Mackay Sulphate of Potash Project: Flora and Vegetation Environmental Management Plan

PREPARED FOR AGRIMIN April 2024

We design with community in mind

Stantec

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APPROVED FOR ISSUE BY

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19 April 2024

Revision Schedule

Rev No	Date	Description	Signature of Typed Name (documentation on file)			
			Prepared by	Checked by	Reviewed by	Approved by
V1.0	21/7/2023	FVEMP	S. Puglisi	P. Bolton	F. Taukulis	F. Taukulis
V2.0	19/4/2024	FVEMP incorporating feedback from EPA (DWER) and DCCEEW.	S. Puglisi C. Roberts	P. Bolton	F. Taukulis I. Kenwery	F. Taukulis I. Kenwery

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Abbreviations

Enter Abbreviation	Enter Full Name
ACAR	Annual Compliance Assessment Report
AERs	Annual Environmental Reports
Agrimin	Agrimin Limited
BC Act	Biodiversity Conservation Act
CCWA	Conservation Council of Western Australia
СЕМР	Construction Environmental Management Plan
DBCA	Department of Biodiversity, Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DFES	Department of Fire and Emergency Services
DMIRS	Department of Mines, Industry Regulation and Safety
DMP	Dust Management Plan
DWER	Department of Water and Environmental Regulation
EPA	Environmental Protection Authority
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999
ERD	Environmental Review Document
ERT	Emergency Response Team (ERT)
ESD	Environmental Scoping Document
FVEMP	Flora and Vegetation Environmental Management Plan
FVHMP	Flora and Vegetation Health Monitoring Program
GDV	groundwater dependent vegetation
ha	hectare
IF	Indicative Footprint
IPA	Indigenous Protected Areas
IUCN	International Union for Conservation of Nature
km	kilometre
m	meters
МСР	Mining Closure Plan
MNES	Matter of National Environmental Significance
NIDE	Northern Infrastructure Development Envelope
NP	Night Parrot
Monitoring Program	Night Parrot Monitoring Program
NPMP	Night Parrot Management Plan
NT	Northern Territory
Off-LDE	Off Lake Development Envelope
On-LDE	On Lake Development Envelope
PEC	Priority Ecological Community
PER	Public Environmental Review
SIDE	Southern Infrastructure Development Envelope



Enter Abbreviation	Enter Full Name
SMP	Science and Monitoring Plan
TEC	Threated Ecological Community
TF	Terrestrial Fauna
TFEMP	Terrestrial Fauna Environmental Management Plan
то	Traditional Owners
WA	Western Australian
WAH	Western Australian Herbarium
WoNS	Weeds of National Significance



Executive Summary

Table ES 1 summarises the purpose of the Flora and Vegetation Environmental Management Plan (FVEMP) and Monitoring Program within the context of the Western Australia Environmental Protection Authority (EPA) objectives for the key environmental factor of Flora and Vegetation (EPA, 2016a). The FVEMP and Monitoring Program also aligns with the (EPA, 2021) and (Commonwealth of Australia, 2014) Environmental Management Plan Instructions and Guidelines. The FVEMP and Monitoring Program has been prepared for the Agrimin Proposal for Lake Mackay.

This EMP specifically addresses the Flora and Vegetation environmental factor associated with the Proposal.

Summary **Table ES 1** below presents the environmental outcomes and objectives for the environmental factor to be met through implementation of this FVEMP, as well as the environmental criteria and management targets to measure achievement of the associated environmental outcomes and objectives.

Item	Description
Proposal Title	Mackay Sulphate of Potash Project (the Proposal)
Proponent Name	Agrimin Limited (Agrimin)
Ministerial Statement number	N/A- Under Assessment
Key Environmental Factor and Objectives	Flora and Vegetation: The EPA Objective for Flora and Vegetation is ' <i>To protect flora and vegetation so that biological diversity and ecological integrity are maintained</i> (EPA, 2016a). The proponent shall manage the operations of the Proposal to meet the following Outcome-based and Objective-based management provisions.
Purpose of the FVEMP	Development of a framework to ensure potential impacts on flora and vegetation from the Proposal are avoided to the maximum extent practicable by:
	• Identify the risks and potential impacts from the Proposal on significant flora and vegetation within the Proposal Area.
	• Outline management provisions for significant flora and vegetation, to avoid and minimise potential impacts to populations within the Proposal Area.
	• Provide Monitoring Programs for riparian vegetation, potentially ground water dependent tree health (<i>Allocasuarina decaisneana</i>) and Night Parrot habitat (<i>Triodia</i> hummocks).
	• Propose corrective actions if triggers and thresholds are exceeded to avoid adverse project-related impacts to flora and vegetation.
Outcome-based Management Provisions	• FV1 : No significant decline in the health of riparian vegetation (lake margin complex - Night Parrot critical habitat) or trees that may be utilising groundwater (<i>Allocasuarina decaisneana</i>) as a result of:
	 Uncontrolled discharge of saline water;
	 Changes in inundation regime;
	- Groundwater abstraction; or
	• FV2 : No significant decline in the health of vegetation supporting:
	 Priority flora Stackhousia sp. Lake Mackay (P.K. Latz 12870) (P1) within the riparian zone, from:
	 Uncontrolled discharge of saline water;
	 Changes in inundation regime;
	 Groundwater abstraction; or
	 Sedimentation.
	 Critical Night Parrot Habitat (where the populations are intersected by the Haul Road), from:

 Table ES 1: Summary and Purpose of the Flora and Vegetation Environmental Management Plan and Monitoring

 Program.

Changes to altered surface hydrology.



Item	Description		
	• FV3: No project-related adverse impacts to significant (priority) flora species from project-related clearing:	s	
	 Stackhousia sp. Lake Mackay (P.K. Latz 12870) (Priority 1) and Comesperma sabulosum (Priority 3). 		
	• FV4: No proliferation or introduction of new weed species rated as high o very high management priority by DBCA in the Proposal Area as a result o the Proposal.	r of	
	• FV5: No introduction of weed species rated as high or very high management priority by DBCA within the habitat for the Night Parro populations as a result of the Proposal.	า ot	
	• FV6: No net increase in the baseline extent of weed populations within the Proposal area as a result of the implementation of the Proposal.	е	
	• FV7: No new populations of a weed species compared to baseline weed mapping within the Proposal Area.	b	
Objective-based Management Provisions	• MO1 : No project-related adverse impacts to native vegetation or significan (priority) flora species <i>Stackhousia</i> sp. Lake Mackay (P.K. Latz 12870 (Priority 1) and <i>Comesperma sabulosum</i> (Priority 3), from project-related clearing:	nt) d	
	 Clearing not to exceed 1,500 ha of flora and vegetation (the combined total of 200 ha of native vegetation within the 688 ha Off-LDE, and 300 ha of native vegetation within the 11,799 ha SIDE and 1,000 ha of native vegetation within the 33,928 ha NIDE). 	к 0	
	 No significant decline to native vegetation supporting significant (Priority) flora species Stackhousia sp. Lake Mackay (P.K. Latz 12870 (Priority 1) and <i>Comesperma sabulosum</i> (Priority 3), from project- related clearing. 	1)	
	MO2 : No project-related impacts to vegetation from a decline in vegetation healt (including riparian vegetation associated with critical habitat for the Nigh Parrot), or trees that may be utilising groundwater (<i>Allocasuarina</i> <i>decaisneana</i>) from:	า it a	
	 Uncontrolled discharge of saline water; 		
	 Project-related drawdown from groundwater abstraction; 		
	 Monitoring of groundwater levels as per the IWEMP in the vicinity of potentially sensitive receptors. 	İ	
	 Changes to surface hydrology; or 		
	 Changes to water flows during inundation: 		
	 Verification of detailed hydrological modelling of surface wate flows, including simulation 1:100-year rainfall events in place (a detailed in the IWEMP); 	s IS	
	 Staged development of trenches via BMUs and engineering design (1 km spacing, install crossovers) to maintain natural hydrologica processes; 	n al	
	 No adverse project-related impacts to surface hydrology (excluding on-lake operations) and water flows resulting in significan disturbance and decline of vegetation; and 	g it	
	 Groundwater abstraction not to exceed groundwater licence limit 	t.	
	• MO3 : No proliferation or introduction of new weed species rated as high o very high management priority by DBCA in the Proposal Area as a result o the Proposal:	or of	
	 No introduction of new weed species rated as high or very high management priority by DBCA in the Proposal Area as a result of the Proposal. 	1	

Item	Description
	 Weed management programs should be designed in accordance with relevant EPBC Act weed threat abatement plans.
	 Weed management procedures informed by best practice management of the weed species identified during weed baseline surveys.
	 Weed control measures implemented for Buffel Grass in Night Parrot avoidance buffer zones in accordance with the Weed Management Plan.
	 No net increase in the baseline extent of weed populations within the Proposal area as a result of the implementation of the Proposal.
	• MO4 : No significant project-related decline in flora and vegetation health or and vegetation types supporting significant priority flora <i>Stackhousia</i> sp. Lake Mackay (P.K. Latz 12870) (Priority 1) and <i>Comesperma sabulosum</i> (Priority 3), from Project-related unplanned fire events:
	 Provision and maintenance of firefighting equipment in accordance with the relevant fire safety standards.
	 Firefighting emergency response plan and procedures are in place.
	• MO5 : No significant project-related decline in flora and vegetation health to vegetation types supporting significant Priority flora <i>Stackhousia</i> sp. Lake Mackay (P.K. Latz 12870) (Priority 1) and <i>Comesperma sabulosum</i> (Priority 3), vegetation supporting critical Night Parrot habitat from:
	 Discharge or seepage of untreated wastewater;
	 Increased soil salinity from uncontrolled discharge of saline water.
	 Dust deposition, and
	 Hydrocarbon and chemicals spills.
	 Hazardous Substances Management Plan (HSMP) and Procedure implemented.
	 Spill response training for all personnel and contractors.
	 Spill response equipment provided for all site vehicles (including on all Haul Trucks).
	 Dust management plan in place.
	 Dust suppression measures in place.
	 Implement speed limits on unsealed tracks.
Condition Clauses	N/A - Under Assessment
Key Components of the FVEMP	Key provisions are detailed in Section 3 .
Proposed Construction Date	N/A
FVEMP required pre-construction?	Yes

Corporate endorsement

I hereby certify that to the best of my knowledge, the provisions within this Agrimin Sulphate of Potash Project Flora and Vegetation Environmental Management Plan are true and correct.

Name: Ingrid Kenwery

Signed:

Designation: Environment Manager

Date: 19 April 2024



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- Appendix D Weed Monitoring Program
- Appendix E Weed Management Procedure
- Appendix F Weed Control Procedure
- Appendix G Weed Hygiene Procedure
- Appendix H Weed Monitoring Form
- Appendix I Weed Identification Checklist

1 Context, Scope and Rationale

1.1 Proposal Background

Agrimin Limited (Agrimin) proposes to develop and operate a greenfields potash fertiliser operation, the Mackay Sulphate of Potash Project (the Proposal), approximately 450 kilometres (km) south of Halls Creek, adjacent to the Western Australian (WA) and Northern Territory (NT) borders (**Figure 1-1**). The Proposal involves the extraction of brine from a network of shallow trenches established on the surface of Lake Mackay. The brine will be transferred into evaporation ponds for the precipitation of salt which will be harvested and then processed to produce a potash fertiliser product.

Disturbance of the lake's surface and clearing of native vegetation are required for Proposal development. The Proposal is remote and extensive (263,675 ha) and comprises four Development Envelopes shown in **Figure 1-1**. The following areas and applicable terms relevant to the Proposal and this Terrestrial Fauna Management Plan (FVEMP) are outlined below:

- Study Area refers to the boundary within which all investigations and field surveys were undertaken (443,985 ha), extending beyond the Proposal Area.
- Proposal Area The combined area in which the four Development Envelopes are contained.
- Development Envelopes the boundary within which the elements of the Proposal are situated. The Development Envelopes occur entirely within the Study Area and comprise four components that make up the Proposal. The Proposal includes disturbance of up to 15,000 hectares (ha) of the lake's surface and clearing of approximately 1,500 ha of native vegetation. The proposed extent of the physical and operational elements includes four development envelopes (Figure 1-1) as follows:
 - On-lake Development Envelope (On-LDE): On-lake development of trenches, extraction of up to 100 GL/a of brine, and solar evaporation and harvesting ponds for potash salts, including ground disturbance of approximately 15,000 ha with the 217,261 ha On-LDE.
 - Off-Lake Development Envelopes (Off-LDE): Off-lake development of a processing plant and associated site infrastructure, including access roads, accommodation camp, airstrip, and solar farm, including clearing of approximately 200 ha of native vegetation within the 688 ha Off-LDE.
 - Southern Infrastructure Development Envelope (SIDE): Development of borefield, water pipeline and access tracks for abstracting up to 3.5 GL/a of processing water and off-lake access to Lake Mackay including clearing of approximately 300 ha of native vegetation within the 11,799 ha SIDE.
 - Northern Infrastructure Development Envelope (NIDE): Haul road for trucking potash product to Wyndham Port, including clearing of approximately 1,000 ha of native vegetation within the 33,928 ha NIDE.
- Indicative Footprint (IF) the area that is proposed to be directly disturbed by the Proposal. The layout of the IF may change; however, the total disturbance will not exceed the maximum disturbance for each Development Envelope. Proponent-led avoidance and mitigation measures have been implemented where possible to minimise potential impacts to areas of high ecological or heritage value through the detailed design of the IF.

1.2 Key Environmental Factors

The Proposal was referred to the Western Australian (WA) Environmental Protection Authority (EPA) on 02/01/2019 and the EPA determined the Proposal required a Public Environmental Review (PER) level of assessment on 30/01/2019. The EPA approved an Environmental Scoping Document (ESD) on 10/09/2020 identifying key environmental factors, including Terrestrial Fauna.

The Environmental Review Document (ERD) submitted to the EPA on 11/04/2022 was followed by a public review period that closed on 30/05/2022. The Proposal is currently being assessed under an accredited process by the State Government (EPA Assessment Number 2173) and the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW). As the Proposal is still under assessment, a Ministerial Statement has not yet been issued.

The EPA objective for Flora and Vegetation is to 'protect flora and vegetation so that biological diversity and ecological integrity are maintained." (EPA, Environmental Protection Authority, 2016b). Comprehensive surveying and environmental impact assessment (EIA) identified potential impacts to flora and vegetation from the Proposal, detailed within the ERD. None of the flora species identified in relation to the Proposal are Matters of National Environmental Significance (MNES), listed under the EPBC Act 1999.



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Figure 1-1: The Proposal Area, Development Envelopes and Study Area.



1.3 Purpose and Framework

The purpose of the FVEMP and monitoring programs (Appendix B) are to:

- Ensure that the Proposal is carried out in a manner that minimises the direct and indirect impacts to flora and vegetation;
- Ensure there is no direct or indirect adverse impacts to significant flora or vegetation within the Proposal Area and immediate surrounds; and
- To actively engage with Traditional Owner (TO) groups, building capacity for Indigenous Ranger involvement, where possible.

This will be addressed by ensuring potential impacts to flora and vegetation from the Proposal are avoided to the maximum extent practicable by:

- Identifying the risks and potential impacts from the Proposal on flora and vegetation;
- Outlining management provisions for flora and vegetation, to avoid and minimise potential impacts to significant flora and vegetation;
- Preparing and implementing monitoring programs for vegetation and tree health within the Proposal Area and at regional reference locations; and
- Proposing corrective actions and response actions if triggers and thresholds are exceeded to avoid impacts to vegetation.

1.4 Rationale and Approach

Agrimin is committed to avoiding and minimising potential impacts caused by the operations of the Proposal to flora and vegetation and their associated habitats to ensure the biodiversity and ecological integrity and function of flora and vegetation are maintained. The Proposal has been designed to avoid impacts to key environmental factors located within the footprint.

The FVEMP focuses on outcome-based management provisions including monitoring and evaluating success of management actions with respect to flora and vegetation within the Development Envelope, driven by triggers and thresholds. Assessment of the path ways over which impacts may occur provides the rationale for choice of provisions and choice of appropriate indicators to measure against the environmental outcome an d/or objective.

This FVEMP is subject to approval by the EPA and Department of Climate Change, Energy, the Environment and Water (DCCEEW) and will subsequently be implemented. Any reporting for the FVEMP will be undertaken in accordance with the DCCEEW Departmental Policy – (DoE, 2016c) Sensitive Ecological Data – Access and Management Policy, where applicable.

1.5 Documentation

1.5.1 Legislation, Policy and Guidance

This FVEMP has been written in accordance with Western Australian (WA) and Commonwealth Policy and Guidance, including:

- Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures 2016; (EPA, Environmental Protection Authority, 2021a)
- Instructions on how to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans; (EPA, 2024)
- Environmental Impact Assessment (Divisions 1 and 2) Procedures Manual (EPA, Environmental Protection Authority, 2021b);
- Environmental Management Plan Guidelines (Commonwealth of Australia, 2014);
- Outcomes-based conditions policy (DoE, 2016b);
- Outcomes-based conditions guidance (DoE, 2016a);
- Environmental Factor Guideline Terrestrial Flora (EPA, Environmental Protection Authority, 2016a);
- Biosecurity and Agriculture Management Act 2007 (WA);
- Biodiversity Conservation Act 2016 (WA); and
- Rights in Water and Irrigation Act 1914 (WA).



1.5.2 Plans and Strategies

The following management plans and strategies are also relevant to the FVEMP, specific to the Proposal and include:

- Terrestrial Fauna Environmental Management Plan (TFEMP) (Stantec, 2023).
- Construction Environmental Management Plan (CEMP) (Stantec, 2024a).
- Night Parrot Management Plan (NPMP) (Stantec, 2024b); and
- Mackay Sulphate of Potash Project Revised Offsets Strategy (Offset Strategy) (including relevant approved Offset Proposals, Research Proposals for the Night Parrot) (Stantec, 2024c).

State and Commonwealth plans and management prescriptions that are relevant to flora and vegetation include:

 Matters of National Environmental Significance. Significant impact guidelines 1.1 - Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth of Australia, 2013).

1.6 Indigenous Protected Areas

The Proposal traverses three Indigenous Protected Areas (IPAs) comprising the Tjurabalan, Ngururrpa and Kiwirrkura IPAs (**Figure 1-1**). IPAs are voluntarily dedicated by indigenous groups on indigenous owned or managed land or sea country, in accordance with Traditional Owner objectives. They are recognised by the Australian Government as an important part of the National Reserve System, protecting the nation's biodiversity for the benefit of all Australians.

The Ngururrpa IPA is managed by Traditional Owners through their prescribed body corporate, the Parna Ngururrpa Aboriginal Corporation and includes most of the haul road and the Proposal's NIDE. It is bounded by the Tjurabalan IPA to the north and the Kiwirrkurra IPA (Tjamu Tjamu Aboriginal Corporation) to the south, the latter of which comprises part of Lake Mackay (On-LDE). The three IPAs contribute to a contiguous network of protected areas throughout the region.

The IPAs are managed to protect biodiversity and cultural resources, based on indigenous perspectives of connecting and looking after country, complemented by western knowledge and management principles (Tjamu Tjamu Aboriginal Corporation, 2014). They are supported by a number of strategies including the Ngururpa IPA – Plan for Country 2020-2025 (Parna Ngururpa, 2019) and Kiwirrkurra IPA – Plan for Country (Tjamu Tjamu Aboriginal Corporation, 2014). These plans outline management actions to protect natural and cultural values, and provide a range of economic, educational, health and wellbeing benefits for communities. There is also a focus on Traditional Owners working collaboratively with scientists to undertake fauna surveys and monitoring, increase conservation experience, and protect habitat and manage feral animals.

Agrimin also have a Native Title Agreements (NTA) in place for the Parna Ngururrpa, Tjamu Tjamu and Tjurabalan Peoples'. Commitments in these NTAs focus on consultation and reasonable endeavours, to avoid adverse impacts to the environment or areas of cultural concern from the Proposal. In addition, Agrimin will provide opportunities for engagement in environmental surveys and monitoring, and the management of feral animals and fire. These measures align with the management provisions applied in this FVEMP.

All three IPA determinations are of relevance to the FVEMP, and specifically the haul road of the Proposal's NIDE.

2 Flora and Vegetation

2.1 Surveys

The Study Area, which totals 443,985 ha, encompasses the entire Proposal Area (263,675 ha) and is a consolidation of the previous survey areas for the Proposal. The Proposal Area and local surrounds (the Study Area) has been the subject of five flora and vegetation surveys commissioned by Agrimin for the Proposal. This large body of work included level 1 and level 2 flora and vegetation surveys, as well as specific riparian vegetation surveys between 2016 and 2021 (**Table 2-1**). In addition, from 2001 to 2018, two regional surveys have been conducted that overlap the Study Area and provide additional local and regional context (Stantec, 2021b). The consolidation of all previous work (vegetation mapping, survey effort and survey findings) is detailed in the ERD and summarised below.

Across all surveys conducted for the Proposal, there were a total of 216 quadrats, 42 relevés and 30 transects sampled. Vegetation types were described and mapped using the data collected from quadrats and relevés, and in-field observations. Mapping notes (brief annotations of dominant species, stratum, and other habitat attributes) were recorded to refine the descriptions. Vegetation condition was mapped according to vegetation type boundaries, using a combination of quadrat and relevé data, opportunistic observations, and the mean condition rating for each vegetation type.



Table 2-1: Summary of flora and vegetation surveys conducted for the Proposal.

