



Amendment to City of Karratha Local Planning Scheme No. 8

Lot 1 Dampier Road, Gap Ridge

Document Control

Amendment to City of Karratha Local Planning Scheme No. 8

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Executive Summary

This report is prepared in support of a formal request to the City of Karratha to amend its Local Planning Scheme No. 8 ('LPS 8'), seeking to rezone Lot 1 Dampier Road, Gap Ridge ('subject land') from 'Rural' to 'Industry'. This amendment is necessary to facilitate industrial expansion within the Gap Ridge area, addressing a short-term supply shortage of industrial lands and resolving the land use challenges faced by the land under its current rural zoning.

The subject land's location is strategically advantageous, being in close proximity to existing and established industrial operations and key transport routes, while remaining suitably distanced from residential developments. This makes it an ideal location for industrial development, which would enhance the compatibility of land uses in the area.

The land represents one of the few development-ready, freehold land parcels that is strategically located for Industrial development.

The proposed amendment is appropriate and consistent with orderly and proper planning for the following reasons:

- The subject land is situated near major industrial activities and transport routes, enhancing its suitability for industrial use and supporting efficient logistics and operations.
- The existing noxious industry operations on the adjacent Lot 500 Dampier Road require extensive land use buffers that include the entirety of the subject land, rendering its current rural zoning incompatible and impractical. Rezoning to 'Industry' would resolve these conflicts and provide a more appropriate transition for industrial activities.
- An Industrial Land Assessment was prepared by Lucid Economics, identifying an urgent need for additional industrial land in Karratha, highlighting the region's reliance on the mining and resource sectors and the risks posed by a critical shortage of general industry land.
- The proposed amendment aligns with the Western Australian Planning Commission's State Planning Framework, specifically supporting the transition of land use to accommodate industrial growth and economic diversification.
- The current rural designation of the subject land is not viable due to its size and the surrounding land use conditions, making industrial zoning the most logical and efficient use of the site.
- Rezoning will directly contribute to economic diversification and resilience in Karratha by providing much-needed industrial land to support current and future development projects.
- The proposal is supported by comprehensive technical assessments, including environmental, bushfire, traffic, and stormwater management reports, confirming that the site is capable of being rezoned without



adverse impacts on the surrounding area, meeting all relevant legislative and policy requirements.

- The development of the adjacent Gap Ridge East industrial Estate (north of the site) is expected to be considerably delayed, due to developmental issues including servicing, tenure and native title resolution. This is anticipated to have a considerable negative impact on the availability of Industrial land in Karratha, with this proposal seeking to, in part, rectify this.

Rezoning Lot 1 to 'Industry' is a logical and necessary step that aligns with the City of Karratha's strategic objectives and the broader State Planning Framework. It addresses the demand for industrial land, supports economic growth, and resolves the existing land-use conflicts associated with the current rural zoning. It is requested that the City of Karratha initiates this amendment to its LPS 8 to facilitate industrial development opportunities within the region.



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1. DA23-146: Temporary Land Use Approval.
2. Request to Lift Restrictive Covenant
3. Certificate of Title
4. Feature Survey
5. Industrial Land Assessment
6. Bushfire Management Plan
7. Environmental Assessment Report
8. Traffic Impact Assessment
9. Engineering Servicing Report
10. Stormwater Management Plan



1 Introduction

RFF Pty Ltd acts on behalf of the landowner of Lot 1 Dampier Road, Gap Ridge (the subject land). This report has been prepared in support of a formal request to the City of Karratha, pursuant to Section 75 of the *Planning and Development Act 2005*, to initiate an amendment to the City of Karratha Local Planning Scheme No. 8 ('LPS 8'), to:

- Rezone Lot 1 Dampier Road, Gap Ridge from 'Rural' to 'Industry';
- Update the Scheme Maps accordingly.

The Scheme Amendment will facilitate the development of the land for industrial purposes. The rezoning of the subject land is a logical extension to the contemplated Gap Ridge East Industrial Estate, given:

- The land is inadequate in size to support any form of viable rural operation.
- This land can be brought to market in a more timely fashion than the contemplated estate, which is **Unallocated Crown Land ('UCL')**, has no legal road access or connection to utilities, and is subject to native title and environmental risks.
- Adjoining land is already being use for industrial purposes and expansion of the Industry zone as contemplated in the **City's Local Planning Strategy** would only further diminish the ability to undertake sensitive land use activities on the subject land.

This report provides the background information on the subject land, and addresses the town planning, servicing and environmental considerations relevant to the Scheme Amendment Request area.

1.1 Project Team

The following multi-disciplinary project team has been engaged by the Proponent:

Town Planning	RFF
Environmental	Western Environmental
Bushfire	Linfire
Engineering & Stormwater	Porters Consulting Engineers
Traffic	PTG
Economic Demand	Lucid Economics

1.2 Pre-Lodgement Consultation

This request to amend the City of Karratha Local Planning Scheme No. 8 has been prepared as a necessary step to facilitate the industrial development of the site. Pre-lodgement engagement has been undertaken throughout the preparation of this request with representatives of:

- The City of Karratha;



- Department of Planning, Lands and Heritage;
- Office of the Minister for Lands;
- Offices of Local Members of Parliament.

The request also follows both a Development Application for the temporary use of the land for Storage and Laydown Area and a Formal Request to remove the Restrictive Covenant on Title. These processes are discussed further at Section 1.3.

1.3 Background

1.3.1 Temporary Land Use

RFF, on behalf of the landowner, lodged an Application for Development Approval in November 2023, seeking approval from the City of Karratha for the temporary, time limited use of the land for Storage and Laydown on the site, which might support the decommissioning phases of a number of offshore oil and gas projects or other major industrial projects on the Burrup Peninsula.

The Development Application (DA23-146) was granted approval by the City of Karratha for a period of 5 years on 12 September 2024, and included the following elements:

- Removal of the existing dwellings and outbuildings.
- Construction of a new, internal ring road to facilitate both passenger vehicle and truck access.
- Approximately 10 hectares of laydown area, organised into (approximately and indicatively) 1-hectare parcels, to facilitate the orderly storage of material, and limit the visual impact of storage on the locality.
- Access to Dampier Highway via the existing crossover and access way on Lot 500 Dampier Road, Gap Ridge, secured via License Agreement for access.

[Refer Attachment 1 – DA23-146: Temporary Land Use Approval.](#)

1.3.2 Restrictive Covenant Removal

The land is subject to an existing Restrictive Covenant on the title, which limits the use of the land to Aquaculture. The Covenant is a historical anomaly which was formally registered pursuant to Section 15 of the *Land Administration Act 1997* in September 2014.

RFF, on behalf of the landowner, lodged a formal request with the Department of Planning, Lands and Heritage ('DPLH') in January 2024 to remove the Restrictive Covenant, for the following reasons:

- The size of the land parcel and adjacent noxious land uses prohibit meaningful or viable aquaculture operations from being pursued on the land.



- Preliminary due diligence and feasibility for the site has determined there is substantial upside opportunity for medium-term industrial development, with several resource projects currently in the pipeline.
- Lifting of the covenant is anticipated to further stimulate economic development in the City of Karratha and promote diversification of activity in the region.
- Having regard to the broader regional context, the use of the land for aquaculture represents a considerable underutilisation of well located, serviceable land.
- Consistent with the WAPC's Fact Sheet for Restrictive Covenants, covenants that seek to control the use of land are considered inappropriate. It is the Proponent's position that the most appropriate mechanism for controlling land use is the City of Karratha's local planning framework.
- The City's strategic planning framework identifies the extension of the Gap Ridge Industrial Park directly north of the subject land. Use of the land for aquaculture is not considered an appropriate transitional land use adjacent industrial land.
- The subject land, and the Pilbara Region more broadly, are not identified as strategic Aquaculture development zones within the Department of Primary Industries and Regional Development ('DPIRD') Aquaculture Development Plan for Western Australia (2020). We submit that any new aquaculture operation would not receive the necessary support to warrant funding for a new operation.
- Lifting of this covenant is supported by the City of Karratha.

At the time of writing, the Department of Planning, Lands and Heritage were in the final stages of its consideration of the request, with support for the proposal being received from the Minister's Office.

[Refer Attachment 2 – Request to Lift Restrictive Covenant.](#)



2 Description of Site

2.1 Location

The subject land is located within the locality of Gap Ridge, immediately abutting the established Gap Ridge North General Industrial Area, within the City of Karratha. The Karratha City Centre is located approximately 7.5 kilometres east of the subject site, and the Karratha Airport is located approximately 2.5 kilometres north of the site.

[Refer Figure 1: Regional Location.](#)

Land west of Dampier Road comprises the Gap Ridge Industrial Estate and Rio Tinto's 7-Mile operations, which comprises light and general industrial development.

Karratha Airport is located approximately 2.5 kilometres north of the subject land, with height and noise limits affecting the subject land and preventing sensitive development. Further north-west, a number of salt mining facilities exist. Residential development (the suburb of Nickol) exists 1.8 kilometres east of the subject land.

In summary the area around the subject land creates a substantially industrialised landscape, which is expected to further intensify given the intentions to facilitate industrial land development on the eastern side of Dampier Road identified in the local planning strategy.

[Refer Figure 2: Local Context.](#)

2.2 Subject Land Description

The subject land comprises a freehold parcel, with an area of approximately 15.59 hectares and is accessed via a 10.5-metre-wide battle axe driveway to Dampier Road. The land is generally unencumbered and Native Title does not exist.

The subject site contains an existing dwelling and associated outbuildings.

[Refer Figure 3: Site Plan.](#)

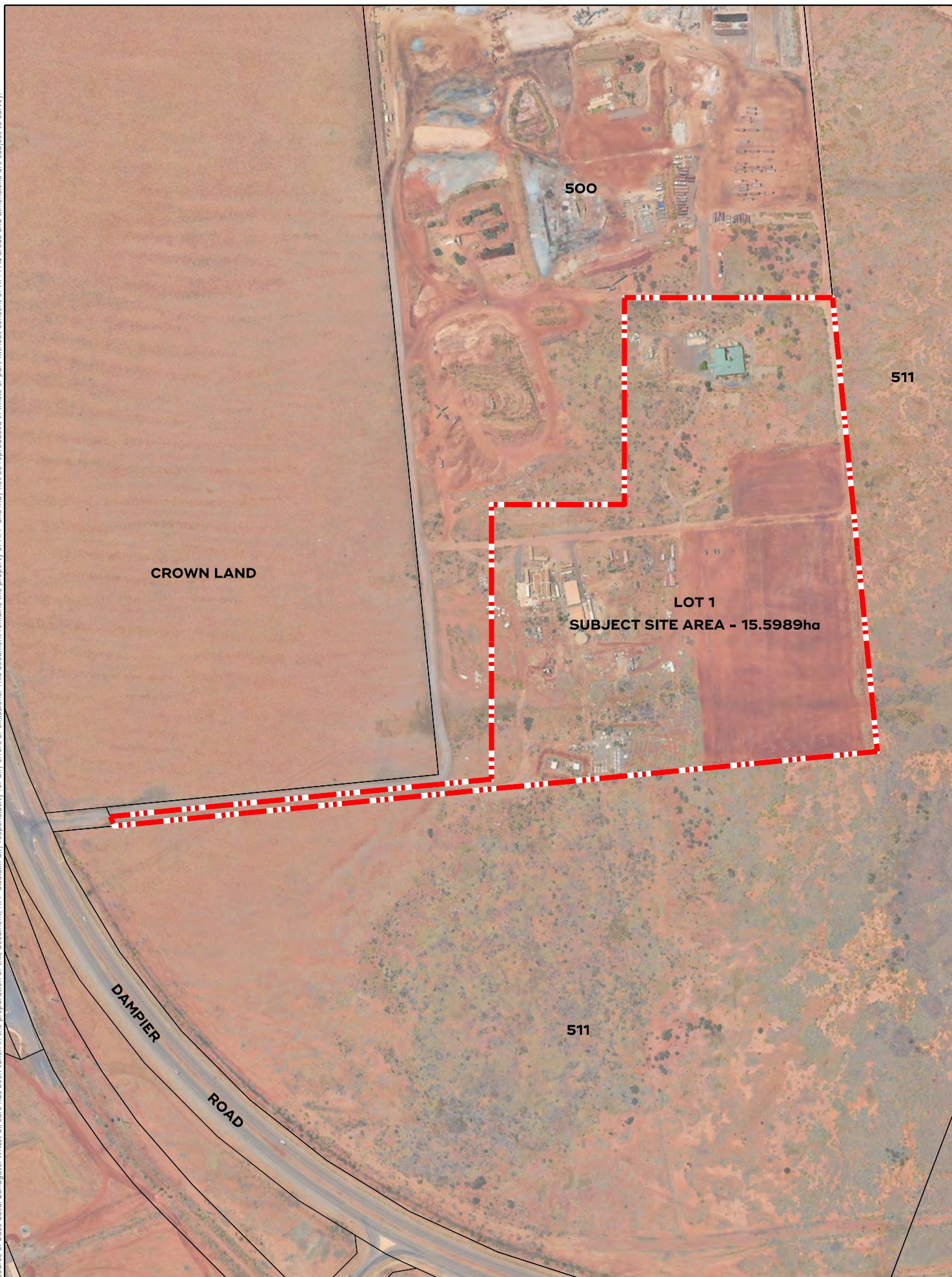
The subject site comprises a single landholding, formally described as Lot 1 on Plan 400638, contained within Certificate of Title 2848, Folio 927. A covenant exists in the title limiting the use to aquaculture only (Refer Section 1.3.2 for further discussion).

[Refer Attachment 3 – Certificate of Title and Attachment 4 – Feature Survey.](#)









2.3 Surrounding Land Uses

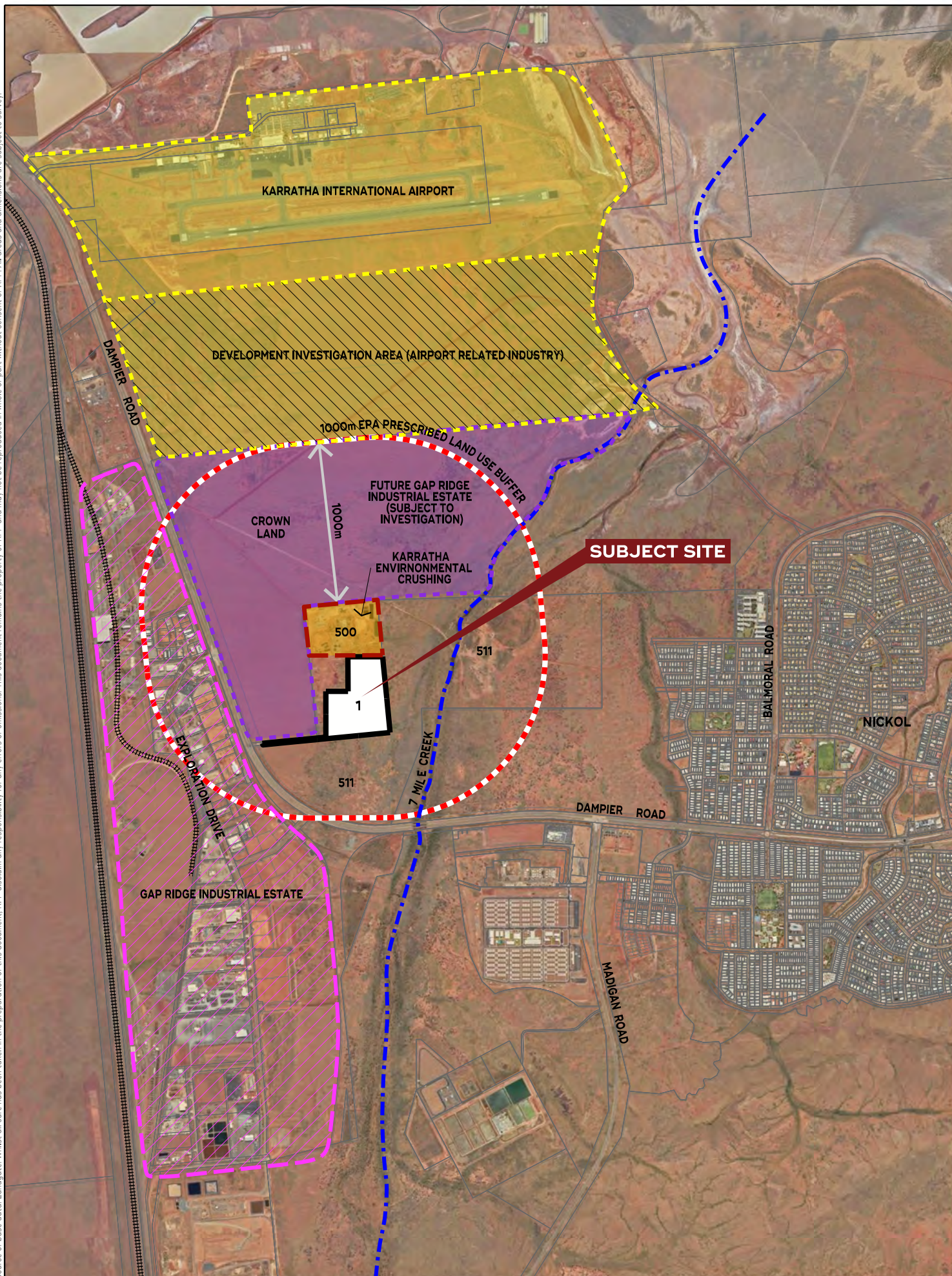
The subject land is strategically located within proximity to major freight routes, the Burrup Peninsula strategic industrial estate, Dampier Port and Karratha Airport, the Karratha City Centre, and directly east of the established Gap Ridge Industrial Estate.

The City's Local Planning Strategy identifies a future, eastwards extension of the Industrial Estate – the Gap Ridge East Industrial Estate. This is a portion of Unallocated Crown Land north of the site and the adjoining Lot 500 Dampier Road. This is subject to future planning and tenure and reaching agreement with the Ngarluma Aboriginal Corporation with respect to their non-exclusive native title rights and interests. The land also is not serviced by power and water utilities. The Karratha Airport is located north of the site, with an area identified for Development Investigation Area – Airport Related Industry shown on the City's Local Planning Strategy. At the time of writing, we are unaware of any progress with respect to this.

The site directly abuts Lot 500 Dampier Road on its northern boundaries. Lot 500 accommodates the existing Karratha Environmental Crushing operations, which has planning approval for a Noxious Industry, and is a licensed Prescribed Premises (Category 13 – Crushing of Building Material) by the Department of Water and Environmental Regulation ('DWER'). Lot 500 is a significant and intensive industrial operation with observed impacts that include odour, dust and gas. The Environmental Protection Authority ('EPA') Guidance Notice No. 3 sets out a standard required separation distance of 1,000 metres between a Category 13 premises and a sensitive development. The entirety of the subject land is contained within this land use buffer, effectively sterilising the land from any rural uses occurring. This is discussed further at Section 5.3.4.

Refer Figure 4: Context Plan.





3 Scheme Amendment Proposal

This formal request to Council, pursuant to Section 75 of the *Planning and Development Act 2005*, is to initiate an amendment to the City of Karratha Local Planning Scheme No. 8 by:

1. Rezoning Lot 1 Dampier Road, Gap Ridge from 'Rural' to 'Industry'; and
2. Update the Scheme Maps accordingly.

Refer Figure 5: Scheme Amendment Map.

Pursuant to Part 5, Division 1 of the *Planning and Development (Local Planning Schemes) Regulations 2015* ('Regulations'), there are three types: basic, standard and complex. These are defined under Clause 34 of the Regulations. Clause 34(2) of the Regulations requires the local government to specify in their resolutions to prepare or adopt an amendment, what type of amendment it is, as well as an explanation for forming that opinion.

The proposed amendment is considered to be a standard amendment which, under Clause 34 of the Regulations, is described as follows:

- | | |
|---|-----|
| a) An amendment relating to a zone or reserve that is consistent with the objectives identified in the scheme for that zone or reserve; | Y |
| b) An amendment that is consistent with a local planning strategy for the scheme that has been endorsed by the Commission; | N |
| c) An amendment to the scheme so that it is consistent with a region planning scheme that applies to the scheme area, other than an amendment that is basic amendment; | N/A |
| d) An amendment to the scheme map that is consistent with a structure plan or local development plan that has been approved under the scheme for land to which the amendment relates if the scheme does not currently include zones of all types that are outlined in the plan; | N/A |
| e) An amendment that would have minimal impact on land in the scheme area that is not the subject of the amendment; | Y |
| f) An amendment that does not result in any significant environmental, social, economic or governance impacts on land in the scheme area; | Y |
| g) An amendment that is not a complex or basic amendment. | Y |

The balance of this report will demonstrate that the proposed amendment will not have any impact on adjacent landholdings, which either accommodate, or are planned to accommodate, industrial development, and does not have any significant environmental, social, economic or governance impacts on the Scheme Area.



3.1 Industry Zone

The purpose of the Industrial zone is set out within Clause 5.8.6 of LPS 8, as to provide areas:

- a) *Where a wide range of industrial development may be located with adequate separation from residential zones; and*
- b) *Which support the needs of the local community and economy in addition to supporting the needs of activities undertaken in the Strategic Industry zone.*

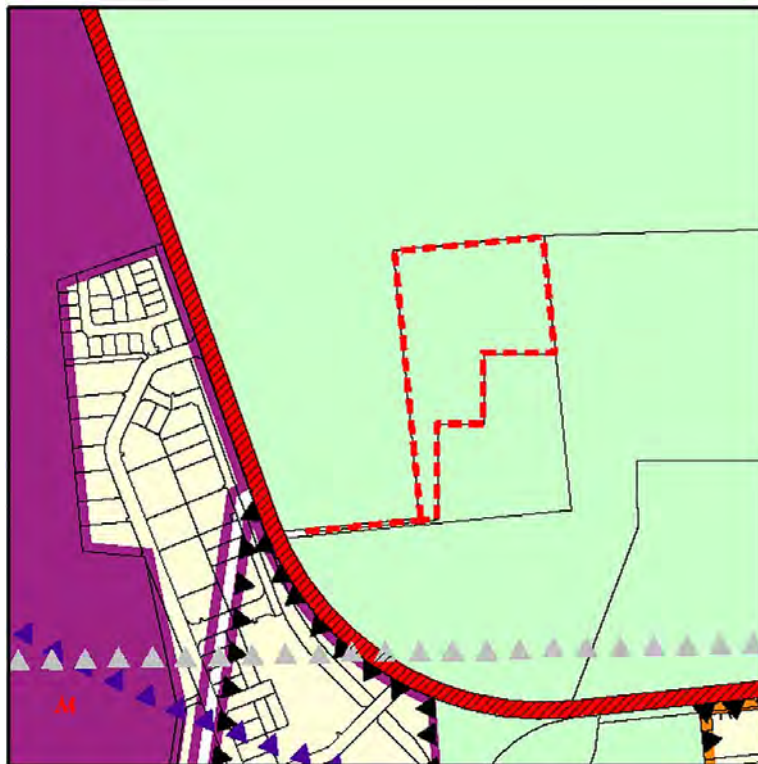
Rezoning of the land to Industry is appropriate for the following reasons:

- The land is some 1.9 kilometres from the nearest urban development or residential zone, ensuring adequate separation between land uses.
- The land is currently underutilised and more appropriately used for industrial land supply to support the needs of the community; given it has already been converted to freehold, is serviced, and has formalised road access from a **Restricted Vehicle Access ('RAV')** road, and which connects to the Burrup Strategic Industry Zone.
- The Land Supply Analysis, provided by Lucid Economics (Attachment 5) concludes that the depleting supply and strong demand for Industry zoned land in Karratha is creating a short-term shortage of Industrial land. It also concludes that this industrial land is critical to meeting the needs of existing and emerging industries associated with global decarbonisation.



SCHEME AMENDMENT MAP

CITY OF KARRATHA TOWN PLANNING SCHEME No.8 AMENDMENT No. ??



EXISTING ZONING



PROPOSED ZONING

LEGEND

LOCAL SCHEME RESERVES

STATE REGIONAL ROADS

LOCAL SCHEME ZONES

INDUSTRIAL DEVELOPMENT

RURAL

STRATEGIC INDUSTRY

URBAN DEVELOPMENT

OTHER CATEGORIES

AIRPORT OBSTACLE HEIGHT LIMITATION AREA SCA

AIRPORT NOISE RESTRICTION

ADDITIONAL USE

DA1 STRUCTURE PLAN AREAS

4 Justification

The proposed Amendment to the City of Karratha Local Planning Scheme No. 8 is appropriate and logical for the following reasons:

- The land is well located and readily serviceable. Use of the land for rural purposes is a significant underutilisation of the land and does not represent the most efficient or effective use of the land.
- The land is not of a sufficient size to enable a viable rural or agricultural operation.
- The adjacent noxious industry operations on Lot 500 significantly undermines the ability of the subject land to be developed for other more passive, but sensitive uses, given the significant land use separation buffers that extend over the entirety of the subject land.
- The balance of uses that could be reasonably approved in the proximity of the surrounding approved land uses (noxious industry) are industrial or commercial in nature.
- General industrial development is considered an appropriate transitional use to intensive industry uses (such as noxious industry), consistent with the provisions of the WAPC's State Planning Policy 4.1 – Industrial Interface.
- Economic modelling has confirmed the short-term and immediate demand for readily serviceable industrial land in the Karratha area. The current rate of consumption of General Industrial land suggests Karratha and its surrounds only has a six-year supply of development ready, serviceable industrial land. This is considered a critical shortage, particularly for an industrial based local economy where the demand profile is subject of high volatility.
- Rezoning of the land as proposed is consistent with the land use transition position for incompatible land uses, as set out in the WAPC's State Planning Policy 2.5 – Rural Planning and State Planning Policy 4.1 – Industrial Interface.
- The land is freehold and not subject to any native title obligations. The attached reporting confirms it is capable of being serviced and can therefore be zoned and developed in the short term to service the forecast shortfall of general industrial land.
- The rezoning of the land is a logical extension to the proposed industrial development contemplated by the City's Local Planning Strategy.
- The rezoning to industry does not compromise future strategic planning of the area and enhances future strategic planning as it would enable use of the existing approved access from Dampier Road into a future industrial area.
- The rezoning and development of the Gap Ridge East Industrial Estate is not anticipated to occur in the near future, given the servicing and tenure/ native challenges requiring resolution prior to any development occurring. The proposal seeks to facilitate the supply that is lost by these development delays.



4.1 Economic Demand

Lucid Economics prepared an Industrial Land Assessment in support of this proposal, included at Attachment 5 to this report. It provides an analysis of the economic landscape and the demand for Industrial land in Karratha. The analysis outlines the current limitations and future pressures on industrial land in Karratha, driven by the region's expanding economic activities and significant reliance on the mining and resources sector.

Karratha plays a central role in Australia's mining industry, hosting major projects including the Northwest Shelf and Pluto LNG facilities, as well as Rio Tinto's export operations. The report highlights that 85% of Karratha's local economy is driven by mining activities, leading to significant economic volatility that directly affects industrial land demand. Historical data indicates that the local economy has experienced periods of rapid growth and decline in line with fluctuations in mining investments. Currently, Karratha's economy is experiencing robust growth, driven by a renewed surge in mining exploration and development projects, reinforcing the urgency to expand industrial land availability.

The assessment identifies a total of 76 hectares of zoned, freehold and serviced industrial land available in Karratha, with a notable shortage of general industry land, compared to the recommended supply of 79 hectares required to meet a ten-year rolling demand. This shortfall is particularly concerning given that recent trends indicate an accelerated rate of land consumption due to increased industrial activity in the region. **The current rate of consumption suggests that all general industry land could be exhausted within six years.** potentially leading to significant constraints on economic development if no new land is made available.

Major projects, both ongoing and planned, are set to bring over \$50 billion of capital investment into Karratha over the coming decade, further intensifying the demand for industrial land. High-profile projects such as Woodside's Scarborough LNG/Pluto Train 2, the Browse LNG project, and several solar and urea plant developments are expected to generate substantial economic activity and creating a surge in demand for industrial sites. These projects not only require land during their construction phase but also lead to a permanent increase in demand for facilities and services once operational. Without adequate industrial land supply, Karratha risks missing out on these economic opportunities.

By enabling the expansion of industrial land, the scheme amendment aligns with the principle of maintaining a rolling, ten-year supply of zoned and serviced land to support sustained economic growth. This approach is crucial for preventing supply shortages, which can lead to inflated land prices and lost investment opportunities.



The findings of the Industrial Land Assessment unequivocally demonstrate the need for more industrial land. The proposal to expand general industry zoned areas is not just a response to current trends but a strategic move to future-proof Karratha's economic landscape against the cyclical nature of the mining sector. By ensuring a consistent supply of industrial land, the proposal will support long-term economic stability, attract new businesses, and secure Karratha's position as a critical hub in Australia's resource-driven economy.

[Refer Attachment 5 – Economic Demand Assessment.](#)



5 Town Planning Considerations

5.1 City of Karratha Local Planning Scheme No. 8

The subject land is currently zoned 'Rural' under the provisions of the City of Karratha Local Planning Scheme No. 8 (LPS 8). The land is also located within the Airport Noise Restriction Special Control Area (SCA) and the Airport Obstacle Height Limitation Area SCA.

Land surrounding the site (i.e., land generally east of Dampier Highway) is also zoned Rural under LPS 8. Lot 500, directly north of the subject land, is included within Appendix 4 – Additional Uses of LPS 8, which permits the use of Industry Noxious (restricted) on the site.

Dampier Highway is reserved as a Primary Regional Road. Land west of Dampier Highway, the Gap Ridge Industrial Estate, is zoned Industrial Development under LPS 8 and identified as Structure Plan Area DA24.

[Refer Figure 6: City of Karratha Local Planning Scheme No. 5.](#)

5.2 Strategic Planning Framework

5.2.1 City of Karratha Local Planning Strategy

The City of Karratha Local Planning Strategy was endorsed by the Western Australian Planning Commission ('WAPC') on 2 February 2021, for the purpose of setting out the long-term planning directions for local government over the coming 10 – 15 years. It is prepared to guide the growth and development of the municipality in accordance with a vision, objectives and goals.

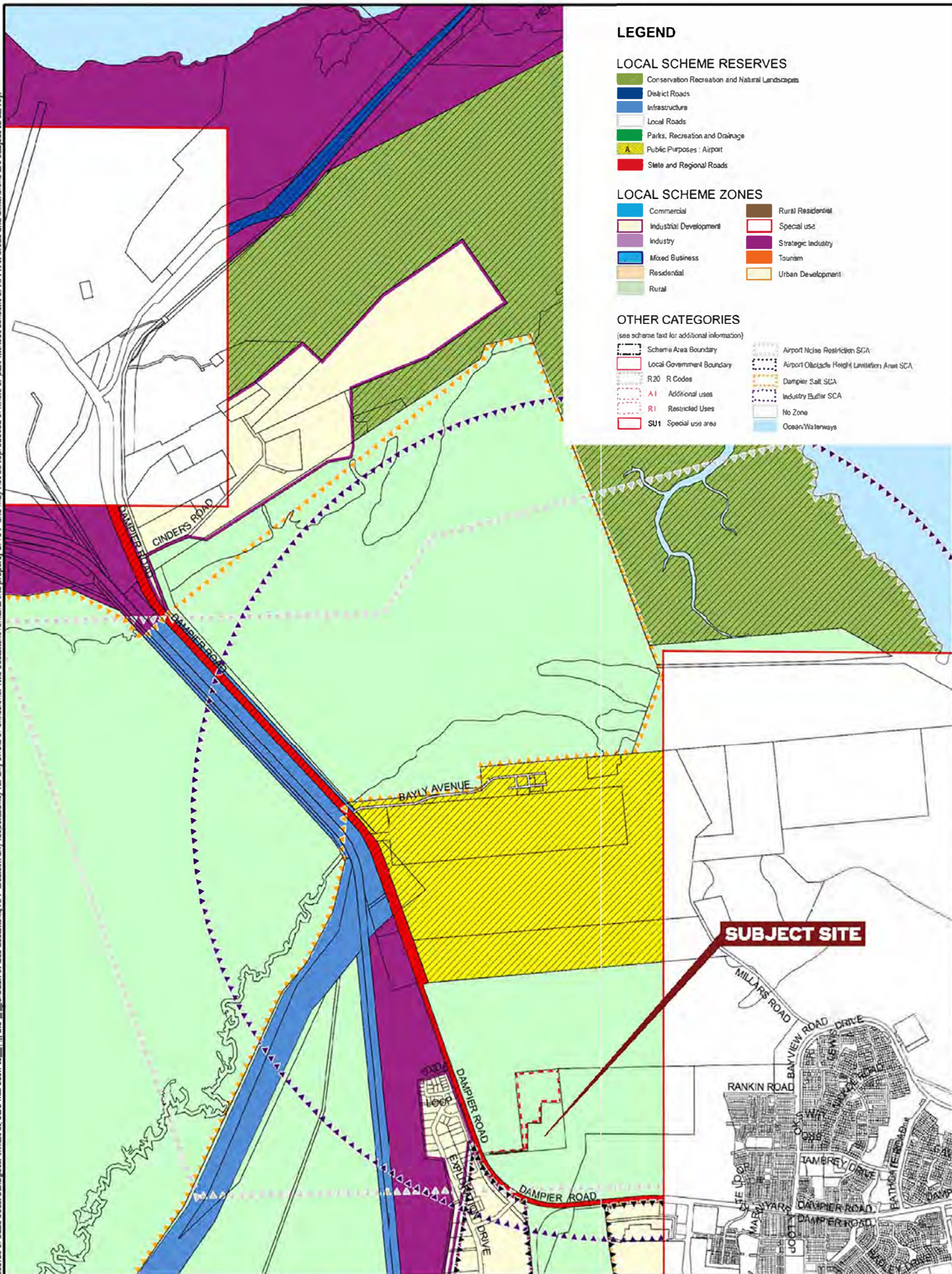
Consistent with LPS 8, the subject land is identified as Rural zone under the Local Planning Strategy; however, it is noted that land north of the site is identified for General Industrial (expansion) – the Gap Ridge North General Industrial Area. This is an important consideration in the context of the proposed scheme amendment.

[Refer Figure 7: City of Karratha Local Planning Strategy Map.](#)

Having regard to the existing Industry Noxious (restricted) use of the adjoining site, and the future contemplated General Industry use for land north of the site, the land can appropriately be rezoned to 'Industry' under LPS 8 to round out the industrial estate.

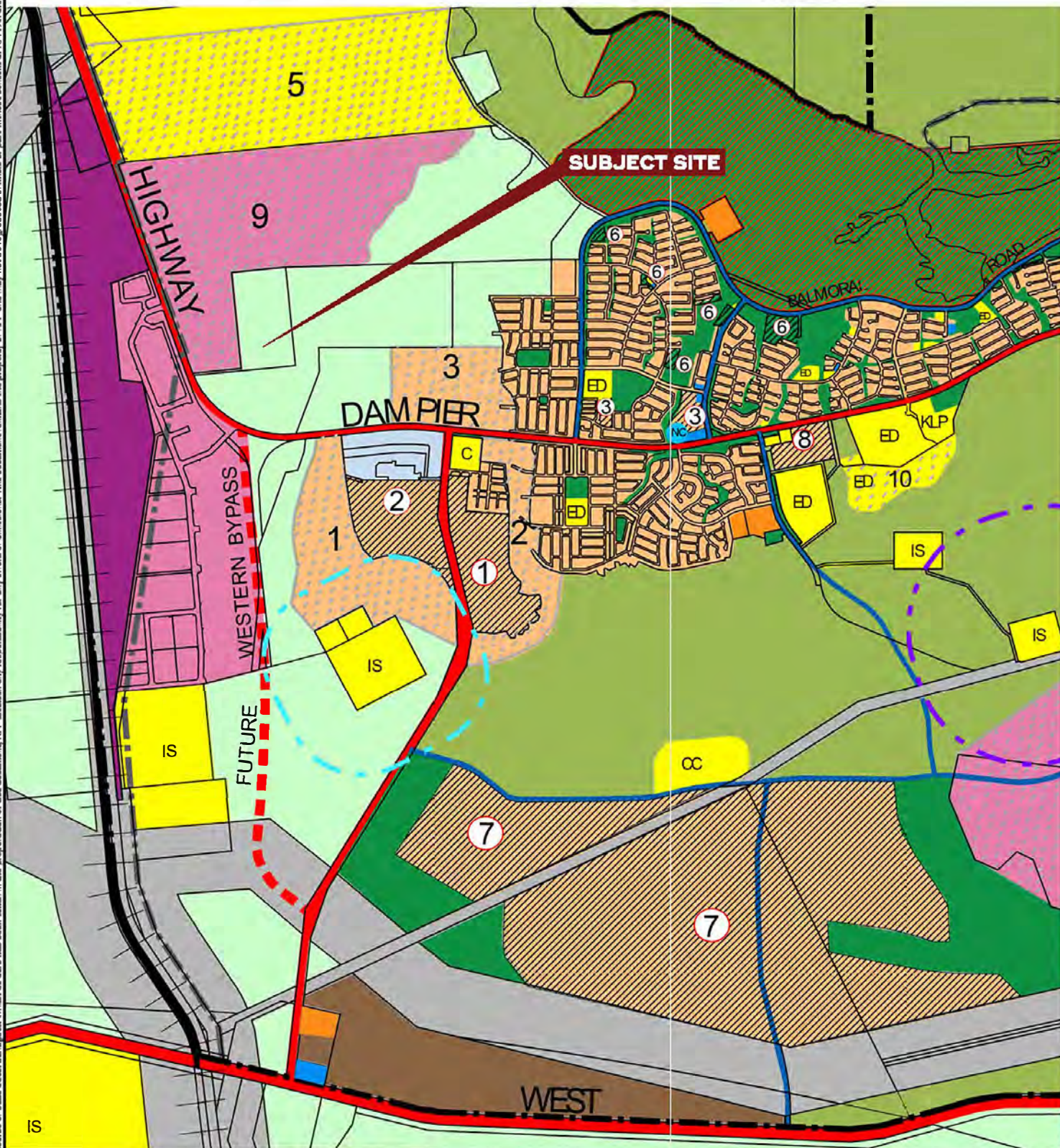
It is also noted that while the land is identified and zoned Rural, there are no existing agricultural operations occurring on the site. The site remains an isolated parcel of land in a strategic location for development (and not rural pursuits). This is particularly the case given the existing land use conflict attributed to the use of Lot 500 Dampier Road, with the separation required between this use and any viable agricultural or rural land use not being able to be achieved within the site.





LEGEND:

- | | | | |
|---|-----------------------|---|---|
| Shire Boundary | Urban | Rural Residential | Ocean |
| Railway | City Centre | Tourism | Potential Special Control Area - Wastewater Treatment Buffer 500m |
| Existing Townsite Boundary | Commercial | Environmental Conservation | Potential Special Control Area - Power Station Buffer 800m |
| Proposed Townsite Boundary | Service Commercial | Infrastructure | Proposed WWTP 500m Buffer |
| Primary Distributor | Future Light Industry | Strategic Industry | Future Urban Expansion Areas |
| District Distributor | General Industry | Public Purpose, CC - Civic & Community, C - Cemetery, ED - Education, M - Medical Services, KLP - Karratha Liesurplex, KCP - Karratha Cultural Precinct, IS - Infrastructure Services | |
| Potential Future Alignment | Rural | | |
| Neighbourhood Centre | Public Open Space | | |
| Coastal Nodes | | | |
| Area subject to Foreshore Management Plan | | | |



5.2.2 Pilbara Planning and Infrastructure Framework

The Pilbara Planning and Infrastructure Framework ('PPIF') guides regional growth by prioritising the development of industrial areas to support economic expansion. Rezoning the subject land from freehold 'Rural' to 'Industry' aligns with the Framework's objectives of creating strategically located industrial hubs to drive investment and diversify the Pilbara's economy.

This project-ready and serviceable land is consistent with the PPIF's emphasis on utilising existing infrastructure to minimise costs and environmental impact. The subject land's proximity to transportation routes and utility connections will support efficient operations, making it ideal for industries vital to the Pilbara's resource-based economy.

By providing readily available industrial land, the rezoning proposal meets the increasing demand for project-ready sites, attracting businesses that can capitalise on the region's growth potential. This proactive land use change aligns with the Framework's vision for a more resilient and diversified economic future.

5.3 State Planning Framework

5.3.1 State Planning Policy 2.5 – Rural Planning

The WAPC endorsed its State Planning Policy 2.5 – Rural Planning (SPP 2.5) in December 2016. This policy aims to guide land use planning in rural areas to avoid conflicts between rural and non-rural land uses and ensure that any changes to land use are compatible with the surrounding environment.

SPP 2.5 highlights the importance of recognising and managing land use conflicts, particularly where rural land adjoins other industrial activities. According to Clause 5.1 of SPP 2.5, "The primary objective is to protect and preserve rural land for rural purposes unless otherwise determined to be appropriate for rezoning." As outlined throughout this report, the subject land is affected by significant encroachment by noxious industrial operations and its emissions, which undermine its ability to function as a rural area.

Clause 5.5 of SPP 2.5 explicitly states that "Land use conflicts should be avoided by ensuring that only land uses compatible with the rural zone are permitted." The existence of an intensive noxious industry directly adjoining the rural parcel raises a critical concern regarding the adequacy of measures to mitigate adverse impacts on rural land use. The encroachment of these impacts clearly demonstrates that the current zoning does not effectively address the conflicts between industrial activities and rural uses.

Furthermore, Clause 6.3 of SPP 2.5 discusses the need to consider buffer areas to minimise the impact of incompatible land uses. In this



case, the buffer between the noxious industry and rural land is insufficient and the adverse effects have extended into the rural zone. The decision to permit a noxious industry in such proximity without adequate buffers is inconsistent with the objectives outlined in SPP 2.5.

The proposal to rezone the subject land to General Industry seeks to rectify the land use incompatibility and ensure the land can be appropriately developed and mitigate against the impacts of the existing operations.

5.3.2 State Planning Policy 3.7 – Planning in Bushfire Prone Areas

State Planning Policy 3.7 – Planning in Bushfire Prone Areas (SPP 3.7) outlines the measures for strategic planning, subdivision and development applications to reduce the impact of bushfire on property and infrastructure.

The subject land is identified as a Bushfire Prone Area on the Department of Fire and Emergency Services (DFES) mapping. Accordingly, a Bushfire Management Plan (BMP) is required to support any future planning and development of the subject land, prepared in accordance with the requirements of SPP 3.7. A BMP has therefore been prepared by Linfire Consultancy in support of this Scheme Amendment.

[Refer Attachment 6 – Bushfire Management Plan.](#)

The outcomes of the BMP demonstrate that, as the development of the site progresses, it can achieve compliance with each of the four bushfire protection criteria outlined in the Appendices to the Guidelines for Planning in Bushfire Prone Areas. This is discussed further in Section 6.5 of this report.

5.3.3 State Planning Policy 4.1 – Industrial Interface

State Planning Policy 4.1 – Industrial Interface ('SPP 4.1') is prepared to provide guidance to decision makers with respect to industrial development and sets out the appropriate management strategies for any potential land use conflict. In this regard, it seeks to achieve

- a) *appropriate siting and long-term operational certainty for industry;*
- b) *appropriate siting of sensitive land uses for the protection of health and amenity for people and the environment; and*
- c) *sustainable land use planning and development outcomes consistent with broader State strategic planning objectives.*

Clause 6.1.3 of the Policy relates to Compatible zones, reserves and land uses. It states as follows:

“To ensure industrial impacts are avoided, mitigated or managed, where necessary, compatible zones, reserves and land uses should be provided to allow for a gradual land use transition between industrial and sensitive land uses.”



and

“Where it is considered appropriate and desirable for industrial land to have an interface with rural zoned land, each instance should be considered on a case by case basis and also be guided by SPP 2.5. The interface must ensure existing rural operations can continue to function and any potential impacts on the health and amenity of people and the environment are appropriately avoided, mitigated or managed.”

This proposal is brought about, in part, because of the existing and operating noxious industry land use on the adjacent Lot 500 Dampier Road, which accommodates the Karratha Environmental Crushing operation. Lot 500 is a significant, industrial operation and registered Prescribed Premises (Category 13) under the *Environmental Protection Authority 1986*.

It is considered that the development on the adjacent lot is incompatible with any agricultural (rural) land use, and significantly erodes the ability of the landowner to develop it as such. We submit that the appropriate transitional measures were not considered during the consideration of this proposal, and therefore, rezoning of the land to General Industry is proposed to the compatibility of land uses moving forward.

The proposed amendment is consistent with the objectives and policy measures of SPP 4.1.

5.3.4 EPA Guidance Note No. 3 – Separation Between Industrial and Sensitive Land Uses

The Environmental Protection Authority (‘EPA’) published its Guidance Note No. 3 regarding the Separation Distances Between Industrial and Sensitive Land Uses in June 2005. The purpose of the Guidance Note is to set out the generic minimum separation distances between types of industrial activity and sensitive development to prevent land use conflict from occurring.

Appendix 1 of the Guidance Note sets out the generic separation distances for a range of industrial uses. It is noted that the Crushing of Building Material is listed, as follows:

Table 1: EPA Guidance Note No. 3 - Separation Distances

Industry	Description	Impacts					Buffer Distance
		Gas	Noise	Dust	Odour	Risk	
Crushing of Building Material	Crushing or cleaning of waste, building, or demolition material		X	X			1000 metres

The required separation buffer of 1,000 metres significantly encroaches into the subject land and erodes the usable portion of the land and



impacts the existing residential dwelling on the site. Rezoning the land to General Industry is an appropriate and WAPC supported transitional use to that on Lot 500 and ensure that no person could reside in an area that is considered to have unsafe impacts from the adjacent industrial operation.



6 Environmental Attributes, Impacts & Management

The following section provides a summary of the environmental site conditions and constraints based on the findings of the Environmental Assessment Report, prepared by Western Environmental in support of this Request.

[Refer Attachment 7 – Environmental Assessment Report.](#)

6.1 Topography & Soils

The subject land is relatively flat, with slight undulations, with the surrounding land generally at approximately 10 metres above the Australian Height Datum ('AHD'). The geology consists of two primary units: clay, silt, and sand found on floodplains, and a combination of clay, silt, sand, and gravel within fluvial channels.

The area falls within the Horseflat system, characterised by gilgaied clay plains that support the Roebourne Plains grassland and minor grassy snakewood shrublands. Acid Sulphate Soil ('ASS') risk mapping indicates that the eastern portion of the site has a 'moderate to low' risk of ASS occurring within 3 metres of the natural soil surface, while the remainder of the site has no significant ASS risk.

6.2 Biodiversity & Natural Area Assets

6.2.1 Flora

The vegetation on the subject land is mapped as the Abydos Plain - Roebourne vegetation association, which retains approximately 97.29% of its original extent in the region. While no records of Threatened Flora species were identified on the site itself, several Priority flora species were assessed as having a 'medium' or 'high' likelihood of occurring in the area. However, a Complete Likelihood of Occurrence Assessment has determined that there is a zero chance of occurrence on the site for any Threatened Ecological Community or Priority Ecological Community, having regard to historical clearing and use of the site.

6.2.2 Fauna

The site supports approximately 7 hectares of remnant native vegetation, which could potentially provide some habitat value for terrestrial fauna. Although no conservation-significant fauna species have been directly recorded on the site, a total of 14 species were identified as having a 'medium' to 'high' likelihood of occurrence in the broader area. These species are generally migratory or have extensive ranges, indicating that the site is likely to serve only as a supporting or non-core habitat rather than a crucial ecological zone; however it is



noted that the site would not be considered favourable having regard to the adjacent industrial operation located to the north of the site.

6.3 Heritage

No Aboriginal or European heritage sites have been identified within the boundaries of the subject land.

There are four Aboriginal heritage places are located within 2 kilometres of the site:

- Registered Place ID 9601, Thirteen Mile Well - Artefacts / Scatter, 450 m southeast of the Site.
- Registered Place ID 10963, Powerline Survey 054 - Artefacts / Scatter; Engraving; Grinding areas / Grooves, 1.3 km west of the Site.
- Registered Place ID 31573, Sub-surface cultural material; artefacts/scatter; quarry, 1.1 km southeast of the Site.
- Registered Place 31565, Sub-surface cultural material; artefacts/scatter; quarry, 1.2 km southeast of the Site.

The proposed development will have no impact on any registered Aboriginal Heritage Place.

The closest European heritage feature is the De Grey - Mullewa Stock Route, situated approximately 5.3 kilometres to the south of the site. This distance suggests that the site is unlikely to impact any known cultural or historical heritage values.

6.4 Hydrology

6.4.1 Groundwater

The subject land is located within the Pilbara Groundwater Area, underlain by the Pilbara - Fractured Rock aquifer. Fractured rock aquifers typically have complex structures that influence water availability, recharge, and storage. No groundwater abstraction or dewatering is planned for the site, and there is currently no existing groundwater extraction licences associated with the property.

6.4.2 Surface Water

There is no natural surface water features present on the site itself. The closest watercourse is an unnamed stream located approximately 240 metres to the east of the site. This watercourse connects to larger systems in the region, including Lulu Creek, Cockatoo Creek, and the Maitland River. Additionally, the site does not intersect any ecologically significant wetlands or public drinking water source areas, with the nearest notable wetland, Millstream Pools, located about 140 kilometres to the south.



6.5 Bushfire Risk

The subject land is identified as a 'Bushfire Prone Area' as designated on the Department of Fire and Emergency Services (DFES) Map of Bushfire Prone Areas. Accordingly, a Bushfire Management Plan (BMP) has been prepared by Linfire in support of this Request to the Local Planning Scheme No. 8. The BMP is prepared to address the requirements of SPP 3.7 and the associated Guidelines for Planning in Bushfire Prone Areas.

[Refer Attachment 6 – Bushfire Management Plan.](#)

The BMP confirms the risk of bushfire is capable of being appropriately managed to achieve compliance with the Guidelines. The main considerations relating to bushfire management of the site are set out in [Table 2](#).

[Table 2: Bushfire Protection Criteria – Compliance Table.](#)

Bushfire Protection Criteria	Proposed Bushfire Management Strategies
Element 1: Location	The post-development Bushfire Hazard Level ('BHL') assessment demonstrates that on completion of the development, the land will comprise a Moderate and Low bushfire hazard level.
Element 2: Siting & Design	<p>Future proposed habitable development to be located appropriately to achieve a BAL-29 or less rating. This separation can be achieved by:</p> <ul style="list-style-type: none"> - Roads/ driveways; - Firebreaks; - Building setbacks; - Targeted onsite landscaping; - Strategically located / vegetated drainage basins to reduce separation requirements. <p>This is required to be identified and assessed by a subsequent, more detailed BMP, at each future stage of planning (development approval / subdivision).</p>
Element 3: Vehicular Access	<p>No public roads are proposed as part of this development. The development will be accessed via the existing access to Dampier Road which is compliant with the requirements of SPP 3.7.</p> <p>The existing battle-axe access to the site will be upgraded as required by Guidelines.</p>
Element 4: Water	The land will be connected to reticulated water supply.



7 Servicing & Infrastructure

7.1 Traffic & Access

The amendment seeks facilitate a change in zoning to accommodate new industrial activities that are expected to generate and attract a significant volume of traffic.

Access to the subject land is currently via an existing battle-axe leg to Dampier Highway. The landowner has entered an access agreement with the adjoining lessees of Lot 500, permitting access to the site via its constructed driveway access.

