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PORT HEDLAND INTERNATIONAL AIRPORT RENEWABLE ENERGY SYSTEM

PROJECT SUMMARY

Date: 19/12/2023

Prepared for: Port Hedland

Ekistica

About Ekistica

Ekistica is a professional advisory and technical consultancy firm based in Central Australia.

We deliver innovative solutions to the complex challenges of remote area infrastructure development through a diverse team of more than twenty professional engineers, project managers, engagement specialists and data analysts.

We provide high quality, independent advice, project development, engineering design and project delivery services for a wide range of infrastructure and related services, to clients that include state and national governments, intergovernmental agencies, power utilities, community service organisations, large commercial firms and private investment firms.

Version	Prepared by	Reviewed by	Details	Approved by	Date
0.2	M Fowler	J Fajardo	Updated layouts	P.Rodden	19/12/23
0.1	M Fowler	J Fajardo	Draft document submitted for review	P.Rodden	22/11/23

Disclaimer

Executive Summary

Port Hedland International Airport (PHIA) has considered how its energy consumption and commercial operations may incorporate renewable energy (RE). This led to planning of a ground-mounted solar photovoltaic and battery energy storage system (PV & BESS) to be installed within the PHIA aerodrome. PHIA engaged Ekistica to develop a detailed business case, concept design and management of the procurement process for the RE system. BT Energy was awarded the D&C contract in June 2023 for a 1.2 MW_{DC} PV array and 600 kW / 2500 kWh BESS.

Site works are due to commence in March 2024 pending DA and CASA approvals, with civil works to be completed within ~6 weeks and practical completion scheduled for August 2024.

The proposed PV system will be a fixed-tilt array built on the eastern side of the runways and south of the main terminal building at a maximum height above ground of 1.825m, with the BESS enclosure height at a 2.795m above ground. These heights are well below the airport Obstacle Limitation Surfaces. Further, glare studies have shown no glare detected at any of the measured observation points.

The proposed PV system location (particularly in relation to runways and air traffic services) and module layout is provided in Figure 0-1 and Figure 0-2 respectively. Site elevations are provided in Figure 1-3.

The following drawings are provided with this Development Application:

- General Layout: C1051-00-EL-DWG-001 (P15) Hybrid Power Plant - Site General Arrangement.pdf
- Elevations: C1051-01-EL-DWG-004 (P4) Elevations.pdf
- Feature Survey: BT-PHIA-DW-001 FeatureUAMSurvey[72].pdf
- Environmental Management Plan (PHIA): EP23-020(03)--002 PHIA Environmental Management Plan.pdf

Given the site is within PHIA's existing site and the restricted access airside area, BT Energy will ensure the final design and delivery of the project will align with PHIA's existing Environmental Management Plan (EMP), drainage systems and traffic management process for internal, restricted access roads. BT Energy has prepared a Construction Environmental Management Plan (CEMP) which is available on request.

In particular, regarding the following key planning elements:

- **Landscaping:** The PV & BESS site will be cleared and levelled. No vulnerable or endangered species are located within the proposed site boundaries according to PHIA's EMP.
- **Heritage:** PHIA's current EMP includes a survey of Heritage areas within the Airport boundary. No heritage sites have been identified within the bounds of the PV & BESS site. The CEMP has procedures that outline steps to be taken if any items with heritage or cultural value are encountered.

- **Dust and Noise:** The EMP and CEMP outline procedures for managing dust and noise, which BT Energy will implement in collaboration with PHIA as the site is airside, including appropriate notification to airport users that may be affected.
- **Waste:** Waste will be managed in accordance with the EMP and the Waste Management Plan included in the CEMP, including daily checks and monthly site audit, with targets aiming to maximise recycling and reuse of materials where appropriate.
- **Stormwater:** A small slope will be preserved when the site is levelled following the natural slope of the site to allow sheet flow across the site to existing drainage channels. Because the PV array foundation is driven piles, there will be limited additional impervious surface area added to the site.
- **Traffic:** The road providing site access is not accessible to the public, and all access will be strictly in accordance with PHIA's access protocols.
- **Bushfire Management Plan:** PHIA has procured the development of a bushfire Management Plan which is due to be completed in the coming weeks.
- **Utilities:** The PV & BESS system will connect to an existing substation and supply energy to the airport. No water or wastewater connections are required.

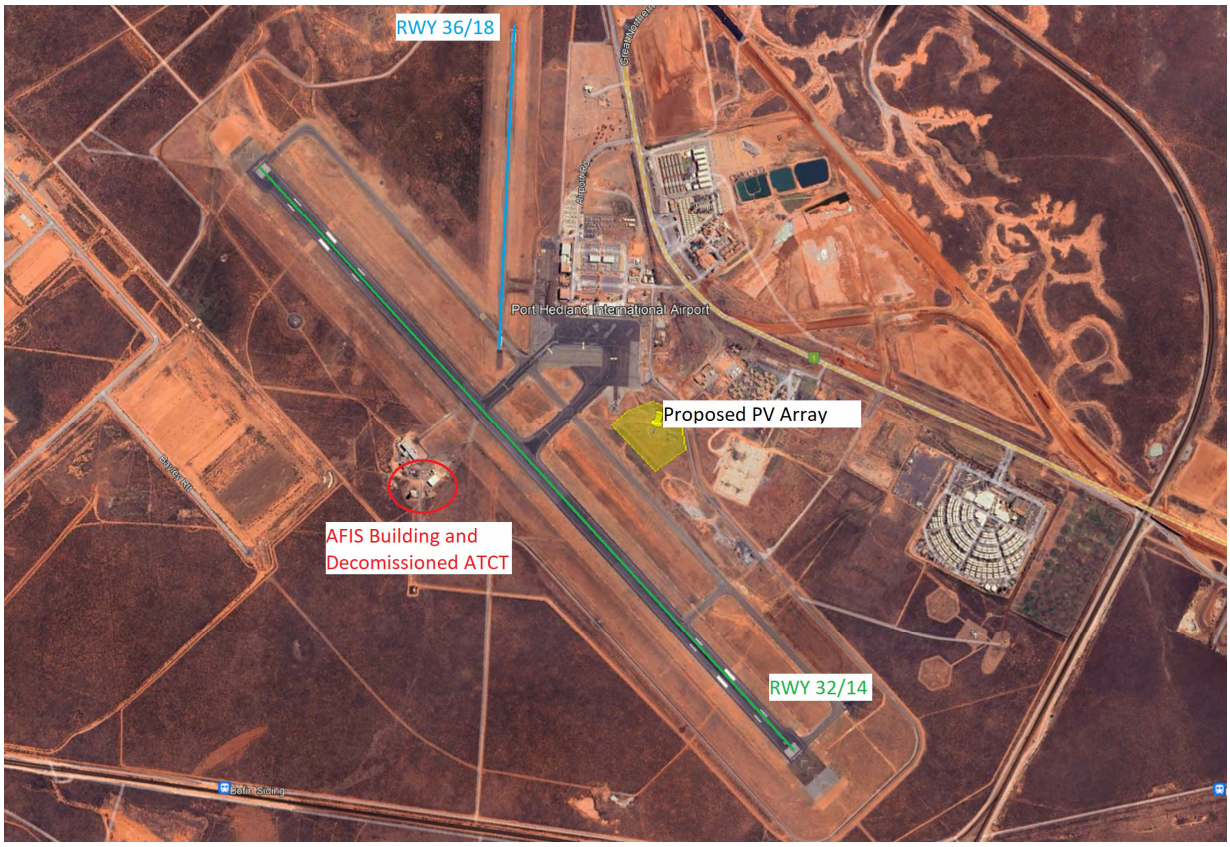

Figure 0-1 Proposed Solar PV Array Location

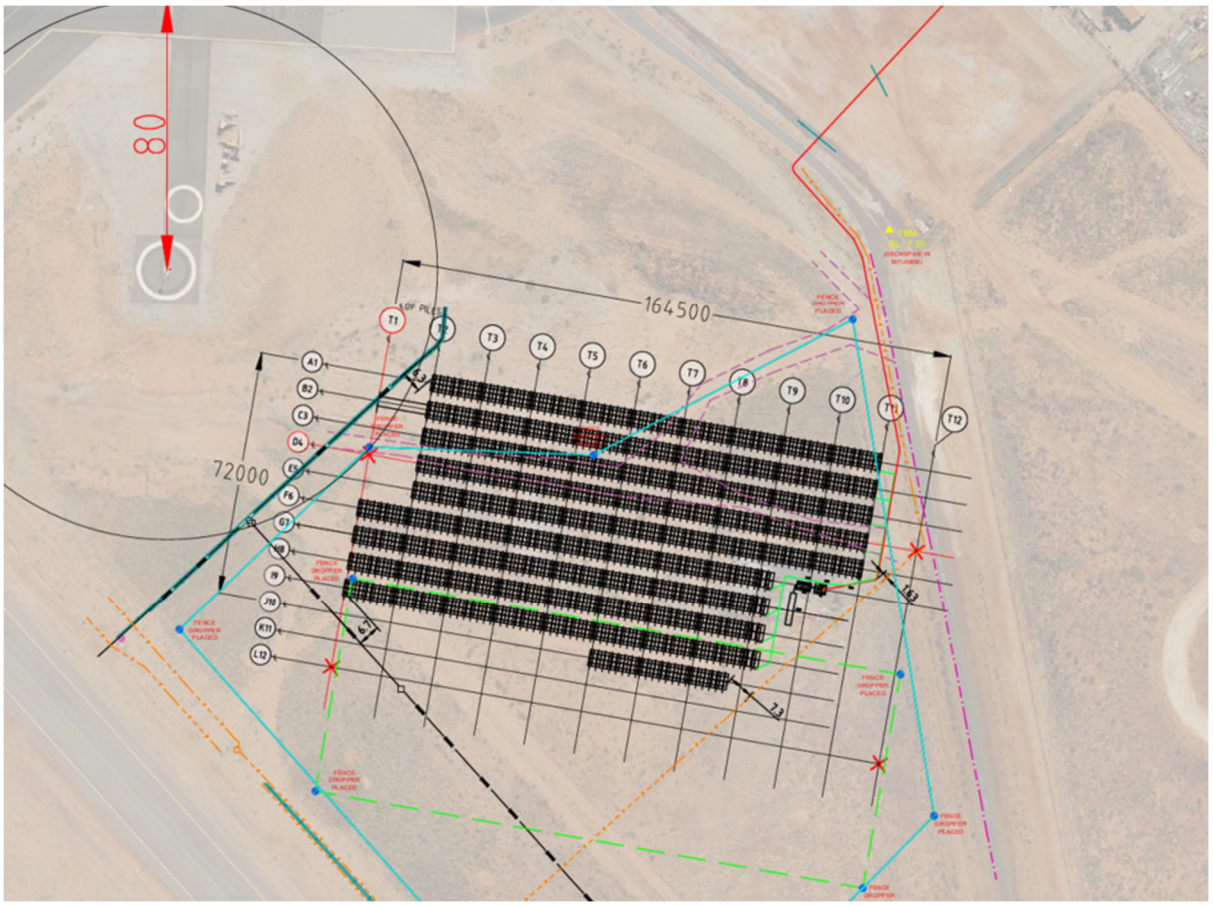

Figure 0-2 Proposed Solar PV Array Layout

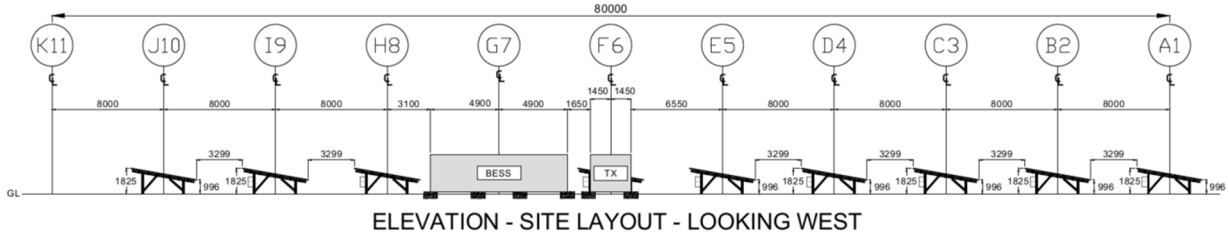

Figure 0-3 Proposed Solar PV Array Layout

ABBREVIATIONS

Abbreviation	Definition
BESS	Battery Energy Storage System
CASA	Civil Aviation Safety Authority
kW/MW/GW	Kilowatt/Megawatt/Gigawatt
kWh/MWh/GWh	Kilowatt-hour/Megawatt-hour/Gigawatt-hour
PHIA	Port Hedland International Airport
PV	Photovoltaic

DOCUMENT LIST

The following documents have been provided with this Development Application:

1. Town of Port Hedland Development Application Form
2. Project Summary: 3780.4.1 PHIA RE System Project Summary - ToPH DA.pdf
3. General Layout: C1051-00-EL-DWG-001 (P15) Hybrid Power Plant - Site General Arrangement.pdf
4. Elevations: C1051-01-EL-DWG-004 (P4) Elevations.pdf
5. Feature Survey: BT-PHIA-DW-001 FeatureUAMSurvey[72].pdf
6. Environmental Management Plan (PHIA): EP23-020(03)--002 PHIA Environmental Management Plan.pdf

Environmental Management Plan

Port Hedland International Airport (PHIA)

Project No: EP23-020(03)

Prepared for PHIA
November 2023

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	Draft for client review				

Executive Summary

Port Hedland International Airport (PHIA) identified the need for an Environmental Management Plan (EMP) to assist in the implementation of a framework to manage environmental impacts, considerations, and values for airport operations and projects.

PHIA is situated on Great Northern Highway Port Hedland, (herein referred to as 'the site'), extending over 817 ha and is located approximately 9.3 km south-east of Port Hedland within the Town of Port Hedland (TOPH) and has been leased since March 2016 to PHIA Asset Pty Ltd for a term of 50 years. The site is situated on the Pilbara coast approximately 1,300 km north of Perth.

This EMP has been written in consideration of the following documents:

- Statutory environmental legislation and policy that apply to environmental values identified within PHIA and recommends management actions that will assist in complying with these statutory processes and requirements.
- The PHIA 2019, *Port Hedland International Airport Master Plan 2018 – 2038 DRAFT MASTER PLAN AND LAND USE REPORT*, which provides the existing airport context as well as the future vision of land use within PHIA and any staged development delivery.
- PHIA's Global Real Estate Sustainability Benchmark (GRESB) requirements and Environmental, Sustainable and Governance (ESG) reporting to improve business intelligence, industry engagement and decision making is undertaken.
- PHIA's Risk Register (updated 2023) incorporating environmental risks.
- PHIA Environment Policy (2022) and its eight key overarching environmental objectives.

This EMP provides a framework for PHIA to identify and manage its environment by compiling environmental considerations, impacts, and values to formulate management actions that assist in airport operations.

These management actions include:

- **Contamination:** existing and potential contamination needs to be investigated and remediated to ensure it does not present a risk to human health or the environment. This may be applicable to other areas throughout the site subject to further investigation.
- **Hydrology:** Although the site is generally well drained with the potential for surface and stormwater management, previous information indicates partial periodic flooding to the northern section of the site and the development of a stormwater master plan, installation of wastewater aerobic treatment units and having due regard or the Town of Port Hedland Floodplain mapping, groundwater and Better Urban Water Management (BUWM) guidelines will assist with managing hydrology across the site.
- **Flora and Vegetation:** Previous surveys identified one priority flora *Tephrosia rosea var* within the site. Additionally, online databases (DBCA) have recorded other priority species as possibly occurring on site. Site specific flora and vegetation investigations will likely need to take place in the event of any future clearing or development proposals. These investigations can determine the type of vegetation and its condition and should incorporate information

on weeds and *Phytophthora* Dieback. This EMP provides precautionary measures for such threats to be incorporated as part of the management actions.

- **Fauna:** Fauna habitat present within the site may provide potential habitat for several native species, most notably the Brush tailed Mulgara *Dasycercus blythi* which is a priority listed species under the *Biodiversity Conservation Act 2016*. Management strategies have been incorporated into this EMP to identify and protect where necessary terrestrial fauna if future development takes place, or fauna is sighted.
- **Bushfire risks:** The site is located within a bushfire prone area according to the Map of Bush Fire Prone Areas published by the Office of Bushfire Risk Management (OBRM, 2021). A BAL assessment and Bushfire Management Plan (BMP) will need to be prepared in support of any future development and will need to detail the bushfire hazards that will be present post-development. Any bushfire implementation will be done in accordance with *AS3959 Construction in Bushfire-prone areas* (Standards Australia 2018) and the *Guidelines for planning in Bushfire Prone Areas* (WAPC and DFES 2021).
- **Aboriginal Heritage:** One registered Aboriginal heritage site (ID 27835) is located between the south-eastern edge of the Great Northern Highway and the airport fence with an extent that intrudes 1.5 m into Lot 9004. An Aboriginal Cultural Management Plan was undertaken by Terra Rosa Consulting in 2017 which formulated some management recommendations.

The EMP outlines an integrated approach for environmental management actions, aims and strategies to address these actions as outlined below in **Table E1**.

Table E1: Summary of Management Actions, Aims and Strategy

Management Action	Aim	Strategy	Policy Objective Principle(s)
Stormwater, soil, and erosion	To control the severity and extent of soil erosion and pollutant transport during any future development or construction. Ensure management actions are in place to prevent stormwater causing erosion and/ or sedimentation issues, or in the event that erosion issues occur, ensure the correct management plans are in place to manage this risk accordingly.	Ensure that no uncontrolled discharge of water from the site that results in erosion or sedimentation and no complaints received from the community, neighbour's, other stakeholders, or regulatory authorities in relation to offsite dust impacts from the construction activities.	1, 4, 7, 8
Contamination	Establish and adhere to effective environmental measures to prevent and handle spills and the release of hazardous substances. The PHIA should also aim to oversee and examine sites that are either already contaminated or have the potential to become contaminated, following applicable laws and regulations.	Mitigate and control contamination through a contaminated management strategy.	1, 4, 7, 8
Native Vegetation	To protect native flora and vegetation as far as practicable so that biological diversity and ecological integrity are maintained within and adjacent to the site.	Ensure native or conservation vegetation is retained and managed following the correct environmental procedures.	1, 4, 7, 8
Fauna Management	To ensure fauna disturbance will be minimised where possible and protect terrestrial fauna so that biological diversity and ecological integrity are maintained.	Undertake the fauna assessment process for any future development plans.	1, 4, 7, 8
Waste Management	Reduce waste generated from the PHIA and increase recycling and reuse through Airport operations in an effort to manage waste in the most sustainable way possible.	Develop a waste management plan to drive improvement in waste management practices including hazardous and controlled waste management.	1, 2, 3, 4, 7, 8
Indigenous Heritage	To create a management plan to ensure all Indigenous heritage is protected and managed in the event any heritage values are found within the site. Ensure the appropriate consultation takes place with the relevant Indigenous bodies.	Ensure that indigenous values are protected through consultation with local indigenous bodies, and adherence with the relevant legislation.	3, 4, 6, 7, 8
Bushfire	Ensure the correct bushfire precautions are implemented in accordance with AS3959, to protect infrastructure and personnel in the event of a bushfire and provide appropriate separation from any identified risks without negatively impacting existing environmental values.	Ensure that future development appropriately considers the bushfire risks by implementing BAL assessments and bushfire management plans.	1, 4, 7, 8
Sustainability	To ensure sustainable practices by PHIA with the aim of implementing strategies aligned with the goals outlined in the *Environmental Sustainability Strategy 2022-2027* (Town of Port Hedland 2022), and any other relevant future local sustainable strategies.	Continue to monitor fuel, energy usage and implement multiple sustainability strategies to reduce emissions and targets as per local strategies.	1, 2, 3, 4, 6, 7, 8

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Port Hedland International Airport Master Plan 2018 – 2038

Appendix B

Flora and Fauna Survey Port Hedland International Airport - Highway Precinct 2 (Emerge Associates 2018).

Appendix C

PHIA Environmental Risk Assessment

Abbreviation Tables

Table A1: Abbreviations – Organisations

Organisations	
DBCA	Department of Biodiversity, Conservation and Attractions
DPaW	Department of Parks and Wildlife (now DBCA)
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DWER	Department of Water and Environmental Regulation
DPIRD	Department Primary Industry and Regional Development
DPLH	Department Planning Lands and Heritage
DoD	Department of Defence
EPA	Environmental Protection Authority

Table A2: Abbreviations – General terms and Legislation

General terms	
EN	Endangered
EX	Extinct
VU	Vulnerable
MI	Migratory
P1	Priority 1
P2	Priority 2
P3	Priority 3
P4	Priority 4
P5	Priority 5
Legislation	
EBPC Act	Environment Protection and Biodiversity Conservation Act 1999
BC Act	Biodiversity Conservation Act 2016

Table A4: Abbreviations – units of measurement

Units of measurement	
DBH	Diameter at breast height
cm	Centimetre
ha	Hectare
km	Kilometre
mm	Millimetre

1 Introduction

1.1 Background

Port Hedland International Airport (PHIA) identified the need for an Environmental Management Plan (EMP) to assist in the implementation of a framework to manage environmental impacts, considerations, and values for airport operations and projects. This EMP will also provide a supporting document in PHIA's Global Real Estate Sustainability Benchmark (GRESB) requirements in which they undertake validation of their Environmental, Sustainable and Governance (ESG) reporting to improve business intelligence, industry engagement and decision making.

As GRESB provides a basis for systematic reporting for environmental management and performance, PHIA identified that an Environmental Management Plan (EMP) would assist their annual GRESB procedural review. The relevant management objectives are discussed in **Section 7**.