Project (Reference)	Study details	Scope	Survey / study effort	Flora and Vegetation recorded	Key
Lake Mackay Potash Project: Detailed Flora and Vegetation Survey and Consolidation (Stantec, 2021b)	 Survey Area: 34,622 ha Study Area: 443,664 ha Study Type: Dual phase detailed flora survey and targeted flora survey Survey date: 5-21 October 2019 and 7-25 March 2020; 21-29 April 2021 Seasonal conditions: Average (Phase 1), Above average to below average (Phase 2), Above average (targeted survey). 	Dual phase detailed flora and vegetation survey, and consolidation of previous surveys. Targeted flora survey with a focus on Priority flora known, or likely to occur.	 138 quadrats (50 m by 50 m) 16 relevés Mapping notes Targeted searches Opportunistic collections. One quadrat and one relevé were resurveyed Strategen sample sites from 2018. Consolidation of data from a total of: 216 quadrats 42 relevés 11 transects Mapping notes Targeted searches Opportunistic collections. 	The consolidated data from all survey results conducted with the Study Area included: 541 taxa from: 58 families 189 genera 14 Broad Floristic Formations 50 Vegetation Types. Vegetation Condition: Excellent (approximately 99% of vegetated component of the Study Area).	Fiv • • • • • • • • • • • • • • • • •
Lake Mackay Potash Project: Baseline Aquatic Ecology Study (Stantec, 2021a)	 Study Type: Riparian vegetation sampling Survey date and seasonal conditions: (1) 1 – 20 May 2019; (2) 25 – 28 February 2020; (3) 21 February 2021; and (4) 28 March - 1 April 2021. 	Baseline aquatic ecology study with riparian vegetation sampling.	 Established 19 new riparian transects around Lake Mackay and within the peripheral wetlands. Transect/quadrat method: 30 m transect comprising 10 3 x 3 m contiguous quadrats. Multiple surveys to capture <i>Tecticornia</i> reproductive timing. Species diversity, abundance, cover (%) and health recorded for each species in each quadrat Opportunistic sampling. 	 56 taxa including: 16 families; and 30 genera. 	Flo • • • •
Lake Mackay Sulphate of Potash Project Detailed Flora and Vegetation Assessment at Lake Mackay (Strategen, 2018)	 Area: 1,403 ha Study Type: Single phase detailed flora survey Survey date: 10-15 November 2017 Seasonal conditions: Above average. 	Single phase detailed flora survey.	 10 quadrats (50 m by 50 m) 2 transects consisting of six 3 m by 3 m quadrats established in transitional vegetation. 		Pric • Flo spe
Lake Mackay Sulphate of Potash Project Detailed Flora and Vegetation Assessment at Lake Mackay (360 Environmental, 2017)	 Area: 297,195 ha Study type: Single phase detailed flora and vegetation survey Survey date: 14-23 April 2017 Seasonal conditions: Below average. 	Single phase detailed flora and vegetation survey.	 34 quadrats (50 m by 50 m) six quadrats were re-surveyed ecologia quadrats from 2016. 4 transects comprising of 3 m by 3 m quadrats (one transect was a re-surveyed ecologia transect from 2016) 24 transect quadrats 3 m by 3 m (six quadrats were re-surveyed ecologia quadrats) 11 relevés Mapping notes Targeted searches, and opportunistic collections. 	 253 taxa including: 42 families 117 genera 10 vegetation sub-formations Vegetation Condition: Excellent. 	Pric • • Flo
Mackay Project Level 1 Fauna and Single-Phase Level 2 Flora Assessment (ecologia, 2017)	 Area: 400,138 ha Study type: Single phase level 2 flora assessment Survey date: 6-13 September 2016 Seasonal conditions: Above average. 	Single phase level 2 flora assessment.	 31 quadrats (50 m by 50 m) Six transects consisting of six 3 m by 3 m quadrats (36 quadrats) established in transitional vegetation. 	 214 taxa including; 44 families 115 genera 12 vegetation sub-formations. 	Pric