PTG Consulting prepared the attached Traffic Impact Assessment ('TIA') in support of the proposal, prepared in accordance with the WAPC's Assessment Guidelines for Development (Volume 2). The TIA concluded:

- The proposal is anticipated to generate approximately 880 additional trips per day (or 88 trips during the peak hours).
- Dampier Road is an existing Restricted Access Vehicle ('RAV') network, appropriate for accommodating the type of vehicles proposed by the development.
- High level assessment of the intersection with Dampier Road indicates that a short Auxiliary left-turn lane may be warranted for the approach from the site. The need for this is marginal and should be determined at planning approval or subdivision stage based on a specific proposal.
- The proposal is anticipated to generate a 'low to moderate' volume of new trips and there is no material impact to the road safety anticipated.
- Overall, the proposal is considered low impact, with no material impact on any surrounding transport network anticipated.

Further traffic reporting will be provided in support of a future development application with detailed analysis of anticipated traffic movements and access arrangements.

[Refer Attachment 8 – Traffic Impact Assessment.](#)

7.2 Civil Servicing

An Engineering Servicing Report has been prepared in support of the proposed Amendment Request and is summarised below.

[Refer Attachment 9 – Engineering Servicing Report.](#)

7.2.1 Wastewater

The site has access to an existing Water Corporation gravity sewer located on the eastern verge of Resource Road. A private sewer pump



station and extension of gravity sewer mains may be required to facilitate future development.

7.2.2 Water

The closest water main is located approximately 120 meters from the lot boundary on the western verge of Resource Road. A water main extension and a new water meter will be needed to service new development. This will be detailed during future design.

7.2.3 Power

Horizon Power infrastructure exists within the site boundary, including an overhead HV distribution service that terminates at a pole-top transformer. Upgrades to the transformer and infrastructure may be required, depending on the development scale.

7.2.4 Telecommunications

Existing Telstra and NBN services are available on-site, with the site also located within a Telstra 4G coverage area. Depending on the type of industrial development contemplated, an upgrade to the infrastructure from Dampier Road may be necessary. This will be further detailed at Development Application stage.

7.3 Drainage Strategy

Porter Consulting Engineers has prepared the attached Stormwater Management Plan ('SWP') in support of this proposal. It is designed to manage both onsite and external stormwater flows effectively, ensuring compliance with the City of Karratha drainage requirements. The proposed approach includes diverting external flows to the south of the site boundary and providing sufficient storage to control runoff to pre-development levels for a 1% Annual Exceedance Probability ('AEP') flood event. Key elements of the strategy involve setting internal road and building levels above the 1% AEP flood levels and implementing treatment for the initial 15mm of runoff from road areas to manage water quality.

The design also addresses erosion control and flow velocities, with specific measures in place at outlet locations and open swale drains. An overflow system will be incorporated to handle extreme storm events, ensuring that excess flows are safely managed without impacting the site. The drainage plan anticipates minor localised ponding during significant storms, which will be managed through routine maintenance. The proposed layout aligns with the City of Karratha's guidelines, raising lot levels to mitigate flood risks and incorporating culverts to facilitate efficient water conveyance towards 7 Mile Creek.

[Refer Attachment 10 – Stormwater Management Plan.](#)



8 Conclusion

This request to amend the City of Karratha Local Planning Scheme No. 8 seeks to rezone Lot 1 Dampier Road, Gap Ridge from 'Rural' to 'Industrial'.

The proposal to amend LPS 8 is logical and provides for the orderly 'rounding out' of the contemplated expansion of the Gap Ridge Industrial Estate, ensuring that the land, which currently cannot be developed for any viable agricultural use, can contribute to the industrial offerings of the City of Karratha.

As outlined during the body of this submission, the proposal is brought about in response to the existing and operating Noxious Industry development on the land directly north of the site (Lot 500 Dampier Road). Lot 500 accommodates a licensed Prescribed Premises operation for environmental crushing and screening of building material and would normally be protected by land use buffers. This has not been the case in this instance, with the required buffers extending into the subject land and diminishing the developable portion of the land and impacting the existing residential development on the site. Rezoning the land to General Industry is considered an appropriate land use transition from intensive industry, as set out in the WAPC's SPP 4.1.

In the broader, Karratha context, the subject land represents one of the limited project ready, freehold lots that is strategically located to accommodate industrial development in an appropriate and considered location. It is able to be brought online to service a forecast demand in the short term, and in a shorter timeframe than other, contemplated areas in the City.

On this basis, it is considered that the proposed Scheme Amendment is consistent with the relevant state planning framework, and it is requested that the City of Karratha initiates the requested amendment to the Local Planning Scheme No. 8.



Attachment 1:

DA23-146 – Temporary Land Use Approval



RFF Pty Ltd
PO Box 88
Karratha WA 6714

Dear Madison,

APPLICATION FOR DEVELOPMENT APPROVAL DA23-146 - TEMPORARY STORAGE AND LAY DOWN AREA - LOT 1 DAMPIER ROAD, GAP RIDGE WA 6714

The City of Karratha's decision on your application for development approval is attached.

Please note, this is not a Building Permit, Health Approval or Crossover Approval. The attached Decision Notice generally advises of other approvals if required.

City officers can assist you with any specific building, environmental health or technical/engineering aspect of your proposal. The following teams can be contacted for advice:

Building: (08) 9186 8555 / building.user@karratha.wa.gov.au

Environmental Health: (08) 9186 8555 / environmentalhealthteam@karratha.wa.gov.au

Technical Services: (08) 9186 8082 / tech.request@karratha.wa.gov.au

Should you have any questions in relation to this decision or wish to discuss any related matters please contact Zane Zaidiah on 9186 8509 or at zane.zaidiah@karratha.wa.gov.au.

Yours sincerely,



Jerom Hurley
MANAGER APPROVALS AND COMPLIANCE

12 September 2024

Enc.: Decision Notice and Endorsed Plans



LOCAL PLANNING SCHEME NO. 8 DECISION ON APPLICATION FOR DEVELOPMENT APPROVAL

APPLICATION: DA23-146

DATE OF DECISION: 12 SEPTEMBER 2024

LOCATION: LOT 1 DAMPIER ROAD, GAP RIDGE WA 6714

LAND PARCEL: LOT 1 ON DEPOSITED PLAN 400638

OWNER: GREEN GRID ENERGY PTY LTD
17 BURKE CRESCENT
DAMPIER WA 6713

APPLICANT: RFF PTY LTD
PO BOX 88
KARRATHA WA 6714

PROPOSED DEVELOPMENT: TEMPORARY STORAGE AND LAY DOWN AREA

PROPOSED USES: STORAGE FACILITY/ DEPOT/ LAY DOWN AREA

Approval to commence or carry out development in accordance with the provisions of the City of Karratha Local Planning Scheme No.8 [LPS8], the application lodged 10/11/2023 and the attached stamped plans is: -

GRANTED subject to the following conditions: -

1. The approved development is to be undertaken in accordance with the attached stamped approved plans, and these plans shall not be altered without the prior written consent from the City of Karratha.
2. This approval is time-limited for a period of five (5) years only from the date of the determination notice, with the approved use "**Storage Facility/ Depot/ Lay Down Area**" to cease thereafter.
3. An Operational Management Plan of the site shall be submitted and approved by the City of Karratha prior to commencement of development, and once approved by the City of Karratha, it shall be implemented at all times to the satisfaction of the City of Karratha.
4. Suitable material shall be installed as per the approved plans to the internal road and to the designated storage and laydown areas.
5. Storage and stockpiling of any material shall not exceed the height of 5m.
6. Suitable vehicle access arrangements for this site from Dampier Road to the satisfaction of the City of Karratha.

7. Stormwater shall be discharged in accordance with the Stormwater Management Plan prepared by Porter Consulting Engineers (Doc Number RT/L004.24) and in a manner so that there is no discharge onto adjoining properties. At the point/s of discharge, erosion protection is to be installed to the satisfaction of the City of Karratha.
8. Any external lighting shall be installed and maintained so as to avoid causing distraction and/or nuisance to passing traffic and neighbouring properties.
9. The ongoing use of the site and approved development shall not cause erosion or degradation to the subject site or surrounding land. Should the City deem it necessary to undertake mitigation works to address erosion or degradation associated with this development, such works shall be in accordance with plans, specifications and works schedules to be submitted to the City of Karratha for approval and be undertaken at the proponent's cost, to the satisfaction of the City of Karratha.

Advice Notes

- a) Any future proposed works may require development approval. Prior to any future development/works occurring, the City's Planning Services should be consulted to determine if further development approval is required.
- b) This approval is for the storage/ laydown of materials only and does not grant approval for any other industrial/commercial operations to be conducted on-site.
- c) There is a process that is underway to remove the Restrictive Covenant that is registered against the certificate of title for this lot. Please contact the Department of Planning, Lands and Heritage if you would like further information about the process for removal of the Restrictive Covenant and/or any implications for use of the land.
- d) In regard to Condition 3, the Operational Management Plan shall outline the following as a minimum:
 - Management of storage and stockpiling of material on-site;
 - Location of designated storage and laydown areas across the site within designated allotments;
 - Management of dust;
 - Management and protection of stored materials on-site during cyclone events;
 - Community consultation and complaints management; and
 - Any other matter that may impact community safety, security and amenity or the surrounding environment.
- e) In regard to Condition 6, if construction of vehicle access between Dampier Road and the property is required in the access leg for Lot 1, then the City's Technical Services must approve the specifications for that access prior to works commencing.
- f) Storage that falls within the definition of a Noxious Industry is not permitted on this land by City of Karratha Local Planning Scheme No.8.
- g) Storage of dangerous goods and/or chemicals must be in accordance with the requirements under the *Dangerous Goods Safety Act 2004*, and other associated legislative requirements and/or codes of practice.
- h) It is the responsibility of the proponent to ensure that development setbacks correspond with the legal description of the land. This may necessitate re-surveying and re-pegging the site. The City of Karratha will take no responsibility for incorrectly located buildings.
- i) It is the responsibility of the proponent to search the title of the property to ascertain the presence of any easements and/or restrictive covenants that may apply.

- j) Any signage may require the proponent to obtain a separate Development Approval from the City of Karratha should the signage not meet the exemption requirements as stated in DP22 – Advertising Signs.
- k) The proposed development must maintain compliance with the *Environmental Protection (Noise) Regulations 1997* at all times to the satisfaction of the City of Karratha.

Note 1: If the development the subject of this approval is not substantially commenced within a period of 2 years, or another period specified in the approval after the date of the determination, the approval will lapse and be of no further effect.

Note 2: Where an approval has so lapsed, no development must be carried out without the further approval of the local government having first been sought and obtained.

Note 3: If an applicant or owner is aggrieved by this determination there is a right of review by the State Administrative Tribunal in accordance with the Planning and Development Act 2005 Part 14. An application must be made within 28 days of the determination.



Jerom Hurley
MANAGER APPROVALS AND COMPLIANCE

CITY OF KARRATHA

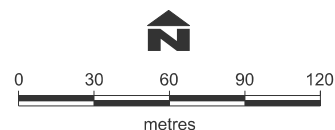
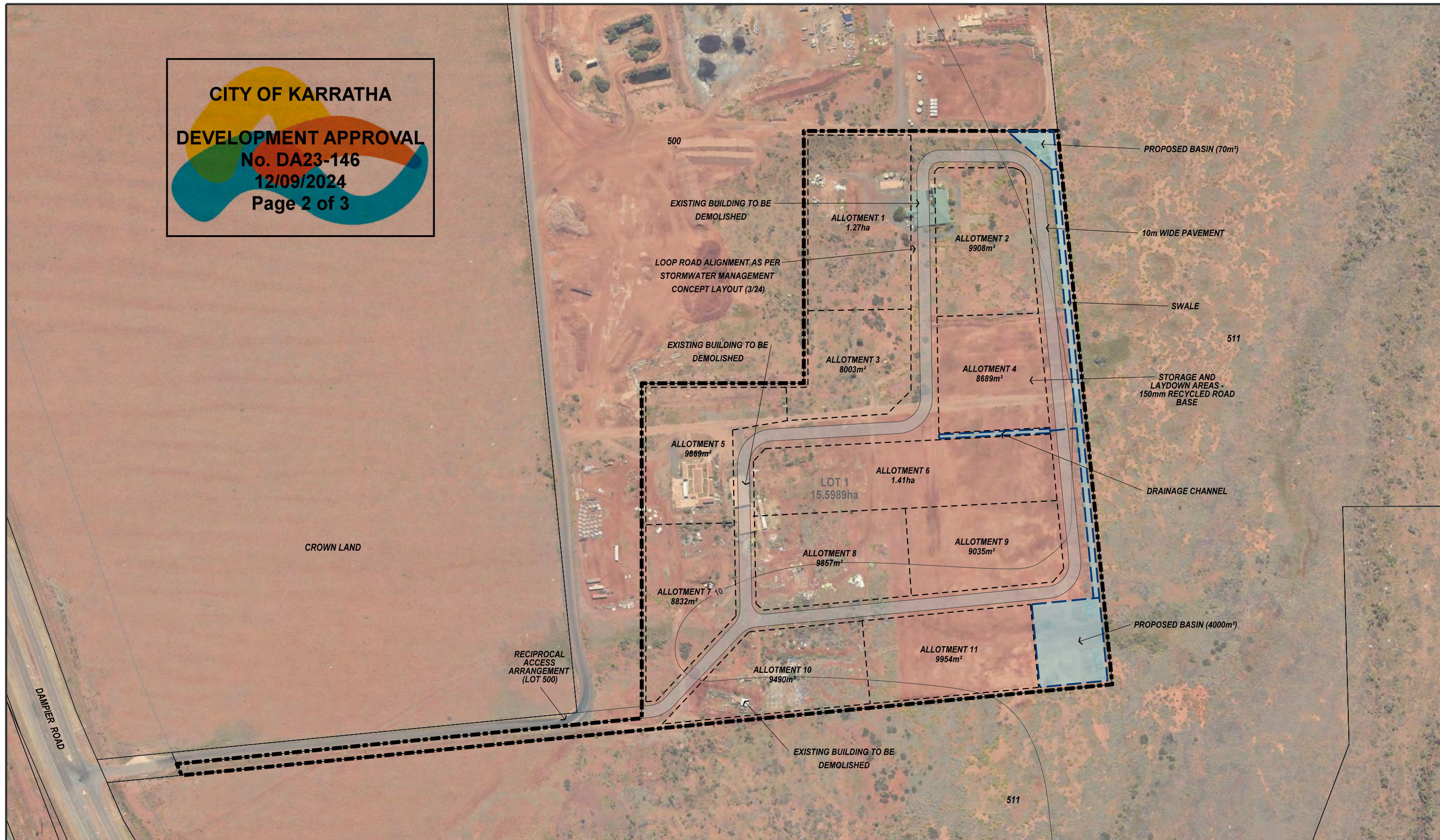
DEVELOPMENT APPROVAL

No. DA23-146

12/09/2024

Page 1 of 3





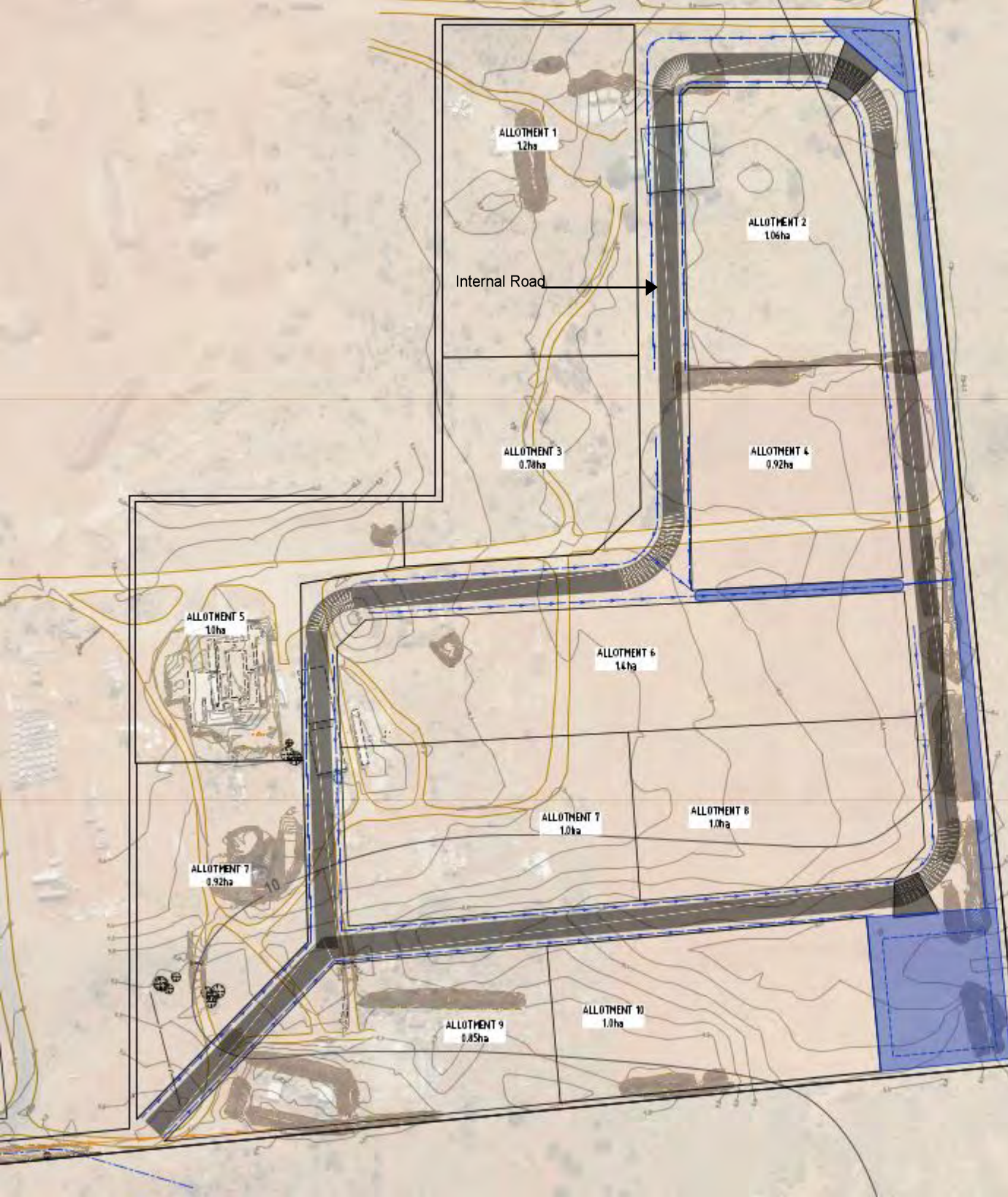
LEGEND

- SUBJECT LOT
- ALLOTMENTS
- DRAINAGE BASIN / SWALE

DEVELOPMENT SITE PLAN LOT 1 DAMPIER ROAD, GAP RIDGE (KARRATHA)

Client: -
Date: AUGUST 2024
Scale: 1:3,000@A3
Revision No: B
File No: CNCPT-1-1-004





Attachment 2:

Request to Lift Restrictive Covenant





Request to Lift Restrictive Covenant

Lot 1 on Deposited Plan 400638
Dampier Highway, Gap Ridge

Document Control

Request to Lift Restrictive Covenant – Lot 1 on DP 400638

Client: Green Grid Energy Systems

Client Contact: Jordan Ralph

Version Control

Version	Date	Authorisation
VO – Draft	22/01/23	MM
V1	29/01/23	OH



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1 INTRODUCTION

RFF Pty Ltd acts on behalf of the landowner of Lot 1 Dampier Road, Road, Gap Ridge ('the subject land'). This report is prepared in support of a formal request to the Department of Planning, Lands and Heritage ('DPLH') to lift the existing Restrictive Covenant on the title of the subject land, which limits the use of the land to Aquaculture. The Covenant (M757761) was registered pursuant to Section 15 of the *Land Administration Act 1997* in September 2014.

Refer Attachment 1 – Transfer of Land Document (M757761).

The Proponent holds long term development aspirations for the site to form part of the contemplated Gap Ridge East Industrial Park, which is intended to provide for the short to medium term supply of Industrial zoned land within the City of Karratha. In this regard, the land is strategically located within proximity to the existing (and nearing capacity) Gap Ridge Industrial Park, and the Burrup and Maitland Strategic Industrial areas. In this way, the proposed development would further contribute to agglomeration of industrial activity and support the growth of activity within the strategic industrial areas.

The purpose of this report is to outline the proposed development of the land, and to provide justification for the request to lift the covenant. In summary, the proposal is justified because:

- The size of the land, and the adjacent existing noxious land uses, prohibit any meaningful or viable aquaculture operation that can exist on the land, particularly given the standard separation distances for the crushing operations that currently occur on land directly adjacent the site, and which extend well beyond the boundaries of that landholding.
- Preliminary due diligence and feasibility over the site has determined that there is substantial upside opportunity for medium-term industrial development associated with a number of resource projects currently in the pipeline. This requires forward planning by the property sector to accommodate the demand.
- Lifting the restrictive covenant over the subject land will further stimulate economic development in the City of Karratha and promote diversification of activity in the region. Enabling the timely development of commercial and industrial land will support local investment on a site that is strategically located, service ready and would otherwise remain vacant.
- Having regard to the existing economic climate within the City of Karratha and the Pilbara region more broadly, and the strategic location of the subject land, use of the land for Aquaculture represents a considerable underutilisation of well located, serviceable land.
- Consistent with the WAPC's Fact Sheet for Restrictive Covenants, covenants that seek to control the use of land are considered inappropriate. It is the Proponent's position that the most appropriate mechanism for controlling land use is the City of Karratha local planning framework.

- The City's strategic planning framework identifies the extension of the Gap Ridge Industrial Park directly north of the subject land. Use of the land for Aquaculture is not considered an appropriate transitional land use adjacent industrial land.
- The subject land, and the Pilbara Region more broadly, are not identified as strategic Aquaculture development zones within the Department of Primary Industries and Regional Development (DPIRD) Aquaculture Development Plan for Western Australia (2020). We submit that any new aquaculture operation would not receive the necessary support to warrant funding of a new operation.
- Lifting of this covenant is supported by the City of Karratha.

This request is made in accordance with the Western Australian Planning Commission ('WAPC') Fact Sheet: Restrictive Covenants.



2 BACKGROUND & CONTEXT

The subject land was historically identified as Crown Land (LR3123/494) and subject to a lease. The (at the time) lessees were granted a Freehold Title in 2014 (2848/927) via excision from the lease, and at which time a Restrictive Covenant was imposed requiring the land to use used only for Aquaculture.

The Proponent (Green Grid Energy) subsequently purchased the land in 2023 from the previous landowner, due to the unviable nature of aquaculture at the site in the current economic climate. The Proponent purchased the site with the intention of developing a solar / renewable energy project, however the recently approved conflicting land use (Karratha Environmental Crushing) has since rendered the project unfeasible. As discussed in the balance of this report, this operation has serious implications (environmental emissions) for an aquaculture operation at the site.

More broadly, there is a developing demand for service ready industrial land within the City of Karratha. We understand that the existing Gap Ridge Industrial Estate (west of the subject land) has limited available supply that is anticipated to reach capacity in the coming 12 – 18 months. The subject land is strategically located to form part of the contemplated Gap Ridge East Industrial Area (as identified on the City of Karratha Local Planning Strategy), and the Proponent intends to progress the planning works to formalise this.

A lack of appropriately zoned and planned industrial land often results in illegal laydown activities and industrial operations occurring, particularly in economic upturns (such is beginning to occur in the City). This request seeks to be on the front foot of this occurring.

3 SITE DETAILS

3.1 SITE DETAILS

The subject site comprises a single landholding, formally described as Lot 1 on Plan 400638, contained within Certificate of Title 2848, Folio 927.

This request seeks to remove the Covenant listed at Part 1 of the Second Schedule on the Certificate of Title. The Covenant is detailed on the transfer of land document M757761, as follows:

1. *The Transferee for itself, its successors in title and the registered proprietor from time to time of the land described in the front page of this Transfer and each and every part of it (Land) pursuant to section 15 of the Land Administration Act 1997 (LAA) (Covenantor) covenants and agrees with the Transferor as covenantee (Covenantee) as follows:*
 - a. *Not to use the Land for any purpose other than and incidental to Aquaculture (Covenant).*

Refer Attachment 2 – Certificate of Title.

3.2 LOCATION

The subject site is located within the locality of Gap Ridge, immediately abutting the strategic Gap Ridge North General Industrial Area, within the City of Karratha. The Karratha City Centre is located approximately 7.5 kilometres east of the subject site, and the Karratha Airport is located approximately 2.5 kilometres north of the site.

The subject site comprises an area of approximately 15.59 hectares and is accessed via a 10.5-metre-wide battle axe driveway to Dampier Road. The land abuts other rural landholdings to all boundaries.

The subject site adjoins a substantive extractive industry and concrete recycling operation which emits numerous emissions by way of noise, dust and light which affect the amenity of the subject site to be used for rural purposes.

The subject site contains an existing dwelling and associated outbuildings.

Refer Figure 1 – Site Plan and Attachment 3 – Feature Survey.

3.3 SURROUNDING LAND USES

Land directly north of the subject land, Lot 500 Dampier Road, accommodates an Industry Noxious (restricted) operation by Karratha Environmental Crushing. The operation includes crushing and processing of building material for commercial sale as recycled bitumen and asphalt. Part of this operation also includes stockpile of material throughout the process. Prevailing westerly winds have a significant and deleterious impact on the subject land, in terms of dust and noise. This is discussed further in Section 4.3.3.



Land west of Dampier Road comprises the Gap Ridge Industrial Estate, which comprises light and general industrial development. RFF understands that there is limited land supply available left in this to service the City of Karratha in the short term, with future plans for expansion to east of Dampier Highway (north of the subject land).

Karratha Airport is located approximately 2.5 kilometres north of the subject land, with height and noise limits affecting the subject land and preventing sensitive development. Further north-west, a number of salt mining facilities exist. Residential development (the suburb of Nickol) exists 1.8 kilometres east of the subject land.

Refer Figure 2 – Location Plan.





Figure 1 – Site Plan.

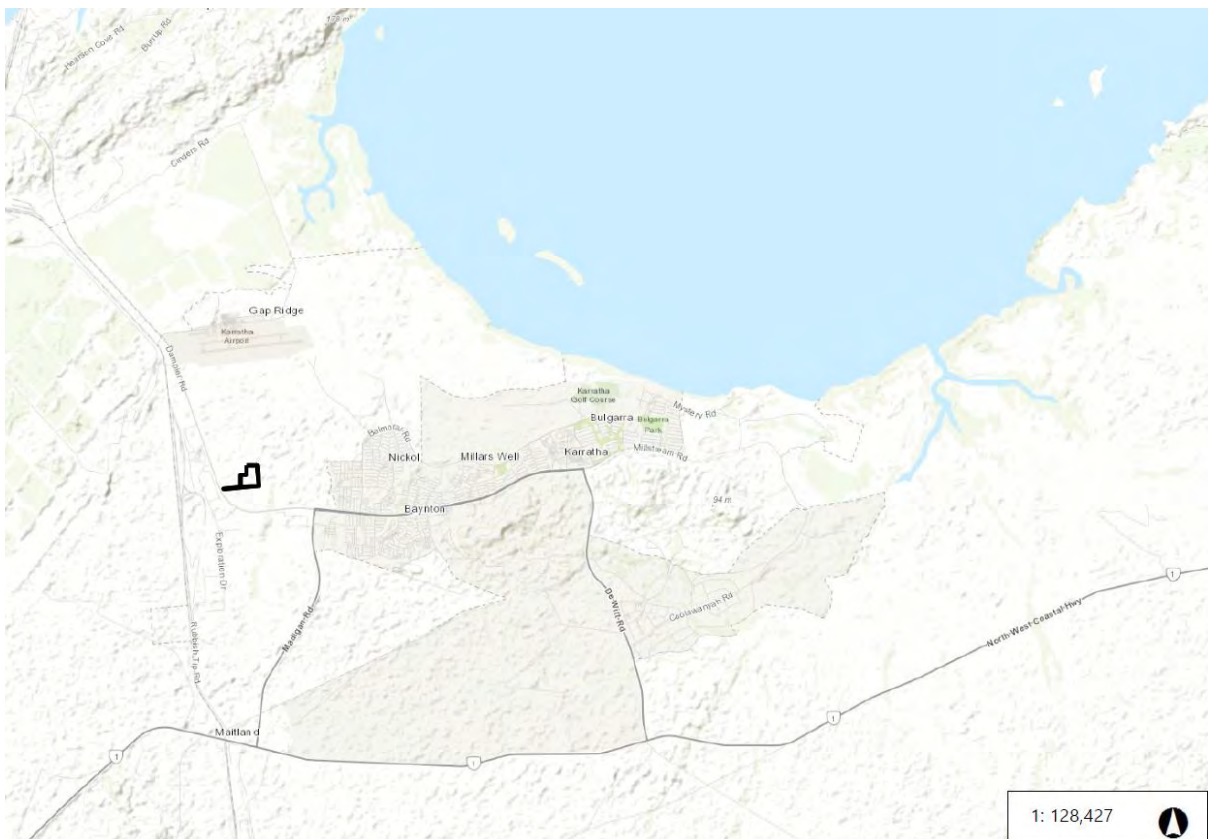


Figure 2 – Location Plan.

4 TOWN PLANNING FRAMEWORK

4.1 CITY OF KARRATHA LOCAL PLANNING SCHEME NO. 8

The subject land is currently zoned 'Rural' under the provisions of the City of Karratha Local Planning Scheme No. 8 ('LPS 8'). The land is also located within the Airport Noise Restriction Special Control Area (SCA) and the Airport Obstacle Height Limitation Area SCA.

Land surrounding the site (i.e., land generally east of Dampier Road) is also zoned Rural under LPS 8. Lot 500, directly north of the subject land, is included within Appendix 4 – Additional Uses of LPS 8, which permits the use of Industry Noxious (restricted) on the site.

Dampier Road is reserved as a Primary Regional Road. Land west of Dampier Road, the Gap Ridge Industrial Estate, is zoned 'Industrial Development' under LPS 8 and identified as Structure Plan Area DA24.

Refer Figure 3 – Local Planning Scheme No. 8 Zoning Plan.

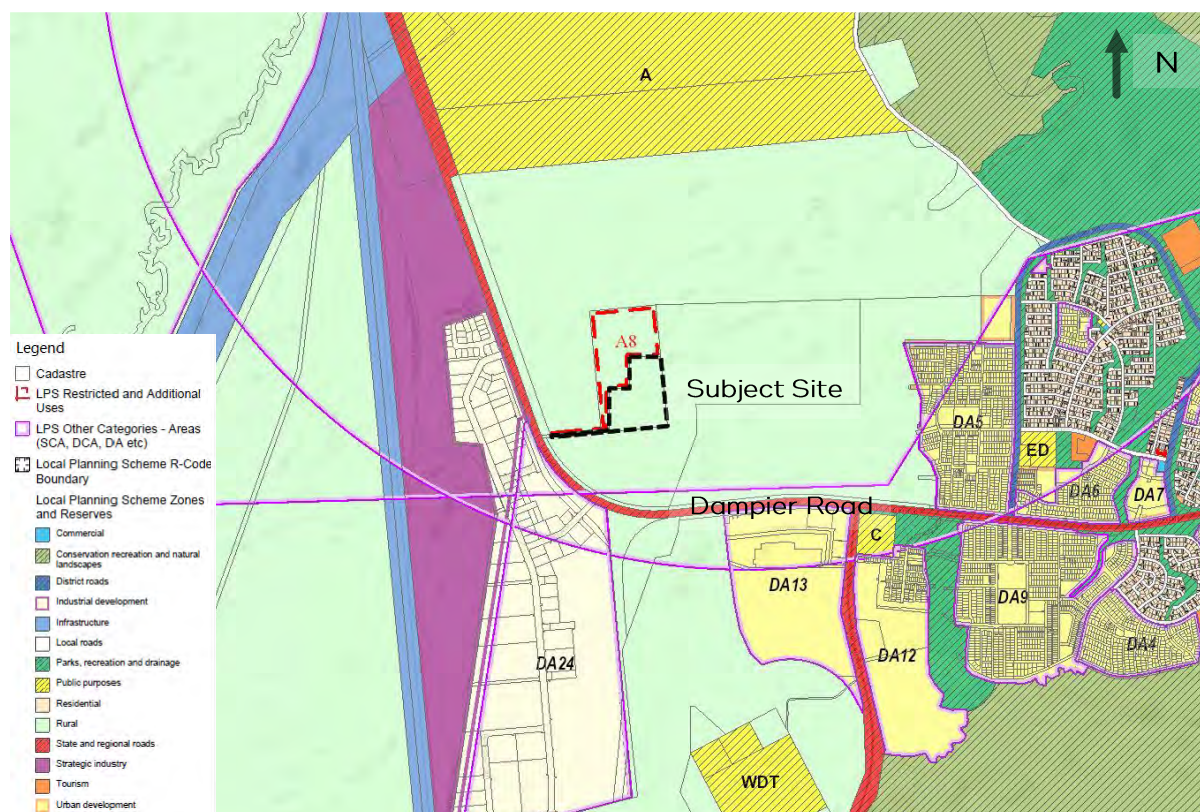


Figure 3 – LPS 8 Zoning Plan.

4.2 STRATEGIC PLANNING FRAMEWORK

4.2.1 City of Karratha Local Planning Strategy

The City of Karratha Local Planning Strategy was endorsed by the WAPC on 2 February 2021, for the purpose of setting out the long-term planning directions for local government over the coming 10 – 15 years. It is prepared to guide the growth and development of the municipality in accordance with a vision, objectives and goals.

Consistent with LPS 8, the subject land is identified for Rural zone under the Strategy; however, it is noted that land north of the site is identified for General Industrial (expansion) – the Gap Ridge North General Industrial Area.

Refer Figure 4 – Extract of City of Karratha Local Planning Strategy Map.

Having regard to the existing ‘Industry Noxious (restricted)’ use of the adjoining site, the use of the subject land for a new aquaculture operation is considered inappropriate and unviable. Further to this, the size of the site (being less than 40 hectares in area), and the high impact of the existing adjoining land uses, it is considered that the subject land is more appropriately identified for industrial use.

It is also noted that while the land is identified and zoned Rural, there are no existing agricultural operations occurring on the site. The site remains an isolated parcel of land in a strategic location for development (and not rural pursuits). This is particularly the case given the existing land use conflict attributed to the use of Lot 500 Dampier Highway, with the separation required between this use and any viable agricultural land use not being able to be achieved within the site.

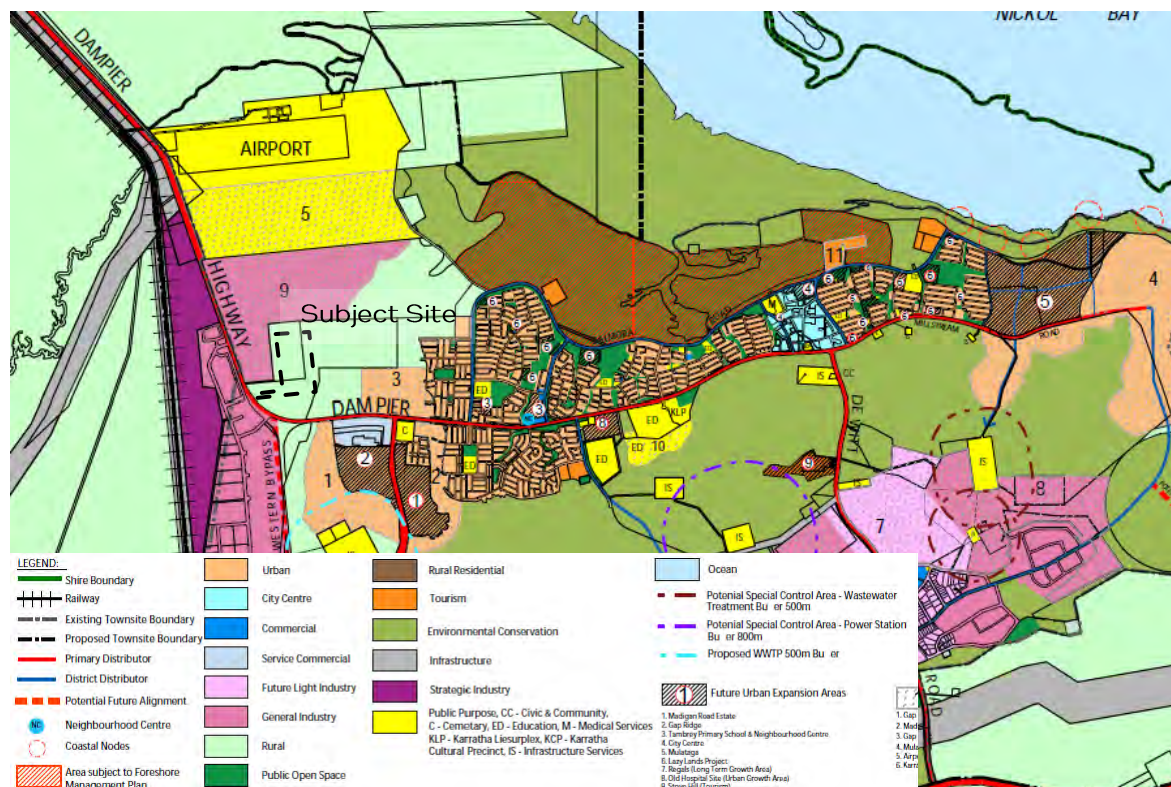


Figure 4 – Extract of City of Karratha Local Planning Strategy Map.

4.3 STATE PLANNING FRAMEWORK

4.3.1 State Planning Policy 3.7 – Planning in Bushfire Prone Areas

State Planning Policy 3.7 – Planning in Bushfire Prone Areas (SPP 3.7) outlines the measures for strategic planning, subdivision and development applications to reduce the impact of bushfire on property and infrastructure.

The subject land is identified as a Bushfire Prone Area on the Department of Fire and Emergency Services (DFES) mapping. Future applications for intensification of the land (i.e., Local Planning Scheme Amendment) will require the support of a Bushfire Management Plan.

4.3.2 State Planning Policy 4.1 – Industrial Interface

State Planning Policy 4.1 – Industrial Interface (SPP 4.1) is prepared to provide guidance to decision makers with respect to industrial development and sets out the appropriate management strategies for any potential land use conflict. In this regard, it seeks to achieve:

- appropriate siting and long-term operational certainty for industry
- appropriate siting of sensitive land uses for the protection of health and amenity for people and the environment
- sustainable land use planning and development outcomes consistent with broader State strategic planning objectives.

Having regard to the existing and operation noxious land use immediately adjacent the subject land, there are limited land use opportunities that can occur within the subject land without conflict. The Proponent submits that the existing operation at Lot 500 Dampier Road (Karratha Environmental Crushing) erodes any ability of the Proponent to develop any agricultural (rural) use on the land, let alone an aquaculture use.

This is demonstrated at Figure 5.

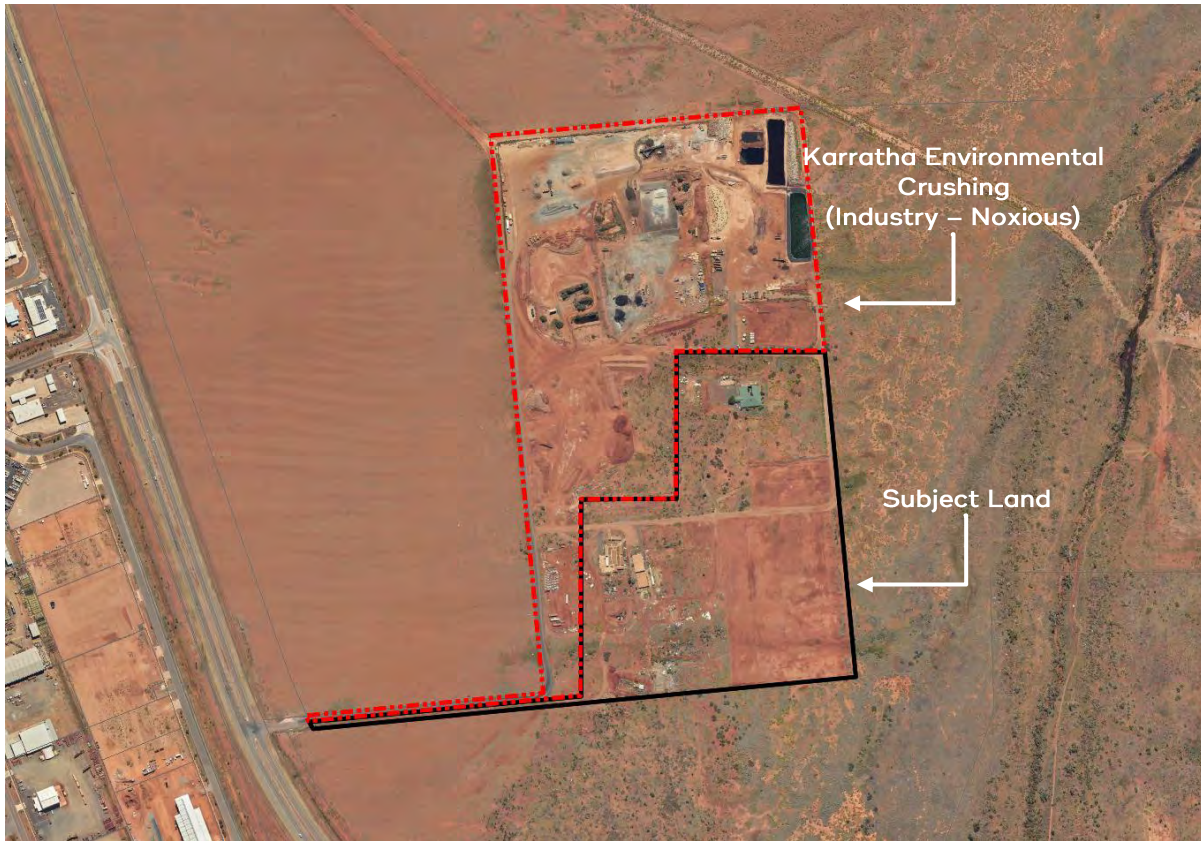


Figure 5 – Land Use Conflict.

4.3.3 EPA Guidance No. 3 – Separation Distances Between Industrial and Sensitive Land Uses

The Environmental Protection Authority (EPA) published its Guidance Note No. 3 regarding the Separation Distances Between Industrial and Sensitive Land Uses in June 2005. The purpose of the Guidance Note is to set out their generic minimum separation distances between types of industrial activity and sensitive development to prevent land use conflicts from occurring.

Appendix 1 of the Guidance Note sets out the generic separation distances for a range of industrial land uses. In this regard, it is noted that both Aquaculture and Crushing of Building Material are listed, as follows:

Industry	Description	Impacts					Buffer Distance
		Gas	Noise	Dust	Odour	Risk	
Aquaculture – ponds or tanks & natural waters included	Propagation or rearing of aquatic fauna, with supplementary feeding.		X		X		100 – 300m depending on the size.
Crushing of Building Material	Crushing or Cleaning of waste building or demolition material		X	X			1000m

Table 1 – EPA Guidance Note No. 3 – Separation Distances

The sheer size and scale required for both a viable crushing and aquaculture operation cannot co-exist on the lots as the planning and development framework contemplates. That is, the buffer distance required for the crushing operation extends to within the subject land, making it impossible to ensure a viable and certifiable fisheries product.



5 PROPOSAL & JUSTIFICATION

5.1 PROPOSED TEMPORARY LAND USE

As aforementioned, the Proponent is separately seeking Development Approval from the City of Karratha for the temporary, time limited use of the land for Storage and Laydown to support the decommissioning phases of a number of offshore oil and gas projects.

The Development Application (DA23-146) proposes that the use of the subject land in this matter would alleviate an acknowledged shortage of serviced laydown area within the City of Karratha and therefore contribute to the efficient coordination and logistics for the decommissioning of these projects, and potentially the ability to service new projects within the pipeline into the future.

Development and use of the subject land is proposed as follows:

- Removal of the existing dwellings and outbuildings;
- Construction of a new, unsealed internal ring road to facilitate both passenger vehicle and truck access;
- Approximately 10 hectares of laydown area, organised into (approximately and indicatively) 1-hectare parcels, to facilitate the orderly storage of material, and limit the visual impact of storage on the locality;
- Access to Dampier Highway via the existing crossover and access way on Lot 500 Dampier Road, Gap Ridge.

A Development Site Plan for the temporary use of the site is included at Attachment 4.

It is anticipated that the land would function for storage and laydown for a period of approximately 5 years, during which time the landowners and project team would navigate the longer-term planning for the land (refer Section 6.2).

5.2 PROPOSED LONG TERM LAND USE

5.2.1 Summary of Development

The landowner has commissioned RFF Pty Ltd to prepare and lodge a request to amend the City of Karratha Local Planning Scheme No. 8 (LPS 8) by rezoning the subject land from Rural to Industrial. As aforementioned, the landowner acquired the land for the purpose of developing a renewable energy facility; however, detailed due diligence suggests that general industrial use is more appropriate. Accordingly, the landowner is seeking to progress the necessary planning works to rezone the land.

Rezoning of the land will provide the necessary support of the activity within the Maitland and Burrup Strategic Industrial Areas. This request is being made having regard to the contemplated Gap Ridge East Industrial Estate, which is planned to be located directly north of the subject land.



5.3 JUSTIFICATION

It is proposed that the existing Covenant impacting the Certificate of Title for Lot 1 on Deposited Plan 400638 be lifted, removing the restriction that requires the land to only be used for Aquaculture. As demonstrated throughout this report, this request is appropriate and justified on the following grounds:

- The size of the land, and the adjacent existing noxious land uses, prohibit any meaningful or viable aquaculture operation that can exist on the land, particularly given the standard separation distances for the crushing operations that currently occur on land directly adjacent the site, and which extend well beyond the boundaries of that landholding.
- Preliminary due diligence and feasibility over the site has determined that there is substantial upside opportunity for medium-term industrial development associated with a number of resource projects currently in the pipeline. This requires forward planning by the property sector to accommodate the demand.
- Lifting the restrictive covenant over the subject land will further stimulate economic development in the City of Karratha and promote diversification of activity in the region. Enabling the timely development of commercial and industrial land will support local investment on a site that is strategically located, service ready and would otherwise remain vacant.
- Having regard to the existing economic climate within the City of Karratha and the Pilbara region more broadly, and the strategic location of the subject land, use of the land for Aquaculture represents a considerable underutilisation of well located, serviceable land.
- Consistent with the WAPC's Fact Sheet for Restrictive Covenants, covenants that seek to control the use of land are considered inappropriate. It is the Proponent's position that the most appropriate mechanism for controlling land use is the City of Karratha local planning framework.
- The City's strategic planning framework identifies the extension of the Gap Ridge Industrial Park directly north of the subject land. Use of the land for Aquaculture is not considered an appropriate transitional land use adjacent industrial land.
- The subject land, and the Pilbara Region more broadly, are not identified as strategic Aquaculture development zones within the Department of Primary Industries and Regional Development (DPIRD) Aquaculture Development Plan for Western Australia (2020). We submit that any new aquaculture operation would not receive the necessary support to warrant funding of a new operation.
- Lifting of this covenant is supported by the City of Karratha (refer Attachment 5).



6 CONCLUSION

This request seeks to lift the existing Restrictive Covenant, which limits the use of the land for, or incidental to, aquaculture. The Covenant was registered pursuant to Section 15 of the *Land Administration Act 1997*, in September 2014 in relation to the use of the land by the former lessee/landowner. The land was later sold to the Proponent as aquaculture was not viable at this location.

This report has been prepared to demonstrate that a land use limitation, such as this, is not appropriate in the outlined circumstances, erodes the highest and best use of the land, and is at odds with the strategic planning for the land. The Proponent submits that the land is strategically located, service ready and appropriate for accommodating a range of industrial land uses in support of a number of resource projects planned within the Burrup and Maitland Strategic Industrial Areas, thereby promoting local investment and economic development in the City of Karratha.

The request to lift the Restrictive Covenant is appropriate and justified for the following reasons:

- The size of the land, and the adjacent existing noxious land uses, prohibit any meaningful or viable aquaculture operation that can exist on the land, particularly given the standard separation distances for the crushing operations that currently occur on land directly adjacent the site, and which extend well beyond the boundaries of that landholding.
- Preliminary due diligence and feasibility over the site has determined that there is substantial upside opportunity for medium-term industrial development associated with a number of resource projects currently in the pipeline. This requires forward planning by the property sector to accommodate the demand.
- Lifting the restrictive covenant over the subject land will further stimulate economic development in the City of Karratha and promote diversification of activity in the region. Enabling the timely development of commercial and industrial land will support local investment on a site that is strategically located, service ready and would otherwise remain vacant.
- Having regard to the existing economic climate within the City of Karratha and the Pilbara region more broadly, and the strategic location of the subject land, use of the land for Aquaculture represents a considerable underutilisation of well located, serviceable land.
- Consistent with the WAPC's Fact Sheet for Restrictive Covenants, covenants that seek to control the use of land are considered inappropriate. It is the Proponent's position that the most appropriate mechanism for controlling land use is the City of Karratha local planning framework.
- The City's strategic planning framework identifies the extension of the Gap Ridge Industrial Park directly north of the subject land. Use of the land for Aquaculture is not considered an appropriate transitional land use adjacent industrial land.



- The subject land, and the Pilbara Region more broadly, are not identified as strategic Aquaculture development zones within the Department of Primary Industries and Regional Development (DPIRD) Aquaculture Development Plan for Western Australia (2020). We submit that any new aquaculture operation would not receive the necessary support to warrant funding of a new operation.
- Lifting of this covenant is supported by the City of Karratha.

On this basis, it is requested that the Department of Planning, Lands and Heritage support this request to lift the restrictive covenant.



Attachment 3:
Certificate of Title



WESTERN



AUSTRALIA

TITLE NUMBER

Volume

Folio

2848

927

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

BGRoberts
REGISTRAR OF TITLES



LAND DESCRIPTION:

LOT 1 ON DEPOSITED PLAN 400638

REGISTERED PROPRIETOR: (FIRST SCHEDULE)

GREEN GRID ENERGY PTY LTD OF 25 WALKINGTON CIRCLE MILLARS WELL WA 6714
(T P566530) REGISTERED 29/5/2023

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS: (SECOND SCHEDULE)

1. M757761 COVENANT BURDEN. REGISTERED 3/9/2014.
2. P566531 MORTGAGE TO JORDAN THOMAS FARRELL OF 25 WALKINGTON CIRCLE MILLARS WELL WA 6714, IN 1/2 SHARE, BC & JK GROUP PTY LTD OF 23 STANBRIDGE WAY MILLARS WELL WA 6714, IN 1/2 SHARE, AS TENANTS IN COMMON REGISTERED 29/5/2023.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
Lot as described in the land description may be a lot or location.

-----END OF CERTIFICATE OF TITLE-----

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: DP400638
PREVIOUS TITLE: LR3123-494
PROPERTY STREET ADDRESS: NO STREET ADDRESS INFORMATION AVAILABLE.
LOCAL GOVERNMENT AUTHORITY: CITY OF KARRATHA

Attachment 4: Feature Survey





SERVICE LEGEND

DRAINAGE

GRATE

SIDE ENTRY PIT

STORM WATER MANHOLE

ELECTRICAL

CABLE MANHOLE

CABLE PIT / BOX

CABLE DOME

CONSUMER POLE

LIGHT POLE

POWER POLE

STAY POLE

STAY WIRE ANCHOR

O/H POWER LINE

GAS

GAS MANHOLE

GAS MARKER

GAS METER

GAS VALVE

SEWERAGE

SEWER MANHOLE

PROPERTY CONNECTION

SEWER LINE

COMMUNICATIONS

COMMS MANHOLE

COMMS MARKER

COMMS CABLE PIT

WATER

FLUSH POINT

HYDRANT

STOP VALVE

TAP

WATER MARKER

WATER METER

UNDEFINED

UNDEFINED MANHOLE

UNDEFINED PIT

UNDEFINED SERVICE

SURVEY

DATUM

PEG FOUND

SURVEY STATION

TEMPORARY / BENCH MARK

OTHER

AWNING / EAVES

ROOF RIDGE

FLOOR RL

BOLLARD

WINDOW / DOOR

BANK - BOTTOM

BANK - TOP

LOT SERVICE RECORD

SERVICE	STATUS		
	LOCATED	NOT FOUND	NO SERVICE
WATER	✓	✓	✓
SEWER CONN.	✓	✓	✓
GAS	✓	✓	✓
COMMS	✓	✓	✓
POWER U/G	✓	✓	✓
POWER O/H	✓	✓	✓

SERVICES MARKED CONFIRM REQUIRE BUILDER / CLIENT TO CONFIRM POSITION AND / OR AVAILABILITY ON SITE.