The airport site has been leased to PHIA Asset Pty Ltd for 50 years, commencing in March 2016 and is supported by the *Port Hedland International Airport Master Plan 2018 – 2038* which outlines a plan for the future development and makes recommendations, taking into consideration the aspirations and requirements of the airport operator and the Town of Port Hedland (ToPH). The current draft Master plan is attached as **Appendix A.**

1.2 Land details

PHIA is situated on Great Northern Highway Port Hedland, (herein referred to as 'the site'), extending over 817 ha and is located approximately 9.3 km south-east of Port Hedland within the Town of Port Hedland (TOPH) as shown in **Figure 1** and has been leased since March 2016 to PHIA Asset Pty Ltd for 50 years.. The site is situated on the Pilbara coast approximately 1,300 km north of Perth.

The site is zoned "Airport" within the Commercial zoning of the ToPH's Planning Scheme No. 5. The site is governed by conditions outlined Section 5.10 Document Requirements of that scheme.

The site also contains multiple non-aviation related land uses, including accommodation facilities, weather station, emergency service units, freight facilities and communications infrastructure. The land use precincts are further defined in the *Port Hedland International Airport Draft Master Plan and Land Use report 2018 – 2038* (PHIA Operating Company Pty Ltd 2019).

Surrounding land on the southern and eastern borders of the site is zoned as conservation (a buffer for surrounding uses), whilst approximately 2.5km to the north of the site is an area zoned strategic Infrastructure. Northwest of the site is zoned strategic industry. Adjacent to the western boundaries includes some land zones of general industry, light industry and public use. 0.5km Southwest of the site lies existing urban land with mixed uses of residential, commercial and a city centre (South Hedland). Further North of the site is the Port Hedland town centre, (existing urban and mixed uses.) The TOPH Planning zones and reserves are shown below in **Plate 1**.

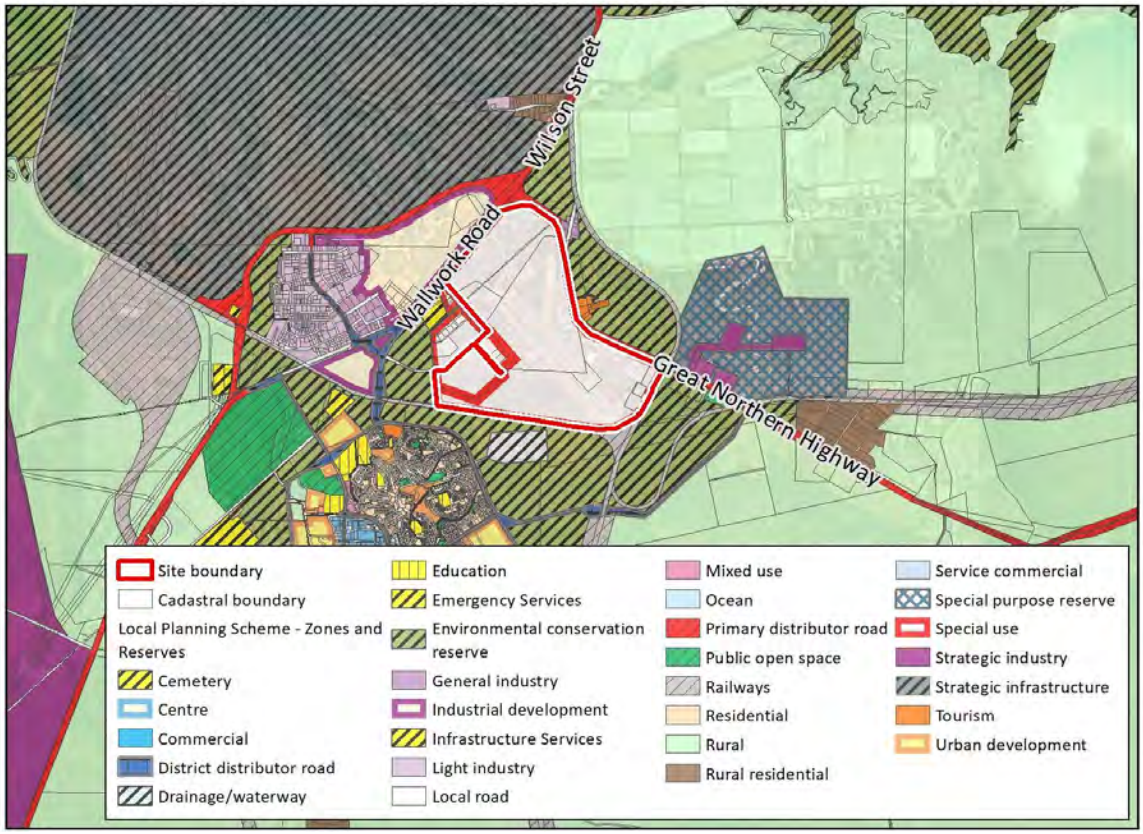


Plate 1: Local Planning Scheme- Zones and Reserves

1.3 Purpose of the Plan

The environmental management plan's purpose is to:

Guide PHIA's management and operational practices whilst minimising environmental risk and harm.

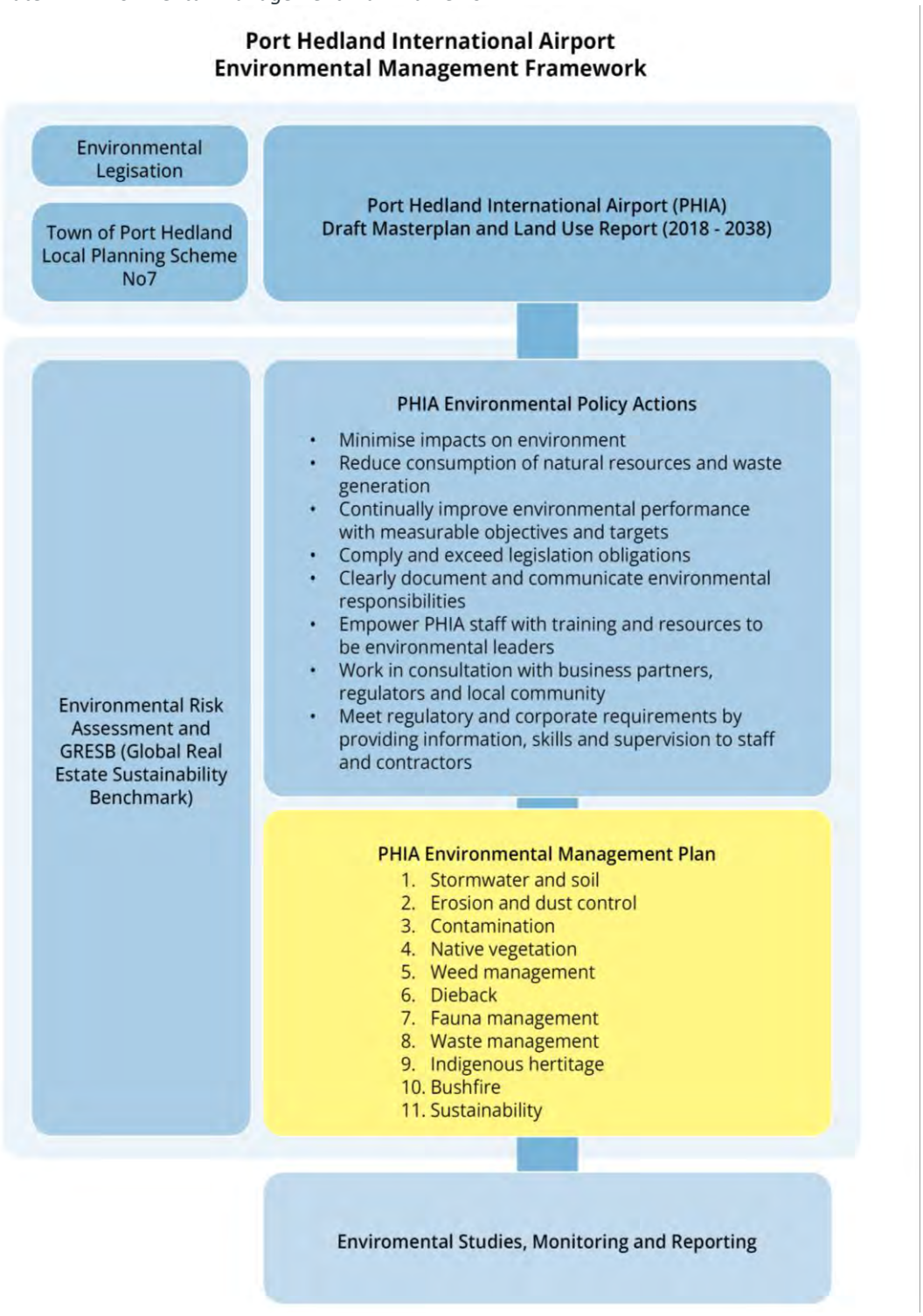
This Environmental Management Plan (EMP) has been prepared to provide and environmental framework for future management and development within the site, as well as providing supporting documentation for PHIA in achieving requirements under the GRESB process. Specifically, the GRESB process allows PHIA to examine the various environmental attributes including its contributions to improving its CO2 emissions, energy usage, water usage, waste management, and air pollution, which fall under PHIA's environmental policy. Management frameworks for various environmental related factors will be formulated and summarised throughout **Section 7** of this report.

This EMP provides a framework for PHIA to identify and manage its environment by compiling environmental considerations, impacts, and values to formulate management objectives that assist in airport operations. This includes identifying environmental risks, ensuring these are managed to an acceptable level. Additionally, this EMP will assist PHIA with any proposed future development applications for its site.

An environmental risk assessment is included within this EMP. PHIA had a previous operational Risk Register that included an environment category. This register was reviewed from a strategic environmental perspective through liaison with Emerge and PHIA staff responsible for managing the current risk register. Specifically, the risk register identifies the environmental risks (and legal

obligations) associated with the day-to-day operations of PHIA and specifies the actions to mitigate and manage these risks. The risk assessment is attached as **Appendix C** and the outcomes summarised in **Section 6**. Plate 2 below outlines a framework for how this EMP relates to the PHIAs environmental policy and GRESB requirements that sits under the PHIA master plan.

Plate 2: Environmental Management Plan Framework



1.4 Objectives

The Port Hedland International Airport has eight key overarching environmental objectives as outlined in the PHIA Environmental Policy (PHIA Operating Company Pty Ltd 2022). The EMP has been prepared with the following key objectives:

Table 1: PHIA Environmental Objectives

1. Minimise impacts on the environment including pollution of soil, air, water and protect biodiversity.
2. Reduce the consumption of natural resources and the generation of waste.
3. Develop and review measurable objectives, and targets that promote continual improvement of environment performance.
4. Ensure we comply and exceed all legislative obligations.
5. Ensure environment responsibilities are documented, clearly communicated, understood, and accepted by all staff.
6. Work in consultation with business partners, regulators, and local community.
7. Ensure personnel and contractors have the necessary information, skills, and supervision to meet regulatory and corporate requirements.
8. Empower PHIA staff with quality training and resources, ensuring they are environment leaders within our business.

1.5 Implementation and Review

To ensure these objectives are met, management actions have been established and provided in **Section 7.**

In addition to the management actions, the following EMP process is required to assist in keeping the EMP current and relevant to PHIA operations and reporting requirements:

1. Maintain the EMP – audit and implement required changes.
2. Review policy, standards, procedures and guides to include the environment.
3. Conduct environmental specific training with staff and contractors.
4. Include this EMP framework into PHIA's GRESB review.
5. Manage, monitor and review the environmental risks register.

1.6 Assessment scope

Emerge Associates (Emerge) was engaged to document the existing environmental attributes and values of PHIA and ensure that any relevant environmental values can managed through future stages of planning and development of the site. This involved extensive desktop research through utilising a range of local and regional information sources (including reports that have been previously prepared for PHIA), databases, mapping, and site-specific investigations, including:

- Various publicly available databases and information sources
- Port Hedland International Airport Draft Master Plan and Land Use report 2018 – 2038 (PHIA Operating Company Pty Ltd 2019)
- PHIA Environmental Policy (PHIA Operating Company Pty Ltd 2022)
- Environmental and Heritage Review (360 Environmental 2017)
- Alice Springs Airport 2020 Master Plan (Alice Springs Airport 2020)
- Baseline Contamination Assessment – Preliminary Site Investigation (GHD 2016a)
- Baseline Contamination Assessment – Detailed Site Investigation (GHD 2017)
- Aboriginal Cultural Heritage Management Plan (Terra Rosa Consulting 2017)
- Technical Memorandum Flora and Fauna Survey Port Hedland International Airport - Highway Precinct 2 (Emerge Associates 2018)

Emerge conducted a comprehensive desktop review on environmental considerations within and surrounding the site. The outcomes of these findings have provided context for the following:

- Landforms, topography and soils
- Flora and vegetation
- Terrestrial fauna
- Surface and groundwater hydrology
- Aboriginal and non-indigenous heritage
- Historical and existing land uses within and surrounding the site
- Bushfire hazards.

The following previous investigations were undertaken by Emerge for a portion of the PHIA area. While these investigations do not cover the full site, certain elements do assist for this report.

- Bushfire Management Plan PHIA - Highway Precinct (Emerge Associates 2019a)
- Site Contamination Review Port Hedland International Airport Highway Precinct 2 (Emerge Associates 2019b)
- Technical Memorandum - Flora and Fauna Survey Port Hedland International Airport - Highway Precinct 2 (Emerge Associates 2018)

2 Legislation Policies and Relevant Documents

The development of PHIA is considered relative to Commonwealth, State and Local Government regulations and policies. Any future land use planning will have to consider relative legislation. This section outlines the legislation relevant to environmental regulation.

2.1 EPBC Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a legal mechanism for the Commonwealth government to play a role a role in the protection and management of nationally and internationally important flora, fauna, wetland, ecological communities, and heritage places, defined in the EPBC Act as Matters of National Environmental Significance (MNES). Under the EPBC Act, a person must not take an action that has, will have, or is likely to have a significant impact on any MNES without approval from the Australian Government Environment Minister. Development at PHIA whilst unlikely to have matters of national environmental significance should have due regard to this legislation and process to address any impact to matters of national environmental significance.

2.2 EP Act 1986

The Environmental Protection Act 1986 is the key piece of environmental legislation for WA. The Act provides for the prevention, control and mitigation of pollution and for the conservation, preservation, protection, enhancement and management of the environment.

The key role of the EPA is to provide the government with advice on the environmental acceptability of development proposals and statutory planning schemes. Development proposals include industries, such as mining and infrastructure such as ports, airports and railways.

Any proposal for development that is likely or has potential to have significant environmental impacts or effects should be referred to the EPA. There are two relevant considerations under the act in relation to any potential development applications, which are:

- The potential requirement for a future development proposal to be referred to the Environmental Protection Authority (EPA) as a significant proposal pursuant to Part IV of the EP Act, and any associated EPA assessment and Ministerial approval of the proposal.

- The requirement for a clearing permit for the clearing of any native vegetation associated with any future development proposal pursuant to Part V of the EP Act.

The Department of Water and Environmental Regulation (DWER) manages Western Australia's environment and the environmental impacts of the clearing of native vegetation through the provisions of the *Environmental Protection Act 1986* and via the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004.* Any clearing of native vegetation under a development application would require a clearing permit.

2.3 Rights in Water and Irrigation Act 1914

The Department of Water and Environmental Regulation manages Western Australia's water resources, and the *Rights in Water Irrigation Act 1914* relates to rights in water resources and makes provision for regulation, management, use and protection of water resources, specifically related to any development that may occur with the PHIA site.

2.4 Planning and Development Act 2005

The Planning and Development Act 2005 is the primary piece of planning legislation for WA. The purpose of the Act is to provide for an efficient and effective land use planning system for the state and to promote the sustainable use and development of land in the state. The Act endeavors to:

- Establish and specify the functions and powers of the Western Australian Planning Commission (WAPC).
- Establish the need for and process by which the WAPC can create and administer state planning policies, region planning schemes, planning control areas and interim development orders whilst identifying the relationships between these instruments.
- Provides the power for local governments to develop local planning schemes for their area and establish the processes by which these plans should be formulated, administered, and reviewed; and
- Establishes the requirement for WAPC approval to subdivide or amalgamate any lot and outlines the functions of the WAPC and processes they must follow in dealing with applications of this nature.

2.5 State Planning Policies

There are numerous state planning policies that may apply to development applications in the case of the Port Hedland International Airport as listed below in **Table 2**.

Table 2: Relevant State planning policies (SPP) to the PHIA site

State Planning Policy	Objectives
SPP 2.0 *Environment and Natural Resources Policy*- defines the principles and considerations that represent good and responsible planning with respect to environment and natural resource issues.	• To integrate environment and natural resource management with broader land use planning and decision-making. • To protect, conserve and enhance the natural environment; and • To promote and assist in the wise and sustainable use and management of natural resources.
SPP 2.9 *Water Resources Policy*- provides further guidance on the matters set out under SPP 2.0.	• Protect, conserve and enhance water resources that are identified as having significant economic, social, cultural and/or environmental values. • Assist in ensuring the availability of suitable water resources to maintain essential requirements for human and all other biological life with attention to maintaining or improving the quality and quantity of water resources. • Promote and assist in the management and sustainable use of water resources.

SPP 3.4 Natural Hazards and Disasters Policy- minimise the adverse impacts of natural disasters on communities, the economy, and the environment.	• SPP 3.4 seeks to ensure LPS's and schemes provide planning responses to a range of natural hazards and disasters, including: Severe storms and cyclones, Storm surge, Coastal erosion, Bushfires, Landslides and Earthquakes.
SPP 3.7 *Planning in Bushfire Prone Areas Policy*- seeks to guide the implementation of effective risk-based land use planning and development to preserve life and reduce the impact of bushfire on property and infrastructure.	• Additional Planning and building requirements apply to developments, within areas designated as bushfire prone by the Fire and Emergency Services Commissioner, in accordance with Schedule 2 Part 10A of the Planning and Development (Local Planning Schemes) Regulations 2015, State Planning Policy 3.7 Planning in Bushfire Prone Areas (SPP 3.7), the supporting Guidelines for Planning in Bushfire Prone Areas (Guidelines) and the National Construction Code.

Additional State Planning Policies may be applicable where relevant. A full list of SPPs are outlined in the *Town of Port Hedland Local Planning Strategy* (Town of Port Hedland 2021).

2.6 TOPH Local Planning Strategy

The *Town of Port Hedland Local Planning Strategy* (Town of Port Hedland 2021) outlines a strategy for the Town of Port Hedland that informs the Local Planning Scheme and a range of other planning instruments, ensuring that land use and development within the Town contributes to the realisation of the Strategy's objectives.

The Town of Port Hedland *Local Planning Strategy* states an environmental objective including:

"Enhance and conserve our natural environment for the social, cultural, spiritual and economic wellbeing of the community." (Town of Port Hedland 2021)

2.7 TOPH Local Planning Scheme

The Town of Port Hedland *Local Planning Scheme No. 7* (LPS No.7) (DPLH 2021), gazetted on the 20th January 2021 provides regulations and guidelines that govern land use, development and zoning within the Town of Port Hedland Local Government Area (LGA). Section 9 of LPS No.7 includes aims of the scheme of which section (d) outlines the natural environment:

(d) *Natural environment*

(i) Protect, maintain and enhance the values of the natural environment;
(ii) Provide adaptation planning to address changes in the environment;
(iii) Protect and enhance important tourist sites with environmental values

Table 6 in the LPS No. 7 –outlines conditions for special use zones which includes Special Use 1 (SU1) - Port Hedland International Airport PHIA. The conditions in relation to PHIA are outlined below in **Table 3**.

Table 3: Special use zone 1 (PHIA) in Scheme area

No.	Description of land	Conditions
SU1	Port Hedland International Airport	**(1)** Development shall be consistent with a Structure Plan, Local Development Plan or Local Planning Policy for the area. **(2)** Land uses shall be compatible with surrounding development. **(3)** Development shall be in accordance with an approved precinct scale urban water management plan. **(4)** Development shall not detract from the transportation functions of the airport. **(5)** The distribution of land uses shall be generally consistent with the land use precincts identified within the Port Hedland

2.8 Environmental Sustainability Strategy 2022-2027 – Town of Port Hedland

The *Environmental Sustainability Strategy 2022-2027* (Town of Port Hedland 2022) is an overarching local environmental strategy which outlines a framework for sustainable practices for infrastructure and services in the Town of Port Hedland.

The strategy outlines sustainable focus areas for improvement, which have been guided by the United Nations Sustainable Development Goals report. These include, but are not limited to; CO2 emissions, energy targets, water usage, waste management, among other things. Five focus areas outlined in the *Environmental Sustainability Strategy 2022-2027* include:

- Focus Area 1: Energy and climate change
- Focus Area 2: Waste
- Focus Area 3: Water
- Focus Area 4: Natural Environment
- Focus Area 5: Sustainable development, planning and infrastructure.

This EMP will aim to ensure proposed strategies align with those set out in the *Environmental Sustainability Strategy 2022-2027,* ensuring the five focus areas are addressed.

3 GRESB Overview

3.1 GRESB Requirements

GRESB (Global Real Estate Sustainability Benchmark) offers ESG (Environmental, Social and Governance) engagement and benchmarking tools for institutional investors, fund managers, infrastructure companies, and asset operators in the infrastructure sector.

To align with GRESB goals, PHIA focuses on three sustainability pillars as part of their Environmental objectives, being Environmental, Social and Governance, which aligns with GRESB requirements.

The GRESB Infrastructure Assessments consist of two assessments: the Fund Assessment and the Asset Assessment, which evaluate ESG performance using a standardized reporting and benchmarking framework. The Fund Assessment is designed for infrastructure funds and portfolios of assets, while the Asset Assessment is intended for individual underlying assets (portfolio companies).

Both assessments cover a wide range of infrastructure sectors, such as data infrastructure, energy and water resources, environmental services, network utilities, power generation x-renewables, renewable power, social infrastructure, transport, and the GRESB Infrastructure.

The Infrastructure Asset Assessment includes two components: the Management Component and the Performance Component. These components can be completed separately or together, enabling entities to develop their data collection processes before reporting performance data. The Management Component measures the entity's strategy and leadership management, policies and processes, risk management, and stakeholder engagement approach. The Performance Component measures the entity's asset portfolio performance and is suitable for any company with operational assets.