y findings within the Stantec 2020 Study Area

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ve Priority flora species recorded during the Stantec Survey:
Stackhousia sp. Lake Mackay (P.K. Latz 12870) (P)1
Goodenia virgata (P2)
Comesperma sabulosum (P3)
Eragrostis lanicaulis (P3)
Indigofera ammobia (P3).
review and consolidation of all Priority flora recorded in
evious surveys included:
Goodenia anfracta (P1)
 Stackhousia sp. Lake Mackay (P.K. Latz 12870) (P1)
 Tecticornia globulifera (P1)
Goodenia virgata (P2)
 Thysanotus sp. Desert East of Newman (R.P. Hart 964)
 (P2)
 Bergia occidentalis (P3)
Goodenia halophila (P3)
Goodenia modesta (P3)
Rothia indica subsp. australis (P3)
 Senna artemisioides subsp. alicia (P3)
Stackhousia clementii (P3).
ora of 'other significance':
Lawrencia aff. viridigrisea;
Tecticornia aff. calyptrata (NT form);
Tecticornia sp. sterile 1
Tecticornia sp. sterile 2
Tecticornia sp. sterile 3
Tecticornia sp. sterile 4
Tecticornia sp. sterile 5
Tecticornia sp. sterile 6
 Tecticornia sp. sterile 7
 Tecticornia sp. sterile 8.
ority flora species:
Stackhousia sp. Lake Mackay (P.K. Latz 12870) (P1).
ora of 'other significance' (bearing affinity to recognised
ecies):
Tecticornia aff. halocnemoides subsp. longispicata.
ority flora species:
Tecticornia globulifera (P1)
Goodenia virgata (P2)
Goodenia modesta (P3)
ora of 'other significance' (sterile material):
Tecticornia sp. sterile 8.
ority flora species
Tecticornia globulifera (P1)
 Goodenia virgata (P2)
 Thysanotus sp. Desert East of Newman (R.P. Hart 964)
 (P2)
Stackhousia clementii (P3).
```

2.2 Vegetation Types

Several broad landform types occur within the Study Area, the most common of which are sandplains, gravelly plains, sand dunes, swales, clay depressions and saline lake margins. The relatively restricted landforms included mesas, breakaways and gorges, gullies and minor creeks, and soaks and drainage basins, predominantly within the haul road corridor.

Fourteen broad floristic formations were described within the Study Area and 50 vegetation types were mapped, none of which represent Threatened or a Priority Ecological Communities, or groundwater dependent vegetation (**Table 2-2**). The Samphire dominated vegetation types listed in **Table 2-2** are not considered to be dependent on groundwater, however they are considered to be representative of vegetation in association with the riparian zone and were recorded in the following habitats:

- hypersaline lake margins and smaller islands of Lake Mackay, dominated by halophytic taxa such as *Tecticornia*, *Frankenia*, *Eragrostis falcata* and *Triodia salina*; and
- saline flats and small depressions consisting of similar species to the lake margins.

All 50 of the of the vegetation types described and delineated in the Study Area occur within the Proposal Area. The descriptions, condition and extent of each vegetation type in the Study Area, Proposal Area and Indicative Footprint is presented in **Appendix A**. The distribution and extent of each vegetation type is presented as an overview in **Figure 2-1**, **Figure 2-2** and **Figure 2-3**, with detailed figures presented in the ERD.

Of these 50 vegetation types:

- 39 occur in the NIDE,
- 15 occur in the SIDE,
- 11 occur within the On-LDE and
- five occur within the Off-LDE.

2.3 Flora

A cumulative total of 541 confirmed vascular flora species from 58 families and 189 genera have been recorded in the Study Area. The most represented families and genera were *Fabaceae* and *Acacia*, respectively.

No Threatened flora were recorded during the surveys and based on the results of the desktop assessment; no Threatened flora are considered likely to occur within the Study Area (**Table 2-2**). A total of 14 Priority Flora species were recorded in the Study Area, of which seven occur within the Proposal Area (**Table 2-2**). Of these, one species, *Comesperma sabulosum* (P3), was recorded within the Indicative Footprint. This species was recorded at 106 locations within the Study Area with 10 locations (9%) occurring within the Indicative Footprint. No other Priority flora were recorded within the Indicative Footprint.

Based on survey work, an additional two species of 'other significance' (*Goodenia* aff. *armitiana* and *Triodia* c.f. *epactia*) also occur within the Indicative Footprint, however, these species have also been recorded extensively outside the Study Area. The only Priority 1 species recorded during the surveys was *Stackhousia* sp. Lake Mackay (P.K. Latz 12870) (P1). This species was recorded at 16 locations in the Study Area, including the SIDE and Off-LDE, with no records in the Indicative Footprint **Table 2-2**. Although it is likely that some of these species have distributions which extend into the Indicative Footprint (in association with similar vegetation types), all of the vegetation types were well represented outside the Indicative Footprint in the Study Area and regional surrounds.

Significant flora identified are not restricted locally and are distributed widely in a regional context, with no expected change or elevation in conservation status as a result of direct or indirect impacts associated with the implementation of the Proposal.

Details of Affinity species, potential hybrids, and anomalous recorded during surveys are provided in **Table 2-2**. Further taxonomic work would be required to determine these as distinct taxa, and until resolved, these should be considered as flora of significance.

The location of significant flora within their respective vegetation types is presented within Figure 2-1, Figure 2-2 and Figure 2-3.



Table 2-2: Summary of Significant Flora and Vegetation, Proposal Impacts, and Key Survey Findings.

Flora or Vegetation Aspect	Description	Key Survey Findings	Records				
Flora of significance:	Species identified as a Threatened or Priority taven	A total of 14 Priority Flora species were recorded in the Study Area, of which seven occur within the Proposal Area. Of these, one species,	Locations of Priority flora, affinity species, poter Study Area, Proposal Area and Indicative Footp	ntial hybrids a rint	and anomalous r	ecords with respect to the	
	 Locally endemic or associated with a restricted 	<i>Comesperma sabulosum</i> (P3), occurs within the Indicative Footprint. This species was recorded at 106 locations within the Study Area with 10 locations (9%) occurring within the NIDE. No other Priority flora were	Flora	Study Area	Proposal Area records	Indicative Footprint records	
	habitat type (e.g. surface water or GDE).	recorded within the Indicative Footprint. A total of 11 flora species of 'other significance' have been recorded within	Priority 1				
	New species or anomalous features that indicate a potential new taxon.	the Study Area, of which 10 occur within the Proposal Area (Table 6 19). Of these, two species, (<i>Goodenia aff. armitiana</i> and <i>Triodia c.f. epactia</i>) occur within the Indicative Footprint. Based on survey work, <i>Goodenia</i>	<i>Stackhousi</i> a sp. Lake Mackay (P.K. Latz 12870)	16	16	-	
	Representatives of the range of a taxon	aff. armitiana has been recorded 15 locations within the Study Area, of which five occur within the Indicative Footprint. Triodia c.f. epactia has	Priority 2				
	(particularly at the extremes	been recorded 22 locations within the Study Area of which one record occurs within the Indicative Footprint. Both species have been recorded	Goodenia virgata	9	6	-	
	discovered range	extensively outside the Study Area (Table 6 12).	Priority 3				
	outliers of the main range).	Figure 2-1, Figure 2-2 and Figure 2-3 show the location of significant flora species within their respective vegetation types found in the Study	Comesperma sabulosum	106	105	10	
	Unusual species, including a restricted subspecies,	Area.	Eragrostis lanicaulis	16	15	-	
	varieties or naturally occurring hybrids.		Goodenia modesta	2	1	-	
	Relictual status, being representative of taxonomic		Indigofera ammobia	44	44	-	
	groups that no longer occur		Stackhousia clementii	5	5	-	
	landscape.		Flora of other significance				
			Acacia bivenosa xligulata	8	8	-	
			Goodenia lunata (P1)	2	2	-	
			Goodenia aff. armitiana	22	22	1	
			Goodenia aff. microptera	1	1	-	
			Lawrencia aff viridigrisea	3	2	-	
			Newcastelia aff. bracteosa	2	1	-	
			Tecticornia aff. calyptrata (NT form)	75	46	-	
			Tecticornia aff. halocnemoides subsp. longispicata	6	3	-	
			Triodia c.f. epactia	15	15	5	
			Triodia c.f. pungens	7	7	-	
TECS and PECs	State or Commonwealth listed Threatened Ecological Communities or Priority Ecological Communities.	 No vegetation types identified and described within the Study Area were considered analogous to any State or Commonwealth listed Threatened Ecological Communities or Priority Ecological Communities. No Threatened Ecological Communities or Priority Ecological Communities have been previously mapped in close proximity to the Study Area. 	NA				
Significant Vegetation Types	 Vegetation may be considered significant for a range of reasons, including but not limited to the following: Being identified as a threatened ecological community (TEC) or a 	 A total of 19 vegetation types support Priority flora within the Proposal Area and are therefore considered to be locally significant. Of the 19, two support the Priority 1 species <i>Stackhousia</i> sp. Lake Mackay (P.K. Latz 12870). Both of these vegetation types are associated with the margins of Lake Mackay and dominated by chenopods including <i>Tecticornia</i> species. These vegetation types 	 Two vegetation types supporting P1 species an TsppEf –<i>Stackhousia</i> sp. Lake Mackay (P.H Lake Mackay. This vegetation type typically playa and terrestrial vegetation types, and or 	d considered (. Latz 12870) represented ri dominated by	to be of highest (P1) was record parian vegetation a suite of <i>Tectic</i>	local significance include: ded on the saline margins of nat the interface between the <i>orni</i> a spp.	

Flora or Vegetation Aspect	Description	Key Survey Findings	Records			
	 priority ecological community (PEC). Restricted distribution. Degree of historical impact from threatening processes. A role as a refuge. Providing an important 	 are extensive within Study Area and are of limited extent within the Indicative Footprint: MIGcSdFcTspp(TsaTp): 7673.33ha within Study Area. 21.68 (0.28%) within Indicative Footprint. TsppEf: 7,871.48ha within Study Area. 0.25ha (<0.01%) within Indicative Footprint. Of the 19, 12 vegetation types support the Priority 3 species 	MIGcSdFcTspp(the margins of L halophilic specie (P3) and Stackhe Extent and proportio and the Indicative Fo	(TsaTp) – a vegetation ake Mackay, and on es, including <i>Stackhou</i> ousia clementii (P3), a n of each vegetation potprint.	n type supporting riparian flora, most islands. This vegetation t <i>isia</i> sp. Lake Mackay (P.K. Latz and also supported a suite of <i>Te</i> type that support <i>Comesperma</i>	and mapped in close proximity to ype is dominated by a number of 12870) (P1), <i>Eragrostis lanicaulis</i> <i>ecticornia</i> spp. <i>sabulosum</i> within the Study Area
	function required to maintain ecological integrity of a significant ecosystem.	Comesperma sabulosum. Extents and proportion of each vegetation type within the Study Area and Indicative Footprint are presented within the adjacent column.	Vegetation Types	Extent within the Study Area (ha)	Total Disturbance within the Indicative Footprint (ha)	Total Disturbance as a proportion of the Study Area %
			EpGwaAancTp	2,830.39	72.16	2.55
			AstipHmTe	2,319.05	65.84	2.84
			AstipTsTe	2,176.92	61.25	2.81
			HmAeTp	1,818.27	54.98	3.02
			AhTbTe	1,601.37	46.95	2.93
			EpEgAblAancTbTe	1,009.37	27.15	2.69
			CcGsNsDdTpilTs	563.46	15.59	2.77
			CddEpAelAancTb	545.77	15.26	2.8
			CcdTeTb(Tp)	393.58	12.17	3.09
			CcAstipTeAhh	391.77	11.2	2.86
			CcDdTpAhh	119.54	3.09	2.59
			СоТе	36.99	0.85	2.3
Potential Groundwater- dependent Vegetation	 Groundwater dependent species are defined as phreatophytes. These species can be obligate (requiring groundwater eg <i>Melaleuca argentea</i>) or facultative (may use groundwater if available eg Eucalyptus victrix). A vadophyte is non- groundwater dependent species. It should be noted that there is a paucity of data for many species. 	 There were no groundwater dependent vegetation (GDV) types recorded within the Proposal Area. No permanent or semi-permanent surface water features such as rivers or major creeks occur within the Proposal Area. Claypans that temporarily hold freshwater following significant rainfall events are distributed within the southern and central portions of the Study Area. 	 Four species rec Allocasuarina de following are co Eucalyptus v Melaleuca g Corymbia ca One species rec however its reli dependence of ti is known to hav potential this sp association with Borefield: Neithe a result, Agrimin intend to monit established to co Lake Islands: O Although buffers drawdown of the affected. Consec Appendix B of th ground water as 	corded within the Prop caisneana, Eucalyptu nsidered vadophytes victrix; lomerata and andida. orded, Allocasuarina ance on groundwate his species, except th re deep root systems recies could be affect two vegetation types er of these two vegetate do not propose to mo or ground water level prect actions if draw ne of these vegetate have been implement be brine will be limited quently, monitoring of his FVEMP. Monitorin required within the limited	bosal Area were identified as haves victrix, Melaleuca glomerata and are not considered groun as and are not considered groun decais near a (Desert Oak) has the star is unknown. There is no li at it appears to change its form up to 10m (Atlas of Living Au ted by drawdown. Allocasuarins: Ad(Eg)TpTb and AdAIALMTs. tion types occur within the drawdown limits are exceeded. So types (Ad(Eg)TpTb) occurs and around the islands and grout the health (Allocasuarina decais g of tree health would be underta WEMP.	ving potential to use groundwater d Corymbia candida. Of these the d water dependent: he potential to utilise groundwater terature relating to groundwater once it reaches groundwater and stralia, 2023). Therefore there is a decaisneana was recorded in down contours of the borefield. As cinity of the borefield and instead sociated triggers and thresholds on the islands of Lake Mackay undwater modelling indicates that rology under the islands could be meana) has been proposed within iken in association with monitoring
Riparian Vegetation	Riparian zone vegetation occurs within the Study Area, primarily in	 Composition dominated by chenopods Assemblage typical of salt lake riparian vegetation 	Riparian zone vegeta	ation types dominated	d by <i>Tecticornia</i> species within t	he Proposal Area

Flora or Vegetation	Description	K	ey Survey Findings	Records						
Aspect										
	association with Lake Mackay and its islands.	•	No declared rare flora or weeds			Study Area		Proposal Area		Proposal Area
 Chenopod shrublands, dominated by <i>Tecticornia</i> fringe the lake and islands, typically occurring between the playa and hummock grassland communities. Dominant tax - Tecticorn - Franken - Lawrenc Total Taxa, 9 - Lake Ma - Peripher - Island C Taxa of Sign - The restored 		•	Dominant taxa - Tecticornia aff. calyptrata (NT form) - Frankenia cordata - Lawrencia viridigrisea.	Vegetation Type	Habitat	Extent (ha)	Proportion (%)	Extent (ha)	Proportion (%)	extent as a proportion of representation in the Study Area (%)
		•	Total Taxa, 96; – Lake Mackay taxa recorded, 77; – PeripheralWetland Taxa, 16; and	TsppEf	Riparian zone (lake margin)	7,871.48	1.77	698.04	0.26	8.87
		Island Claypan Taxa, 45. xa of Significance : <i>Tecticornia globulifera</i> (P1)	MIGcSdFcTspp(TsaTp)	Riparian zone (lake margin)	7,673.33	1.73	678.34	0.26	8.84	
		-	WA salt lake have been found to grow no deeper than 30 cm in the soil profile (Botanica Consulting 2018). It is unlikely that <i>Tecticornia</i> at Lake Mackay will be accessing saline groundwater given the depths to groundwater are greater than 0.3 m (typically at least 0.5	FcTsppEf(TsaTs)	Saline clay pans	6,090.96	1.37	146.99	0.06	2.41
			m on the playa and can range between 3 m and up to 10 m in terrestrial habitats).	Total		21,635.77	4.87	1,523.37	0.58	n/a
		•	<i>Tecticornia</i> in the vicinity of Lake Mackay are therefore most likely to opportunistically access stored water within the capillary fringe of the vadose zone. This capillary fringe is low in salinity and is recharged by rainfall. Water is subsequently bound and stored in pore spaces, supporting the shallow root systems of samphire vegetation during dry conditions, independent of the lakebed sediments. In addition, the salinity of hypersaline groundwater (>200,000 mg/L) is likely outside the tolerance limits of <i>Tecticornia</i> . <i>Tecticornia</i> are therefore unlikely to represent GDV and no indirect impacts are expected from the drawdown.			1	•			
Vegetation supporting high conservation value significant fauna species	Vegetation types that provide habitat for high conservation value significant fauna	•	Night Parrot (CE; <i>Pezoporus occidentalis</i>) were recorded at two locations within the Survey Area, both were in large drainage basins which contained large hummocks of Triodia.	The Night Parrot (CE; Pez long unburnt hummocks o were in association with I known to be important roo	oporus occi f Triodia. N arge, long ost and nes	<i>identalis)</i> has P recorded a unburnt Trioc ting habitat f	one of the mo t two location dia hummocks or the species	pre specific l s in proxim s. Long unb s.	nabitat require ity to the Prop urnt hummoc	ements, reliant on bosal Area. These ks of <i>Triodia</i> are





fewalker

Revised:

Notes 1. Coordinate System: GDA 1994 MGA Zone 52 2. Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2021). 3. Background: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User

- Goodenia ?lunata
- Goodenia aff. armitiana
- Triodia cf. epactia
- Triodia cf. pungens

Stante	ec 🔮 agrimin
Project Location Stantec Australia Pty Ltd Perth, Western Australia	Prepared by KB on 2020-11-0 TR by DK on 2020-11-0 IR Review by GW on 2020-11-0
^{Client/Project} Agrimin Limited Mackay Potash Project	

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Figure 2-1 Map of Vegetation Types in the NIDE and significant flora locations(north).







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Figure 2-2 Map of Vegetation Types in the NIDE and significant flora locations (south).





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Figure 2-3 Map of Vegetation Types in the SIDE, On-LDE and Off-LDE and significant flora locations.



2.4 Introduced Flora

Introduced flora (weeds) have a detrimental effect on ecological values of communities in which they invade. Weeds outcompete native flora, alter the structure of vegetation, have an impact on fire regimes and change habitat characteristics for fauna; often leading to a decline in the quality of fauna habitat.

Six introduced flora species have been recorded within the Proposal Area, all of which occur within the NIDE (**Figure 2-4**). One of these weed species, **Tribulus terrestris*, also has been recorded on an island, in close proximity to the On-LDE. None of the introduced flora species represent Weeds of National Significance (WoNS) or are listed under the *Biosecurity and Agriculture Management Act 2007* as declared pests for either the Tanami or Great Sandy Desert bioregions. However, **Cenchrus* spp. and **Aerva javanica* are generally considered to be serious environmental weeds with the potential to proliferate and become dominant in their preferred habitats. The record of **Flaveria trinervia* within the NIDE also represented a bioregional range extension. The ecological impact and invasiveness classifications (DPaW, 2013, 2015) for these weed species are provided in **Table 2-3**, **Figure 2-4**.

In general, the diversity and abundance of weeds within the Proposal Area was considered low, and this is likely a reflection of the low level of disturbance. However, outside the Study Area for the Proposal, the botanists for the surveys noted that the town of Kiwirrkurra had extensive populations of **Aerva javanica* throughout the town and likely supported multiple other weed species. Additionally, the Tanami Road was observed to support extensive grasslands of **Cenchrus* spp. along the road verge. The abundance of weeds at these potential source populations will have implications for weed management over the life of the Proposal (**Appendix C**).

Weed species	Development	Number of records	DBCA Classifica	tion^
(common name)	Envelope		Ecological impact	Invasiveness
*Aerva javanica (Kapok Bush)	NIDE	1	High	Rapid
* <i>Cenchrus ciliari</i> s (Buffel Grass)	NIDE	19	High	Rapid
* <i>Cenchrus setiger</i> (Birdwood Grass)	NIDE	3	High	Rapid
* <i>Flaveria trinervia</i> (Speedy Weed)	NIDE	1	n/a	n/a
*Malvastrum americanum (Spiked Malvastrum)	NIDE	6	High	Rapid
	NIDE	2		
* <i>Tribulus terrestris</i> (Caltrop)	Island of Lake Mackay	1	Unknown	Moderate

Table 2-3: Introduced flora recorded within the Proposal Area and the DBCA Weed Prioritisation Process.

[^]In the absence of DBCA classifications for the Tanami and Great Sandy Desert bioregions, the Pilbara classifications are presented. No classification information is available for * *Flaveria trinervia*.



	Study Area
	Indicative Footprint
el	opment Envelopes
	Off-lake Development Envelope
	Northern Infrastructure Development Envelope
	On-lake Development Envelope
	Southern Infrastructure Development Envelope
0	luced Flora
	*Aerva javanica
	*Cenchrus ciliaris
	*Cenchrus setiger
	*Flaveria trinervia
	*Malvastrum americanum
	*Tribulus terrestris
	Minor Road
	Tracks

J Star	itec 🔮 agrimin
<i>Project Location</i> Stantec Australia Pty Ltd Perth, Western Australia	Prepared by FW on 2023-06-2 TR by FW on 2023-06-2 IR by JD on 2023-06-2
^{Client/Project} Agrimin Limited Mackay Potash Proje	ect

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Figure 2-4 Map of introduced flora locations.



3 Management Approach

3.1 Provisions Background

This section (**Section 3**) outlines the management approach of this FVEMP. The approach comprises outcome-based and objective-based management provisions, with appropriate indicators developed for environmental objectives and criteria, which are robust and measurable, where possible.

Outcome-based management provisions are applied where a sufficient level of information exists to measurable criteria (Environmental Protection Authority, 2020), defined to assess performance against the environmental outcome. These include:

- **Trigger Criteria** Measures set at a conservative level (trigger criteria), to forewarn the approach of threshold criteria and ensure trigger level response actions are implemented well in advance of an environmental outcome being compromised.
- **Threshold Criteria** Framed to represent the limit of acceptable impact beyond which there is likely to be a significant effect on the environment. This indicates there is risk that the environmental outcome will not be met.

Objective-based management provisions are applied where a level of uncertainty exists or where performance cannot be measured against trigger or threshold criteria. In this case, management targets are established to measure the success of management actions in achieving the environmental objective.

Complementary provisions (including both outcome and objective-based) have also been applied to address values where a high level of management is required, and/or a degree of uncertainty and complexity exists.

3.2 Key Assumptions and Uncertainties

The key assumptions and uncertainties that apply to Flora and Vegetation are summarised as follows:

- The extent to which climatic factors outside of the Proponent's control will impact on successful rehabilitation.
- The extent to which climatic factors outside of the Proponent's control will impact on the health and extent of populations of significant flora.
- Variation in soil condition over the Disturbance Envelope and within the revegetation zones.
- It is assumed that by utilising areas of existing disturbance, minimising clearing, and implementing progressive rehabilitation throughout the life of the Proposal, the impacts to significant flora and vegetation will be minimised.
- There are a number of environmental factors that may affect populations dynamics of the species in the landscape. A decline in the relative abundance and health, in comparison to baseline levels, may in some cases be attributed to environmental variables etc that are outside of Agrimin's control.
- Monitoring programs (Appendix B and Appendix D) have been designed based on the most recent available
 information on the flora and vegetation in the vicinity of the Proposal. However, implementing the monitoring programs
 may depend on access within the respective IPAs. Access will require permission from the relevant traditional owner
 groups and the proposed sampling sites may need to be revised depending on the potential occurrence of heritage
 'no go' areas.

3.3 Potential Proposal Impacts

Considering the key assumptions and uncertainties, the potential direct and indirect impacts to Flora and Vegetation from the Proposal include:

- Potential direct impacts:
 - Clearing and fragmentation of native vegetation (including loss of significant flora and vegetation); and
- Potential indirect impacts:
 - Drawdown from groundwater abstraction resulting in decline in vegetation health (including riparian vegetation and trees which may be utilising groundwater);
 - Weed introduction and proliferation resulting in disturbance and decline in vegetation health;
 - Changes to surface hydrology and water flows during inundation, resulting in disturbance and decline in flora and vegetation health;
 - Altered fire regimes resulting in disturbance and decline in vegetation health;
 - Hydrocarbon and chemicals spills resulting in disturbance and decline in vegetation health;
 - Discharge or seepage of untreated wastewater resulting disturbance and decline in vegetation health;

- Increased soil salinity resulting in disturbance and decline in vegetation health, and
- Fugitive dust emissions resulting in disturbance and decline in vegetation health.

The EPA mitigation hierarchy has been applied to avoid and minimise potential project-related impacts to flora and vegetation within the Proposal Area, through the development of appropriate objectives and targets for management provisions (**Section 4**). This approach has been informed by best practice and experience on similar potash infrastructure projects in Western Australia.

3.4 Application of Mitigation Hierarchy

The Proposal will avoid impacts to significant flora and vegetation via the following:

- Processing plant and associated infrastructure constructed outside of the riparian vegetation;
- No clearing of vegetation on lake islands;
- 30% of the haulage corridor will be constructed on the existing cleared track reducing total clearing;
- Clearing will only occur in approved ground disturbance areas;
- The On-LDE has been designed to incorporate exclusion buffers around islands to avoid direct and potential secondary impacts (total of 20,119 ha of islands excluded from On-LDE):
 - Landform islands (3 islands in total) buffer size will be 500 m.
 - Intermediate and Large islands (52 islands in total) buffer size will be 250 m.
 - Small islands (216 islands in total) buffer size will be 100 m.
- The location and layout of the On-LDE infrastructure has been designed to avoid impacts to the lake margin habitat that fringes the lake;
- Significant communities in vicinity of borefield are not true GDEs and considered vadophytes, therefore will not be impacted by drawdown;
- Avoid facilitating the introduction of new weed species or the spread of existing weed species in the Proposal Area as a result of the Proposal;
- Limit disturbance On-LDE (<5%; 15,000 ha);
- Avoid clearing within drainage features and drainage lines where possible;
- Avoid hot works in fire sensitive vegetation;
- Power generation by using LNG, solar and wind operation reduces field fuel usage required for the Proposal;
- Avoid fuel/chemical storage and transfer from occurring outside of designated area;
- Avoid off-road driving and stay on approved access ways;
- Monitoring and remediation measures for Uuncontrolled discharge or seepage;
- Avoid uncontrolled discharge of brackish/saline water;