CONTOUR LEGEND - 0.2m INTERVALS

MAJOR CONTOURS 00

MINOR CONTOURS


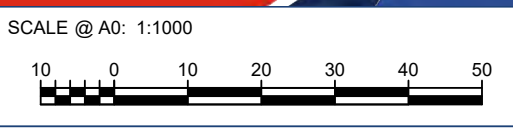
NOTE:
AHD LEVEL DERIVED FROM STANDARD SURVEY MARK DAMPIER 67 - RL = 12.10

NOTE:
THIS PLAN HAS BEEN PREPARED WITH MGA2020 ZONE 50 COORDINATES.

SURVEY CONTROL COORDINATE LISTING
MGA94 ZONE 50

SURV NAME	EASTING	NORTHING	ELEVATION
DAMPIER 67	47634.088	770261.438	12.105
DAMPIER 14	47626.892	770262.476	16.896
DAMPIER 93	476133.852	770265.815	15.449



REV	DESCRIPTION	DRN	DATE	APP	 19 Brennan Way Belmont WA 6104 T (08) 9477 4477 E admin@landsurveys.net.au www.landsurveys.net.au	SURVEYED BY: SM,KG SURVEYED ON: 11/09/2023 DRAWN BY: JM DRAWN ON: 12/09/2023 HOR DATUM: MGA2020z50 VERT DATUM: AH	CLIENT: GREEN GRID ENERGY
						SCALE @ A0: 1:1000 	This document is a draft and remains the property of Land Surveys. It is not to be used for any purpose other than the purpose for which it was prepared and is not to be used for any other purpose without the written consent of Land Surveys. Unauthorised use of this document in any way is prohibited.

Attachment 5:
Economic Demand Assessment





Karratha Industrial Land Assessment

Report prepared for

RFF Australia

October 2024



LUCID
ECONOMICS

lucid

/ˈluːsɪd/

adjective

1. expressed clearly; easy to understand

2. bright or luminous



LUCID
ECONOMICS

Document Control

Job Name: Gap Ridge Industrial Land Demand Assessment

Client: RFF Australia

Client Contact: Madison Mackenzie

Version Control

Version	Date	Authorisation
Draft v1	11/10/24	MC

Disclaimer:

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Acknowledgement of Country

Lucid Economics acknowledges the Traditional Custodians and Elders of Country throughout Australia, and their connection to land, sea and community. We pay our respects to Aboriginal and Torres Strait Islander Elders past, present and emerging.

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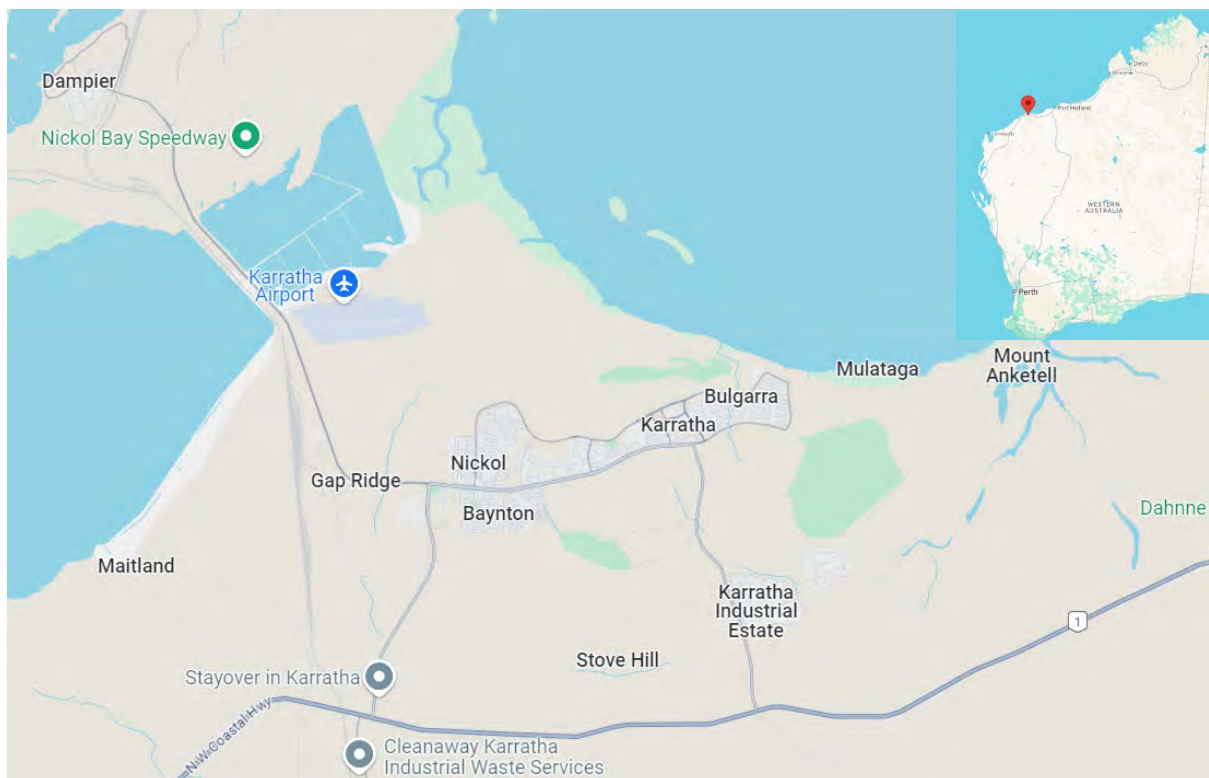
1. Introduction

Lucid Economics Pty Ltd (Lucid Economics) has been engaged by RFF Australia (RFF) to conduct an industrial land demand assessment for Karratha.

RFF has a client interested in industrial development in the Gap Ridge Industrial Estate and a better understanding of the industrial land market is now required. Specifically, this assessment considers the supply and demand for industrial land in Karratha.

Karratha is a City in the Pilbara Region of over 24,000 people that is one of the country's most significant mining and resource regions. The North West Shelf and Pluto LNG facilities as well as Rio Tinto call Karratha home and Cape Lambert and Cape Walcott are major export terminals for iron ore (Rio Tinto).

Figure 1.1. Karratha Location Map



Source: Google

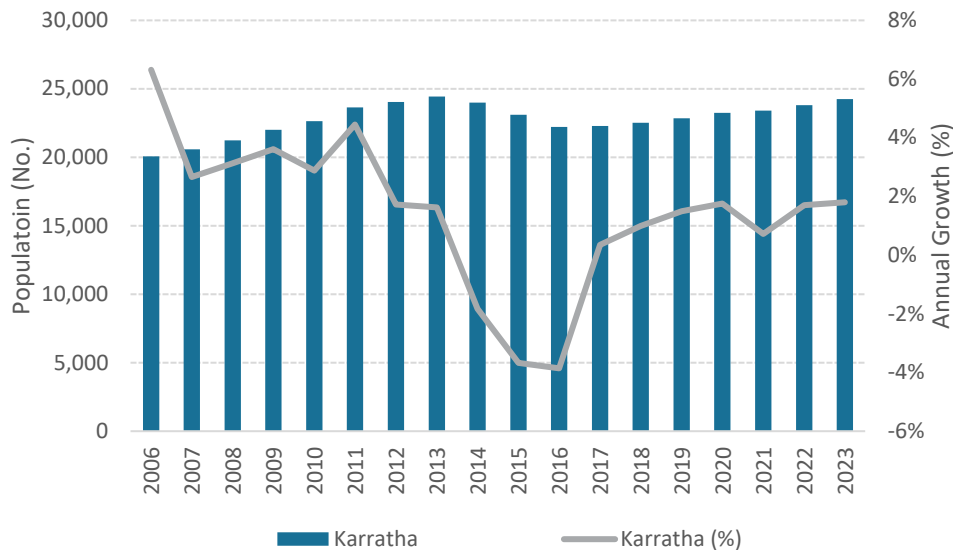
Unless otherwise stated in this report Karratha refers to the local government area.

2. Existing Context

2.1 Population

The population of the City of Karratha was 24,237 people in 2023 with Roebourne having an estimated population of 725 (Figure 2.1). Historically, the population across the City of Karratha has been volatile, moving up and down in accordance with economic cycles.

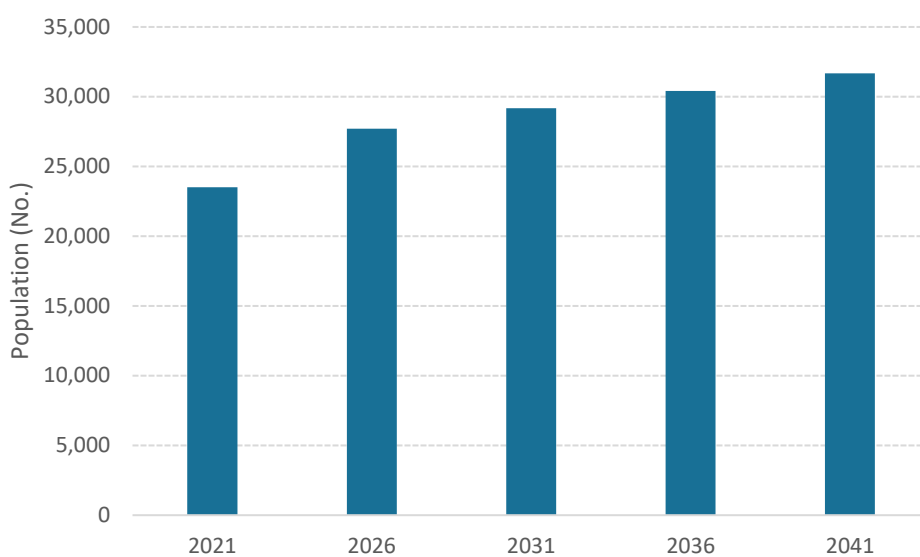
Figure 2.1. Karratha and Roebourne Population



Source: ABS (2024)

The population of the City of Karratha is projected to grow 31,650 people by 2041 (Figure 2.2). Based on historical experience, there would need to be fundamental changes in the local environment in order to achieve this level of population growth.

Figure 2.2. Karratha, Projected Population



Source: REMPLAN (2024)

2.2 Size and Structure of the Economy

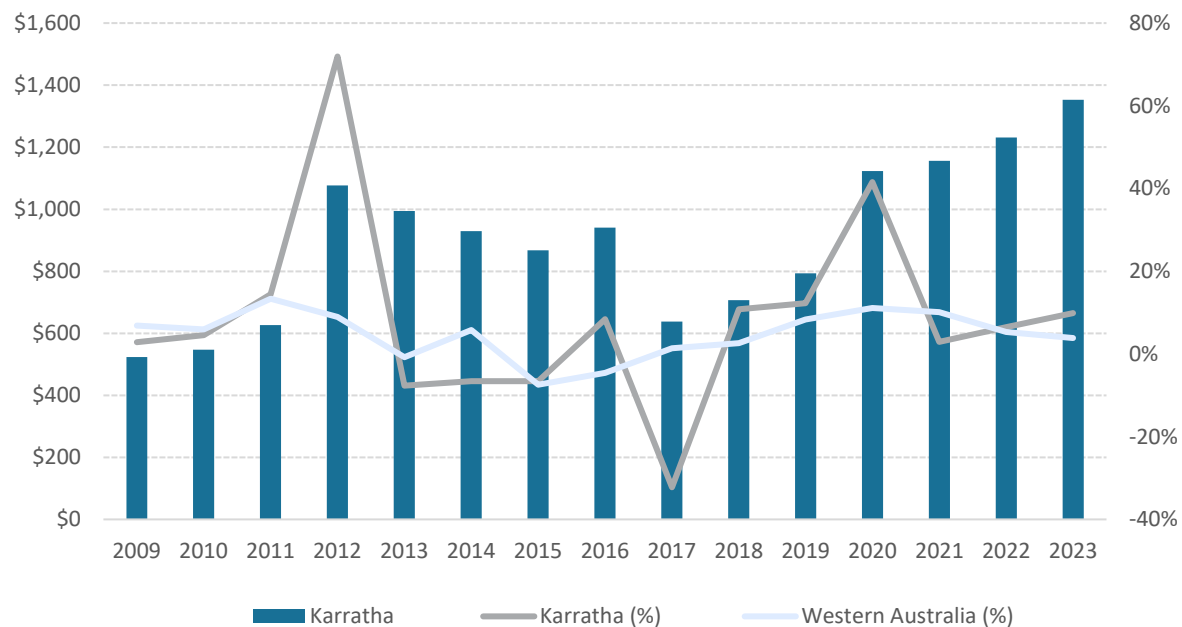
The local economy will be a driver of demand for industrial land.

The Karratha economy has experienced volatility historically, including significant periods of growth and decline (Figure 2.3). After slowing from a recent peak in 2020, the Karratha economy has averaged 6% per year growth, which is in line with the growth of the economy at a State level.

The volatility of the local economy is driven by its reliance on mining and resource activity, which has driven significant periods of growth through the development of major projects in the area. 85% of the local economy is represented by mining (Figure 2.4).

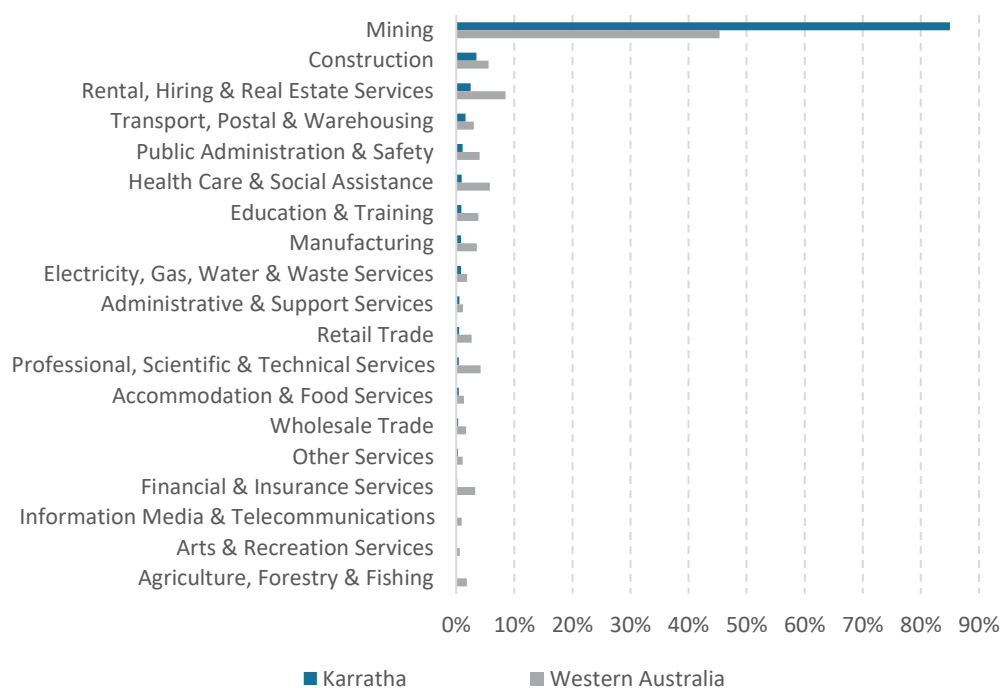
Karratha's unemployment rate is well below the State level and has been below 2% for over two years, which signals a very healthy job market and likely some labour shortages (Figure 2.5). Despite some movements in the size of the labour force, the unemployment rate has remained very low.

Figure 2.3. Karratha Gross Regional Product (\$b)



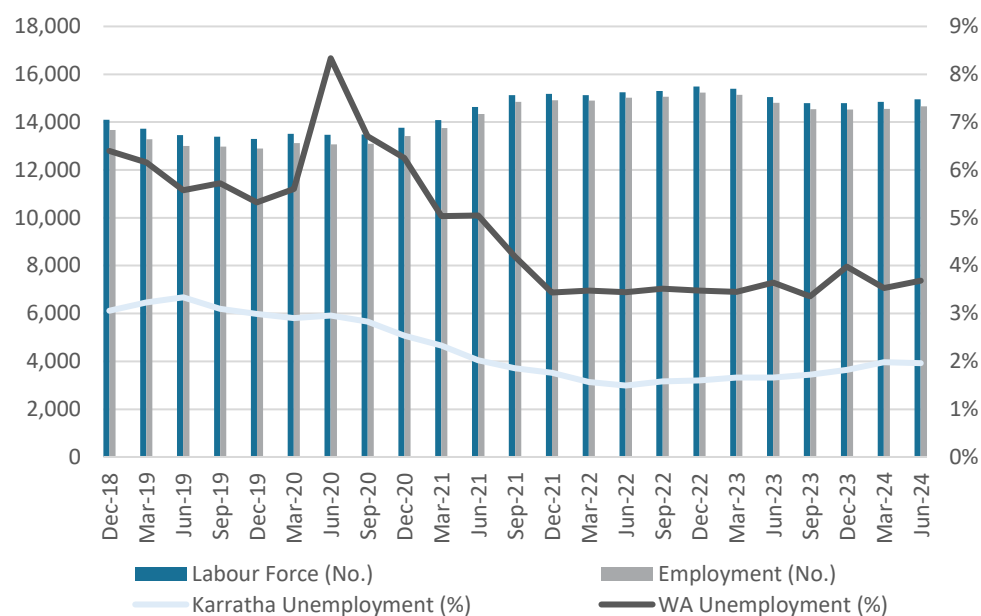
Source: REMPLAN (2024)

Figure 2.4. Karratha Economy, by Industry (2023)



Source: REMPLAN (2024)

Figure 2.5. Karratha Labour Force, Employment and Unemployment Rate



Source: Jobs and Skills Australia (2024); ABS (2024b)

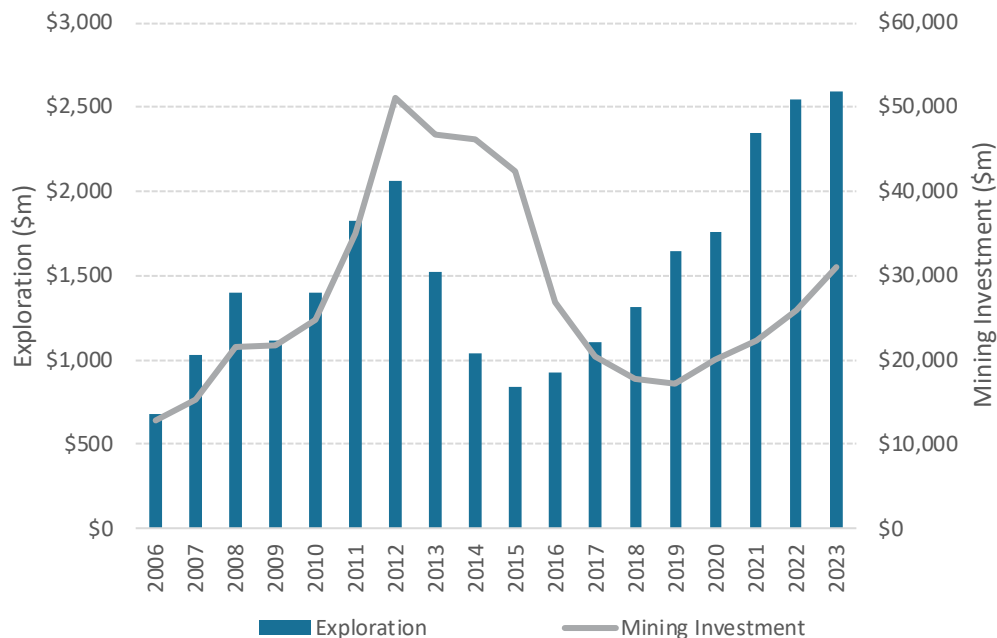
2.3 Major Project Activity

As highlighted in Figure 2.4, mining is very important to both the local and State economy. Figure 2.6 shows that as expenditure into mining exploration grows over time in Western Australia, so too does investment into new mining activity. Expenditure on mining exploration is now well above the level experienced during (and in the lead up to) the mining investment boom in 2011-12. While investment into mining has not yet reached a similar level as in 2011-12, it has been growing strongly over the last five years. Based on this information, investment into major projects in the Pilbara (including Karratha) is likely to increase in the short-term.

In 2023, investment into mining in Western Australia was over \$30 billion. The ABS estimates that expected expenditure into mining in Western Australia over the short-term is \$14.6 billion while the long-term expectation is \$25.9 billion (ABS, 2024c), showing the very buoyant mining investment market at the moment.

Mining and resource activity in the Pilbara has the ability to greatly influence demand for industrial land in Karratha.

Figure 2.6. Investment into Exploration and Mining, Western Australia



Note: Exploration expenditure excludes petroleum. Year Ending December.

Source: ABS (2024b); ABS (2024c)

Karratha has a significant pipeline of major projects that are either under construction or in the advanced stages of planning (Table 2.1). In total, there are over \$50 billion in major projects either under construction or in advanced planning and almost 50% of the capital investment into major projects is currently under construction.

Major project activity in Karratha (and the Pilbara more broadly) has always contributed greatly to the local economy, both during the construction period as well as once operational.

Major Projects Impact on the Local Economy

For decades, major projects have had a significant impact on the local economy in a number of ways. During the construction phase of any project or any significant shut-down period, there is a significant increase in demand for workers. Almost all major projects require specialist equipment and construction methods, so the construction workforce is FIFO, which puts local accommodation under pressure and often increases prices. Small businesses in town are often under pressure to support these projects as well, which puts further strain on the local workforce and accommodation market. Major projects can also occupy large tracts of land, which results in large swings in demand for a variety of land uses and contribute to a 'lumpy' demand profile, which means that significant amounts of land can be consumed or demanded in a short period of time. Such a demand profile makes it difficult to manage and plan for a variety of land uses.

Essentially, major projects consume a significant amount of workforce, land and other economic resources within the Karratha economy.

Table 2.1. Karratha Major Projects

Project	Capital Expenditure (\$m)	Anticipated Timeframe	Date of Completion
Woodside – Scarborough LNG / Pluto Train 2	\$16,000	5 years	2026
Woodside - Browse LNG	\$20,500	5 Years	2030
Yara Pilbara & Engie Phase 1	\$87	2 years	2024
Yara Pilbara & Engie Phase 2	\$1,740	3 years	2028
Perdaman - Urea Plant	\$6,000	3 years	2026
BCI Mardie Salt	\$1,421	4 years	2026
Dampier Cargo Wharf Projects (Pilbara Ports)	\$160	18 months	2026
Andover Lithium Mine – SQM/Hancock (Azure)	\$345	2 years	2028
Woodside - Solar	\$300	9 months	2024
WA Oil / Chevron Barrow Island Decommissioning	\$1,370	10 years	2035
Maitland Burrup Transmission Line	\$75	18 months	2026
Rio Tinto Desalination Plant	\$600	3 years	2026
Eramurra Solar Salt	\$280	4 years	2028
Hexagon WAH2 Project	\$1,620	3 years	2028
Perdaman - Solar	\$300	9 months	2028
Total	\$50,798		

Source: Various corporate announcements, news articles and engagement with local stakeholders.

3. Industrial Land Supply

Industrial land in the City of Karratha will often cater for the catchment of the local government area. Traditionally, industrial land uses in Karratha have occupied land in the Karratha Industrial Estate and later as this area began to fill, Gap Ridge was established as an industrial area. Additionally, there is a significant amount of strategic industrial land in the City that caters for major users, such as the North West Shelf.

The Karratha Regional Land Supply Assessment (2020) showed a total of 116.7 hectares of available industrial land in Karratha (Table 3.1). Since the time of this publication there has been an increase in mining and resource activity, which has led to further consumption of industrial land. Sales evidence of vacant industrial land in Karratha has showed that 29.0 hectares of industrial land has been consumed in Gap Ridge (Table 3.2). No sales of vacant land were recorded for Roebourne or Wickham and no land is available in the Karratha Industrial Estate.

Analysis of this data shows that general industry zoned land is being consumed at a much faster rate than light industry zoned land. At the current average consumption rate of 9.7 hectares per year (for both light and general industry land), the remaining industrial land in the Gap Ridge estate will be consumed within seven years. Based on the average consumption of general industry zoned land of 7.8 hectares per year, general industry zoned land will be consumed within six years. Currently, there are 87.7 hectares of industrial land remaining in Karratha, split relatively evenly between light industrial land and general industrial land (Table 3.3). All of the general industry land remaining in Karratha is in Gap Ridge.

Additionally, there is 12,475 hectares of strategic industrial land available across the Maitland Strategic Industrial Area and the Anketell Strategic Industrial Area as well as additional land on the Burrup Peninsula. The Burrup Peninsula will house Pluto Train 2, the North-West Shelf Refurbishment, Browse and Perdaman's Urea Project and will have limited future capability due to existing constraints (DPLH, 2020). The Maitland Strategic Industrial Area and the Anketell Strategic Industrial Area are currently zoned but are not serviced and the development of these areas will require considerable investment from the State Government and many years to fulfill. The Anketell Strategic Industrial Area is underpinned by the development of the Anketell Port, which is meant to facilitate increased export of iron ore from the Pilbara. Capacity remains at the existing Port Dampier and Port Walcott (Cape Lambert). While these precincts often include an allocation of land for general industry use, this land (and its future users) are meant to service the major project located within the SIA. As such, the SIAs are excluded in terms of existing industrial land supply to focus on general and light industry use land.

Table 3.1. Available Industrial Land (2020), Karratha

	Total (HA)
Gap Ridge	94.2
Roebourne	16.3
Wickham	6.2
Total	116.7

Source: DPLH (2020)

Table 3.2. Consumption of Industrial Land, 2021-2023, Karratha

	General Industry	Light Industry	Total
2021	7.5	3.1	10.5
2022	6.7	0.7	7.4
2023	9.4	1.7	11.1
Total	23.5	5.5	29.0
Average	7.8	1.8	9.7

Source: Pricefinder (2024); Lucid Economics

Table 3.3. Available Industrial Land (2024), Karratha

	General Industry	Light Industrial	Total
Gap Ridge	46.2	19.0	65.2
Roebourne	0	16.3	16.3
Wickham	0	6.2	6.2
Total	46.2	41.5	87.7

Source: DPLH (2020); Pricefinder (2024); Lucid Economics

4. Industrial Land Demand

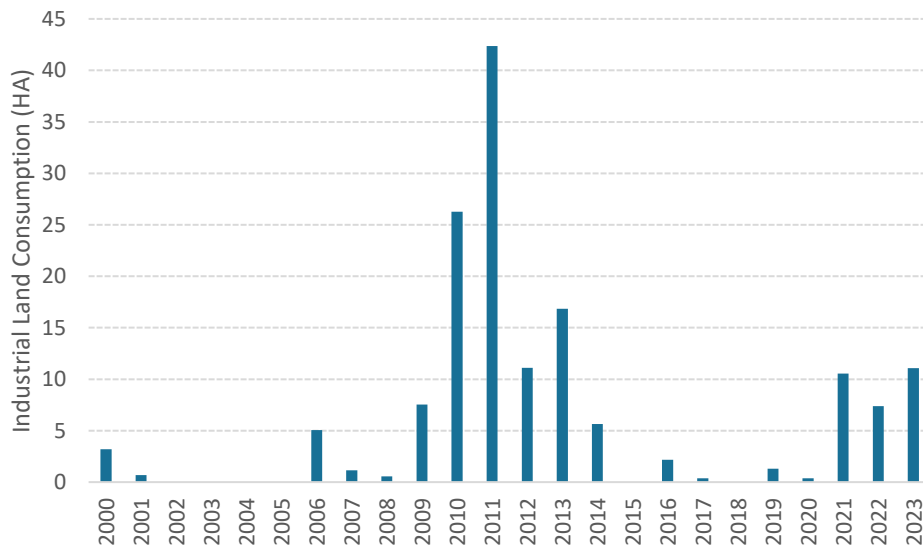
In order to project future industrial land demand, an analysis of historical industrial land consumption (take-up) was conducted. Historical sales data was evaluated dating from 2000 to provide a longer term perspective on historical industrial land consumption. The State Government is the industrial land developer in Karratha, currently represented by Development WA. As such, historical vacant industrial land sales where the State Government was the vendor were recorded and the area of land summed across individual years. While a land sales transaction is not a guarantee that the land will be utilised, the State Government provides conditions in their sale contracts that stipulate the land has to be developed to avoid land banking. As such, this proxy is considered a strong indicator of industrial land consumption. Analysis of building approval data from the Australian Bureau of Statistics (ABS) confirmed that in the year following an increase in industrial land sales, there is an increase in building approvals for industrial buildings.

The resultant analysis shows a very volatile industrial land market in Karratha, which is consistent with the volatile nature of major projects and resource/mining related activities. Demand for industrial land peaked at 42 hectares in 2011 (during the mining investment boom) and there have been multiple years that experienced no industrial land consumption at all. Such a volatile market is characteristic for mining and resourced related regions.

The average annual industrial land consumption over the last two decades is 6.4 hectares per year. Given the significant pipeline of major projects over the recent past, it is no surprise that an elevated level of industrial land is being consumed. Over the last three years, industrial land consumption has averaged 9.7 hectares per year. Of further note is the fact that the current elevated level of industrial land consumption has favoured land zoned for general industrial use, which has made up over 80% of total industrial land consumption (by area).

Based on these rates, between 64 hectares and 97 hectares of industrial land will be required over the next ten years. Based on current trends, there will be demand for between 52 hectares and 76 hectares of general industry land and between 12 hectares and 18 hectares of light industrial land during this time.

Based on these metrics, the current industrial land supply in Karratha will be exhausted between 2032 and 2037 (

Figure 4.1. Industrial Land Consumption, Karratha

Source: Pricefinder (2024); Lucid Economics

Figure 4.2). It should be noted that general industry zoned land will likely be extinguished within six years, given its accelerated rate of consumption.

Based on very little sales evidence over the last five years, industrial land in Roebourne and Wickham (which is light industry land) appears to be a legacy and no longer attractive to the market. As such, it is likely that the market will focus on the remaining land at Gap Ridge.

Nature of Industrial Land Supply and Demand

Industrial land demand is not as ubiquitous as residential land demand where a dwelling generally consumes the same amount of land on a regular basis. The lot configuration for Gap Ridge, where all remaining general industry land resides, has been completed and it is probable that before the remaining sites are purchased and utilised (e.g. land supply is extinguished), industrial land demand will not be satisfied and some projects will not be able to be accommodated in Karratha.

The reason behind this phenomenon is that some industrial processes may require facilities of a certain shape or size. For example, a business may require a storage shed of 6,000 sqm and hard stand area of 3,000 sqm. While these areas could be accommodated on a 1 ha site, there would be insufficient room for the business to navigate and operate on the land as trucks and forklifts would not be able to access and turn in the site. If this was the only remaining site, the business would not be able to locate to the area, even though there is land available. Another example could see a business that requires a rectangular shaped building (for example, a 6,400 sqm building that is 100m long and 64m wide) based on their internal process and operations. While a square shaped building (80m X 80m) could likely fit on a 1 ha (100m X 100m) site, the rectangular building may not.

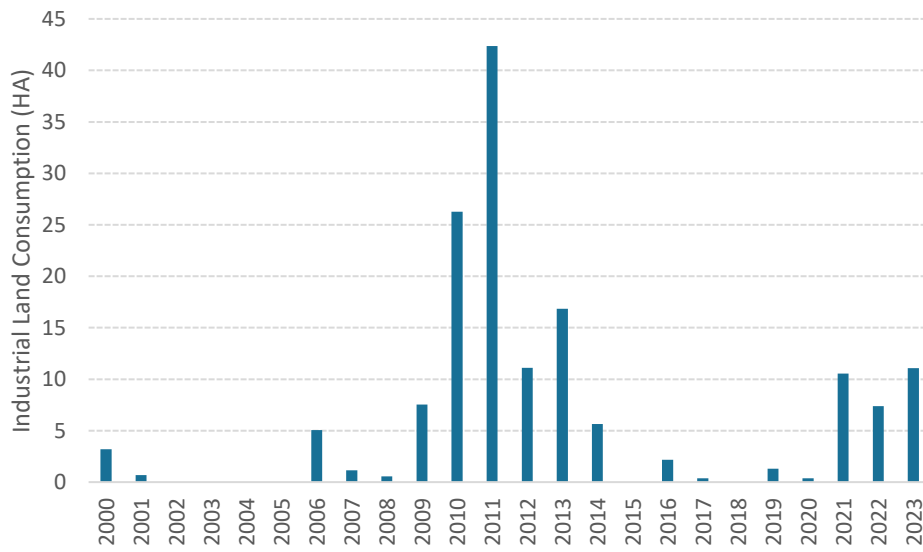
For these reasons, from a practical perspective, industrial estates usually fill to 80% capacity before take-up in the estate slows dramatically. Many years are often required before an industrial estate is 100% occupied (and industrial land supply is exhausted). Additionally, as capacity exceeds 80%, prices generally accelerate disproportionately to the number of sales as land supply becomes scarcer.

From a Karratha perspective, the last recorded vacant land sales in the Karratha Industrial Area were in 2014 and 2012 when the industrial estate was established in 1968. Prices in 2000 for land in the Karratha Industrial Area were between \$3 and \$4 per square meter. The last sites sold in 2012 and 2014 were between \$180 and \$254 per square meter.

For these reasons, it is advised that local government areas maintain a rolling, 10 year supply of zoned and serviced industrial land supply in order to accommodate future demand and not effectively 'run out' of land.

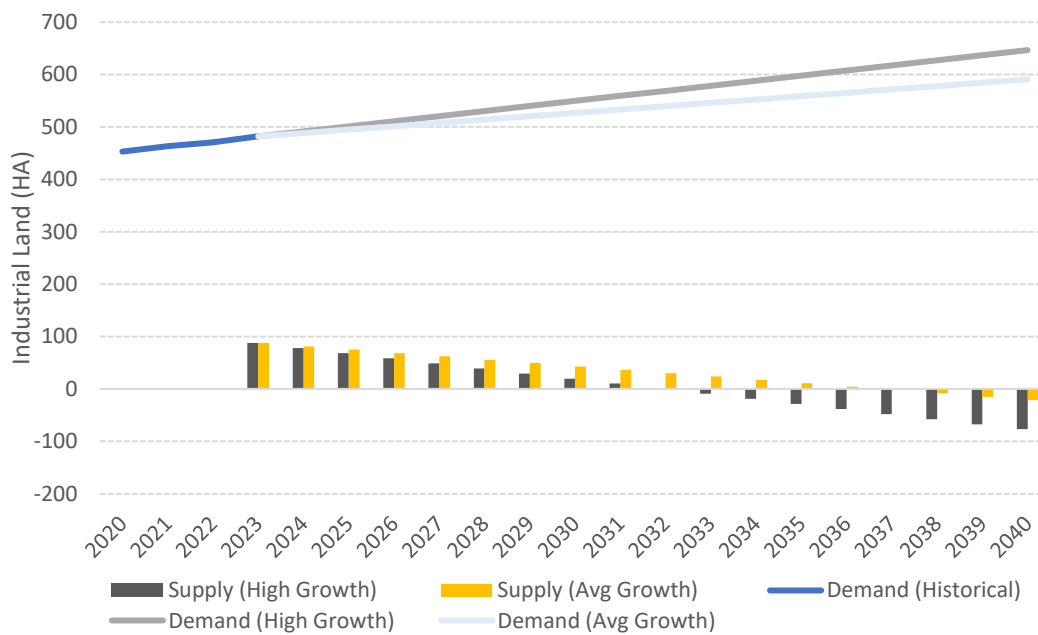
In practical terms and at current levels of take-up, over the next 3-4 years, Karratha will likely be unable to accommodate all industrial demand (due to a shortage of zoned and serviced land), which means businesses that would like to invest into the area, will not be able to. For general industry land, this situation may take place sooner.

Figure 4.1. Industrial Land Consumption, Karratha



Source: PricewaterhouseCoopers (2024); Lucid Economics

Figure 4.2. Future Industrial Land Demand and Supply, Karratha



Source: DPLH (2020a); Lucid Economics

5. Summary and Findings

This assessment has shown a shortage of industrial land in Karratha, particularly for general industry use. There is currently an elevated level of activity in the mining and resource sector as well as a \$50 billion major projects pipeline, which means demand for industrial land is likely to remain at an elevated level.

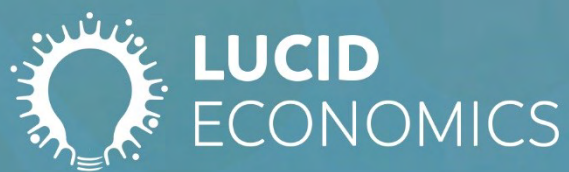
While the 88 hectares of zoned and serviced industrial land currently in the market aligns to the principle of maintaining at a 10-year rolling supply of zoned and serviced industrial land, there is a discrepancy between general industry and light industrial land. Based on the 10-year rolling supply concept, Karratha should have 79 hectares of general industry land instead of the 46 hectares currently available. The discrepancy equates to a shortage of 32 hectares of general industry land. At the same time, there would be a surplus of 29 hectares of light industrial land.

In order to maintain a healthy and functioning industrial land market, additional general industry land needs to be brought onto the market. Doing so would ensure that economic development opportunities are not lost, particularly in the current economic climate of elevated mining, resource and major project activity.

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Attachment 6:
Bushfire Management Plan



Bushfire management plan/Statement addressing the Bushfire Protection Criteria coversheet

Site address:

Site visit:

Yes

☐

No

☐

Date of site visit (if applicable):

Day

Month

Year

Report author or reviewer:

WA BPAD accreditation level (please circle):

Not accredited

☐

Level 1 BAL assessor

☐

Level 2 practitioner

☐

Level 3 practitioner

☐

If accredited please provide the following.

BPAD accreditation number:

Accreditation expiry: Month

Year

Bushfire management plan version number:

Bushfire management plan date: Day

Month

Year

Client/business name:

	Yes	No
Has the BAL been calculated by a method other than method 1 as outlined in AS3959 (tick no if AS3959 method 1 has been used to calculate the BAL)?		
Have any of the bushfire protection criteria elements been addressed through the use of a performance principle (tick no if only acceptable solutions have been used to address all of the bushfire protection criteria elements)?		

Is the proposal any of the following (see [SPP 3.7 for definitions](#))?

	Yes	No
Unavoidable development (in BAL-40 or BAL-FZ)		
Strategic planning proposal (including rezoning applications)		
High risk land-use		
Vulnerable land-use		

None of the above

☐

Note: Only if one (or more) of the above answers in the tables is yes should the decision maker (e.g. local government or the WAPC) refer the proposal to DFES for comment.

Why has it been given one of the above listed classifications (E.g. Considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

The information provided within this bushfire management plan to the best of my knowledge is true and correct:

Signature of report author
or reviewer



Date



Lot 1 Dampier Road, Gap Ridge

Bushfire Management Plan

Date: 10 October 2024

Prepared for: RFF Pty Ltd

Linfire Ref: 20230922316RFF-BMP-001_0

Linfire Consultancy

ABN: 577 930 47299

Revision	Issue Date	Revision Description	Approved By
0	10 Oct 2024	Issued for Approval	Linden Wears (Level 3 BPAD 19809)



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Fire is an unpredictable force of nature. Changing climatic factors (whether predictable or otherwise) either before or at the time of a fire can also significantly affect the nature of a fire and in a bushfire prone area it is not possible to completely guard against bushfire. The mitigation strategies contained in this Bushfire Management Plan (BMP) are considered to be prudent minimum standards only, based on the standards prescribed by relevant authorities. It is expressly stated that Linfire do not guarantee that if such standards are complied with or if a property owner exercises prudence, that a building or property will not be damaged or that lives will not be lost in a bush fire.

Further, the achievement of the level of implementation of fire precautions will depend on the actions of the landowner or occupiers of the land, over which Linfire has no control. If the proponent becomes concerned about changing factors then either a review of the existing BMP, or a new BMP, should be requested. Linfire accepts no liability or responsibility whatsoever for or in respect of any use or reliance upon this report and its supporting material by any third party.

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1.0 Proposal details

1.1 Background

RFF Pty Ltd, on behalf of the Proponent, are seeking to lodge a Local Planning Scheme (LPS) Amendment application for the proposed development across Lot 1 Dampier Road (on Plan 400638), Gap Ridge (the project area) in the City of Karratha. The proposed development seeks to provide industrial land use, within the lot, and requires amendment of the City of Karratha LPS No. 8 to rezone from Rural to Industrial. A zoning plan has been provided in Figure 1, with the project area shown in blue dashed line.

1.2 Site description

The project area comprises approximately 15.6 ha, and has previously had several rural dwellings on it (although only one dwelling remains) and approximately half of the lot has been recently cleared.

The project area is surrounded by the following (see Figure 2):

- Directly north of the project area is Lot 500, which contains an existing crushing business which has resulted in much of the lot being cleared.
- Further north of Lot 500, and to the west of the project area, is undeveloped Unallocated Crown Land containing unmanaged grassland vegetation.
- To the east and south of the project area, is Lots 570 and 571 Dampier Road, which are undeveloped Unallocated Crown Land containing unmanaged vegetation.

Access to the project area is currently from Dampier Road to the west, via a 450 m long battle-axe leg to the main part of the Lot 1. The nearest reticulated water supply to the site is currently within industrial development further west of Dampier Road, however there doesn't appear to be existing town main supply or street hydrants along Dampier Road or the project area.

The majority of the project area is designated as bushfire prone on the *Map of Bush Fire Prone Areas* (DFES 2023; see Plate 1).

1.3 Purpose

This Bushfire Management Plan (BMP) has been prepared to address requirements under *Policy Measure 6.3 of State Planning Policy 3.7 Planning in Bushfire-Prone Areas* (SPP 3.7; WAPC 2015) and *Guidelines for Planning in Bushfire-Prone Areas* (the Guidelines; WAPC 2021).

Linfire note that the final use of future development is still to be determined, however is expected to be used for industrial purposes. On this basis, the assessment against the Guidelines, has been conducted for Elements 1 to 4.

1.4 Other plans/reports

There are no known bushfire reports or assessments that have been prepared previously for the project area.



Plate 1: Map of Bush Fire Prone Areas (DFES 2024)



Figure 1: Zoning Plan



Legend

- Project Area
- 100m
- 150m
- Cadastre

Scale 1:3,300



0 60 120 180 Metres



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Lot 1 Dampier Road, Gap Ridge

Figure 2: Site Overview

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2.0 Environmental considerations

2.1 Native vegetation - modification and clearing

The project area has been cleared of some vegetation, and it is expected that the site will need to be cleared to accommodate development as part of future planning applications. Table 1 provides a summary of a search of publicly available environmental data.

Linfire assumes that all relevant environmental and aboriginal heritage studies will be undertaken to support the project, and if any State and Federal environmental referrals and approvals are required, they will be sought prior to commencing on-site vegetation modification or clearing required to construct the development.

Table 1: Summary of environmental values

Environmental value	Not mapped as occurring within or adjacent to the project area	Mapped as occurring within or adjacent to the project area		Description
		Within	Adjacent	
Environmentally Sensitive Area	✓			No part of the project area is identified as being an Environmentally Sensitive Area, nor is any adjacent land.
Swan Bioplan Regionally Significant Natural Area	✓			No Regionally Significant Natural Areas were identified.
Ecological linkages	✓			No ecological linkages were identified.
Wetlands	✓			No wetlands are mapped as occurring within or adjacent to the project area
Waterways	✓			No waterways are mapped within the project area or in adjacent land however there is evidence of a waterway is located approximately 300 m to the east of the project area. This is not anticipated to be impacted by the proposed development.
Threatened Ecological Communities listed under the EPBC Act		✓	✓	This layer is currently publicly available at a very coarse level but suggests that Threatened Ecological Communities could occur within the project area and in adjacent land.
Threatened and priority flora	✓			No Threatened and Priority Flora are mapped as occurring within or adjacent to the project area
Fauna habitat listed under the EPBC Act	✓			No fauna habitat was mapped as occurring within or adjacent to the project area

Environmental value	Not mapped as occurring within or adjacent to the project area	Mapped as occurring within or adjacent to the project area		Description
		Within	Adjacent	
Threatened and priority fauna	✓			No Threatened and Priority Fauna are mapped as occurring within or adjacent to the project area
Bush Forever Site	✓			No Bush Forever Area is mapped as occurring within or adjacent to the project area.
DBCA managed lands and waters (includes legislated lands and waters and lands of interest)	✓			No DBCA managed lands and waters is mapped as occurring within or adjacent to the project area.
Conservation covenants	✓			No information has been provided by the client regarding Conservation Covenants.
Crown Reserves	✓			No Crown Reserves are mapped as occurring within or adjacent to the project area.
Aboriginal Heritage	✓			No Aboriginal Heritage Places are mapped as occurring within or adjacent to the project area.

2.2 Revegetation / Landscaping

Pre-development mapping depicting the current vegetation classifications and extent, is provided in Section 3.1.3, with the anticipated post-development vegetation classifications following completion of the development, identified in Section 3.1.4.

While the project area is currently vegetated, all vegetation is expected to be cleared as part of future development. Any required Asset Protection Zones (APZs) are to be either non-vegetated elements or landscaped in accordance with Schedule 1 of the Guidelines (refer to Appendix 2). All other future landscaping onsite, is to comply with the requirements of AS 3959 Clause 2.2.3.2 (e) and (f) (refer to Appendix 3), and align with the principles of Schedule 1 of the Guidelines.

3.0 Bushfire assessment results

3.1 Assessment inputs

3.1.1 Vegetation classification

Linfire assessed classified vegetation and exclusions within 150 m of the project area through on-ground verification on 8 October 2024 in accordance with AS 3959—2018 *Construction of Buildings in Bushfire-Prone Areas* (AS 3959; SA 2018) and the *Visual Guide for Bushfire Risk Assessment in Western Australia* (DoP 2016). Georeferenced site photos and a description of the vegetation classifications and exclusions are contained in Appendix 1, depicted in Figure 3 (pre-development) and Figure 4 (post-development) and summarised on Table 2 and Table 3.

The assessed classified vegetation that is expected to remain following development works is as follows:

- Glass G Grassland
- Class C Shrubland
- Class D Scrub

A summary of the assessed exclusions are as follows:

- Clause 2.2.3.2 (a) plots of unmanaged vegetation further than 100 m from the project area
- Clause 2.2.3.2 (e) areas of non-vegetated land such as land cleared for existing and proposed roads, infrastructure and buildings
- Clause 2.2.3.2 (f) land managed in a minimal fuel low threat condition, such as road verges, managed gardens and lawns including the managed POS areas.

Other exclusions that may be relevant for future development are as follows:

- Clause 2.2.3.2 (c) isolated plots of unmanaged vegetation, that will be less than 2500 m² and will be located so it is further than 20 m from any proposed lots or any other classified vegetation
- Clause 2.2.3.2 (d) isolated plots of unmanaged vegetation, that will be less than 20 m wide and will be located so it is further than 20 m from any proposed lots or any other classified vegetation

Exclusions under Clauses 2.2.3.2 (e) and (f) used for all non-vegetated elements and managed vegetation proposed as part of the development, with Clauses 2.2.3.2 (c) and (d) potentially used to exclude vegetation associated with small plots of unmanaged vegetation such as future drainage areas, if possible.

3.1.2 Effective slope

Linfire assessed effective slope under classified vegetation through on-ground verification on 8 October 2024 in accordance with AS 3959. Results were cross-referenced with Landgate 10m contour data and are depicted in Table 2, Table 3 and Figures 3 and 4.

Site observations are that there is a gentle slope from west to east across the landscape, toward a local waterway 300 m east of the project area.

3.1.3 Pre-development inputs

A summary of the assessed pre-development classified vegetation, exclusions and effective slope

within the project area, and the adjacent 150 m, are listed in Table 2 and illustrated in Figure 3.

Table 2: Pre-development vegetation classifications/exclusions and effective slope

Vegetation plot	Vegetation classification	Effective slope	Comments
1	Class G Grassland	Flat/upslope (0°)	Unmanaged grassland >100 mm in height outside the project area
2	Class G Grassland	Downslope >0–5°	
3	Class C Shrubland	Downslope >0–5°	Vegetation less than 2m high outside the project area, containing areas of grassland and smaller shrubs, with very occasional shrub.
4	Class D Scrub	Flat/upslope (0°)	Plots of vegetation 2 m to 6 m high (more typically 4m high) outside the project area. Often this classification still includes a significant amount of grass and shrubland vegetation, however the more concentrated presence of taller vegetation has required a more conservative classification.
5	Class D Scrub	Downslope >0–5°	
6	Class G Grassland	Flat/upslope (0°)	Unmanaged grassland >100 mm in height within the project area.
7	Class G Grassland	Downslope >0–5°	
8	Class C Shrubland	Downslope >0–5°	Vegetation less than 2m high within the project area, containing areas of grassland and smaller shrubs, with very occasional shrub.
9	Class D Scrub	Downslope >0–5°	Plots of vegetation 2 m to 6 m high (more typically 4m high) within the project area. Often this classification still includes a significant amount of grass and shrubland vegetation, however the more concentrated presence of taller vegetation has required a more conservative classification.
10	Excluded – Clause 2.2.3.2 [a]	N/A	Plots of unmanaged vegetation further than 100 m from the project area.
11	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])	N/A	Existing non-vegetated elements and low threat vegetation outside project area, largely consisting of roads, paths, buildings, cultivated gardens and maintained lawns.
12	Excluded – Non-vegetated (Clause 2.2.3.2 [e])	N/A	Existing non-vegetated elements and low threat vegetation within the project area, largely consisting of roads, buildings, cleared land around dwelling and managed gardens.

3.1.4 Post-development inputs

A summary of the potential post-development classified vegetation, exclusions and effective slope

within the project area, and the adjacent 150 m, are listed in Table 3 and illustrated in Figure 4.

The post-development vegetation classifications for all land external to the project area has remained the same as for the pre-development classifications. If external vegetation is altered prior to future planning stages, the change in vegetation condition is to be captured through a future BHL assessment or BAL contour map assessment.

Within the project area, the BMP assumes that there will be no onsite vegetation retention following construction of future development, internal roads and infrastructure. Should any vegetation retention or revegetation be proposed as part of future development, or should proposed drainage swales or basins be unable to be excluded from classification, it is expected that sufficient separation will need to be provided as part of future planning so that any BAL impact on habitable buildings is limited to BAL-29 or lower and captured through a future BHL assessment or BAL contour map assessment.

