gabanintha 27 full and 27 empty heavy vehicle movements per day between Tenindewa and Geraldton 2 small buses transporting workers from Geraldton each day.		Traffic data for Geraldton Mount Magnet Rd east of Glengarry Road near Geraldton indicates annual average daily traffic volume for 2022-23 was 1,086 movements per day (402 heavy vehicles and 684 light vehicles). The forecast traffic movements associated with the proposal would be a 7% increase in heavy vehicle movements and 0.6% increase in light vehicle movements per day towards Geraldton, compared to 2022-23 data.

Type	Social Values	Potential Impacts	Mitigation	Assessment of Residual Impacts
Homesteads	Nearest homesteads are located: 1.6 km west of Lot 40 1.8 km north of Lot 40 2.0 km northeast of Lot 40	Fugitive dust emissions from: Wind erosion of cleared areas and stockpiles Material handling including loading and tipping Driving on unsealed roads Land clearing for establishment of infrastructure	Fugitive dust emissions will be managed through typical controls such as water trucks on any unsealed road and sprays as needed for stockpiles and material handling. The concentrate and Fe-Ti Co-product will be transported with moisture levels suitable to facilitate handling and minimize dust emissions (typically 7-8%). AVL will apply for a Works Approval and Operating Licence under the EP Act Part V prior to commencement of construction of the processing plant.	Dust deposition associated with the Processing Facility is predicted to be a maximum of 0.03 g/m2/month at the boundary of Lots 40 & 41, which is well below the relevant assessment criteria of 2 g/m2/month above background (see Section 4.7 Air Quality in Appendix E). The potential noise impacts associated with construction and operations of the processing plant will be assessed and regulated by DWER under Part V of the EP Act.
		Noise emissions from construction and operation of processing facility.	A screening assessment will be undertaken as part of the DWER Works Approval application using the DWER Guideline: Assessment of environmental noise emissions. The processing facility will be designed to meet noise limits. AVL will apply for a Works Approval and Operating Licence under the EP Act Part V prior to commencement of construction of the processing plant.	The potential noise impacts associated with construction and operations of the processing plant will be assessed and regulated by DWER under Part V of the EP Act.
Other nearby land uses	Railway line immediately north of the proposal boundary	Haul vehicle and light vehicle interactions with two level crossings on Geraldton-Mt Magnet Road and one level crossing on Erangy Springs Road.	A Traffic Impact Statement has been prepared and submitted with the Development Application to the State Development Assessment Unit. The road network along Geraldton-Mt Magnet Road is a major highway and proposed haul trucks are compliant with the existing highway classification. Main Roads WA will review the traffic impact statement and agree road use conditions with AVL.	Road usage is not expected to impact on the railway line.

Type	Social Values	Potential Impacts	Mitigation	Assessment of Residual Impacts
	Public road users	Visual amenity impacts.	An analysis of the views of the Processing Facility from Geraldton-Mt Magnet Road was undertaken using a 3D model and submitted as part of the Development Application to the State Development Assessment Unit. The processing plant will have at least 1 km setback from the Geraldton-Mt Magnet Road. There is existing vegetation along the road and the railway. Vegetation along the road corridor will be retained where possible (with the exception of the haul road) to preserve the visual screen.	The 3D model demonstrated that the Processing Facility would not have a meaningful impact on visual amenity from the Geraldton-Mt Magnet Road.
Agricultural use of land	Agricultural production within Lots 40 and 41	Loss of productive agricultural land within Lots 40 and 41 when AVL take ownership and develop the processing plant.	The proposal lies in the Mullewa Agricultural Land Area. Agricultural importance is limited by availability of fresh groundwater and low rainfall, which leads to lower yields than experienced on similar soils to the south and west (Department of Agriculture and Food, 2013). AVL will purchase Lots 40 and 41 from the landowner, which will provide financial compensation for loss of the land. AVL has signed an options agreement with the landowner for the purchase of Lots 40 and 41, which will provide financial compensation for loss of the land. Parts of the options agreement makes provision for the landowner to optionally use that portion of Lots 40 and 41 that are outside of the Processing Facility development envelope for agricultural purposes..	The residual impact from loss of productive agricultural land is expected to be low.

Type	Social Values	Potential Impacts	Mitigation	Assessment of Residual Impacts
	Agricultural production within adjoining and nearby land	The proposal could impact on agricultural productivity of adjacent and nearby land if: Dust emissions result in accumulation of environmentally deleterious materials on nearby agricultural land outside of Lots 40 and 41. Discharges of environmentally hazardous materials result in contamination of surface or groundwater.	Mitigation of impacts from discharge of contaminants is described in Section 4.6 Terrestrial Environmental Quality of Appendix E. AVL will apply for a Works Approval and Operating Licence under the EP Act Part V prior to commencement of construction of the processing plant.	Dust deposition associated with the Processing Facility is predicted to be 0.03 g/m2/month at the boundary of Lots 40 & 41, which is well below the relevant assessment criteria of 2 g/m2/month above background (see Section 4.7 Air Quality). The potential dust emissions and discharges of hazardous materials associated with construction and operations of the processing plant will be assessed and regulated by DWER under Part V of the EP Act.
Aboriginal heritage	Tenindewa Creek (Site ID 18905) located 8 km east of the proposal location	Due to the distance from the proposal, no impacts to Tenindewa Creek are expected. It is possible that excavation associated with construction could unearth Aboriginal artefacts or remains.	The design, construction, commissioning and operations of the processing plant and associated facilities that may discharge or emit materials to the environment will be regulated by DWER under Part V of the EP Act. The proposed area is largely cleared, and no evidence of Aboriginal sites has been found during a desktop search of the Aboriginal Heritage Inquiry System. Should any Aboriginal artefacts or human remains be encountered during construction or other excavations, all nearby excavation work will cease and appropriate authorities will be notified.	No residual impacts to Aboriginal heritage sites are expected.