- Haul road will be sealed in the early stages of the Proposal, limiting dust emissions that would otherwise be likely from an unsealed haul road.

The Proposal will minimise impacts to significant flora and vegetation via the following:

- Delineate clearing boundary areas, and confirmed cleared areas via survey after clearing;
- Implement ground disturbance procedure;
- Large rainfall events (300 mm within one month) will recharge groundwater level and reset to within 0.5 m of the surface (baseline conditions);
- Cohesive salt crust to assist in retention of sediment/soil moisture limiting sediment/soil mobilisation;
- Borefield pumping is managed to limit groundwater drawdown (in accordance with the IWEMP);
- Implement appropriate vehicle hygiene and weed and seed hygiene practices for all contractors and personnel entering the site;
- Timely response for management of any declared weed occurrences;
- Limit vehicle and personnel movements outside of approved areas;

- Vehicles to remain on designated tracks.
- Training for personnel to identify weed species and process for reporting weed locations;
- Incident reporting of new weed species and new locations;
- Detailed hydrological modelling of surface water flows, simulation 1:100-year events to determine impacts;
- Staged development of trenches via BMUs and engineering design (1 km spacing, install crossovers) to allow natural surface water flows and flooding in natural depressions of the lake. The staged development will allow for adaptive management and mitigation;
- Haul road constructed to avoid impediments to surface water flows/sheet drainage during flooding events;
- Liaise with Traditional Owners about the management of local fire regimes and fire management practices;
- Establish Emergency Response Plan and Emergency Response Team (ERT);
- Fire response equipment maintained at site and in vehicles, and machinery and Haul Trucks;
- Water trucks fitted with high pressure monitors and pumps for fire management;
- Implement a hot works permit system for high ignition risk work activities high ignition risk work activities;
- Develop education programs for haul road users (including Traditional Owners);
- Spill response equipment available;
- Spill response training for all personnel and contractors;
- Dedicated workshop for maintenance;
- Wastewater Treatment Plant (WWTP) and irrigation infrastructure to be operated and maintained in accordance with design specifications;
- Obtain all required environmental approvals for construction and operation of the WWTP (Part 5 and local council/ Department of Health approvals);
- Maintain high standard of housekeeping around processing plant and associated infrastructure;
- Adhere to wastewater best practice health and environmental legislation and guidelines for irrigation of treated wastewater;
- Pipelines to be installed in earthen bunded culverts to prevent spills from discharging into the surrounding environment,
- Use of dust suppression (water carts) during clearing activities and operations; and
- Vehicle speeds on construction roads will be reduced where necessary to minimise dust emissions.

4 Management Provisions

4.1 Overview

The FVEMP outlines the requirements to avoid, minimise, manage, monitor, and rehabilitate direct and indirect impacts to flora and vegetation from the Proposal, aligning with the EPA's mitigation hierarchy. The subsequent sections identify the management provisions that will be implemented by Agrimin for the Proposal to ensure that the environmental objectives, criteria, targets, and outcomes are met for flora and vegetation. Where unacceptable environmental outcomes remain post the implementation to controls measure such as permanent loss of significant vegetation, offset strategies will be proposed (Stantec, 2024c). The FVEMP will be reviewed and updated as required, following an adaptive management approach (Section 8).

4.2 Outcome-Based Provisions

This FVEMP focuses on outcome-based provisions, which are performance-based and can be audited. The objectives developed are measurable, and the success of management actions can be monitored and reported. Outcome-based provisions specify triggers and thresholds (environmental criteria) for direct impacts that are quantifiable and specifically relate to potential project related impacts to flora and vegetation (**Table 4-1**). Seven outcome-based provisions have been developed for the FVEMP, with associated triggers and thresholds (**Table 4-1**). Where required, suitable response and corrective actions are also recommended for environmental criteria.

The following outcomes-based provisions for the FVEMP (beginning with the prefix FV in Table 4-1) have been established:



- **FV1**: No significant decline in the health of riparian vegetation (lake margin complex Night Parrot critical habitat) or trees that may be utilising groundwater (*Allocasuarina decaisneana*) as a result of::
 - Uncontrolled discharge of saline water;
 - Changes in inundation regime;
 - Groundwater abstraction; or
 - Sedimentation
- FV2: No significant decline in the health of vegetation supporting:
 - Priority flora Stackhousia sp. Lake Mackay (P.K. Latz 12870) (P1) (associated with riparian zone), from
 - Uncontrolled discharge of saline water;
 - Changes in inundation regime;
 - Groundwater abstraction; or
 - Sedimentation.
 - Critical Night Parrot habitat (where the populations are intersected by the Haul Road), from
 - Changes to altered surface hydrology.
- FV3: No project-related adverse impacts to significant (Priority) flora species from project-related clearing to:
 - Stackhousia sp. Lake Mackay (P.K. Latz 12870) (Priority 1); and
 - Comesperma sabulosum (Priority 3).
- **FV4:** No proliferation or introduction of new weed species rated as high or very high management priority by DBCA in the Proposal Area as a result of the Proposal.
- **FV5:** No introduction of weed species rated as high or very high management priority by DBCA within the habitat for the Night Parrot populations as a result of the Proposal.
- FV6: No net increase in the baseline extent of weed populations within the Proposal area as a result of the implementation of the Proposal.
- FV7: No new populations of a weed species compared to baseline weed mapping within the Proposal Area.

4.3 Objective-Based Provisions

Objective-based provisions relate to environmental management actions that are not specifically measurable. They specify management actions according to management targets, particularly for indirect impacts that are not quantifiable. For flora and vegetation, as ongoing monitoring is undertaken and additional population data is gathered, these management targets may be reviewed, and quantifiable outcome-based provision(s) may be established accordingly. Five objective-based management provisions has been outlined in **Table 4-2**, to prevent project-related adverse impacts to flora and vegetation (including significant flora species) within proximity to the Proposal, with appropriate management and monitoring actions.

The following objectives-based provisions (referred to as MO1, MO2 etc in **Table 4-2**) each with specific measurable targets for flora and vegetation have been established.

- MO1: No project-related adverse impacts to native vegetation or significant (priority) flora species Stackhousia sp. Lake Mackay (P.K. Latz 12870) (Priority 1) and Comesperma sabulosum (Priority 3), from project-related clearing:
 - Clearing not to exceed 1,500 ha of flora and vegetation (the combined total of 200 ha of native vegetation within the 688 ha Off-LDE, and 300 ha of native vegetation within the 11,799 ha SIDE and 1,000 ha of native vegetation within the 33,928 ha NIDE).
 - No significant decline to native vegetation supporting significant (Priority) flora species Stackhousia sp. Lake Mackay (P.K. Latz 12870) (Priority 1) and Comesperma sabulosum (Priority 3), from project-related clearing.
- **MO2**: No project-related impacts to vegetation from a decline in vegetation health (including riparian vegetation associated with critical habitat for the Night Parrot), or trees that may be utilising groundwater (*Allocasuarina decaisneana*) from:
 - Uncontrolled discharge of saline water;
 - Project-related drawdown from groundwater abstraction;
 - Changes to surface hydrology; or
 - Changes to water flows during inundation:
 - Verification of detailed hydrological modelling of surface water flows, including simulation 1:100-year rainfall events in place (as detailed in the IWEMP);

- Staged development of trenches via BMUs and engineering design (1 km spacing, install crossovers) to maintain natural hydrological processes;
- No adverse project-related impacts to surface hydrology (excluding on-lake operations) and water flows
 resulting in significant disturbance and decline of vegetation; and
- Groundwater abstraction not to exceed ground water licence limit.
- **MO3**: No proliferation or introduction of new weed species rated as high or very high management priority by DBCA in the Proposal Area as a result of the Proposal:
 - No introduction of new weed species rated as high or very high management priority by DBCA in the Proposal Area as a result of the Proposal.
 - Weed management programs should be designed in accordance with relevant EPBC Act weed threat abatement plans.
 - Weed management procedures informed by best practice management of the weed species identified during weed baseline surveys.
 - Weed control measures implemented for Buffel Grass in Night Parrot avoidance buffer zones in accordance with the Weed Management Plan.
 - No net increase in the baseline extent of weed populations within the Proposal area as a result of the implementation of the Proposal.
- **MO4**: No significant project-related decline in flora and vegetation health or and vegetation types supporting significant priority flora *Stackhousia* sp. Lake Mackay (P.K. Latz 12870) (Priority 1) and *Comesperma sabulosum* (Priority 3), from Project-related unplanned fire events.
 - Provision and maintenance of firefighting equipment in accordance with the relevant fire safety standards.
 - Firefighting emergency response plan and procedures are in place.
- MO5: No significant project-related decline in flora and vegetation health to vegetation types supporting significant Priority flora Stackhousia sp. Lake Mackay (P.K. Latz 12870) (Priority 1) and Comesperma sabulosum (Priority 3), vegetation supporting critical Night Parrot habitat from:
 - Discharge or seepage of untreated wastewater.
 - Increased soil salinity from uncontrolled discharge of saline water.
 - Dust deposition:
 - Dust management plan in place.
 - Dust suppression measures in place.
 - Implement speed limits on unsealed tracks.
 - Hydrocarbon and chemicals spills:
 - Hazardous Substances Management Plan (HSMP) and Procedure implemented.
 - Spill response training for all personnel and contractors.
 - Spill response equipment provided for all site vehicles (including on all Haul Trucks).

Several supplementary plans, procedures and registers are required to be developed and implemented which include commitments to minimise the risk of impact to flora and vegetation. A summary of these supporting documents and the commitments relating to the management of flora and vegetation is provided in **Table 4-3**.

4.4 Environmental Criteria, Targets and Justification

The development of environmental objectives and criteria for outcome-based provisions within the FVEMP are based on available data and information and align with the purpose of the FVEMP. Outcome-based provisions utilise monitoring and reporting to assess against the measurable environmental criteria. The triggers and thresholds in some instances are considered preliminary and may be revised as further data becomes available from the Monitoring Programs (Appendix B, Appendix D). In addition, where data or information is considered limited, objective-based provisions have been applied, with management targets to address knowledge gaps, with corresponding monitoring and reporting requirements.

During monitoring, where threshold criteria (outcome-based) or management targets (objective-based) are exceeded, and are project-related, response and corrective actions are provided, and should be implemented, where deemed appropriate. Monitoring will inform adaptive management, with the revision of environmental criteria, and response or corrective actions, as required.

Justification for the management provisions outlined in the FVEMP are based on the following:

 Vegetation has the potential to be impacted through secondary factors such as groundwater drawdown, saline water discharge, changes in the inundation regime or sedimentation. A vegetation health monitoring program has been



developed (**Appendix B**) to detect any changes in the health of riparian vegetation (of which the Lake Margin complex is considered critical Night Parrot habitat), trees that may utilise groundwater, and vegetation (specifically old growth spinifex) in the vicinity of known Night Parrot populations. Monitoring will compare vegetation health to baseline conditions and relative to reference sites with trigger and thresholds developed for the early detection of vegetation decline and the implementation of corrective actions, if required.

- Significant (Priority) have the potential to be impacted through direct clearing and secondary factors. Within the riparian zone, potential indirect impacts include groundwater drawdown, saline water discharge, changes in the inundation regime or sedimentation. Within other areas of the Proposal, indirect impacts could include weeds, unplanned fire events, environmental spills or dust. Of the 14 Priority flora recorded from the Study Area, one species is Priority 1 (*Stackhousia* sp. Lake Mackay (P.K. Latz 12870)) and one Priority 3 species (*Comesperma sabulosum*) has been recorded within the Indicative Footprint. *Stackhousia* sp. Lake Mackay (P.K. Latz 12870) (P1) occurs within the riparian zone and monitoring for any indirect impacts to this species has been incorporated into the Vegetation Health Monitoring Program (Appendix B). For both species, a small proportion of the vegetation types known to support each species is proposed to be cleared for the Proposal. Triggers and thresholds (Table 4-1) have been developed to limit clearing extents within each of these vegetation types to ensure there are no project related adverse impacts to significant flora populations occurring within the IF.
- Weeds can have a detrimental effect on ecological communities, with certain weeds such as *Cenchrus spp. leading to an increased risk of fire, which is a key threat to a number of significant fauna. Although the diversity and abundance of weeds within the Proposal Area was considered low (due to a low level of disturbance), there are extensive source populations in the surrounding region to the south at Kiwirrkurra (*Aerva javanica) and to the north along the Tanami Road (*Cenchrus spp.). Agrimin is committed to managing the introduction and spread of weeds as a result of Proposal, however it is acknowledged that Agrimin are unlikely to be able to prevent weeds from spreading from source populations into the Proposal Area. As a result, the Weed Management Plan and Weed Monitoring Programs (Appendix C and Appendix D) have been developed with appropriate triggers, thresholds and corrective actions in accordance with the Weed Management Plan include:
 - No proliferation or introduction of new weed species rated as high or very high management priority by DBCA in the Proposal Area as a result of the Proposal.
 - No introduction of weed species rated as high or very high management priority by DBCA within the critical habitat for the known Night Parrot populations as a result of the Proposal.
 - No net increase in the baseline extent of weed populations within the Proposal area as a result of the implementation of the proposal.
 - No new populations of a weed species compared to baseline weed mapping within the Proposal Area.
- Clearing of vegetation can result in the loss of significant flora and lead to degradation of vegetation types through edge effects. Clearing within the Proposal Area will be minimised, where practicable and undertaken in accordance with the CEMP.
- Secondary impacts to vegetation health can occur through altered fire regimes, discharge of untreated wastewater or saline water, dust deposition or hydrocarbon or chemical spills. Management actions have been developed to minimise any potential project-related decline in vegetation health as a result of these secondary impacts.

4.5 Traditional Owner Engagement

A key outcome of this FVEMP is to provide ongoing opportunities for involvement of Traditional Owners in the implementation of conservation actions and improve understanding of flora and vegetation and facilitate TO knowledge-sharing. Agrimin will actively seek opportunities to engage Traditional Owners from the Ngururpa, Kiwirrkurra and Tjurabalan IPAs, considered important local stakeholders of the Proposal, to participate in management and monitoring, where possible. Agrimin also acknowledges that management actions are already undertaken by Rangers as part of the Plans for Country (Parna Ngururpa, 2019; Tjamu Tjamu Aboriginal Corporation, 2014), and will seek to align with existing programs, where possible.

Indigenous Ranger groups in desert country play an integral role in the conservation of the flora and vegetation throughout the area and are actively involved with supporting initiatives. The Rangers have undertaken numerous surveys in the region. Rangers have also participated in workshops facilitated through the Threatened Species Recovery Hub, with two-way ecological and knowledge exchange contributing to the understanding of the species in the area. This provides an invaluable opportunity to involve Rangers in the monitoring and management of significant flora and vegetation.

A key component of the FVEMP is to consult, actively engage with, and build the capacity of Traditional Owners to implement management actions on IPAs. Opportunities for potential engagement are presented in **Table 4-1** and **Table 4-2**, **a**nd include the following:

- Installation of signage which will include local indigenous language;
- Education programs for haul road users;
- Engagement to understand local fire regimes and involvement in fire management practices; and

• Two-way knowledge sharing and ongoing engagement with Indigenous Rangers through management and monitoring of significant flora and vegetation.

Note that these measures are considered indicative only and are to be determined following further consultation with Traditional Owners. Agrimin are committed to ongoing discussions with both groups, which will involve spending time on country and engaging in two-way knowledge sharing. Through these ongoing discussions, there may be refinement in the locations of some of the reference sites for Monitoring Programs in the FVEMP, based on recent increases in knowledge of significant fauna in the area. It is also acknowledged that monitoring methods may change over time, through adaptive management, in line with most recent scientific practices. Any refinements made to the Monitoring Program will be aligned with the requirements of the FVEMP. Agrimin recognises and respects that the Traditional Owners and Ranger Groups have well-defined threatened species protection strategies, and extensive experience and skills in a range of monitoring, protection and management activities which are integral to ongoing discussions as part of stakeholder engagement for the life of the Proposal.

Table 4-1: Flora and vegetation outcome-based management provisions.

EPA F	actor and Objective	Flora and Vegetation: to protect flora and vegetation so that biological diversity and ecological integrity are maintained.						
FVEM	P Purpose	To avoid adverse project-relate	d impacts to native vegetation,	including significant flora and vegetation	and associated habitat.			
Key Ir	npacts and Risks	Potential loss or degradation of	of riparian vegetation and the	potential loss of significant flora from the	e proposal area, as a result of impleme	ntation of the Proposal.		
Indica	tors	Decline in the health of vegeta	ation important for supporting	significant flora and fauna species. Incre	ease in the proliferation of existing wee	eds or introduction of new	weed species.	
Outco Provis	me-based Management ions	Trigger and Threshold Criteri	a	Trigger and Threshold Response Act	ions	Monitoring	Timing / Frequency of Monitoring	Reporting
		Trigger Criteria	Threshold criteria	Trigger Level Actions	Threshold Criteria and Corrective Actions			
FV1	 No significant decline in the health of riparian vegetation (lake margin complex - Night Parrot critical habitat) or trees that may be utilising groundwater (<i>Allocasuarina decaisneana</i>) as a result of: Uncontrolled discharge of saline water; Changes in inundation regime; Groundwater abstraction; or Sedimentation. 	 A statistically significant decline in one or more riparian vegetation monitoring indices (species diversity, vegetation health, plant cover and abundance) at impact sites over a single monitoring event compared to baseline levels and relative to reference sites. Or A statistically significant decline in the health of potentially ground water dependent species (<i>Allocasuarina decaisneana</i>) (Appendix B) detected over a single monitoring event compared to baseline levels and relative to reference sites. Or Uncontrolled saline discharge event occurs from evaporation ponds. 	 A statistically significant decline in one or more riparian vegetation monitoring indices (species diversity, vegetation health, plant cover and abundance) at impact sites over two or more monitoring events compared to baseline levels and relative to reference sites. Or A statistically significant decline in the health of riparian vegetation, or the health of potentially groundwater dependent species (<i>Allocasuarina decaisneana</i>) (<i>Appendix B</i>) detected over two or more consecutive monitoring events compared to baseline levels and relative to reference sites. Or Consecutive uncontrolled saline discharge events occurs from evaporation ponds and extends into riparian zone. 	 Report internally as an incident in accordance with internal procedures. Investigate the cause of vegetation health decline e.g. groundwater drawdown, sedimentation, salt accumulation or environmental variables. If decline in vegetation health is attributed to project-related activities, undertake a review of management actions and procedures to determine if impact can be minimised. Implement corrective actions with consideration of the following: Determine whether the changes to vegetation health observed at the impact sites are comparable to the observations at the reference sites. Cross-reference vegetation health monitoring results with the most recent environmental monitoring data (i.e. surface water, groundwater monitoring meteorological, etc.) to determine potential causes. Assess groundwater levels in the IWEMP against triggers and thresholds to ensure drawdown is not extending beyond predictions. Ground truth the results of the disturbance (eg. uncontrolled discharge) to determine extent, potential causes and if additional actions are required to prevent reoccurrence. Implement appropriate remediation measures, as required. Review Vegetation Health Monitoring Program (Appendix B) and increase the number of vegetation health monitoring sites 	 Report incidence of significant decline in vegetation health to DWER and DBCA in 7 days. Compare the outcomes of vegetation and tree health monitoring data (including remote sensing where appropriate) against predicted hydrological modelling of surface and groundwater. Investigate cause of potential impacts and review trench network design and configuration, and if required, modify abstraction schedule. Assess groundwater levels in the IWEMP against triggers and thresholds to ensure drawdown is not extending beyond predicted and is not affecting areas of the lake differently. Ground truth the results of the disturbance (eg. uncontrolled discharge) and potential impacts to riparian vegetation, to determine potential causes and if additional actions are required to prevent reoccurrence and whether remediation is required. Where the threshold exceedance was caused by operation or decommissioning activities: Review management measures in the FVEMP and IWEMP and implement an adaptive management response. Review Vegetation Health Monitoring Program (Appendix B) parameters to determine if management actions are effective and where necessary, implement changes to the monitoring program. 	 Monitor riparian vegetation health and potentially groundwater dependent species (<i>Allocasuarina decaisneana</i>) in accordance with the Vegetation Health Monitoring Program (Appendix B). Monitor surface water conditions in accordance with IWEMP. Monitor groundwater levels in accordance with IWEMP. 	 Monitor riparian vegetation health and potentially groundwater dependent species (<i>Allocasuarina decaisneana</i>) in accordance with the Monitoring Program (<i>Appendix B</i>). In accordance with IWEMP. In accordance with IWEMP. 	 Annual Compliance Assessment Report (ACAR). Internal incident reporting and investigation process.

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EPA Factor and Objective	Flora and Vegetation: to protect	ct flora and vegetation so that	biological diversity and ecological integ	rity are maintained.				
FVEMP Purpose	To avoid adverse project-related	d impacts to native vegetation,	including significant flora and vegetation a	and associated habitat.				
Key Impacts and Risks	Potential loss or degradation of	of riparian vegetation and the	potential loss of significant flora from the	e proposal area, as a result of impleme	ntation of the Proposal.			
Indicators	Decline in the health of vegeta	ecline in the health of vegetation important for supporting significant flora and fauna species. Increase in the proliferation of existing weeds or introduction of new weed species.						
Outcome-based Management Provisions	Trigger and Threshold Criteri	a	Trigger and Threshold Response Act	ions	Monitoring	Timing / Frequency of Monitoring	Reporting	
	Trigger Criteria	Threshold criteria	Trigger Level Actions	Threshold Criteria and Corrective Actions				
			evaluate the use of remote sensing (using baseline imagery) to further understand trends in changes to vegetation health over the broader area.	 vegetation health decline. Depending on the findings of investigation into potential causes, corrective actions may include: Uncontrolled discharge (riparian zone): increase frequency of inspection of infrastructure and conduct preventative and proactive works such as bunding and associated drainage to avoid the riparian zone being affected by any potential future breaches. Changes in inundation regime (riparian zone: verify hydrological modelling of surface water flows, including simulation 1:100-year events and investigate potential impacts that vary from predicted and if required, review and modify trench network design and configuration appropriately. Groundwater abstraction and/or Sedimentation (riparian zone): verify predicted hydrological modelling of groundwater and whether different areas of the lake are affected differently by groundwater drawdown. Review trench network design and configuration, and if required, refine/modify abstraction from the affected areas of the lake Once corrective actions have been completed, review the frequency of monitoring events (Appendix B) to verify that actions are effective. 				
 Priority flora Stackhousia sp. Lake 	 Priority flora Stackhousia sp. Lake Mackay (P.K. Latz 12870) (Priority 1) occurs within vegetation types MIGcSdFcTspp(TsaTp) 	Priority flora Stackhousia sp. Lake Mackay (Priority 1) occurs within vegetation types MIGcSdFcTspp(TsaTp)	Report internally as an incident in accordance with internal procedures.	 Report incidence of significant decline in vegetation health to DWER and DBCA in 7 days. Report incidence of significant decline to vegetation comprising Night Parrot 	1. Monitor Vegetation Health in accordance with the Vegetation Health	 Annually Annually (Vegetation health monitoring photos) in response to exceedance of 	 Vegetation Health Monitoring Program reporting (Appendix B). 	