Table 3: Post-development vegetation classifications/exclusions and effective slope

Vegetation plot	Vegetation classification	Effective slope	Comments
1	Class G Grassland	Flat/upslope (0°)	Unmanaged grassland >100 mm in height outside the project area
2	Class G Grassland	Downslope >0–5°	
3	Class C Shrubland	Downslope >0–5°	Vegetation less than 2m high outside the project area, containing areas of grassland and smaller shrubs, with very occasional shrub.
4	Class D Scrub	Flat/upslope (0°)	Plots of vegetation 2 m to 6 m high (more typically 4m high) outside the project area. Often this classification still includes a significant amount of grass and shrubland vegetation, however the more concentrated presence of taller vegetation has required a more conservative classification.
5	Class D Scrub	Downslope >0–5°	
10	Excluded – Clause 2.2.3.2 [a]	N/A	Plots of unmanaged vegetation further than 100 m from the project area.
11	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])	N/A	Existing non-vegetated elements and low threat vegetation outside project area, largely consisting of roads, paths, buildings, cultivated gardens and maintained lawns.
12	Excluded – Non-vegetated (Clause 2.2.3.2 [e])	N/A	Existing non-vegetated elements and low threat vegetation within the project area, largely consisting of roads, buildings, cleared land around dwelling and managed gardens.
13	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])	N/A	Existing classified vegetation within the project area (Plots 6 -9 from Table 2), to be modified to non-vegetated elements and low threat vegetation as part of this development.



Legend

- Photo Location
- Contours
- Project Area
- 100m
- 150m
- Cadastre
- Vegetation Plot
- Classified Vegetation
 - C. Shrubland
 - D. Scrub
 - G. Grassland
- Excluded Clause 2.2.3.2(a)
- Excluded Clause 2.2.3.2(e&f)

Scale 1:3,300



0 60 120 180 Metres



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Figure 3: Pre-Development Vegetation and Effective Slope



Legend

- Contours
- Project Area
- Assessment Area
 - 100m
 - 150m
- Vegetation Plot
- Classified Vegetation
 - C. Shrubland
 - D. Scrub
 - G. Grassland
- Excluded Clause 2.2.3.2(a)
- Excluded Clause 2.2.3.2(e&f)
- Modified to non vegetated and low threat

Scale 1:3,300



0 60 120 180 Metres



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Lot 1 Dampier Road, Gap Ridge

Figure 4: Post-Development Vegetation and Effective Slope

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3.2 Assessment outputs

In accordance with SPP 3.7 Policy Measure 6.3, a bushfire hazard level (BHL) assessment can be used for strategic proposals, or where lot layout is known, a Bushfire Attack Level (BAL) contour assessment to determine the indicative acceptable BAL ratings across the site. In this instance, given the lot layout is not currently known, a BHL assessment has been provided to demonstrate that compliance can be achieved at future planning stages.

3.2.1 Bushfire Hazard Level (BHL) assessment

Pre- and post-development vegetation extents have been assigned a bushfire hazard level in accordance with the methodology detailed in Appendix Two of the Guidelines as outlined in Table 4.

Table 4: Bushfire hazard levels and characteristics

Bushfire hazard level	Characteristics*
Extreme	<ul style="list-style-type: none"> Class A Forest Class B Woodland (05) Class D Scrub Any classified vegetation with a greater than 10° slope.
Moderate	<ul style="list-style-type: none"> Class B Low woodland (07) Class C Shrubland Class E Mallee/Mulga Class G Grassland, including sown pasture and crops Class G Grassland: Open woodland (06), Low open woodland (08), Open shrubland (09) Vegetation that has a low hazard level but is within 100 metres of vegetation classified as a moderate or extreme hazard, is to adopt a moderate hazard level.
Low	<ul style="list-style-type: none"> Low threat vegetation may include areas of maintained lawns, golf courses, public recreation reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks Managed grassland in a minimal fuel condition (insufficient fuel is available to significantly increase the severity of the bushfire attack). For example, short-cropped grass to a nominal height of 100 millimetre Non-vegetated areas including waterways, roads, footpaths, buildings and rock outcrops.

*Vegetation classifications from AS 3959-2018 Table 2.3.

3.2.1.1 Pre-development BHL assessment

Linfire has mapped the pre-development bushfire hazard levels within the project area and adjacent 150 m wide assessment area. The bushfire hazard levels have been assessed on the basis of the vegetation discussed in Section 3.1.3 (i.e. the current pre-development extent of vegetation within, and surrounding, the project area).

The pre-development BHL assessment (refer to Figure 5) show that based on the existing vegetation, the project area contains land with Moderate and Extreme bushfire hazard levels.

3.2.1.2 Post-development BHL assessment

Linfire has mapped the potential post-development bushfire hazard levels to demonstrate that the future bushfire hazard levels will be acceptable for future development to occur within the project area. The bushfire hazard levels have been assigned on the basis of the vegetation discussed in Section 3.1.4 and the future expected vegetation extent within and surrounding the project area.

The post-development BHL assessment (refer to Figure 6) demonstrate that all future habitable development (i.e. flat land within proposed lots) will be located on land with be Moderate and Low bushfire hazard level.



Legend

- Project Area
- 100m
- 150m
- Cadastre
- Vegetation Plot
- Bushfire Hazard Level
 - Extreme
 - Moderate

Scale 1:3,300



0 60 120 180 Metres



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Lot 1 Dampier Road, Gap Ridge

Figure 5: Pre-Development BHL Assessment

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Legend

- Project Area
- Assessment Area
- 100m
- 150m
- Vegetation Plot
- Bushfire Hazard Level
- Extreme
- Moderate
- Low

Scale 1:3,300



0 60 120 180 Metres



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Figure 6: Post-Development BHL
Assessment

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4.0 Identification of bushfire hazard issues

4.1 Bushfire context

Upon completion of the development, the predominant bushfire risk to the project area is from the broad extent of unmanaged grassland shrubland and scrub vegetation to east, north and south of the project area, with continuous fires runs kilometres long possible in these directions. Bushfires from the west are shorter due to existing development west of Dampier Road reducing fire runs to 500 m long, and depending on the existing land use to the north, if the existing cleared land here were to remain, it would provide some reduction in bushfire impact on future development within the project area. Notwithstanding, bushfires do have the potential to impact the site with elevated radiant heat and ember attack if the risk is not managed.

4.2 Bushfire hazard issues

Examination of strategic development design in accordance with the concept plan and pre and post-development bushfire hazards has identified the following bushfire hazard issues to be considered at future planning stages:

1. Based on the existing extent of vegetation outside the project area, parts of the proposed development would subject to an initial BAL of BAL-FZ, if unmanaged. In order for the development to achieve a compliant rating of BAL-29 or less, sufficient separation need to be provided between habitable development and classifiable, unmanaged vegetation. Similarly, sufficient separation will also be required from any classifiable onsite vegetation, if any, to achieve BAL-29 or less.
2. Provision of a coherent internal vehicular access network to ensure occupants are able to egress away from bushfire, and fire brigade has appropriate and flexible access to habitable development and direct interfaces with unmanaged vegetation
3. Provision of a secure water supply for bushfire fighting activities.
4. Ensure the bushfire risk to any future vulnerable land uses is appropriately considered and mitigated.

4.3 Bushfire safety strategy

The following bushfire safety strategy is proposed to demonstrate compliance with the Bushfire Protection Criteria of the Guidelines at future planning stages, in order to address the bushfire hazards identified above:

1. Create sufficient separation between future habitable buildings and post-development classified vegetation outside the project area, to achieve BAL-29 or lower in accordance with AS 3959. All land within the project area is expected to be either non-vegetated or low threat landscaping, otherwise APZ will also be required from any classified vegetation within the project area. Internal APZ setbacks may be required within some lots to prevent development in areas of BAL-40/FZ.
2. Ensure vehicular access to and from the proposed development complies with the technical specifications of Guidelines.
3. Ensure a secure bushfire fighting water supply, most likely through use of static firewater tanks.
4. Ensure a Bushfire Emergency Evacuation Plan accompanies the BMP for any future planning applications for vulnerable land uses, and Bushfire Risk Management Plans for any future high-risk land uses.

Based on the above, Linfire considers the bushfire hazards within and adjacent to project area and the associated bushfire risks are manageable through standard management responses outlined in

the Guidelines and AS 3959. These responses will be factored into proposed development as early as possible at all stages of the planning process to ensure a suitable, compliant and effective bushfire management outcome is achieved for protection of future life, property and environmental assets.

5.0 Assessment against the bushfire protection criteria

Given the final occupants of the future development is still to be determined,

5.1 Compliance assessment against the Bushfire Protection Criteria (Elements 1 to 4)

An acceptable solutions assessment against Elements 1 to 4 of the bushfire protection criteria is provided in Table 5.

Table 5: Compliance with the bushfire protection criteria of the Guidelines

Bushfire protection criteria			Development response	
Performance Principle	Acceptable solutions	Planning Stage	Method of compliance	Proposed bushfire management measures
Element 1: Location				
<i>Intent: To ensure that strategic planning proposals, subdivision and development applications are located in areas with the least possible risk of bushfire to facilitate the protection of people, property and infrastructure</i>				
Performance Principle P1 The strategic planning proposal, subdivision and development application is located in an area where the bushfire hazard assessment is or will, on completion, be moderate or low, or a BAL-29 or below, and the risk can be managed. For unavoidable development in areas where BAL-40 or BAL-FZ applies, demonstrating that the risk can be managed to the satisfaction of the decision-maker.	A1.1 Development location The strategic planning proposal, subdivision and development application is located in an area that is or will, on completion, be subject to either a moderate or low bushfire hazard level, or BAL-29 or below.	All	Acceptable Solution	The post-development BHL assessment (Figure 6), which assumes future development will modify the project area to non-vegetated or low threat vegetation, demonstrates that on completion of development, all developable land will comprise Moderate and Low bushfire hazard level, which is compliant with A1.1.
Element 2: Siting and design of development				
<i>Intent: To ensure that the siting and design of development minimises the level of bushfire impact.</i>				
Performance Principle P2 The siting and design of the strategic planning proposal, subdivision or development application, including roads, paths and landscaping, is appropriate to the level of bushfire threat that applies to the site. The proposal incorporates a defensible space and significantly reduces the heat intensities at the building surface thereby minimising the bushfire risk to people, property and infrastructure, including compliance with AS 3959 if appropriate.	A2.1 Asset Protection Zone (APZ) Every habitable building is surrounded by, and every proposed lot can achieve, an APZ depicted on submitted plans, which meets the following requirements: Width: Measured from any external wall or supporting post or column of the proposed building, and of sufficient size to ensure the potential radiant heat impact of a bushfire does not exceed 29kW/m ² (BAL-29) in all circumstances. Location: the APZ should be contained solely within the boundaries of the lot on which the building is situated, except in instances where the neighbouring lot or lots will be managed in a low-fuel state on an ongoing basis, in perpetuity (see explanatory notes) Management: the APZ is managed in accordance with the requirements of 'Standards for Asset Protection Zones' (see Guidelines Schedule 1).	All	Acceptable Solution	Where post-development vegetation (including any proposed onsite unmanaged retention, rehabilitation or drainage vegetation) is not able to be excluded in accordance with AS 3959 Clause 2.2.3.2, sufficient separation will be required to achieve BAL-29 at proposed habitable development. Strategies to achieve this separation include the use of: <ul style="list-style-type: none"> • interfacing roads or driveways, • firebreaks, • building setbacks • targeted onsite non-vegetated elements and/or managed low threat landscaping • strategically located and vegetated drainage basins to reduce separation requirements. The required separation distances (including APZs where required) will be identified for each stage of planning application, where required, based confirmed lot layout and BAL contour assessment. Based on the vegetation classifications identified during the site assessment, or considered potentially likely within the assessment area, the following separation distances may apply to achieve BAL-29: <ul style="list-style-type: none"> • 8 m from Class G grassland (flat/upslope) • 9 m from Class G grassland (downslope 0°-5°) • 9 m from Class C shrubland (flat/upslope) • 10 m from Class C shrubland (downslope 0°-5°) • 13 m from Class D scrub (flat/upslope) • 15 m from Class D scrub (downslope 0°-5°) At future planning stages, it will be possible to define the required APZs widths and locations to

Bushfire protection criteria			Development response	
Performance Principle	Acceptable solutions	Planning Stage	Method of compliance	Proposed bushfire management measures
				<p>respond to unmanaged vegetation more accurately.</p> <p>Any identified APZs are to be implemented and maintained in accordance with Schedule 1 of the Guidelines (see Appendix 2) and the City of Karratha Firebreak Notice (see Appendix 6). Outside of nominated APZs and areas of unmanaged vegetation, any landscaping within the project area, will likely consist of low threat and managed gardens in accordance with AS 3959 Clause 2.2.3.2 (f) (refer Appendix 3) and Schedule 1 of the Guidelines (refer to Appendix 2).</p> <p>If any staging of development is to occur, it may be necessary to consider staging buffers to remove any temporary BAL-40/FZ impacts from vegetation remaining in undeveloped parts of the project area, or temporarily quarantine until the bushfire hazard can be removed.</p>
Element 3: Vehicular access				
<i>Intent: To ensure that the vehicular access serving a subdivision/ development is available and safe</i>				
<p><u>Performance Principle P3i</u></p> <p>The design and capacity of vehicular access and egress is to provide for the community to evacuate to a suitable destination before a bushfire arrives at the site, allowing emergency services personnel to attend the site and/or hazard vegetation.</p>	<p><u>A3.1 Public Roads</u></p> <p><i>The minimum requirements under this acceptable solution are applicable to all proposed and existing public roads.</i></p> <p>Public roads are to meet the minimum technical requirements in Table 6, Column 1.</p> <p>The trafficable (carriageway/pavement) width is to be in accordance with the relevant class of road in the Local Government Guidelines for Subdivisional Development (IPWEA Subdivision Guidelines), Liveable Neighbourhoods, Austroad standards and/or any applicable standards for the local government area.</p>	SP, Sb, Do	<u>Existing compliance with Acceptable Solution</u>	<p>No public roads are currently proposed as part of future development.</p> <p>Vehicular access to project area is from Dampier Road, which is a sealed two-way road that appear to be compliant with Guidelines, and are sufficient for occupant egress and emergency services access.</p> <p>Should any public roads be proposed as part of future development, they will be required to comply with the relevant technical requirements of the Guidelines (see Appendix 4).</p>
	<p><u>A3.2a Multiple access routes</u></p> <p>Public road access is to be provided in two different directions to at least two different suitable destinations with an all-weather surface (two-way access).</p> <p>If the public road access to the subject site is via a no-through road which cannot be avoided due to demonstrated site constraints, the road access is to be a maximum of 200 metres from the subject lot(s) boundary to an intersection where two-way access is provided.</p> <p>The no-through road may exceed 200 metres if it is demonstrated that an alternative access, including an emergency access way, cannot be provided due to site constraints and the following requirements are met:</p> <ul style="list-style-type: none"> the no-through road travels towards a suitable destination; and the balance of the no-through road, that is greater than 200 metres from the subject site, is wholly within BAL-LOW, or is within a residential built-out area – Figure 23. 	SP, Sb, Do	<u>Acceptable Solution</u>	<p>The project area is already well-served by the existing public road network, namely Dampier Road, which is a two-way road providing for travel north (to Dampier) and south then east (to Karratha) to suitable destinations. Internal access from the project area to Dampier Road, is expected to be via the existing battle-axe leg, which addressed further below under A3.5.</p> <p>Based on the above, future development is able to be provided with at least, two access routes which meets and exceeds the requirements of Acceptable Solution A3.2a.</p> <p>While access to development within the existing lot via the battle-axe leg can be compliantly achieved with the Guidelines, it is noted that the ability to subdivide the project area will be contingent on the ability to extend a second vehicular access route to Lot 1 through the adjacent lots, namely Lot 500 or Unallocated Crown Land. The likely vehicular access options available should subdivision be pursued, would be either a public road via a gazetted road reserve, or an Emergency Access Way via an access easement, which would need to be secured across land outside of the Proponents control.</p> <p>Linfire are not aware of any specific decision whether to seek subdivision of the project area, however simply raise that there would need to be vehicular access arrangements secured in order to comply with the Guidelines, should subdivision be pursued.</p>
	<p><u>A3.2b Emergency access way</u></p> <p><i>Where it is demonstrated that A3.2a cannot be achieved due to site constraints, or where an alternative design option does not exist, an emergency access way can be considered as an acceptable solution.</i></p> <p>An emergency access way is to meet all the following requirements:</p> <ul style="list-style-type: none"> requirements in Table 6, Column 2; provides a through connection to a public road; be no more than 500 metres in length; and must be signposted and if gated, gates must open the whole trafficable width and remain unlocked. 	SP, Sb, Do	<u>Not Applicable (Acceptable Solution if required in future planning applications)</u>	<p>No emergency access ways (EAWs) are currently proposed as part of future development.</p> <p>If permanent emergency access ways (EAW) are required, or if development and vehicular access construction is to be staged and requires temporary EAWs, these are also to be constructed to the relevant technical requirements of the Guidelines (see Appendix 4).</p>

Bushfire protection criteria			Development response	
Performance Principle	Acceptable solutions	Planning Stage	Method of compliance	Proposed bushfire management measures
	<p>A3.3 Through roads</p> <p>All public roads should be through-roads. No-through roads should be avoided and should only be considered as an acceptable solution where:</p> <ul style="list-style-type: none"> it is demonstrated that no alternative road layout exists due to site constraints; and the no-through road is a maximum length of 200 metres to an intersection providing two-way access, unless it satisfies the exempt ion provisions in A3.2a of this table. <p>A no-through road is to meet all the following requirements:</p> <ul style="list-style-type: none"> requirements of a public road (Table 6, Column 1); and turn-around area as shown in Figure 24 	SP, Sb	Acceptable Solution (if required in future planning applications)	<p>No public roads are currently proposed as part of future development and Dampier Road is an existing through road.</p> <p>If as part of future planning, the development requires any permanent no-through roads, or on a temporary basis as part of development staging, they will need to be less than 200 m in length and include either an 18 m turning head or compliant hammerhead, or be excludable under A3.2a, and are to be constructed to the relevant technical requirements of the Guidelines (see Appendix 4).</p>
<p>Performance Principle P3ii</p> <p>The internal layout, design and construction of public and private vehicular access and egress in the subdivision / development allow emergency and other vehicles to move through it safely and easily.</p> <p>The design of vehicular access and egress provides:</p> <ul style="list-style-type: none"> access and egress for emergency service vehicles while allowing the community to evacuate; a defensible space for emergency services personnel on the interface between classified vegetation and development site; and hazard separation between classified vegetation and the subject site to reduce the potential radiant heat that may impact a lot(s). 	<p>A3.4a Perimeter Roads</p> <p>A perimeter road is a public road and should be provided for greenfield or infill development where 10 or more lots are being proposed (including as part of a staged subdivision) with the aim of:</p> <ul style="list-style-type: none"> separating areas of classified vegetation under AS3959, which adjoin the subject site, from the proposed lot(s); and removing the need for battle-axe lots that back onto areas of classified vegetation. <p>A perimeter road is to meet the requirements contained in Table 6, Column 1.</p> <p>A perimeter road may not be required where:</p> <ul style="list-style-type: none"> the adjoining classified vegetation is Class G Grassland; lots are zoned for rural living or equivalent; it is demonstrated that it cannot be provided due to site constraints; or all lots have frontage to an existing public road 	SP, Sb	Not Applicable	<p>No public roads are currently proposed as part of future development.</p> <p>Notwithstanding, the use of roads between proposed development and the bushfire hazard is recommended where possible, to provide separation between buildings and unmanaged vegetation, and also to aid firefighting operations. While A3.4a is referring to the use of public perimeter roads, if possible, private driveways could also be used to provide interfacing roads.</p>
<p>Performance Principle P3iii</p> <p>Vehicular access is provided which allows:</p> <ul style="list-style-type: none"> access and egress for emergency service vehicles; defendable space for emergency services personnel on the interface between classified vegetation and development; and hazard separation between classified vegetation and the site to reduce the potential radiant heat that may impact a lot(s). 	<p>A3.4b Fire service access route</p> <p><i>Where proposed lots adjoin classified vegetation under AS3959, and a perimeter road is not required in accordance with A3.4a, a fire service access route can be considered as an acceptable solution to provide firefighter access, where access is not available, to the classified vegetation.</i></p> <p>A fire service access route is to meet all the following requirements:</p> <ul style="list-style-type: none"> requirements in Table 6, Column 3; be through-routes with no dead-ends; linked to the internal road system at regular intervals, every 500 metres; must be signposted; no further than 500 metres from a public road; if gated, gates must open the required horizontal clearance and can be locked by the local government and/or emergency services, if keys are provided for each gate; and turn-around areas designed to accommodate type 3.4 fire 	SP, Sb	Not Applicable (Acceptable Solution if required in future planning applications)	<p>The proposed development does not require fire service access routes (FSARs) to achieve fire brigade access to the project area.</p> <p>Should an FSAR be required as part of future planning stages, they will be constructed to the relevant technical requirements of the Guidelines (see Appendix 4) including interconnecting with the public road network at 500 m intervals, be through roads no further than 500 m from a public road, and have turnarounds every 500 m.</p>

Bushfire protection criteria			Development response	
Performance Principle	Acceptable solutions	Planning Stage	Method of compliance	Proposed bushfire management measures
	appliances and to enable them to turn around safely every 500 metres.			
Performance Principle P3iv Vehicular access is provided which allows emergency service vehicles to directly access all habitable buildings and water supplies and exit the lot without entrapment	A3.5 Battle-axe access legs <i>Where it is demonstrated that a battle-axe cannot be avoided due to site constraints, it can be considered as an acceptable solution.</i> There are no battle-axe technical requirements where the point the battle-axe access leg joins the effective area of the lot, is less than 50 metres from a public road in a reticulated area. In circumstances where the above condition is not met, or the battle-axe is in a non-reticulated water area, the battle-axe is to meet all the following requirements: <ul style="list-style-type: none"> requirements in Table 6, Column 4; and passing bays every 200 metres with a minimum length of 20 metres and a minimum additional trafficable width of two metres (i.e. the combined trafficable width of the passing bay and constructed private driveway to be a minimum six metres) 	Sb	Acceptable Solution	The project area is currently serviced by an existing battle-axe leg that is 450 m long and 10 m wide. While battle-axe lots should be avoided in bushfire prone areas, where unavoidable as part of future planning applications (such as this existing lot configuration) and where further than 50 m from public roads, they are required to be constructed to the relevant technical requirements of the Guidelines (see Appendix 4), including passing bays at 200 m intervals. The existing lot boundary is able to contain a battle-axe leg compliant with A3.5.
	A3.6 Private driveways There are no private driveway technical requirements where the private driveway is: <ul style="list-style-type: none"> within a lot serviced by reticulated water; no greater than 70 metres in length between the most distant external part of the development site and the public road measured as a hose lay; and accessed by a public road where the road speed limit is not greater than 70 km/h. In circumstances where all of the above conditions are not met, or the private driveway is in a non-reticulated water area, the private driveway is to meet all the following requirements: <ul style="list-style-type: none"> requirements in Table 6, Column 4; passing bays every 200 metres with a minimum length of 20 metres and a minimum additional trafficable width of two metres (i.e. the combined trafficable width of the passing bay and constructed private driveway to be a minimum six metres); and turn-around area as shown in Figure 28 and within 30 metres of the habitable building. 	Dd, Do	Acceptable Solution	All internal driveways from the termination of the battle-axe leg to, and throughout, future development within the project area, are to be constructed to the relevant technical requirements of the Guidelines for private driveways (see Appendix 4), including turn-around areas within 30 m of each building, passing bays if driveways are longer than 200 m.
Element 4: Water <i>Intent: To ensure that water is available to enable people, property and infrastructure to be defended from bushfire</i>				
No Performance Principle Applies	A4.1 Identification of future water supply Evidence that a reticulated or sufficient non-reticulated water supply for bushfire fighting can be provided at the subdivision and/or development application stage, in accordance with the specifications of the relevant water supply authority or the requirements of Schedule 2. Where the provision of a strategic water tank(s) is required a suitable area within a road reserve or a dedicated lot the location should be identified, should be identified on the structure plan, to the satisfaction of the local government.	SP	Acceptable Solution	There are currently not known street hydrants in Dampier Road, so it is expected that static bushfire water tanks would be required to achieve compliance with A4.1. Firefighting water supply to larger developments within the project area, may be provided by onsite fire hydrant systems that may be installed at these facilities, if triggered by the National Construction Code).
Performance Principle P4 The subdivision, development or land use	A4.2 Provision of water for firefighting purposes Where a reticulated water supply is existing or proposed, hydrant	Sb, Dd, Do	Acceptable Solution	Assuming that providing a compliant reticulated water supply is not achievable to any part of the proposed development, static bushfire water tanks would need to be installed within the project area,

Bushfire protection criteria			Development response	
Performance Principle	Acceptable solutions	Planning Stage	Method of compliance	Proposed bushfire management measures
<p>is provided with a permanent and secure water supply that is sufficient for firefighting purposes.</p> <p>Provide a permanent water supply that is:</p> <ul style="list-style-type: none"> sufficient and available for firefighting purposes; constructed from non-combustible materials (e.g. steel), or able to maintain its integrity throughout a bushfire; and accessible, with legal access for maintenance and re-filling by tankers and emergency service vehicles 	<p>connection(s) should be provided in accordance with the specifications of the relevant water supply authority. Where these specifications cannot be met, then the following applies:</p> <ul style="list-style-type: none"> The provision of a water tank(s), in accordance with the requirements of Schedule 2; and Where the provision of a strategic water tank(s) is applicable, then the following requirements apply: <ul style="list-style-type: none"> land to be ceded free of cost to the local government for the placement of the tank(s); the lot or road reserve where the tank is to be located is identified on the plan of subdivision; tank capacity, construction, and fittings, provided in accordance with the requirements of Schedule 2; and a strategic water tank is to be located no more than 10 minutes from the subject site (at legal road speeds). <p>Where a subdivision includes an existing habitable building(s) that is to be retained, a water supply should be provided to this existing habitable building(s), in accordance with the requirements listed above.</p>			<p>and appropriately sized in accordance with Schedule 2 (refer to Appendix 5), and designed in accordance with the requirements of the local council and the technical requirements of Schedule 2 of the Guidelines.</p>

* **Applicable Planning Stages** (**SP** - Strategic planning and structure plan where lot layout is unknown; **Sb** - Structure plan where lot layout is known and subdivision application; **Dd** – Development application for a single dwelling, ancillary dwelling or minor development; **Do** – Development application for any other development)

6.0 Responsibilities for implementation and management of the bushfire measures

This BMP has been prepared as a strategic guide to demonstrate how development compliance will be delivered at future planning stages in accordance with the Guidelines. Aside from the preparation of future BMPs to accompany future subdivision and development applications where appropriate, there are no further items to implement, enforce or review at this strategic stage of the planning process.

Future BMPs prepared for subsequent subdivision and development applications are to meet the relevant commitments outlined in this strategic level BMP, address the relevant requirements of SPP 3.7 (i.e. Policy Measures 6.4 and 6.5 respectively) and demonstrate in detail how the proposed development will incorporate the relevant acceptable solutions or meet the performance requirements of the Guidelines. Future BMPs are to include the following detailed information:

- proposed development layout, including any lots, high risk land uses, roads, POS/drainage areas, etc
- detailed landscape plans for all POS, drainage and areas of revegetation or retention, to confirm the final extent of classified vegetation (retained or revegetated) and exclusions (non-vegetated areas and low threat vegetation).
- final determination of post development classified vegetation extent, exclusions and effective slope
- BAL contour map demonstrating that proposed development areas will achieve BAL-29 or lower (may require designation of building envelopes)
- width and alignment of compliant APZs/setbacks
- confirmation of how bushfire management will be addressed during development staging including consideration of low threat staging buffers and vehicular access (temporary no-through roads/EAWs)
- proposed approach to fuel management throughout POS, vacant land, staging buffers, adjacent properties and road verges; or application of AS 3959 in response to classified vegetation
- vehicular access provisions, including demonstration that a minimum of two access routes will be achieved for each stage of development in accordance with Acceptable Solution A3.2a
- water supply provisions with regards to reticulated water supply provisions (including network of street hydrants), or static firewater tanks if required
- demonstration of compliance with the bushfire protection criteria of the Guidelines
- requirements for any proposed vulnerable land uses including provision of a BMP and Bushfire Emergency Evacuation Plan to accompany the development application
- requirements for BMP compliance reports as a condition of subdivision
- provisions for notification on Title for any future lots with a rating of BAL-12.5 or greater as a condition of subdivision
- compliance requirements with the current local government annual firebreak notice, as amended or varied
- construction of Class 1, 2, 3 or associated 10a buildings in accordance with AS 3959 to the assessed BAL rating
- proposed implementation and audit program outlining all measures requiring implementation and the appropriate timing and responsibilities for implementation.

On the basis of the information contained in this BMP, Linfire considers the bushfire hazards within and adjacent to the project area and the associated bushfire risks are manageable through standard management responses outlined in the Guidelines and AS 3959. Linfire considers that on implementation of the proposed management measures, the project area will be able to be developed with a manageable level of bushfire risk whilst maintaining full compliance with the Guidelines and AS 3959.

7.0 References

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Appendix 1 Vegetation plot photos and description



Photo ID: 1a



Photo ID: 1c



Photo ID: 1b



Photo ID: 1d



Photo ID: 1e

Plot number	Plot 1
Vegetation classification	Class G Grassland
Description / justification	Grassland greater than 100 mm in height

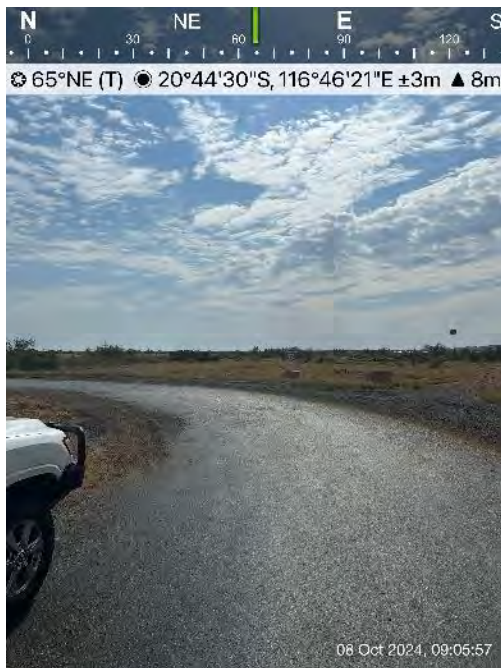


Photo ID: 2a



Photo ID: 2c



Photo ID: 2b



Photo ID: 2d



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Photo ID: 2g



Photo ID: 2f



Photo ID: 2h

Plot number	Plot 2
Vegetation classification	Class G Grassland
Description / justification	Grassland greater than 100 mm in height



Photo ID: 3a



Photo ID: 3b



Photo ID: 3c



Photo ID: 3d



Photo ID: 3e



Photo ID: 3g



Photo ID: 3f



Photo ID: 3h

Plot number	Plot 3
Vegetation classification	Class C Shrubland
Description / justification	Shrub vegetation less than 2 m high at maturity



Photo ID: 5a



Photo ID: 5b



Photo ID: 5c



Photo ID: 5d



Photo ID: 5e



Photo ID: 5g



Photo ID: 5f



Photo ID: 5h

Plot number	Plot 5
Vegetation classification	Class D Scrub
Description / justification	Vegetation with a continuous horizontal and vertical structure, greater than 2 m high at maturity



Photo ID: 7a



Photo ID: 7b



Photo ID: 7c



Photo ID: 7d



Photo ID: 7e



Photo ID: 7f



Photo ID: 7g

Plot number	Plot 7
Vegetation classification	Class G Grassland
Description / justification	Grassland greater than 100 mm in height



Photo ID: 8a



Photo ID: 8c



Photo ID: 8b



Photo ID: 8d

Plot number	Plot 8
Vegetation classification	Class C Shrubland
Description / justification	Shrub vegetation less than 2 m high at maturity



Photo ID: 9a



Photo ID: 9b



Photo ID: 9c



Photo ID: 9d

Plot number	Plot 9
Vegetation classification	Class D Scrub
Description / justification	Vegetation with a continuous horizontal and vertical structure, greater than 2 m high at maturity



Photo ID: 11a



Photo ID: 11b

Plot number	Plot 11
Vegetation classification	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])
Description / justification	Low threat cultivated gardens and maintained lawns within surrounding properties and non-vegetated areas including roads, footpaths, driveways and building footprints

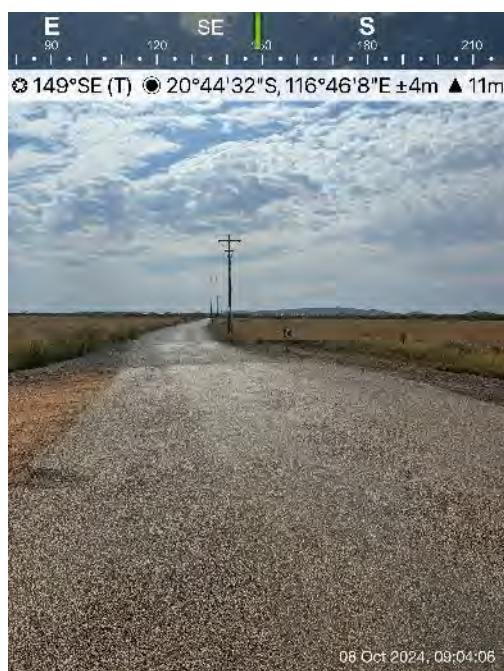


Photo ID: 12a



Photo ID: 12b

Plot number	Plot 12
Vegetation classification	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])
Description / justification	Low threat cultivated gardens and maintained lawns within surrounding properties and non-vegetated areas including roads, footpaths, driveways and building footprints

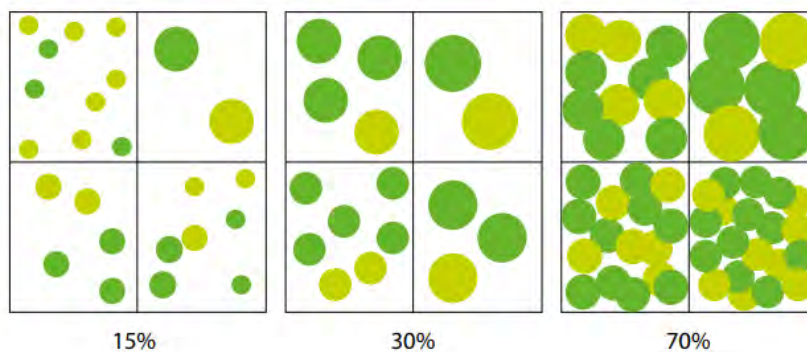
Appendix 2 APZ standards (Schedule 1 of the Guidelines)

An APZ is a low fuel area maintained around a habitable building to increase the likelihood that it will survive a bushfire, by providing a defensible space and reducing the potential for direct flame contact, radiant heat exposure and ember attack.

Vegetation management within an APZ should provide defensible space and be maintained to a low threat state, in perpetuity, in accordance with the requirements outlined in Schedule 1.

Schedule 1: Standards for Asset Protection Zones

- **Trees* (> 6 metres in height)**
 - Trunks at maturity should be a minimum distance of six metres from all elevations of the building.
 - Branches at maturity should not touch or overhang a building or powerline.
 - Lower branches and loose bark should be removed to a height of two metres above the ground and/or surface vegetation.
 - Canopy cover within the APZ should be <15 per cent of the total APZ area.
 - Tree canopies at maturity should be at least five metres apart to avoid forming a continuous canopy. Stands of existing mature trees with interlocking canopies may be treated as an individual canopy provided that the total canopy cover within the APZ will not exceed 15 per cent and are not connected to the tree canopy outside the APZ.



- **Shrub* and Scrub* (0.5 metres to 6 metres in height)**
 - Should not be located under trees or within three metres of buildings.
 - Should not be planted in clumps >5 square metres in area.
 - Clumps should be separated from each other and any exposed window or door by at least 10 metres.
 - Shrub and scrub >6 metres in height are to be treated as trees.
- **Ground covers (<0.5 metres in height)**
 - Can be planted under trees but must be maintained to remove dead plant material, as prescribed in 'Fine fuel load' above.
 - Can be located within two metres of a structure, but three metres from windows or doors if >100 millimetres in height.
 - Ground covers >0.5 metres in height are to be treated as shrubs
- **Grass**
 - Grass should be maintained at a height of 100 millimetres or less, at all times.
 - Wherever possible, perennial grasses should be used and well-hydrated with regular application of wetting agents and efficient irrigation.
- **Fine Fuel load (combustible dead vegetation mater <6 mm in thickness)****
 - Should be managed and removed on a regular basis to maintain a low threat state.
 - Should be maintained at <2 tonnes per hectare (on average).
 - Mulches should be non-combustible such as stone, gravel or crushed mineral earth or wood mulch

Schedule 1: Standards for Asset Protection Zones

>6 millimetres in thickness.

- **Defendable Space**
 - Within three metres of each wall or supporting post of a habitable building, the area is kept free from vegetation, but can include ground covers, grass and non-combustible mulches as prescribed above.
- **Fences within the APZ**
 - Should be constructed from non-combustible materials (for example, iron, brick, limestone, metal post and wire, or bushfire-resisting timber referenced in Appendix F of AS 3959)
- **LPG Cylinders**
 - Should be located on the side of a building furthest from the likely direction of a bushfire or on the side of a building where surrounding classified vegetation is upslope, at least one metre from vulnerable parts of a building.
 - The pressure relief valve should point away from the house.
 - No flammable material within six metres from the front of the valve.
 - Must sit on a firm, level and non-combustible base and be secured to a solid structure.

** Plant flammability, landscaping design and maintenance should be considered – refer to explanatory notes*

*** Fine fuel load should be maintained to less than two tonnes per hectare, however this is often a subjective assessment.*

- *Reducing fuel load levels does not necessarily require the removal of existing vegetation. A combination of methods can be utilised to reduce fuel load such as raking, weed removal, pruning, mulching and/or the removal of plant material.*
- *A simple method to estimate fuel load is to roughly equate one tonne of fuel load per hectare as 100 grams per square metre. For example, two tonnes per hectare of leaf litter is roughly 200 grams of leaf litter per square metre and eight tonnes per hectare is roughly 800 grams.*
- *Eucalyptus leaf litter is approximately 100 grams per handful, so two handfuls of litter per square metre will roughly equate to two tonnes per hectare.*
- *Different types of fine fuel, like mulch or pine needles may be more or less than a handful, however the 100 grams per square metre rule of thumb can still be used.*

E2 Plant flammability

There are certain plant characteristics that are known to influence flammability, such as moisture or oil content and the presence and type of bark. Plants with lower flammability properties may still burn during a bushfire event, but may be more resistant to burning and some may regenerate faster post-bushfire.

There are many terms for plant flammability that should not be confused, including:

- Fire resistant – plant species that survive being burnt and will regrow after a bushfire and therefore may be highly flammable and inappropriate for a garden in areas of high bushfire risk.
- Fire retardant – plants that may not burn readily or may slow the passage of a bushfire.
- Fire wise – plants that have been identified and selected based on their flammability properties and linked to maintenance advice and planting location within a garden.

Although not a requirement of these Guidelines, local governments may develop their own list of fire wise or fire retardant plant species that suit the environmental characteristics of an area. When developing a recommended plant species list, local governments should consult with ecologists,

land care officers or environmental authorities to ensure the plants do not present a risk to endangered ecological communities, threatened, or endangered species or their habitat.

When selecting plants, private landholders and developers should aim for plants within the APZ that have the following characteristics:

- grow in a predicted structure, shape and height;
- are open and loose branching with leaves that are thinly spread;
- have a coarse texture and low surface-area-to-volume ratio;
- will not drop large amounts of leaves or limbs, that require regular maintenance;
- have wide, flat, and thick or succulent leaves;
- trees that have bark attached tightly to their trunk or have smooth bark;
- have low amounts of oils, waxes, and resins (which will often have a strong scent when crushed);
- do not produce or hold large amounts of fine dead material in their crowns; and/or
- will not become a weed in the area.

Refer to the WAPC Bushfire and Vegetation Fact Sheet for further information on clearing and vegetation management and APZ landscaping, design and plant selection reference material.

Appendix 3 Low Threat Vegetation (AS 3959 Clause 2.2.3.2)

2.2.3.2 Exclusions—Low threat vegetation and non-vegetated areas


The following vegetation shall be excluded from a BAL assessment:

- (a) Vegetation of any type that is more than 100 m from the site.
- (b) Single areas of vegetation less than 1 ha in area and not within 100 m of other areas of vegetation being classified vegetation.
- (c) Multiple areas of vegetation less than 0.25 ha in area and not within 20 m of the site, or each other or of other areas of vegetation being classified vegetation.
- (d) Strips of vegetation less than 20 m in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20 m of the site or each other, or other areas of vegetation being classified vegetation.
- (e) Non-vegetated areas, that is, areas permanently cleared of vegetation, including waterways, exposed beaches, roads, footpaths, buildings and rocky outcrops.
- (f) Vegetation regarded as low threat due to factors such as flammability, moisture content or fuel load. This includes grassland managed in a minimal fuel condition, mangroves and other saline wetlands, maintained lawns, golf courses (such as playing areas and fairways), maintained public reserves and parklands, sporting fields, vineyards, orchards, banana plantations, market gardens (and other non-curing crops), cultivated gardens, commercial nurseries, nature strips and windbreaks.

NOTES:

- 1 Minimal fuel condition means there is insufficient fuel available to significantly increase the severity of the bushfire attack (recognizable as short-cropped grass for example, to a nominal height of 100 mm).
- 2 A windbreak is considered a single row of trees used as a screen or to reduce the effect of wind on the leeward side of the trees.

Appendix 4 Vehicular access technical standards of the Guidelines

Public roads
Acceptable Solution A3.1
Public roads are to meet the minimum technical requirements in Table 6, Column 1.
Explanatory note E3.1
<p>These Guidelines do not prescribe values for the trafficable (carriageway/pavement) width of public roads as they should be in accordance with the class of road as specified in the IPWEA Subdivision Guidelines, Liveable Neighbourhoods, Austroad Standards and/or any applicable standard in the local government area.</p> <p>The IPWEA Subdivision Guidelines, Liveable Neighbourhoods, Austroad Standards do not prescribe a horizontal clearance. However, it is recommended that a traversable verge is provided to allow for emergency services vehicles to stop and operate on the side of the public road, specifically where the public road may traverse large areas of classified vegetation.</p> <p>Where local government roads are proposed to be widened by the proponent, they must obtain approval from the local government</p> <div data-bbox="268 987 724 1518">  <p>The diagram illustrates a cross-section of a public road. It shows a central paved area with a dashed white line down the middle. On either side of the paved area is a shoulder. A red fire truck is shown on the left shoulder, and a blue car is on the right shoulder. A vertical line on the left indicates a 4.5m height clearance. A horizontal line at the bottom indicates a 4m paving width and a 1m shoulder on either side.</p> </div> <p>Figure 20: Example of a public road</p>

Multiple Access Routes
Acceptable solution A3.2a
<p>Public road access is to be provided in two different directions to at least two different suitable destinations with an all-weather surface (two-way access).</p> <p>If the public road access to the subject site is via a no-through road which cannot be avoided due to demonstrated site constraints, the road access is to be a maximum of 200 metres from the subject lot(s) boundary to an intersection where two-way access is provided.</p> <p>The no-through road may exceed 200 metres if it is demonstrated that an alternative access, including an emergency access way, cannot be provided due to site constraints and the following requirements are met:</p> <ul style="list-style-type: none"> • the no-through road travels towards a suitable destination; and • the balance of the no-through road, that is greater than 200 metres from the subject site, is wholly within BAL-LOW, or is within a residential built-out area – Figure 23.
Explanatory note E3.2a
<p>Two-way public road access is public road access from a lot in at least two different directions to two suitable destinations, and provides residents and the community, as well as emergency services, with access and egress from both the subdivision and individual habitable buildings/development in the event of a bushfire emergency. A single road provides no alternative route if the access becomes congested or is unable to be traversed due to smoke and/or fallen trees during a bushfire.</p> <p>Two-way public road access applies to access/egress routes leading into a subdivision, as well as those within a subdivision. A road that loops back onto itself does not constitute the option of two different directions.</p> <p>Two-way public road access should always be the first option. Where the site is not able to achieve two-way access within 200 metres of the lot boundary, due to demonstrated site or environmental constraints, the proponent should identify options for an emergency access way from the subject site to a suitable destination. Where an emergency access way cannot be provided, the proponent should demonstrate compliance with the performance principle.</p> <p>Subject sites or proposed lots greater than 200 metres from an intersection, which provides two-way access, do not satisfy the requirement for two-way access unless they meet the provisions which allow for nothrough roads greater than 200 metres in A3.2a.</p> <p>To demonstrate compliance with the performance principle for two-way access, the bushfire planning practitioner may have regard to:</p> <ul style="list-style-type: none"> (a) the extent of the bushfire hazard, location and vegetation classification, the likelihood, potential severity and impact of bushfire to the subject site and the road network; (b) time between fire detection and the onset of conditions in comparison to travel time for the community to evacuate to a suitable destination; (c) available access route(s) travelling towards a suitable destination; and (d) turn-around area for a fire appliance for no-through roads

Multiple Access Routes



Figure 21: Example of compliant and non-compliant two-way

Emergency access way
Acceptable solution A3.2b
<p><i>Where it is demonstrated that A3.2a cannot be achieved due to site constraints, or where an alternative design option does not exist, an emergency access way can be considered as an acceptable solution.</i></p> <p>An emergency access way is to meet all the following requirements:</p> <ul style="list-style-type: none"> • requirements in Table 6, Column 2; • provides a through connection to a public road; • be no more than 500 metres in length; and • must be signposted and if gated, gates must open the whole trafficable width and remain unlocked.
Explanatory note E3.2b
<p>An emergency access way is not a preferred alternative to through public road access and should only be considered acceptable where it has been demonstrated that it will provide the safety and performance needs of emergency services and the community, including consideration for future needs, and that public road access to satisfy A3.2a cannot be achieved due to site constraints, such as an established road network with no opportunity to provide a public road for secondary access. Acceptance of an emergency access way should also consider the ability to accommodate reasonable worst-case vehicle volumes.</p> <p>The principle function of the emergency access way is to provide a contingency (second) community evacuation route and simultaneously provide access for emergency services, in the event of a bushfire emergency. Where an emergency access way traverses classified vegetation, which has the potential to create a bushfire hazard, an emergency access way performs the secondary function of providing access by emergency services to this vegetation.</p> <p>Emergency access ways should connect to a public road to allow alternative two-way through access. An emergency access way should not exceed 500 metres in length as they may not be as safe for road-use due to not being designed or constructed to the full requirements of a public road and may present uncertainties to emergency service personnel and the public as they are not part of the daily road network and not identified on Maps.</p> <p><u>Permanent public emergency access way</u></p> <p>An emergency access way can be provided as either a public easement in gross or a right-of-way. In both approaches, the management of the emergency access way is by the local government as the grantee of the easement or management body of the right-of-way. The proponent must obtain written consent from the local government that the local government will accept care, control and management of the easement or right-of-way; this must be provided to the decision-maker prior to granting planning approval. The approach taken is at the discretion of the decision-maker and/ or the local government and is also dependent on whether the land is to remain in private ownership or be ceded to the Crown. Consultation with Land Use Management at the Department of Planning, Lands and Heritage should also be considered if the land is to be ceded to the Crown or if the local government is uncertain of which approach to take.</p> <p>If the emergency access way is provided as an easement, it should be provided as a public easement in gross under sections 195 and 196 of the Land Administration Act 1997 in favour of the local government and/or public authority, to ensure accessibility for emergency services and the public at all times. To be provided as a right-of-way the emergency access way should be vested in the Crown under section 152 of the Planning and Development Act 2005 as a right-of way and such land to be ceded free of cost and without any payment or compensation by the Crown. If gates are used to control traffic flow during non-emergency periods, these will be managed by the local government and must not be locked. Gates should be double gates wide enough to access the full pavement width and accommodate Type 3.4 fire appliances with the design and construction to be approved by the relevant local government.</p> <p><u>Temporary public emergency access way</u></p> <p>A temporary emergency access way may be proposed to facilitate the staging arrangements of a subdivision. The provision of two public roads may not be possible in the first stage of the subdivision and an emergency access way can be provided as an interim access route until the second public road is developed and gazetted in a subsequent stage of the subdivision (see figure 22). The emergency access way should be provided in the same manner as a permanent emergency access way, but it should be removed from the certificate of title once the public road is developed and gazetted. Where an emergency access way is</p>

Emergency access way

proposed as an alternative to a public road, the Bushfire Management Plan should provide thorough justification for its use.

Restricted public emergency access way

There may be some instances where a restricted emergency access way is proposed as a performance principle based solution where access is only available to the public in the event of a bushfire emergency. This option can only be considered where the local government or Main Roads WA have advised that vehicular access on the emergency access way is not allowed during non-emergency periods, as it provides an additional thoroughfare and entry point on a local or State road. In this scenario, the emergency access way can be provided as an easement under section 195 of the Land Administration Act 1997, as public access in the event of a bushfire emergency or vested in the Crown as a reserve under section 152 of the Planning and Development Act 2005. Such land is to be ceded free of cost without any payment or compensation by the Crown. The proponent must obtain written consent from the local government that the local government will accept care, control and management of the proposed reserve and agree to the terms of the Management Order Conditions (if applicable); this must be provided to the decision-maker prior to granting planning approval.

The purpose of the reserve should be for a public purpose specified in the condition related to the subdivision, for example for emergency access only, or for emergency access and recreation. A reserve for emergency access and recreation can optimise the land-use as a dual purpose where it provides vehicular access in the event of a bushfire emergency, but can be accessed by the public (on foot) on a day-to-day basis as a recreation link. Appropriate signage can ensure the general public is aware of the purpose of the reserve. The approach taken is at the discretion of the decision-maker and/or local government.

Right-of-carriageway emergency access way

There may be some instances where a right-of-carriageway easement is proposed as a performance principle-based solution. This may be where particular landowner(s) and emergency services, but not the public, require access over a neighbouring lot(s).

A right-of-carriageway easement should be provided under section 195 of the Land Administration Act 1997. The easement is to provide alternative access for the particular landowner(s) in the event of a bushfire emergency and not for use by the public. In this scenario, support will be necessary from the adjoining lot owner(s). The easement is to be granted to the local government and it is to agree with the landowner on the arrangements of the management of the easement area by deed. These management arrangements will be at the discretion of the local government. If gated, the easement area can be locked to restrict day-to-day vehicular access.