Source: Umwelt (see Appendix E)

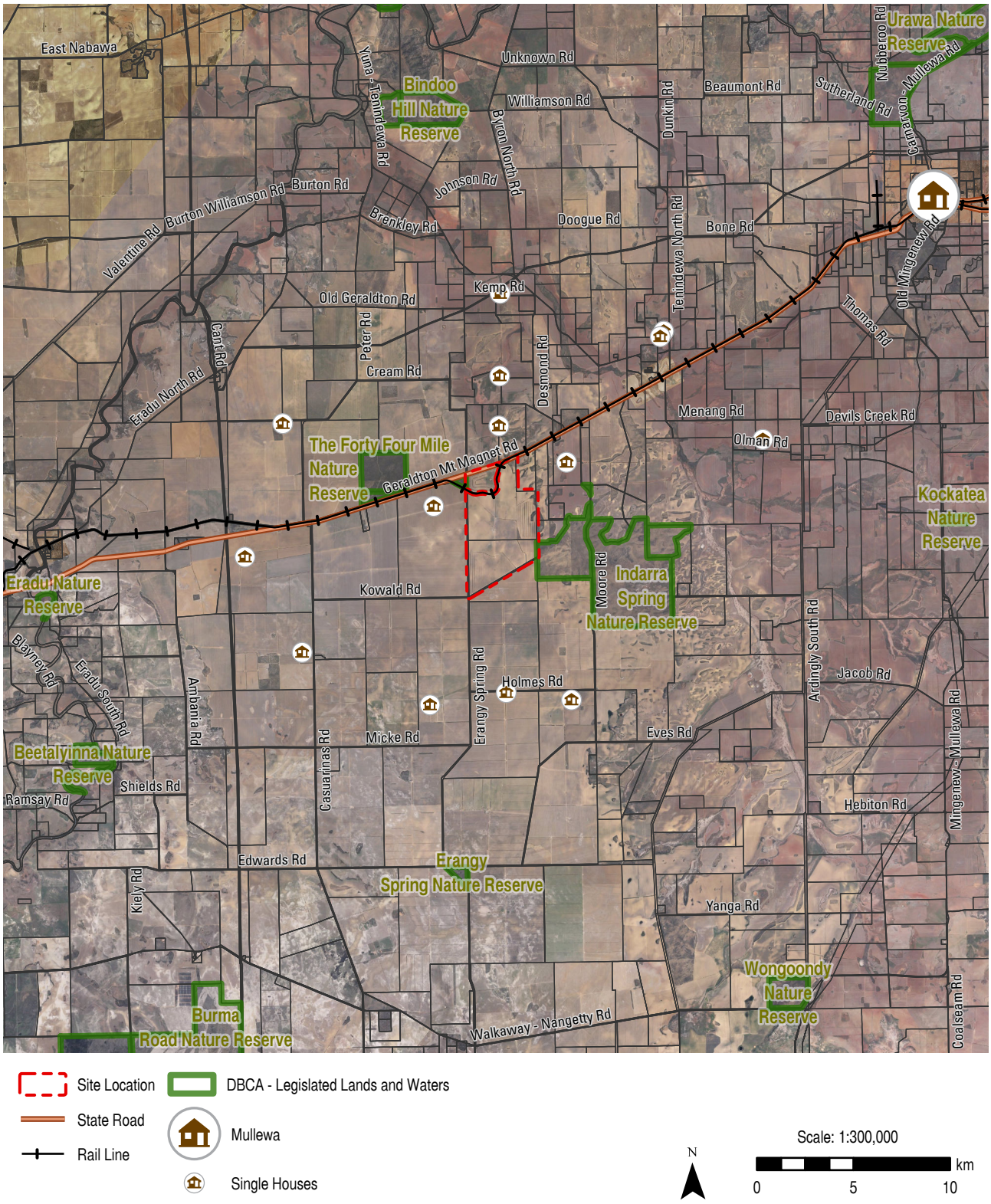


Figure 5.8 - Nearby Houses

6.0 Conclusion

On behalf of Australian Vanadium Limited, we seek the support of the Western Australian Planning Commission for the proposed construction of a $450 million vanadium processing facility on Lots 40 and 41 Geraldton-Mt Magnet Road, Tenindewa.

In summary, the project:

- Is recognised as being of significance by both the Federal and State governments
- Comprises a significant investment into the City of Greater Geraldton that will have significant economic benefit to the city and the broader region
- Will create up to 400 jobs during construction, and 125 jobs thereafter
- Will be subject to further consideration and approvals from the Department of Water and Environmental Regulation, and the Environmental Protection Authority.

It is recognised that the proposal is not currently fully consistent with the City's Local Planning Scheme No. 1, however Australian Vanadium has committed to a process to amend the Local Planning Scheme to facilitate the development, a process that has already commenced with the initiation of an amendment to rezone the development site from Rural to General Industry.