To participate in the GRESB assessment, entities must register on the GRESB website and complete the relevant assessment(s). The Fund Assessment requires information on the structure and composition of the portfolio, including asset type, geography, and investment strategy. Entities also need to provide details about their ESG policies and management systems, including governance, risk management, stakeholder engagement, and reporting practices. The Asset Assessment requires data on the ESG performance of individual assets, including energy, water, and waste management, as well as social and governance factors such as health and safety, employee training, and community engagement. These assessments are usually submitted to GRESB annually in July.

Both assessments require detailed data on environmental, social, and governance factors, which can be collected through various methods, including surveys, third-party data providers, and direct measurement and monitoring. It's essential for entities to ensure that their data is accurate and complete, as this determines their GRESB score and ranking.

This Environmental Management Plan is aimed to assist PHIA in their GRESB requirements by providing background information on the key environmental considerations of PHIA as well as providing a framework for managing these considerations.

3.2 Previous GRESB results

In 2022 PHIA experienced a 26% improvement across asset portfolios within the GRESB process. Through the 2022 GRESB Infrastructure Asset Benchmark Report it was identified that both risk management and the environment were areas of improvement for PHIA.

In general PHIA are trending upwards with its GRESB results and this EMP will assist particularly with the reporting of "biodiversity & habitat" which received a zero-point result in 2022. This EMP also aligns environmental risk management with the requirements of the GRESB framework.

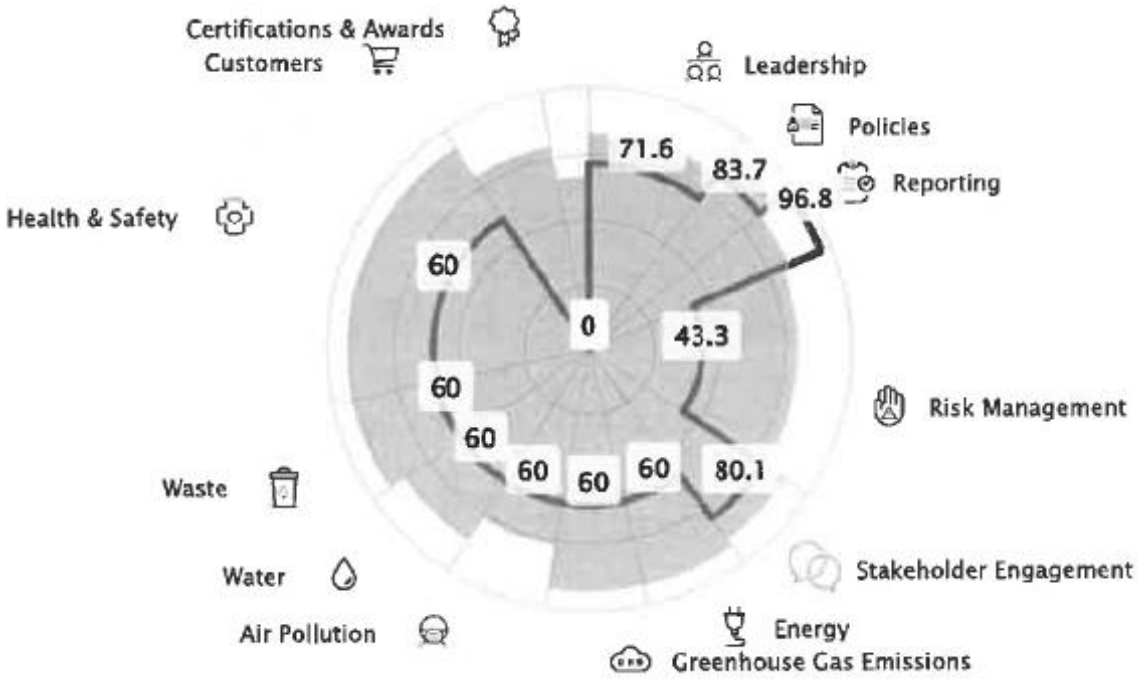


Plate 3: 2022 GRSEB Results for the Port Hedland International Airport

There are evident areas for improvement for PHIA in the GRESB results, and as such this EMP will focus on the relevant environmental aspects that need improving which include but are not limited to:

- Risk Management (Environment)
- Waste
- Water
- Air Pollution
- Greenhouse gas emissions
- Energy

4 Existing environment

The following section outlines an overview of the environmental characteristics of the site including climate and rainfall, geomorphology and soils, hydrology, flora and vegetation, terrestrial fauna, heritage and bushfire hazards.

4.1 Climate and rainfall

The site is located in the Pilbara region of Western Australia, which is described as a hot desert climate with very hot dry summers, mild winters and low and variable rainfall (BoM 2023). Situated on the site is the Bureau of Meteorology (BoM) Port Hedland Airport weather station (004032), which has been recording data since 1942. Data recorded from 1942-2023 displayed an average of 318.5mm of rainfall recorded annually at the station. Rainfall in the Pilbara is sporadic and can occur in summer and winter. Most of the rainfall is received between the months of January and March, associated with the wet season of the tropics. Summer rainfall is typically associated with tropical storms in the north or tropical cyclones that cross the coast and move inland. Winter rainfall is commonly the result of cold fronts moving north-easterly across the State (Beard 1975). The mean maximum temperature was recorded to be 33.4 Degrees Celsius (°C) ranging from 27.4°C in July to 36.8°C in March, while mean minimum temperatures range from 12.5°C in July to 25.7°C in January (BoM 2023).

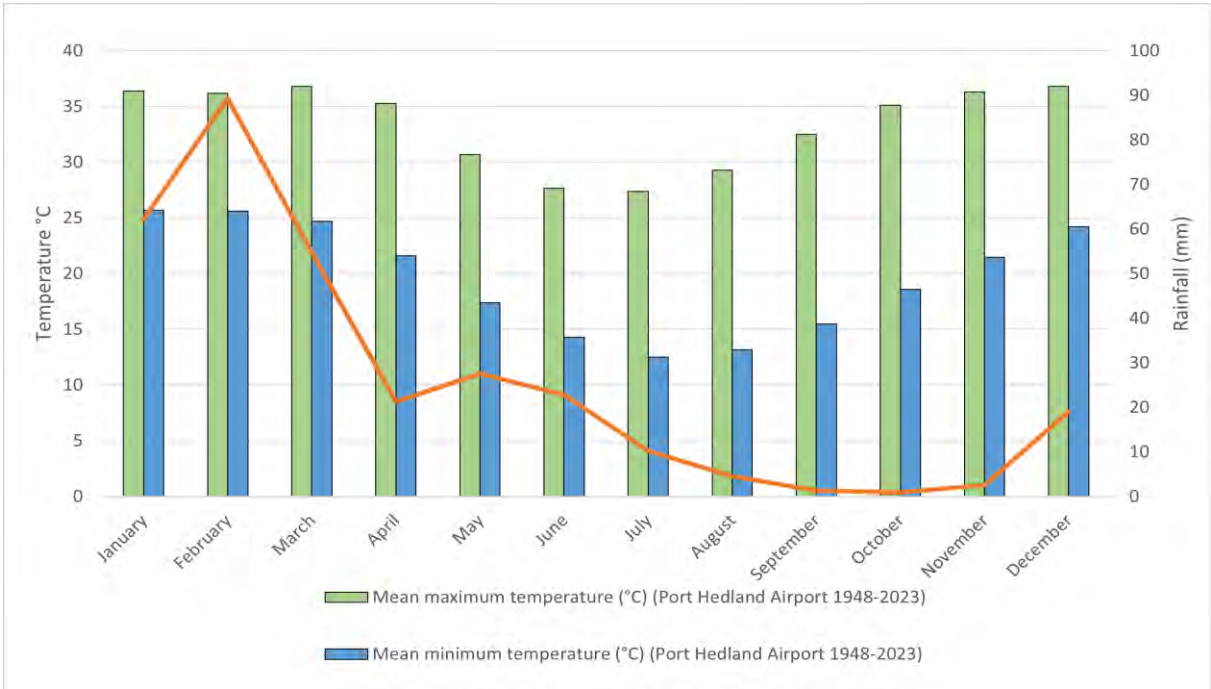


Plate 4: Climate data for the Port Hedland Airport weather station (004032) 1948-2022 (BoM 2023)

4.2 Geomorphology and soils

4.2.1 Topography

The site has a flat topography due to the alluvial sandplain system on which it lies. It has an approximate elevation of 12 m Australian Height Datum (m AHD), which is a slight elevation to the North/ Northwest of the site (See **Figure 2**).

4.2.2 Soils and landforms

The soil across the site has been mapped as De Grey-Roebourne Lowlands, which is described as: "Alluvial plains and sandplains on alluvial and marine deposits over the northern Pilbara Craton with Red deep sandy duplexes, Red loamy earths, Red/brown noncracking clays, Cracking clays, Red sandy earths and Red deep loamy duplexes." The Pilbara Soils Landscape project describes the site as part of the Uaroo System, which comprises broad sandy plains, pebbly plains and drainage tracts supporting hard and soft spinifex hummock grasslands with scattered acacia shrubs. (Locate V4, Soil Landscape Mapping - Best Available (Landgate 2022a). Soils and Landforms are shown in **Figure 3.**

4.2.3 Geology

Environmental geology for the site has been mapped by the Geological Survey of Western Australia. Spatial datasets for interpreted bedrock geology locates the site sits within two geological units listed in **Table 4**:

Table 4: Environmental Geology (Geological Survey of Western Australia 1983)

Geological Unit	Description
Pippingarra Granitic Complex	Undivided granitoid rocks; metamorphosed.
Carlindi Granitoid Complex	Gneissic tonalites, undeformed porphyritic monzogranites, strongly foliated and folded granitic rocks, foliated to weakly strained monzogranites, undeformed monzogranites and syenogranites.

4.2.4 Acid Sulfate Soils

Acid sulfate soils (ASS) is the name commonly given to naturally occurring soils and sediment containing iron sulphide (iron pyrite) materials. In their natural state, ASS is generally present in waterlogged and/or anoxic conditions and does not present any risk to the environment. ASS can pose issues when oxidised, producing sulphuric acid, which can present a range of risks for the surrounding environment, infrastructure, and human health.

The Department of Water and Environment Regulation (DWER) provides broad-scale mapping indicating areas of potential ASS risk. ASS risk mapping shows two risk categories:

- **Class 1** – high to moderate risk of ASS occurring within 3 m of the natural soil surface; and
- **Class 2** – moderate to low risk of ASS occurring within 3 m of the natural soil surface but high to moderate risk of ASS beyond 3 m of the natural soil surface.

The Acid Sulfate Soil Risk Map, Pilbara Coastline (DWER-053) indicates that the airport site is not located within an ASS risk area. The site is adjacent to an area having a high to moderate risk of ASS occurring within 3 m of the natural soil surface, but that the site unlikely to be affected by ASS. The extent of ASS risk areas in the vicinity of the site is shown in **Figure 4**.

4.3 Hydrology

4.3.1 Surface water

There are no surface water features on the site. The site is within a 100 Year ARI Floodplain Development Control Area (DWER-003); although the airport's current draft masterplan states that the airport site is not susceptible to flooding in a 100-year ARI storm.

Hydrography is shown in **Figure 5.**

4.3.2 Public drinking water sources

Public Drinking Water Source Areas (PDWSAs) are proclaimed by the Department of Water and Environmental Regulation (DWER) to protect the quality of identified drinking water sources, which can be surface water or groundwater sources (DWER 2020). PDWSA provide the community of Western Australia with the majority of its drinking water supplies and can be vulnerable to contamination from a range of land uses and water based activities (DWER 2019). Once an area is identified as a PDWSA consideration needs to be given to the intended land use and associated activities to ensure that they are appropriate in meeting the water protection quality objectives of the area.

No Public Drinking Water Source Areas (PDWSA) are within the site. The closest PDWSA is located approximately 40 km to the southwest of the site.

4.3.3 Groundwater

Information on the regional groundwater resources obtained from the DWER Water Register (DWER 2022) indicates that the site has an underlying alluvial fractured rock aquifer system located in the Pilbara Groundwater area and in the Ashburton Groundwater sub area.

A site investigation by GHD (GHD 2016b) indicates that groundwater levels across the site range from between 5.8 m to 6 m AHD. This indicates that to the requirement for import fill is unlikely should development occur. Nearby DWER monitoring bores record groundwater depths between 5 and 10m below ground level.

4.3.4 Stormwater

As outlined in **Section 4.2.1**, the site is generally flat with a slight slope to the North/Northeast and is well drained. Due to the site's predominantly unsealed condition, it is likely that any runoff will seep into the upper layer of soil or flow across the surface towards the northern section. The findings from a site inspection (GHD 2016b) indicated that the northern part of the site experiences periodic partial flooding, mainly influenced by rainfall and tidal changes. Most of the runoff from the apron areas and terminal facilities is channeled into a drainage system located along the northwestern boundary

of the site. It is likely that any stormwater/overland flows will follow the topography of the site as shown in **Figure 2**.

4.4 Flora and vegetation

4.4.1 Regional context

Broad scale vegetation mapping of the Pilbara region was undertaken by (Beard et al.) from 1974 to 1981 throughout Western Australia. The site forms part of the Roebourne plains which is located within the Fortescue botanical district of the Eremaean botanical province of Western Australia (Beard 1975). The two Beard vegetation units identified within the site are described below in **Table 5**:

Table 5: Vegetation Units identified (Beard 1975)

Vegetation Type No.	Vegetation Description
127	Bare areas; mud flats. Typically occur along sheltered coastlines (North of PHIA site)- and may have a fringing vegetation of mangroves, samphire's and grasslands.
647	Hummock grasslands, dwarf-shrub steppe; Acacia translucens over soft spinifex. (Roebourne IBSA subregion). The Statewide Vegetation Statistics 2017 indicates that vegetation type 647 has 97.88% of its pre-European extent remaining (Government of Western Australia 2018).

The *Statewide Vegetation Statistics 2017* indicates that vegetation type 647 has 97.88% of its pre-European extent remaining (Government of Western Australia 2018).

Vegetation complex mapping from the 'Native Vegetation Extent Mapping' (DPIRD) showed pockets of native vegetation evident throughout the site (See **Figure 6**).

4.4.2 Plant communities

No on-site flora and vegetation investigations have been undertaken for this report. Any future development proposed on the site will likely require extensive site-specific investigations to determine the specific plant communities and its condition.

Previous surveys have been done for specific portions of the site, and while the data observed does not capture the entire site, useful information can be drawn to provide an overview of the plant communities which would likely represent the vegetation of the broader area of the site.

A flora and fauna survey for the eastern portion of the site (Highway Precinct 2), was undertaken by Emerge in 2019 and is detailed in *Flora and Fauna Survey Port Hedland International Airport - Highway Precinct 2* (Emerge Associates 2018), attached as **Appendix B**. Vegetation within the site was determined to be representative of two plant communities consisting of Acacia shrublands in lower lying areas, as described in **Table 6** and shown in **Figure 7**.

Table 6: Plant communities present within the site (Emerge Associates 2018)

Plant Community	Description
AtTtE	Shrubland of Acacia trachycarpa over low open shrubland Acacia stellaticeps, Tecticornia sp. and Trianthema turgidifolia over grassland of Eragrostis spp., Triodia spp. and *Cenchrus setiger
AsTtCc	Low open shrubland to low shrubland Acacia stellaticeps, Tecticornia sp. and Trianthema turgidifolia with open vineland of Cassytha capillaris over open forbland of Pluchea longiseta and grassland to closed grassland of Eragrostis spp., Triodia spp. and *Cenchrus setiger
Cleared	Cleared areas with scattered native species

4.4.3 Vegetation condition

The condition of mapped vegetation was determined to range from 'completely degraded' to 'very good' (See **Figure 8**). Vegetation was mapped as being in 'degraded' and 'good' condition due to signs of vegetation structure alteration and the level of weed cover. Vegetation in good and degraded condition comprised native low shrub, forb and grass species with higher densities of non-native species (particularly the grass species, *Cenchrus setigera*). Scattered woody weed species were also present. The south-eastern portion of the vegetation in the site was mapped as largely being in 'very good' condition, due to higher cover by native species and reduced weed cover.

Overall, the investigations undertaken and mapped for the east portion would likely also represent the vegetation of the broader area of the site. However, any future development would likely require more detailed site-specific flora and vegetation investigations that capture the whole broader area of the site.

4.4.4 Threatened and priority ecological communities

An ecological community is a naturally occurring group of native plants, animals and other organisms that are interacting in a unique habitat. Its structure, composition and distribution are influenced by environmental factors such as soil type, position in the landscape, altitude, climate, and water availability. 'Threatened ecological communities' (TECs) are ecological communities that are recognised as rare or under threat and therefore warrant special protection (DCCEEW 2021).

Selected TECs are afforded statutory protection at a Commonwealth level under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). TECs listed under the EPBC Act are categorised as either 'critically endangered', 'endangered' or 'vulnerable'.

Within Western Australia, state listed TECs are statutorily protected through the Biodiversity Conservation Act 2016 (BC Act) and BC Regulations. Where a proposed development is likely to disturb or modify an identified TEC, Ministerial authorisation is required.

An ecological community under consideration for listing as a TEC in Western Australia, but which does not yet meet survey criteria or has not been adequately defined, or which is rare but not currently threatened, is referred to as a 'Priority Ecological Community' (PEC). Whilst PECs are not afforded statutory protection in Western Australia, they are also considered during approval processes.

Known locations of TECs and PECs within 50 km of the site were searched using the publicly available Protected Matters Search Tool (DCCEEW 2023) and DBCA's threatened and priority ecological communities' database. These search results indicate that no TECs or PECs are known to occur within the site, but that one PEC (Eighty Mile Land System) occurs within 50 km of the site. This PEC is specifically named and focused on the Eighty Mile Beach area due to extensive threatening processes at the landscape scale and it is not considered to potentially occur within the site.

4.4.5 Conservation significant flora

Certain flora species that are rare or under threat warrant protection under Commonwealth and/or State legislation. At a Commonwealth level, flora species may be listed as 'threatened' pursuant to the EPBC Act and any action likely to have a significant impact on a listed threatened species requires approval from the commonwealth minister for the Environment.

At a state level, plant species may also be classed as 'threatened' under the BC Act. Species which are potentially rare or threatened, or meet the criteria for near threatened, or have recently been removed from the threatened species list are classed as 'priority' flora species. However, priority flora species are not afforded statutory protection.

A search of the DBCA Threatened and Priority Flora database was undertaken and found that no threatened flora species were recorded in the site however a flora survey undertaken by Newland Environmental (2011) identified one Priority Flora species on site:

- *Tephrosia rosea var.* Port Hedland (A.S. George 1114) (Priority 1) [formerly known as *Tephrosia rosea var. venulosa Pedley*] (Newland Environmental 2011).

In addition to the Priority 1 (P1) species previously located within the Site, the DBCA database search also identified one priority flora has previously been recorded within the Site:

- *Pterocaulon intermedium* (P3).

An assessment using DBCA data sources and NatureMap, was also undertaken to determine the likely occurrences of any other Threatened and Priority flora. This assessment is based on the presence of suitable habitat and the proximity of the nearest recording to the site. It found that additionally there is one priority species 'Likely' to occur and five priority species that may 'Possibly' occur within the site. These species include:

- *Bonamia oblongifolia* (P1) – Likely;
- *Heliotropium muticum* (P1) – Possibly;
- *Rothia indica subsp. australia* (P1) – Possibly;
- *Eragrostis crateriformis* (P3) – Possibly;
- *Gymnanthera cunninghamii* (P3) – Possibly;
- *Goodenia nuda* (P4)-Possibly

Flora species considered rare or under threat warrant special protection under Commonwealth and/or State legislation. Flora species considered 'threatened' pursuant to Schedule 1 of the EPBC Act are assigned categories according to their conservation status. Priority flora categories and definitions are listed in **Table 7**.

Table 7: Definitions of conservation significant flora species pursuant to the EPBC and BC Act and on DBCA's Priority Flora List

Conservation Code	
P1	Priority One – Poorly Known Taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat e.g. road verges, urban areas, farmland, active mineral leases etc., or the plants are under threat, e.g. from disease, grazing by feral animals etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora' but are in urgent need of further survey.
P2	Priority Two – Poorly Known Taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but urgently need further survey
P3	Priority Three – Poorly Known Taxa which are known from several populations, and the taxa are not believed to be under immediate threat (i.e. not currently endangered), either due to the number of known populations (generally >5), or known populations being large, and either widespread or protected. Such taxa are under consideration for declaration as 'rare flora' but needs further survey.
P4	Priority Four – Rare Taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5-10 years.

4.5 Terrestrial Fauna

4.5.1 Conservation significant fauna

A search was conducted for threatened and priority fauna within a 50 km radius of the site using the Protected Matters Search Tool (DCCEEW 2023), NatureMap (combined data from DBCA, Western Australian Museum, Birds Australia and consultants' reports, DBCA 2018) and DBCA's threatened and priority fauna database. As advised by the Environmental Protection Authority of Western Australia (EPA) in the *Technical Guidance Terrestrial Fauna Surveys* (EPA 2016), taxonomy and nomenclature for fauna species was taken from the current *Checklist of the Terrestrial Vertebrate Fauna of Western Australia* (Western Australian Museum 2019).

A total of 21 conservation significant fauna species were identified as potentially occurring in the wider local area.

Of the fauna species potentially occurring in the local area, only those with habitat preferences of low open shrublands and grasslands were deemed likely to occur in the site.

Three conservation significant fauna species (night parrot, brush-tailed mulgara and bilby) were identified having potential to utilise the habitat within the site.

Table 8: Summary of conservation significant fauna species known or likely to occur within 50 km of the site.