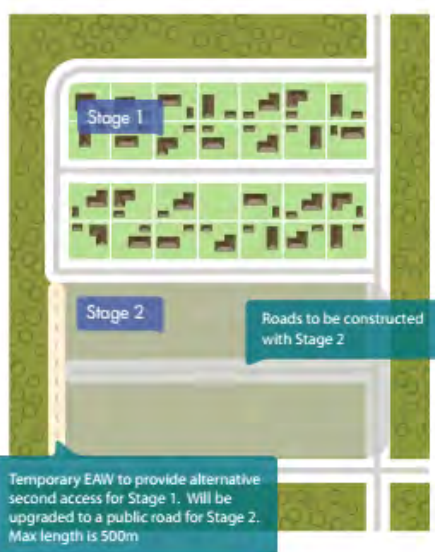
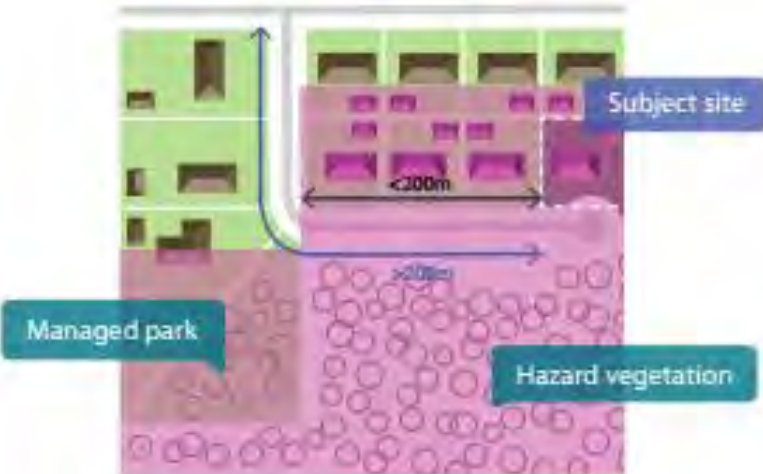
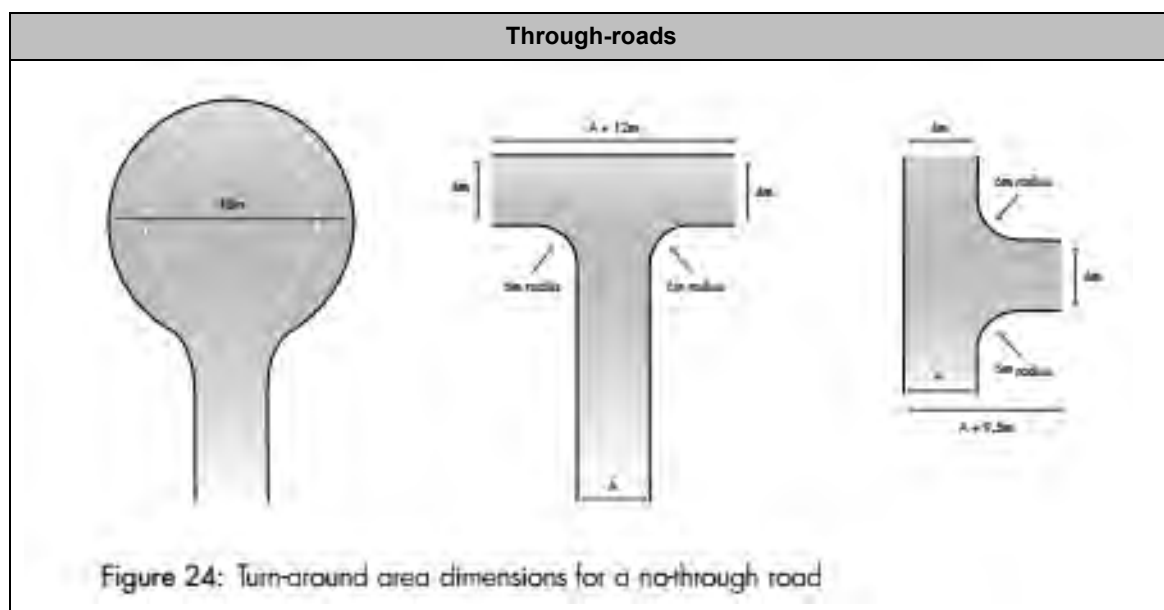


Figure 22: Example of an emergency access way

Through-roads
<p>Acceptable solution A3.3</p> <p>All public roads should be through-roads. No-through roads should be avoided and should only be considered as an acceptable solution where:</p> <ul style="list-style-type: none"> it is demonstrated that no alternative road layout exists due to site constraints; and the no-through road is a maximum length of 200 metres to an intersection providing two-way access, unless it satisfies the exemption provisions in A3.2a of this table. <p>A no-through road is to meet all the following requirements:</p> <ul style="list-style-type: none"> requirements of a public road (Table 6, Column 1); and turn-around area as shown in Figure 24
<p>Explanatory note E3.3</p> <p>In bushfire prone areas, a proposed structure plan or subdivision that incorporates no-through roads should be avoided because they do not provide a connected and legible design that allows for easy access and egress by the community, residents and emergency services in the event of a bushfire. No-through roads also reduce the options available for access and egress in the event of a bushfire emergency.</p> <p>There will however be situations where a subject site is accessed via an existing or proposed no-through road and alternative access cannot be provided. In these situations, the proponent should demonstrate to the decision-maker, that all efforts have been made with the local government and/or adjoining landowners to secure alternative public road access or an emergency access way and that a redesign has been explored. The bushfire planning practitioner may need to develop a performance principle-based solution or address the non-compliance and demonstrate to the decisionmaker why discretion should be exercised in accordance with section 2.6 of these Guidelines.</p> <p>No-through roads will only be considered an acceptable solution where it is demonstrated by the proponent, to the satisfaction of the decision maker, that a no through-road cannot be avoided due to site constraints. For example, the internal road design of a structure plan or subdivision where site constraints, such as a water body or Bush Forever, prevent the ability to create a through-road and a no through road may be a more appropriate road layout.</p> <p>No-through roads should be a maximum of 200 metres from the lot(s) boundary to an intersection where two-way access is provided and may only exceed 200 metres if it meets the provisions which allow for no-through roads greater than 200 metres in A3.2a.</p>  <p>Figure 23: Example of a site on a no-through road greater than 200 metres from the intersection, but within 200 metres of BAL-LOW</p>



Fire service access routes
Acceptable solution A3.4b
<p><i>Where proposed lots adjoin classified vegetation under AS3959, and a perimeter road is not required in accordance with A3.4a, a fire service access route can be considered as an acceptable solution to provide firefighter access, where access is not available, to the classified vegetation.</i></p> <p>A fire service access route is to meet all the following requirements:</p> <ul style="list-style-type: none"> • requirements in Table 6, Column 3; • be through-routes with no dead-ends; • linked to the internal road system at regular intervals, every 500 metres; • must be signposted; • no further than 500 metres from a public road; • if gated, gates must open the required horizontal clearance and can be locked by the local government and/or emergency services, if keys are provided for each gate; and • turn-around areas designed to accommodate type 3.4 fire appliances and to enable them to turn around safely every 500 metres.
Explanatory note E3.4b
<p>Where a subdivision adjoins classified vegetation and where A3.2a has been satisfied, hazard separation and defensible space across multiple lots may be required in the form of a fire service access route.</p> <p>A fire service access route is not intended to provide residents and the general public with emergency egress and therefore is not a suitable second access or substitute for a public road. A fire service access route is to provide access for emergency services to classified vegetation for firefighting and fire management purposes.</p> <p>A fire service access route can be provided as either an easement in gross over private or Crown land, or ceded to the Crown as a reserve. In both approaches, the management of the fire service access route is by the local government as the grantee of the easement or management body of the reserve. Determining which approach to take is dependent on what the intended tenure of the fire service access route is, which is explained further below. The proponent must obtain written consent from the local government that the local government will accept care, control and management of the easement or reserve and agree to the terms of the Management Order Conditions (if applicable); this must be provided to the decision-maker prior to granting planning approval. The approach taken is at the discretion of the decision-maker and/or the local government. Consultation with Land Use Management at the Department of Planning, Lands and Heritage should also be considered if the land is to be ceded to the Crown or if the local government is uncertain of which approach to take.</p> <p>Where gates are used, these should be double gates wide enough to access the full required horizontal clearance and accommodate type 3.4 fire appliances with the design and construction to be approved by the relevant local government. Gates on fire service access routes may be locked to restrict access, provided a common key system is used, and such keys are made available for emergency services and designated fire officers within the local government area and/or surrounding district. Gates should be installed where fences cross fire service access routes. If an easement in gross is proposed, such arrangements for gates should be included in the deed of easement and be agreed to by the local government.</p> <p>Fire service access route to remain in private ownership of multiple landowners Where a fire service access route is proposed to traverse multiple private lots and they are intended to remain in the private ownership of the multiple landowners, it should be provided as an easement in gross under section 196 of the Land Administration Act 1997, to ensure accessibility for fire emergency services and not for use by the public. The easement is to be granted to the local government and/or public authority for firefighting and emergency management purposes.</p> <p><u>Fire service access route to be created under State ownership</u></p> <p>Where a fire service access route is proposed to traverse multiple private lots, but the decision-maker and/or local government prefer for the fire service access route to remain in one ownership under the State for management purposes, the fire service access route can be vested in the Crown under section 152 of the Planning and Development Act 2005 as a reserve, such land to be ceded free of cost without any payment or compensation by the Crown. The purpose of the reserve should be for a public purpose specified in the</p>

Fire service access routes

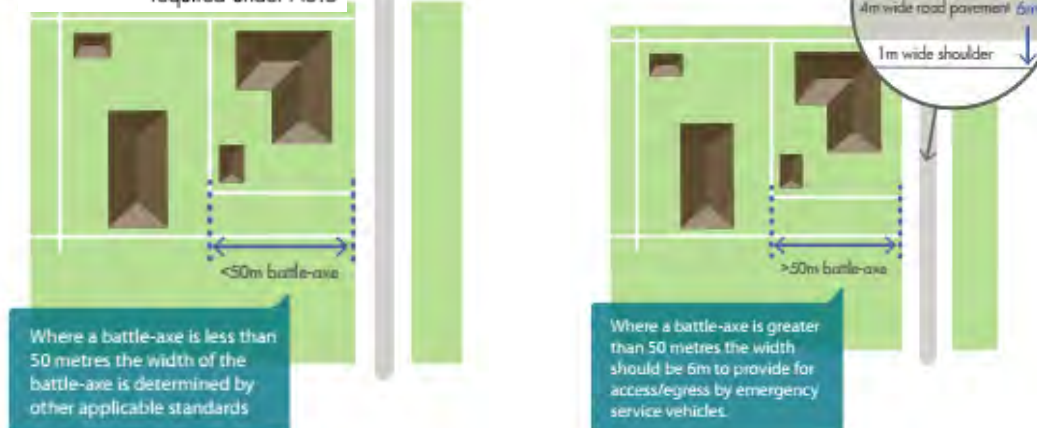
condition related to the subdivision, for example for vehicular access for emergency services and the local government only, or for vehicular access for emergency services and the local government and recreation. A reserve for emergency services access and recreation can optimise the land-use as a dual purpose, where it provides vehicular access for emergency services, but can be accessed by the public (on foot) on a day-to-day basis as a recreation link. Appropriate signage will ensure the general public is aware of the purpose of the reserve. The approach taken is at the discretion of the decision-maker and/or local government.

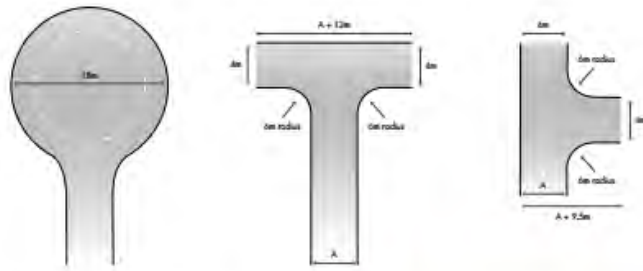
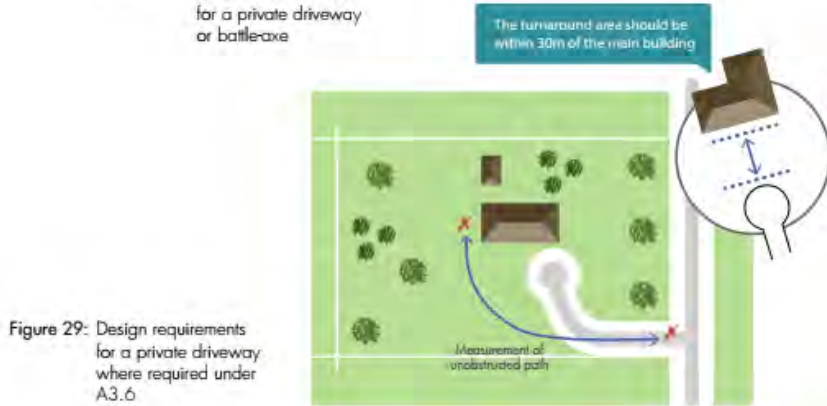


Figure 26: Example of a fire service access route

Battle-axe access legs
Acceptable solution A3.5
<p><i>Where it is demonstrated that a battle-axe cannot be avoided due to site constraints, it can be considered as an acceptable solution.</i></p> <p>There are no battle-axe technical requirements where the point the battle-axe access leg joins the effective area of the lot, is less than 50 metres from a public road in a reticulated area.</p> <p>In circumstances where the above condition is not met, or the battle-axe is in a non-reticulated water area, the battle-axe is to meet all the following requirements:</p> <ul style="list-style-type: none"> • requirements in Table 6, Column 4; and • passing bays every 200 metres with a minimum length of 20 metres and a minimum additional trafficable width of two metres (i.e. the combined trafficable width of the passing bay and constructed private driveway to be a minimum six metres)
Explanatory note E3.5
<p>In bushfire prone areas, lots with battle-axe access legs should be avoided because they:</p> <ul style="list-style-type: none"> • do not enable the habitable building to be located close to a public road where it is visible to emergency services; • result in longer than necessary access routes for evacuation and the response of emergency services; • may be blocked by falling trees or debris; and • may not provide certainty for emergency services regarding the width, length and ability to turn emergency services vehicle around. <p>In some instances, it may be appropriate for battle-axe access legs to be used to overcome specific site or design constraints created by the existing road networks or lot layout. The Bushfire Management Plan should provide justification for proposed battle-axe access leg(s), including exploration of a redesign of the proposal, and the decision-maker should determine whether the justification is valid.</p> <p>The measurement of the battle-axe access leg should be from the edge of the public road to where the access leg joins the effective area of the lot.</p> <p>Effective lot area means that part of the battle-axe lot that is capable of development and excludes the access leg and associated truncations for vehicle manoeuvrability. Where a proposed battle-axe lot has an existing habitable building that will be retained, the private driveway requirements and/or the battle-axe requirements (as appropriate) should be satisfied.</p> <p>Battle-axe access should be 6 metres in width where the battle-axe is more than 50m in length or for lots serviced by a water source within the property, such as a water tank. It is acceptable for a single battle-axe to have a trafficable width of 4 metres with a traversable edge of 1 metre on either side of the carriageway</p>

Figure 27: Battle-axe design requirements where required under A3.5



Private driveways
Acceptable solution A3.6
<p>There are no private driveway technical requirements where the private driveway is:</p> <ul style="list-style-type: none"> • within a lot serviced by reticulated water; • no greater than 70 metres in length between the most distant external part of the development site and the public road measured as a hose lay; and • accessed by a public road where the road speed limit is not greater than 70 km/h. <p>In circumstances where all of the above conditions are not met, or the private driveway is in a non-reticulated water area, the private driveway is to meet all the following requirements:</p> <ul style="list-style-type: none"> • requirements in Table 6, Column 4; • passing bays every 200 metres with a minimum length of 20 metres and a minimum additional trafficable width of two metres (i.e. the combined trafficable width of the passing bay and constructed private driveway to be a minimum six metres); and • turn-around area as shown in Figure 28 and within 30 metres of the habitable building.
Explanatory note A3.6
<p>In areas serviced by reticulated water, where the road speed limit is not greater than 70 km/h, and where the distance from the public road to the further part of the habitable building is no greater than 70 metres, emergency service vehicles typically operate from the street frontage.</p> <p>In the event the habitable building cannot be reached by hose reel from the public road, then emergency service vehicles will need to gain access within the property. Emergency service vehicles will also need to gain access within the property, where access to reticulated water (fire hydrants) is not possible. In these situations, the driveway and battle-axe (if applicable) will need to be wide enough for access for an emergency service vehicle and a vehicle to evacuate.</p> <p>Turnaround areas should be available for both conventional two-wheel drive vehicles of residents and Type 3.4 fire appliances. Turn-around areas should be located within 30 metres of habitable buildings. Circular and loop driveway design may also be considered. Note that the design requirements for a turn-around area for a private driveway or battle-axe differ to a cul-de-sac.</p>
<div data-bbox="367 1272 1013 1541">  </div> <p data-bbox="367 1568 622 1657">Figure 28: Design requirements for a turn-around area for a private driveway or battleaxe</p> <div data-bbox="263 1612 1093 2016">  </div> <p data-bbox="263 1926 526 2016">Figure 29: Design requirements for a private driveway where required under A3.6</p>

Technical requirement	1	2	3	4
	Public road	Emergency access way ¹	Fire service access routes ¹	Battle-axe and private driveways ²
Minimum trafficable surface (m)	In accordance with A3.1	6	6	4
Minimum horizontal distance (m)	N/A	6	6	6
Minimum vertical clearance (m)	4.5			
Minimum weight capacity (t)	15			
Maximum grade unsealed road ³	As outlined in the IPWEA Subdivision Guidelines	1 in 10 (10%)		
Maximum grade sealed road ³		1 in 7 (14.3%)		
Maximum average grade sealed road		1 in 10 (10%)		
Minimum inner radius of road curves (m)		8.5		

Notes
¹ To have crossfalls between 3 and 6%

² Where driveways and battle-axe legs are not required to comply with the widths in A3.5 or A3.6, they are to comply with the Residential Design Codes and Development Control Policy 2.2 Residential Subdivision.

³ Dips must have no more than a 1 in 8 (12.5% -7.1 degree) entry and exit angle

Appendix 5 Water technical standards of the Guidelines

Schedule 2 – Water Supply Dedicated for Bushfire Fighting Purposes	
2.1 Water supply requirements	
Water dedicated for firefighting should be provided in accordance with Table 7 below, and be in addition to water required for drinking purposes.	
Table 7: Water supply dedicated for bushfire firefighting purposes	
PLANNING APPLICATION	NON-RETICULATED AREAS
Development application	10,000L per habitable building
Structure Plan / Subdivision: Creation of 1 additional lot	10,000L per lot
Structure Plan / Subdivision: Creation of 3 to 24 lots	10,000L tank per lot or 50,000L strategic water tank
Structure Plan / Subdivision: Creation of 25 lots or more	50,000L per 25 lots or part thereof Provided as a strategic water tank(s) or 10,000L tank per lot
2.2 Technical requirements	
<p><u>2.2.1 Construction and design</u></p> <p>An above-ground tank and associated stand should be constructed of non-combustible material. The tank may need to comply with AS/NZS 3500.1:2018.</p> <p>Below ground tanks should have a 200mm diameter access hole to allow tankers or emergency service vehicles to refill direct from the tank, with the outlet location clearly marked at the surface. The tank may need to comply with AS/NZS 3500.1:2018. An inspection opening may double as the access hole provided that the inspection opening meets the requirements of AS/NZS 3500.1:2018. If the tank is required under the BCA as part of fire hydrant installation, then the tank will also need to comply with AS 2419.</p> <p>Where an outlet for an emergency service vehicle is provided, then an unobstructed, hardened ground surface is to be supplied within four metres of any water supply.</p> <p><u>2.2.2 Pipes and fittings</u></p> <p>All above-ground, exposed water supply pipes and fittings should be metal. Fittings should be located away from the source of bushfire attack and be in accordance with the applicable section below, unless otherwise specified by the local government.</p> <p><u>2.2.2.1 Fittings for above-ground water tanks:</u></p> <ul style="list-style-type: none"> Commercial land uses: 125mm Storz fitting; or Strategic water tanks: 50mm or 100mm (where applicable and adapters are available) male camlock coupling with full flow valve; or Standalone water tanks: 50mm male camlock coupling with full flow valve; or Combined water tanks: 50mm male camlock coupling with full flow valve or a domestic fitting, being a standard household tap that enables an occupant to access the water supply with domestic hoses or buckets for extinguishing minor fires. <p><u>2.2.2.2 Remote outlets</u></p> <p>In certain circumstances, it may be beneficial to have the outlet located away from the water supply. In such instances in which a remote outlet is to be used, the applicant should consult the local government and DFES on their proposal.</p>	



Appendix 6 City of Karratha Firebreak Notice

IMPORTANT FIRE MITIGATION NOTICE

ALL OWNERS AND/OR OCCUPIERS OF LAND SITUATED IN THE CITY OF KARRATHA

This is a requirement under the *Bush Fires Act 1954* Section 33. Failure to comply with this Notice may incur penalties of up to \$5,000 and the works required by this Notice will be carried out at the expense of the owner/occupier.

Pursuant to the powers contained in Section 33 of the *Bush Fires Act 1954*, you are hereby required on or before the 1st day of November, (or within fourteen days of your becoming owner or occupier of land should this be after the 1st day of November), or within fourteen days of you receiving this notice, to clear and maintain mineral earth breaks and reduce the fuel load from the land owned or occupied by you as specified hereunder and to have the specified land and firebreaks clear of all flammable material all year round.

LAND IN TOWNSITES- INCLUDING MINING AND OR CONSTRUCTION ACCOMMODATION FACILITIES

1.1 Where the area of land is 2000 square metres (approximately 1/2 an acre) or less, all flammable material must be reduced over the whole of the land. Grasses shall be slashed to a height 75mm.

1.2 Where the area of land exceeds 2000 square metres, mineral earth breaks of at least five (5) metres in width must be cleared of all flammable material immediately inside and along the boundaries of the land. Where there are buildings on the land additional mineral earth breaks five (5) metres in width must be cleared immediately surrounding each building.

1.3 Ensure a minimum vertical clearance of 4 metres is maintained along the firebreaks to enable vehicles to drive along the firebreaks without access being obstructed.

LAND OUTSIDE TOWNSITES INCLUDING MINING AND OR CONSTRUCTION ACCOMMODATION FACILITIES

2.1 For all buildings on land outside of the townsite, two mineral earth breaks with a width not less than five (5) metres and cleared of all flammable material must surround the buildings. The inner mineral earth break must be no less than twenty (20) metres from the perimeter of the building or group of buildings and the outer mineral earth break no less than one hundred (100) metres from the inner mineral earth break.

POWERLINES AND POWER TRANSMISSION LINES IN TOWNSITES INCLUDING MINING AND OR CONSTRUCTION ACCOMMODATION FACILITIES

3.1 Aerial hazards to power and power transmission lines must be maintained as per the guidelines issued by the Energy Safety - Department of Mines, Industry Regulation and Safety.

For power lines conducting less than or equal to 33,000 volts; ground fuels such as grasses and ground storey species must be cleared to a minimum of five (5) metres either side of a centre line created by the poles, or towers. The total cleared area must not be less than ten (10) metres wide and the entire area must be maintained to the standard of a mineral earth break.

3.2 For power transmission lines greater than 33,000 volts, a mineral earth break of not less than five (5) metres in width must be maintained either side of the widest point of any arms or cross arms on the pole or tower. A mineral earth break of no less than five (5) metres width is to be maintained directly under the power line corridor. All power and transmission lines are to be maintained as per Australian Standard AS7000, to assist in minimizing the risk from sparks or arcing and shall be the responsibility of the owner of the transmission line.

WATER SUPPLY PIPELINES AND INFRASTRUCTURE

4.1 All water supply pipelines and associated infrastructure must have mineral earth breaks not less than five (5) metres wide on both sides of the pipeline and all associated infrastructure and be cleared of all flammable material to prevent the spread of fire and damage to the pipelines or associated infrastructure. Access points must be installed and maintained to allow for Emergency Services access and maintenance use.

EXPLOSIVES MAGAZINES AND STORAGE AREAS

5.1 All Flammable Materials are to be removed to bare earth between any bunkers or storage facilities and all Flammable Materials are to be removed for a distance of not less than fifteen (15) metres from the perimeter of any such storage area.

FUEL DEPOT / FUEL STORAGE AREA / HAYSTACKS / STOCKPILED FLAMMABLE MATERIAL

6.1 For all fuel depots/fuel storage areas, all flammable matter within 10 metres of where fuel drums, fuel ramps or fuel dumps are located, and where fuel drums, whether containing fuel or not are stored, a mineral earth break of not less than five (5) metres in width must be installed immediately adjacent

6.2 For all haystacks/stockpiled flammable materials, a mineral earth break of not less than five (5) metres in width must be installed immediately adjacent to any haystacks or stockpiled flammable material.

RAILWAY RESERVES IN TOWNSITES

7.1 Mineral earth breaks of at least five (5) metres in width must be installed immediately inside all boundaries continuous with any railway reserve on which railway traffic operates and are the responsibility of the owner of the railway.

APPLICATION TO VARY FIREBREAK REQUIREMENTS

If you consider it to be impractical to clear a mineral earth break or remove flammable material as required by this Notice, you may apply to Council or its Authorised Officer no later than the 30th day of August, for permission to provide firebreaks in alternative positions or take alternative action to remove or abate fire hazards. If permission is not granted by Council or Authorised Officer, you must comply with the requirement of this Notice. An application must include a detailed map (google map or similar) of the area you intend to vary, outlining the variation you require, along with the reason for variation.

BURNING GARDEN REFUSE DURING LIMITED BURNING TIMES

9.1 A person must not burn garden refuse at a place (other than a rubbish tip) during the limited burning times for that place unless it is burned:

- (a) in an incinerator in accordance with subsection (2); or
- (b) on the ground in accordance with subsection (3).

9.2 Garden refuse burned in an incinerator is burned in accordance with this subsection where:

- (a) the incinerator is designed and constructed so as to prevent the escape of sparks or burning material; and
- (b) either
 - (i) the incinerator is situated not less than two (2) metres from any building or fence; or
 - (ii) if the incinerator is less than two (2) metres from a building or fence, the Council or its Authorised Officer has given written permission in writing for the incinerator to be used; and there is no flammable material within two (2) metres of the incinerator while it is in use; and

- (c) there is no flammable material within two (2) metres of the incinerator while it is in use; and,
- (d) at least one person is present at the site of the fire at all times until it is completely extinguished; and
- (e) the fire is no longer required, the person ensures that the fire is completely extinguished by the application of water or earth.
- 9.3 The Council or Authorised Officer must not give permission under subsection 9.2
- (b) (ii) unless it is satisfied that the use of the incinerator is not likely to create a fire hazard.

ADDITIONAL WORKS

10.1 In addition to the requirements of this Notice, you may be required to carry out further works which are considered necessary by an Authorised Officer and specified by way of a separate written notice forwarded to the address of the owner/s as shown on the City rates record for the relevant land.

10.2 If the requirements of this Notice are carried out by burning, such burning must be in accordance with the relevant provisions of the Act.

10.3 Pursuant to Section 33(4) of the Act, where the owner and/or occupier of land fails or neglects to comply with the requisitions of this Notice within the times specified, the City may by its officers and with such servants, workmen and contractors, vehicles and machinery as the officers deem fit, enter upon the land and carry out the requisitions of this Notice which have not been complied with and pursuant to Section 33(5) of the Act, the amount of any costs and expenses incurred may be recovered from the owner and or occupier of the land.

10.4 Failing to comply with this notice may incur a modified penalty or prosecution. A person in default is also liable, whether prosecuted or not, to pay the cost of performing the work directed in this notice, if it is not carried out by the owner or occupier by the date required by this notice.

Implementing a new, nationally consistent Fire Danger Rating system.

From 1 September 2022, Australia's Fire Danger Rating System will be improved and simplified to make it easier for you to make decisions to stay safe on days of fire danger risk.





The move to a simpler system is backed by improvements in science, which will mean we can better predict areas of greater risk on days of fire danger.

Across the country fire and emergency services are applying nationally consistent colours, signs and terminology. This means that wherever you go in Australia, and whatever the season or fuels you're surrounded with, you can understand the level of threat and what you need to do to stay safe.

Visit afac.com.au/initiative/afdrs for more information.

The new ratings are:



	Moderate Plan and prepare
	High Be ready to act
	Extreme Take action now to protect life and property
	Catastrophic For your survival, leave bushfire risk areas

Attachment 7:
Environmental Assessment Report





WESTERN
ENVIRONMENTAL

Environmental Assessment Report

Lot 1 Dampier Road, Gap Ridge

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Environmental Assessment Report

Lot 1 Dampier Road, Gap Ridge

Report No:

A24.217-RPT-EAR_0_FINAL

Issue Date:

10-Oct-2024

Status

<FINAL>

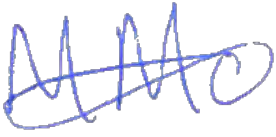


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This environmental report ("this report") has been prepared for the sole benefit and exclusive use of the Client for the purpose for which it was prepared in accordance with the agreement between the Client and WEPL ("the Agreement"). However, in addressing the requirements of the Contaminated Sites Act 2003, an Accredited Contaminated Sites Auditor may be engaged by the Client to undertake review of this report, prior to its submission to the DWER. The report shall be made available and can be relied upon for the purposes of the Contaminated Sites Act.

WEPL disclaims any and all liability with respect to any use of or reliance upon this report for any other purpose whatsoever.

In particular, it should be noted that this report is based on a scope of services defined by the Client, and is limited by budgetary and time constraints, the information supplied by the Client (and its agents) and, in some circumstances, access and/or site disturbance constraints.

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Except as otherwise stated in this report, WEPL has not verified the accuracy or completeness of the data. WEPL does not represent or warrant that the data is true or accurate, and disclaims any and all responsibility or liability with respect to the use of the data.

To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in this report ("conclusions") are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data.

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The conclusions must also be considered in light of the agreed scope of services (including any constraints or limitation therein) and the methods used to carry out those services, both of which are as stated or referred to in this report.

Environmental Conclusions

In accordance with the scope of services, WEPL has conducted environmental field monitoring and/or testing in the preparation of this report. The nature and extent of monitoring and/or testing conducted is described in this report.

On all sites, varying degrees of non-uniformity of vertical and horizontal conditions in media (soil, water, air, waste or other media as described in the report) are encountered. Hence no monitoring, common testing or sampling technique can eliminate the possibility that monitoring or testing results/samples are not totally representative of media conditions encountered. The conclusions are based on the data and the environmental field monitoring and/or testing actually undertaken, and are therefore merely indicative of the environmental condition of the site at the time of preparing this report, including the presence or otherwise of contaminants or emissions. It should be recognised that site conditions, including the extent and concentration of contaminants, can change.

Within the limitations imposed by the scope of services, the monitoring, testing, sampling and preparation of this report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. To the maximum extent permitted by law, no other warranty, express or implied, is made.

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Other parties should not rely on this report or the accuracy or completeness of any conclusions contained in this report, and should make their own enquiries and obtain independent advice in relation to such matters.

If an Auditor is engaged by the Client to undertake review of this report, it shall be made available subject to the terms and conditions of the agreement between the Client and WEPL and the caveats in this statement.

Other Limitations

This report is intended to be read in its entirety, and sections or parts of this report should therefore not be read and relied on out of context.

WEPL will not be liable to update or revise this report to take into account any events or circumstances or facts becoming apparent after the date of this report.

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Appendix A	Likelihood of Occurrence Flora
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1. Introduction

1.1 Background

Western Environmental Approvals Pty Ltd (WEPL) were commissioned by RFF Australia Pty Ltd, on behalf of Green Grid Energy, to prepare an Environmental Assessment Report (EAR) for Lot 1 Dampier Road, Gap Ridge (herein referred to as the 'Site'). The location of the Site is shown in Figure 1.

The Site is located within the City of Karratha, approximately 8.5 km west of Karratha, Western Australia. The Site is currently zoned Rural under the City of Karratha Local Planning Scheme No. 8 (LPS 8) (Figure 2).

This EAR has been prepared to support a Local Planning Scheme (LPS) amendment for the Site. The proposed LPS amendment will re-zone the Site from Rural to General Industry to facilitate equipment laydown and storage.

1.2 Purpose and Scope

This EAR has been prepared to support the LPS amendment for the Site. Scheme amendments are automatically referred to the WA Environmental Protection Authority (EPA) under section 48A of the *Environmental Protection Act 1986* (EP Act). As such, this document will form the primary document describing the environmental values and proposed management of the Site, for the information of the project team and the EPA.

The EAR has been prepared using publicly available datasets, and provides the following:

- Summary of the legislative, policy, and planning framework relating to the Site, and associated approvals.
- Description of the Site's environmental context, based on desktop information held in publicly available datasets, government databases, and published literature where available.
- Assessment of the likelihood of occurrence of Threatened and Priority flora, fauna, and ecological communities within the Site based on the environmental characteristics and known records held by the Department of Biodiversity, Conservation and Attractions (DBCA) within the surrounding area.
- Description of potential impacts and proposed mitigation relevant to the proposed LPS amendment against applicable EPA factors and objectives, and other environmental matters. These include:
 - Flora and vegetation.
 - Terrestrial environmental quality.
 - Terrestrial fauna.
 - Inland waters.

-
- Social surroundings.
 - Bushfire.
 - Heritage (both Aboriginal and European).
 - Holistic environmental impact assessment and recommended management responses.
- Advice and recommended management of any areas of significance.

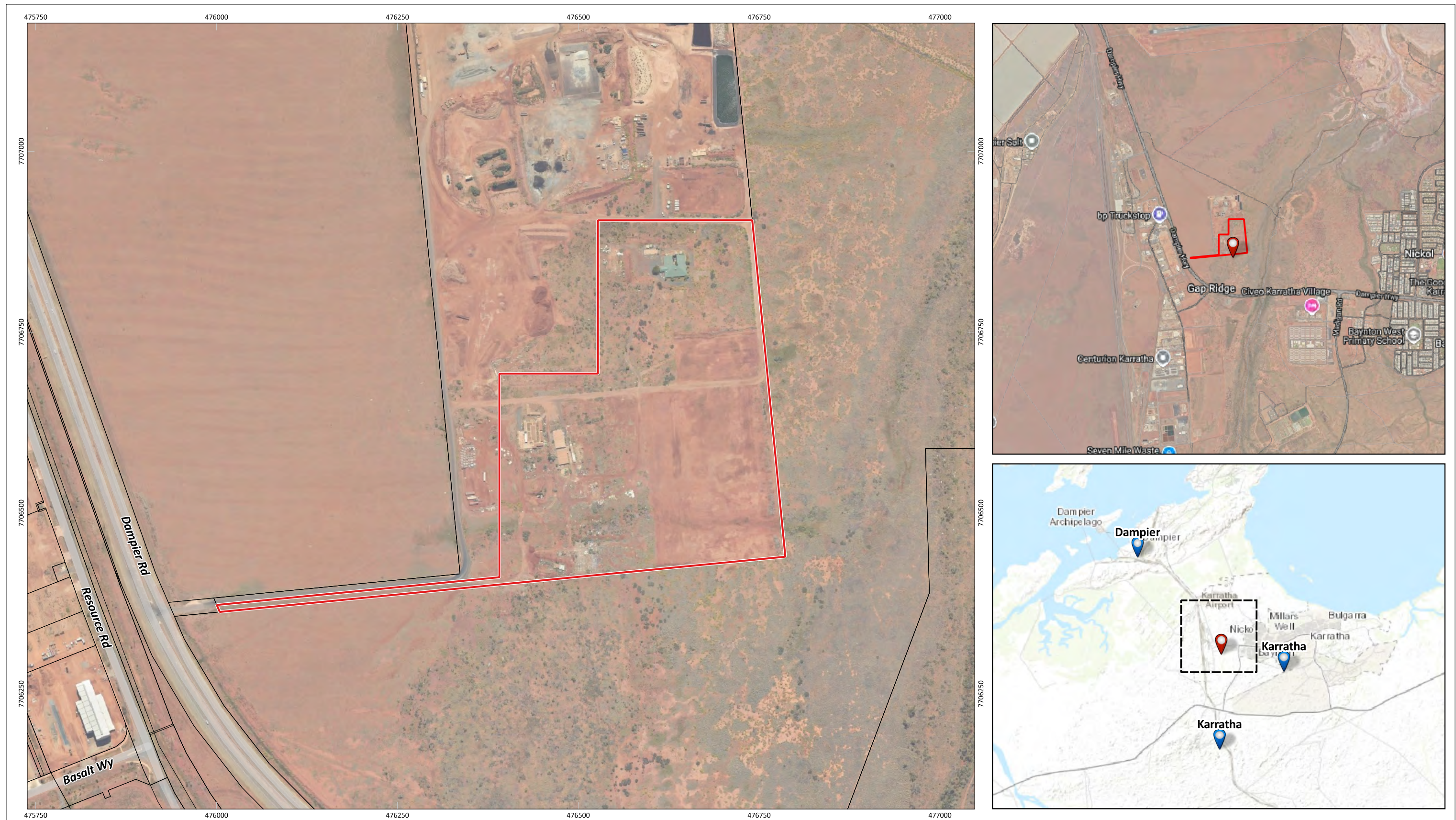


Figure 1: Site Location

<div><div><div></div><div>N</div></div><div><div>0</div><div>50</div><div>100</div><div>150</div><div>200 m</div></div></div>		PROJECT/REPORT NAME Environmental Assessment Report Lot 1 Dampier Road, Gap Ridge	
SCALE 1:5,000		SHEET SIZE A3 COLOUR	CLIENT RFF Australia Pty Ltd
COORDINATE REFERENCE SYSTEM GDA2020 / MGA zone 50		PROJECT NUMBER A24.217	VERSION 0
DATA SOURCE LANDGATE AERIAL IMAGERY Summer 2023		DRAWN BY / REVIEWED BY HS/MM	DATE 24/9/2024

Legend

Site

Cadastre (No Attributes) (LGATE-001)

No	Description	Drawn	Approved	Date
A	Original issue	HS	MM	24/9/2024
NOTES:				
Cadastral boundary (LGATE-002). Base map ESRI Topo. Townsites (LGATE-248).				

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2. Legislation, Policy, and Guidelines

2.1 Commonwealth

For the purpose of the development of Local Scheme Amendments, State legislation is the only relevant legislation. Commonwealth environmental legislation, the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is not directly relevant to the Region or Local Scheme Amendment process, as this legislation is not appropriately geared toward the assessment of strategic planning exercises and would only be applicable to future proposed development action, should Matters of National Environmental Significance (MNES) be impacted.

However, the following legislation and policy were considered as they relate to environmental values within the Site and future planning stages:

- EPBC Act.
- Department of the Environment Water Heritage and the Arts (DEWHA). (2010). *Survey Guidelines for Australia's Threatened Birds*.
- Department of the Environment (DoE). (2013). *Matters of National Environmental Significance. Significant Impact Guidelines 1.1*.

2.2 State

2.2.1 Legislation

Environmental Protection Act 1986 (EP Act)

The EP Act provides for an EPA, for the prevention, control and abatement of pollution and environmental harm, for the conservation, preservation, protection, enhancement and management of the environment and for matters incidental to or connected with the foregoing. It is administered by the Department of Water and Environmental Regulation (DWER), the EPA, and the Minister for Environment.

Under section 48A of the EP Act, proposed scheme amendments are automatically referred to the EPA. The EPA then determine whether or not the scheme should be formally assessed, or determine that it is incapable of being made environmentally acceptable. The assessment levels include the following:

- Scheme amendment not to be assessed under part IV of the EP Act. No advice given (not appealable).
- Scheme amendment not to be assessed under part IV of the EP Act. Advice given (not appealable).
- Scheme incapable of being made environmentally acceptable.
- Assess – Environmental Review.

Other Relevant State Legislation

All assessments have been conducted with reference to the following State legislation and regulations, which provides for the environmental values and contamination risks addressed within this document:

- *Biodiversity Conservation Act 2016* (BC Act).
- *Biosecurity and Agriculture Management Act 2007* (BAM Act).
- *Contaminated Sites Act 2003* (CS Act).
- *Contaminated Sites Regulations 2006* (CS regulations).
- *Planning and Development Act 2005* (PD Act).
- *Aboriginal Heritage Act 1972*.
- *Heritage Act 2018*.

2.2.2 State Planning Policies

Table 1 details the key standards, guidelines, and State Planning Policies relevant to future development of the Site.

Table 1: Key Standards, Guidelines, and State Planning Policies

Document	Description
Environmental Protection Authority (EPA) Guidance	
Statement of Environmental Principles, Factors, Objectives and Aims of EIA (EPA, 2023a)	This statement communicates the EPA considers the object and principles of the EP Act, uses environmental factors and objectives to organise and systemise environmental impact assessment (EIA), taking a holistic view of the environment and considering significance of a proposal.
Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016c)	The technical information provided within this guidance is applicable to flora and vegetation only and should be applied in conjunction with the Environmental Protection Authority's (EPA) policy for the Flora and Vegetation Factor.
Technical Guidance - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA, 2020)	The purpose of this technical guidance is to ensure that terrestrial vertebrate fauna data of an appropriate standard are obtained and used for environmental impact assessment.
Guidance Statement No. 3: Separation Distances Between Industrial and Sensitive Land Uses (EPA, 2005)	Provides guidance on the generic separation (buffer) distances between Industrial and Sensitive land uses to avoid conflicts between these land uses.
Guidance Statement No. 33: Environmental Guidance for Planning and Development (EPA, 2008)	Provides information and advice to assist land use planning and development processes to protect, conserve and enhance the environment. Describes the processes the EPA may apply under the EP Act to land use planning and development in Western Australia, and the

Document	Description
	environmental impact assessment process applied by the EPA to schemes.
Guidance Statement No. 41: Aboriginal Heritage Assessment (EPA, 2004)	Provides guidance on the EPA's position on the assessment of Aboriginal heritage and information that the EPA will consider when assessing proposals where Aboriginal heritage is a relevant environmental factor.
EPA Environmental Factor Guidelines	The EPA factor guidelines provide guidance on how the environmental factors are considered by the EPA in the EIA process. The applicable environmental factors for this report have been identified and discussed in Section 4.
WA Environmental Offsets Policy (EPA, 2011)	Seeks to protect and conserve environmental and biodiversity values for present and future generations. The policy ensures that economic and social development may occur while supporting long term environmental and conservation values.
State Planning Policies	
State Planning Policy 2.9: Water Resources (WAPC, 2006)	Provides clarification and additional guidance to planning decision-makers for consideration of water resources identified as having significant economic, social, cultural, or environmental values.
State Planning Policy 3.7: Planning in Bushfire Prone Areas (WAPC, 2015)	Provides guidance on the implementation of effective risk-based land use planning and development to preserve life and reduce the impact of bushfire on property and infrastructure.
Guideline for the Determination of Wetland Buffer Requirements (WAPC, 2005b)	Provides guidance on the consideration of wetland during a change in land use or a proposed development in the immediate vicinity of a wetland where future land use is likely to conflict with the established wetland management objectives. Under these guidelines, an appropriate buffer distance should be identified to achieve an acceptable planning outcome.
Department of Water and Environmental Regulation (DWER) Guidelines (formerly Department of Environment Regulation [DER])	
Assessment and Management of Contaminated Sites (DWER, 2021a)	Provides guidance on the assessment and management of contaminated sites in Western Australia within legislative framework of the Contaminated Sites Act 2003 and the Contaminated Sites Regulations 2006.
Identification and Investigation of Acid Sulphate Soils and Acidic Landscapes (DER, 2015)	Provides guidance to assist with the identification, assessment, and management of acid sulphate soils in Western Australia.
Water Quality Protection Note No. 25: Land Use Compatibility Tables for Public Drinking Water Source Areas (DWER, 2021)	This note provides guidance for land use planning within onshore PDWSAs. It sets out guidelines on appropriate land uses and activities within PDWSAs that represents best management practice to protect water quality and public health.
Clearing Regulation Fact Sheet 24: Environmentally Sensitive Areas (DER, 2014)	Provides information on the declaration of environmentally sensitive areas (ESAs), how to view the location of ESAs and how ESAs affect when a clearing permit is required.

2.3 Local Government

The following local planning documents have been identified relevant to the proposed development:

-
- City of Karratha. (2021). Local Planning Strategy.
 - City of Karratha. (2019). Local Planning Scheme No. 8.

2.4 Approvals Context

The proposed Local Scheme Amendment will be referred to the EPA under s48A of the EP Act. A clearing permit exemption applies to assessed schemes implemented in accordance with a subdivision approval, development approval, or planning approval where the clearing of native vegetation was assessed.

If the scheme is not formally assessed by the EPA, the exemption will not apply, and a clearing permit (or referral to clear native vegetation) will be required.

3. Environmental Context

3.1 Land Use

3.1.1 Current Land Use

Green Grid Energy acquired the Site in 2023, and propose to utilise the land as a Storage Facility/ Depot/ Lay Down Area in accordance with Development Approval DA23-146 issued by the City of Karratha on the 12th of September 2024. There is currently a building located on the north of the Site, with a small amount of vegetation surrounding. Approximately half of the Site has been cleared of native vegetation (particularly evident in the southeast) with patches of remnant vegetation present in the southwest and northwest portions of the Site.

3.1.2 Previous Land Use

The earliest available aerial imagery of the Site is dated 22 August 1981 and shows the entirety of the Site as remnant native vegetation (Plate 1).

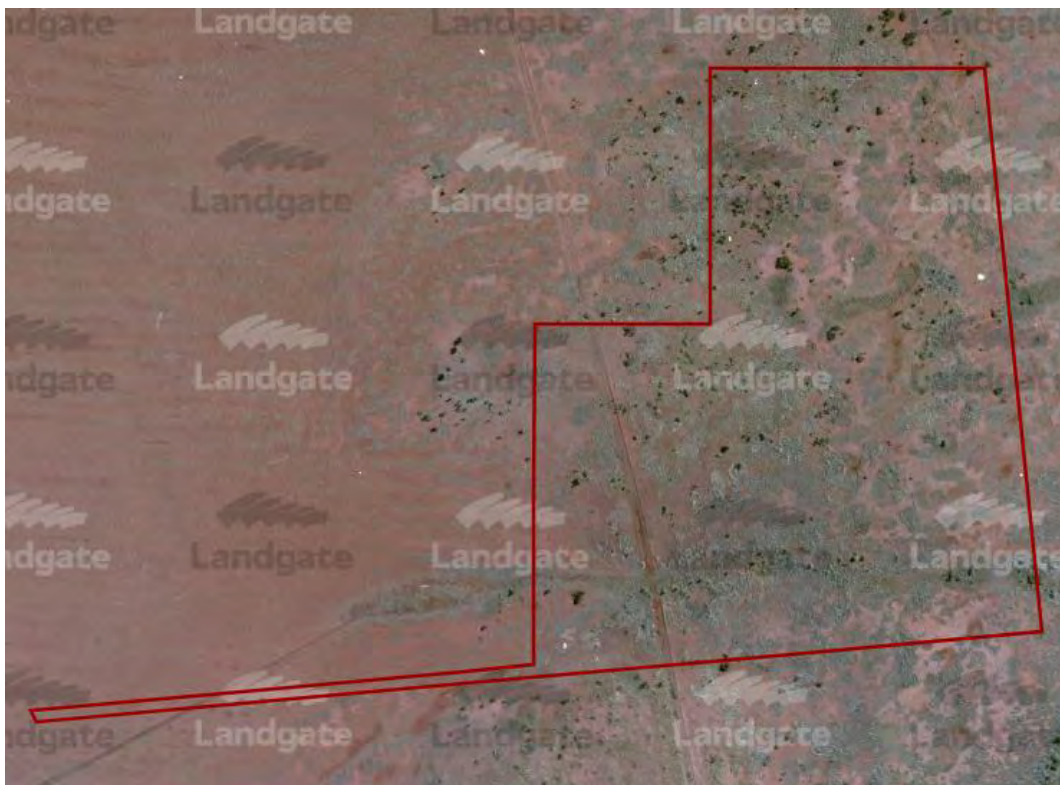


Plate 1. Aerial Imagery Dated 22 August 1981 (Landgate, n.d.)

The Site has been progressively cleared, and the current extent of development and clearing within the Site was reached in 2022 (Plate 2).

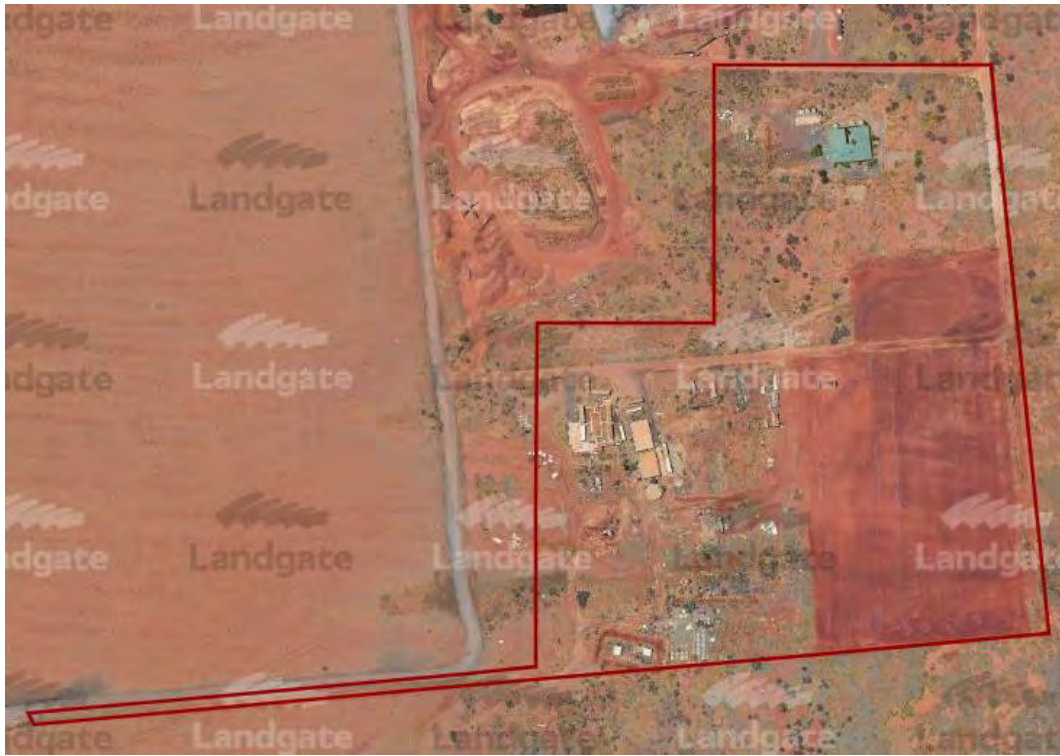


Plate 2. Aerial Imagery Dated 27 October 2022 (Landgate, n.d.)

3.1.3 Surrounding Land Use

The Site is bound to the east and south by remnant native vegetation (zoned Rural), Karratha Environmental Crushing to the north, and Dampier Highway to the west. Land to the north, east, south, and west are zoned Rural under the City of Karratha LPS 8, and land to the west of Dampier Highway is zoned 'Industrial Development'.

3.2 Topography, Geology, and Soils

3.2.1 Topography

Topographic contours within the Site are limited. Figure 3 shows the surrounding land to be approximately 10 m AHD. The surrounding land appears to be relatively flat and undulates only gradually.

3.2.2 Regional Geology and Soils

Two geological units are found within the Site, according to 1:500,000 State Regolith Geology mapping. These are:

- Af-PIP: Clay, silt, and sand on floodplains,
- Ac-PIP: Clay, silt, sand, and gravel in fluvial channels.

The Site is within the Horseflat system (218Hf) according to regional soil-landscape mapping (DPIRD-027) which is described as Gilgaied clay plains supporting Roebourne Plains grass grassland and minor grassy snakewood shrublands.

Surface geology of the Site is presented in Figure 3.

3.2.3 Acid Sulphate Soils

Acid Sulfate Soil (ASS) risk mapping (DWER-053) identifies that the eastern portion of the Site has a moderate to low risk of ASS occurring within 3 m of the natural soil surface (Figure 4). There is no mapped risk of ASS occurring in the remainder of the Site.

3.3 Contamination

According to the Contaminated Sites Database (DWER-059) there are no contaminated sites within or immediately adjacent to the Site. The nearest known contaminated site (ID 36575) is approximately 900 m east of the Site to the opposite side of Dampier Highway. The site is classified as 'contaminated - remediation required' (Figure 5).

The DWER Contaminated Sites Database identifies that petroleum hydrocarbons have been found at multiple locations across a large portion of the Site. Groundwater is impacted by both dissolved phase hydrocarbons and light non-aqueous phase liquid, such as pur hydrocarbon floating on the surface of groundwater. The affected land is restricted to the current industrial land use, and groundwater abstraction for any purpose other than remediation or monitoring is not permitted.

The direction of groundwater flow between the Site and the nearest contaminated site is unknown. However, the Site is unlikely to be affected by this contamination, as no groundwater abstraction is proposed.

3.4 Conservation Areas and Environmentally Sensitive Areas

The Site does not intersect any conservation areas (DBCA-011). The nearest conservation area to the Site is Murujuga National Park which is situated 7.5 km to the north (Figure 6).