EPA Factor and Objective	Flora and Vegetation: to protect flora and vegetation so that biological diversity and ecological integrity are maintained.						
FVEMP Purpose	To avoid adverse project-relate	d impacts to native vegetation,	including significant flora and vegetation	and associated habitat.			
Key Impacts and Risks	Potential loss or degradation of	of riparian vegetation and the	potential loss of significant flora from the	e proposal area, as a result of impleme	ntation of the Proposal.		
Indicators	Decline in the health of vegeta	ation important for supporting	significant flora and fauna species. Incre	ease in the proliferation of existing wee	eds or introduction of new	weed species.	
Outcome-based Management Provisions	Trigger and Threshold Criteri	a	Trigger and Threshold Response Act	ions	Monitoring	Timing / Frequency of Monitoring	Reporting
	Trigger Criteria	Threshold criteria	Trigger Level Actions	Threshold Criteria and Corrective Actions			
 Mackay within the riparian zone, from Uncontrolled discharge of saline water; Changes in inundation regime; Groundwater abstraction; or Sedimentation. Night Parrot Critical Habitat (where the populations are intersected by the Haul Road (NPEMP) from changes to altered surface hydrology. 	 and TsppEf which comprise the riparian zone (Table 2-2). Triggers for any decline in the health of this vegetation type which supports <i>Stackhousia</i> sp. Lake Mackay (P.K. Latz 12870) are presented in FV1. Statistically significant reduction in indices of vegetation health (Appendix B) at the Night Parrot populations in comparison to baseline over a single monitoring event. 	 and TsppEf which comprise the riparian zone (Table 2-2). Thresholds for any decline in the health of this vegetation type which supports <i>Stackhousia</i> sp. Lake Mackay (P.K. Latz 12870) is presented in FV1. Statistically significant reduction in indices of vegetation health (Appendix B) at the Night Parrot populations in comparison to baseline over two or more monitoring events. 	 Undertake site inspection to investigate likely reason for decline in vegetation health: Undertake site inspection to look for evidence of potential project-related indirect impacts to vegetation health such as changes in surface hydrology, fire, dust deposition, proliferation of weeds. Investigate likely reason for decline in vegetation health in consultation with a suitably qualified botanist: Cross reference monitoring results with the most recent environmental monitoring data for example, rainfall, weeds, fire to determine whether the potential cause for the decline in vegetation health can be identified. Cross reference vegetation health monitoring results with reference sites to determine if the changes are likely to be project related. Depending on the findings of the investigation, implement appropriate corrective actions as soon as possible: Establish vegetation health monitoring Photo points at permanent locations to detect any additional decline in vegetation health over time. Review Vegetation Health Monitoring Program (Appendix B) parameters to determine if they are effective and where necessary, implement changes to the Monitoring Program, as required. Uncontrolled discharge (riparian zone): Increase frequency of inspections of infrastructure at discharge locations. Changes in inundation regime: verify hydrological modelling is within 	 Critical habitat to DCCEEW and DWER in 7 days. Investigate likely reason for decline in vegetation health in consultation with a suitably qualified botanist: Undertake site inspection to look for evidence of potential project-related indirect impacts such as changes in surface hydrology, fire, dust deposition, proliferation of weeds. Implement corrective management actions as soon as possible. Determine whether the changes in vegetation health observed in critical Night Parrot habitat impact monitoring sites are comparable to changes in vegetation health observed at the Night Parrot reference sites. Cross reference monitoring results with the most recent environmental monitoring data for example, rainfall, weeds, fire to determine the potential cause for the decline in vegetation health. Investigation report to be submitted to DWER and DCCEEW (where threshold exceedance occurred in critical habitat supporting NP populations). Report will outline the extent and likely source of decline in vegetation health. Investigation into potential causes of threshold exceedance. Depending on the findings of investigation into potential causes of threshold exceedance, implement appropriate corrective actions: – Uncontrolled discharge (riparian zone): increase 	Monitoring Program (Appendix B). 2. Establish Photo Monitoring points to monitor Vegetation health in response to exceedance of trigger/threshold criteria.	trigger/threshold criteria.	 Annual Compliance Assessment Report (ACAR). Incident reports.

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EPA Factor and Objective	Flora and Vegetation: to prote	ct flora and vegetation so that	biological diversity and ecological integ	rity are maintained.			
FVEMP Purpose	To avoid adverse project-related	d impacts to native vegetation,	including significant flora and vegetation a	and associated habitat.			
Key Impacts and Risks	Potential loss or degradation of	of riparian vegetation and the	potential loss of significant flora from the	e proposal area, as a result of impleme	ntation of the Proposal.		
Indicators	Decline in the health of vegeta	tion important for supporting	significant flora and fauna species. Incre	ase in the proliferation of existing wee	ds or introduction of new	weed species.	
Outcome-based Management Provisions	Trigger and Threshold Criteri	a	Trigger and Threshold Response Acti	ons	Monitoring	Timing / Frequency of Monitoring	Reporting
	Trigger Criteria	Threshold criteria	Trigger Level Actions	Threshold Criteria and Corrective Actions			
			 predictions for surface water flows. Groundwater abstraction and/or Sedimentation: verify hydrological modelling of groundwater is within predictions and whether different areas of the lake are affected differently by groundwater drawdown. Changes in surface hydrology (haul road in proximity to Critical Night Parrot Habitat): verify haul road construction and drainage features are in accordance with design. Increase monitoring frequency Vegetation Health Monitoring Program (Appendix B) for vegetation health in proximity to NP populations. Weeds: undertake weed control in accordance with Weed Management Plan (Appendix C). 	 frequency of inspection of infrastructure (evaporation ponds and trench networks). Undertake appropriate works (such as pond or trench maintenance) to avoid the riparian zone being affected by any potential future breaches. Changes in inundation regime (riparian zone): verify hydrological modelling of surface water flows, including simulation 1:100-year events are within modelled predictions. Determine if potential impacts vary from predicted levels. If required review effectiveness of crossovers designed to maintain the hydrological regime. Undertake maintenance and amendments as required, to on lake infrastructure (such as trench network design and configuration) Groundwater abstraction and/or Sedimentation (riparian zone): verify predicted hydrological modelling of groundwater and whether different areas of the lake are affected differently by groundwater drawdown. Review trench network design and configuration, and if required, refine/modify abstraction schedule from the affected areas of the lake. Changes in surface hydrology (haul road in proximity to Critical Night Parrot Habitat): Implement changes to the road and drainage features so that future surface flows in proximity to Night Parrot populations are not affected. Potential amendments include 			

EPA Factor and Objective	lora and Vegetation: to protect flora and vegetation so that biological diversity and ecological integrity are maintained.									
FVEMP Purpose	To avoid adverse project-related	I impacts to native vegetation,	including significant flora and vegetation a	and associated habitat.						
Key Impacts and Risks	Potential loss or degradation of	f riparian vegetation and the	potential loss of significant flora from the	e proposal area, as a result of impleme	ntation of the Proposal.					
Indicators	Decline in the health of vegetat	ecline in the health of vegetation important for supporting significant flora and fauna species. Increase in the proliferation of existing weeds or introduction of new weed species.								
Outcome-based Management Provisions	Trigger and Threshold Criteria	3	Trigger and Threshold Response Act	ions	Monitoring	Timing / Frequency of Monitoring	Reporting			
	Trigger Criteria	Threshold criteria	Trigger Level Actions	Threshold Criteria and Corrective Actions						
				 alterations to the height of the haul road surface relative to the adjacent surrounds or installation of drainage infrastructure ie. culverts. Weeds: undertake weed control in accordance with Weed Management Plan and implement appropriate changes (i.e. increase frequency of Weed Monitoring) (Appendix C). Review Vegetation Health Monitoring Program (Appendix B) parameters to determine if management actions are effective and where necessary, implement changes to the monitoring program, as required. 						
No project-related adverse impacts to significant (priority) flora species from project-related clearing: • Stackhousia sp. Lake Mackay (P.K. Latz 12870) (Priority 1) and • Comesperma sabulosum (Priority 3).	 Total clearing (ha of direct disturbance to vegetation) not to exceed the following proportions: 1% of a vegetation type that support <i>Stackhousia</i> sp. Lake Mackay (P.K. Latz 12870) (Priority 1)*; or 5% of a vegetation type that support <i>Comesperma sabulosum</i> (Priority 3)**. *Stackhousia sp. Lake Mackay (P.K. Latz 12870) (Priority 1)*; or 5% of a vegetation type that support <i>Comesperma sabulosum</i> (Priority 3)**. *Stackhousia sp. Lake Mackay (P.K. Latz 12870) (Priority 1): clearing not anticipated to exceed 0.3% of any of the vegetation types that support this species (Table 2-2). ** <i>Comesperma sabulosum</i> (Priority 3): clearing not anticipated to exceed 3.1% of any of the vegetation types that support this species (Table 2-2). 	 Total clearing (ha of direct disturbance to vegetation) not to exceed the following proportions: 2% of a vegetation type that support Stackhousia sp. Lake Mackay (P.K. Latz 12870) (Priority 1)*; or 10% of a vegetation type that support Comesperma sabulosum (Priority 3)**. *Stackhousia sp. Lake Mackay (P.K. Latz 12870) (Priority 3)**. 	 Report internally as an incident in accordance with internal procedures. Investigate potential cause of exceedance: Undertake in field inspection and record the nature and extent of direct disturbance that has occurred and record within the internal clearing register. Determine if clearing is authorised. Review management strategies and implement changes where required including: Audit and review of training and staff inductions Increase staff training for clearing activities, legislative requirements, ground disturbance procedure and appropriate clearing protocols, as required. 	 Implement the following threshold contingency actions within 24 hours of threshold exceedance: Temporarily cease clearing activities. Undertake in field inspection and record the nature and extent of direct disturbance that has occurred and record within the internal clearing register. The following threshold contingency actions are to be undertaken within 7 days of the threshold exceedance occurring: Review of the potential impact(s) of unauthorised clearing and report any noncompliance to Department of Water and Environmental Regulation (DWER) and DCCEEW (for matters relating to MNES) within 7 days of identification. Environmental Manager (or suitably qualified delegate) to undertake a review to determine if impact of clearing can be minimised. 	 Monitoring of clearing register for compliance to approvals. Land clearing reconciliation (against GIS exclusion and disturbance layers) to ensure clearing does not exceed triggers and threshold values (% of vegetation type cleared supporting <i>Stackhousia</i> sp. Lake Mackay (P.K. Latz 12870) (Priority 1) and <i>Comesperma</i> <i>sabulosum</i> (Priority 3), Aerial image capture (satellite or remotely piloted aircraft (RPA)). Internal audit and inspection of areas of clearing. 	 Monitoring of clearing register- Monthly. Aerial image capture- Annual. Internal audit and inspection- Regular compliance inspections during clearing. 	 Clearing Register. Internal clearing permits. Reporting requirements described in Section 6 apply: Annual Environmental Reporting (Section 6.1). Threshold exceedance reporting in accordance with Section 6.2. Incident reporting in accordance with Section 6.3. 			
EPA	Factor and Objective	Flora and Vegetation: to protect flora and vegetation so that biological diversity and ecological integrity are maintained.								
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FVEMP Purpose		To avoid adverse project-related impacts to native vegetation, including significant flora and vegetation and associated habitat.								
Key	Impacts and Risks	Potential loss or degradation	of riparian vegetation and the	potential loss of significant flora from th	ne proposal area, as a result of implement	ntation of the Proposal.				
Indi	cators	Decline in the health of vegeta	ation important for supporting	significant flora and fauna species. Incl	rease in the proliferation of existing wee	ds or introduction of new	weed species.			
Out Prov	come-based Management <i>v</i> isions	Trigger and Threshold Criteri	ia	Trigger and Threshold Response Actions		Monitoring	Timing / Frequency of Monitoring	Reporting		
		Trigger Criteria	Threshold criteria	Trigger Level Actions	Threshold Criteria and Corrective Actions					
					 Review and revise ground disturbance procedure with the aim to prevent further occurrences in the future. Undertake rehabilitation of unauthorised clearing as required, in accordance with rehabilitation procedures, with the aim to reinstate habitat for significant flora as described in Section 2.3. Monitor threshold contingency actions to validate success of mitigation strategy. Investigation report to be submitted to DWER and DCCEEW with remediation 					
					actions proposed within 28 days of incident report.					
FV4	No proliferation or introduction of new weed species rated as high or very high management priority by DBCA in the Proposal Area as a result of the Proposal*	Triggers and thresholds and	d corrective actions with mo	onitoring and reporting are provided i	n the Weed Management Plan (Appen	dix C).				
FV5	No introduction of weed species rated as high or very high management priority by DBCA within the habitat for the Night Parrot populations as a result of the Proposal*									
FV6	No net increase in the baseline extent of weed populations within the Proposal area as a result of the implementation of the Proposal.									
FV7	No new populations of a weed species compared to baseline weed mapping within the Proposal Area.									

Table 4-2: Flora and Vegetation objective-based management provisions.

EPA Eactor and Objective	Flora and Vegetation: to protect flora and vegetation so that biological divers	ity and ecological integrity are	maintained.					
FVEMP Purpose and Objectives	To avoid adverse project-related impacts to flora and vegetation, including significant flora and vegetation.							
Key Impacts and Risks	Potential loss or degradation of riparian vegetation and the potential loss of significant flora from the proposal area, as a result of implementation of the Pro-							
Indicators	Decline in the health of vegetation important for supporting significant flora a	nd fauna species. Increase in th	he proliferation of existing week	ds or introductio				
Management Target	Management Actions	Monitoring	Timing	Responsible				
MO1: No project-related adverse impac	ts to native vegetation or significant (priority) flora species Stackhousia sp. La	ake Mackay (P.K. Latz 12870) (P	riority 1) and Comesperma sab	ulosum (Priority				
 Clearing not to exceed 1,500 ha of flora and vegetation (comprising 200 ha of native vegetation in the 688 ha Off-LDE, 300 ha of native vegetation in the 11,799 ha SIDE and 1,000 ha of native vegetation within the 33,928 ha NIDE). No significant decline to native vegetation supporting significant (Priority) flora species Stackhousia sp. Lake Mackay (P.K. Latz 12870) (Priority 1) and Comesperma sabulosum (Priority 3), from project- related clearing. 	 Conservative clearing limits established for vegetation types that are known to support <i>Stackhousia</i> sp. Lake Mackay (P.K. Latz 12870) (Priority 1) and <i>Comesperma sabulosum</i> (Priority 3). Processing plant and associated infrastructure constructed outside of the riparian vegetation. No clearing of vegetation on lake islands. 30% of the haulage corridor will be constructed on the existing cleared track reducing total clearing. Clearing will only occur in approved ground disturbance areas. Coordinates for clearing extents will be provided to the Construction Contractor. All Ground Disturbance Permits (GDP's) issued within each financial year will be recorded and reported to internal personnel on an annual basis. Undertake rehabilitation of temporarily cleared areas in accordance with rehabilitation procedures. Delineate clearing boundary areas and confirm cleared areas via survey after clearing. Develop a Ground Disturbance Permit System and Procedure. Develop an Incident Reporting Procedure. Comply with: CEMP 	 Monitoring and annual reconciliation of clearing for compliance to approvals. Analysis of clearing undertaken via annual aerial imagery survey to assess whether any unauthorised clearing has occurred. Comply with: CEMP; and MCP. 	 During construction, preclearing clearing and post-clearing activities. Annual aerial imagery capture and analysis to monitor clearing extent. In accordance with: CEMP; and MCP. 	 Constructio Operations Environmer 				
	– MCP.							
MO2: No project-related adverse impacts	to vegetation from a decline in vegetation health, including riparian vegetat	ion, vegetation associated wit	h critical habitat for the Night	Parrot, or trees				
Uncontrolled discharge of saline	water;							
Project-related drawdown from g	roundwater abstraction							
Changes to surface water hydrolo	ygy, or							
Changes to water flows during int	undation.							
		I	I	T				
3. Verification of detailed hydrological modelling of surface water flows, including simulation 1:100-year rainfall events (as per the IWEMP)	 Large rainfall events (300 mm within one month) will recharge groundwater level and reset to within 0.5 m of the surface (baseline conditions). Cohesive salt crust to assist in retention of sediment/soil moisture limiting 	1. Monitor vegetation health in accordance with Vegetation Health Monitoring Program (Annendix B) quidance	1. In accordance with the Vegetation Health Monitoring Program (Appendix B)	Construction Operations Environment				

3. Verification of detailed hydrological modelling of surface water flows, including simulation 1:100-year rainfall events (as per the IWEMP)	 Large rainfall events (300 mm within one month) will recharge groundwater level and reset to within 0.5 m of the surface (baseline conditions). Cohesive self ervet to essist in retention of codiment/self maintum limiting. 	1.	Monitor vegetation health in accordance with Vegetation Health Monitoring Program	1.	In accordance with the Vegetation Health Monitoring Program (Appendix B)	• • •	Constructio Operations Environmer
4. Staged development of trenches via BMUs and engineering design (1 km spacing, install crossovers) to maintain natural hydrological	 Conesive salt crust to assist in retention of sediment/soil moisture limiting sediment/soil mobilisation. Haul road constructed to avoid impediments to surface water flows/sheet drainage during flooding events. 	2	(Appendix B), guidance and industry best practice.	2. 3.	In accordance with IWEMP. Regular inspections.		
 5. No adverse project-related impacts to surface hydrology (excluding on-lake operations) and water flows 	 Haul road to include inclusion of culverts to allow surface hydrology, where required based on structural engineering report. 	2.	monitoring will be conducted to monitor groundwater drawdown.	4.	In accordance with: – CEMP; and – IWEMP.		

oposal.	
n of new weed s	species.
	Reporting
3), from project	-related clearing.
n.	Annual Compliance Assessment Report (ACAR).
at Toom	• Internal incident reporting.
nt ream.	Annual Monitoring reports.
	5 -1 - 10
that which man	
that which may	utilise groundwater
	Annual Os and lise
n.	 Annual Compliance Assessment Report (ACAR)
	Internal incident reporting
nt Team.	Annual Monitoring reports
	• Annual wonitoning reports.

EPA Factor and Objective	Flora and Vegetation: to protect flora and vegetation so that biological divers	ity and ecological integrity are	maintained.				
FVEMP Purpose and Objectives	To avoid adverse project-related impacts to flora and vegetation, including significant flora and vegetation.						
Key Impacts and Risks	Potential loss or degradation of riparian vegetation and the potential loss of significant flora from the proposal area, as a result of implementation of the Proposal.						
Indicators	Decline in the health of vegetation important for supporting significant flora and fauna species. Increase in the proliferation of existing weeds or introduction of new weed species						
Management Target	Management Actions	Monitoring	Timing	Responsible	Reporting		
resulting in significant disturbance and decline of vegetation 6. Groundwater abstraction not to exceed ground water license limit.	 Implement a buffer zone to the riparian vegetation of up to 250 m to provide a mechanism to reduces the potential for, and extent of potential drawdown and drying of the playa surface and potential deposition of lake sediments on <i>Tecticornia</i> within the riparian zone. Adequate distance between trenches (1 km spacing) and buffer zones of 500 m around the largest islands has been implemented as a mitigation against drawdown will also protect the riparian zone from potential wind-blown salts (or additional wind-blown material, as the lake and surrounds is naturally saline). Staged development of evaporation ponds and salt piles. Evaporation ponds have been designed for a 1% AEP flood event, with minimum embankment height of 1.5 m, providing sufficient freeboard to limit saline runoff into the lake during major rainfall events. Evaporation pond embankment will be breached at closure to allow periodic pulsed flows and natural dissipation of salt to the lake over time. Adhere to 5C DWER water licence requirements. Comply with: CEMP; and IWEMP. 	 Regular borefield equipment inspections and maintenance. Comply with: CEMP; and IWEMP. 					
MO3: No proliferation or introduction of n	ew weed species rated as high or very high management priority by DBCA in the	e Proposal Area as a result of t	the Proposal:	1	1		
 No introduction of new weed species rated as high or very high management priority by DBCA in the Proposal Area as a result of the Proposal.* Weed management programs should be designed in accordance with relevant EPBC Act weed threat abatement plans*. Weed management procedures informed by best practice management of the weed species identified during weed baseline surveys*. Weed control measures implemented for Buffel Grass in Night Parrot avoidance buffer zones in accordance with the Weed Management Plan*. No net increase in the baseline extent of weed populations within the Proposal area as a result of the implementation of the Proposal. 	Management actions with monitoring and reporting are provided in the Weed	Management Plan (Appendix C	;).				
MO4: No project-related decline in flora a related unplanned fire events.	nd vegetation health or and vegetation types supporting significant priority f	lora <i>Stackhousia</i> sp. Lake Mac	ckay (P.K. Latz 12870) (Priority	1) and Comesperma sabulosu	um (Priority 3), from project-		

EPA Factor and Objective		Flora and Vegetation: to protect flora and vegetation so that biological diversity and ecological integrity are maintained.								
FVEMP Purpose and Objectives		To avoid adverse project-related impacts to flora and vegetation, including significant flora and vegetation.								
Key Impacts and Risks		Potential loss or degradation of riparian vegetation and the potential loss of significant flora from the proposal area, as a result of implementation of the Proposal.								
Inc	dicators	Decline in the health of vegetation important for supporting significant flora and fauna species. Increase in the proliferation of existing weeds or introduction of new weed species.								
Ма	anagement Target	Management Actions	Monitoring	Timing	Responsible	Reporting				
2.	<text></text>	 Avoid hot works in fire sensitive habitats (i.e. areas of long unburnt spinifex) and along the Haul Road. Liaise with Traditional Owners about the management of local fire regimes and fire management practices. Establish Emergency Response Plan and Emergency Response Team (ERT). Require all personnel to complete a site induction that will include information on prevention of project-related fires, including designated smoking areas, no fires permitted in workplace, use of extinguishers, hot works procedures, appropriate waste management. All fuel stored on site to be in a secure bund. Implement a hot works permit system for high ignition risk work activities. If hot works adjacent to vegetation can't be avoided, the area immediately surrounding 'hot work' to be dampened with water if vegetated and vegetation is not already naturally damp. Fire response equipment maintained at site and in vehicles, machinery and Haul Trucks. Water trucks to have fire management capabilities (pumps/hoses). Consider 'no fires' or 'fires prohibited' signage in areas of fire sensitive habitat i.e. Night Parrot habitat. Engagement of Traditional Owners for understanding local fire regimes and fire management practices. Establish Emergency Response Plan and Emergency Response Team (ERT). Fire response equipment maintained at site and in vehicles and machinery and Haul Trucks. 	 Monitor success of fire management, particularly near significant species/habitat. Internal incident reporting and investigation process. Daily wind conditions will be taken into consideration when clearing activities are proposed. Monitor and record occurrence of fires within the Proposal area through internal reporting system. Comply with: TFEMP; CEMP; NPMP and Monitoring Program. 	 Daily during construction. On-going, as triggered. 	 Construction. Operations. Environment Team. 	 Incident reporting. Annual Compliance Assessment Report (ACAR). 				
		 Implement a hot works permit system for high ignition risk work activities high ignition risk work activities. Develop education programs for haul road users (including Traditional Owners). Develop a Fire Management Procedure. Develop an Emergency Response Plan. Develop a Traffic Management Plan (TMP). Develop a Hot Works Permit System. 								
		Develop an Incident Reporting Procedure.								
MC ve	D:5 No significant project-related decline getation supporting critical Night Parro Discharge or seepage of untreated wa	e in flora and vegetation health to vegetation types supporting significant pr t habitat from changes to: stewater.	iority flora <i>Stackhousia</i> sp. La	ake Mackay (P.K. Latz 12870) (P	riority 1) and Comesperma sal	bulosum (Priority 3),				
•	Increased soil salinity from uncontroll	ed discharge of saline water.								
•	Dust deposition.									
•	Hydrocarbon and chemicals spills.									

EPA Factor and Objective	Flora and Vegetation: to protect flora and vegetation so that biological diversity and ecological integrity are maintained.							
FVEMP Purpose and Objectives	To avoid adverse project-related impacts to flora and vegetation, including significant flora and vegetation.							
Key Impacts and Risks	Potential loss or degradation of riparian vegetation and the potential loss of significant flora from the proposal area, as a result of implementation of the Proposal.							
Indicators	Decline in the health of vegetation important for supporting significant flora and fauna species. Increase in the proliferation of existing weeds or introduction of new weed species.							