Species	Common name	Level of significance		Habitat	Likelihood of occurrence
		State	EPBC Act		
Pezoporus occidentalis	Night Parrot	CE	EN	Treeless or sparsely wooded spinifex (Triodia spp.) near water (including artesian bores) (Johnstone and Storr 1998).	Possible
Dasycercus blythi	Brush-tailed mulgara	P4	VU	Hummock grass plains, sand ridges, mulga shrubland on loamy sand (Menkhorst and Knight 2011).	Possible/ Sighted
Macrotis lagotis	Bilby	VU	VU	Open tussock grassland on uplands and hills, mulga woodland/shrubland growing on ridges and rises and hummock grassland (spinifex) growing on sandplains and dunes, drainage systems, Salt Lake systems and other alluvial areas (DBCA 2017a).	Possible

4.5.2 Fauna habitat

The habitats present for fauna species within the site are mixed tussock and hummock grasslands and low shrublands (spinifex). Based on the habitat descriptions for conservation significant fauna detailed in **Table 8**, the site contains some potential habitat for night parrot, brush-tailed mulgara and bilby. However, due to the disturbed condition of most of the vegetation present, and the location of the airport runway within the site, BHP Billiton Iron Ore train line to the east and Great Northern Highway to the north, the site is not considered likely to provide significant habitat for these species. The historical clearing of the land to accommodate airport infrastructure has impacted the likelihood of the site containing any significant habitat values, including the movement and migration of animals. Moreover, there are extensive areas of similar or superior habitat further to the north and east of the site (Emerge Associates 2018).

4.5.3 Brush Tailed Mulgara

One priority species is considered as possibly occurring in the site; the brush-tailed mulgara, *Dasycercus blythi*. The brush-tailed mulgara is a priority 4 species that is near threatened. This species is close to vulnerable, but not listed as conservation dependent. The brush-tailed mulgara habitat is associated mostly with spinifex grasslands, but also uses other vegetation types (open sandplains, grasslands and woodlands) when mixed with or adjacent to hummock grasslands (Christopher R. Dickman 2001). The species is typically solitary with individual home range sizes from 1.4 – 25 ha.

The taxonomy of the brush-tailed mulgara is complicated. Historically, three species have been described, then synonymised and then re-split (Woinarski et al. 2014). The DBCA database returned

80 records of the brush-tailed mulgara, all of which were from surveys (2007 at Railway Loop, 1 km from the Site, and Pippingarra 20 km from the Site). All, except two records were classed as 'moderately certain' with regard to species identification (360 Environmental 2017).

While the lack of certainty along with limited spinifex grasslands result in the brush-tailed mulgara being considered as possibly occurring in the site according to the DBCA database, the Town of Port Hedland notified PHIA that the brush-tailed mulgara has been spotted on site/ in the surrounding areas. Whilst the brush-tailed mulgara is not listed as threatened, it is important to the local ecological community and as such should be considered important in association with assessing any future activity or development on the site.

Plate 5: Brush Tailed Mulgara (DBCA 2019)

4.6 Heritage

4.6.1 Indigenous heritage

The Department Planning Lands and Heritage (DPLH) maintain the Aboriginal Heritage Inquiry System (AHIS) under the Aboriginal Heritage Act (AHA) 1972, which contains information on 'Registered Aboriginal Sites' and 'Other Heritage Places' throughout Western Australia. Based on a review of the AHIS database, undertaken in accordance with the Aboriginal Heritage Due Diligence Guidelines (DAA 2013), the site contains one Registered Aboriginal Site, ID 27835 (MAI-09-MD28).

Under the AHIS the site ID 27835 is registered and defined as having Shell Midden Scatter/ Arch Deposits as shown in **Table 9**. This Heritage Site is located between the south-eastern edge of the Great Northern Highway and the airport fence with an extent that intrudes 1.5 m into Lot 9004 see **Figure 9***Figure 7*. A broader ethnographic survey and investigation was conducted by Australian Interaction Consultants. The survey identified that there are no sites or areas of concern.

Table 9: Details of Registered Aboriginal Heritage Site

ID	Name	Status	Access	Restricted	Location (GDA94 Zone 50)		Type
					mE	mN	
27835	MAI-09-MD-28	Registered Site	Access Open	File Not Restricted	668975	7747560	Midden/ Scatter, Arch Deposit, Shell

4.6.2 Indigenous Heritage Desktop Assessment Site

An archaeological survey was conducted by Anthropos Australia Pty Ltd in 2009 for the realignment of the Great Northern Highway and a report was prepared for Marapikurrinya Pty Ltd and Main Roads Western Australia. The heritage site (midden scatter) was located on a pindan dune located in the corridor between the Great Northern Highway (10 m from the road seal) and a fence surrounding the Port Hedland Airport see **Figure 9**. The Aboriginal Cultural Material Committee (ACMC) assessed this midden scatter to be a registered site under sections 5(a) and 39.2(c) of the AHA (ACMC Resolution ID 6115 No.6115 Meeting ID 4407 held on 5 November 2009).

The specific Heritage Site is approximately 1,200 m² in size, a relatively small site. It was described as medium density shell scatter comprising of dense deposits of *Anadara granosa* shells eroding out of a low pindan dune adjacent (10 m southeast) to the Great Northern Highway (360 Environmental 2017). The archaeological survey also noted that subsurface stratigraphic deposits of archaeological material may be located at this heritage site and two quartz stone tool artefacts in association were recorded. It was noted in the report that the sites condition had been compromised by tidal and storm surges and from vehicles crossing the southern portion of this area. Additionally, disturbance from mechanical activity as well as industrial rubbish dumping has occurred in the past and had the potential to impact the heritage site (Anthropos Australis Pty Ltd 2009).

There are no other recorded Aboriginal Heritage Sites or Places located within the PHIA Site, however the absence of a site or place could be due to the lack of survey across the PHIA Site in its entirety. Several surveys, however, have been completed in the broader and surrounding areas of

the site. One survey undertaken for the South Hedland estate by (Brad Goode & Associates 2008), identified low-lying areas, floodplains, and watercourses throughout the Port Hedland area were used as settlement by past groups. Specifically, ephemeral creeks that cut across the sand plains and run to the littoral zone to the north and west of the Port Hedland Area were paths followed by Aboriginal people as evidenced by the archaeological signature. As such any creeks or watercourses that cut across the PHIA site area may contain a similar archaeological signature and would have the same levels of ethnographic cultural significance (360 Environmental 2017).

4.6.3 Non-indigenous heritage

Based on a review of available information at a federal, state and local government level, there are no non-indigenous heritage sites recorded within the site.

4.7 Bushfire Hazards

The Map of Bush Fire Prone Areas published by the Office of Bushfire Risk Management (OBRM, 2021) identifies the site and surrounding area as a 'bushfire prone area.' Development within an area identified as bushfire prone is subject to consideration under the *Planning and Development Act 2005*, *State Planning Policy 3.7 – Planning in Bushfire Prone Areas* (SPP 3.7) and the *Guideline for Planning in Bushfire Prone Areas (2021)*.

A Bushfire Attack Level BAL assessment and Bushfire Management Plan (BMP) will need to be prepared in support of any future development and will need to detail the bushfire hazards that will be present post-development. Any bushfire implementation will be required in accordance with *AS3959 Construction in Bushfire-prone areas* (Standards Australia 2018) and the *Guidelines for planning in Bushfire Prone Areas* (WAPC and DFES 2021).

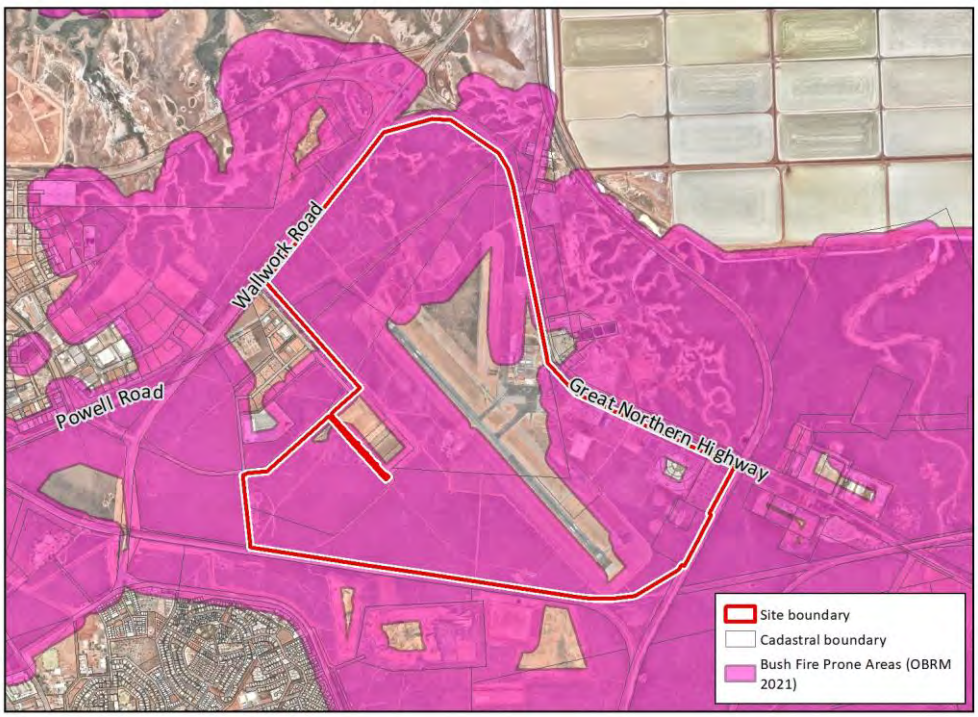


Plate 6: Areas within and surrounding the site identified as 'bushfire prone areas' under the state-wide Map of Bush Fire Prone Areas (OBRM 2021).

4.8 Other land use considerations

4.8.1 Historic and existing land uses

A review of historical aerial imagery from 1964 onwards (Landgate 2022b) indicates the primary use of the land being cleared for airport runways. Numerous clearing events have occurred over this time including vehicle tracks as well as increased infrastructure development.

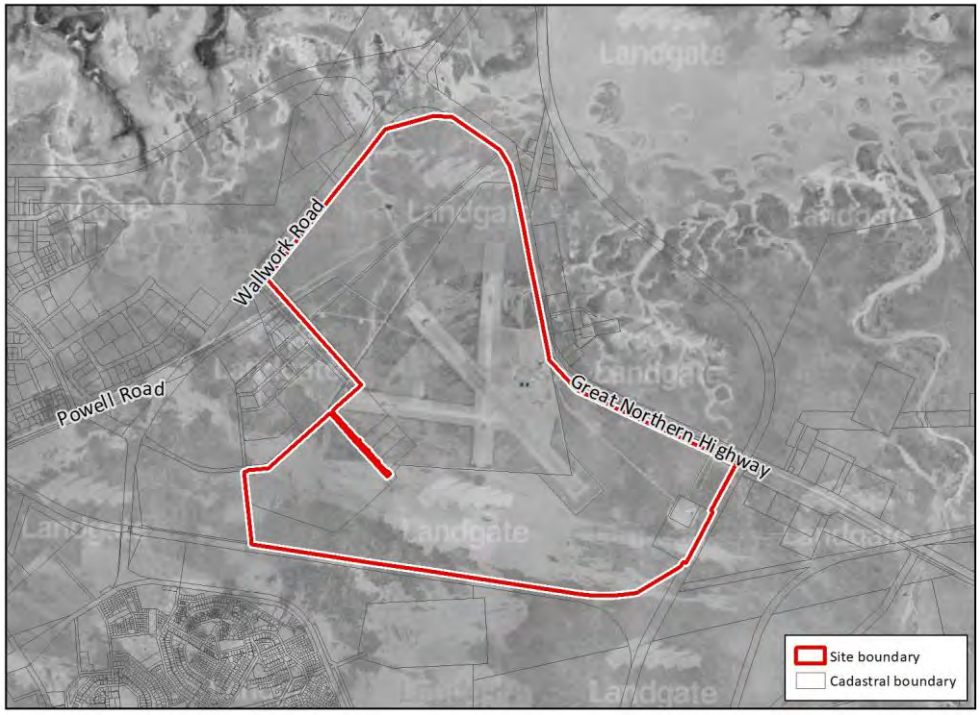


Plate 7: Historic Aerial Imagery taken in 1964 (Landgate)

4.8.2 Potential site contamination and UXO

A review of the Department of Water and Environment Regulation Contaminated Sites Database (DWER 2021b), indicates that the site contains one mapped area (Lot 435 in the western section), registered as a contaminated site pursuant to the *Contaminated Sites Act 2003* (see **Figure 4**). This site is classified as *contaminated- remediation required*, meaning the site is contaminated and needs to be investigated and cleaned up to ensure it does not present a risk to human health or the environment. This classification will remain until remediation is complete (DWER 2021a).

Whilst the western portion of the site is registered under the DWER database, this does not mean that other portions of the site are not contaminated. Numerous contamination investigations have been undertaken within the PHIA site and found multiple areas of contamination mainly associated with Asbestos and Asbestos Containing Materials (ACM). As part of the development process, any future development will require a contaminated sites investigative process, to ensure a remediation process is undertaken and to minimise any potential development constraints.

A review of the Department of Defence Unexploded Ordinance (UXO) search tool identified the site as having 'slight UXO potential' occurring within the site (DoD 2020). This is associated previous Anti-aircraft live firing as well as aerial gunnery and bombing. The surrounding area was also bombed and torpedoed by the Japanese during WW2 and as such may hold remnant unexploded ordnance. The Department of Defence recommends that any development, land usage re-zoning proposals or other significant changes in proposed activities for land parcels classified as "Slight" are preceded by an appropriate UXO Risk Assessment.

5 Sustainability

Sustainability in the context of this EMP has been based around the *Environmental Sustainability Strategy 2022-2027* (Town of Port Hedland 2022) which outlines some clear sustainable objectives in the context of the Town of Port Hedland and is transferable to the PHIA site. The *Environmental Sustainability Strategy 2022-2027* focuses on the global goals of the United Nations 2030 agenda for sustainable development, through which a global agenda to lower carbon emissions has been declared.

Specifically, sustainability in this EMP is aimed at addressing the GRESB requirements relating to Greenhouse gas emissions, Pollution and Energy. Sustainable management objectives are discussed in **Section 7.9.**

PHIA has an opportunity to introduce a Sustainability Strategy that will assist with reporting on GRESB sustainability requirements. Two sustainability initiatives could include voluntary participation under the National Greenhouse Gas Energy Reporting (NGER) and Green Star accreditation.

5.1.1 Greenhouse Gas emissions

There is an opportunity for PHIA to undertake a voluntary comprehensive Greenhouse Gas reporting under the National Greenhouse Gas Energy Reporting (NGER) framework. Greenhouse gas emissions reported under this framework include measurements of carbon dioxide emissions, methane, nitrous oxide, sulphur hexafluoride and specified kinds of hydro fluorocarbons and perfluorocarbons.

A similar voluntary reporting under the NGER scheme has been undertaken by the Airport Development Group in the Northern Territory. They measure the consumption of energy from airport terminals, maintenance sheds, management offices and other airport infrastructure. They have significantly invested in solar energy and renewable energy generation and in return reducing their carbon footprint.

5.1.2 Green Star Building Design

Green Star is a voluntary, national environmental rating system that evaluates the environmental design and construction of buildings throughout all stages of a project. It assigns points for initiatives against defined categories, including site selection, design, construction, operation and maintenance. Ratings are assigned as 4 Star (Best Practice), 5 Star (Australian Excellence) or 6 Star (World Leader). PHIA has an opportunity to become Green Star rated to reduce the impact of climate change and verify the environmental and social outcomes set out to achieve goals within a Sustainability Strategy and assist with GREBS reporting requirements.

5.1.3 Pollution

Pollution is currently monitored by PHIA and reported every financial year. Diesel usage is recorded, with the target of <4000 Liters Per Month (AVG) by financial year 2025. Spills are also recorded and reported and there are specific operational practices to address these pollution events.

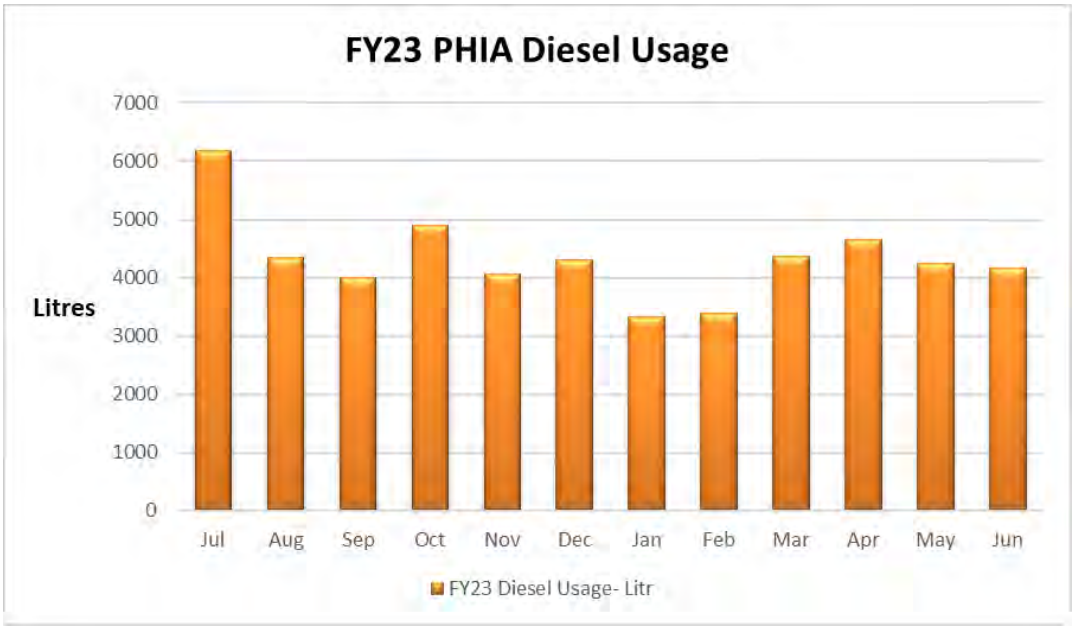


Plate 8: PHIA recorded Diesel Usage for FYI 2023

Additionally, Petroleum, oil and lubricant spills are recorded as part of hazard management.

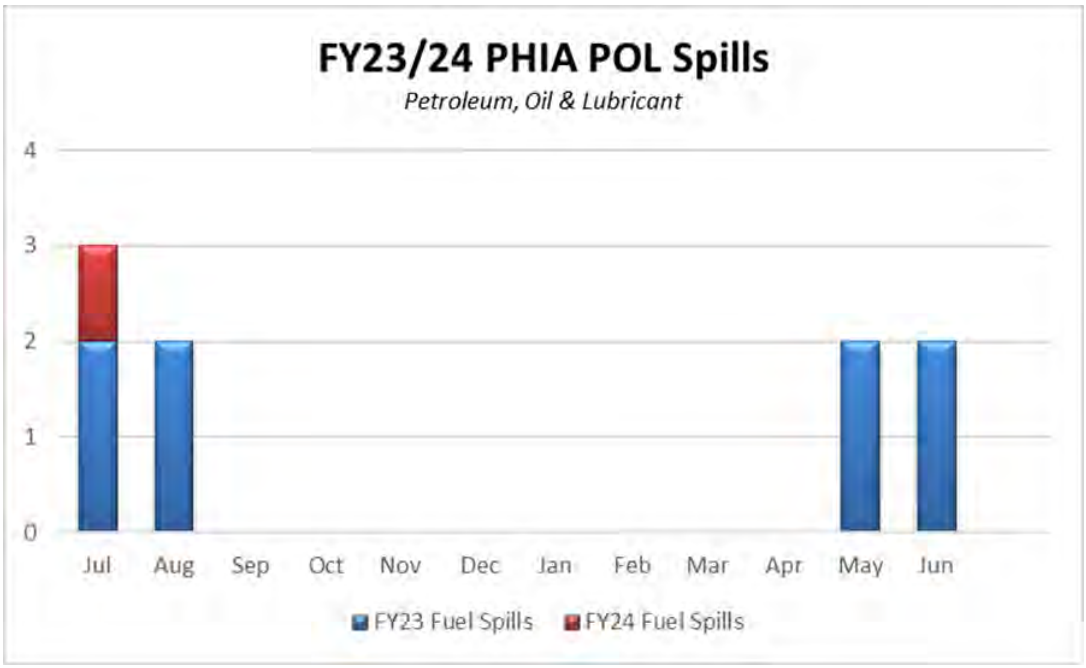


Plate 9: PHIA recorded POL Spills for FYI 2023/2024

5.1.4 Energy

Electricity is used for lighting, heating and cooling of buildings, including airport terminals. Electricity is also used for activities such as airfield lighting (runway, taxiway and aprons), car parks and street lighting, and is also used by PHIA and tenants across the estate.

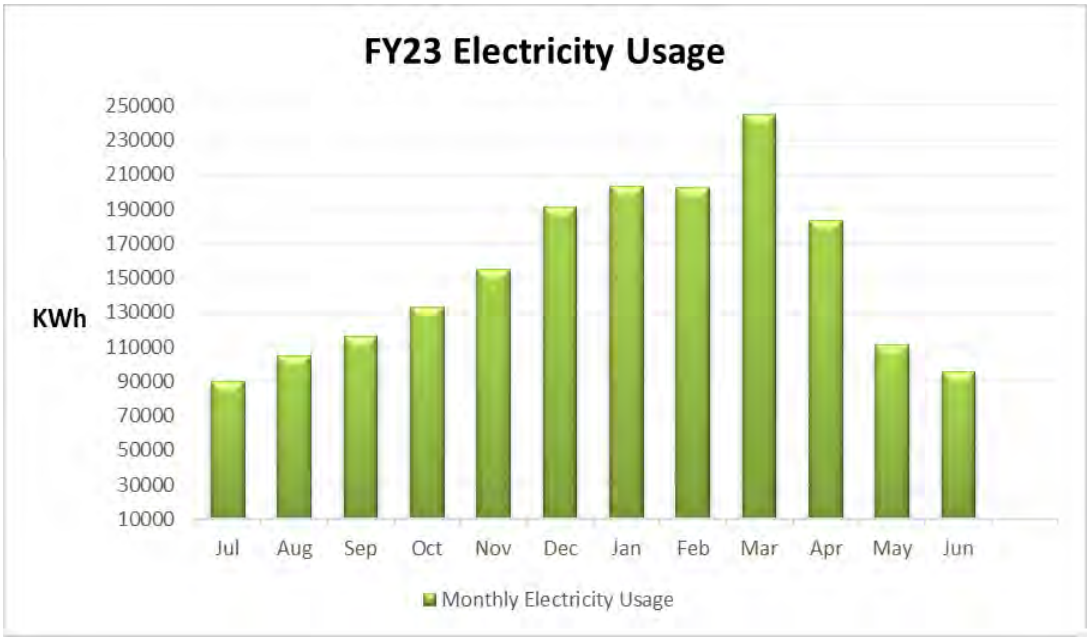


Plate 10: PHIA recorded electricity usage FYI 2023

Energy usage is monitored by PHIA and reported every financial year. The target for electricity usage is <130,000 Kilowatt hours per month (AVG) by financial year 2025. Additionally, daily water usage is recorded, with an aim of <60 Kiloliters per month (AVG) by financial year 2025.