Similarly, there are no mapped Environmentally Sensitive Areas (ESAs) with or adjacent to the Site. The nearest is 16 km to the northwest, associated with the Dampier Archipelago.

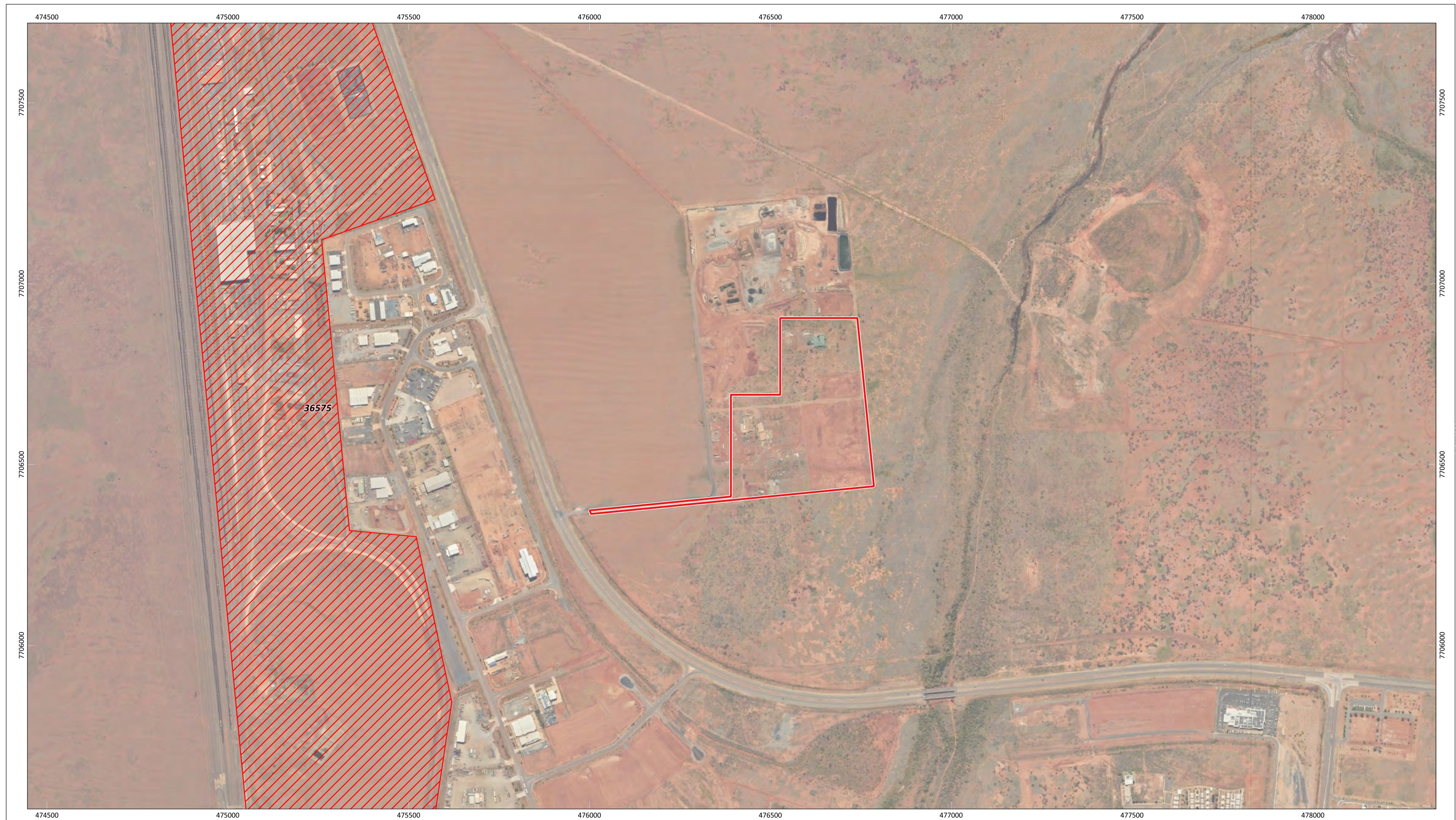


Figure 5: Known and Potential Contamination Risk

<div><div><div>N</div></div><div><div>0</div><div>150</div><div>300</div><div>450</div><div>600 m</div></div></div>		PROJECT/REPORT NAME Environmental Assessment Report Lot 1 Dampier Road, Gap Ridge	
SCALE 1:10,000		SHEET SIZE A3 COLOUR	CLIENT RFF Australia Pty Ltd
COORDINATE REFERENCE SYSTEM GDA2020 / MGA zone 50		PROJECT NUMBER A24.217	VERSION 0
DATA SOURCE LANDGATE AERIAL IMAGERY Summer 2023		DRAWN BY / REVIEWED BY HS / MM	DATE 24/9/2024
<div><div>Legend</div><div><div><div></div></div>Site</div><div><div><div></div></div>Contaminated Sites Database (DWER-059)</div><div><div><div></div></div>Contaminated - remediation required</div></div>			

No	Description	Drawn	Approved	Date
A	Original issue	HS	MM	24/9/2024
NOTES:				
Cadastral boundary from LANDGATE 2022				

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Figure 6: Conservation Areas and Environmentally Sensitive Areas

<div><div><div></div><div>N</div></div><div><div>0</div><div>3</div><div>6 km</div></div></div>		PROJECT/REPORT NAME Environmental Assessment Report Lot 1 Dampier Road, Gap Ridge	
SCALE 1:120,000		SHEET SIZE A3 COLOUR	CLIENT RFF Australia Pty Ltd
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DATA SOURCE LANDGATE AERIAL IMAGERY Summer 2023		DRAWN BY / REVIEWED BY HS / MM	DATE 9/10/2024
<div><div>Legend</div><div><div></div> Site</div><div><div></div> Environmentally Sensitive Areas (DWER-046)</div><div><div></div> DBCA - Legislated Lands and Waters (DBCA-011)</div><div><div></div> National Park</div><div><div></div> Nature Reserve</div><div><div></div> Section 5(1)(h) Reserve</div></div>			

No	Description	Drawn	Approved	Date
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NOTES:				
Cadastral boundary from LANDGATE 2022				

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3.5 Hydrology

3.5.1 Groundwater

The Site is within the Pilbara Groundwater Area (DWER-034) and is underlain by the Pilbara - Fractured Rock aquifer (DoW, 2013). Fractured rock aquifers have complex and irregular structures and characteristics such as water availability, recharge, and storage (DoW, 2013). Allocation limits are not set for fractured rock aquifers (DoW, 2013; Essential Environmental, 2016).

There are no existing groundwater licences within the Site (DWER, n.d.).

3.5.2 Surface Water

There are no natural surface water features within the Site. There is one un-named watercourse approximately 240 m east of the Site (GA, 2015) as shown on Figure 7. This watercourse connects to major watercourses in the surrounding area including Lulu Creek, Cockatoo Creek, and Maitland River, and coastal watercourses.

3.5.3 Wetlands

The Directory of Important Wetlands (DBCA-045) identifies that there are no ecologically significant wetlands in the vicinity of the Site. The nearest significant wetland is Millstream Pools, approximately 140 km to the south (DBCA-045).

3.5.4 Public Drinking Water Source Areas

The Site is not mapped as a public drinking water source area (DWER-033).

3.6 Flora and Vegetation

3.6.1 Pre-European Vegetation

During the 1970s, John Beard and associates conducted a systematic survey of native vegetation, describing the vegetation systems in Western Australia at a scale of 1:250 000 in the south-west and at a scale of 1:1,000,000 in less developed areas (Beard, 1981).

This mapping sought to describe the native vegetation presumed to occur prior to European settlement and, as such, is referred to as pre-European vegetation associations. These vegetation maps are maintained in digital form by the Department of Primary Industries and Regional Development (DPIRD) (DPIRD-006). Extents are updated periodically by DBCA (GoWA, 2019a).

The Site is mapped as the Abydos Plain - Roebourne vegetation association (Figure 8). The estimated pre-European and current extent of the vegetation association is provided in Table 2.

Table 2: Pre-European Vegetation Association within the Site and Proportions Remaining within the Abydos Plain - Roebourne

Vegetation Association	Description	Original Extent (ha)	Current Extent (ha)	% Remaining	% Managed for Conservation
Abydos Plain - Roebourne_589	Mosaic: Short bunch grassland - savanna / grass plain (Pilbara) / Hummock grasslands, grass steppe; soft spinifex.	80,741.91	78,549.79	97.29%	0.75%

Extent of Remnant Vegetation

Remnant vegetation extent mapping (DPIRD-005) estimates that there is 9.35 ha of remnant vegetation within the Site. However, based on aerial imagery, this is expected to be approximately 7 ha.

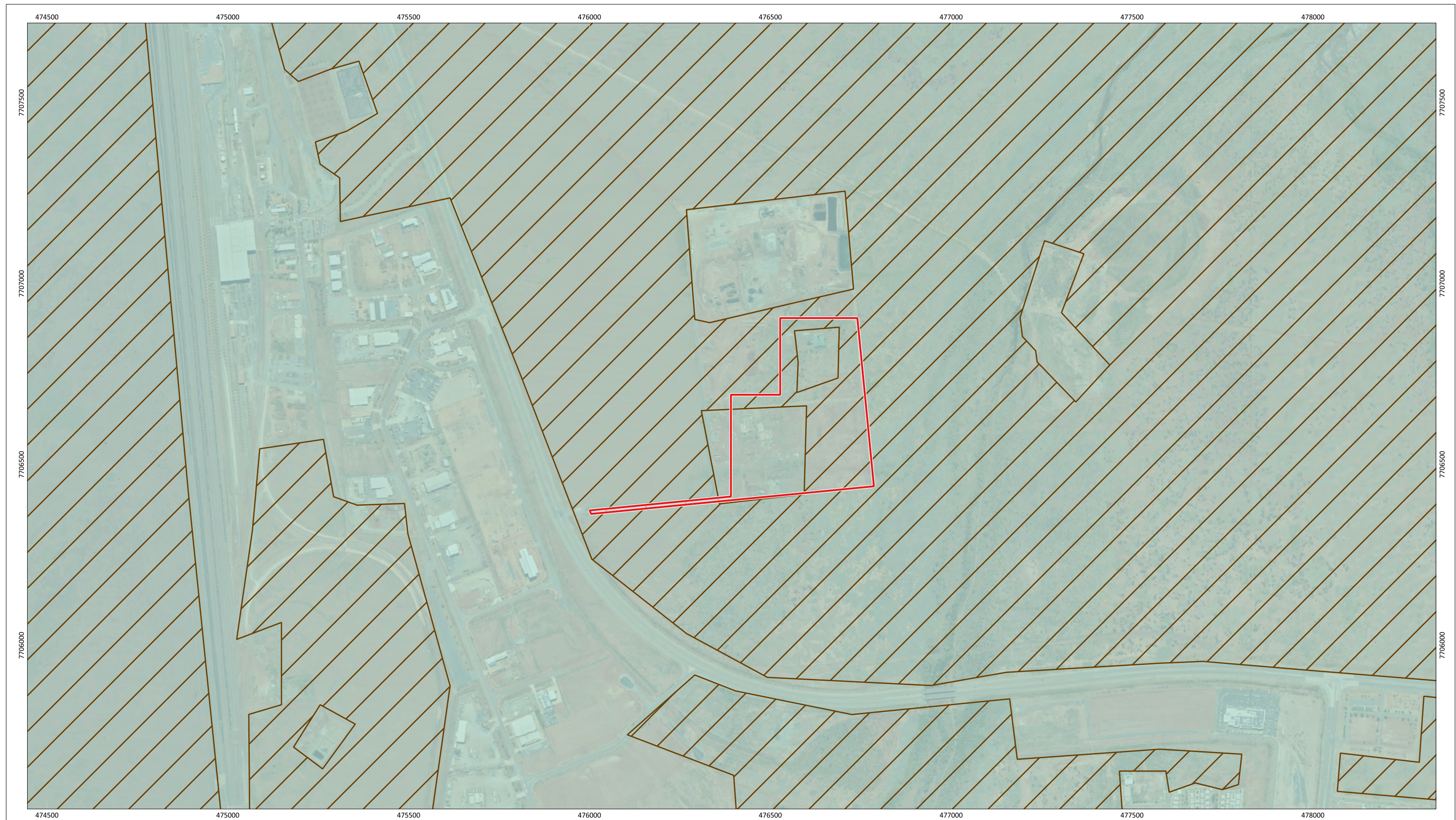


Figure 8: Vegetation Associations

<div><div><div></div><div>N</div></div><div><div>0</div><div>150</div><div>300</div><div>450</div><div>600 m</div></div></div>		PROJECT/REPORT NAME Environmental Assessment Report Lot 1 Dampier Road, Gap Ridge		<div><div>Legend</div><div><div></div> Site</div><div><div></div> Native Vegetation Extent (DPIRD-005)</div><div><div>Vegetation Associations (DPIRD-006)</div><div><div></div> ABYDOS PLAIN - ROEBOURNE_589</div></div></div>																																									
SCALE 1:10,000		SHEET SIZE A3 COLOUR	CLIENT RFF Australia Pty Ltd																																										
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3.6.2 Threatened and Priority Flora

A search of DBCA databases was undertaken to identify records of Threatened and Priority flora within 50 km of the Site. Records within 10 km of the Site are shown in Figure 9.

The likelihood of each species occurring within the Site was assessed based on the following:

- Distance of each record from the Site.
- Age of most recent record.
- Habitat preferences and presence/absence of suitable habitat from the Site.
- Previous survey effort.

There are no records of Threatened or Priority flora species occurring within the Site, according to a search of DBCA database records. Further, there are no records of Threatened flora species within 50 km of the Site.

The following Priority flora species (listed by DBCA) were assigned a 'Medium' likelihood of occurring within the Site:

- *Neptunia longipila* - Priority 2.
- *Paspalidium retiglume* - Priority 2.
- *Trianthema* sp. Python Pool (G.R. Guerin & M.E. Trudgen GG 1023) - Priority 2.
- *Stackhousia clementii* - Priority 3.
- *Vigna triodiophila* - Priority 3.

The following Priority flora species were assigned a 'High' likelihood of occurring within the Site:

- *Dolichocarpa* sp. Hamersley Station (A.A. Mitchell PRP 1479) - Priority 3.
- *Themeda* sp. Hamersley Station (M.E. Trudgen 11431) - Priority 3.

The complete likelihood of occurrence assessment is provided as 0.

3.6.3 Threatened and Priority Ecological Communities

A search of DBCA databases was undertaken to identify records of Threatened and Priority ecological communities within a 50 km radius of the Site. Records within 10 km of the Site are shown in Figure 9.

The likelihood of each community occurring within the Site was assessed based on the habitat characteristics of the Site.

Five Priority Ecological Communities (PECs) have been recorded within 50 km of the Site. There are no records of Threatened Ecological Communities (TECs) within 50 km of the Site.

The Site intersects a known record of the Roebourne Plains coastal grasslands with gilgai microrelief on deep cracking clays (Roebourne Plains gilgai grasslands), which is a Priority 1 PEC.

The Horseflat Land System of the Roebourne Plains PEC (Priority 3) has also been recorded in very close proximity to the Site.

The following PECs were assigned a 'High' likelihood of occurring (or are known to occur) within the Site:

- Roebourne Plains gilgai grasslands - Priority 1.
- Horseflat Land System - Priority 3.

The following PEC was assigned a 'Medium' likelihood of occurring within the Site:

- Roebourne chenopod association - Priority 1.

The complete likelihood of occurrence assessment is provided as 0.

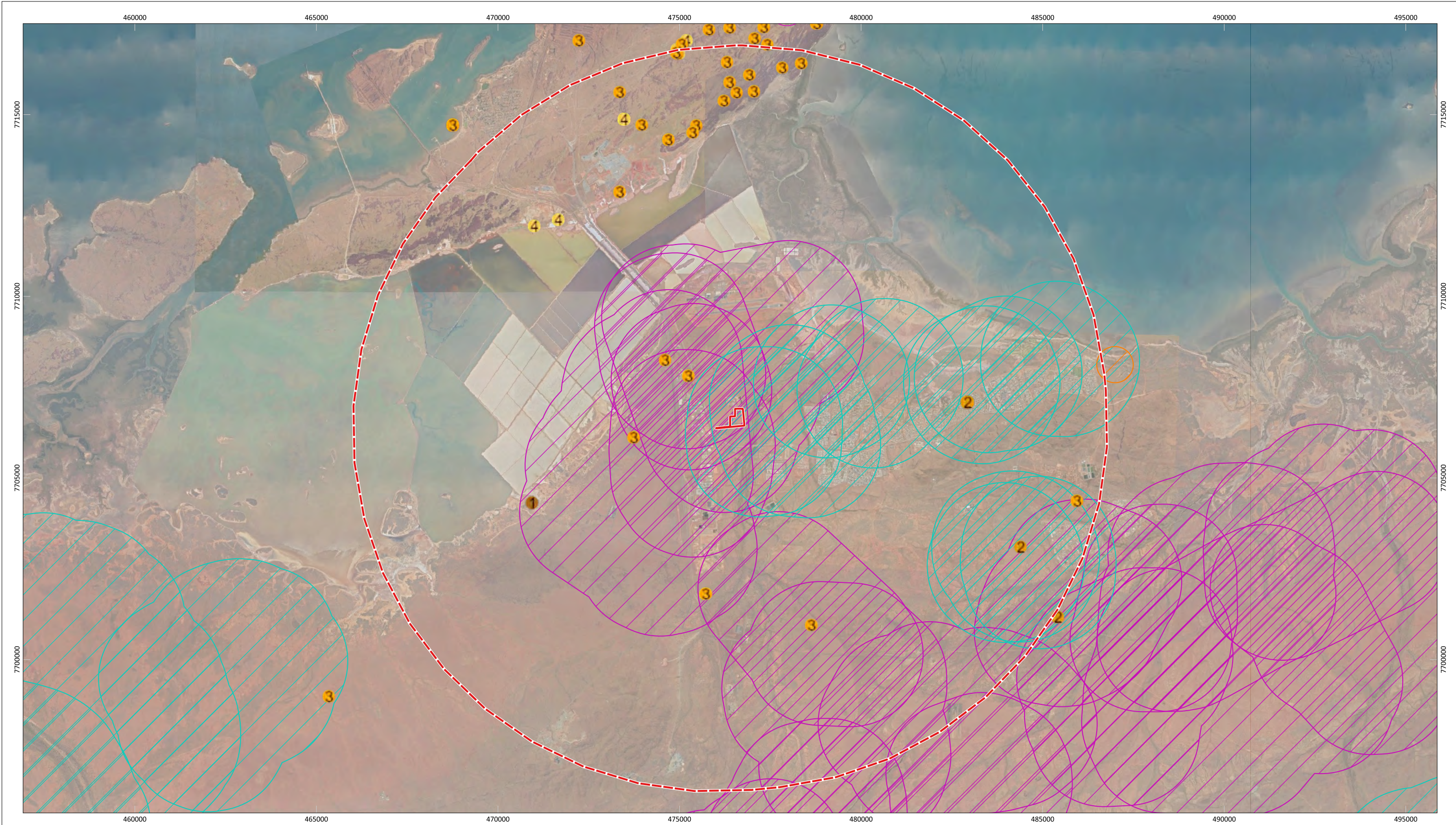


Figure 9: Records of Conservation Significant Flora and Communities within the Site

0

3

6 km

N

SCALE

1:100,000

SHEET SIZE

A3 COLOUR

PROJECT/REPORT NAME

Environmental Assessment Report
Lot 1 Dampier Road, Gap Ridge

CLIENT

RFF Australia Pty Ltd

PROJECT NUMBER

A24.217

VERSION

0

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HS/MM

DATE

9/10/2024

Site

10 km Buffer of the Site

Threatened and Priority Ecological Communities (DBCA Database Searches)

Burru Peninsula rock pile communities (Priority 1)

Burru Peninsula rock pool communities (Priority 1)

Coastal dune native tussock grassland (Priority 3)

Horseflat Land System (Priority 3)

Roebourne Plains gilgai grasslands (Priority 1)

Threatened and Priority Flora (DBCA Database Searches)

Priority 1

Priority 2

Priority 3

Priority 4

No

Description

Drawn

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Date

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05/06/2023

B

Revision

9/10/2024

NOTES:

Cadastral boundary from LANDGATE 2022. Label corresponds to the vegetation association number.

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3.7 Terrestrial Fauna

3.7.1 Threatened and Priority Fauna Database Search

A search of DBCA databases was undertaken to identify records of Conservation Significant fauna within a 50 km radius of the Site. The search returned records of 15 Threatened fauna taxa, 40 Specially Protected fauna taxa, and nine Priority fauna taxa within 50 km of the Site. No records of conservation significant fauna occur within the Site. Records that occur within 10 km are shown in Figure 10.

The likelihood of each fauna species occurring within the Site was assessed based on:

- Distance of each record from the Site.
- Age of most recent record.
- Habitat preferences and presence/absence of suitable habitat from the Site.
- Previous survey effort.

A total of 14 species of conservation significant fauna were assessed as having a 'Medium' or 'High' likelihood of occurring within the Site. These are provided in Table 3.

Table 3. Conservation Significant Fauna with a 'Medium' or 'High' Likelihood of Occurring within the Site

Scientific Name Common Name	Conservation Status		Assessed Likelihood of Occurrence
	State	Commonwealth	
<i>Calidris ferruginea</i> Curlew sandpiper	CR	CR, MI	Medium
<i>Numenius madagascariensis</i> Eastern curlew	CR	CR, MI	Medium
<i>Calidris tenuirostris</i> Great Knot	CR	CR & MI	Medium
<i>Charadrius mongolus</i> Lesser sand plover	EN	EN & MI	Medium
<i>Dasyurus hallucatus</i> Northern quoll	EN	EN	High
<i>Tringa nebularia</i> Common greenshank	Specially Protected - Migratory	EN, MI	Medium
<i>Charadrius leschenaultia</i> Greater sand plover	VU	VU & MI	Medium
<i>Liasis olivaceus barroni</i> Pilbara olive python	VU	VU	Medium

Scientific Name Common Name	Conservation Status		Assessed Likelihood of Occurrence
	State	Commonwealth	
<i>Hydroprogne caspia</i> Caspian tern	Specially Protected - Migratory	Specially Protected - Migratory	Medium
<i>Pluvialis squatarola</i> Grey Plover	Specially Protected - Migratory	Specially Protected - Migratory	Medium
<i>Numenius minutus</i> Little curlew	Specially Protected - Migratory	Specially Protected - Migratory	Medium
<i>Tringa brevipes</i> Grey-tailed tattler	P4 & MI	Specially Protected - Migratory	High
<i>Leggadina lakedownensis</i> Northern short-tailed mouse, Lakeland Downs mouse, kerakenga	P4	N/A	Medium
<i>Notoscincus butleri</i> Lined soil-crevice skink (Dampier)	P4	N/A	Medium

As identified in Table 3, the majority of conservation significant fauna species with a 'Medium' or 'High' likelihood of occurring within the Site are migratory or have a large distribution and home range. These species are likely to pass over the Site on occasion, however any habitat present within the Site itself would be classed as supporting or non-significant habitat only. No core habitat is expected to be present. As defined by DotE (2013) supporting habitat is that which is likely to be used for foraging and connective purposes, but is not essential habitat for the continuation of a local population. Non-significant habitat is that which would be used only very infrequently or for foraging or dispersing.

As such, whilst fauna species of conservation significance are likely to pass over or through the Site on occasion, it is unlikely to represent core habitat given its small size and history of disturbance.

3.8 Bushfire prone areas

The Site is within a designated bushfire prone area (OBRM-022). *State Planning Policy 3.7 - Bushfire* (SPP 3.7) typically requires a Bushfire Management Plan (BMP) to be prepared where development occurs within a designated bushfire prone area. However, as the proposed development only involves the construction of infrastructure, it may be considered exempt from the requirements of SPP 3.7, subject to agreement from the Local Government Authority. It is possible that a high-level bushfire assessment to support the re-zoning may be required.

3.9 Heritage

3.9.1 Aboriginal Heritage Places

A search of the Aboriginal Cultural Heritage Inquiry System (ACHIS) did not identify any Aboriginal Heritage places within the Site (Figure 11).

There are four Registered Aboriginal Heritage Places within 2 km of the Site, which are:

- Registered Place ID 9601, Thirteen Mile Well - Artefacts / Scatter, 450 m southeast of the Site.
- Registered Place ID 10963, Powerline Survey 054 - Artefacts / Scatter; Engraving; Grinding areas / Grooves, 1.3 km west of the Site.
- Registered Place ID 31573, Sub-surface cultural material; artefacts/scatter; quarry, 1.1 km southeast of the Site.
- Registered Place 31565, Sub-surface cultural material; artefacts/scatter; quarry, 1.2 km southeast of the Site.

3.9.2 Other Heritage Places

No European Heritage places are located within or in close proximity to the Site. The nearest is the De Grey - Mullewa Stock Route No. 9701 (DPLH 090) which is located 5.3 km south of the Site.

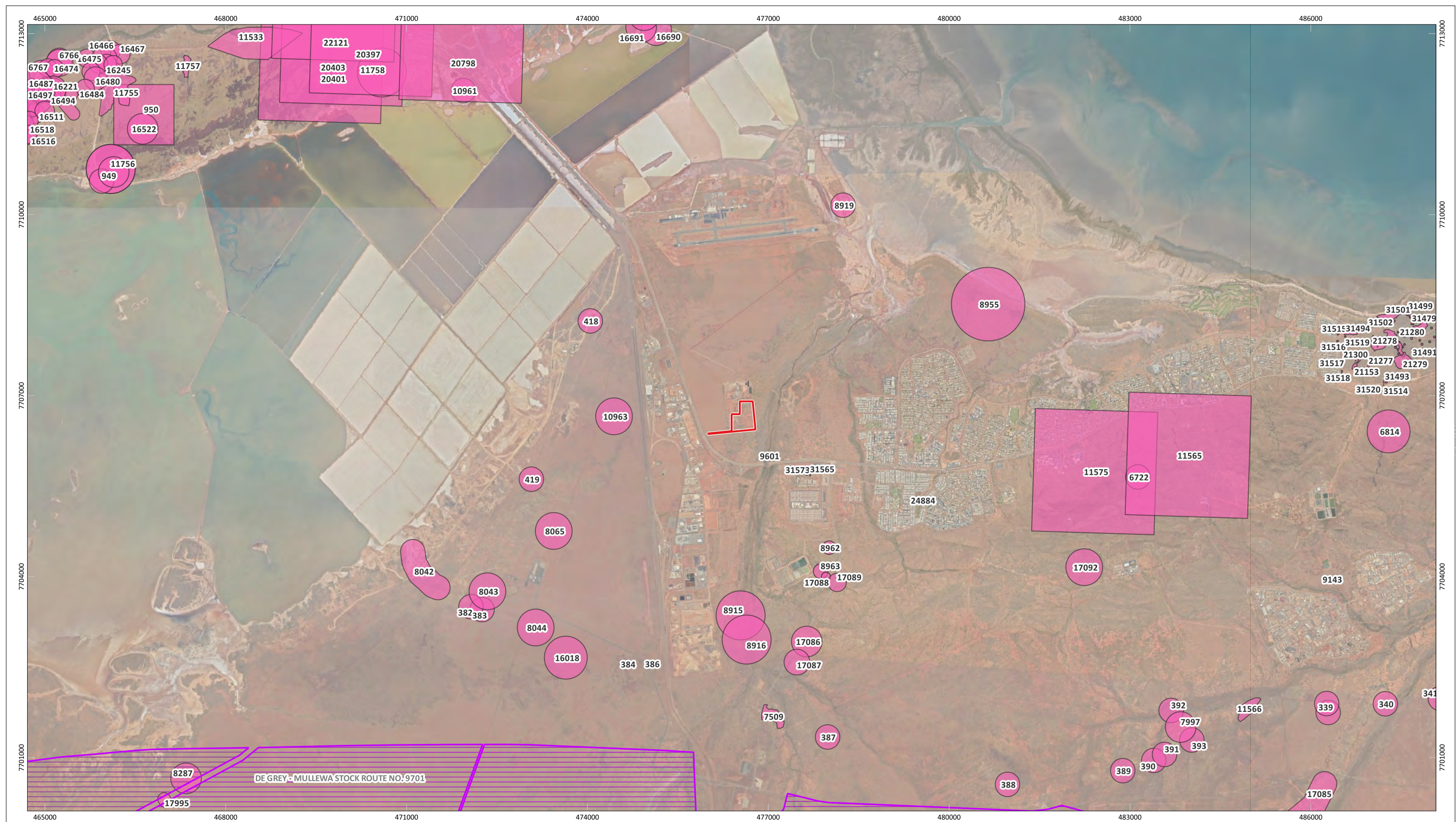


Figure 11: Heritage

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SCALE 1:60,000		CLIENT RFF Australia Pty Ltd			
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DATA SOURCE LANDGATE AERIAL IMAGERY Summer 2023		DRAWN BY / REVIEWED BY HS / MM	DATE 10/10/2024		
				<div><div><div>No</div><div>Description</div><div>Drawn</div><div>Approved</div><div>Date</div></div><div><div>A</div><div>Original issue</div><div>HS</div><div>MM</div><div>10/10/2024</div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div><div><div></div><div></div><div></div><div></div><div></div></div></div> <div>NOTES: Cadastral boundary from LANDGATE 2022</div>	<div><div><div></div></div><div>WESTERN ENVIRONMENTAL</div><div><div>Western Environmental Pty Ltd 08 6244 2310 enquiries@westernv.com.au Level 3/25 Prowse St, West Perth WA 6005 westernv.com.au</div></div></div>

4. Potential Impacts and Assessment Against the EPA's Environmental Factors

The proposed Local Scheme Amendment will result in the entirety of the Site being re-zoned from Rural to General Industry. As such, it should be assumed that all vegetation within the Site will be cleared of native vegetation.

An assessment of the proposed impacts has been undertaken against the EPA's Environmental Factors and Objectives, as detailed in Table 4.

Given the Site is not located within a marine or coastal environment, the EPA's 'Sea' theme is deemed not applicable.

Table 4: Assessment of Potential Impacts against the EPA's Environmental Factors

Factor	Objective	Assessment
Flora and vegetation	To protect flora and vegetation so that biological diversity and ecological integrity are maintained.	<p>The proposed scheme amendment will result in the loss of approximately 7 ha of remnant native vegetation that represents the Abydos Plain - Roebourne_589 vegetation association. This vegetation association is well-represented at the State, IBRA, and local scales, with over 99% of the pre-European extent remaining.</p> <p>One PEC intersects the Site, which is:</p> <ul style="list-style-type: none"> Roebourne Plains coastal grasslands with gilgai microrelief on deep cracking clays (Roebourne Plains gilgai grasslands) - Priority 1. <p>One PEC has been recorded in close proximity to the Site, which is:</p> <ul style="list-style-type: none"> Horseflat Land System of the Roebourne Plains - Priority 3. <p>The Site itself does not provide suitable habitat for either community.</p> <p>Seven Priority flora taxa have been recorded in close proximity to the Site or in habitat suitable to that present within the Site. As such, they are identified to have a 'Medium' or 'High' likelihood of occurring within the Site.</p> <p>The vegetation within the Site has been historically disturbed, through partial clearing, construction of a number of structures, and equipment laydown. As such, it is not expected to represent a high-quality remnant, and is unlikely to demonstrate a high level of biological diversity.</p> <p>Higher quality vegetation is expected to be present approximately 400 m east of the Site, associated with a mapped watercourse. As impacts associated with the scheme amendment will be constrained to the boundaries of the Site, no impacts will occur to surrounding areas.</p> <p>Given the above, the proposed scheme amendment can be managed in consistence with the EPA's objective for flora and vegetation.</p>
Landforms	To maintain the variety and integrity of distinctive physical landforms so that environmental values are protected.	<p>No significant landforms are present within the Site, and the proposed scheme amendment is to facilitate storage and laydown of equipment only. Therefore, no impacts to the landform are proposed.</p>

Factor	Objective	Assessment
		Given the above, the proposed scheme amendment can be managed in consistence with the EPA's objective for landforms.
Subterranean fauna	To protect subterranean fauna so that biological diversity and ecological integrity are maintained.	<p>The Site is not situated in an area of karst geology, calcrete geology, or banded iron formations. As such, significant habitat for subterranean fauna is unlikely to be present.</p> <p>Given the above, the proposed scheme amendment can be managed in consistence with the EPA's objective for subterranean fauna.</p>
Terrestrial environmental quality	To maintain the quality of land and soils so that environmental values are protected.	<p>No portion of the Site is mapped as having a high risk of ASS occurrence. The eastern portion of the Site is mapped as having a moderate to low risk of ASS occurring within 3 km of the natural soil surface. The remainder of the Site is not mapped as having ASS risk. Further, no excavation or dewatering is proposed, so the risk of disturbing ASS-containing material is very low.</p> <p>A search of the contaminated sites database did not identify any potential or actual contaminated sites within the Site, and the nearest is ~900 m to the west. Given the presence of existing structure and equipment laydown within the Site, there is a low risk of contamination. Appropriate controls will be maintained throughout any proposed demolition, construction, and equipment storage that will occur following the scheme amendment to ensure no increased risk of contamination occurs.</p> <p>Given the above, the proposed scheme amendment can be managed in consistence with the EPA's objective for terrestrial environmental quality.</p>
Terrestrial fauna	To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.	<p>The Site contains approximately 7 ha of remnant native vegetation which has value for terrestrial fauna.</p> <p>A search of DBCA databases and assessment of habitat values within the Site identified 14 conservation significant fauna species with a 'Medium' or 'High' likelihood of occurring within the Site. Of these, 10 are migratory.</p> <p>All species with a 'Medium' or 'High' likelihood of occurring within the Site are migratory or are wide-ranging. Given the extent of remnant native vegetation within the Site and history of disturbance, these species are expected to pass over the Site on occasion; however, core habitat is not expected to be present. Instead, the Site is expected to provide supporting or non-significant habitat for these species.</p> <p>Given the above, the Site is not expected to provide core habitat for conservation significant fauna, and the proposed scheme amendment can be managed in consistence with the EPA's objective for terrestrial fauna.</p>
Inland Waters	To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.	<p>The Site forms part of the Pilbara - fractured rock aquifer. No dewatering or abstraction of groundwater is proposed through the scheme amendment.</p> <p>The Site does not intersect any surface water features. The nearest mapped watercourse is approximately 400 m to the east. The Site is proposed for equipment laydown and storage only, the proposed works are not expected to impact any surface or groundwater features. There is sufficient separation between proposed works and the nearest watercourse, with a 400 m vegetated buffer between the Site and nearest watercourse.</p> <p>Given the above, the proposed scheme amendment can be managed in consistence with the EPA's objective for inland waters.</p>

Factor	Objective	Assessment
Air quality	To maintain air quality and minimise emissions so that environmental values are protected.	<p>Clearing of the Site may result in minor dust emissions, which should be managed through standard dust suppression measures as required. Impacts are not expected to be significant given the presence of clay soils.</p> <p>Given the above, the proposed scheme amendment can be managed in consistence with the EPA's objective for air quality.</p>
Greenhouse gas emissions	To minimise the risk of environmental harm associated with climate change by reducing greenhouse gas emissions as far as practicable.	<p>The proposed scheme amendment is not expected to cause a significant increase in scope 1, 2 and 3 greenhouse gas emissions. Some emissions will be caused by removal of native vegetation and increased transport to and from the Site, however this will be insignificant in the context of the thresholds identified in the greenhouse gas factor guideline.</p> <p>Given the above, the proposed scheme amendment can be managed in consistence with the EPA's objective for greenhouse gas emissions.</p>
Social surroundings	To protect social surroundings from significant harm.	<p>The Site does not intersect any known Aboriginal or European heritage sites.</p> <p>The proposed use of the Site is consistent with that to the immediate north, and further to the east. Therefore, social impacts are expected to be minimal.</p> <p>Given the above, the proposed scheme amendment can be managed in consistence with the EPA's objective for social surroundings.</p>
Human health	To protect human health from significant harm.	<p>The proposed scheme amendment is not expected to have any negative impacts on human health. Therefore, the EPA's objective will be upheld.</p>

5. Conclusion

This EAR presented the results of a desktop assessment of environmental values within the Site and determined that, assuming appropriate pre-clearance and clearance measures are implemented, the Site is suitable for equipment laydown and storage.

The following is a summary of key findings:

- No potentially conflicting land uses were identified in the surrounding area, and the proposed use is consistent with that to the north.
- Topography, geology and soils within the Site do not present a constraint to development.
- There are no known contaminated sites within close proximity to the Site, with the nearest being ~900 m to the east. This does not present a constraint to development.
- The proposed use of the Site will not impact any surface or groundwater features. The nearest surface water feature is 400 m to the east.
- The eastern portion of the Site is mapped as having a moderate to low risk of ASS occurrence. However, as no excavation is proposed as part of the proposed use, this does not represent a constraint to development.
- The Site has been historically disturbed and currently contains limited flora and vegetation values. The Site intersects a mapped occurrence of Roebourne Plains gilgai grasslands PEC (Priority 3), however the portion of the Site that intersects the PEC is currently an access track. The buffer of a second Priority 3 PEC, Horseflat Land System of the Roebourne Plains, also intersects the Site. Two Priority 3 flora species were assessed as having a 'High' likelihood of occurrence within the Site based on the proximity of the nearest record and presence of suitable habitat. Priority 3 species and communities are not formally protected under the BC Act, and do not appear to be under imminent threat.
- The Site may provide supporting or non-significant habitat for up to 14 fauna species of conservation significance. These species are migratory or wide-ranging, and the Site is unlikely to comprise core habitat due to its small size and historic disturbance.
- No increased risk of noise, odour, or air quality impacts are expected to result from the proposed development.
- There are no known sites of Aboriginal or European heritage value within or in close proximity to the Site.
- The proposed development may be exempt from requiring a BMP as it will be used only for equipment storage and stockpiling, subject to agreement from the City of Karratha.

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Appendix A: Likelihood of Occurrence Flora

Species	Conservation Status		Species information (WAH 1998-)		Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence
	State	Federal	Flowering Period	Preferred Habitat		
<i>Gomphrena axillaris</i>	P1		Mar-May and Jul-Aug	Prefers subsaline habitats or margins of salt lakes and hummock or tussock grasslands on sand, known from locations near Karratha and Dampier Island (Davis et al., 2021).	No	Low One record was mapped 5.5 km from the Site. However, the record is within a tidal streamline and saline drainage area. The Site does not provide the preferred habitat.
<i>Goodenia pallida</i>	P1		Aug	Red soils.	Yes	Low Only one record known from 1970, 30 km south-west of the Site.
<i>Helichrysum oligochaetum</i>	P1		Aug-Nov	Red clay. Alluvial plains. Heavy soils subject to periodic inundation (Barker,).	No	Low Records are within tidal mudflats. Soil systems and landscapes on which species was found does not match the Site conditions. Closest record is 43 km away from the Site.
<i>Minuria tridens</i>	P1		Sep	Roadside. All records on low coastal dune systems adjacent to tidal, saline mudflats. South facing slopes or steep rocky cliffs in low shrubland on dolomite, limestone and calcrete-impregnated sandstone hills and ranges (Nano and Pavey, 2008).	No	Low All DBCA records are mapped on a different soil system than what is present within the Site. Closest record is 56 km from the Site.
<i>Tephrosia rosea</i> var. Port Hedland (A.S. George 1114)	P1		Jul or Aug or Sep	All DBCA records within coastal dune sands and low rocky ridges.	No	Low All DBCA records are mapped on a different soil system than what is present within the Site. Closest record is 35 km from the Site.
<i>Uvedalia clementii</i>	P1		Aug-Sep	Recorded on fine alluvial soil with some river rocks - soil hard and compact.	No	Low Recorded within lake/river edges. This type of habitat is not present within the Site.

Species	Conservation Status		Species information (WAH 1998-)		Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence
	State	Federal	Flowering Period	Preferred Habitat		
						Closest record is 47 km south-east from the Site.
<i>Acacia ryaniana</i>	P2		Jun-Nov	White or red sand. Coastal sand dunes.	No	Low Site does not assemble coastal environment. Only historical DBCA records. Closest record is 6 km east of the Site.
<i>Cladium procerum</i>	P2		Nov (?)	Perennial pools. Recorded within wetland close to river.	No	Low Habitat not present within the Site. Closest record is >95 km from the Site.
<i>Neptunia longipila</i>	P2		Mar-Sep	Confined to the Pilbara bioregion, from Karratha to Newman. Reddish-brown to orange-brown cracking clay, or red to brown gravelly loam, on flat or very gently sloping terrain, in grassland or open shrubland (Bean, 2022).	Yes	Medium Records mapped within the same soil subsystem. Habitat is present within the Site, closest record is 8.3 km from the Site.
<i>Paspalidium retiglume</i>	P2		Apr	Clay. Red-brown cracking clay.	Potentially	Medium Similar soils are present within the Site. Conditions may match the preferred habitat. Most recent record from 2004 is 80 km from the Site.
<i>Pentalepis trichodesmoides</i> subsp. <i>hispida</i>	P2		Aug-Sep	Found in Triodia hummock grassland, often in the understorey of a shrubland of <i>Acacia</i> spp., <i>Gossypium</i> spp., <i>Senna</i> spp., <i>Brachychiton</i> spp., and <i>Eucalyptus</i> spp.	No	Low Records are mapped on different soil types, and on higher altitudes with larger slopes. Closest record is >70 km south-east of the Site.

Species	Conservation Status		Species information (WAH 1998-)		Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence
	State	Federal	Flowering Period	Preferred Habitat		
				On summits and slopes of low hills, on basaltic soils, at altitudes to 1150 m (Orchard and Cross, 2012).		
<i>Teucrium pilbaranum</i>	P2		May or Sep	Clay. Crab hole plain in a river floodplain, margin of calcrete table.	No	Low Habitat not present within the Site. Only historic records.
<i>Trianthema</i> sp. Python Pool (G.R. Guerin & M.E. Trudgen GG 1023)	P2			Plains with a substrate of loam to clay loam with a gravelly/cobbly surface. Brown, dry, rocky soils, floodplains supporting spinifex grasslands	Possibly	Medium Habitat may match Site conditions but records are mapped on a different soil system. Closest record is 23 km south of the Site.
<i>Abutilon</i> sp. Pritzelianum (S. van Leeuwen 5095)	P3		Aug	Recorded on red stony loam	Possibly	Low Only one historic record, 40 km east of the Site.
<i>Atriplex lindleyi</i> subsp. <i>conduplicata</i>	P3			Crabhole plains	No	Low Habitat not present. Only one historic record, 26 km west of the Site.
<i>Corchorus congener</i>	P3		Apr-Jun or Aug-Nov	Sand, red sandy loam with limestone. Sand dunes, plains.	No	Low Habitat not present within the Site. One record within coastal habitat, 68 km from the Site.
<i>Dolichocarpa</i> sp. Hamersley Station (A.A. Mitchell PRP 1479)	P3		Records showed flowers in Jul and Sep	Open flat grasslands, gentle slopes, red-brown cracking silt and clay.	Yes	High Habitat is present within the Site. Closest record is 2.5 km west of the Site.
<i>Eragrostis lanicaulis</i>	P3		Mar-May or Aug-Oct	Red sandy clay. Flats.	Possibly	Low Only historic records 43 km from the Site.
<i>Eragrostis surreyana</i>	P3		May-Sep	Seasonally wet, shallow, grey alluvial soils over rock, with some from deeper soils in	No	Low

Species	Conservation Status		Species information (WAH 1998-)		Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence
	State	Federal	Flowering Period	Preferred Habitat		
				a seasonally wet creek line. Most collections have been made from streams, with one from a seasonal seepage area on a gentle slope near the base of the Chichester escarpment. Associated species include a sedgeland – tussock grassland (Shepherd and Trudgen, 2011).		Habitat not present within the Site. Closest records are 19 km north of the Site within Murujuga National Park
<i>Eriochloa fatmensis</i>	P3		Flowers sporadically throughout the year but mostly Jan-May	Wet habitats, coastal grasslands, and tropical sub-humid grasslands.	No	Low Historical records only. Closest record within river edges 43 km from the Site.
<i>Euphorbia inappendiculata</i> var. <i>inappendiculata</i>	P3		May or Aug	Heavy clay soils on open plains or gentle slopes (Halford and Harris, 2012).	Possibly	Low Records are mapped within vegetation types that do not seem to be present within the Site. Closest record is mapped 65 km south of the Site.
<i>Euphorbia stevenii</i>	P3		N/A	Clay, sandy soils.	Possibly	Low DBCA records are more than 20 years old, closest is 59 km from the Site.
<i>Euploca mutica</i>	P3		N/A	Grows primarily in the desert or dry shrubland biome. Recorded on flats. Red/brown sand/clay.	Possibly	Low One record 90 km from the Site.
<i>Fimbristylis sieberiana</i>	P3		May-Jun	Mud, skeletal soil pockets. Pool edges, sandstone cliffs.	No	Low Habitat type is not present within the Site. Closest record 90 km from the Site along river.

Species	Conservation Status		Species information (WAH 1998-)		Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence
	State	Federal	Flowering Period	Preferred Habitat		
<i>Glycine falcata</i>	P3		May or Jul	Black clayey sand. Along drainage depressions in crabhole plains on river floodplains.	No	Low Habitat type is not present within the Site. Closest record 31 km from the Site.
<i>Gomphrena cucullata</i>	P3		Feb or May	Red sandy loam, clayey sand. Open floodplains.	Possibly	Low Closest record is 24 km from the Site.
<i>Gomphrena leptophylla</i>	P3		Mar-Sep	Sand, sandy to clayey loam, granite, quartzite. Open flats, sandy creek beds, edges salt pans & marshes, stony hillsides.	No	Low Habitat is not present within the Site. Closest record within roadside 23 km from the Site.
<i>Goodenia obscurata</i>	P3		Apr, May and Aug-Oct	Floodplains or low rocky ridges, growing in red-brown sandy clay or lateritic loam over banded ironstone.	No	Low Habitat is not present within the Site. Only one historical record.
<i>Gymnanthera cunninghamii</i>	P3		Jan-Dec	Sandy soils.	Possibly	Low Only historical records
<i>Ipomoea racemigera</i>	P3		Mainly Mar-Aug	Growing on sandy soils along watercourses	No	Low No watercourses intersect the Site.
<i>Owenia acidula</i>	P3			Clay. Outback woodlands.	No	Low No woodlands present within the Site. Only historical records, with the closest 95 km from the Site.
<i>Solanum albotellatum</i>	P3		Mar-May	Cracking clay soils on open floodplains in open scrubland over grasses (Davis and Hurter, 2012).	Yes	Low Mapped record within river system, which does not match Site conditions. Closest record is 30 km south of the Site.
<i>Stackhousia clementii</i>	P3			Skeletal soils. Sandstone hills.	Possibly	Medium No sandstone hills present.

Species	Conservation Status		Species information (WAH 1998-)		Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence
	State	Federal	Flowering Period	Preferred Habitat		
						Closest record is 2.4 km from the Site.
<i>Swainsona thompsoniana</i>	P3		Aug-Sep or Mar	Restricted to the central south-western parts of the Pilbara bioregion (Davis and Hurter, 2013).	No	Low Site is outside of species distribution range.
<i>Terminalia supranitifolia</i>	P3		May or Jul or Dec	Sand. Among basalt rock.	No	Low Several records on Dampier Peninsula. Closest record is 4.6 km from the Site. The preferred habitat is however not present within the Site. Mapped on different soil systems.
<i>Themeda</i> sp. Hamersley Station (M.E. Trudgen 11431)	P3		Aug	Red clay. Clay pan, grass plain.	Yes	High Habitat likely present. One record from 1992 is 1.6 km from the Site.
<i>Triodia basitricha</i>	P3		Mar-Aug	Slopes or crests of rocky hills (Barrett and Barrett, 2015).	No	Low Only one historic record 94 km from the Site. Habitat types doesn't match the Site conditions.
<i>Triodia pisoliticola</i>	P3		Feb-Aug	Edges of mesas capped with Robe Pisolite or on the tops of the mesas of that geology and other iron-rich geology (Barrett and Trudgen, 2018).	No	Low Habitat does not match the Site conditions.
<i>Vigna triodiophila</i>	P3		May-Sep	Grows in association with rockpiles among cobbles and boulders in shallow, red-brown or brown, clayey sand or loam (Holland and Butcher, 2016).	Possibly	Medium The Site does not seem to provide the same amount of rocks and cobbles as recorded as preferred habitat of the species. Closest records are within the Dampier Peninsula, 10 km from the Site.
<i>Livistona alfredii</i>	P4		Jul-Sep	Edges of permanent pools.	No	Low

Species	Conservation Status		Species information (WAH 1998-)		Habitat Occurs Within the Survey Area	Pre-Survey Likelihood of Occurrence
	State	Federal	Flowering Period	Preferred Habitat		
						Habitat is not present within the Site. Only historical records. All records within Millstrewam Chichester National Park, >90 km from the Site.
<i>Rhynchosia bungalowensis</i>	P4		unknown	Pebbly, shingly coarse sand amongst boulders. Banks of flow line in the mouth of a gully in a valley wall.	No	Low Habitat is not present within the Site. All records within Dampier Peninsula and Archipelago.

Appendix B: Likelihood of Occurrence Ecological Communities

Floristic Community Name	Community Description	Conservation Status		Database		Likelihood of Occurrence	Justification
		State	Federal	PMST	DBCA		
Burru Peninsula rock pool communities	Calcareous tufa deposits. Interesting aquatic snails.	P1			x	Low	The Site does not provide suitable habitat for this community, which is restricted to the Burru Peninsula.
Roebourne Plains gilgai grasslands	Roebourne Plains coastal grasslands with gilgai microrelief on cracking clays These grasslands occur on microrelief on strongly gilgaied self-mulching cracking clays, and emergent depositional surfaces. The grasslands are surrounded by non-gilgaied clay plains/flats and sandy coastal and alluvial plains. The gilgai depressions support ephemeral and perennial tussock grasslands dominated by Sorghum sp. and Eragrostis xerophila (Roebourne Plains grass) along with other native species including Eriachne benthamii (swamp wanderrie grass), Chrysopogon fallax (golden beard grass) and Panicum decompositum (native millet). Restricted to the Karratha area, where it has been largely removed.	P1			x	High	The buffer of a DBCA mapped record of the community intersects with the Site. The Site has been largely cleared but patches of remnant native vegetation are present.
Roebourne chenopod association	Chenopod vegetation associations of the Roebourne Plains The community is dominated by Eragrostis xerophila and chenopods (Sclerolaena, Atriplex species) growing in saline clay soils with moderate surface strew of pebbles and cobbles. The association appears to be uncommon and only been located to date at Roebourne Airport and west of Nickol (Karratha) however it is likely some other small occurrences occur between Cape Preston and Mundabullangana.	P1			x	Medium	While no buffered DBCA records intersect with the Site, the Site is located west of Nickol. The community incorporates Unit 5 (alluvial plains) of the Horseflat land system, which is mapped as intersecting with the Site (see below).
Wona Land System	Four plant assemblages of the Wona Land System (previously 'Cracking clays of the Chichester and Mungaroona Range')	P1			x	Low	Habitat is not present within the Site. Closest buffered record is 47 km south of the Site.