Management Target	Management Actions	Monitoring	Timing	Responsible	Reporting			
 Hazardous Substances Management Plan (HSMP) and Procedure implemented. Spill response training for all personnel and contractors. Spill response equipment provided for all site vehicles (including on all Haul Trucks). Dust management plan in place. Dust suppression measures in place. Implement speed limits on unsealed tracks. 	 Develop an Incident reporting Procedure. Comply with: CEMP; and IWEMP. Wastewater: Develop a Controlled Waste Management Procedure. WWTP and irrigation infrastructure to be operated and maintained in accordance with design specifications. Obtain all required environmental approvals for construction and operation of the WWTP (Part V and local council/ DoH approvals). Maintain high standard of housekeeping around processing plant and associated infrastructure. Adhere to wastewater best practice health and environmental legislation and guidelines for irrigation of treated wastewater. Increased Soil Salinity: Pipelines to be installed in earthen bunded culverts to prevent spills from discharging into the surrounding environment. Dust Deposition: Haul road will be sealed in the early stages of the Proposal, avoiding dust emissions that would otherwise be likely from an unsealed haul road; and Develop and implement Dust Management Plan. Hydrocarbon and Chemical Spills: Avoid fuel/chemical storage and transfer from occurring outside of designated bunded areas (i.e. dedicated workshop for maintenance). Ensure spill response equipment available. Spill response training for all personnel and contractors. Maintain high standard of housekeeping around construction activities. Develop an Incident Reporting Procedure and ensure all personnel and contractors are trained in the correct response. Develop an Incident Reporting Procedure. 	 Routine testing of treated wastewater to ensure discharged wastewater meets minimum compliance discharge criteria. Daily wind conditions will be taken into consideration when clearing activities are proposed. Regular pipeline inspections and maintenance. Internal incident reporting and investigation process. Comply with: CEMP; IWEMP; and Dust Management Plan. 	 As triggered. Daily. As required. As triggered Comply with: CEMP; IWEMP; and Dust Management Plan. 	 Construction. Operations. Environment Team. 	 Annual Compliance Assessment Report (ACAR). Internal incident reporting and investigation process. 			
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Table 4-3: Supporting environmental management plans, procedures and documents.

Environmental Management Aspect	Document Type	Document Title	Required Action/ Status	Commitments relating to terrestrial fauna (MNES)
Fire Weeds	Procedure	Fire Management Procedure	Develop and Implement Procedure and submit to DWER and DCCEEW for approval.	 Fire management procedure to include appropriate measures for the management of the managemen
Hazardous substances	Procedure	Hazardous Substances Management Plan (HSMP) and Procedure	Develop and Implement Plan and Procedure	 Minimise risk of occurrence of hazardous substances spills in riparian veget developing and implement a Hazardous Substances Management Plan (HSM following: Risk assessment; Hierarchy of controls; Authorization; Separation of dangerous goods; Labelling and storage requirements; Training and competency requirements; Fire protection; Removing and disposing of hazardous substances; Legislation and Australian standards; Reporting requirements; and Review requirements.
Event Reporting	Procedure	Event and Hazard Reporting Procedure	Develop and Implement Proce	edure in accordance with reporting requirements outlined in the FVEMP.
Investigations following Incident	Procedure	Investigation and Action Management Procedure	Develop and Implement Proce	edure.
Weeds	Procedure	Weed Management Procedure	Plan has been completed and	I appended to the CEMP and FVEMP submitted to DWER and DCCEEW for approv
Dust Management Plan	Management Plan	Dust Management Plan	Plan has been completed (inc	cluded as attachment in the CEMP) and submitted to DWER and DCCEEW for appr
Clearing	Procedure	Ground Disturbance Permit System and Procedure.	Ensure clearing does not adv	versely impact priority flora locations.
Clearing / Rehabilitation	Procedure	Topsoil Stripping and Storage Procedure.	Ensure appropriate collection	of topsoil and outline techniques for topsoil stripping and storage for rehabilitation

gement of fire and fuel loads and subsequent weed

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etation and vegetation within Night Parrot habitat by MP) and Procedure to include but not limited to the

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5 Monitoring and Evaluation

A monitoring schedule has been developed with performance targets, to assess the effectiveness of the management measures outlined in this FVEMP (Section 4). The performance targets have been aligned with the outcomes-based objectives and associated environmental criteria, with associated measurement parameters, monitoring frequencies and responsibilities.

In addition, Monitoring Programs have been developed to align with the FVEMP and are presented in **Appendix B** and **Appendix C**. The survey design, frequency and components have been considered and informed by previous findings, and where possible aligned with the baseline survey (Stantec, 2021c), for consistency and to allow for comparison over time.

The Monitoring Program has been developed to achieve the following objectives:

- Monitor the success of mitigation and management and detect potential impacts (Section 3.3) to significant vegetation and tree health;
- Evaluate potential impacts against trigger, threshold, and target criteria (management provisions) (Section 4);
- Report exceedances against environmental criteria and implement corrective actions where required (Section 6); and
- Assess the effectiveness of the environmental criteria to inform adaptive management and revision where required (Section 8).

Where environmental threshold criteria are exceeded, potential corrective actions have been identified for significant flora and vegetation (Section 4).

6 Reporting Provisions

All the analysis and subsequent reporting provisions relating to the performance of this FVEMP will be submitted to the relevant regulatory authorities by the Manager Environment, as follows:

- DBCA: where plans relate to matters listed under the Biodiversity Conservation Act 2016 (BC Act)
- DWER: where plans relate to matters regulated under the Environmental protection Act 1986 (EP Act).
- DCCEEW: where plans relate to a matter listed under the *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act) or is a matter of national environmental significance (MNES).

Requirements for annual reporting, exceedance and incident reporting in accordance with this FVEMP are discussed in subsequent sections.

6.1 Annual Reporting

Agrimin will prepare an Annual Environmental Reports (AER) for submission to the DWER and DBCA (where applicable). An Annual Compliance Assessment Report (ACAR) will be prepared for submission to:

- DWER/ EPA
- DCCEEW annually for MNES related values (ACAR annual compliance assessment report).

The format and contents of these reports will align with the conditions and requirements stipulated by the individual authorities and demonstrate compliance. Reporting specific to the management of flora and vege tation will be summarised in the AER and ACAR to address the relevant conditions, with technical reports appended.

6.2 Exceedance Reporting

In the event that a threshold within this plan is exceeded, the DWER, EPA and DBCA will be notified as required within 7 days of identification of the exceedance in accordance with **Table 4-1**.

For matters regulated under the Environmental Protection Act 1986 (EP Act):

- The Proponent will report a non-compliance to DWER within 7 days of identification.
- The Proponent will provide an investigation report to be submitted to DWER with remediation actions proposed within 28 days of incident report.

6.3 Incident Reporting

All environmental incidents, regardless of the scale and nature of the incident, will be reported in accordance with the internal incident reporting procedure to the Agrimin Manager Environment as soon as practicable. The following procedure will be adhered to:

- All environmental near misses and incidents will be recorded within an incident management system. Incidents will be recorded internally by the person/s who cause or identify the event, within 24 hours of the incident occurring.
- The area supervisor or Superintendent will determine the need for corrective actions and level of investigation required dependent on severity of the incident. Investigations will be conducted in accordance with the Investigation and Action Management Procedure and recorded within the incident reporting system within two weeks of the incident occurring, or as instructed by the Registered Mine Manager. Where applicable, environmental incidents will be reported to the relevant regulatory authorities by the Manager Environment.
- In the event of a non-compliance, the cause of the non-compliance will be investigated and reported as an incident. Corrective actions will be developed and recorded, and outcomes monitored, as required. Non-compliance and incident reports will be closed out by the Manager Environment and/or the Registered Mine Manager.

7 Roles and Responsibilities

The key personnel involved in implementation of the FVEMP and their roles and responsibilities are listed in Table 7-1.

Table 7-1: Roles and Responsibilities for implementation of the FVEMP.

Role	Responsibility			
Agrimin	 Agrimin have the overall responsibility for implementation of the FVEMP and the Monitoring Programs outlined in (Appendix B and Appendix D) Audit and compliance. 			
Manager Environment (may delegate all or part responsibility to an appropriately qualified person)	 Obtain relevant approvals from regulatory agencies for disturbance as required. Implement flora and vegetation monitoring in accordance with the Monitoring Programs outlined in (Appendix B and Appendix D) Monitor and report incidents. Maintain clearing register to ensure compliance with approvals. Undertake internal audits and inspections of clearing areas and compliance with FVEMP. Implement and maintain the FVEMP, review its effectiveness and review the implementation as required. Undertake training and inductions of project personnel in accordance with the FVEMP. Liaise with stakeholders and technical experts for advice and resolution of management aspects/objectives as required. Engagement with Traditional Owners. Report as required to regulating authorities. 			
All personnel (including contractors)	 Complete induction prior to commencement of work on site. Toolbox meetings. Training. Comply with requirements in FVEMP. Report any incidents through the Agrimin incident management system within 24 hours. 			
consultant)	• Specialist consultant to undertake monitoring according to FVEMP Monitoring Program (Appendix B and Appendix D).			

8 Adaptive Management and Review

It is recognised that there are some knowledge gaps relating to the key factor of Flora and Vegetation, such as the taxonomy and distribution of some cryptic species. Therefore, this FVEMP has been designed to be adaptive, and should be updated over the life of the Proposal. It is expected that additional information from flora and vegetation monitoring will be used to revise environmental criteria and response actions, as required.

Other changes that may prompt the revision of the FVEMP include:

- addressing items identified during incident investigations.
- audits or inspections; and
- additional information or data becomes available.

The FVEMP will be reviewed and revised every three years throughout the life of the Proposal, or as deemed necessary. Any revisions by Agrimin will be undertaken in consultation with DWER, DCCEEW and or DBCA (where appropriate). The review process for will include:

- **Periodic review and evaluation of monitoring data or methods** to determine whether monitoring results indicate that management provisions and environmental objectives are suitable and management targets can be achieved.
- Increased understanding of this factor and habitat requirements of biota additional information is received, which may be used to better inform environmental criteria, management or response actions.
- Proposal changes (such as design and processing, or technical advances and innovation) consider the
 relevance and effectiveness of management provisions will be considered following any significant changes to the
 Proposal.

9 Changes to an EMP

This FVEMP (v1) is the original version submitted to the EPA and DCCEEW for review prior to assessment.

All changes to the FVEMP post-assessment must be provided separate to compliance reports and submitted to DWER and DCCEEW (for matters relating to MNES) for approval with changes summarised in **Table 9-1**.

Table 9-1: Changes to FVEMP.

Complexity of Changes Min		Minor Revis	sions M	oderate Revisions	Major Revisions					
Number o	of Key Environmental F	actors	One Tw	ro – Three	> Three					
Date Revi	Date Revision submitted to EPA: DD/MM/YYYY									
Proponen Reason fo	Proponent's Operational Requirement Timeframe for approval of revision < One Month <pre> <six <="" months="" pre=""> > Six Months </six></pre> None									
Item No.	EMP Section No.	EMP Page No.	Summary of Change		Reason for Change					



10 Stakeholder Consultation

Several key stakeholder groups have been identified for the Lake Mackay Potash Proposal. Whilst engagement continues, some of the key stakeholders with respect to the Proposal include:

- State Government agencies, including the EPA, DWER, DBCA, Department of Mines, Industry Regulation and Safety (DMIRS), Department of Planning, Lands and Heritage (DPLH), and the Department of Jobs, Tourism, Science and Innovation (DJTSI);
- The Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW);
- Local Government agencies including the Shires of Shire of East Pilbara; Shire of Halls Creek; and Shire of Wyndham-East Kimberley;
- Native Title Bodies including Central Desert Native Title Services; and Kimberley Land Council;
- Traditional Owners and Heritage representative groups, including the Tjamu Aboriginal Corporation and Kiwirrkurra People; Parna Ngururrpa Aboriginal Corporation and Ngururrpa People; and Tjurabalan Native Title Land Aboriginal Corporation.
- Community representatives.

Agrimin maintains a Stakeholder Engagement Register that includes specific consultation with stakeholders and a detailed response to issues is provided. Stakeholder engagement will continue through the construction and operation of the Proposal and reported through revisions of Environmental Management Plans. Stakeholder consultation will continue to be monitored and reported following revision of the FVEMP as the document is finalised and implemented. A summary of stakeholder consultation specific to the FVEMP is summarised in **Table 10-1**.

Table 10-1: A summary of stakeholder consultation associated with the FVEMP.

Stakeholder	Date of Communication	Type of consultation	Attendees	Summary of communication		itcome of co		
 Between 2014-2017, Regular meeting Meetings with the with the DSD an A meeting with t A meeting with I 	Setween 2014-2017, consultations with relevant regulatory agencies, government departments and indigenous groups are summarised as follows: Regular meetings with representatives of the Kiwirrkurra People and CDNTS to discuss country, arrangements for an exploration agreement an negotiation protocol and discussions on heritage sure Meetings with the DMP (now DMIRS) to discuss environmental assessments and management plans and discuss options given the limitations associated with applying the Mining Act to brine mineral with the DSD and Minister for State Development's office regarding this issue. A meeting with the DOW to discuss implications to ground-water dependent ecosystems in relation to the Project. A meeting with DPaW to discuss arrangements for flora and vegetation, terrestrial fauna and subterranean fauna in relation to the Project. Department of Water ("DOW") recommends to check for Groundwater							
DoW	14-Feb-17	Meeting at DOW office to provide project briefing	DOW: Gary Humphreys, Josephine Searle, Lilly Magombedze, Natalie McAlpine Agrimin: Tom Lyons	 In regard to riparian vegetation, Agrimin must note any draw-down impacts from activities on the lake. Agrimin must investigate whether there are GDEs associated with islands and whether the project's water abstraction will impact on the Kiwirrkurra community's bore water supply. 	•	Unlikely that bore but Ag Unlikely that activities or		
DPAW	16-Feb-17	Meeting at DPAW office to provide project briefing	Agrimin: Tom Lyons DPAW: Sandra Thomas, Murray Baker, Michelle Corbellini	 Flora & Vegetation The Department of Parks & Wildlife ("DPAW") understand full environmental impact of Project on and off footprint. Agrimin should focus on conservation significant species. Salt lakes are ecological islands. Note fringing vegetation, restricted species, new species, range extensions. Correct ID of plants – confirmed by WA Herbarium – specimens to be properly vouchered. Target genera and species of conservation significance, eg Tecticornia spp and samphires. Transect surveys preferred over individual quadrats. Gypsum islands have potential to host unique species – need thorough, targeted investigation. Increase general survey area to capture more area outside of impact footprint Vertebrate Fauna Migratory birds after significant rainfall need to be investigated and the potential for large bird numbers and associated aquatic invertebrates. Target conservation significant species, especially Greater Bilby, Great Desert Skink and Brush-tailed Mulgara. Map Bilby, Mulgara, Skink locations so that preferred living/foraging habitat is avoided as far as practicable. Target endemic fauna, particularly reptiles. Current fauna work needs to be more extensive, albeit Level 1 survey to date. Subterranean Fauna Need to understand calcrete locations which are related to subterranean fauna distributions. Need to assess subterranean fauna off-footprint as well as within disturbance envelope. 	•	Future stud agencies. Future bore off-footprin Agrimin wil practicable		
OEPA	21-Feb-17	Meeting at OEPA office to provide project briefing	Agrimin: Tom Lyons EPA: Chris Stanley	 Ensure guidance document recommendations are incorporated into environmental assessments. Provide technical environmental reports to the Office of the EPA ("OEPA") Technical Team for review and feedback. Ensure early consultation on project with the Commonwealth Government. 	• •	Provided te vertebrate f Initiated co Environme		
DMP	17-Apr-17	Meeting at DMP office to provide project briefing	Agrimin: Tom Lyons DMP: Demelza Dravnieks	Impacts to surface water hydrology from trenching (bund wall influence on surface flows) should be assessed.	•	Trench cor with surface		

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nsultation

urveys ral resources. Subsequent discussions took place

I check for GDEs.

nat project will impact the Kiwirrkurra community's ogrimin will monitor for any draw-down effects. nat riparian vegetation will be impacted by on the lake but Agrimin will monitor this.

dies to incorporate advice from government

re hole drilling to incorporate calcretes on- and nt.

Il make use of existing bores as far as for subterranean fauna assessments.

echnical reports on flora, vegetation and fauna for review.

ontact with Commonwealth's Department of ent & Energy ("DEE") regarding project briefing.

nfiguration constructed to minimise interference ce water flow

Stakeholder	Date of Communication	Type of consultation	Attendees	Summary of communication	Outcome of con
				 Use of piping constructed through bunds to direct surface flow over trenches. Strategies should be considered to allow fauna egress from trenches if required. Groundwater drawdown, including depth and extent, and impacts to flora and subterranean fauna needs to be considered. Closure planning. 	 Piping strate conditions. Appropriate considered f Further hydr drawdown ir Closure plan developmen
Kiwirrkurra People & IPA Rangers	15-Sep-17	Flora & fauna survey briefing.	Agrimin: Tom Lyons DSS: Kate Crossing	IPA Ranger involvement in environmental baseline studies, particularly with respect to conservation significant flora and fauna.	Cultural lead opportunity consultants.
IPA Rangers Program	24-Oct-17	Flora & fauna survey briefing.	Agrimin: Tom Lyons DSS: Kate Crossing	Discussed logistical requirements and targeted survey activities including scheduling for the November 2017 field survey.	 Improved un and delivera Agreed on d Rangers.
IPA Rangers Program	31-Oct-17	Flora & fauna survey briefing.	Agrimin: Tom Lyons DSS: Kate Crossing	Coordination of field survey activities to be held in November 2017 at Lake Mackay involving IPA Rangers and zoology/botany consultants.	 Very positive involvement IPA Rangers to conservat
IPA Rangers Program	10-Nov-17	Environmental baseline surveys.	Agrimin : Tom Lyons DSS : Kate Crossing	 IPA Rangers keen to be involved in environmental surveys within their conservation area, particularly regarding conservation significant species, and engage in two-way learning process with scientists from mining consulting team. 	 Welcome in Traditional e skills used to conservation 4 IPA Range programme Close collab Rangers on engagement
DEE	21-Dec-17	Pre-referral meeting on teleconference.	Agrimin : Tom Lyons DEE : Matt Whitting, Mallory Owen	 The Commonwealth Department of the Environment and Energy ("DEE") requires an understanding of the Project's hydrogeological modelling - need to adequately understand groundwater drawdown in relation to depth and lateral extent, and connectivity between shallow and deep aquifers (existence and rate of connectivity). Hydrological modelling is also required regarding any increase in infiltration from the shallow aquifer, and corresponding reduction in surface water availability. This may include: The impacts of drawdown relating to the proposed project life (period) and area of extraction (spatial) The likelihood of depressurization of the overlying units occurring The approximate period of time to maximum impact extent and rate of recovery of the groundwater level in each aquifer Determine uranium (U) and thorium (Th) concentrations in sediments/soils (assay results) in Project impact area as this has been an issue raised in relation to similar projects by Ministers. If U and Th concentrations are elevated then ultimate test will be whether or not the action meets the test set out in Division 2.1 of the EPBC Regulations, particularly Regulation 2.02). Investigate potential changed hydrology (water drawdown) impacts on the Dwarf Desert Spike-rush Eleocharis papillosa – DEE search radius of 120km around Lake Mackay identified its occurrence to NE of the lake (Northern Territory). Also, any other plant spp which may be similarly impacted and potential impacts to fauna such as Bilby that may be dependent on these species. If Project assigned as 'Controlled Action' then assessment can occur via an 'Accredited Process'. 	 Preliminary g lake complet impacts relat Uranium and impacted by Re-visiting fl papillosa an visible, if pre- similar flora a hydrology (l impacts to de DEE's comm best in lieu o available.

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egy successful elsewhere under similar

e and practical egress measures to be for trenches.

Irological modelling required to quantify impacts.

nning to be addressed as part of project's nt studies.

ders & IPA Rangers enthusiastic about to work collaboratively with Agrimin and expert s.

nderstanding of involvement in the survey work ables.

dates for the survey period involving IPA

ve response with regard to the duration of t with the survey and the activities planned.

rs to engage as planned in field activities relating ation significant species.

nvolvement of IPA Rangers in survey work. ecological knowledge coupled with tracking to great effect in locating habitat and species of on significance.

ers committed to 4-day baseline studies field at Lake Mackay.

boration between mining consultants and IPA a range of survey opportunities with positive at and feedback from all involved.

groundwater and surface water modelling oneted. Off-lake water modelling targeting potential ated to proposed borefield yet to commence.

d thorium concentrations in soils and sediments y Project related activities to be assessed.

flora survey work to check for presence of E. nd whether or not this species would have been resent, during surveys. Also, look for other a spp which may be impacted by changed (lowering of water table) and consider related dependent fauna.

ments should currently be considered a guide at of more detailed information becoming

Stakeholder	Date of Communication	Type of consultation	Attendees	Summary of communication	Outcome of con
OEPA (EPA Services Directorate, DWER)	3-May-18	Feedback regarding draft referral supporting documentation.	Agrimin : Tom Lyons DWER : Chris Stanley	 Advised that the overall referral document appears comprehensive, however, need to address the following: Description for each activity in Key Characteristics table needs trimming to what is environmentally relevant and presented more concisely; Development envelope needs to be reduced in size so that it is, at most, double the amount of disturbance; Check that most recent EPA guidance is followed – see reference to 2004 (updated in 2016); Potential impacts to potentially 5 new <i>Tecticornia</i> species needs to be more fully addressed; Waste salt stockpiles – height and location may be an issue. Greenhouse gas emissions – include truck haulage of product; Remove or clarify reference to 4SX code, and MNES – complex with regard to what may be assessed under the EPBC Act. 	 Agrimin will referral doc Technical re document w the issues c
DEE	9-May-18	Feedback regarding draft referral supporting documentation.	Agrimin: Tom Lyons DEE: Thomas Schindl	 Department requires enough detail to consider whether or not the Proposal constitutes a nuclear action in accordance with Section 22 of the EPBC Act, Regulations 2.01 – 2.03 of the EPBC Regulations 2000 and the Australian Radiation Protection and Nuclear Safety Regulations 1999; Need adequate description and quantification of the quality and extent of vegetation type and habitat to be affected. Night Parrot surveys to be conducted in accordance with the WA DPaW (now DBCA) Interim guideline for preliminary surveys of Night Parrot in WA. 	 Agrimin will referral doc Technical re document w the issues c
Desert Support Services	27-Nov-18	Meeting to discuss opportunities for TO involvement on surveys.	Agrimin: Tom Lyons Stantec: Paul Bolton DSS: Kate Crossing	Meeting to discuss planned environmental surveys in 2019 and where there are opportunities for the Kiwirrkurra IPA Rangers to be involved (i.e. flora and fauna surveys on the islands and along the haul road). And run through the expected dates for the surveys.	Excited about the
Desert Support Services	27-Feb-19	Meeting to discuss approach and survey design for Phase 1 flora and fauna surveys with TOs.	Agrimin: Tom Lyons Stantec: Paul Bolton, Crystal Heydenrych DSS: Kate Crossing, Rachel Paltridge	Phase 1: Meeting to discuss details of how TO will be involved during the upcoming fauna surveys, particularly targeted surveys work for the Bilby and Great Desert Skink amongst other spp.	Excited to be cor
DWER - EPAS	6-Mar-19	EPAS Aquatic and Terrestrial Ecology Discussion.	Agrimin: Tom Lyons Stantec: Sarah Osborne, Kate Stanbury Approvals, Fiona Taukulis, Paul Bolton, Alice Bott EPA: Chris Stanley, Helena Mills, Claire Stevenson	 Key Topics Haul Road corridor flora, vegetation and fauna survey Consolidation of previous survey work within the on-lake and off-lake development envelopes SRE surveys within the Haul Road corridor and in the vicinity of the lake Aquatic ecology survey during flooding (or rewetting trials as an alternative) 	Preliminary feed