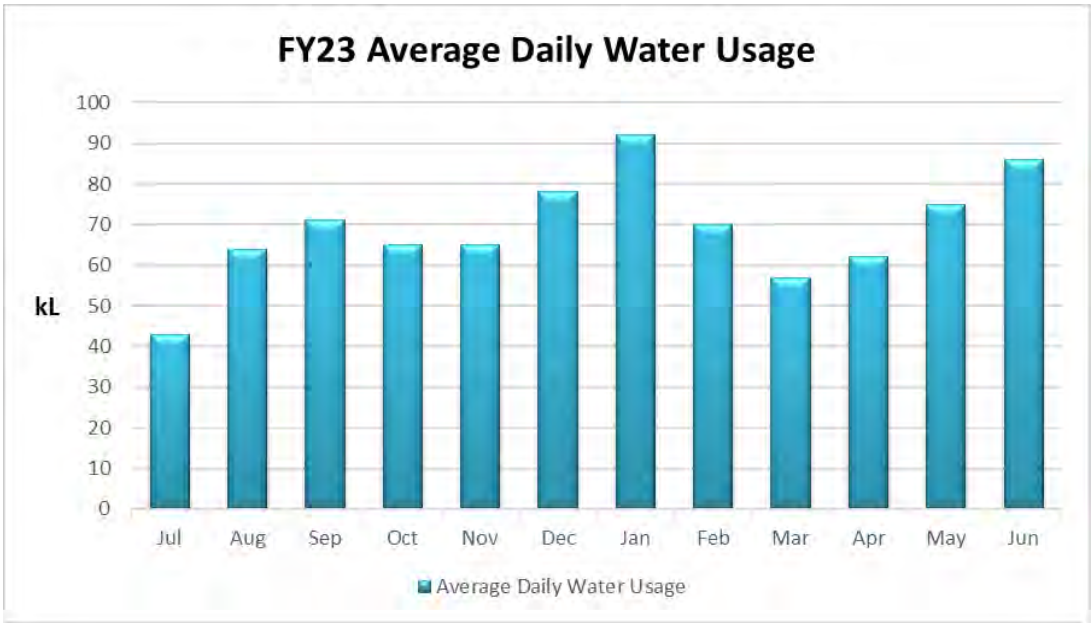


Plate 11: PHIA recorded average daily water usage FYI 2023

6 Risk Assessment Register Review

6.1 Overview

A risk assessment was conducted and is incorporated into this environmental management plan. Emerge reviewed the existing operational PHIA risk register includes an environmental category. Various environmental risks (and legal responsibilities) relating to the daily and long-term operations of PHIA have been identified and added to the risk register. These risks have been evaluated based on a set of risk tolerance criteria and assigned corresponding risk ratings. The register also outlines measures to mitigate, reduce, and effectively handle the identified risks.

6.1.1 Results

The risk register encompasses numerous categories including: Strategic, Economic, Financial and Commercial, Operational, WH&S, HR - Admin, Knowledge, Airport Security and Aviation Safety however the most relevant risk to this EMP are environmental risks. The risk register identified 11 environmental risks of which all but one (waste management) attained a medium risk rating. The results from the Environmental category are outlined in the Risk Register attached as **Appendix C**.

PORT HEDLAND INTERNATIONAL AIRPORT

PHE Risk Assessment Matrix

Likelihood	Consequence Severity: Insignificant	Minor	Moderate	Major	Extreme
Almost Certain	Medium	High	High	Critical	Critical
Likely	Medium	Medium	High	High	Critical
Possible	Low	Medium	Medium	High	High
Unlikely	Low	Low	Medium	Medium	High
Rare	Low	Low	Low	Medium	Medium

Critical	The status of the risk is to be consistently monitored and reported to the GM weekly and included in the Board Risk Reports until it is reduced to within acceptable tolerance levels
High	The status of the risk is to be monitored and reported to the GM monthly and included in the Board Risk Reports until it is reduced to within acceptable tolerance levels
Medium	Ensure that regular monitoring is in place to ensure that controls are effective. The status of the risk is to be reported to the appropriate Senior Manager (Risk Owner reporting line) quarterly
Low	Manage by routine procedures and accountabilities, including regular monitoring to ensure that the risk rating does not change

Plate 12: PHIA Risk Assessment Matrix

6.2 Risk Assessment Outcomes

The risk assessment review recorded 10 environmental risks on site that had the potential to occur. These risks are described in detail in the risk assessment attached as **Appendix C,** with the matrix results summarised in **Table 10**.

Table 10: Risk assessment matrix results

No.	Risk	Risk tolerance	Current Risk Rating	Current gap between actual current risk and risk tolerance	Expected residual risk
1	Hazardous materials spills	Low	Medium	Higher	Low
2	Land contamination	Low	Medium	Higher	Low
3	Noise complaints	Low	Medium	Higher	Low
4	Poor land management	Low	Medium	Higher	Low
5	Non-compliance notice	Low	Medium	Higher	Low
6	Stormwater erosion/ sedimentation issues	Low	Medium	Higher	Medium
7	Loss of native vegetation/ fauna	Low	Medium	Higher	Low
8	Pest and disease including weeds, dieback, foot and mouth disease	Low	Medium	Higher	Medium
9	Poor waste management	Low	Low	Matched	Low
10	Aboriginal heritage sites disturbed	Low	Medium	Higher	Low

6.3 Implementation

The implementation of this EMP will primarily be the responsibility of the landholder (PHIA Asset Pty Ltd) through their various parties. All contractors engaged to undertake works within the site by these parties will be required to adhere to this plan.

Key roles and responsibilities are presented in **Table 11** and are required to be clearly communicated to all the relevant personnel. It is essential that all relevant personnel associated with the project comply with the requirements of applicable environmental legislation, regulations, and standards.

Table 11: Roles and responsibilities for EMP implementation

Roles	Responsibilities
Site Manager	• Ensure that all personnel are inducted in the requirements of this EMP and the system used for reporting of environmental incidents. • In the event of a non-compliance, take corrective action to prevent repeat offences. • Ensure that the site remains tidy and safe for personnel.
All personnel (including subcontractors)	• Attend environmental induction or any other training as required. • Report all environmental non-compliances or risks as they occur to the Site Manager.

All relevant personnel will be provided with an induction covering the requirements of this EMP prior to commencing any work on the site. Records of site induction training attendance should be kept on-site.

Table 12 below provides a summary of environmental management actions to be implemented by PHIA. These actions outline how environmental impacts will be avoided, minimized, and managed.

The Site Manager is required to undertake regular inspections to ensure compliance with management measures contained in this EMP. All non-compliances during inspections will be documented and reported through the GRESB process.

Table 12: Risk management actions

ACTION NO.	RISK	MANAGEMENT ACTION	LOCATION	RESPONSIBILITY	STATUS/MONITORING
1.	Hazardous materials spills	Induct all staff and on-site personnel regarding required actions in response to spill incidents. Site induction will include information on MSDS and spills procedures, so all staff are aware of these hazardous material procedures.	All areas	CEO, on site manager	Ongoing
2.	Land Contamination (PFAS, PFOS, Asbestos and UXO)	Update manuals, policies, and procedures. Induct all relevant staff including adequate on-site training in relation to contamination and substances including PFAS and PFOS.	Selected areas	CEO and site manager	Ongoing
Land Management					
3.	Noise Complaints	Ensure Noise complaints remain minimal through inclusion of Australian Noise Exposure Forecast (ANEF), Australian Noise Exposure Concept (ANEC) and Australian Noise Exposure Index (ANEI). Ensure aircraft follow designated flight routes.	Airport	CEO and site manager	Ongoing
4.	Poor Land use management	Develop a land use plan and master plan and ensure adequate future consultation with future land users and local authorities.	All areas	CEO	Ongoing (Land use and Master plan currently in draft)
Environmental					
5.	Non-compliance notice	Ensure staff are educated on PHIA Economic Social Governance (ESG) sustainability framework through effective communication. Ensure the implementation of the Environmental Management Plan (EMP) is undertaken (once published).	All areas	CEO and Corporate Services Manager / Terminal Redevelopment Co-Ordinator	Ongoing
6.	Stormwater erosion/ sedimentation issues	Monitor and manage stormwater infrastructure in accordance with Better Urban Water Management Guidelines (BUWM). Seek information on the use and installation of Aerobic treatment units (ATUs) for stormwater and sewage treatment.	All areas	CEO and site manager	Ongoing
7.	Loss of native vegetation/ fauna	Undertake detailed flora and fauna surveys in the event of any future clearing or development. Educate and inform staff on native flora and fauna (incl brush tailed Mulgara) so they can be aware and report any sightings. Follow requirements of development processes and the Environmental Management Plan.	All areas	CEO and site manager	Ongoing, future processes and to review before clearing commences.

8.	Pest and disease including weeds, dieback, foot and mouth disease	Implement and follow airport biosecurity operations plans, controls and measures. Continue standardized practices and follow the relevant airports policies with relation to disease.	Airport terminal	CEO and Terminal coordinator	Ongoing
9.	Poor waste management	Follow sustainable practices by ensuring adequate recycling and waste infrastructure is set up (e.g., bins). Develop a sustainability plan that includes actions on reducing carbon footprint and emissions.	All areas	CEO and site manager	Ongoing and future processes
10.	Aboriginal Heritage Sites disturbed	Comply with Aboriginal Cultural Heritage Act 1972 regulations and associated guidelines. Recognise sites and possible future surveys to determine extent of sites. Follow consultation requirements as outlined in this EMP and the Aboriginal Cultural Heritage Act 1972 in the event of any future development/ clearing.	Selected area	CEO	Ongoing and future processes

7 Environmental Management Actions

The environmental management plan's purpose is to:

Guide PHIA's management and operational practices whilst minimising environmental risk and harm.

To ensure this purpose is met, management actions have been established and provided in **Table 13** and further detailed throughout **Section 7** below.

Table 13: Environmental Management Actions

Management Action	Aim	Strategy	Policy Objective Principle(s)
Stormwater, soil, and erosion	To control the severity and extent of soil erosion and pollutant transport during any future development or construction. Ensure management actions are in place to prevent stormwater causing erosion and/ or sedimentation issues, or in the event that erosion issues occur, ensure the correct management plans are in place to manage this risk accordingly.	Ensure that no uncontrolled discharge of water from the site that results in erosion or sedimentation and no complaints received from the community, neighbour's, other stakeholders, or regulatory authorities in relation to offsite dust impacts from the construction activities.	1, 4, 7, 8
Contamination	Establish and adhere to effective environmental measures to prevent and handle spills and the release of hazardous substances. The PHIA should also aim to oversee and examine sites that are either already contaminated or have the potential to become contaminated, following applicable laws and regulations.	Mitigate and control contamination through a contaminated management strategy.	1, 4, 7, 8
Native Vegetation	To protect native flora and vegetation as far as practicable so that biological diversity and ecological integrity are maintained within and adjacent to the site.	Ensure native or conservation vegetation is retained and managed following the correct environmental procedures.	1, 4, 7, 8
Fauna Management	To ensure fauna disturbance will be minimised where possible and protect terrestrial fauna so that biological diversity and ecological integrity are maintained.	Undertake the fauna assessment process for any future development plans.	1, 4, 7, 8
Waste Management	Reduce waste generated from the PHIA and increase recycling and reuse through Airport operations in an effort to manage waste in the most sustainable way possible.	Develop a waste management plan to drive improvement in waste management practices including hazardous and controlled waste management.	1, 2, 3, 4, 7, 8
Indigenous Heritage	To create a management plan to ensure all Indigenous heritage is protected and managed in the event any heritage values are found within the site. Ensure the appropriate consultation takes place with the relevant Indigenous bodies.	Ensure that indigenous values are protected through consultation with local indigenous bodies, and adherence with the relevant legislation.	3, 4, 6, 7, 8
Bushfire	Ensure the correct bushfire precautions are implemented in accordance with AS3959, to protect infrastructure and personnel in the event of a bushfire and provide appropriate separation from any identified risks without negatively impacting existing environmental values.	Ensure that future development appropriately considers the bushfire risks by implementing BAL assessments and bushfire management plans.	1, 4, 7, 8
Sustainability	To ensure sustainable practices by PHIA with the aim of implementing strategies aligned with the goals outlined in the *Environmental Sustainability Strategy 2022-2027* (Town of Port Hedland 2022), and any other relevant future local sustainable strategies.	Continue to monitor fuel, energy usage and implement multiple sustainability strategies to reduce emissions and targets as per local strategies.	1, 2, 3, 4, 6, 7, 8

7.1 Stormwater management actions

The site is generally flat with a slight slope to the North/ Northeast and is well drained with a good potential for surface water management. Due to the site's predominantly unsealed condition, it is highly probable that any runoff will seep into the upper layer of soil or flow across the surface towards the northern section. The northern part of the site experiences periodic partial flooding, mainly influenced by rainfall and tidal changes. Most of the runoff from the apron areas and terminal facilities is channeled into a drainage system located along the northwestern boundary of the site.

Proposed measures to reduce stormwater risk include:

- The installation of Aerobic Treatment Units (ATU's) for Sewage wastewater/ stormwater operation.
- The development of a Master Plan (Currently in draft version)
- Having due regard for the TOPH Floodplain mapping, groundwater and Better Urban Water Management (BUWM) guidelines

7.2 Erosion and dust control management actions

During development processes, erosion and dust control strategies can be implemented. For the duration of construction activities, weather forecasts will be monitored to determine ground moisture level, wind strength (especially prevailing winds) or direction or other seasonal conditions applicable to the extractive operations. In the event that weather conditions are unfavourable, especially in the case of adverse ground moisture level or wind strength or direction, operations will be rescheduled or ceased to minimise excessive dust emissions associated with its operations on neighbouring land uses.

7.3 Contamination management actions

A number of potential activities/ known contamination impacts have been identified through reviews of previous PHIA investigations. These include:

- Former use of PFOS and PFOA firefighting foams
- Heavy metals and Asbestos materials identified in soil within the former firefighting grounds.
- Potential UXO across site following WWII bombings.
- Hydrocarbon impacted soils relating to fuel storage infrastructure were remediated, although area remains classified as ‘potentially contaminated’.
- Per- and Poly-Fluoro Alkyl Substances (PFAS)

Management actions include the implementation of standard work procedures, construction/ operational EMPs and the control and relocation of fill through the relevant guidelines and procedures. **Table 14** outlines some key management actions regarding contamination.

Table 14: Contaminated Land management plans

	Management Action
1	Collaborate with relevant stakeholders to explore potentially contaminated sites and develop remediation strategies.
2	Merge the existing Contaminated Site Register into a comprehensive Environmental Site Register, regularly reviewing and updating it to ensure adherence to industry standards and best management practices.
3	Work in conjunction with Airservices Australia to facilitate PFAS remediation in compliance with current legislation and the PFAS National Environmental Management Plan.
4	Revise and enhance spills management procedures and available resources.
5	Monitor, consolidate, and effectively manage historic soil stockpiles.

Lot 435 in the Western section of the site is registered by DWER as contaminated- remediation required, meaning the site is potentially contaminated and needs to be investigated and remediated to ensure it does not present a risk to human health or the environment.

Additionally, as part of the development process, any future development throughout the site will require a contaminated sites investigative process, to ensure a remediation process is undertaken and to minimise any potential development constraints.

7.4 Native vegetation management actions

7.4.1 Delineation and protection of retained vegetation.

Native vegetation to be retained on the site is required to be appropriately managed. Additionally, native vegetation management will also focus on ensuring clearing activities are restricted to the clearing boundaries so as not to affect adjacent areas of native vegetation.

Whilst no Threatened Ecological Communities (TEC) have been identified within the site, it is beneficial to ensure that protection measures are in place to properly manage any native vegetation including priority flora species, noting that one Priority Flora species: *Tephrosia rosea var* was identified within the surveyed section of the site.

Management actions can include implementing programs for vegetation rehabilitation to restore degraded areas and promote the recovery of native plant communities, which can involve initiatives like reseeding native species, controlling invasive species, and implementing appropriate fire management strategies.

Undertaking further and more detailed Flora and Fauna surveys that encompass the entire PHIA site area will assist in the event of any future development.

7.4.2 Weed Management

Weeds can degrade native vegetation through competition for space and resources. This EMP aims to ensure that the values of the vegetation are retained, particularly for native vegetation identified throughout the site.

Weed inspections should be implemented to determine the extent of weed growth throughout the site prior to any future development processes. The management of weeds should focus on hygiene management during construction activities in order to minimise the spread and/or introduction of weeds as a result of the development.

The most appropriate method to control weeds will be decided after the site has been inspected (so that the methods should be fit for purpose). Weed control may include both manual (hand weeding) and chemical (herbicide) based approaches. Hand weeding can be successful for certain species and when weed abundance is relatively low. When weed cover is relatively high a broad-spectrum herbicide formulation such as Roundup© (glyphosate 360g/L) may be applied as a spot spray that targets specific weeds. Alternatively, if grass weeds are prevalent, a grass selective formulation may be applied to efficiently suppress weed growth, without the risk to native plant damage.

Herbicides shall be applied by a licenced pesticide management technician and in accordance with manufacturer's instructions as provided on product label.

7.4.3 Dieback Management

Phytophthora Dieback is a soil borne fungal pathogen plant disease which spreads through surface and sub-surface water flows and soil movement and is a serious threat to the flora of Western Australia. Subsequently, the implementation of measures to limit pathogen spread is necessary. There is no practical large-scale cure for dieback and therefore prevention and containment are the primary options for management.

Precautionary measures can be incorporated during the construction phase of any future development to minimise the potential for dieback to be introduced in areas of native vegetation within and adjacent to the site.

7.5 Fauna management actions

Desktop investigations have revealed that the Port Hedland International Airport (PHIA) has several potentially occurring priority fauna listed in the area including the Brush-tailed Mulgara, (*Dasycercus blythi)*. Management strategies should be implemented in the event that future development takes place, or fauna is sighted. The goals of macrofauna management include:

- Minimising impacts on macrofauna because of development
- Avoiding the creation of isolated populations of macrofauna
- Limiting egress of macrofauna into developed industrial areas

Fauna management procedures involve various activities aimed at monitoring and managing wildlife populations and their habitats. These procedures are typically implemented by wildlife professionals, conservation organizations, and government agencies to ensure the sustainable use and conservation of fauna.

7.5.1 Fauna Monitoring

To assist in the management of fauna several options are outlined below.

Population Surveys: Conducting surveys to estimate the size, distribution, and composition of wildlife populations. This can involve techniques such as transect surveys, camera trapping, and aerial surveys.

Habitat Assessment: Assessing the quality and suitability of habitats for different species, including factors like food availability, water sources, and vegetation cover.

A fauna monitoring program for the Brush tailed Mulgara can be implemented to recorded sightings of the Mulgara and protect its recorded habitat. Notifying and educating on-site staff about the mulgara so they can report any sightings of the species on site. If Mulgara are sighted on site measures can be taken to protect the species, for example, ensuring there is a buffer between the threat of land use activities and the habitat, or fencing to ensure feral cats/ foxes cannot impact the species.

In the event of any future development, trapping and relocation of the species can be implemented to ensure the safe removal macrofauna from workplace hazards, construction activities, vehicles and machinery. Additionally, the installation of a temporary macrofauna-proof fencing along the works area can protect any species from development threat.

A fauna trapping program/ a pre-clearing site inspection can be undertaken by an experienced fauna specialist to identify potential for fauna interactions during clearing and recent evidence of native fauna activity. In particular, the site can be searched for signs of recent use by Mulgara as well as any other macrofauna species (e.g, kangaroos, emus and other native ground-dwelling vertebrate fauna such as quenda and reptiles.)

Where management of non-native fauna is required, measures can include:

- Trapping/ and or baiting of feral cats/ foxes

- Feral cats and foxes captured during trapping will be taken to a local ranger to be checked for a microchip. If no microchip is identified, then appropriate action to be taken at the discretion of the Ranger, vet and/or supervising zoologist.
- Other feral animals should be humanely euthanised.

Should injured fauna be encountered, the severity of injuries should be assessed. If the experienced fauna specialist considers that an injured native animal has a reasonable chance of being satisfactorily rehabilitated, it will be transferred to a registered DBCA wildlife carer. Where the experienced fauna specialist considers that any injured fauna is unlikely to be satisfactorily rehabilitated, they should be taken to nearby vet to be humanely euthanised.

7.6 Waste Management (including hazardous/controlled wastes) management actions

The process of development and its associated activities can lead to a rise in waste production within the airport premises. This waste can be attributed to the growing number of passengers and aircraft movements, as well as the construction activities and waste products that can result from potential future expansions. Proper waste disposal incurs significant costs. By minimizing waste usage and implementing waste reduction initiatives, the airport has the potential to decrease costs. Furthermore, waste generation and disposal indirectly contribute to climate change through factors like heightened methane and landfill byproducts, as well as increased emissions from manufacturing.

Implementing waste management actions for the airport can involve a range of strategies such as recycling, surveillance, and waste management review. Recycling plays a role in diverting waste from landfills and reducing the overall environmental impact, while surveillance through closely monitoring waste generation, disposal practices, and potential sources of waste can assist the airport in identifying areas where improvements can/ need to be made.