Floristic Community Name	Community Description	Conservation Status		Database		Likelihood of Occurrence	Justification
		State	Federal	PMST	DBCA		
	Cracking clays of the Chichester and Mungaroona Range. This shrubless plain of stony gibber community occurs on the tablelands with very little vegetative cover during the dry season, however during the wet a suite of ephemerals/annuals and short-lived perennials emerge, many of which are poorly known and range-end taxa. Annual Sorghum grasslands on self-mulching clays with a moderate-dense overlay of rocks. This community appears very rare and restricted to the Pannawonica-Robe valley end of Chichester Range. Naturally species poor when dry						
Coastal dune native tussock grassland	Coastal dune native tussock grassland dominated by Whiteochloa airoides Priority 3 24 Tussock grassland of Whiteochloa airoides occurs on the landward side of foredunes, hind dunes or remnant dunes with white or pinkish white medium sands with marine fragments. There may be occasional Spinifex longifolius tussock or Triodia epactia hummock grasses and scattered low shrubs of Olearia dampierii subsp. dampierii, Scaevola spinescens, S. cunninghamii, Trianthema turgidifolia and Corchorus species (C. walcottii, C. laniflorus). Occurs on Barrow Island, Tent Island and possibly some unaffected littoral areas in west Pilbara.	P3			x	Low	The only buffered records are associated Murujuga National Park on Dampier Archipelago.
Horseflat Land System	Horseflat land system of the Roebourne Plains Priority 3(iii) The Horseflat Land System (Roebourne Plains) land units forming extensive clay plains dominated by tussock grasslands on mostly alluvial, red clay loams gilgaied and non-gilgaied for this community. The community is dominated by perennial tussock grasses include Eragrostis	p3			x	High	The buffer of a DBCA mapped record of the community intersects with the Site. The Site has been largely cleared but patches of remnant native vegetation are present.

Floristic Community Name	Community Description	Conservation Status		Database		Likelihood of Occurrence	Justification
		State	Federal	PMST	DBCA		
	xerophila (Roebourne Plains grass), Chrysopogon fallax (ribbon grass) and other Eragrostis spp. and Eriachne spp. The community also supports a suite of annual grasses including Dichanthium spp. and Sorghum spp.. The community extends from Peedamulla to Balla Balla surrounding the towns of Karratha and Roebourne. The land units of the Horseflat land system that align with this PEC are units 3 (excluding areas of snakewood and hummock grass; mosaic areas, and areas of heavily gilgaied soils						
Wona Land System	Mitchell grass plains (Astrebela spp.) on gilgai Mitchell grass and Roebourne Plain grass (Eragrostis xerophila) plain on gilgai. Astrebela pectinata, A. elymoides, E. xerophila, Aristida latifolia, Eriachne and Sida fibulifera. Typical type, heavily grazed	P3			x	Low	Habitat is potentially present within the Site. Closest buffered record is 47 km south of the Site.

Appendix C: Likelihood of Occurrence Fauna

Species	Conservation Status		Database		Likelihood of Occurrence on Site
	WA	Commonwealth	DBCA	PMST	
AVES					
Barn swallow (<i>Hirundo rustica</i>)	Specially Protected - Migratory	Specially Protected - Migratory	x		Low In Australia, the Barn Swallow is recorded in open country in coastal lowlands, often near water, towns and cities. Barn Swallows are often sighted perched on overhead wires and also in or over freshwater wetlands, paperbark Melaleuca woodland, mesophyll shrub thickets and tussock grassland. The Site does not provide suitable habitat for the species.
Bar-tailed Godwit (<i>Limosa lapponica</i>)	Specially Protected - Migratory	Specially Protected - Migratory	x		Low Site does not support habitat for the species, which mainly utilises estuarine mudflats, beaches and mangroves. Closest record is <10 km from the Site.
Black-tailed Godwit (<i>Limosa limosa</i>)	Specially Protected - Migratory	Specially Protected - Migratory	x	x	Low In Australia the Black-tailed Godwit has a primarily coastal habitat environment. The species is commonly found in sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats, or spits and banks of mud, sand or shell-grit. No suitable habitat is present within the Site. Closest record >30 km from the Site.
Bridled tern (<i>Onychoprion anaethetus</i>)	Specially Protected - Migratory	Specially Protected - Migratory	x		Low Species is only rarely recorded along mainland coasts, occurs on islands. Occurs within the Dampier Archipelago but not south of it.
Broad-billed sandpiper (<i>Limicola falcinellus</i>)	Specially Protected - Migratory	Specially Protected - Migratory	x		Low They mostly occur on the coasts of the Pilbara and Kimberley between Onslow and Broome, but are also recorded north to the mouth of Lawley River, and inland at Lake Daley. The Site does not support suitable habitat for the species.
Brown booby (<i>Sula leucogaster</i>)	Specially Protected - Migratory	Specially Protected - Migratory	x		Low Only historical and only coastal records. Found on islands. Habitat is not supported by the Site.

Species	Conservation Status		Database		Likelihood of Occurrence on Site
	WA	Commonwealth	DBCA	PMST	
Caspian tern (<i>Hydroprogne caspia</i>)	Specially Protected - Migratory	Specially Protected - Migratory	x		<p>Medium</p> <p>Widespread in coastal regions, from the Great Australian Bight to the Dampier Peninsula. The species is mostly found in sheltered coastal embayments (harbours, lagoons, inlets, bays, estuaries and river deltas) and those with sandy or muddy margins are preferred. They also occur on near-coastal or inland terrestrial wetlands that are either fresh or saline, especially lakes (including ephemeral lakes), waterholes, reservoirs, rivers and creeks. The Site does not provide suitable foraging or breeding habitat. Species may occur as a visitor.</p> <p>Closest record in Nickol, 2.5 km east of the Site.</p>
Common greenshank (<i>Tringa nebularia</i>)	Specially Protected - Migratory	EN, MI	x	x	<p>Medium</p> <p>The species utilises variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass. Habitats include embayments, harbours, river estuaries, deltas and lagoons and are recorded less often in round tidal pools, rock-flats and rock platforms. The Site does not provide suitable habitat, but habitat is found in surrounding areas. Species may be a visitor to the Site.</p> <p>Closest record is 4 km from the Site.</p>
Common noddy (<i>Anous stolidus</i>)	Specially Protected - Migratory	Specially Protected - Migratory	x		<p>Low</p> <p>Occurs on or near islands, on rocky islets and stacks with precipitous cliffs, or on shoals or cays of coral or sand. The Site does not provide suitable habitat for the species. All records are located on islands.</p>
Common Sandpiper (<i>Actitis hypoleucos</i>)	Specially Protected - Migratory	Specially Protected - Migratory	x		<p>Low</p> <p>Site does not provide foraging or breeding habitat for the species. Closest record < 5 km from the Site. The species may occur as a visitor to the Site.</p>
Common tern (<i>Sterna hirundo</i>)	Specially Protected	Specially Protected - Migratory	x		<p>Low</p>

Species	Conservation Status		Database		Likelihood of Occurrence on Site
	WA	Commonwealth	DBCA	PMST	
	- Migratory				Species forage in marine environments, often close to the shore, including sheltered embayments and in the surf-zone, but also well out to sea. They nest on the ground in the open, usually on bare substrates, occasionally near vegetation or in it, or on a floating mat of vegetation. They usually nest on islands, either marine or in lakes, only sometimes on mainland beaches or promontories or salt or freshwater marshes. No foraging or breeding habitat is present within the Site.
Crested tern (<i>Thalasseus bergii</i>)	Specially Protected - Migratory	Specially Protected - Migratory	x		Low Species is listed as marine species. Closest record < 5 km from the Site. The species may occur as a visitor to the Site.
Curlew sandpiper (<i>Calidris ferruginea</i>)	CR	CR, MI	x	x	Medium Intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. The Site does not provide the preferred habitat. Closest record is 2.2 km from the Site. Species may occur as visitor to the Site.
Eastern curlew (<i>Numenius madagascariensis</i>)	CR	CR, MI	x	x	Medium Intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. The Site does not provide the preferred habitat. Closest record is 2.2 km from the Site. Species may occur as visitor to the Site.
Fairy tern (<i>Sternula nereis nereis</i>)	VU	VU	x	x	Low

Species	Conservation Status		Database		Likelihood of Occurrence on Site
	WA	Commonwealth	DBCA	PMST	
					Species nests on sheltered sandy beaches, spits and banks above the high tide line and below vegetation. The subspecies has been found in embayments of a variety of habitats including offshore, estuarine or lacustrine (lake) islands, wetlands and mainland coastline. The Site does not provide the preferred habitat.
Fork-tailed swift (<i>Apus pacificus</i>)	Specially Protected - Migratory	Specially Protected - Migratory	x		Low Utilises habitats along the coast, inland records update sparsely scattered. Wetland habitat is not present within Site.
Glossy ibis (<i>Plegadis falcinellus</i>)	Specially Protected - Migratory	Specially Protected - Migratory	x		Low Fresh water marshes at the edges of lakes and rivers, lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation. The Site does not provide the preferred habitat of the species.
Great Knot (<i>Calidris tenuirostris</i>)	CR	CR & MI	x	x	Medium Species may visit the Site but usually occurs in coastal areas.
Greater sand plover (<i>Charadrius leschenaultia</i>)	VU	VU & MI	x	x	Medium Species may visit the Site but usually occurs in coastal areas.
Grey Plover (<i>Pluvialis squatarola</i>)	Specially Protected - Migratory	Specially Protected - Migratory	x	x	Medium Species may visit the Site but usually occurs in coastal areas.
Grey-tailed tattler (<i>Tringa brevipes</i>)	P4 & MI	Specially Protected - Migratory	x		High Often found on sheltered coasts with reefs and rock platforms or with intertidal mudflats. It can also be found at intertidal rocky, coral or stony reefs as well as platforms and islets that are exposed at low tide. It has been found around shores of rock, shingle, gravel or shells and also on intertidal mudflats in embayments, estuaries and coastal lagoons, especially fringed with mangroves. Closest record 350 m from the Site.

Species	Conservation Status		Database		Likelihood of Occurrence on Site
	WA	Commonwealth	DBCA	PMST	
Gull-billed tern (<i>Gelochelidon nilotica</i>)	Specially Protected - Migratory	Specially Protected - Migratory	x		Low Wetland habitat is not present within Site.
Lesser frigatebird (<i>Fregata ariel</i>)	Specially Protected - Migratory	Specially Protected - Migratory	x		Low No island habitat present within the Site.
Lesser sand plover (<i>Charadrius mongolus</i>)	EN	EN & MI	x	x	Medium Usually occurs in coastal littoral and estuarine environments. It inhabits large intertidal sandflats or mudflats in sheltered bays, harbours and estuaries, and occasionally sandy ocean beaches, coral reefs, wave-cut rock platforms and rocky outcrops. It also sometime occurs in short saltmarsh or among mangroves. Species may visit the Site.
Little curlew (<i>Numenius minutus</i>)	Specially Protected - Migratory	Specially Protected - Migratory	x		Medium Closest record is 2 km from the Site.
Red knot (<i>Calidris canutus</i>)	EN	EN	x	x	Low Mainly inhabit intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours. Preferred habitat is not present within the Site. Species may visit the Site. Closest record is 5 km from the Site.
MAMMALS					
Australian humpback dolphin (<i>Sousa sahulensis</i>)	Priority 4		x		Low No marine habitat occurs within the Site.
Banded hare-wallaby, mernine (<i>Lagostrophus fasciatus fasciatus</i>)	VU	VU	x		Low Only one historical record.
Northern quoll (<i>Dasyurus hallucatus</i>)	EN	EN	x	x	High

Species	Conservation Status		Database		Likelihood of Occurrence on Site
	WA	Commonwealth	DBCA	PMST	
					Habitat potentially present. Closest record is 1 km from the Site.
Dugong (<i>Dugong dugon</i>)	MI	MI	x		Low No marine habitat present within the Site.
Dwarf spinner dolphin (<i>Stenella longirostris roseiventris</i>)	P4	MI	x		Low No marine habitat present within the Site.
Fin whale (<i>Balaenoptera physalus</i>)	EN	VU	x		Low No marine habitat present within the Site.
Fraser dolphin (<i>Lagenodelphis hosei</i>)	MI	MI	x		Low No marine habitat present within the Site.
Ghost bat (<i>Macroderma gigas</i>)	VU	VU	x	x	Low Preferred habitat not present within the Site. Closest record is 30 km from the Site.
Humpback whale (<i>Megaptera novaeangliae</i>)	CD & MI	MI	x		Low No marine habitat present within the Site.
Northern coastal free-tailed bat (<i>Ozimops cobourgiensis</i>)	P1		x		Low Occurs mostly in mangrove forests and woodlands. Habitat not present within the Site. Closest record is 15 km from the Site.
Northern short-tailed mouse, Lakeland Downs mouse, kerakenga (<i>Leggadina lakedownensis</i>)	P4		x		Medium Suitable habitat (sandy soils, cracking clays, tussock grasslands) may be present. Closest record 6.5 km from the Site.
Pilbara leaf-nosed bat (<i>Rhinonictis aurantia</i> (Pilbara form))	VU	VU	x	x	Low The site does not provide preferred foraging or breeding habitat (caves). One historical record, 19 km from the Site.
Spectacled hare-wallaby (mainland) (<i>Lagorchestes conspicillatus leichardti</i>)	P4		x		Low

Species	Conservation Status		Database		Likelihood of Occurrence on Site
	WA	Commonwealth	DBCA	PMST	
					One historical record, 48 km from the Site.
Water-rat, rakali (<i>Hydromys chrysogaster</i>)	P4		x		Low No wetland habitat present within the Site.
Western pebble-mound mouse, ngadji (<i>Pseudomys chapmani</i>)	P4		x		Low The Western Pebble-mound Mouse is found on stony hillsides with hummock grassland (Menkhorst & Knight, 2021). This species favors scree and stony plains habitat where it constructs conspicuous, extensive mounds of small stones. The pebble-mounds are found on gently sloping hills where the ground is stony with continuous small pebbles. No suitable habitat present within the Site.
REPTILES					
Airlie Island ctenotus, northwestern coastal ctenotus (<i>Ctenotus angusticeps</i>)	P3		x		Low Only one location of record within 50 km radius. Closest record is 14 km from the Site.
Flatback turtle (<i>Natator depressus</i>)	VU	VU	X		Low No marine or coastal breeding habitat within the Site. However, direct impacts can occur through light and vibration.
Four-lined slider (<i>Karratha</i>) (<i>Lerista quadrivincula</i>)	P1		x		Low Only historical records, closest record is 30 km from the Site.
Green turtle (<i>Chelonia mydas</i>)	VU	VU	x	x	Low No marine or coastal breeding habitat within the Site. However, direct impacts can occur through light and vibration.
Hawksbill turtle (<i>Eretmochelys imbricata</i>)	VU	VU	x	x	Low No marine or coastal breeding habitat within the Site. However, direct impacts can occur through light and vibration.

Species	Conservation Status		Database		Likelihood of Occurrence on Site
	WA	Commonwealth	DBCA	PMST	
Lake Disappointment dragon (<i>Ctenophorus nguyarna</i>)	P1		x		Low The Site lies outside the species distribution range.
Lined soil-crevice skink (Dampier) (<i>Notoscincus butleri</i>)	P4		x		Medium Habitat is potentially present. Closest record is 7 km from the Site.
Loggerhead turtle (<i>Caretta caretta</i>)	EN	EN	x	x	Low No marine or coastal breeding habitat within the Site. However, direct impacts can occur through light and vibration.
Nevin's slider (<i>Lerista neviniae</i>)	EN	EN	x	x	Low The Site lies outside the species distribution range.
Pilbara barking gecko (<i>Underwoodisaurus seorsus</i>)	P2		x		Low Site is outside known species distribution range.
Pilbara olive python (<i>Liasis olivaceus barroni</i>)	VU	VU	x	x	Medium All records within Dampier Peninsula, the Burrup Peninsula population was found to prefer granophyre rock-piles, though occasionally were found in neighbouring spinifex grasslands. These individuals, especially males, travelled large distances, suggesting the species has a large home range. Habitat is potentially present within the Site. Species may visit the Site.
Short-nosed seasnake (<i>Aipysurus apraefrontalis</i>)	CR	CR	x	x	Low No marine habitat present within the Site.



Attachment 8:
Traffic Impact Assessment



PTG00989

Transport Impact Assessment Lot 1 Dampier Road

14th October 2024 | Revision A
Prepared for RFF Pty Ltd

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REPORT DETAILS

PTG00989 Document Identification

	Information
Document Title	Lot 1 Dampier Road TIS
Project Number	PTG00989
Document ID	Rev A
Client	RFF Pty Ltd

Revision Details

Revision No.	Date	Comments	Author	Approved by
Rev A	14/10/2024	For Issue	BS	RJC

1 INTRODUCTION

1.1 Background

PTG Consulting Pty Ltd (PTG) has been commissioned by RFF Pty Ltd to prepare a Transport Impact Statement (TIS) to support a Local Planning Scheme Amendment at Lot 1 Dampier Road, Gap Ridge.

This report has been prepared in reference to the Western Australian Planning Commission (WAPC) Transport Assessment Guidelines for Developments: Volume 2 – Planning Schemes, Structure Plans and Activity Centre Plans (2016).

This report aims to assess the transport condition on the surrounding road network of the proposed planning scheme amendment, with a focus on traffic volume, traffic safety and accessibility.

2 SCHEME AMENDMENT PROPOSAL

2.1 Site Location

The Proposed Scheme Amendment Site is located at Lot 1 Dampier Road, Karratha. It is located approximately 4km west of the Karratha town centre, approximately 2.5km south of Karratha Airport, as shown in Figure 1.

Figure 1 Site Location - Regional Context

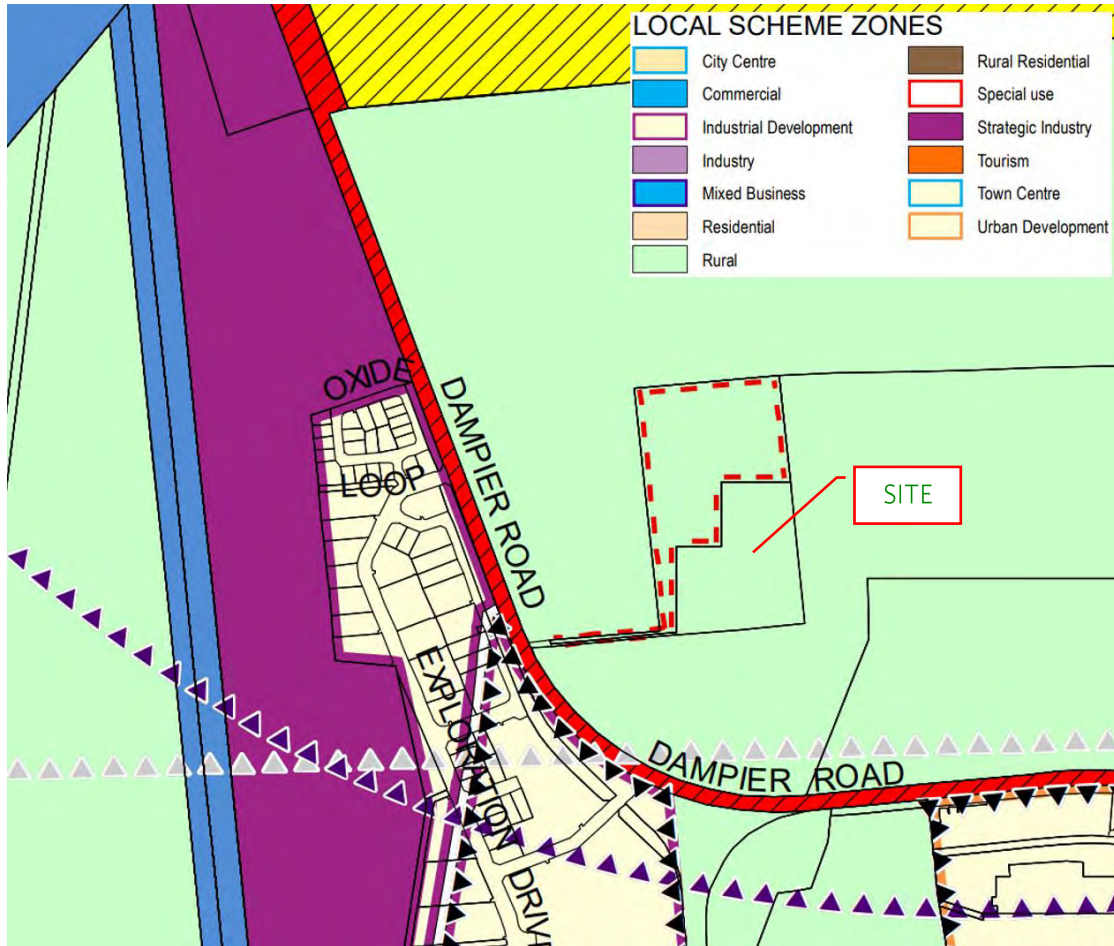


Source: Google Map

2.2 Existing Land Use

According to the City of Karratha *Local Planning Scheme No.8*, the Site is currently zoned as 'Rural'. According to the Planning and Development (Local Planning Schemes) Regulations 2015, Schedule 1, 'Rural' zoning aims to protect broad acre agricultural activities such as cropping and grazing and intensive uses such as horticulture as primary use, with other rural pursuits and rural industries as secondary uses in circumstances where they demonstrate compatibility with the primary use.

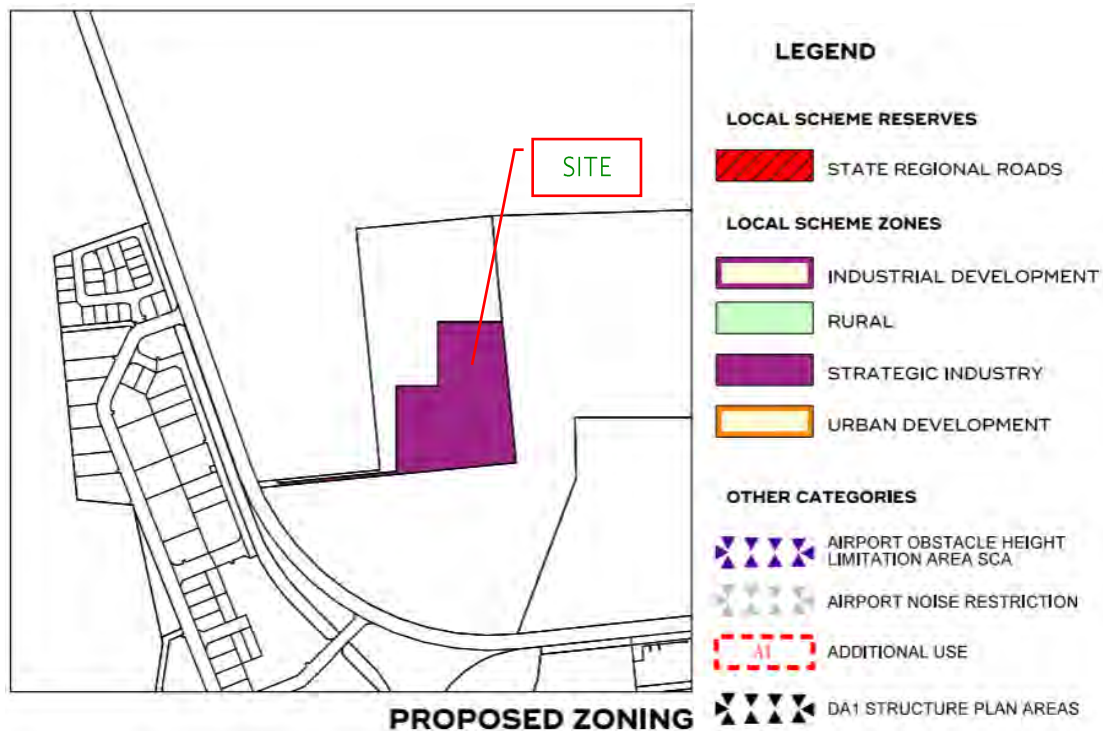
Figure 2 Existing Zoning Map



2.3 Proposed Land Use

The proposal is to rezone the existing Site use from 'Rural' to 'Strategic Industry' (See **Figure 3**). According to Planning and Development (Local Planning Schemes) Regulations 2015, Schedule 1 'Strategic Industry' land use aims to designate industrial sites of State or regional significance.

Figure 3 Proposed Land Use Zoning



2.4 Major Generator and Attractors

The major generators and attractors of the proposed land use are likely to be the Dampier port, Karratha Airport and residential area within the Karratha townsite or Dampier.

3 EXISTING SITUATION

3.1 Existing Land Use

The Site is approximately 15.65ha in area and is currently unoccupied and appears to form part of the adjacent development.

3.2 Existing Traffic Volume

Existing Traffic Data has been sourced from the Main Roads WA *Traffic Map* database and is summarised in **Table 1**.

Table 1 Existing Traffic Data

Road Name	Date	Source	Average Daily Traffic Volume (HV%)
Dampier Road North of Madigan Road	2024	Main Roads WA	9,533 (16.7%)
Dampier Road South of Exploration Drive	2024	SCATS	10,740 (-)

3.3 Existing Road Classifications

Data obtained from the *Main Roads WA Road Information Mapping System* suggests that Dampier Road is classified as a ‘Primary Distributor’, west of Madigan Road, and is classified as ‘Regional Distributor’ east of Madigan Road, as shown in **Figure 4**.

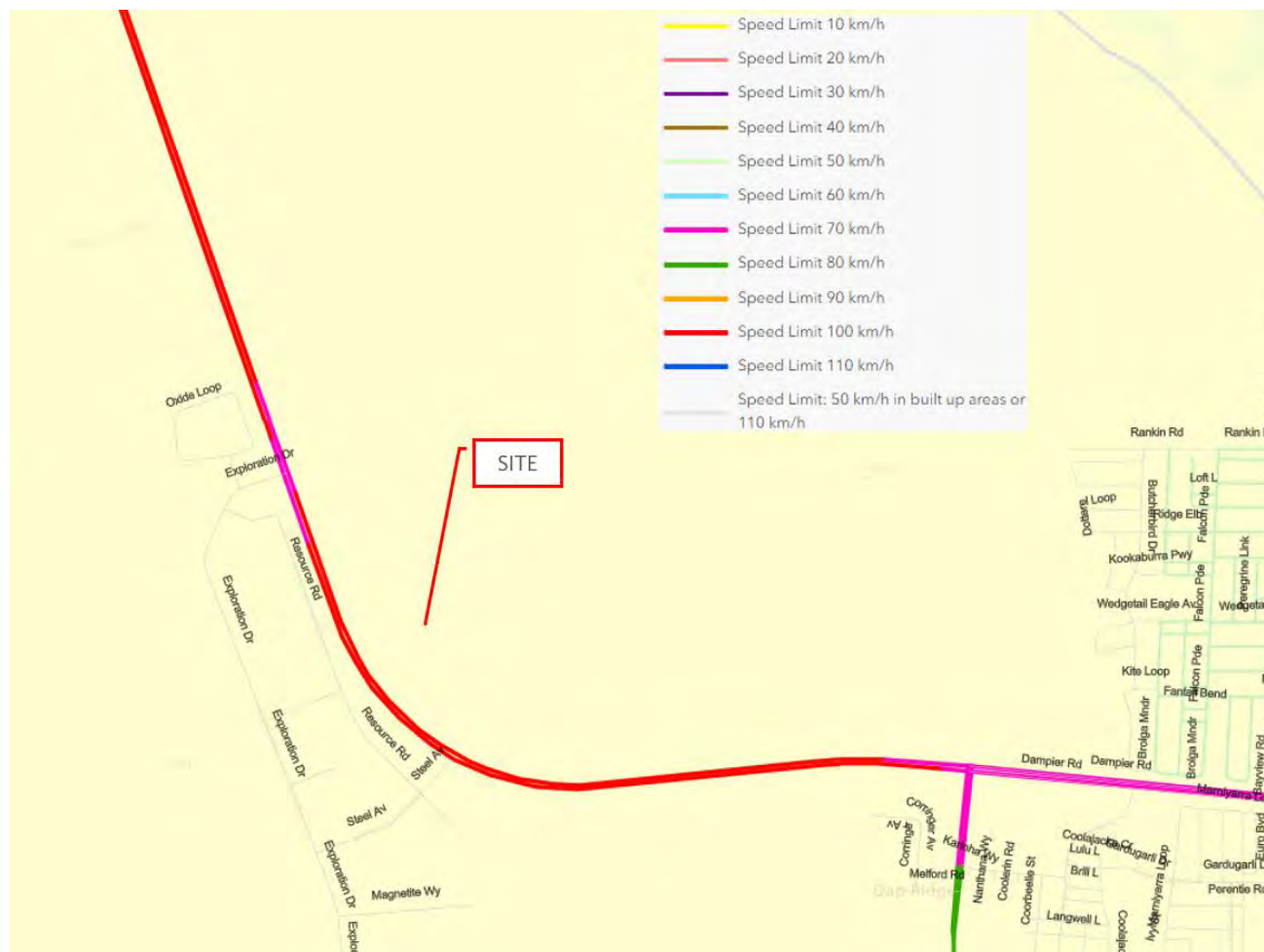
Figure 4 Road Classification



3.4 Existing Road Posted Speed

Data obtained from the *Main Roads WA Road Information Mapping System* shows that Dampier Road west of Madigan Road has a posted speed of 100km/h, with a reduced posted speed of 70km/h near the Exploration Drive signalised intersection, as shown in **Figure 5**.

Figure 5 Existing Posted Speed Data



3.5 Existing Public Transport and Cycle Network

There are currently no public transport services available in the vicinity of the Site.

It is noted that the sealed shoulders on both sides of Dampier Road, fronting the Site access are marked as bicycle lanes, between the intersection of Burrup Road and Karratha town centre.

3.6 Existing Restricted Access Vehicle (RAV) Network

The existing RAV network map obtained from the *Main Roads WA HVS Network* suggests that the Site currently has RAV 10 access off Dampier Road to the north and south, as shown in **Figure 6**.

Figure 6 RAV Network

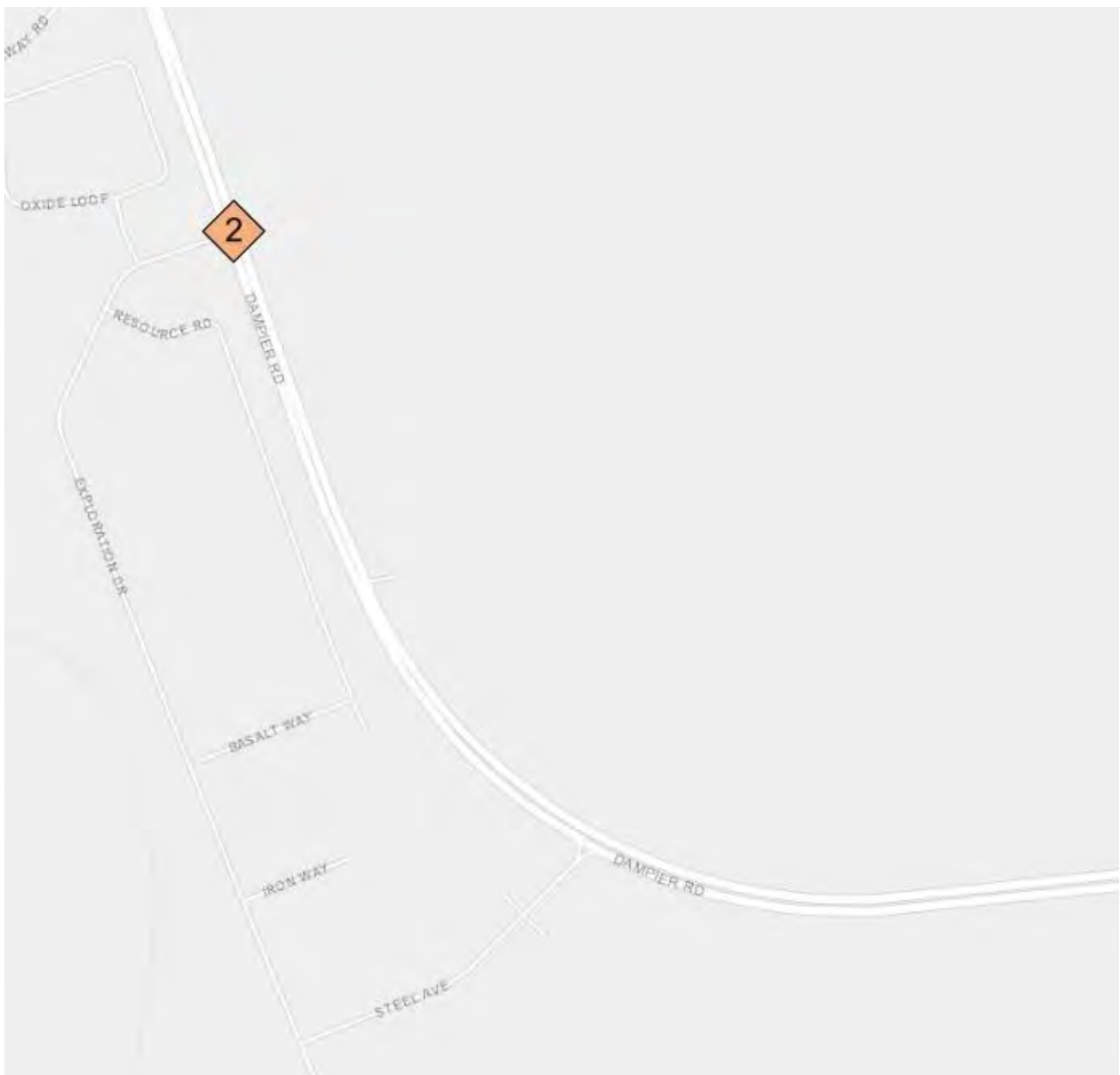


3.7 Existing Crash Data

A crash assessment of the Site's surrounding road network was conducted using MRWA's Crash Reporting Centre database which covers all recorded crashes between January 2019 to December 2023. As shown in **Figure 7**, only 2 crashes were recorded and both occurred at the Dampier Road/Exploration Drive intersection. A summary of the crashes are as follows:

- » Rear end crash resulting in major property damage
- » Hit object crash resulting in major property damage

Figure 7 Crash Location



4 PROPOSED INTERNAL TRANSPORT NETWORKS

The internal road network and characteristics are not available at this stage. Detailed assessment shall be undertaken during the subdivision or individual development stage TIA.

5 CHANGES TO EXTERNAL TRANSPORT NETWORK

There are currently no proposed modifications to the external transport network.

6 ANALYSIS OF TRANSPORT NETWORK

6.1 Traffic Generation

PTG consulting has conducted an aerial image survey on the existing industrial are located west of Dampier Road. This assessment surveyed a total of 30 lots and concluded the following:

- » The average lot size is approximately 1.2ha
- » 53% of the lots are used for storage / truck depot without a building
- » The average building size is approximately 2,000m², approximately 17% of the lot size.

Based on the survey outcomes, the following assumptions have been applied to calculate the trip generation for the proposed Site:

Table 2 Trip Generation Estimate based on GFA

Total Site Area	~15.65ha
Gross Lot Area (GLA) (assuming 10% for internal roads and drainage)	~14 ha
No of Lots (assuming average lot size of 1.2ha)	~12 lots
Assuming 50% of lots (6) used for light industry, occupied by a building with average gross floor area (GFA) of 2,000m ² .	Total GFA = 12,000m ²
Daily Trip generation rates for light industry, sourced from <i>RTA Guide to Traffic Generating Developments V2.2</i> .	5 trips/day/100m ² GFA
Total Daily Trips generated by 6 lots of Industrial use (7ha GLA)	600 trips / day
50% of lots used for storage / warehouse with average daily trip generation of 40 trips/lot (6)	240 trips/day
Total Daily Trips	840 trips/day
Peak hour Trips	84 trips/hour*

** Peak hour trip generation is estimated to be 10% of daily trip*

Based on robust trip generation calculation the proposed site is expected to have a net traffic generation of 840 trips per day, or 84 trips during the peak hour. According to WAPC TIA guideline, a development with peak hour traffic generation lower than 100 trips/hour is considered as moderate impact to the surrounding road network and would therefore not require further performance assessment.

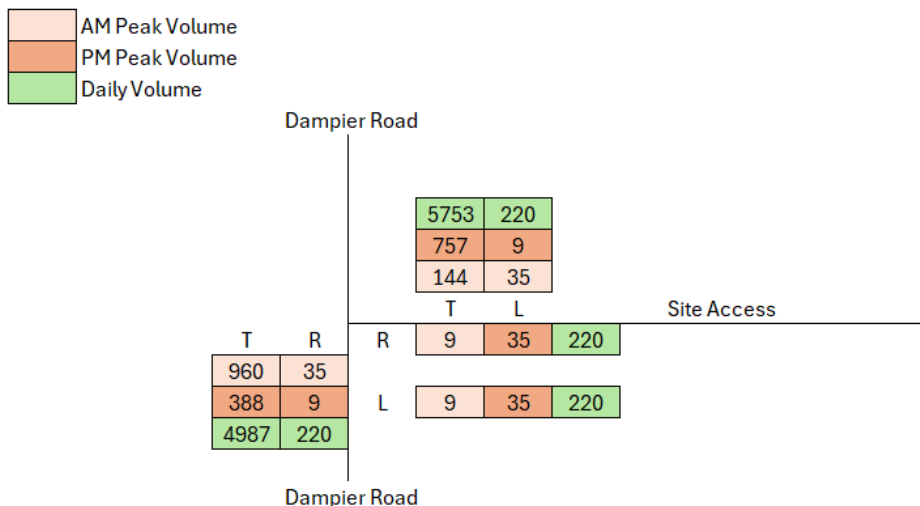
6.2 Traffic Distribution

The distribution of traffic generated by the Site will largely depend on the type of development. Due to its strategic location between Dampier, Karratha and NW Coastal Highway via Madigan Road, the traffic is likely to be evenly distributed between the north and south along Dampier Road as shown in Figure 8.

Figure 8 Estimated Traffic Distribution



Figure 9 Estimated turning movements at Site Access



6.3 Road Cross-sections

Information on road cross-sections will be further discussed in the subdivision stage.

6.4 Intersection Controls

Information on intersection controls will be further discussed in the subdivision stage. Generally, all internal intersections are likely to be managed with give-way priority control.

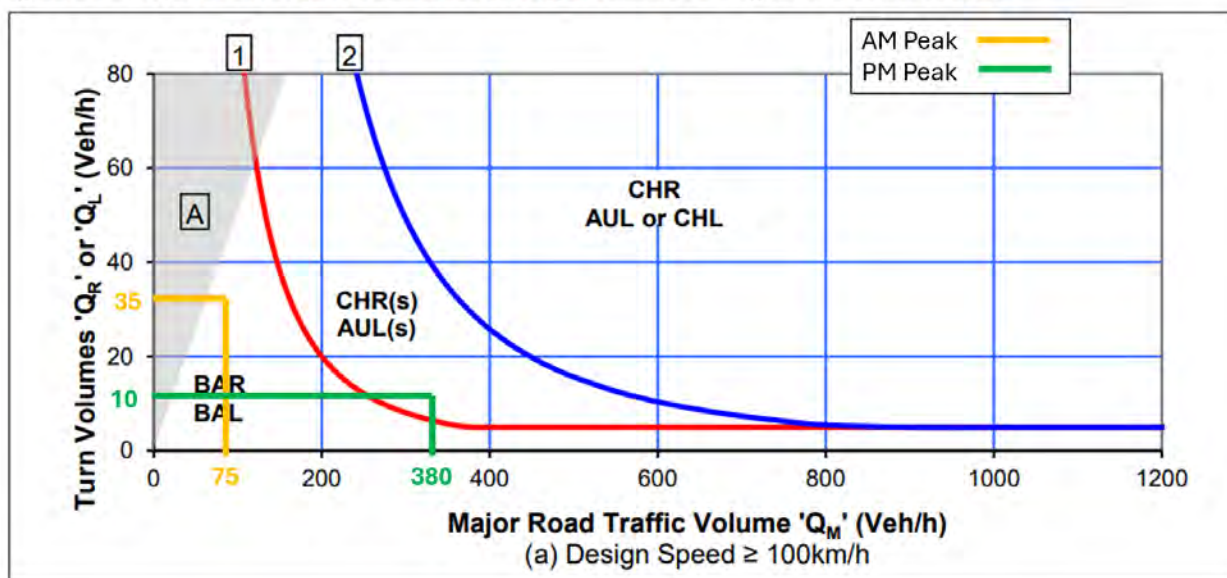
6.5 Access Strategy

The Site access is currently a full movement T intersection onto Dampier Road, with a right-turn deceleration lane (CHR) provided on the southern approach. Therefore, a turn warrant assessment has not been considered for right-turn movement.

Based on the traffic distribution estimated in **Section 6.2**, a turn treatment warrant assessment has been conducted for the Site Access, in accordance with *Austroads Guide to Traffic Management – Part 6* for both AM and PM peak

Figure 10 Left Turn Warrant Treatments Assessment

Figure 3.25: Warrants for turn treatments on major roads at unsignalised intersections



The turn warrant treatment assessment (shown in **Figure 10**) suggests that an AUL(s) is warranted based on the PM peak turning volumes, and no treatment is required for the AM peak at the Site Access.

However, it should be noted that the traffic generation has been calculated based on a robust high level estimate. A detailed assessment should be conducted when more information is available to determine if a left-turn treatment is warranted for the Site access.

7 SUMMARY

This report has been prepared in reference to Western Australian Planning Commission (WAPC) Transport Assessment Guidelines for Developments: Volume 2.

The following conclusions can be drawn from this TIS:

- » The proposal is to rezone 15.65ha of the existing Site (Lot1 Dampier Road) from 'rural' to 'strategic industry' land use.
- » The proposal is anticipated to generate an additional 880 trips per day, or 88 trips during the peak hour(s).
- » A high-level turn treatment warrants suggests that a short Auxiliary left-turn lane (AUL(s)) may be warranted. As the assessment was conducted based on a high-level traffic generation estimate, further assessment should be conducted during the subdivision or detailed development stage.
- » Due to the low to moderate volume of new trips generated by the development, no material impact on road safety is anticipated.
- » Overall, the proposed development is expected to have no material impact on the surrounding transport network.



Appendix A

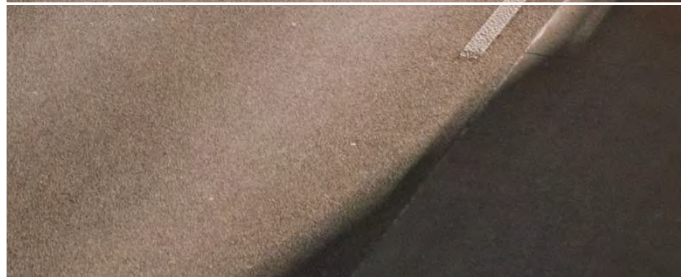
WAPC CHECKLIST PLANNING
SCHEMES, STRUCTURE PLANS AND
ACTIVITY CENTRE PLANS -
TRANSPORT IMPACT ASSESSMENT



APPENDIX A

Item	Status	Comments/Proposal
Summary	Section 7	
Introduction/Background	Section 1	
Structural plan proposal	Section 2	
regional context	Section 2	
proposed land uses	Section 2	
table of land uses and quantities	N/A	
major attractors/generators	Section 2	
specific issues	N/A	
Existing situation	Section 3	
existing land uses within structure plan	Section 3	
existing land uses within 800 metres of structure plan area	Section 3	
existing road network within structure plan area	Section 3	
existing pedestrian/cycle networks within structure plan area	N/A	
existing public transport services within structure plan area	N/A	
existing road network within 2 (or 5) km of structure plan area	Section 3	
traffic flows on roads within structure plan area (PM and/or AM peak hours)	Section 3	
traffic flows on roads within 2 (or 5) km of structure plan area (AM and/ or PM peak hours)	Section 3	
existing pedestrian/cycle networks within 800m of structure plan area	Section 3	
existing public transport services within 800m of structure plan area	Section 3	
Proposed internal transport networks	N/A	
changes/additions to existing road network or proposed new road network	N/A	
road reservation widths	N/A	
road cross-sections & speed limits	N/A	
intersection controls	N/A	
pedestrian/cycle networks and crossing facilities	N/A	
public transport routes	N/A	
Changes to external transport networks	N/A	
road network	N/A	
intersection controls	N/A	
pedestrian/cycle networks and crossing facilities	N/A	
public transport services	N/A	

Integration with surrounding area	N/A	
trip attractors/generators within 800 metres	N/A	
proposed changes to land uses within 800 metres	N/A	
travel desire lines from structure plan to these attractors/generators	N/A	
adequacy of external transport networks	N/A	
deficiencies in external transport networks	N/A	
remedial measures to address deficiencies	N/A	
Analysis of internal transport networks	Section 6	
assessment year(s) and time period(s)	N/A	
structure plan generated traffic	Section 6	
extraneous (through) traffic	Section 6	
design traffic flows (that is, total traffic)	Section 6	
road cross-sections	N/A	
intersection controls	Section 6	
access strategy	Section 6	
pedestrian/cycle networks	N/A	
safe routes to schools	N/A	
pedestrian permeability & efficiency	N/A	
access to public transport	N/A	
Analysis of external transport networks	Section 6	
extent of analysis	Section 8.1	
base flows for assessment year(s)	Section 6	
total traffic flows	Section 6	
road cross-sections	N/A	
intersection layouts & controls	Section 6	
pedestrian/cycle networks	N/A	
Conclusions	Section 7	



ptg
consulting

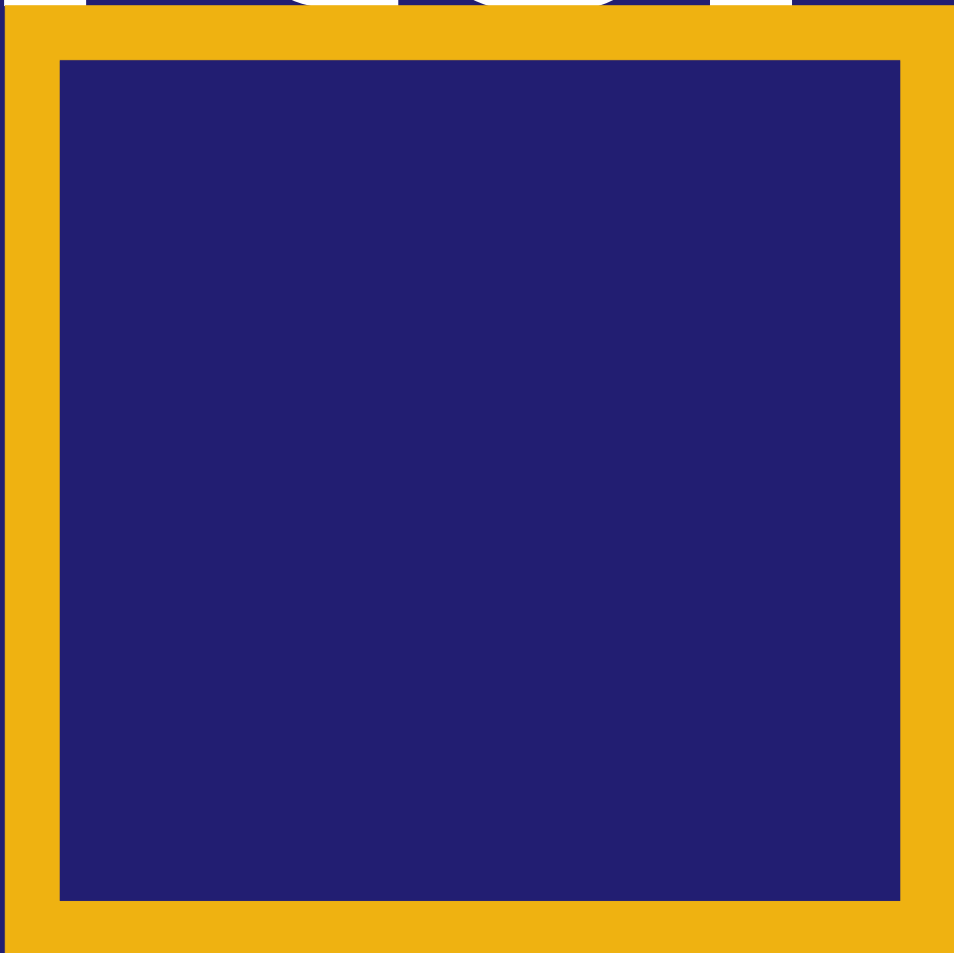
www.ptgconsulting.com.au

Attachment 9:
Engineering Servicing Report



LOT 1 DAMPIER ROAD, GAP RIDGE
ENGINEERING SERVICING REPORT

Porter



REPORT PREPARED FOR

RFF Australia

Prepared by	Porter Consulting Engineers
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Date	10 October 2024
Our reference	R90.24
Job Number	24-01-004
Checked	SH

HISTORY AND STATUS OF THE DOCUMENT

Revision	Date issued	Author	Issued to	Revision type
Rev A	18/10/2024	R. Thomson	M. MacKenzie	Draft Review
Rev B	20/10/2024	R. Thomson	M. MacKenzie	Updated Draft Review
Rev C	21/10/2024	R. Thomson	M. MacKenzie	Submission Issue

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3.2	<i>Geotechnical.....</i>	2
3.3	<i>Flooding.....</i>	2
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4.3	<i>Communications.....</i>	4
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4.5	<i>Wastewater.....</i>	5
4.6	<i>Stormwater Drainage.....</i>	5
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3.0 THE EXISTING SITE

The site has been used for agricultural purposes². Various buildings on the site are expected to be demolished to facilitate the proposed development.

3.1 Topography

A topographical feature survey³(**Attachment B**) shows that existing lot levels gradually grade down from Dampier Road from a high of 10.55m AHD in the west boundary to around 7.56m AHD in the east boundary.

3.2 Geotechnical

The soils on site are expected to be a mix of Eolian Sands and Silty sand⁴ with a low permeability rate. A geotechnical report is required to confirm ground conditions before detailed design.

Groundwater is expected to range from 3-5m below existing ground levels⁵ and may vary seasonally.

The site is at medium risk of acid sulphate soils. However, no works are expected below the groundwater table, therefore this is not expected to be an issue during construction.

3.3 Flooding

The site is located within the identified 500-year storm surge area⁶ as shown in *Figure 2* (right). The 100-year flood levels are expected to be around 8.3m AHD⁷ for the 2010 Climate Scenario.

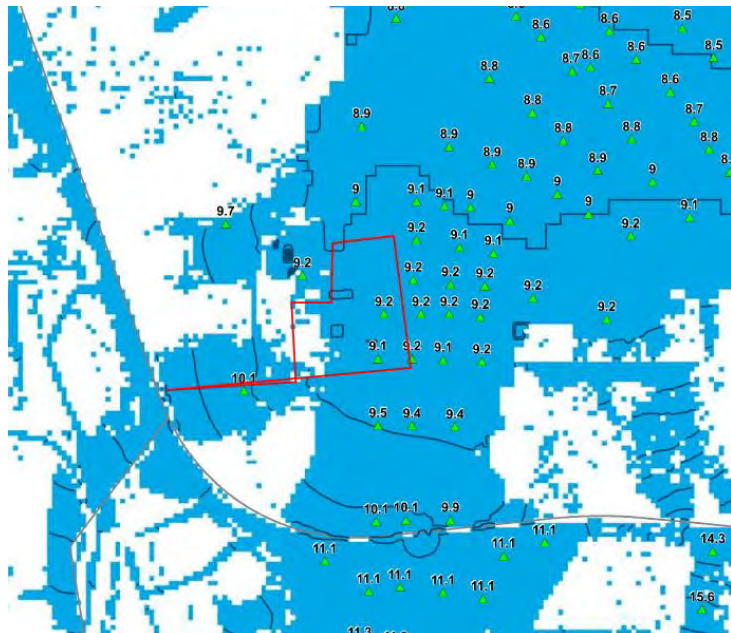


Figure 2: 500-year storm surge levels (Karratha Coastal Study figure D2A: JDA) Storm Surge impact area highlighted in blue. Site boundary in red

² Landgate <https://www.landgate.wa.gov.au/location-data-and-services/maps/online-maps/map-viewer-plus/>

³ Topographical survey by Land Surveys, 200993-FS-001-A September 2023

⁴ Gozzard J.R. 1982 Yanchep Sheet 2034 IV, Perth Metropolitan Region, Environmental Geology Series, Geological Survey of Western Australia

⁵ Karratha Coastal Vulnerability Study by JDA, August 2012, Paragraph 2.6

⁶ Karratha Coastal Vulnerability Study by JDA, August 2012, Figure D5

⁷ Karratha Coastal Vulnerability Study by JDA, August 2012, Figure 12A

4.0 SERVICING

The existing asset mapping for the respective utilities is presented in **Appendix C**.