Desert Support Services	19-Sep-19	Meeting to discuss approach and survey design for Phase 2 flora and fauna surveys with TO's.	Agrimin: Tom Lyons Stantec: Paul Bolton DSS: Kate Crossing, Rachel Paltridge	Phase 2: Meeting to discuss details of how TO will be involved during the upcoming fauna surveys, particularly targeted surveys work for the Bilby and Great Desert Skink amongst other spp.	Excited to be con
EPAS	25-Feb-20	Meeting at EPAS Office to provide project update and advise of changes	Agrimin: Tom Lyons Stantec: Sarah Osborne EPA: Peter Tapsell	 Peter Tapsell (PT) advised that TEB branch have reviewed the flora and fauna memos provided. Peter relayed the messaged that the TEB had reviewed these and said that they looked ok and based on what was proposed in those memo's there was no requirement for TEB branch to meet with Agrimin/Stantec. PT – the Section 43a looks good in terms of the proposed changes and significance to tick the box and he sees no issues in proceeding with the current approval's pathway (i.e. section 43a and ESD submitted concurrently and ERD will reflect the proposed changes). 	Agrimin to proce

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cument, as appropriate.			

reports were not provided with the supporting which may have facilitated an understanding of commented on.

I address each of the comments and amend the cument, as appropriate.

reports were not provided with the supporting which may have facilitated an understanding of commented on.

e opportunity to work together on future surveys

onducted the surveys together.

back provided on approaches for surveys

onducted the surveys together.

eed with lodging S43a change notice

Stakeholder	Date of Communication	Type of consultation	Attendees	Summary of communication	Outcome of cor
Central Deserts and Desert Support Services	7-Aug-20	Meeting to discuss survey results and future survey plans	Agrimin: Tom Lyons Stantec: Paul Bolton DSS: Kate Crossing, Angie Reid	Planning for upcoming targeted Great Desert Skink surveys and Night Parrot surveys with TOs	N/A
EPA	20-Aug-20	Meeting at EPAS Office to provide project presentation to EPA Board members	EPA Board	EPA Board Agrimin's presentation was well received.	
EPAS and DWER	2-Sep-20	Meeting at EPAS office to provide project update and major findings	Agrimin: Tom Lyons Stantec: Sarah Osborne EPA: Liesl Rohl, Vanessa Robinson, Helena Mills, Claire Stevenson Stygofauna environmental assessments will be required and should be a priority given timeline issues with other projects in the State.		EPAS/TEB brand ERD around: ch drying, impacts germination / ch impacts on islan priority <i>Tecticon</i> communities.
EPAS and DWER	30-Sep-20	Meeting at EPAS office to provide project update and major findings	Agrimin: Tom Lyons Stantec: Sarah Osborne, Paul Bolton EPA: Liesl Rohl, Vanessa Robinson, Helena Mills, Claire Stevenson	 Agrimin presented key findings of field surveys to DWER-EPAS and TEB branch including Night Parrot and Great Desert Skink. Discussions around findings and next steps for further survey and impact assessment work for inclusion within the ERD was discussed. 	 It was reconsidered around sign around sign EPAS/TEB the ERD are sediments of / distribution events / ind hydrologica and support
Desert Support Services	12-Oct-20	Meeting to discuss survey findings, and planning involving Tos	Agrimin: Tom Lyon Stantec: Paul Bolton DSS: Kate Crossing, Angie Reid	Summary of recent results and planning of surveys involving TOs	Survey planned
Northern Territory Dept of Environment, Parks and Water Security	30-Apr-21	Meeting with the Northern Territory Dept of Environment, Parks and Water Security	Agrimin: Mark Savich, Tom Lyons, Michael Hartley Stantec: Peter de San Miguel, Fiona Taukulis, Paul Bolton, Matthew Spence DEPWS: Paul Purdon, Lisa Bradley, Kylie Fitzpatrick, Maria Wauchope	 Agrimin/Stantec introduced the project and discussed the key issues that could relate to the NT side of the lake. Key issues being drawdown, which are considered negligible (similar to seasonal range). Key discussion points include: Key Mitigation Strategies Hydrogeological Model Outcomes Impact Predictions. 	N/A
NT EPA Board Meeting (Formal Agenda Item at Board Meeting)	1-Jun-21	Meeting	Agrimin: Tom Lyons Stantec: Sarah Osborne NT EPA Board: meeting (formal agenda item at the meeting) including Paul Vogel	 Agrimin provided a detailed briefing note to inform the Northern Territory (NT) Environmental Protection Authority (EPA) of the Proposal by Agrimin Limited (Agrimin) to construct and operate the Lake Mackay Potash Project (the Proposal). Agrimin detailed their consideration for WA EPA's mitigation hierarchy at each stage of the assessment process across all environmental factors, providing for the implementation of a number of proponent-led avoidance measures. 	These were well
EPAS and DWER	11-Oct-21	Site Visit over two days 11&12 October 2021.	Agrimin: Mark Savich, Tom Lyons Stantec: Peter Tapsell, Fiona Taukulis, Paul Bolton EPA: Lee McIntosh, Jenny Pope, Troy Sinclair, Liesl Rohl, Cristina Angel"	Opportunity to show EPA/DWER the Proposal Area and discuss on site potential impacts and mitigation to Flora and vegetation, waterbirds, SREs, Night Parrot, Subterranean fauna and inland waters.	N/A
DWER	9-Nov-21	Meeting	DWER: Liesl Rohl, Troy Sinclair Agrimin: Tom Lyons, Michael Hartley, Mark Savich Stantec: Matthew Spence, Peter Tapsell, Fiona Taukulis, Paul Bolton.		N/A

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nments or issues were raised.

ach recommended to focus the attention of the nanges to surface water hydrology, sediments to *Tecticornia* (sediment loading / distribution / hange to large scale flooding events / indirect nds) and maintaining hydrological flows to maintain *rnia* species and supporting vegetation

mmended to another discussion including DBCA nificant fauna species be undertaken.

branch recommended to focus the attention of ound: changes to surface water hydrology, drying, impacts to *Tecticornia* (sediment loading on / germination / change to large scale flooding direct impacts on islands) and maintaining al flows to maintain priority *Tecticornia* species rting vegetation communities.

I received by the NT EPA Board.

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Appendices

Appendix A Summary of Vegetation Types

Table A 1: Summary of Vegetation Types.

Broad Floristic Formation	Vegetation Type Code	Vegetation Type Description and Associated Species	Vegetation Condition	Extent in Study Area		Extent in Proposal Area		Extent in Indicative Footprint	
				(ha)	(%)	(ha)	(%)	(ha)	(%)
<i>Triodi</i> a hummock grassland	EgEp(Co)AsppTb	Eucalyptus pachyphylla and/or Eucalyptus gamophylla (± Corymbia opaca) low open woodland over mixed Acacia (Acacia adsurgens, Acacia elachantha, Acacia ancistrocarpa, Acacia ligulata) over Triodia basedowii hummock grassland. <u>Associated species:</u> Acacia cuthbertsonii, Acacia inaequilatera, Acacia tenuissima, Triodia salina and Triodia schinzii.	Excellent	63,076.43	14.21	8,253.63	13.09	143.47	0.23
<i>Triodi</i> a open hummock grassland	AstipGwaAancTbTe	Acacia stipuligera, Grevillea wickhamii subsp. aprica and Acacia ancistrocarpa tall open shrubland over Triodia basedowii (Triodia epactia) open hummock grassland. Associated species: Acacia adsurgens, Acacia adoxa var. adoxa, Acacia elachantha, Acacia maitlandii, Acacia monticola, Corymbia candida subsp.? dipsodes, Dampiera candicans, Dicrastylis doranii, Eucalyptus gamophylla, Eucalyptus pachyphylla, Gompholobiu m simplicifolium, Hakea macrocarpa and Triodia schinzii.	Excellent	4,576.04	1.03	4,576.04	100.00	132.30	2.89
<i>Triodi</i> a open hummock grassland	AhAaaTbTs	Acacia hilliana and Acacia adoxa var. adoxa low open shrubland over Triodia basedowii and Triodia schinzii open hummock grassland. <u>Associated species:</u> Aristida holathera var. holathera, Calytrix carinata, Dampiera candicans, Fimbristylis oxystachya, Grevillea wickhamii subsp. aprica, Halgania solanacea var. solanacea, Hybanthus aurantiacus, Mirbelia viminalis, Ptilotus astrolasius and Triodia spicata.		2,083.11	0.47	2,081.61	99.93	73.65	3.54
<i>Triodi</i> a open hummock grassland	EpGwaAancTp	Eucalyptus pachyphylla scattered mallee over Grevillea wickhamii subsp. aprica and Acacia ancistrocarpa scattered tall shrubs over Triodia pungens open hummock grassland. Associated species: Acacia elachantha, Acacia sericophylla, Dicrastylis doranii and Hakea lorea subsp. lorea.	Excellent to Very Good	2,830.39	0.64	2,204.46	77.89	72.16	2.55
<i>Triodia</i> open hummock grassland	AdAIALMTs	Allocasuarina decaisneana open woodland over Acacia ligulata and Acacia sp. Lake Mackay (P.K. Latz 12836) open shrubland over Triodia schinzii open hummock grassland. <u>Associated species:</u> Aristida holathera var. holathera, Dicrastylis doranii, Grevillea stenobotrya and Scaevola parvifolia subsp. parvifolia.		941.66	0.21	331.48	35.20	69.94	7.43
<i>Triodi</i> a hummock grassland	AstipHmTe	Acacia stipuligera and/or Hakea macrocarpa tall open shrubland over Triodia epactia open hummock grassland. <u>Associated species:</u> Acacia adsurgens, Acacia ancistrocarpa, Acacia melleodora, Acacia tenuissima, Aristida holathera var. holathera, Corymbia sp., Eucalyptus pachyphylla, Eragrostis eriopoda and Fimbristylis oxystachya.		2,319.05	0.52	2,262.76	97.57	65.84	2.84
<i>Triodia</i> open hummock grassland	GsAIALMMINcTp	Grevillea stenobotrya, Acacia ligulata, Acacia sp. Lake Mackay (P.K. Latz 12836) tall open shrubland over Melaleuca lasiandra open shrubland over Newcastelia cladotricha low open shrubland over Triodia pungens open hummock grassland. Associated species: Chrysocephalum eremaeum, Frankenia cordata, Pterocaulon sphacelatum and Stylobasium spathulatum.		6,413.68	1.44	404.61	6.31	62.94	0.98
<i>Triodia</i> hummock grassland	AancTb	Acacia? ancistrocarpa tall shrubland over Triodia basedowii hummock grassland. Associated species: Acacia eriopoda, Acacia hilliana, Stylobasium spathulatum, Triodia epactia and Hakea chordophylla.	Excellent	2,122.25	0.48	2,015.24	94.96	62.92	2.96
<i>Triodia</i> open hummock grassland	AstipTsTe	Acacia stipuligera tall open shrubland over Triodia schinzii and/or Triodia epactia open hummock grassland. <u>Associated species:</u> Acacia sericophylla, Comesperma sabulosum, Dicrastylis doranii, Dicrastylis exsuccosa, Eragrostis eriopoda, Jacksonia aculeata, Melaleuca lasiandra, Petalostylis cassioides, Triodia pungens and Yakirra australiensis var. australiensis.	Excellent to Very Good (1.2 ha was mapped Poor)	2,176.92	0.49	2176.92	100.00	61.25	2.81
<i>Triodi</i> a hummock grassland	(+/-Ev)EgAad(Sao)Tb	Eucalyptus victrix low open woodland and/or Eucalyptus gamophylla mallee over Acacia adsurgens and/or Senna artemisioides subsp. oligophylla open shrubland over Triodia? basedowii and Triodia pungens hummock grassland. <u>Associated species:</u> Acacia? ligulata, Bonamia erecta, Indigofera? georgei, Seringia elliptica and Stylobasium spathulatum.	Excellent	2,104.25	0.47	2,104.25	100.00	57.31	2.72
<i>Triodia</i> hummock grassland	HmAeTp	Hakea macrocarpa and Acacia eriopoda tall open shrubland over Triodia pungens hummock grassland. <u>Associated species:</u> Acacia melleodora, Acacia stipuligera, Aristida holathera var. holathera. Cassytha capillaris, Dicrastylis doranii and Scaevola parvifolia subsp. parvifolia.	Excellent	1,818.27	0.41	1,808.83	99.48	54.98	3.02
<i>Triodia</i> hummock grassland	AhTbTe	Acacia hilliana low open shrubland over Triodia basedowii and Triodia epactia hummock grassland. <u>Associated species:</u> Acacia monticola, Aristida holathera var. holathera, Calytrix carinata, Eriachne aristidea, Eucalyptus pachyphylla, Fimbristylis oxystachya, Grevillea wickhamii subsp. aprica, Senna notabilis and Sida Arenicola.	Excellent	1,601.37	0.36	1,600.25	99.93	46.95	2.93
<i>Triodia</i> hummock grassland	EpAstipGwaCcarTb	Eucalyptus pachyphylla scattered mallee over Acacia stipuligera and Grevillea wickhamii subsp. aprica tall open shrubland over Calytrix carinata low scattered shrubs over Triodia basedowii hummock grassland. Associated species: Acacia ancistrocarpa, Dicrastylis doranii and Grevillea eriostachya.	Excellent	1,416.25	0.32	1,409.59	99.53	43.28	3.06
<i>Triodia</i> hummock grassland	HdSeTsTsp.	Hakea divaricata scattered tall shrubs over Seringia elliptica scattered low shrubs over Triodia schinzii (Triodia sp.) hummock grassland. <u>Associated species:</u> Acacia ligulata, Androcalva? loxophylla, Bonamia erecta, Carissa lanceolata, Indigofera ?georgei, Leptosema chambersii, Petalostylis cassioides, Stylobasium spathulatum and Triodia ?basedowii.	Excellent to Very Good	4,423.51	1.00	1,308.24	29.57	39.26	0.89



Broad Floristic Formation	Vegetation Type Code	Vegetation Type Description and Associated Species	Vegetation Condition	Extent in Study Area		Extent in Proposal Area		Extent in Indicative Footprint	
				(ha)	(%)	(ha)	(%)	(ha)	(%)
<i>Triodia</i> hummock grassland	(Ep)AvAancAblSaoTpTe	Eucalyptus pachyphylla scattered mallee over Acacia victoriae and Acacia ancistrocarpa open shrubland over Acacia bivenosa x ?ligulata and Senna artemisioides subsp. oligophylla low scattered shrubs over Triodia pungens and Triodia epactia hummock grassland. Associated species: Acacia elachantha, Acacia sericophylla, Aristida holathera var. holathera, Atalaya hemiglauca, Arivela viscosa, Corymbia chippendalei, Grevillea wickhamii subsp. aprica, Hakea macrocarpa, Indigofera monophylla, Senna artemisioides subsp. helmsii, Tephrosia rosea s.lat (small cuneate leaflet form), Tephrosia sp. Northern (K.F. Kenneally 11950), and Triodia brizoides.	Excellent	1,468.82	0.33	1,464.45	99.70	39.22	2.67
<i>Triodia</i> hummock grassland	(Eg)AIALMTb(Ts)	(<i>± Eucalyptus gamophylla</i>) Acacia ligulata and Acacia sp. Lake Mackay (P.K. Latz 12836) open shrubland over Triodia basedowii (<i>Triodia schinzii</i>) hummock grassland. <u>Associated species:</u> Stylobasium spathulatum, Trianthema pilosa, Triodia salina and Triodia pungens.	Excellent	2,233.67	0.50	428.27	19.17	33.08	1.48
<i>Triodia</i> open hummock grassland	EoAacTeTsTp	Eucalyptus odontocarpa scattered mallee over Acacia acradenia tall open shrubland over Triodia epactia, Triodia schinzii and/or Triodia pungens open hummock grassland. <u>Associated species:</u> Acacia elachantha, Acacia sericophylla, Dicrastylis exsuccosa, Fimbristylis oxystachya, Grevillea wickhamii subsp. aprica, Halgania solanacea var. solanacea, Jacksonia aculeata, Melaleuca lasiandra, Mirbelia ?ramulosa, Tribulopis angustifolia and Yakirra australiensis var. ?australiensis.	Excellent to Good	1,132.87	0.26	1,132.81	100.00	27.94	2.47
<i>Triodia</i> open hummock grassland	EpEgAblAancTbTe	Eucalyptus pachyphylla and Eucalyptus gamophylla very open mallee over Acacia bivenosa x ?ligulata and Acacia ancistrocarpa scattered shrubs over Triodia basedowii and/or Triodia epactia open hummock grassland. <u>Associated species:</u> Acacia hilliana, Acacia tenuissima, Acacia stipuligera, Bonamia erecta, Hakea chordophylla and Triodia brizoides.		1,009.37	0.23	1,009.37	100.00	27.15	2.69
<i>Triodia</i> open hummock grassland	AadAeAancTbTs	Acacia adsurgens, Acacia elachantha and/or Acacia ancistrocarpa) open shrubland over Triodia basedowii and/or Triodia schinzii open hummock grassland. Associated species: Acacia ligulata, Carissa lanceolata, Eucalyptus gamophylla, Senna notabilis and Senna artemisioides		5,804.73	1.31	360.15	6.20	21.76	0.37
<i>Maireana/</i> <i>Tecticornia</i> low shrubland	MIGcSdFcTspp(TsaTp)	Maireana luehmannii, Goodenia collaris, Surreya diandra, Frankenia cordata, Tecticornia calyptrata and Tecticornia indica subsp. leiostachya low shrubland over Triodia salina (Triodia pungens on islands) very open hummock grassland. <u>Associated species:</u> Aristida holathera var. holathera, Eragrostis falcata, Lawrencia viridigrisea and Sclerolaena crenata.	Excellent	7,673.33	1.73	678.34	8.84	21.68	0.28
<i>Triodia</i> hummock grassland	Ad(Eg)TpTb	Allocasuarina decaisneana (± E. gamophylla) low open woodland over Triodia basedowii and/or Triodia pungens hummock grassland. Associated species: Acacia adsurgens, Melaleuca lasiandra, Stylobasium spathulatum, and Triodia schinzii.	Excellent	12,625.80	2.84	472.43	3.74	18.81	0.15
<i>Triodia</i> open hummock grassland	CspGpIAancTe	Corymbia sp. scattered mallees over Grevillea pyramidalis subsp. leucadendron tall open shrubland over Acacia ancistrocarpa scattered shrubs over Triodia epactia open hummock grassland. <u>Associated species:</u> Acacia acradenia, Acacia adoxa var. adoxa, Acacia bivenosa x?ligulata, Aristida holathera var. holathera, Arivela viscosa, Dicrastylis exsuccosa, Dolichandrone occidentalis, Eragrostis eriopoda, Eriachne obtusa, Fimbristylis dichotoma, Grevillea wickhamii subsp. aprica, Indigofera monophylla, Tribulopis angustifolia, Trigastrotheca molluginea and Yakirra australiensis var. ?australiensis.	Excellent	633.07	0.14	633.07	100.00	17.42	2.75
<i>Aristida</i> open tussock grassland	±SahDrAcAhhFdAvII	(±Senna artemisioides subsp. helmsii low scattered shrubs) Dactyloctenium radulans, Aristida contorta and/or Aristida holathera var. holathera open tussock grassland with Fimbristylis dichotoma scattered sedges and Arivela viscosa and Indigofera linifolia scattered herbs. <u>Associated species:</u> Abutilon otocarpum, , Eragrostis eriopoda, Eragrostis xerophila, Evolvulus alsinoides var. villosicalyx, Marsilea hirsuta, Ptilotus exaltatus, Ptilotus xerophilus, Tephrosia sp. Northern (K.F. Kenneally 11950), and Tribulus hirsutus.	Excellent to Very Good	382.92	0.09	382.92	100.00	16.80	4.39
<i>Corymbia</i> low open woodland	CcGsNsDdTpilTs	Corymbia chippendalei low open woodland over Grevillea stenobotrya scattered shrubs over Newcastelia spodiotricha and Dicrastylis doranii low open shrubland over Trianthema pilosum low scattered shrubs over Triodia schinzii very open hummock grassland. <u>Associated species:</u> Acacia melleodora, Aristida holathera var. holathera, Eragrostis eriopoda, Paractaenum refractum, Thinicola incana and Triodia epactia.	Excellent	563.46	0.13	562.26	99.79	15.59	2.77
<i>Triodia</i> open hummock grassland	CddEpAelAancTb	Corymbia deserticola subsp. deserticola scattered low trees and/or Eucalyptus pachyphylla very open mallee over Acacia elachantha tall open shrubland over Acacia ancistrocarpa scattered shrubs over Triodia basedowii open hummock grassland. <u>Associated species:</u> Acacia eriopoda, Acacia hilliana, Acacia sericophylla, Grevillea wickhamii subsp. aprica, Hakea lorea subsp. lorea, Stylobasium spathulatum and Triodia pungens.	Excellent	545.77	0.12	545.77	100.00	15.26	2.80
<i>Triodia</i> hummock grassland	AITp	Acacia ligulata tall shrubland over Triodia pungens hummock grassland. Associated species: Acacia trachycarpa, Eucalyptus gamophylla and Grevillea stenobotrya.	Excellent	377.95	0.09	377.95	100.00	14.46	3.83
<i>Triodia</i> hummock grassland	AIMgTb(TpTs)	Acacia ligulata and Melaleuca glomerata scattered low shrubs over Triodia basedowii (± Triodia pungens, or Triodia schinzii) hummock grassland. <u>Associated species:</u> Corchorus sidoides, Heliotropium glanduliferum and Ptilotus obovatus.	Excellent	5,885.48	1.33	340.64	5.79	13.87	0.24
<i>Triodia</i> hummock grassland	CcdTeTb(Tp)	Corymbia candida subsp. ?dipsodes low open woodland over Triodia epactia, Triodia basedowii and/or Triodia ?pungens hummock grassland. Associated species: Acacia adsurgens, Eucalyptus pachyphylla and Mirbelia viminalis.	Excellent	393.58	0.09	393.58	100.00	12.17	3.09

Broad Floristic Formation	Vegetation Type Code	Vegetation Type Description and Associated Species	Vegetation Condition	Extent in Study Area		Extent in Proposal Area		Extent in Indicative Footprint	
				(ha)	(%)	(ha)	(%)	(ha)	(%)
<i>Frankenia / Tecticornia</i> low open shrubland	FcTsppEf(TsaTs)	Frankenia cordata and Tecticornia spp.low open shrubland over Eragrostis falcata scattered tussock grasses and/or Triodia salina and Triodia schinzii very open hummock grassland. <u>Associated species</u> : Aristida holathera var. holathera, Calocephalus platycephalus, Fimbristylis dichotoma, Melaleuca glomerata, Osteocarpum salsuginosum and Sclerolaena crenata.	Excellent	6,090.96	1.37	146.99	2.41	11.20	0.18
<i>Triodia</i> open hummock grassland	CcAstipTeAhh	Corymbia chippendalei scattered low trees over Acacia stipuligera scattered tall shrubs over Triodia epactia open hummock grassland with Aristida holathera var. holathera scattered tussock grasses. <u>Associated species:</u> Acacia acradenia, Acacia ?sericophylla, Dicrastylis doranii, Eriachne obtusa, Hakea lorea, Indigofera monophylla and Yakirra australiensis var. ?intermedia.	Excellent to Very Good	391.77	0.09	391.77	100.00	11.20	2.86
<i>Triodia</i> open hummock grassland	CcAIALMAmNsDdTsTp	Corymbia chippendalei low open woodland over Acacia (Acacia ligulata, Acacia sp. Lake Mackay (P.K. Latz 12836) or Acacia melleodora) open shrubland over Newcastelia spodiotricha and Dicrastylis doranii low open shrubland over Triodia schinzii and/or Triodia pungens open hummock grassland. Associated species: Aristida holathera var. holathera, Crotalaria cunninghamii and Eriachne aristidea.	Excellent	16,060.89	3.62	1695.98	10.56	10.78	0.07
<i>Triodia</i> open hummock grassland	(Eb)AacTi	(±Eucalyptus brevifolia scattered mallee) Acacia acradenia open shrubland over Triodia intermedia open hummock grassland. <u>Associated species:</u> Acacia adoxa var. adoxa, Acacia elachantha, Acacia eriopoda, Acacia tenuissima, Acacia hilliana, Dodonaea coriacea, Enneapogon polyphyllus, Grevillea wickhamii subsp. aprica, Ptilotus astrolasius and Ptilotus calostachyus.	Excellent	785.60	0.18	785.60	100.00	10.11	1.29
<i>Triodia</i> open hummock grassland	AlSaoTbTp	Acacia ligulata and Senna artemisioides subsp. oligophylla open shrubland over Triodia basedowii and/or Triodia pungens open hummock grassland. Associated species: Eucalyptus pachyphylla, Ptilotus obovatus, Senna artemisioides subsp. helmsii and Streptoglossa macrocephala.	Excellent	208.91	0.05	208.91	100.00	9.25	4.43
<i>Triodia</i> open hummock grassland	AccSaoTp	Acacia cuthbertsonii subsp. cuthbertsonii high open shrubland over Senna artemisioides subsp. oligophylla scattered shrubs over Excellent 378.43 Triodia pungens open hummock grassland. Associated species: Aristida contorta, Arivela viscosa, Enneapogon polyphyllus, Eragrostis xerophila and Eucalyptus victrix. State of the second species is a state of the second species is the sec		378.43	0.09	315.01	83.24	9.11	2.41
<i>Acacia</i> open woodland	AaAccSao	Acacia? aneura low open woodland over Acacia cuthbertsonii subsp. cuthbertsonii and Senna artemisioides subsp. oligophylla open Excellent 273.81 shrubland. Associated species: Capparis umbonata, Enteropogon ramosus, Eragrostis xerophila, Ptilotus obovatus and Triodia sp.		273.81	0.06	240.94	88.00	8.84	3.23
<i>Triodi</i> a hummock grassland	AeDdTeAhh	Acacia eriopoda scattered tall shrubs over Dicrastylis doranii scattered low shrubs over Triodia epactia hummock grassland with Aristida holathera var. holathera scattered tussock grasses. <u>Associated species:</u> Acacia melleodora, Calytrix carinata, Cassytha capillaris, Eragrostis eriopoda, Fimbristylis oxystachya, Grevillea stenobotrva and Paraneurachne muelleri.		329.65	0.07	329.65	100.00	7.88	2.39
<i>Triodia</i> hummock grassland	MgTbTsaTs	Melaleuca glomerata open shrubland over Triodia basedowii, Triodia salina, and/or Triodia schinzii hummock grassland. <u>Associated species:</u> Aristida holathera, Dicrastylis doranii, Eriachne aristidea, Eragrostis falcata and Senna artemisioides subsp. oligophylla.	Excellent	5,833.57	1.31	153.74	2.64	5.64	0.10
<i>Grevillea</i> tall shrubland	GsAtAINsTsTp	Grevillea stenobotrya tall shrubland over Acacia trachycarpa and Acacia ligulata shrubland over Newcastelia spodiotricha low open shrubland over Triodia? schinzii and/or Triodia pungens very open hummock grassland. <u>Associated species:</u> Aristida holathera var holathera, Acacia? melleodora, Corymbia? chippendalei, Eucalyptus gamophylla and Stylobasium spathulatum.	Very Good	458.73	0.10	458.73	100.00	4.60	1.00
<i>Corymbia</i> low open woodland	CcDdTpAhh	Corymbia chippendalei low open woodland over Dicrastylis doranii low scattered shrubs over Triodia pungens open hummock grassland with Aristida holathera var. holathera scattered tussock grasses. Associated species: Acacia eriopoda, Acacia melleodora, Eremophila forrestii subsp? forrestii, Grevillea stenobotrya, Hakea macrocarpa, Melaleuca lasiandra, Newcastelia spodiotricha and Setaria surgens.	Excellent	119.54	0.03	118.59	99.20	3.09	2.59
<i>Triodia</i> hummock grassland	EvAvSaoTITe	Eucalyptus victrix low open woodland over Acacia? victoriae and Senna artemisioides subsp. oligophylla open shrubland over Triodia longiceps and/or Triodia epactia open hummock grassland. <u>Associated species:</u> Atalaya hemiglauca, Acacia adsurgens, Acacia cuthbertsonii subsp. cuthbertsonii, Aristida holathera var. holathera, Arivela viscosa, Eragrostis lanicaulis and Evolvulus alsinoides var. villosicalyx.	Excellent to Very Good	81.81	0.02	81.81	100.00	2.05	2.50
<i>Corymbia</i> low woodland	СоТе	Corymbia opaca low woodland over Triodia epactia open hummock grassland. <u>Associated species:</u> Acacia melleodora, Androcalva loxophylla, Clerodendrum floribundum var. coriaceum, Corchorus sidoides subsp. vermicularis, Hakea lorea subsp. lorea, Hakea macrocarpa, Polycarpaea corymbosa, Sida ?sp. Rabbit Flat (B.J. Carter 626), Sida ?sp. Western Sand Dunes (P.K. Latz 11980), Solanum diversiflorum and Trichodesma zeylanicum var. zeylanicum.	Excellent	36.99	0.01	36.99	100.00	0.85	2.30
<i>Triodia</i> hummock grassland	EvTb(TsaTs)	Eucalyptus victrix low open woodland over Triodia basedowii (±Triodia salina or Triodia schinzii) hummock grassland. Associated species: Carissa lanceolata, Melaleuca glomerata and Pluchea ferdinandi-muelleri	Excellent	544.14	0.12	28.19	5.18	0.84	0.15
<i>Tecticornia</i> low open shrubland	TsppEf	Tecticornia spp. low open shrubland over Eragrostis falcata scattered tussock grasses. Associated species: Frankenia cordata, Maireana luehmannii, Lawrencia viridigrisea and Surreya diandra.	Excellent	7,871.48	1.77	698.04	8.87	0.25	0.00
Senna Iow open shrubland	SaoFcTsa(Tb)	Senna artemisioides subsp. oligophylla and Frankenia cordata low open shrubland over Triodia (Triodia basedowii or Triodia salina) very open hummock grassland.	Excellent	5,972.17	1.35	70.51	1.18	0.20	0.00



Broad Floristic Formation	Vegetation Type Code	Vegetation Type Description and Associated Species	Vegetation Extent in Study Area Condition		tudy Area	Extent in Area	Proposal	Extent in Indicative Footprint	
				(ha)	(%)	(ha)	(%)	(ha)	(%)
		Associated species: Acacia ligulata, Aristida holathera, Euphorbia tannensis subsp. eremophila, Scaevola spinescens and Sclerolaena crenata.							
<i>Corymbia</i> low woodland	CcdCaDpTiPa	Corymbia candida subsp. dipsodes and/or Corymbia aspera low woodland over Dodonaea polyzyga tall open shrubland over Triodia intermedia scattered hummock grasses and Pseudochaetochloa australiensis very open tussock grassland. Associated species: Acacia monticola, Amaranthus undulatus, Boerhavia coccinea, Arivela viscosa, Cymbopogon obtectus and Eriachne mucronata.		46.38	0.01	46.38	100.00	0.09	0.20
<i>Acaci</i> a low woodland	AaptAparSaoAhh	Acacia aptaneura and/or Acacia paraneura low woodland over Senna artemisioides subsp. oligophylla low open shrubland over Aristida. holathera var. holathera very open tussock grassland. <u>Associated species:</u> Aristida contorta, Carissa lanceolata, Enchylaena tomentosa, Eucalyptus victrix, Rhagodia eremaea and Sida fibulifera.		195.84	0.04	0.00	0.00	0.00	0.00
<i>Acacia</i> open shrubland	ALMNsTp	Acacia sp. Lake Mackay (P.K. Latz 12836) open shrubland over Newcastelia spodiotricha low open shrubland over Triodia pungens hummock grassland. <u>Associated species:</u> Anthobolus leptomerioides, Aristida holathera var. holathera, Corynotheca micrantha, Grevillea stenobotrya, Leiocarpa semicalva, Paractaenum refractum, Ptilotus latifolius, Ptilotus polystachyus Sida sp. sand dunes (A.A. Mitchell PRP1208), Stylobasium spathulatum and Triumfetta winneckeana.	Excellent	2,626.07	0.59	20.18	0.77	0.00	0.00
<i>Chrysopogon</i> open tussock grassland	EssDpAsyCencCfAv	<i>Ehretia saligna</i> var. <i>saligna</i> and/or <i>Dodonaea polyzyga</i> tall open shrubland over <i>Chrysopogon fallax</i> and * <i>Cenchrus ciliaris</i> open tussock grassland with <i>Arivela viscosa</i> open herbland. <u>Associated species:</u> Abutilon hannii, Acacia? synchronicia, Amaranthus induratus, Atalaya hemiglauca, Boerhavia coccinea, Crotalaria medicaginea var. neglecta, Evolvulus alsinoides var. villosicalyx, Indigofera colutea and Triodia intermedia.	Good to Very Good	6.95	<0.01	6.95	100.00	0.00	0.00