This proactive approach enables the airport to address waste-related issues promptly, implement corrective actions, and prevent future waste-related challenges. Regular waste management reviews provide an opportunity to assess the effectiveness of current waste management practices and identify opportunities for enhancement. This process involves analyzing waste data, evaluating waste reduction initiatives, and exploring innovative solutions that align with the airport's sustainability goals.

7.7 Indigenous heritage management actions

Native title exists upon all land except where the granting of tenure has extinguished or suspended native title. Freehold land and crown land subject to certain types of leasing arrangements (pre native title) has generally extinguished or suspended native title. Unallocated crown land and some crown leases (granted after 1993 that are compatible with the existence of native title) are generally subject to the Native Title Act 1993.

In relation to the Site, the land tenure has had native title suspended or extinguished under the Native Title Act 1993 as all lots within the Site are freehold lots owned by the TOPH and leases to the Airport Lessee Company.

In relation to the Western Australian Aboriginal Heritage Act 1972 (AHA) compliance means that the proponent is obligated to identify and protect all Aboriginal heritage sites and places as defined by section 5 of the AHA prior to development occurring. If protection is not an option, then consent to affect such sites and places can be sought from the Department of Aboriginal Affairs and the Minister of Aboriginal Affairs under section 16 & 18 of the AHA, or under regulation 10 of the Aboriginal Heritage Regulations Act 1974.

An Aboriginal Cultural Management Plan was undertaken by Terra Rosa Consulting in 2017 for the Port Hedland International Airport and provided management recommendations. While the site identifies a registered Aboriginal Site ID 27835, within the Northern portion of the PHIA area, it is not located in a zone that requires, or is planning, any redevelopment works, and as such there are no current man-made factors likely to impact the registered Aboriginal site.

Terra Rosa advises that should any further redevelopment of the airport take place; works should be undertaken to avoid any potential impacts or damage to the small portion of Registered Aboriginal site ID 27835. Should this not be possible, PHIA must seek written consent of the minister to use the land under section 18 of the Aboriginal Heritage act. Consultation must be undertaken with the relevant Indigenous Aboriginal people- for the PHIA area is the Kariyarra people (details specified in **Table 15**). Under Section 18, if redevelopment is proposed, PHIA must:

- Consult with the Kariyarra people providing details and proposed use of land.
- Meet with Kariyarra people and their representatives to discuss use of land if required.
- Consider any concerns and recommendations of the Kariyarra people in use of land.
- Discuss and strategize efforts to minimise/ avoid damage to sites, through the use of buffer zones, Aboriginal monitors and development practices, as necessary.

Table 15: Aboriginal Heritage Representative Body Contact details

Native Title Claim	Representative Body	Contact
Kariyarra People WC1999/003 NTC applicants: Mr Cyril Gordon, Mr Donny Wilson, Mr Kerry Robinson	Yamatji Marlpa Aboriginal Corporation (YMAC)	YMAC Level 8, 12-14 The Esplanade PERTH WA 6000 Ph: (08) 9268 7000

While PHIA is a highly disturbed area, with extensive development over its historical use as an active airport, a targeted archaeological inspection of the 2018 Master Plan area may be a considered as a strategy to minimise any risk due to the high level of potential for archaeological sites.

In the event that any culturally significant artifacts or sites of suspected heritage are discovered during development, PHIA must follow a management plan. This includes the discontinuation of all groundwork that is causing a disturbance in the particular area of the site and alerting PHIA management to cease works until further notice. Additionally, the PHIA management must organise inspections from representatives of the Kariyarra people to undertake heritage surveys and determine the extent of Aboriginal heritage identified (Terra Rosa Consulting 2017).

7.8 Bushfire management actions

State Planning Policy 3.7 Planning in Bushfire Prone Areas (SPP3.7) (WAPC 2015) stipulates that any development proposal which occurs partly or wholly within a designated bushfire prone area is required to be accompanied by a bushfire management plan (BMP). The preparation of a BMP is required to incorporate the following tasks:

- Classification of existing vegetation types and effective slope within the site and surrounding 150 m, in accordance with Australia Standard 3959-2018 Construction of buildings in bushfire-prone areas (AS 3959) (Standards Australia 2018).
- Assessment of bushfire hazard levels within the site and surrounding 150 m, in accordance with the Guidelines for Planning in Bushfire Prone Areas (WAPC and DFES 2021).
- Completion of an indicative Bushfire Attack Level (BAL) assessment and preparation of an associated BAL contour plan.
- Assessment of the structure plan design against the bushfire protection criteria, in accordance with the Guidelines for Planning in Bushfire Prone Areas (WAPC and DFES 2021).

Policy objective 5.4 of SPP 3.7 specifies that development is required to:

'achieve an appropriate balance between bushfire risk management measures and biodiversity conservation values, environmental protection and biodiversity management and landscape amenity'.

This policy objective ensures that future development appropriately considers the bushfire risks and provides appropriate separation from any identified risks without negatively impacting existing environmental values.

The principal management action for bushfire risk to the site is to ensure that the risk to future people, property and infrastructure is appropriately minimised without negatively impacting on environmental values within or surrounding the site.

7.9 Sustainability management actions

Sustainability management actions for PHIA outline strategic pathways to minimize adverse impacts by setting forth actionable goals that encompass energy efficiency, resource conservation, community engagement, and environmental stewardship. Sustainability management objectives empower entities to ensure sustainable practices and targets are met as per the *Environmental Sustainability Strategy 2022-2027* (Town of Port Hedland 2022). It would be reasonable to utilise these objectives from the Town of Port Hedland for PHIA sustainable actions.

It's important to acknowledge that several of these objectives are broad in scope and, although they might not be feasibly achievable in the immediate term, they establish a commendable foundation for aspirational targets.

Table 16: Sustainability management actions

Energy Efficiency and Carbon Emissions Reduction: Implement energy-efficient technologies, such as LED lighting, efficient HVAC systems, and automated energy management systems, to reduce the airport's energy consumption. Integrate renewable energy sources, like solar panels, to generate clean energy on-site and reduce reliance on fossil fuels. These efforts should result in a significant reduction of CO2 emissions associated with airport operations.
Waste Reduction and Recycling: Develop comprehensive waste management strategies to minimize waste generation, promote recycling, and properly dispose of hazardous materials. Prioritize recycling initiatives for materials like plastics, paper, and glass, further reducing the carbon footprint of waste management activities. This could involve setting up recycling stations throughout the airport and encouraging tenants and visitors to participate.
Water Conservation: Implement water-saving technologies and practices, such as low-flow fixtures, rainwater systems and efficient irrigation systems, to reduce water consumption and associated energy use for water treatment and distribution.
Noise and Air Quality Control: Implement measures to reduce noise and air quality impacts on the environment. Noise reduction measures may result in adjustments to flight paths that optimize fuel efficiency, thereby reducing CO2 emissions. Air quality improvements, such as electrification of ground vehicles, also contribute to lower carbon emissions.
Community Engagement: Engage with local communities and stakeholders to raise awareness about the airport's efforts to reduce CO2 emissions and its commitment to sustainable practices. Encourage the community to participate in carbon reduction initiatives and share feedback on further improvements.
Accessibility and Inclusivity: Ensure that the airport is accessible to all individuals, including those with disabilities, and that facilities and services are designed with inclusivity in mind. This could include accessible public transit and electric vehicle charging infrastructure, encouraging reduced carbon emissions from travel to and from the airport.
Resilience Planning: Develop climate resilience plans that account for potential carbon-related impacts, such as increased frequency of extreme weather events. Implement measures to protect critical infrastructure and maintain operations during disruptive events.
Heritage and Cultural Preservation: Collaborate with local Indigenous communities to protect and respect cultural heritage sites and traditions during any airport development or expansion.
Long-Term Economic Viability: Invest in innovative solutions that support the long-term economic viability of the airport, such as partnerships with airlines using more fuel-efficient aircraft, which contribute to lower CO2 emissions per passenger mile.
Greenstar building design: Future development and building design can participate in the Greenstar building initiative, to ensure the consideration of good environmental design principles to achieve environmentally positive outcomes.

8 Conclusion

This Environmental Management Plan (EMP) has been prepared to inform and support Port Hedland International Airport in achieving requirements under the GRESB process as well as providing an environmental framework for future development within the site. The framework has provided the structure for PHIA to identify and manage its environment by compiling environmental considerations, impacts, and values to formulate management actions that assist in airport operations.

Environmental considerations for PHIA to mitigate and manage as part of future operations include:

- **Contamination:** A review of the Department of Water and Environment Regulation Contaminated Sites Database (DWER 2021), indicates that the site contains one area (Lot 435 in the western section), registered as a contaminated site pursuant to the Contaminated Sites Act 2003. This site is classified as contaminated- remediation required, meaning the site is potentially contaminated and needs to be investigated and remediated to ensure it does not present a risk to human health or the environment. Additionally, the site is classified as having 'Slight UXO potential'.
- **Hydrology:** Although the site is generally well drained with the potential for surface and stormwater management, previous site inspections indicate partial periodic flooding to the northern section of the site. Due to the site's predominantly unsealed condition, it is highly probable that runoff will seep into the upper layer of soil or flow across the surface towards the northern section.
- **Flora and Vegetation:** Previous surveys identified one priority flora *Tephrosia rosea var* within the site. Additionally, online databases (DBCA) have recorded other priority species as possibly occurring on site. Most of the vegetation on site is comprised of Hummock grasslands and spinifex which can support native fauna. Site specific investigations will likely need to take place in the event of any future clearing or development proposals. These investigations can determine the type of vegetation and its condition. Weeds and Phytophthora Dieback have the potential to pose a threat in the degradation of native vegetation. This EMP provides precautionary measures for such threats to be incorporated as part of the management actions.
- **Fauna:** Fauna habitat present within the site may provide potential habitat for several native species. Most notably the Brush tailed Mulgara *Dasycercus blythi,* has been sighted within the area, and is a native priority listed species under the Biodiversity Conservation Act (2016). Desktop investigations have revealed that the Port Hedland International Airport (PHIA) has several potentially occurring priority listed fauna in the area, therefore, management strategies have been incorporated into this EMP to protect terrestrial fauna if future development takes place, or fauna is sighted to protect the biological diversity and ecological integrity.
- **Bushfire risks:** The site is located within a bushfire prone area according to the Map of Bush Fire Prone Areas published by the Office of Bushfire Risk Management (OBRM, 2021). A BAL assessment and Bushfire Management Plan (BMP) will need to be prepared in support of any future development and will have to detail the bushfire hazards that will be present post-

development. Any bushfire implementation will be done in accordance with AS3959 (Standards Australia 2018) and the Guidelines for planning in Bushfire Prone Areas (WAPC and DFES 2021).

- **Aboriginal Heritage:** One registered Aboriginal heritage site (ID 27835) defined as having Shell Midden Scatter/ Arch Deposits, is located between the south-eastern edge of the Great Northern Highway and the airport fence with an extent that intrudes 1.5 m into Lot 9004. An Aboriginal Cultural Management Plan was undertaken by Terra Rosa Consulting in 2017 for the Port Hedland International Airport and formulated some management recommendations. While the site identifies a registered Aboriginal Site ID 27835, within the Northern portion of the PHIA area, it is not located in a zone that requires, or is planning, any redevelopment works, and as such there are no current man-made factors likely to impact the registered Aboriginal site.

9 References

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Figures

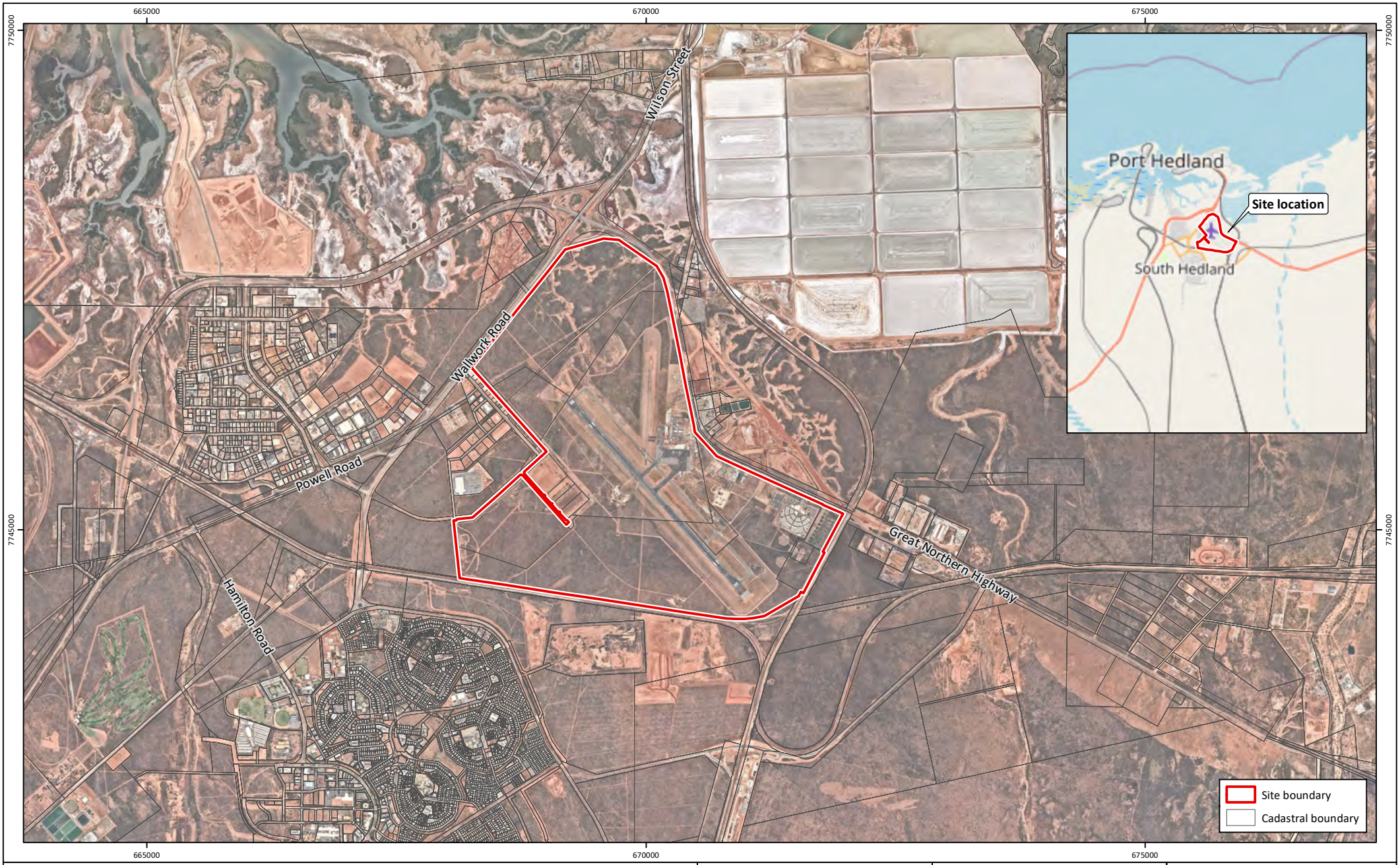

Figure 1: Site Location

Project:	Environmental Management Plan PHIA Environmental Management Plan
Client:	Port Hedland International Airport (PHIA)

Plan Number:
EP23-020(03)--F01

Drawn:	WJC
Date:	18/05/2023
Checked:	SPL
Approved:	TB
Date:	17/11/2023

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Scale: 1:50,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

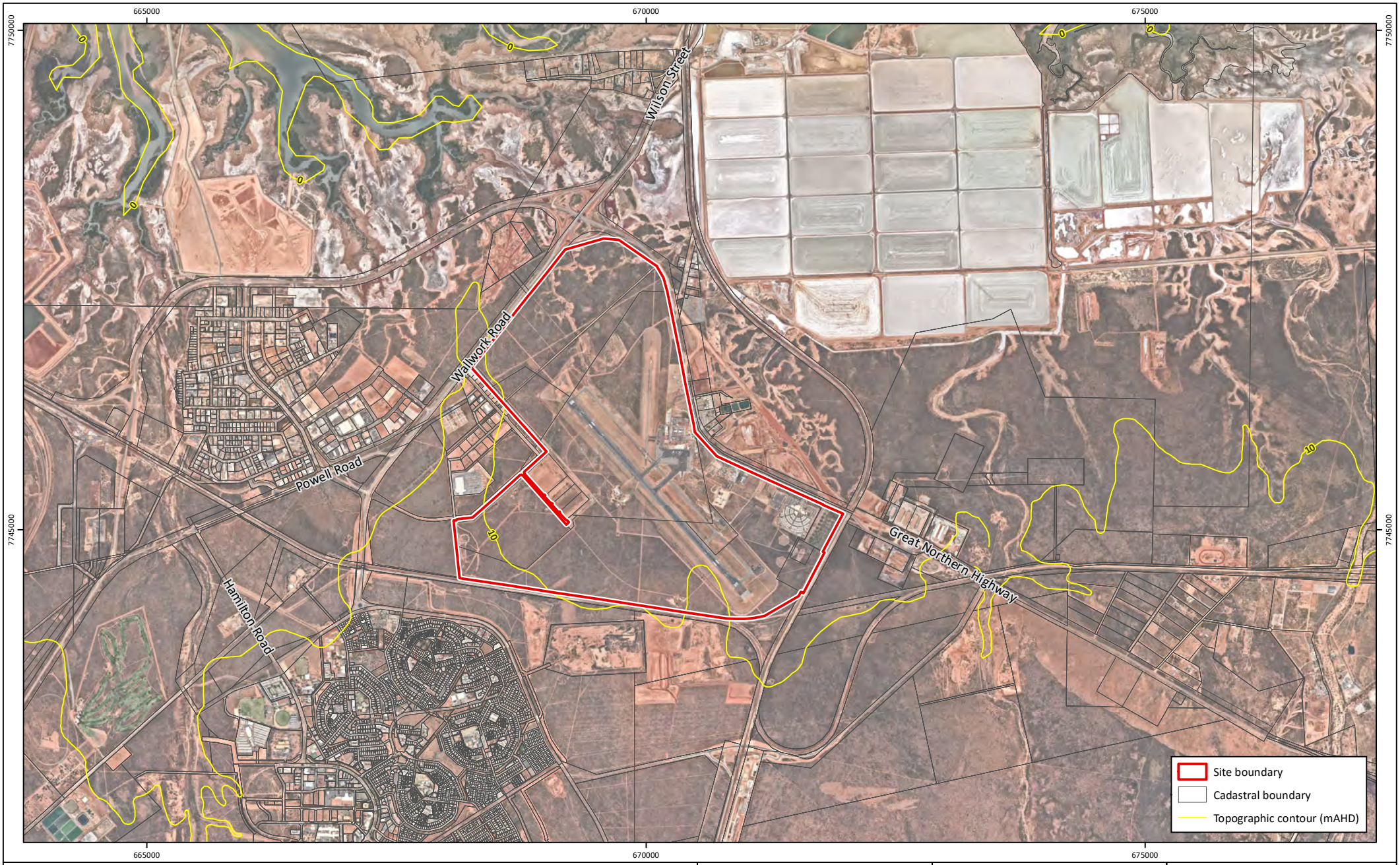

Figure 2: Topography

Project:	Environmental Management Plan PHIA Environmental Management Plan
Client:	Port Hedland International Airport (PHIA)

Plan Number:
EP23-020(03)--F09

Drawn:	WJC
Date:	30/08/2023
Checked:	SPL
Approved:	TB
Date:	17/11/2023

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Scale: 1:50,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

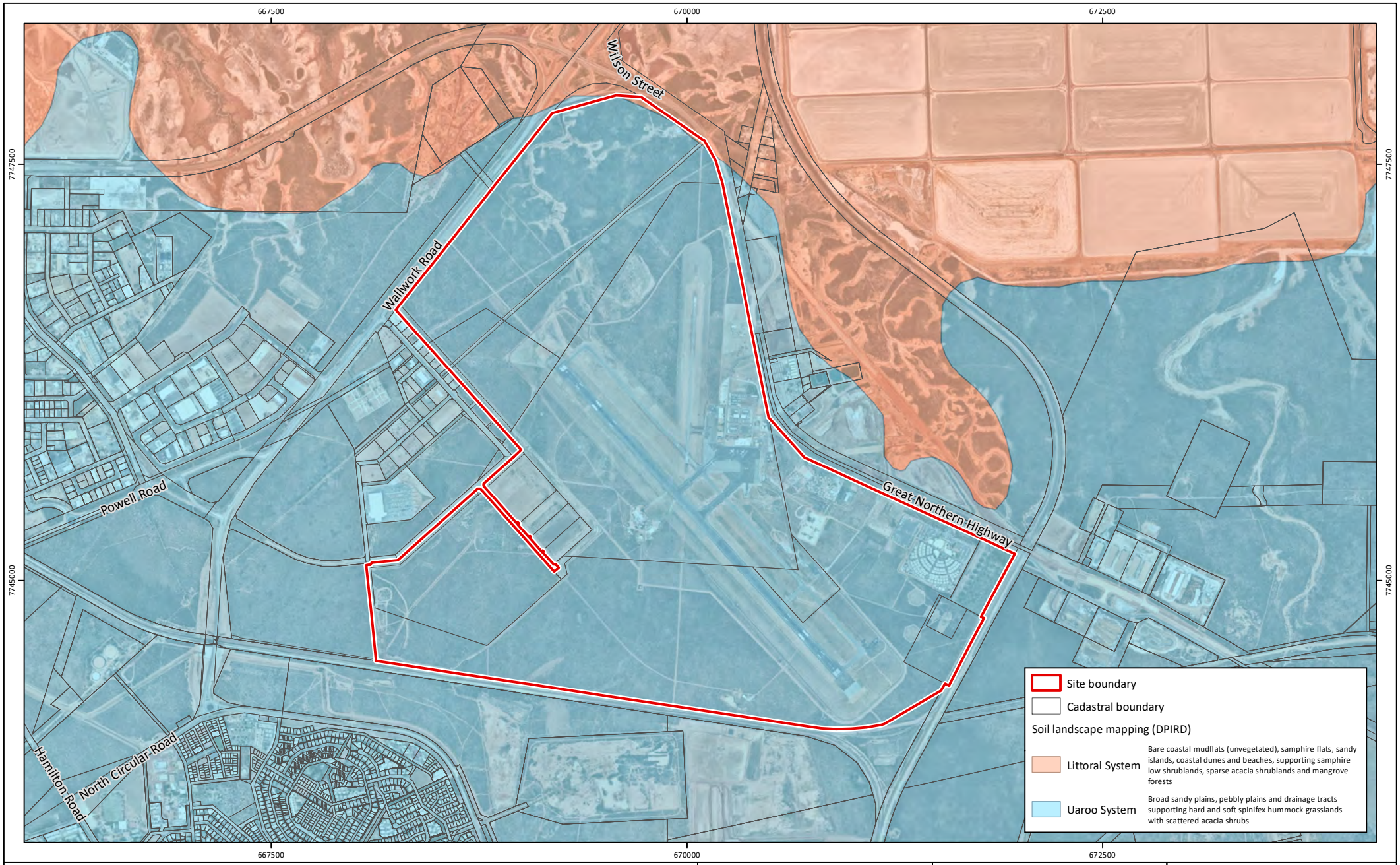

Figure 3: Soils and Landforms

Project: Environmental Management Plan
PHIA Environmental Management Plan
Client: Port Hedland International Airport (PHIA)