4.1 Clearing and Demolition Works

As there is no record of known contamination in the online Contaminated Sites Database, soil remediation is not expected to be required.

Demolition of the existing buildings should be carried out per the City of Karratha requirements, noting environmental reports may be required for the existing buildings on site for asbestos management or lead paint identification.

Minor clearing of low-level shrubs within the site boundary is required to facilitate the proposed development, resulting in the requirement for a clearing permit. The City of Karratha will advise if this permit is required as part of the development approval process.

It is assumed the existing residential building on site has a septic system or ATU to treat waste. This should be decommissioned per the Department of Health requirements.

Mapping imaging suggests a general rubbish clean-up is required before work commences on site.

4.2 Electrical

Before you Dig Mapping shows Horizon Power records with infrastructure present within the site boundary, as shown in *Figure 4*. An existing overhead HV distribution service is available and appears to terminate at a pole-top transformer near proposed Allotment 9.

Based on the proposed development layout, it is expected the power requirements will be minimal (i.e. only lighting). Therefore, an upgrade to the existing Horizon Power infrastructure is not expected to be required. An application should be made as early as possible to confirm this.

The application should note that the power demand for this Site will likely be lower than a typical commercial/ industrial subdivision of the same area due to the proposed end use being predominantly hardstand.

If the scope of the development changes and buildings are proposed, an upgrade to the offsite infrastructure, new transformer and switchboard is expected to be required.

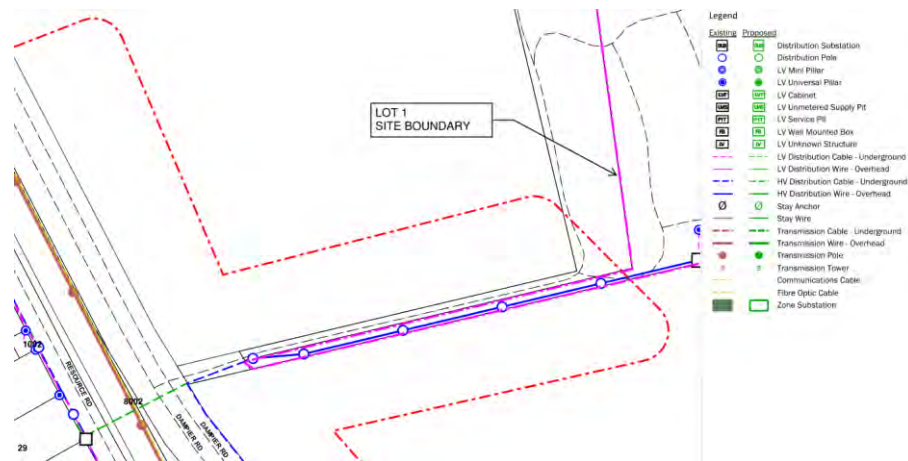


Figure 3: Existing Horizon Power Infrastructure

4.3 Communications

Existing Telstra and NBN services are present in Dampier Road. Mapping records show Telstra services are present on site.

The site is located in a Telstra 4G coverage area, as shown in *Figure 5* below. Mobile services are expected to be available on-site.

Based on the current concept development layout, an upgrade to this existing service is not expected to be required.

If the development should require a communication service to each allotment, an upgrade from the infrastructure in Dampier Road to the end of the battleaxe driveway will likely be required.



Figure 4: Existing Telstra Network Coverage Map

4.4 Water

Water Corporation records show the nearest water main is located on the western verge of Resource Road, approximately 120m from the lot boundary.

Based on the proposed development layout, a water service is not expected to be required for the current project.

If a potable water supply is required in future, a 120m watermain extension of the Water Corporation network is required. The water main shall be installed by trenchless methods below Dampier Road and a new water meter installed to meet the site flow requirements. The pipe material should be selected in accordance with Water Corporation requirements, noting the tropical weather conditions in Karratha. An internal private water main will be required to provide a potable water service to all allotments.

4.5 Wastewater

An existing Water Corporation gravity sewer is located on the eastern verge of Resource Road.

Based on the proposed development layout, a sewer service is not expected to be required for the current project.

If sewer service is required in future, it is expected a private sewer pump station and gravity sewer mains extension will be required.

Current guidelines will likely not permit the installation of an onsite septic or ATU system due to the proximity to 7 Mile Creek and flood levels present on site.

4.6 Stormwater Drainage

A stormwater management plan has been prepared for the proposed development. Refer to Porter Consulting Engineers Report Ref: L299.24 for further details. A high-level summary of the stormwater management requirements is noted below:

- The existing overland flow path through the site will be diverted south of the site and discharged to Crown Land via a culvert below the access road to the site.
- Runoff from the proposed allotments will sheet flow to the roadside swales and drain to basins 1 and 2.
- Internal road and allotment areas are to be raised to the concept levels shown on the stormwater management plan in Attachment 3. This will provide a 300mm freeboard to the 1% AEP flood event.
- Any future buildings are to be constructed with a finish floor level of 9.2m AHD or above to comply with the City of Karratha Storm Surge Risk Policy DP19
- Mortared stone pitching will most likely be used to manage erosion on site. This will be confirmed at the detailed design stage.

4.7 Earthworks

In order to achieve the minimum stormwater storage volumes on site and protect the site from flooding in the 1 in 100-year event, imported fill is required to raise allotment and road levels on site.

Based on a review of the existing survey levels, the depth of fill required is expected to range from 0m in the western boundary to approximately 600mm in the eastern boundary. The concept earthworks levels are shown in **Attachment A**.

The source and placement of the clean fill shall comply with advice from a geotechnical consultant.

4.8 Roadworks

4.8.1 INTERSECTION UPGRADES

The Traffic Impact Statement carried out by PTG Consulting suggests an upgraded intersection is required to facilitate the proposed development, subject to further review.

The existing access to the site is 7.5m wide. This may require widening depending on the types of vehicles accessing the site. The design of the intersection will be carried out to accommodate the largest vehicle expected on site.

The approval process for upgrading the MRWA network can take around 12 months.

4.8.2 BATTLEAXE ACCESS ROAD

Aerial imaging shows the site is currently access from Lot 500 battleaxe driveway. There does not appear to be any easement of right of way in place to maintain this for the proposed site. Further discussions are required with the owner of Lot 500 (and the leaseholder) to confirm if a shared access arrangement can be maintained following the proposed development works.

If an agreement with the owner of Lot 500 cannot be reached and a new access road is required to service the Site, the existing overhead power supply may need to be diverted to permit construction of the new two-way driveway. Refer to *Figure 6* below.

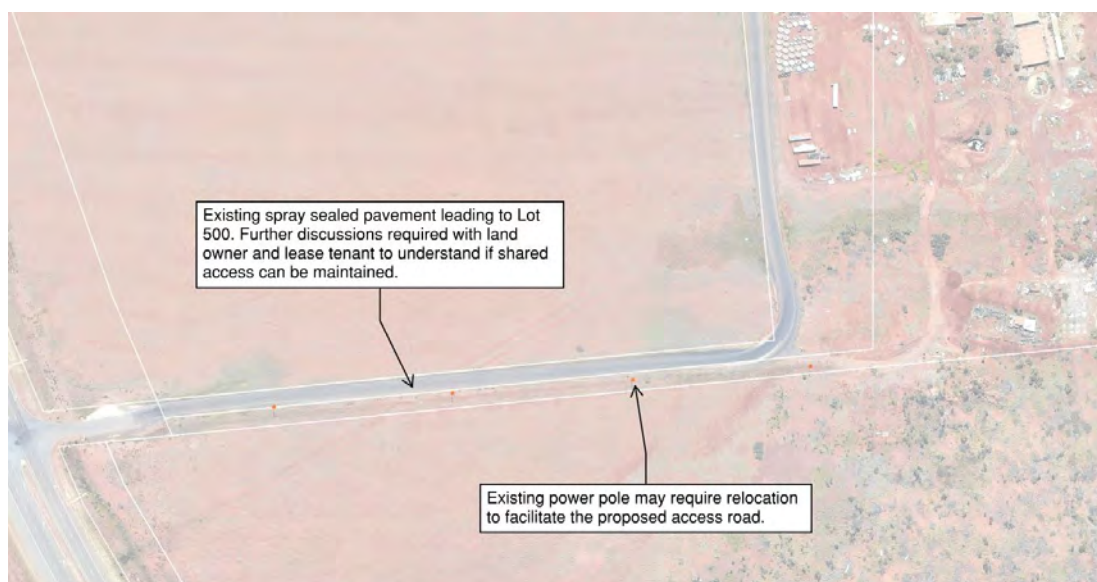


Figure 5: Existing access road located in Lot 500 boundary.

If the existing road within Lot 500 can be used to access the site, an agreement for future maintenance works is expected to be required. The existing access road leading to Lot 500 is in good condition, as shown in *Figure 7* below.



Figure 6: Existing shared access road (photo from near Allotment 9 facing west towards Dampier Highway)

4.8.3 INTERNAL ACCESS ROAD

A proposed internal unsealed access road will provide passenger and truck access to all allotments. The proposed internal road layout is presented in **Attachment A**.

A 10m wide unsealed pavement is proposed. This pavement width will be reviewed once the largest design vehicle for the site has been confirmed.

Access to allotments can be at any location. Where a roadside swale is present, the crossover should be installed with a culvert.

4.8.3 PAVEMENT

The pavement design for the intersection, battleaxe road and internal roads will be designed to suit the types of vehicles expected on-site and the number of trips expected for the design life of the pavement.

4.9 Fencing & Landscaping

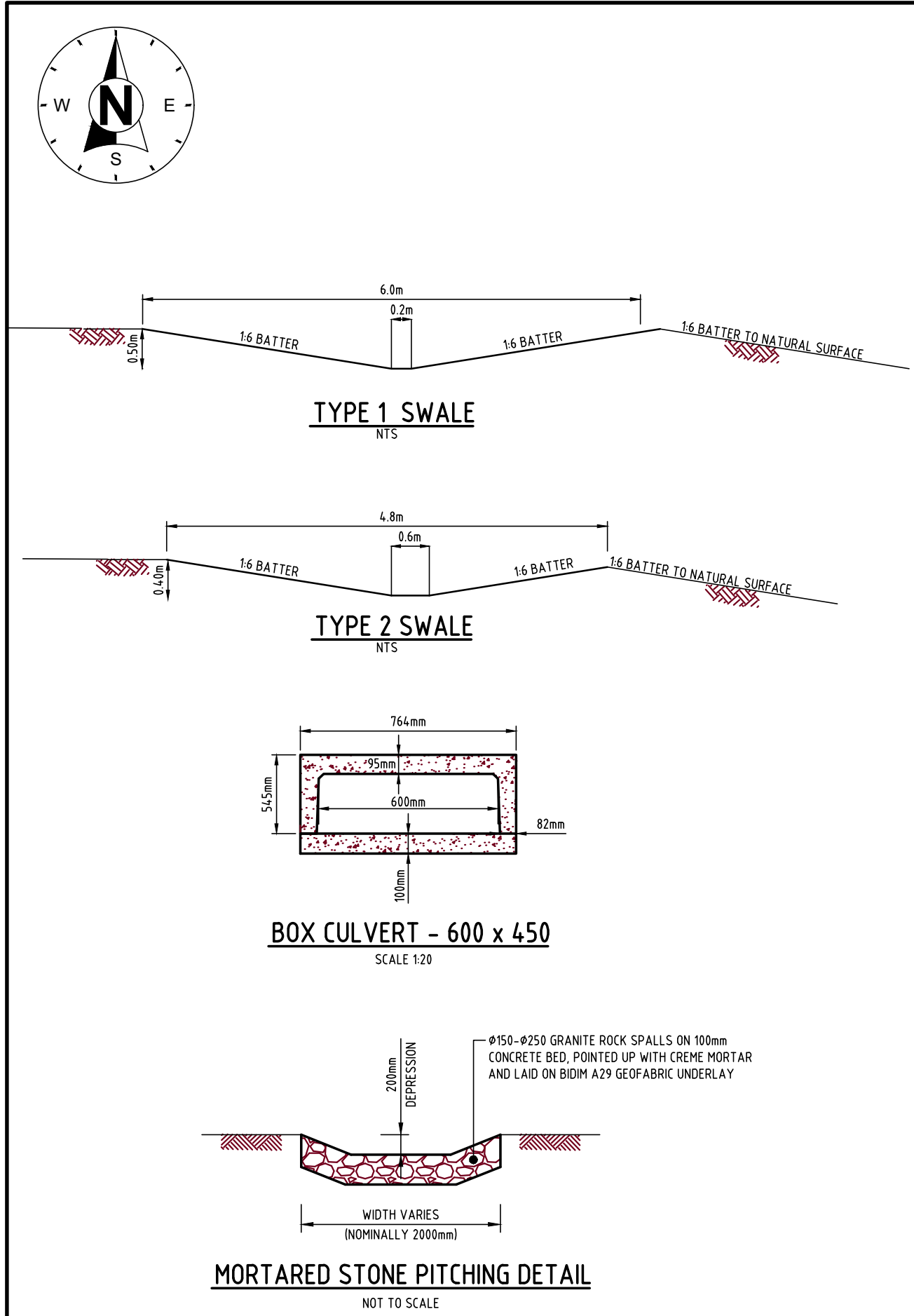
Items are not expected to be a requirement of the development conditions. Works can be carried out per client preferences.

5.0 CONCLUSION

Based on the information reviewed, the site can be upgraded to accommodate the proposed development. Further discussions are required to confirm the following:

- Power requirements for the site are required to determine the power upgrades to the existing Horizon Power Network.
- Client to confirm sewer and water servicing is not required for the proposed development
- Information required on expected type and number of vehicle movements accessing the site and from which direction they are entering the site from. This will confirm the access road upgrade requirements
- Discussions are required with the owner of Lot 500 to determine if a shared access road arrangement can be agreed
- Import fill to be sourced for the site and advice required from a geotechnical consultant for placement and compaction of fill materials
- Pavement design to be progressed
- Stormwater management plan to be submitted to the City of Karratha technical services department for comment.

APPENDIX A - Proposed Development Layout



DRAINAGE STRATEGY

THE STORAGE PROVIDED ON SITE HAS BEEN DESIGNED TO RESTRICT DISCHARGE FROM SITE TO THE PRE DEVELOPMENT FLOW RATES FOR THE 1 HOUR 1% AEP EVENT.

THE PEAK PRE DEVELOPMENT FLOW RATE HAS BEEN CALCULATED USING THE ARR IL-CL METHOD AT 1,650l/s

THE STORMWATER STORAGE WILL BE PROVIDED WITHIN THE PROPOSED SWALES AND DRAINAGE BASINS.

THE EXISTING OVERLAND FLOW PATH PRESENT ON SITE SHALL REMAIN. THE FLOW PATH WILL CONVEY STORMWATER THROUGH ALLOTMENT 7 AND INTERNAL ACCESS ROAD BEFORE DISCHARGING FLOWS ALONG THE EASTERN BOUNDARY AS SHOWN ON THE PLAN.

TOTAL STORAGE VOLUME AVAILABLE ON SITE:

STORAGE WITHIN SWALES:	1,800m³
STORAGE WITHIN DETENTION BASINS:	1,600m³
TOTAL:	3,400m³

LEGEND

9.10
ALLOTMENT 7
1.05ha

PROPOSED FINISHED GROUND LEVEL

PROPOSED ALLOTMENT No. AND AREA

PROPOSED ALLOTMENT BOUNDARY

PROPOSED INTERNAL ACCESS ROAD

NOTE

ANY FUTURE BUILDINGS SHALL BE CONSTRUCTED WITH A FINISH FLOOR LEVEL AT OR ABOVE 9.4m AHD TO COMPLY WITH THE CITY OF KARRATHA STORM SURGE POLICY DP19

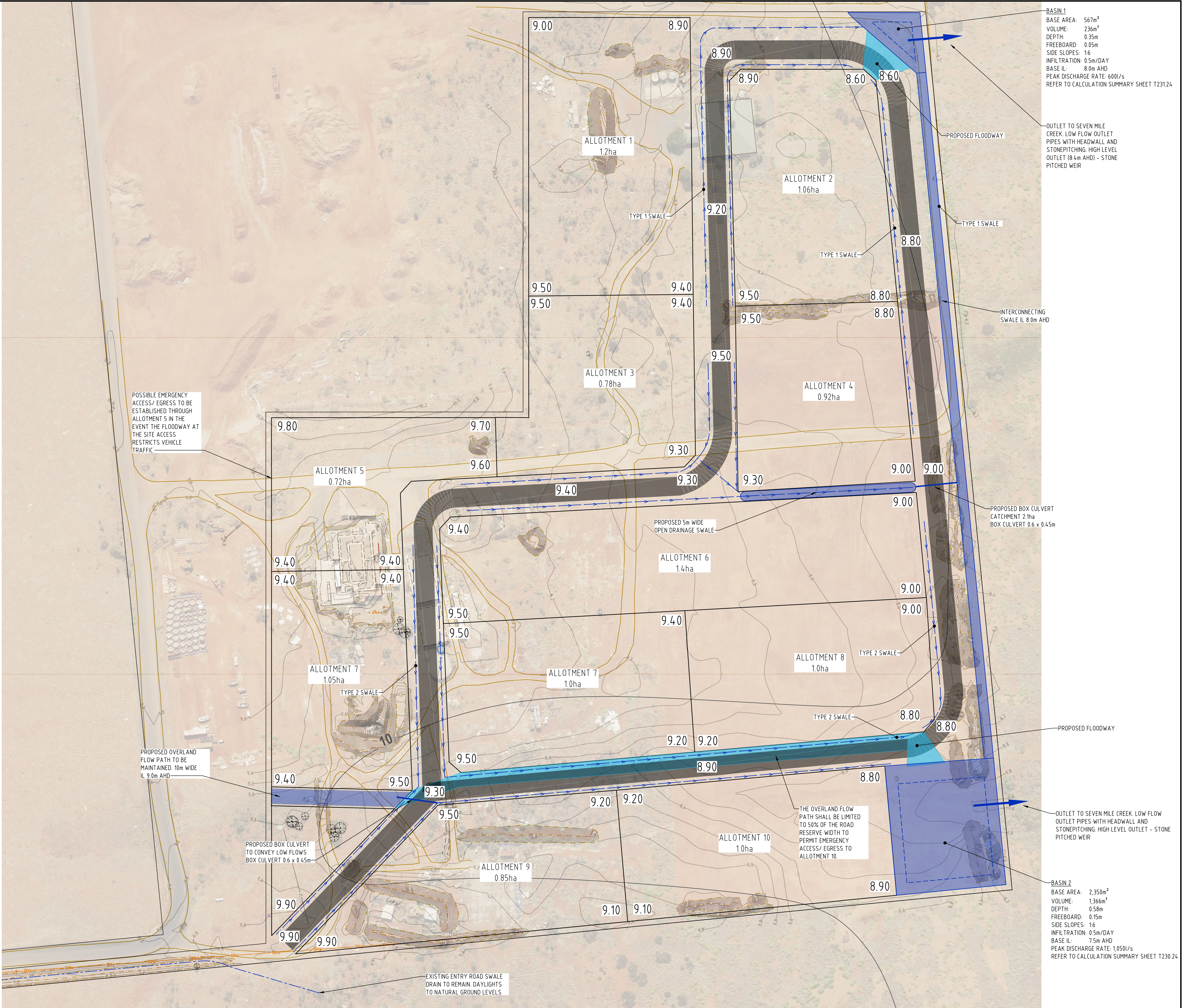
NOTE

PLAN TO BE READ IN CONJUNCTION WITH STORMWATER MANAGEMENT PLAN REF: L229.24



0m 20 40 60m

1:1000



BASIN 1

BASE AREA: 567m²
VOLUME: 236m³
DEPTH: 0.35m
FREEBOARD: 0.05m
SIDE SLOPES: 1:6
INFILTRATION: 0.5m/DAY
BASE IL: 8.0m AHD
PEAK DISCHARGE RATE: 600l/s
REFER TO CALCULATION SUMMARY SHEET T231.24

OUTLET TO SEVEN MILE CREEK. LOW FLOW OUTLET PIPES WITH HEADWALL AND STONEPITCHING. HIGH LEVEL OUTLET (8.4m AHD) - STONE PITCHED WEIR

INTERCONNECTING SWALE IL 8.0m AHD

PROPOSED BOX CULVERT CATCHMENT 2.1ha
BOX CULVERT 0.6 x 0.45m

PROPOSED FLOODWAY

OUTLET TO SEVEN MILE CREEK. LOW FLOW OUTLET PIPES WITH HEADWALL AND STONEPITCHING. HIGH LEVEL OUTLET - STONE PITCHED WEIR

BASIN 2

BASE AREA: 2,350m²
VOLUME: 1,366m³
DEPTH: 0.58m
FREEBOARD: 0.15m
SIDE SLOPES: 1:6
INFILTRATION: 0.5m/DAY
BASE IL: 7.5m AHD
PEAK DISCHARGE RATE: 1,050l/s
REFER TO CALCULATION SUMMARY SHEET T230.24

LOT 1 DAMPIER ROAD GAP RIDGE

REV	DATE	REVISION
C	15/10/2024	UPDATED TO SUIT SWMP
B	4-3-2024	STAGE 1 UPDATED LAYOUT
A	16-1-2024	ISSUED FOR INFORMATION

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DRAWING:

**STORMWATER MANAGEMENT
LAYOUT**

STATUS: **FOR INFORMATION**

SCALE: 1:1000	DRAWING No:	REV No:	ORIGINAL DRAWING SET:
DATE: Oct-24	24-1-4/501	C	A1
DESIGN: RT	FILE NAME: \24-01-004\ACAD\2414-501.dwg		
DRAWN: MEG			
CHECK: APPD			

APPENDIX B - Topographical Survey



SERVICE LEGEND

DRAINAGE

GRATE

SIDE ENTRY PIT

STORM WATER MANHOLE

ELECTRICAL

CABLE MANHOLE

CABLE PIT / BOX

CABLE DOME

CONSUMER POLE

LIGHT POLE

POWER POLE

STAY POLE

STAY WIRE ANCHOR

O/H POWER LINE

GAS

GAS MANHOLE

GAS MARKER

GAS METER

GAS VALVE

SEWERAGE

SEWER MANHOLE

PROPERTY CONNECTION

SEWER LINE

COMMUNICATIONS

COMMS MANHOLE

COMMS MARKER

COMMS CABLE PIT

WATER

FLUSH POINT

HYDRANT

STOP VALVE

TAP

WATER MARKER

WATER METER

UNDEFINED

UNDEFINED MANHOLE

UNDEFINED PIT

UNDEFINED SERVICE

SURVEY

DATUM

PEG FOUND

SURVEY STATION

TEMPORARY / BENCH MARK

OTHER

AWNING / EAVES

ROOF RIDGE

FLOOR RL

BOLLARD

WINDOW / DOOR

BANK - BOTTOM

BANK - TOP

LOT SERVICE RECORD

SERVICE	STATUS		
	LOCATED	NOT FOUND	NO SERVICE
WATER	✓	✓	✓
SEWER CONN.	✓	✓	✓
GAS	✓	✓	✓
COMMS	✓	✓	✓
POWER U/G	✓	✓	✓
POWER O/H	✓	✓	✓

SERVICES MARKED CONFIRM REQUIRE BUILDER / CLIENT TO CONFIRM POSITION AND / OR AVAILABILITY ON SITE.

CONTOUR LEGEND - 0.2m INTERVALS

MAJOR CONTOURS 00

MINOR CONTOURS

NOTE: AHD LEVEL DERIVED FROM STANDARD SURVEY MARK DAMPIER 67 - RL = 12.10

NOTE: THIS PLAN HAS BEEN PREPARED WITH MGA2020 ZONE 50 COORDINATES.

SURVEY CONTROL COORDINATE LISTING MGA94 ZONE 50

SURVEY NAME	EASTING	NORTHING	ELEVATION
DAMPIER 67	476344.088	7702621.438	12.105
DAMPIER 141	476268.892	7702622.476	16.896
DAMPIER 93	476133.852	7702655.813	15.449



REV	DESCRIPTION	DRN	DATE	APP		19 Brennan Way Belmont WA 6104 T (08) 9477 4477 E admin@landsurveys.net.au www.landsurveys.net.au	SCALE @ A0: 1:1000 	This document is a draft and remains the property of Land Surveys. It is not to be used for any purpose other than the purpose for which it was prepared and is not to be used for any other purpose without the written consent of Land Surveys. Unauthorised use of this document in any way is prohibited.	SURVEYED BY: SM,KG	FEATURE SURVEY LOT 1 TOPO SURVEY DAMPIER HWY	
									SURVEYED ON: 11/09/2023		
									DRAWN BY: JM		
									DRAWN ON: 12/09/2023		
HOR DATUM: MGA2020z50								VERT DATUM: AH	CLIENT: GREEN GRID ENERGY		
JOB No: 2300993 - FS - 001 - A								PLAN	CRG	REV	SHEET
											1 OF 1

APPENDIX C - Before You Dig Servicing Information



100DEAD 100 PEIUT MB (AA)
1001:FA-FI/1-72 72F/- SMOF FNPEHU/STD (AA)
1xP28 SUBDUCTS (AA)
F KAHC 1914:AL-AM/1-12 12F/- SMOF FNPEHU/STD (AA1)

100DEAD 100 PEIUT MB (AA)
1001:FA-FI/1-72 72F/- SMOF FNPEHU/STD (AA)
1xP28 SUBDUCTS (AA)
F KAHC 1914:AL-AM/1-12 12F/- SMOF FNPEHU/STD (AA1)

100DEAD 100 PEIUT MB (AA)
1001:FA-FI/1-72 72F/- SMOF FNPEHU/STD (AA)
1xP28 SUBDUCTS (AA)
F KAHC 1914:AL-AM/1-12 12F/- SMOF FNPEHU/STD (AA1)

100DEAD 100 PEIUT MB (AA)
1001:FA-FI/1-72 72F/- SMOF FNPEHU/STD (AA)
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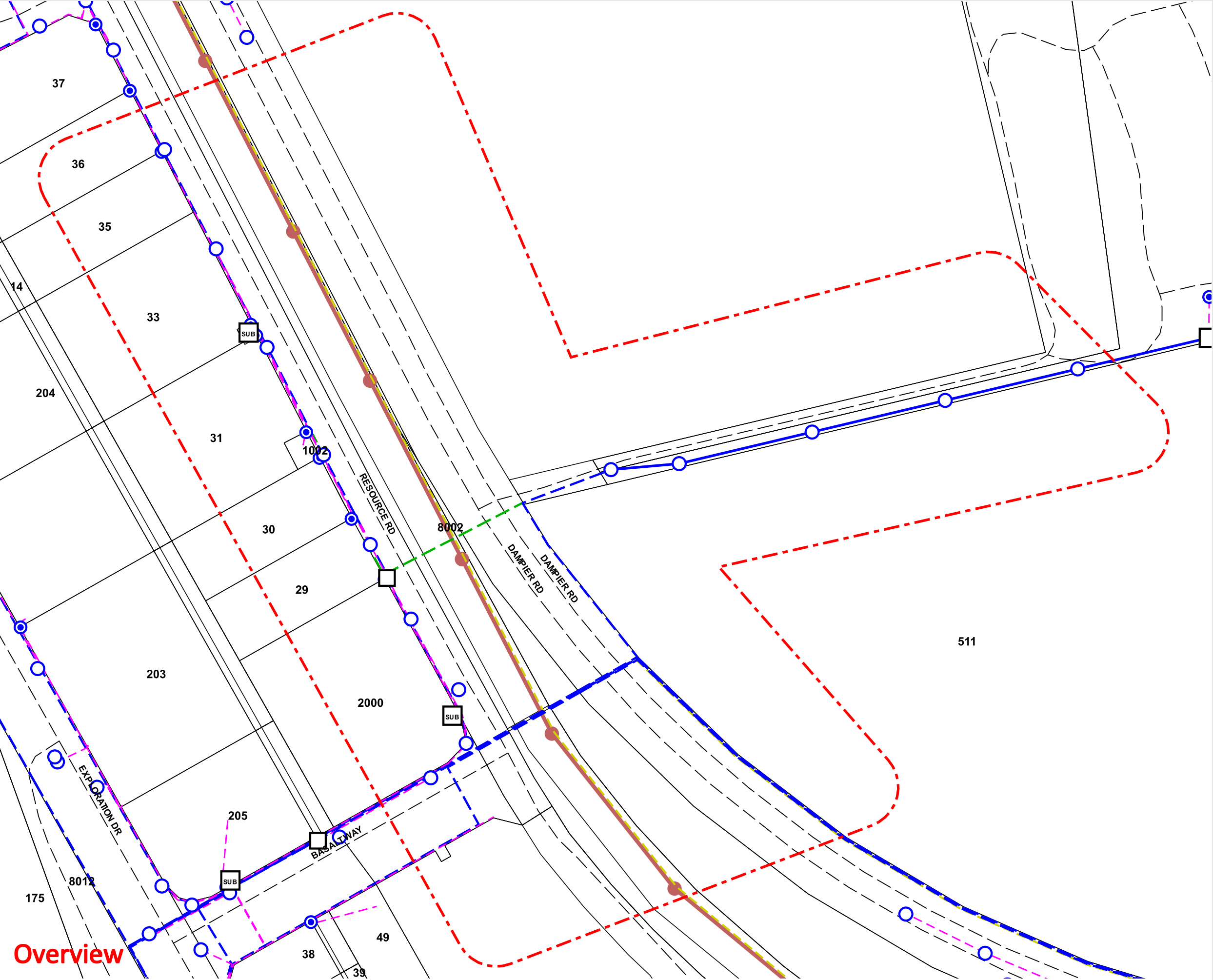
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1xP28 SUBDUCTS (AA)
F KAHC 1914:AL-AM/1-12 12F/- SMOF FNPEHU/STD (AA1)

c3:M1201-1300 200 PEIUT MB (AA)
100DEAD
1001:AP-FA/1-72 72F/- SMOF FNPEHU/STD (AA)
3013:FM-FN/1-72 72F/- SMOF FNPEHU/STD (AA)
3005:FM-FN/1-72 72F/- SMOF FNPEHU/STD (AA)
1xP28 SUBDUCTS (AA)
1xP28 SUBDUCTS (BA)
F KAHC 1914:AL-AM/1-12 12F/- SMOF FNPEHU/STD (BA1)

FA



Legend

Existing	Proposed	
		Distribution Substation
		Distribution Pole
		LV Mini Pillar
		LV Universal Pillar
		LV Cabinet
		LV Unmetered Supply Pit
		LV Service Pit
		LV Wall Mounted Box
		LV Unknown Structure
		LV Distribution Cable - Underground
		LV Distribution Wire - Overhead
		HV Distribution Cable - Underground
		HV Distribution Wire - Overhead
		Stay Anchor
		Stay Wire
		Transmission Cable - Underground
		Transmission Wire - Overhead
		Transmission Pole
		Transmission Tower
		Communications Cable
		Fibre Optic Cable
		Zone Substation



Scale: 1:2694
Expires: 09 Feb 2024

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Overview



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Attachment 10:
Stormwater Management Plan



Our Ref: RT/L004.24
Job No: 24-01-004

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4 March 2024

RFF Australia
PO Box 88
KARRATHA WA 6714
madison@rffaustalia.com

Attention: Madison Mackenzie

Dear Madison,

**LOT 1 DAMPIER ROAD, GAP RIDGE
STORMWATER MANAGEMENT PLAN OF TEMPORARY LAYDOWN AND ACCESS
ROAD (STAGE 1) RevB**

Porter Consulting Engineers have been engaged to review the stormwater requirements for the proposed development located at Lot 1 Dampier Road within the locality of Gap Ridge, Karratha WA. Location shown in **Figure 1** below.



Figure 1 – Location Plan (site area shown in green hatch)

The site is bound by rural land and can be accessed from Dampier Road. 7 Mile Creek is located approximately 0.5km to the west of the site.

Proposed Development

The proposed development layout is presented in **Attachment 1**.

The proposed layout will remain as one lot with 10 allotments for private lease and an internal 10m wide access road. The intention is to deliver the site in stages, with stage 1 including the construction of the internal private access road and Allotment 2 only.

The stormwater management plan for stage 1 will consider the upgrades required to facilitate the future stages.

Existing Site Conditions

A topographical feature survey¹, presented in **Attachment 2**, shows existing lot levels gradually grade down from Dampier Road from a high of 10.55m AHD in the west boundary to around 7.56m AHD in the east boundary.

There is an existing overland flow path conveying stormwater from west to east approximately 70m north of the southern boundary as indicated in **Figure 2** below. There are two existing culverts along this flow path conveying stormwater below existing access roads.

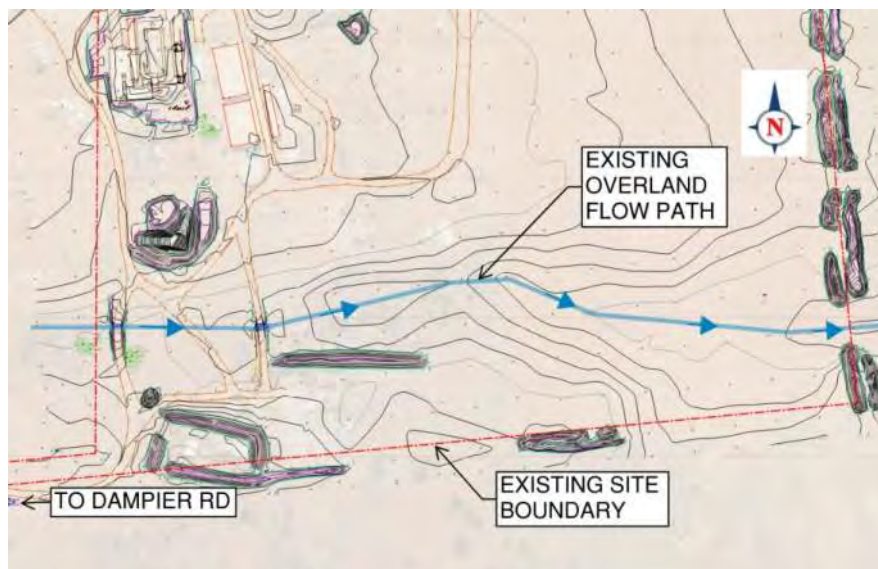


Figure 2 – Existing Overland Flow Path (Shown in Blue)

The soils on site are expected to be a mix of Eolian Sands and Silty sand² with a low permeability rate. A geotechnical report is required to confirm ground conditions prior to detailed design.

Groundwater is expected to range from 2-5m below existing ground levels³.

The site is located within the identified 500-year storm surge area⁴. The 100-year flood levels are expected to be around 8.3m AHD⁵ for the 2010 Climate Scenario.

¹ Topographical survey by Land Surveys, 200993-FS-001-A September 2023

² Gozzard J.R. 1982 Yanchep Sheet 2034 IV, Perth Metropolitan Region, Environmental Geology Series, Geological Survey of Western Australia

³ Karratha Coastal Vulnerability Study by JDA, August 2012, Paragraph 2.6

⁴ Karratha Coastal Vulnerability Study by JDA, August 2012, Figure D5

⁵ Karratha Coastal Vulnerability Study by JDA, August 2012, Figure 12A

Proposed Stormwater Design

The ultimate concept stormwater layout is available in **Attachment 3** of this document.

Stormwater External to Site

Previous modelling⁶ for the 100 year flood event shows 7 Mile Creek water levels reach 8.3m AHD, adjacent to the proposed development site. It is expected that stormwater from the creek may impact the site drainage network. All allotment area will have a minimum 0.3m freeboard from the peak flood levels expected in 7 Mile Creek.

It is anticipated that the majority of the road network will be accessible during the major storm event. The proposed floodways on site may be inundated on occasion until stormwater flood levels recede, however alternative access/ egress points are available to all allotments.

Lidar mapping for the area shows a catchment to the west of the site boundary flowing through Lot 1 prior to discharging to 7 Mile Creek. It is expected that this site will manage stormwater flows within their own site boundary and no flows from the adjoining site will be conveyed through the proposed development. Further discussions are required with the neighbouring land owner to confirm this work can be carried out prior to construction of stage 1 works.

Based on the current layout, no changes are proposed to the existing MRWA drainage network on Dampier Road. If the existing access should be upgraded to facilitate the development, the relevant approvals shall be obtained from MRWA.

Site Stormwater Design

It is proposed that stormwater from the internal road will be conveyed in shallow road side swales to the eastern boundary, discharging to storage basins and a shallow interconnection swale. Refer to layout presented in **Attachment 3** for ultimate site concept management plan. The storage will have the capacity to contain the 1 hour 1% AEP storm event, discharging at predevelopment flow rates, as required by the City of Karratha.

Due to a restricted outlet, some localised ponding in the allotment areas and road swales is expected to occur during major storm events. The client accepts this risk and will implement a suitable maintenance plan to manage any ongoing issues in future.

The following design criteria has been adopted:

- Infiltration rate of 0.5m/day.
- Storage designed to contain 1 hour 1% AEP flows while discharging from site at pre development flow rates.
- Predevelopment runoff coefficient of 0.6 selected based on existing soils being of low infiltration.
- Rainfall intensities from BOM IFD for the City of Karratha used in calculations
- Shallow grades have been adopted to minimise the imported fill required for the development. At detailed design stage, the drainage design system will be modelled to confirm minimum velocity within open swales during minor storm events.
- No allowance for blockages included in calculations.

Allotment Drainage

⁶ Karratha Coastal Vulnerability Study by JDA, August 2012

The allotment drainage shall be reviewed upon further details of the land use. It is expected that imported fill will be required for proposed buildings to ensure the finished floor level is at 8.6m AHD which will provide a 0.3m freeboard to the expected flood levels in the area. All allotments shall install suitable stormwater drainage to discharge to the perimeter road.

The stormwater storage provided in the proposed basins and swales provide adequate storage for the proposed road and allotment areas.

Stage 1 Drainage

Refer to the concept drainage plan presented in **Attachment 4** for details on extent of works included in stage 1.

The stormwater storage volume has been adjusted to accommodate the reduced development area. The proposed flow rates will be maintained at pre development flow rates as required by the local authority.

Summary

Based on the initial review, the proposed layout can contain the required stormwater volume to the City of Karratha requirements.

The following works are required prior to detailed design:

1. Geotechnical Investigation required on site prior to detailed design stage.
2. It is recommended stormwater modelling of the proposed open swales is carried out to review minimum flows are achieved in the proposed shallow roadside swales.
3. Discussions required with owner of lot 500 to the western boundary to determine if flows from neighbouring property are to be conveyed through the proposed development site.
4. Progress detail design layouts, reviewing earthworks required for stage 1.

Yours faithfully,



RACHEL THOMSON
PROJECT ENGINEER

Enc.

Attachment 1 – Proposed Development Layout



**LOT 1 DAMPIER ROAD
GAP RIDGE**

REVISION

MEG
RY

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www.portereng.com.au


RFF PTY LTD

DRAWING: **STORMWATER MANAGEMENT
CONCEPT LAYOUT**

STATUS:	FOR INFORMATION
---------	------------------------

DRAWING No.

-1-4/502

REV No.	ORIGINAL DRAWING SIZE
A	A1
	 COMAU AUSTRALIA

Attachment 2 – Existing Topographical Survey



SERVICE LEGEND

DRAINAGE

GRATE
SIDE ENTRY PIT
STORM WATER MANHOLE

ELECTRICAL

CABLE MANHOLE
CABLE PIT / BOX
CABLE DOME
CONSUMER POLE
LIGHT POLE
POWER POLE
STAY POLE
STAY WIRE ANCHOR
O/H POWER LINE

GAS

GAS MANHOLE
GAS MARKER
GAS METER
GAS VALVE

SEWERAGE

SEWER MANHOLE
PROPERTY CONNECTION
SEWER LINE

COMMUNICATIONS

COMMS MANHOLE
COMMS MARKER
COMMS CABLE PIT

WATER

FLUSH POINT
HYDRANT
STOP VALVE
TAP
WATER MARKER
WATER METER

UNDEFINED

UNDEFINED MANHOLE
UNDEFINED PIT
UNDEFINED SERVICE

SURVEY

DATUM
PEG FOUND
SURVEY STATION
TEMPORARY / BENCH MARK

OTHER

AWNING / EAVES
ROOF RIDGE
FLOOR RL
BOLLARD
WINDOW / DOOR
BANK - BOTTOM
BANK - TOP

LOT SERVICE RECORD

STATUS	LOCATED	NOT FOUND	NO SERVICE	CONFIRM
SERVICE				
WATER	✓			✓
SEWER CONN.	✓			✓
GAS	✓			✓
COMMS	✓			✓
POWER U/G	✓			✓
POWER O/H	✓			✓

SERVICES MARKED CONFIRM REQUIRE BUILDER / CLIENT TO CONFIRM POSITION AND / OR AVAILABILITY ON SITE.

CONTOUR LEGEND - 0.2m INTERVALS

MAJOR CONTOURS 00
MINOR CONTOURS

NOTE:
AHD LEVEL DERIVED FROM STANDARD SURVEY MARK DAMPIER 67 - RL = 12.10

NOTE:
THIS PLAN HAS BEEN PREPARED WITH MGA2020 ZONE 50 COORDINATES.

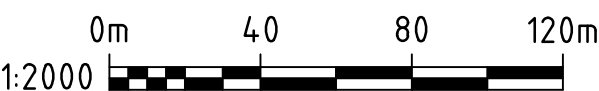
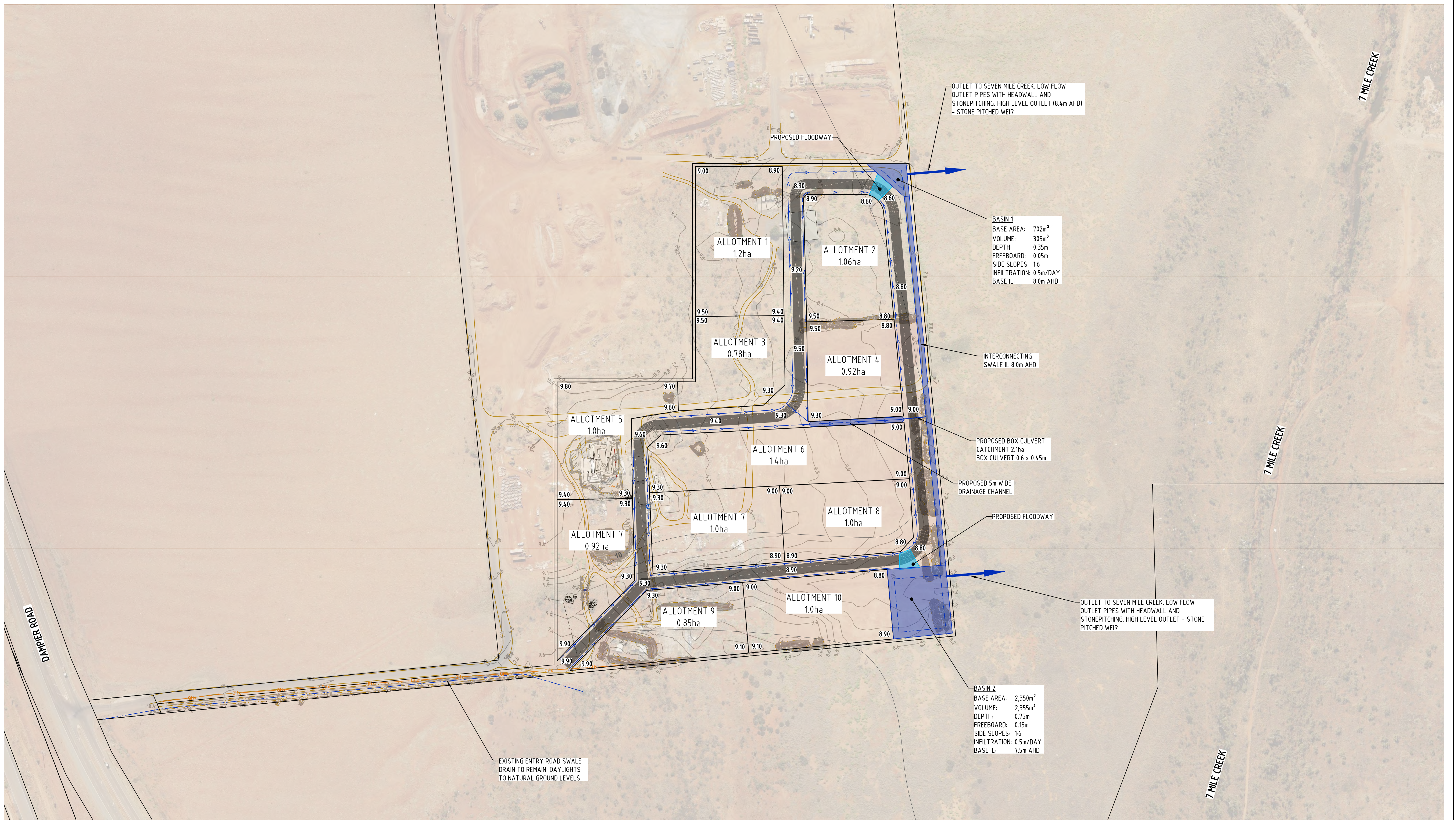
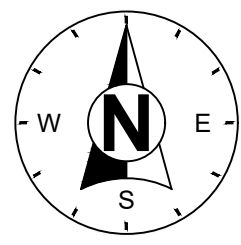
SURVEY CONTROL COORDINATE LISTING MGA94 ZONE 50

SURV NAME	EASTING	NORTHING	ELEVATION
DAMPIER 67	476344.088	7702621.438	12.105
DAMPIER 141	476268.892	7702622.476	16.896
DAMPIER 93	476133.852	7702655.813	15.449



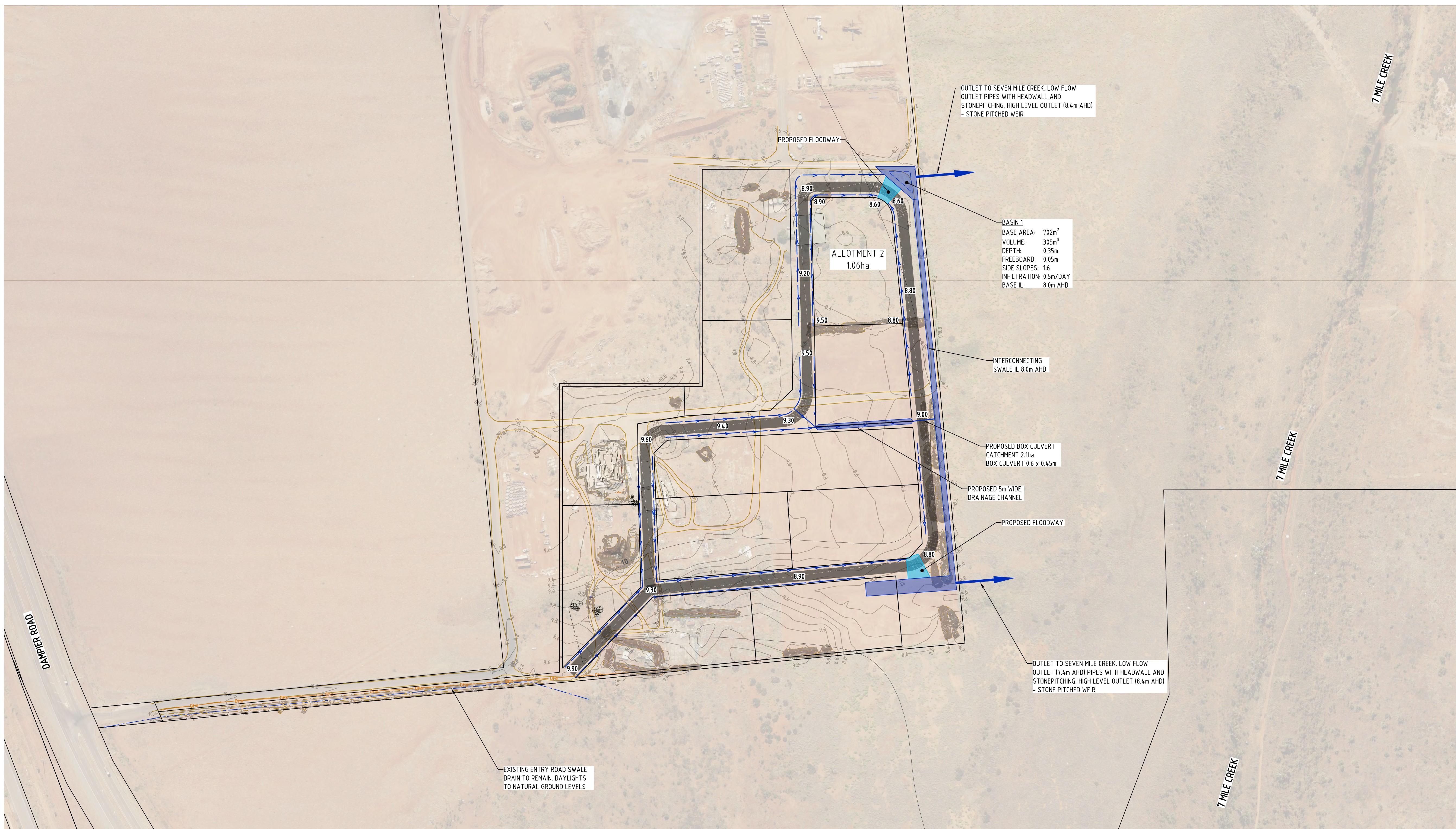
REV	DESCRIPTION	DRN	DATE	APP	 19 Brennan Way Belmont WA 6104 T (08) 9477 4477 E admin@landsurveys.net.au www.landsurveys.net.au	SURVEYED BY: SM,KG SURVEYED ON: 11/09/2023	FEATURE SURVEY LOT 1 TOPO SURVEY DAMPIER HWY
						DRAWN BY: JM DRAWN ON: 12/09/2023	
						HOR DATUM: MGA2020z50 VERT DATUM: AH	
						CLIENT: GREEN GRID ENERGY	
SCALE @ A0: 1:1000 						This document is a draft and remains the property of Land Surveys. It is not to be used for any purpose other than the purpose for which it was prepared and is not to be used for any other purpose without the written consent of Land Surveys. Unauthorised use of this document in any way is prohibited.	JOB No: 23000993 - FS - 001 - A PLAN: 1 OF 1 CRG: 1 OF 1 REV: 1 OF 1 SHEET: 1 OF 1

Attachment 3 – Concept Stormwater Layout ULTIMATE



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B 4-3-2024 STAGE 1 UPDATED LAYOUT				MEG								A	A1
A 16-1-2024 ISSUED FOR INFORMATION				MEG									
No. DATE				REVISION		BY				FILE NAME: \\24-01-004\ACAD\2416-501.dwg			
									STATUS: FOR INFORMATION	CHECK	APPD		

Attachment 4 – Concept Stormwater layout STAGE 1



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SCALE	1:2000	DRAWING No.	REV No.	DRGR DRAWN SHEET
DATE	Mar-24	24-1-4/500	B	A
DESIGN	RT			
DRAWN	MEG			
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