Plan Number:
EP23-020(03)--F04
Drawn: WJC
Date: 18/05/2023
Checked: SPL
Approved: TB
Date: 17/11/2023

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GDA2020 MGA Zone 50

emerge ASSOCIATES

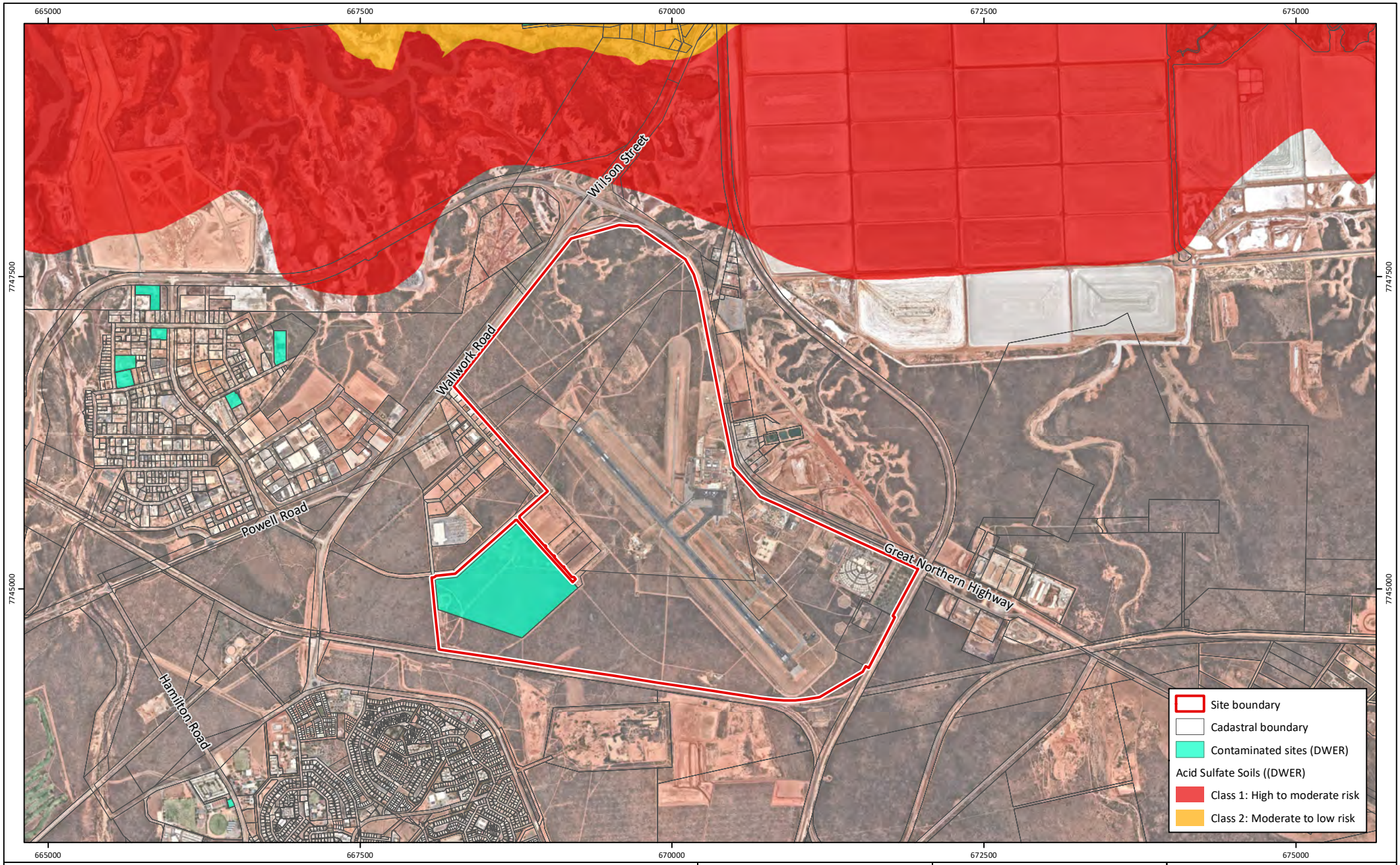

Figure 4: Acid Sulfate Soils/Contaminated Lands

Project: Environmental Management Plan
PHIA Environmental Management Plan
Client: Port Hedland International Airport (PHIA)

Plan Number:
EP23-020(03)--F03
Drawn: WJC
Date: 18/05/2023
Checked: SPL
Approved: TB
Date: 17/11/2023

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Metres
Scale: 1:40,000@A4
GDA2020 MGA Zone 50

emerge ASSOCIATES

Figure 5: Hydrography

Project:	Environmental Management Plan PHIA Environmental Management Plan
Client:	Port Hedland International Airport (PHIA)

Plan Number:
EP23-020(03)--F02

Drawn:	WJC
Date:	18/05/2023
Checked:	SPL
Approved:	TB
Date:	17/11/2023

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Metres

Scale: 1:30,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

Figure 6: Native Plants, TEC and Environmental Features

Project:	Environmental Management Plan PHIA Environmental Management Plan
Client:	Port Hedland International Airport (PHIA)

Plan Number:
EP23-020(03)--F05

Drawn:	WJC
Date:	18/05/2023
Checked:	SPL
Approved:	TB
Date:	17/11/2023

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GDA2020 MGA Zone 50

emerge ASSOCIATES

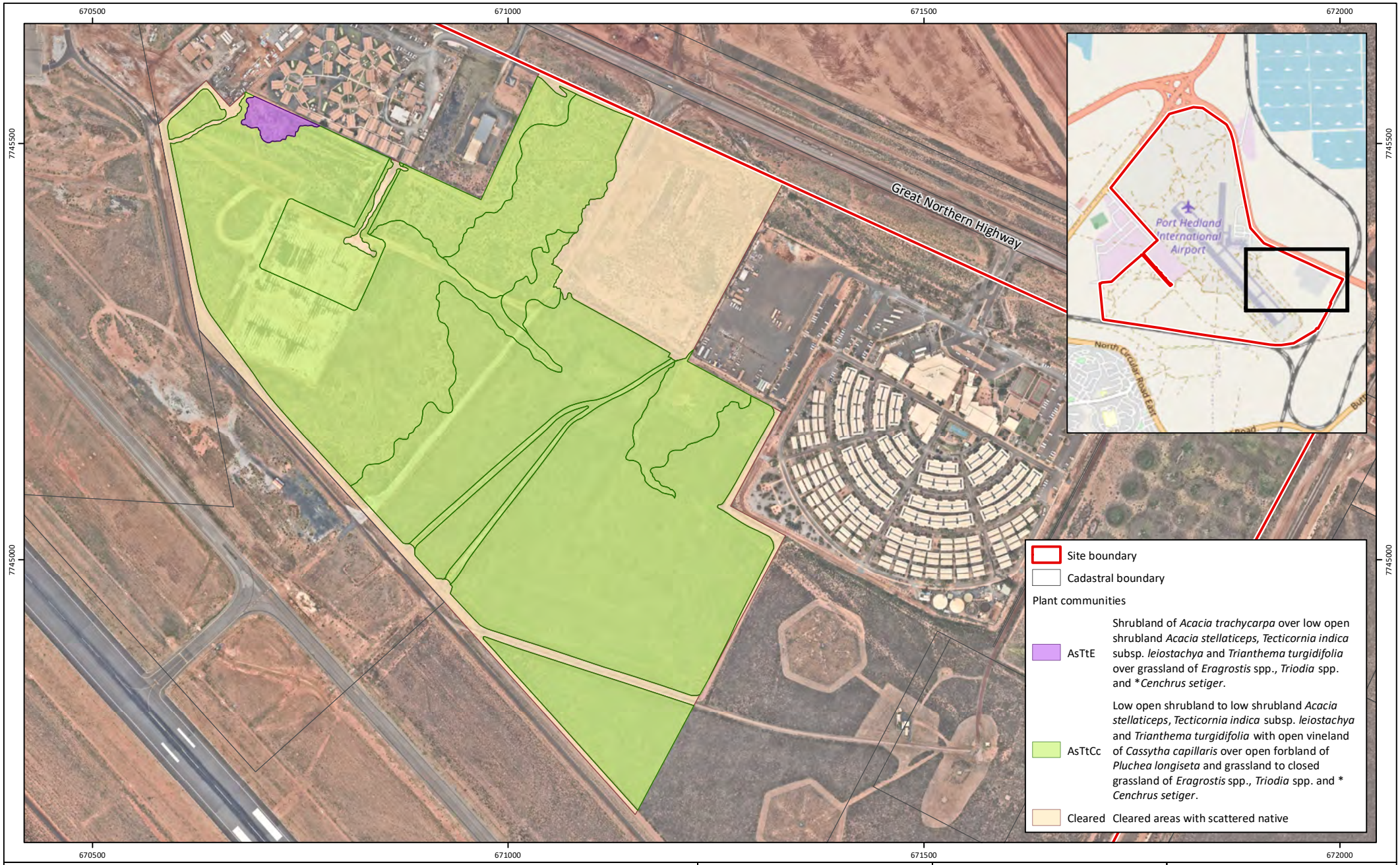

Figure 7: Plant Communities

Project: Environmental Management Plan
PHIA Environmental Management Plan
Client: Port Hedland International Airport (PHIA)

Plan Number:
EP23-020(03)--F11
Drawn: WJC
Date: 11/09/2023
Checked: SPL
Approved: TB
Date: 17/11/2023

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Scale: 1:6,000@A4
GDA2020 MGA Zone 50

emerge ASSOCIATES

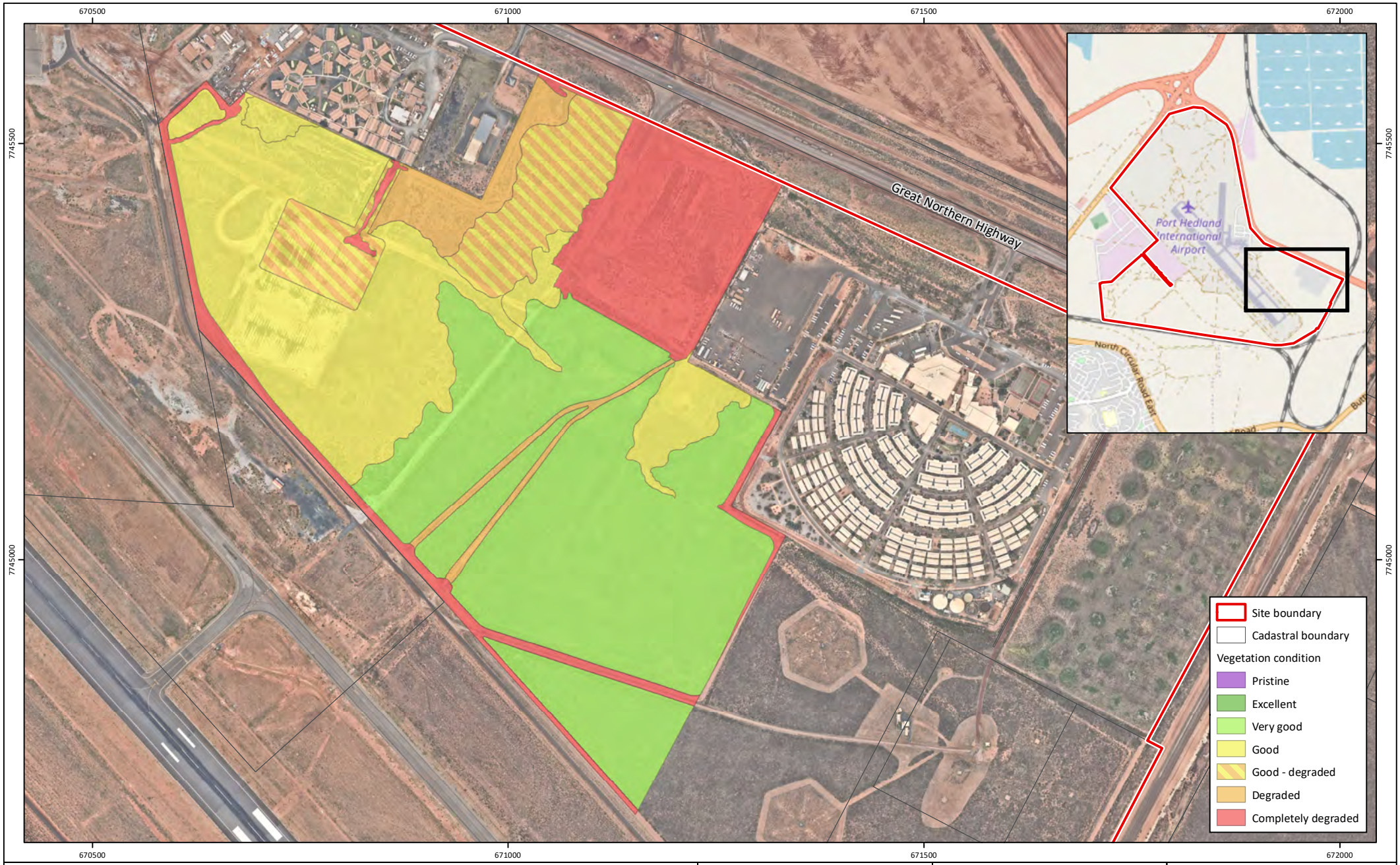

Figure 8: Vegetation Condition

Project:	Environmental Management Plan PHIA Environmental Management Plan
Client:	Port Hedland International Airport (PHIA)

Plan Number:
EP23-020(03)--F12

Drawn:	WJC
Date:	11/09/2023
Checked:	SPL
Approved:	TB
Date:	17/11/2023

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Scale: 1:6,000@A4

GDA2020 MGA Zone 50

emerge ASSOCIATES

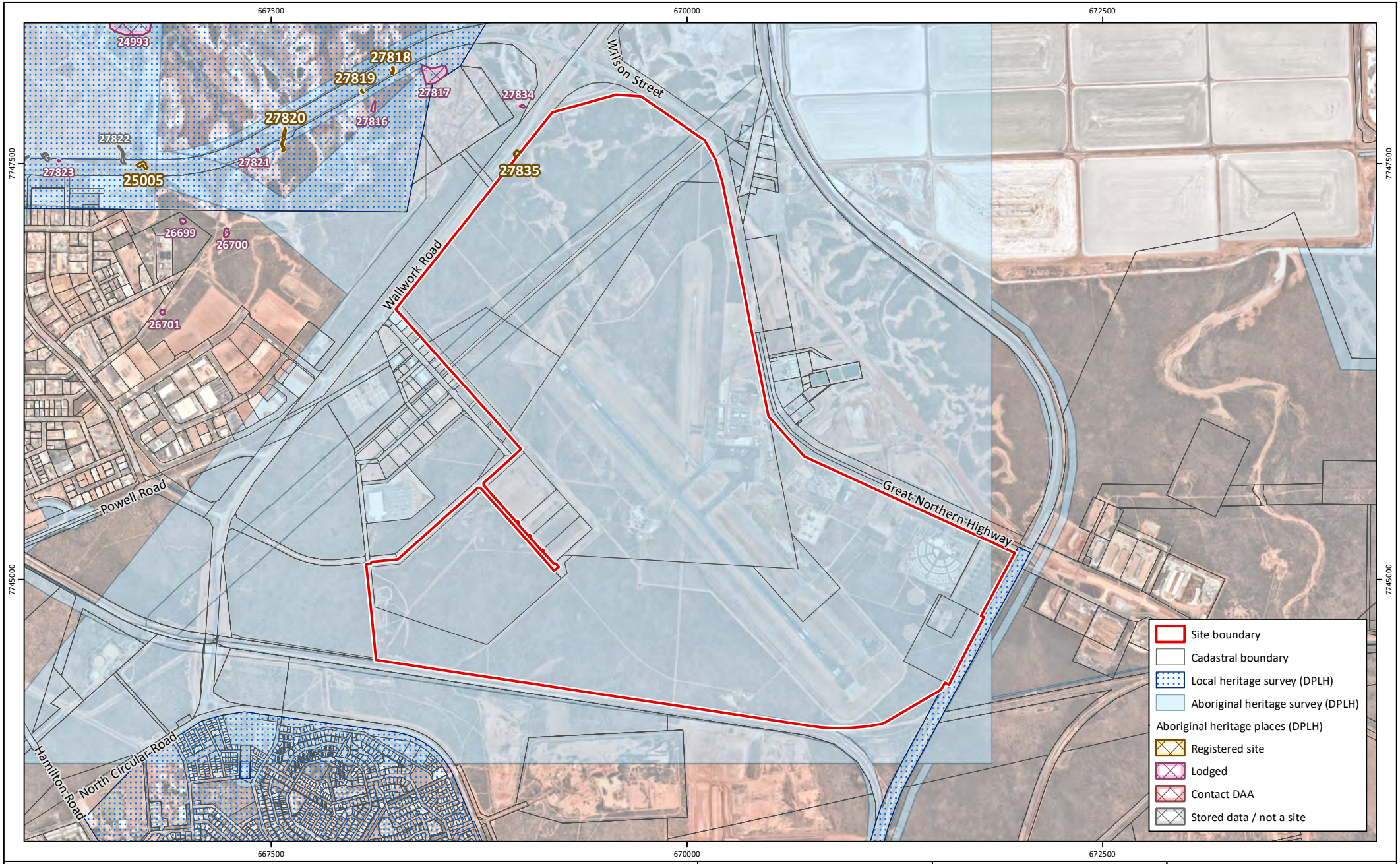

Figure 9: Heritage

Project: Environmental Management Plan
PHIA Environmental Management Plan
Client: Port Hedland International Airport (PHIA)

Plan Number:
EP23-020(03)--F06
Drawn: WJC
Date: 18/05/2023
Checked: SPL
Approved: TB
Date: 17/11/2023

N

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Metres
Scale: 1:30,000@A4
GDA2020 MGA Zone 50

emerge ASSOCIATES

Appendix A

Port Hedland International Airport Master Plan 2018 – 2038

Appendix B

Flora and Fauna Survey Port Hedland International Airport - Highway Precinct 2 (Emerge Associates 2018).

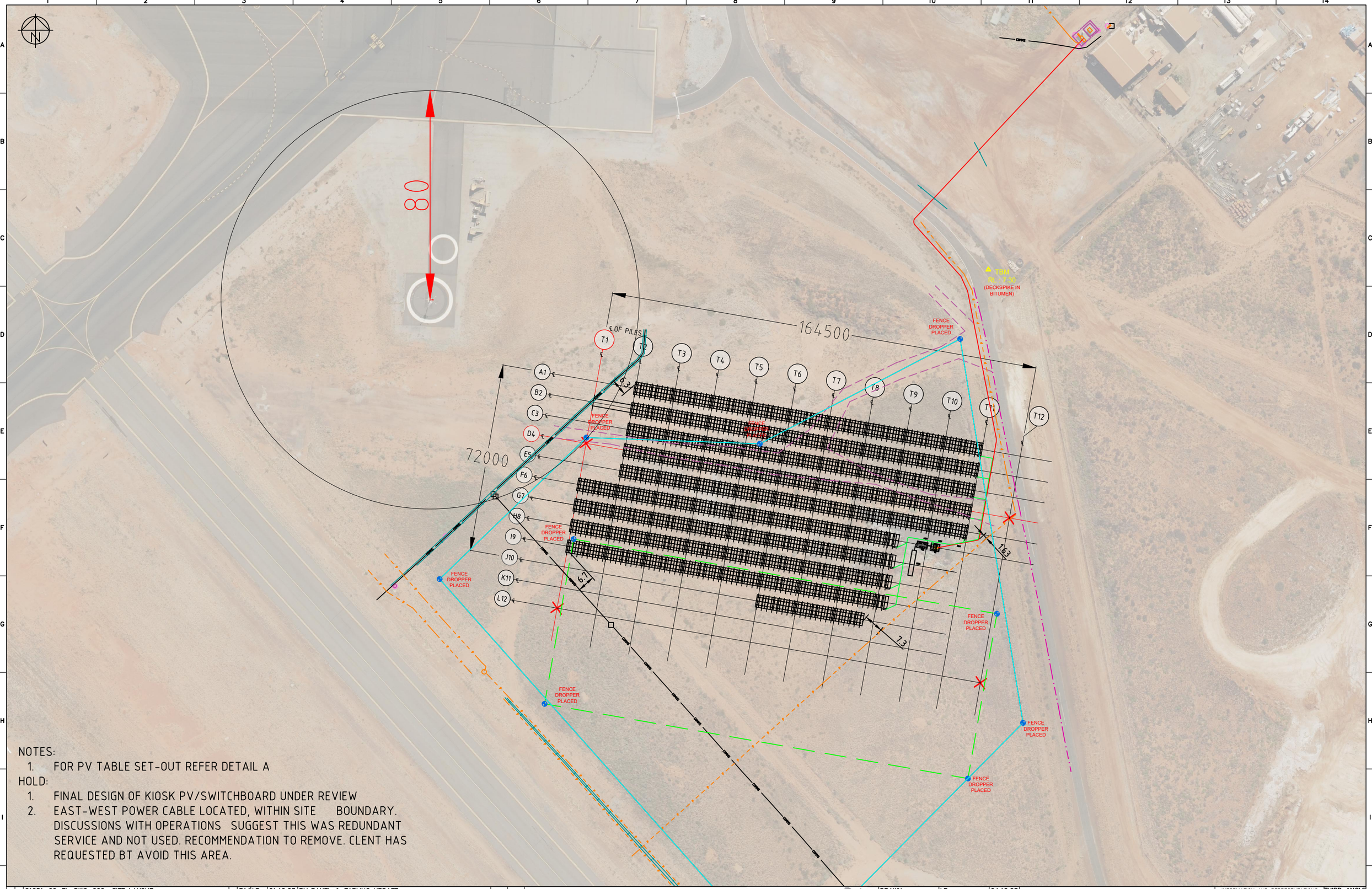
Appendix C

PHIA Environmental Risk Assessment

PORT HEDLAND INTERNATIONAL AIRPORT

PHE Risk Register - Environment

Code	Sub-Category	Risk Description (There is a risk that:)	Causes / Triggers (as a result of:)	Possible Consequences (which could lead to:)	Risk Tolerance (As determined by management)	Tolerance Value	Current measures which minimise the risk (Current risk controls in place and verified)	Assessment with current risk controls CON	Assessment with current risk controls LIK	Con Rating	Lik Rating	Overall Risk Score	Current Risk Rating	Rating Value	Current gap between actual current risk and risk tolerance	Person Responsible (Risk Owner)	Proposed measures to reduce the risk (Proposed risk controls as per Risk Treatment Plan)	Due by:	Revised assessment expected after proposed controls implemented CON	Revised assessment expected after proposed controls implemented LIK	Expected Residual Risk	Reduction Measures Overdue	
Environment																							
ENV 1	Environment	A hazardous material spill occurs at PHE	1. Inadequate training 2. Inadequate or inappropriate equipment 3. Ineffective management processes 4. Equipment failure 5. Inappropriate storage, handling , signage and usage 6. Inadequate policies and manuals	1. Pavement damage 2. Personal injury 3. Environmental impact (HAZMAT) 4. Closure of facilities 5. Financial impact 6. Disruption to operations 7. Loss of an aircraft / equipment 8. Reputation impact	Low	1	1. Aerodrome Operations Manual 2. Aerodrome Emergency Plan 3. ARFF availability and response 4. Training 5. Procedures 6. Storage processes (i.e. aviation fuel) 7. Communication protocols 8. Industry regulations and compliance requirements	Moderate	Possible	3	3	9	Medium	2	Higher		1. Identify and localise areas that spills could occur 2. provide training to those staff who respond to spill incidents 3. research best practice remediation techniques for spills in airports 4. maintaine and asset asset infrastructure to minimise failure 5. have all MSDS at hand and a spills procedure and contact information visible to staff		Minor	Unlikely	Low		Emerge explanation as identified by previous review but with better awareness and training this risk can be lowered.
ENV 2	Environment	Land is contaminated - historically or through incident Specifically, Asbestos, PFAS and PFOS and UXO	1. Inadequate training 2. Inadequate or inappropriate equipment 3. Ineffective management processes 4. Equipment failure 5. Inappropriate storage, handling , signage and usage 6. Historical reasons	1. Soil contamination 2. Personal inury 3. Environmental impact (HAZMAT) 4. Financial impact of remediation 5. Disruption to operations 6. Legilisative requirements and government compliance 7. Environmental consideration impacts to waterways, fauna, flora and soil	Low	1	1. Aerodrome Operations Manual 2. Aerodrome Emergency Plan 3. Training 4. Procedures 5. Remediation and mitigation for contaminated land 6. Government legislation and compliance requirements 7. Asbestos register 8. PFAS reviews	Moderate	Possible	3	3	9	Medium	2	Higher		1. Update manuals, policies and procedures 2. Development of an Environmental Management plan (EMP)(Currently draft) 3. Development of a Land Use plan (Currently draft) 4. Development of a Master plan (Currently draft) 5. Adequate on site training 6. Adhere to Department of Water and Environmental Regulation (DWER) Contaminated sites guidelines		Minor	Unlikely	Low		there is a possibilty that the event will occur and the liklihood may increase if construction happens and asbestosos is rquired to be remediated or PFAS levels become an issue.
ENV 3	Environment	PHE/ PHIA receives noise complaints associated with operations (i.e. aircraft and maintenance activities)	1. Aircraft maintenance ground runs 2. Helicopters doing pre-flight run ups 3. Helicopters not following designated routes 4. Wildlife control activities 5. Out of hours operations	1. Reputation impact 2. Unwanted government attention 3. Financial impact 4. Imposition of curfew/reduction in operational hours 5. Media attention 6. Reported to Air Services Australia	Low	1	1. Community engagement 2. Complaints Handling Policy 3. Helicopter procedures 4. Flight planning 5. Airspace management 6. Reported to Air Services Australia	Minor	Possible	1	3	3	Medium	2	Higher		1. Development of a Land Use plan (Currently draft) 2. Development of a Master plan (Currently draft) 3. Inclusion of Australian Noise Exposure Forecast (ANEF), Australian Noise Exposure Concept (ANEC) and Australian Noise Exposure Index (ANEI)		Minor	Unlikely	Low		based on records of complaints of noise being minimual to non existent
ENV 4	Environment	PHE/ PHIA does not manage its land use effectively	1. Inefficient land use planning 2. Ineffective consultation with possible land users 3. Ineffective communication and coordination with local authorities 4. Unauthorised use of land/ unauthorised land access	1. Environmental regulators inspections and potential fines 2. Aircraft delays 3. Impacts on local community leading to complaints 4. Financial impact 5. Increase in dust 6. Increase levels of erosion 7. Sediment impacting drains and waterways 8. Reputation impact 9. Media attention 10. Operational impact (obstacle limitations)	Low	1	1. Effective land use planning 2. Effective consultation with possible land users 3. Effective communication and coordination with local authorities 4. Effective erosion and dust management 5. TOPH Scheme and Application Approval	Moderate	Possible	3	3	9	Medium	2	Higher		1. Development of a Land Use plan (Currently draft) 2. Development of a Master plan (Currently draft)		Minor	Rare	Low		PHIA is aware of its requirement to manage landuse and the planning requirements by ToPH.
ENC 5	Compliance-Environment	PHE/ PHIA receives a non-compliance notice (and protential infringement) due to environmental practices	1. Inadequate management of environmental requirements 2. Inadequate/ineffective communication regarding environmental requirements 3. Inadequate/ineffective training regarding environmental requirements 4. Non-compliance with statutory requirements	1. Environmental regulators potential fines 2. Reputation impact 3. Financial impact 4. Aircraft delays 5. Media attention 6. Loss/ damage to physical Envt (Habitat)	Low	1	1. Effective training 2. Effective communication 3. Processes 4. Effective coordination and consultation 5. Proactive compliance with statutory requirements	Minor	Possible	1	3	3	Medium	2	Higher		1. Development of an Environmental Management Plan (EMP)(Currently draft) 2. Development of a Land use plan (Currently draft) 3. Development of a Master Plan (Currently draft) 4. Follow ESG framework		Minor	Rare	Low		With processes in place it would be rare for PHIA to make an error that requires a compliance matter if plans are followed.
ENV 6	Environment	Stormwater causes erosion and sedimentation issues	1. Ineffective stormwater infrastructure 2. Climate change flooding/cyclone 3. Ineffective maintenance and management of stormwater infrastructure	1. Flooding 2. Sedimentation 3. Erosion 4. Flora loss and habitat loss 5. Contamination of land	Low	1	1. Stormwater infrastructure management 2. Stormwater maintenance programs 3. Emergency management of spills within stormwater systems 4. Effective design and land use planning for new infrastructure	Moderate	Possible	3	3	9	Medium	2	Higher		1. Aerobic Treatment Units (ATU's) Sewage/ stormwater operation 2. Development of a Master Plan (Currently draft) 3. Regard for TOPH Flood mapping, groundwater and Better Urban Water Management (BUWM) guidelines		Minor	Possible	Medium		regarding stormwater the liklihood of this event remains possible. As long as the design can mitigate the risk, then it will continue to be a risk reduction measure
ENV 7	Environment	Loss of native vegetation or fauna on airport land	1. Land disturbance through development activities 2. Land disturbance through natural causes such as fire and flood 3. Inadquate training regarding flora and fauna 4. Lack of information via flora and fauna surveys 5. Lack of compliance with statutory approvals	1. Prosecution through statutory approval processes 2. Loss of habitat for threatened fauna 3. Loss of threatened flora 4. Delayed future development approvals	Low	1	1. Effective land use planning 2. Effective consultation with possible land users 3. Effective communication and coordination with local authorities 4. Flora and Vegetation Management Plans 5. Fauna survey and management plan - in particular the Brush tailed mulgara. 6. Statutory local, state and federal environmental approvals.	Moderate	Unlikely	3	1	3	Medium	2	Higher		1. Undertake detailed Flora and Fauna Surveys with particular reference to the Brush tailed mulgara 2. Follow requirements as per Development planning processes 3. Implement Environmental management Plan		Minor	Unlikely	Low		with the EMP being written the risk here is lowered and undertaking detailed flora and fauna surveys before development further reduces this risk.
ENV 8	Environment	Pest and Disease encoachment into airport land including weeds, dieback and foot and mouth disease	1. Importation of foreign materials such as soil or vegetative matter that isn't screened or certified as pathogen free 2. Illegal dumping 3. Illegal access 4. Biosecurity breach 5. Known disease (E.g Foot and Mouth disease)	1. Loss of important habitat and vegetation 2. Financial cost of weed management 3. Ongoing management and maintenance of areas 4. Restrictive movement of vehicles due to dieback presence	Low	1	1. Implement PHIA environmental management plan 2. Secure airport site with fencing/security 3. Only import accredited and certified weed and pathogen free soil 4. Effective communication and training initiatives on weed identification 5. Maintenance of weed management 6. Biosecurity SOPs and Procedures	Moderate	Possible	3	3	9	Medium	2	Higher		1. Implement biosecurity operation plans, measures and controls 2. Continue standardised airport biosecurity practices 3. Implement the Environmental Management Plan		Moderate	Possible	Medium		I don't think you can reduce the biodsecurity risk. You may want to separate out this risk from weeds and disease as it will make these two issues higher in risk rating.
ENV 9	Environment	Waste Management generated from the PHIA is not reduced and therefore Airport operations is not sustainable and adhering to ESG principles.	1. Waste plastic generation increases 2. Recycling of waste decreases 3. Visible litter is evident around the airport	1. ESG targets not met 2. increased financial costs for waste management 3. reputation risk	Low	1	1. Implement PHIA waste management plan 2. Education programs on waste production and recycling 3. Integration into strategic documents and operational practices			1	1	1	Low	1	Matched		1. Develop a Sustainability Plan 2. Due regard for Carbon Footprint and Emissions 3. Develop a Waste Management Plan 4. Reach ESG and GRESB targets		Minor	Unlikely	Low		Depending how the targets are reached with ESG and GRESB, this may reduce more. Waste and emissions may want to be separated out as they could be managed as different risks.
ENV 10	Environment	Aboriginal Heritage sites are disturbed	1. Disturbance to ground during develoment or maintenance activities 2. Disturbance due to an airport incident	1. Aboriginal community negative response 2. reputational risk 3. Financial compliance penalities 4. Government scrutiny on compliance 5. ongoing management to minimise further risk of disturbance	Low	1	1. Recognise and respect aboriginal site outlined in the Environmental Management Plan 2. conduct an aboriginal site survey prior to any ground disturbance activities 3. compliance with the Aboriginal Cultural Heritage Act 2021 and associate regulations and guidelines 4. Engage and communicate with local aboriginal elders and knowledge holders.	Minor Major	Unlikely Rare	4	1	4	Medium	2	Higher		1. Develop a Due Diligence Assessment (DDA) under the Aboriginal Cultural Heritage act 2. Refer to Cultural Heritage Management Plan for PHIA (2017) 3. Review and be aware of new legislation soon to be implemented (Aboriginal Cultural Heritage Act 2021)		Moderate	Rare	Low		By following the ACHA legislation, this will reduce the risk.



NOTES:

1. FOR PV TABLE SET-OUT REFER DETAIL A

HOLD:

1. FINAL DESIGN OF KIOSK PV/SWITCHBOARD UNDER REVIEW
2. EAST-WEST POWER CABLE LOCATED, WITHIN SITE BOUNDARY. DISCUSSIONS WITH OPERATIONS SUGGEST THIS WAS REDUNDANT SERVICE AND NOT USED. RECOMMENDATION TO REMOVE. CLENT HAS REQUESTED BT AVOID THIS AREA.

SHEET SIZE A1

REFERENCES

C1051-00-EL-DWG-002 SITE LAYOUT
C1051-00-EL-DWG-003 EQUIPMENT LAYOUT
C1051-00-EL-DWG-004 ELEVATIONS

REVISIONS

REV	BY	DATE	DESCRIPTION	CKD	APP
P14	LR	01.12.23	PV PANEL & TABLING UPDATE.		
			ISSUED FOR CLIENT APPROVAL.		
P15	LR	04.12.23	UPDATED TO OPTIMISE PV SYSTEM PERFORMANCE		

DRAWN	LR	04.12.23
CHECKED		
ENGINEERING		
APPROVED		
APP. FOR CONST.		

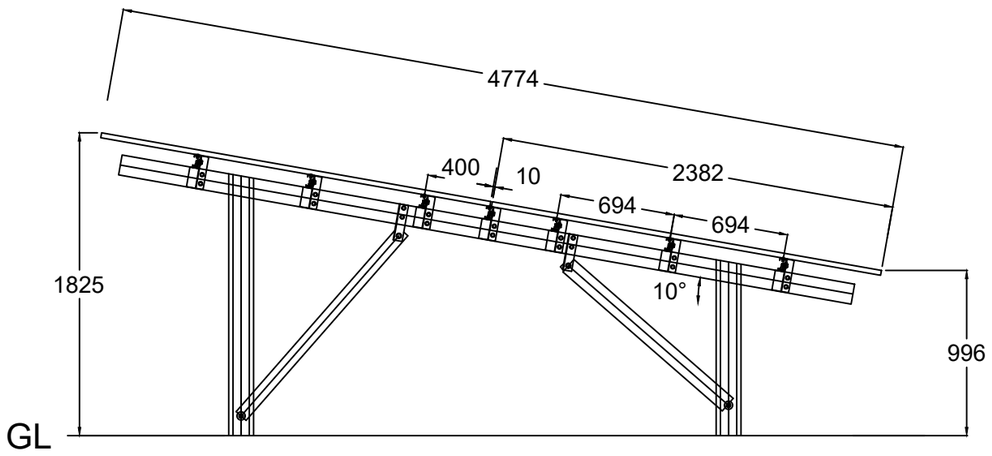
THIRD ANGLE PROJECTION

C1051 – EKISTICA
PORT HEDLAND INTERNATIONAL AIRPORT
HYBRID POWER PLANT
SITE GENERAL ARRANGEMENT

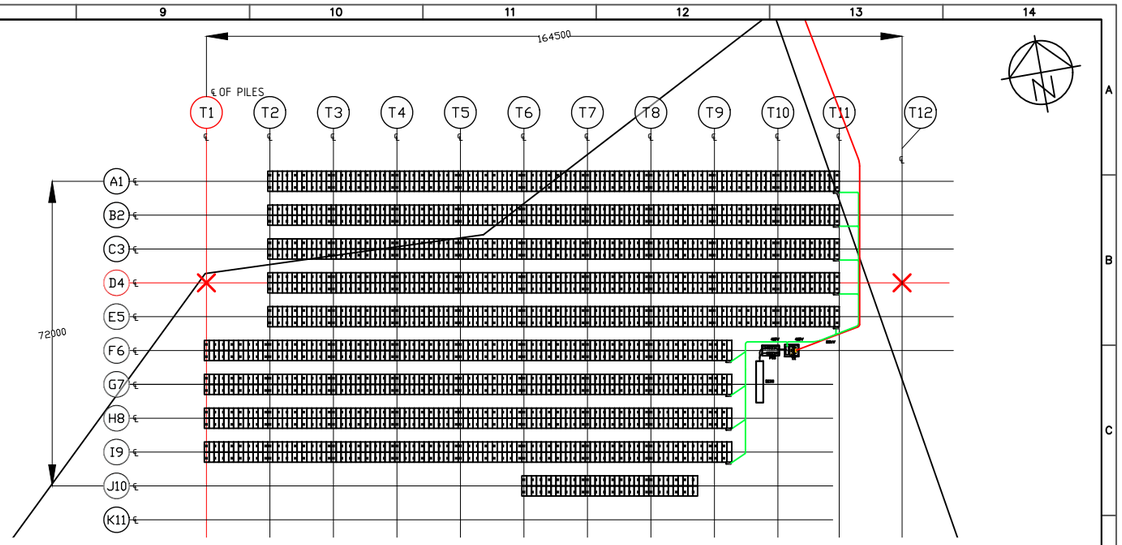
SCALE NTS

DRAWING NUMBER C1051-00-EL-DWG-001 REV P15

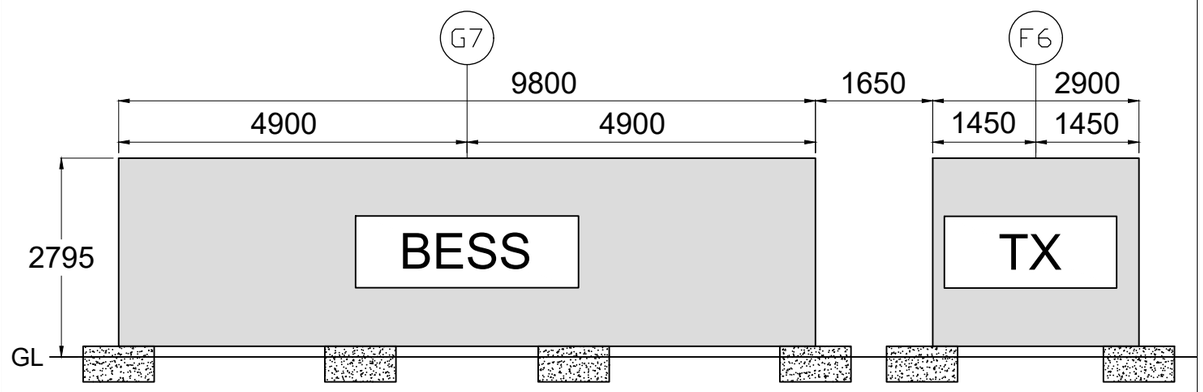
PROJECT NUMBER C1051



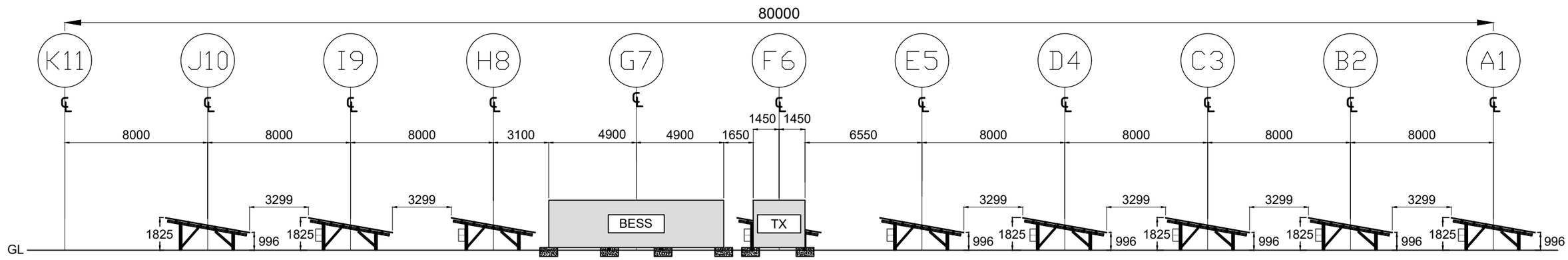
ELEVATION - PV TABLE - LOOKING WEST



SITE OVERVIEW



ELEVATION - BESS SYSTEM - LOOKING WEST



ELEVATION - SITE LAYOUT - LOOKING WEST

SHEET SIZE A1 REFERENCES	
C1051-00-EL-DWG-001 – SITE GENERAL ARRANGEMENT	
C1051-00-EL-DWG-002 – PV ARRAY AREA GA	
C1051-00-EL-DWG-003 – BESS & KIOSK AREA GA	

REVISIONS					
P1	LR	01.11.23	FOR PLANNING SUBMISSION	KR	
P2	LR	21.11.23	UPDATE TO ALIGN WITH SITE LAYOUT P13 DUE TO CLIENT	KR	
			REQUESTED LAYOUT CHANGES		
P3	LR	22.11.23	ADDITION OF PV INVERTERS	KR	
P4	LR	07.12.23	UPDATE TO ALIGN WITH CLIENT APPROVED P15 LAYOUT	KR	
REV	BY	DATE	DESCRIPTION	CKD	APP

DRAWN	LR	07.12.23
CHECKED	KR	07.12..23
ENGINEERING		
APPROVED		
APP. FOR CONST.		

THIRD ANGLE PROJECTION

C1051 – EKISTICA
PORT HEDLAND INTERNATIONAL AIRPORT
HYBRID POWER PLANT
ELEVATIONS

SCALE NTS
DRAWING NUMBER C1051-01-EL-DWG-004
REV P4
PROJECT NUMBER C1051