<i>Triodia</i> hummock grassland	MgAl(Fc)TpEf	Melaleuca glomerata and/or Acacia ligulata open shrubland (± Frankenia cordata) over Triodia pungens hummock grassland with Eragrostis falcata scattered tussock grasses. Associated species: Aristida holathera var. holathera, Arivela viscosa and Euphorbia tannensis subsp. eremophila.	Excellent	13,433.11	3.03	86.83	0.65	0.00	0.00
<i>Triodia</i> open hummock grassland	SggTbr	Senna glutinosa subsp. glutinosa scattered shrubs over Triodia brizoides open hummock grassland. Associated species: Acacia? ancistrocarpa, Indigofera monophylla and Tephrosia sp. Northern (K.F. Kenneally 11950).	Excellent	27.21	0.01	27.21	100.00	0.00	0.00

 $\scriptstyle \pm$ denotes intermittent dominance of species across the overall vegetation type

Appendix B Vegetation Health Monitoring Program

B.1 Background

The Proposal Area encompasses vegetation and tree species that may be susceptible to Proposal impacts. These include:

- **Riparian vegetation**: During operation, the Proposal will reduce groundwater levels in the vicinity of trenches on the lake surface. Although buffers have been implemented and the trench network designed to reduce the potential for impacts, there is the possibility that the health of riparian vegetation on the periphery of the lake and on the islands may be affected by this drawdown. The riparian species that will be the focus of monitoring will be *Tecticornia* spp. and the Priority 1 species *Stackhousia* sp. Lake Mackay (P.K. Latz 12870). The riparian vegetation types align with the lake margin complex habitat which is critical habitat for the Night Parrot.
- Tree health (Allocasuarina decaisneana may access groundwater): During operation, the Proposal will reduce groundwater (brine) levels in the vicinity of trenches on the lake surface. Buffers have been implemented and the trench network designed to reduce the potential for impacts. There are no anticipated impacts to the vegetation on the islands, however as a precautionary approach Agrimin will undertake monitoring of potentially groundwater dependent trees. The largest potentially groundwater accessing tree on the islands is Allocasuarina decaisneana (Desert Oak).
- Vegetation providing Night Parrot habitat (long unburnt *Triodia* hummocks): The alignment of haul road is proposed to intersect broad drainage features which are known to support important habitat for the Night Parrot. The design and construction of the haul road aims to maintain ecosystem function i.e. surface hydrology (within and outside the Proposal Area). However, there is the possibility that the construction of the road may affect surface hydrology which may in turn affect vegetation health in these areas important to the Night Parrot. These areas contain long lived *Triodia* spp. which form important roost and nesting habitat for the species.

This vegetation health monitoring program (VHMP) is required to measure the effectiveness of the management actions outlined in the FVEMP. The outcomes of the monitoring program will contribute to ongoing improvements in management actions to ensure an adaptive management approach is adopted.

B.2 Objectives

The overall objective of the VHMP is to monitor and measure the success of management actions in the FVEMP to minimise impacts on vegetation and tree health. In particular, the aims include:

- Measure any potential adverse impacts of Agrimin's activities on vegetation and tree health within the Proposal Area;
- Identify if changes in vegetation or tree health are impacting, or threatening to impact, related values;
- Determine if changes in vegetation or tree health within the Proposal Area are a direct or indirect result of projectrelated activities or broader regional changes; and
- Monitor and measure the success of management actions identified in the FVEMP to inform an adaptive management approach.

B.3 Monitoring Programs

The approach for the VHMP is summarised in **Table B 1**, which also shows the relevant trigger and threshold criteria (outcome-based) management provisions. Monitoring parameters have been selected to best identify potential changes in vegetation and tree health over time. Monitoring of riparian vegetation health will focus on density, cover and condition (Section B.1). Monitoring of tree health will focus on monitoring of the tree *Allocasuarina decaisneana* (Desert Oak) which occur on the islands (Section B.2). Monitoring of vegetation within areas known to support Night Parrot will focus on the monitoring the persistence of the old growth spinifex (Section B.3).

Monitoring parameters, methods and sites have been selected to provide broad coverage of potential changes in vegetation and tree health over time and in relation to potential project-related impacts. The number of monitoring parameters and sites has been selected to build on baseline data where available and have been informed by vegetation mapped from the baseline survey. The advent of new or improved technology may result in changes to sampling methods employed. Ground truthing of proposed sites may result in refinement of the number and location of monitoring sites.

B.3.1 Traditional Owner Engagement

The Vegetation Health Monitoring Program presents an opportunity to engage with and work alongside TO Ranger groups from the Ngururrpa, Tjurabalan, and Kiwirrkurra IPAs. The TO Ranger Groups all have extensive experience and skills in a range of monitoring, protection and management activities.



Opportunities to involve TO Rangers in this monitoring may include:

• Consulting on survey design

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- Assisting with site selection within impact and reference sites;
- Knowledge sharing to improve understanding of fire management practices.

Agrimin are committed to ongoing discussions with both groups, which will involve spending time on country and engaging in two-way knowledge sharing. Through these ongoing discussions, there may be refinement in the locations of some of the reference sites. It is also acknowledged that monitoring methods may change over time, through adaptive management, in line with most recent scientific practices. Any refinements made to the program will be aligned with the requirements of the FVEMP. Agrimin recognises and respects that the Traditional Owners and Ranger Groups have extensive experience and skills in a range of monitoring, protection and management activities which are integral to ongoing discussions as part of stakeholder engagement for the life of the Proposal.

Table B 1: Vegetation and Tree Health Monitoring Program Summary.

Component	Personnel	Timing	Number of Monitoring Sites	Survey Effort	Monitoring Parameters	Outcome-based Management Objectives	Trigger Criteria	Threshold Criteria
Riparian vegetation health monitoring (lake margin complex) and tree health monitoring (<i>Allocasuarina</i> <i>decaisneana</i>)	 Experienced botanists Experienced GIS specialists Skilled Indigenous Rangers 	• Annually	 31 riparian sites 7 tree health sites 	 Riparian vegetation transect monitoring Tree health monitoring (on ground and remote sensing) 	 Vegetation health Tree health 	 No significant decline in the health of riparian vegetation (lake margin complex - Night Parrot critical habitat) or trees that may be utilising groundwater (<i>Allocasuarina decaisneana</i>) as a result of: Uncontrolled discharge of saline water; Changes in inundation regime; Groundwater abstraction; or Sedimentation. 	 A statistically significant decline in one or more riparian vegetation monitoring indices (species diversity, vegetation health, plant cover and abundance) at impact sites over a single monitoring event compared to baseline levels. A statistically significant decline in the health of potentially ground water dependent species (<i>Allocasuarina decaisneana</i>) detected over two consecutive monitoring events in comparison to baseline levels and relative to reference sites. 	 A statistically significant decline in one or more riparian vegetation monitoring indices (species diversity, vegetation health, plant cover and abundance) at impact sites over two or more monitoring events compared to baseline levels. A statistically significant decline in the health of riparian vegetation, or the health of potentially ground water dependent species (<i>Allocasuarina decaisneana</i>) detected over four consecutive monitoring events in comparison to baseline levels and relative to reference sites.
Vegetation health monitoring at the Night Parrot Critical Habitat (where the populations are intersected by the Haul Road).	 Experienced botanists Experienced GIS specialists Skilled Indigenous Rangers 	• Annually (dry season)	 2 sites i.e. one at each Night Parrot population intersected by the haul road – Site A and Site B. 	10 remote sensing plots at each of the two monitoring sites.	 Vegetation health (analysis of indices from remote sensing). 	No significant decline in the health of vegetation supporting: Night Parrot Critical Habitat (where the populations are intersected by the Haul Road), from changes to altered surface hydrology.	Statistically significant reduction in indices of vegetation health at the Night Parrot populations in comparison to baseline values over a single monitoring event.	 Statistically significant reduction in indices of vegetation health at the Night Parrot populations in comparison to baseline values over two or more monitoring events.

B.4 Riparian Vegetation Monitoring

Riparian vegetation monitoring is proposed to focus on detecting potential changes in the health of riparian vegetation (primarily *Tecticornia* spp.) over time and relative to reference sites. The riparian vegetation monitoring program should take into consideration groundwater levels which will be monitored as a component of the IWEMP. This approach will help to inform if any changes in vegetation health are potentially related to indirect impacts from the Proposal e.g. drawdown, sedimentation etc.

B.4.1 Baseline Survey

Riparian vegetation transects were established at 19 sites in May 2019 (Stantec, 2021a). These sites included 13 sites around the periphery or of the lake and islands, and six sites at peripheral wetlands. Due to the difficulty in timing surveys with when *Tecticornia* spp. have reproductive material (required for identification), three additional sampling events were undertaken during surveys in August 2020, February 2021 and March/April 2021. The surveys in February and March/April followed a large rainfall event and results in the collection of *Tecticornia* specimens with flowering material.

The following methods were undertaken during the survey:

- At each site, transects of 30 m in length were established perpendicular to the shoreline from the edge of the lake or peripheral wetland. Along each transect, 10 quadrats (3 m x 3 m) were established and assessed for: species diversity, vegetation health, plant cover (percentage) and abundance, within each quadrat.
- Photographic monitoring was also undertaken to support the assessment (Stantec, 2021a).
- Vegetation condition will be assessed for each quadrat within a transect, based on the system adapted from (Trudgen, 1988), as presented in EPA Technical Guidance (EPA, Environmental Protection Authority, 2016c).
- Flora specimens collected during the surveys were identified by botanist Sharnya Yates (BSc. Botany/Plant Biology; >10 years' experience), experienced in the flora of the Eremean Botanical Province.
- *Tecticornia* specimens were submitted to specialist Dr Kelly Shepherd (Senior Research Scientist) of the Western Australian Herbarium (WAH) for taxonomic verification.

B.4.2 Monitoring Methods

The riparian vegetation monitoring program will build on existing datasets collected during the baseline surveys. Proposed sites for the monitoring program have been allocated as follows:

- Lake: potential impact up to 17 sites;
- Lake: regional reference up to 7 sites; and
- Peripheral wetland: reference up to 7 sites.

As the lake and peripheral wetlands differ in species abundance and diversity, additional lake reference sites will be established during the monitoring program to ensure there are comparable datasets for the lake riparian zone. Proposed sites for the riparian vegetation monitoring program are presented within **Table B 1** and **Figure B 1**, however, the final location of sites will depend on conditions and access, and may require refinement over time, following an adaptive management approach.

Table E	3 1:	Proposed	riparian	vegetation	monitoring	sites.
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Allocation	Site Code	Status
Lake: Potential Impact	LMD1	Established May 2019 (dry conditions)
	LMD2	
	LMD3	
	LMD4	
	LMD5	
	LMD6	
	LMD7	
	LMD8	
	LMD11	
	LMD12	
	LMD13	
	LMD17	
	LMF1	Established in March 2021 (aquatic
	LMF5	sites during flooding)
	LMF9	
	LMF12	
	1	Proposed
Peripheral wetland: Reference	PWD1	Established May 2019 (dry conditions)
	PWD2	
	PWD3	
	PWD4	
	PWD6	
	PWD7	
	PWF9	
Lake: Regional Reference	LMD14	Established May 2019 (dry conditions)
	R1	Proposed
	R2	
	R3	
	R4]
	R5	
	R6	

The methods for the riparian vegetation monitoring program are proposed as follows:

- Undertake annual transect monitoring of the monitoring sites presented in Table B 1 and Figure B 1, following the same methods as the Baseline surveys. Vegetation condition and health to assessed using a condition rating scale (Table B 2) adapted from Keighery (1994) and Trudgen (1991) in accordance with Technical Guidance Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016b).
- Plant health during both field surveys was rated on a scale of 1 to 5 for each quadrat within a transect, based on the system by Keighery (1994), as follows:
 - 1. dead/no live vegetation;
 - 2. poor/declining vegetation health;
 - 3. good/improving vegetation health;
 - 4. very good vegetation health/no change from previous monitoring if relevant; and
 - 5. excellent health, new germinants.
- Flora specimens collected during the monitoring are to be identified by a botanist experienced in the flora of the Great Sandy Desert bioregion. Presence of the Priority 1 species *Stackhousia* sp. Lake Mackay (P.K. Latz 12870) will be recorded at each site and changes in abundance assessed over time.
- Tecticornia specimens are to be submitted to relevant specialist of the Western Australian Herbarium (WAH) for taxonomic verification. Reproductive material is required for positive identification of *Tecticornia* taxa and flowering is dependent on rainfall, which is unpredictable in the region. To address this, representative plants will be permanently tagged and resampled until positive identification can be made.
- Presence of invasive weeds will also be recorded if present.
- Analogue transects, outside of the Development Envelope will be established and monitored concurrently.

- Statistical analysis will be undertaken to determine if a significant difference between populations within the development envelope and those outside exists and any changes to the known population.
- Written and photographic records will be kept of the visual inspections of plant conditions.
- Remote sensing to be considered as *Tecticornia* spp. are known to change colour in response to stress. If successful, this method could be used to monitor health of the riparian zone over larger portions of the lake and may allow refinement of the on-ground monitoring intensity over time.



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Figure B 1: Proposed riparian vegetation monitoring locations.



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B.5 Tree Health Monitoring

Drawdown of groundwater within the lake sediments during operations has the potential to impact upon freshwater infiltration beneath the islands and this in turn may affect the health of trees that may be utilising this water. The largest tree on the islands is *Allocasuarina decaisneana* (Desert Oak), which potentially accesses groundwater for some of its water requirements. Therefore, monitoring will focus on *A. decaisneana* at potential impact sites on the islands and at equivalent reference sites away from areas of potential impacts. Sites have been selected based on the consolidated mapping undertaken by (Stantec, 2020), however, given the large scale and remoteness of the Study Area, further refinement of site locations and number is anticipated (**Figure B 2**).

B.5.1 Monitoring Methods: On-ground

Tree health at each site will be quantified using an integrated monitoring approach consisting of on -ground assessments, photo monitoring, and remote sensing. As no on -ground monitoring methods have been established for *A. decaisneana*, a sampling effort method was devised that visually depicts the condition of the species with regards to the species phenology and ecological requirements. Methods have been informed by the findings of Wright et al. (2023), and coincided with visual health indicators that address individuals, canopy density/extent, reproduction, die-off, bark condition, and general aliveness. A description of the on-ground assessment rankings is outlined in **Table B 2**, and the respective procedure is as follows:

- Each site will be allocated a unique site name and GPS coordinate with each tree having its unique GPS coordinate recorded with its own individual identifier;
- A photo monitoring point will be installed for each individual and will encompass the entirety of the individual with minimal to no sun glint.
- Visual tree health assessments will be carried out for no less than 10 individuals (where possible) across each monitoring site.
 - Canopy extents will be visually assessed from end to end of the canopy, whereby the diameter of the tree is subsequently related to the individual's extent score.
 - Canopy density will be determined as the canopies phylloclade fullness and will be visually assessed as a
 percentage-of-fullness and corresponding scores.
 - Bark conditions will be identified as the intactness of the bark with reference to bark cracks and incisions.
 - Reproductive elements in the form of the abundance of cones will be recorded based on a qualitative scale of absent, scarce, or common.
 - Canopy die off will be identified as the relative quantity of phylloclade die off amongst the canopy and will be based on a qualitative scale of absent, scarce, or common.
 - Mortality scores, in the form of a binary "Dead" or "Alive" value, will be recorded at each surveyed individual. An
 individual is considered "Alive" if they satisfied one or more of the following:
 - Green phylloclades are present throughout the canopy;
 - Above-ground stems are flexible and show green hues when broken; or
 - Greenness or moisture is present when a small section of bark is removed and exposes the cambium layer of the individual.

B.5.2 Monitoring Methods: Remote Sensing

Remote sensing of the proposed monitoring sites will be administered to quantify the photosynthetic condition of sampled *A. decaisneana* individuals. Vegetation indices (VI) will be used to quantify these subsequent conditions to justify any potential disturbance and detect any early indications of stress. VIs are widely used in remote sensing to assess the condition, density, and diversity of vegetation by capturing the distinct interactions of plant foliage with light. Vegetation under stress often exhibits subtle changes in their light interactions (i.e., photosynthetic behaviour), particularly in the non-visible light spectrum, before any immediate distress in physically observed. Therefore, monitoring these subtle changes through VI's that leverage non-visible light spectrums captured from remote sensing systems can provide early indications of plant stress, resulting in timely interventions.

The Modified Soil-Adjusted Vegetation Index 2 (MSAVI2) has been selected to quantify the photosynthetic health of *A. decaisneana* individuals within the proposed monitoring sites. MSAVI2 is an index often employed in semi-arid and arid ecosystems (Qi et al., 1994; Ren et al., 2018), due to its ability to adjust for soil reflectance in these systems. The output from this analysis is an image delineating the photosynthetic health of the monitoring sites on a normalised scale – e.g., -1 shows stressed/dead vegetation and 1 signifying healthy vegetation. A subsequent array of zonal statistics will be acquired at each *A. decaisneana* individual with analysis to include, mean, median, maximum, minimum, standard deviation, and 90th percentile.



Table B 2: Vegetation health assessment for *Allocasuarina decaisneana* (Desert Oak), adapted from (Souter et al., 2010); Wright et al. (2023).

Score	Health Ranking	Health rating/ description
Canopy Exter	nt	
0	<2 m	Canopy has a diameter less than 2 m
1	2 – 4 m	Canopy has a diameter between 2 – 4 m
2	4 – 6 m	Canopy has a diameter between 4 – 6 m
3	>6 m	Canopy has a diameter greater than 6 m
Canopy dens	ity	
0	0%	None
1	1-10%	Minimal
2	11-25%	Sparse
3	26-75%	Medium
4	76-90%	Major
Bark Condition	on	
0	Intact	Intact bark
1	Minor	Minor cracks
2	Moderate	Moderate bark cracks
3	Extensive	Extensive bark cracks
4	Absent	Long term dead tree
Reproduction	Scores	
1	Absent	Effect is not visible
2	Scarce	Effect is present within the assessable crown but not readily visible
3	Common	Effect is clearly visible through the assessable crown
Canopy Die C	Dff	
1	Absent	Effect is not visible
2	Scarce	Effect is present within the assessable crown but not readily visible
3	Common	Effect is clearly visible through the assessable crown
Presence of \$	Seedlings	
0	Absent	No seedlings visible
1	Present	Seedlings visible
Mortality		
0	Dead	Individual fails to meet any of the "Alive" criteria
1	Alive	Individual meets "Alive" criteria



Figure B 2: Proposed Allocasuarina decaisneana tree health monitoring sites.



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B.6 Vegetation Associated with Night Parrot Populations

The alignment of haul road is proposed to intersect broad drainage features which are known to support important habitat for the Night Parrot. The design and construction of the haul road aims to maintain ecosystem function i.e. surface hydrology (within and outside the Proposal Area). There are no anticipated changes to hydrological flows from the establishment of the haul road in the vicinity of the Night Parrot populations. However, given the importance of the area for the Night Parrot, a conservative approach has been taken to monitor vegetation health to confirm mitigation has been effective and to trigger corrective actions if required. The areas contain long unburnt *Triodia* spp which form important roost and nesting habitat for the species. These hummocks are likely several decades old (**Plate B1**) (DPaW, 2017).

B.6.1 Monitoring Methods: Condition

Given the large size of the areas that are inhabited by the Night Parrot and given that any changes in the health of the *Triodia* hummocks is likely to is likely to be slow (with the exception of fire), remote sensing is likely to be the most effective method of monitoring vegetation health over time. The design of this monitoring program has been developed to align with the locations of acoustic recorders deployed during the Night Parrot Monitoring Program (**Figure B-3**, **Figure B-4**). Within the Night Parrot Monitoring Program, 10 recorders will be established at each monitoring site. Through pairing vegetation health monitoring plots with the Night Parrot recording units, it will be possible to investigate if any changes in Night Parrot call activity are linked to changes in vegetation health over time. The monitoring will be undertaken annually during the dry season when plants tend to be more water stressed allowing changes in vegetation health to be more apparent and able to be detected.

Vegetation health will be informed by the generation of spectral indices, derived from adequate spatial and spectral resolution imagery. Remote sensing of *Triodia* spp. hummocks will follow the process described in **Section B.5.2**, whereby the Modified Soil-Adjusted Vegetation Index 2 will be calculated on aerial, or satellite, imagery and the appropriate statistics ultimately derived to monitor change. Condition measurements will be derived from *Triodia* spp. hummocks extents within a 400 m radius of acoustic recorders to align with the maximum detection radius of the recorders (**Figure A-1**, **Figure A-2**), and to limit measurements from neighbouring vegetation.



Plate B1: Spinifex hummocks with survey lead (Samantha Lostrom) for scale.





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Figure B 3: Proposed Night Parrot acoustic recorder locations at Site A.



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Proposed Night Parrot [



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Figure B 4: Proposed Night Parrot acoustic recorder locations at Site B.



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B.7 Personnel and Licensing Requirements

Each of the programs will be undertaken by suitably qualified botanists or GIS specialists trained in the methods described within this Vegetation Health Monitoring Program and preferably accompanied by TO Ranger groups. TO Ranger groups have invaluable knowledge of the local area. The participation of TO ranger groups will provide an opportunity for meaningful engagement and contribute to two-way knowledge sharing.

Current license requirements comprise a DBCA Flora Taking (biological assessment) License (Regulation 62) to collect and voucher flora specimens. This license will be obtained prior to commencement of monitoring.

B.7.1 Data and Statistical Analyses

Statistical tests will be used to interrogate the data collected from monitoring as appropriate, for example unpaired t-tests, ANOVA or linear models. Data analysis will be undertaken to detect any significant changes in vegetation or tree health observed at impact sites over time, relative to baseline data and reference sites. This information will inform whether trigger or threshold criteria are being exceeded and the effectiveness of management actions outlined within the FVEMP.

The application of statistical analyses will depend on the quality of the data collected, and where possible, will incorporate supporting data, such as environmental factors such as rainfall. If trigger or threshold criteria for vegetation or tree health are exceeded, this supporting data will assist in assessing if changes in vegetation or tree health may be attributed to the Proposal or alternatively environmental factors.

B.8 Reporting

A standalone technical report will be submitted to Agrimin and the Indigenous landholders at the conclusion of each monitoring period, presenting the key findings of each of the vegetation and tree health monitoring programs. The report will include assessment against relevant management provisions, including outcome- and objective-based criteria, and specifically trigger and threshold criteria presented in **Table 4-1** of the FVEMP. In the event that trigger or threshold criteria are exceeded, these will be reported in accordance with **Section 6.2** of the FVEMP and contingency actions will be provided for consideration. The technical report will be summarised within or appended to the Annual Environmental Report (AER) and the Annual Compliance Assessment Report (ACAR), to be submitted to the DWER, DCCEEW, and EPA, respectively, aligning with **Section 6.1** of the FVEMP.

B.9 Adaptive Management and Review

Results obtained from the vegetation and tree health monitoring program may inform adaptive management measures for the FVEMP and guide management actions for flora and vegetation in the broader region. The review of data and information gathered during monitoring may increase understanding of the environment in a regional context. This may inform management and mitigation measures such as:

- Potential changes in Night Parrot habitat (vegetation health) over time may affect the occurrence and activity levels of the Night Parrot. Night Parrot have been documented to increase activity in response to rainfall, presumably in response to the abundance of foraging resources (seeds) and these changes may be possible to detect through the monitoring program and better inform management and mitigation.
- Lake Mackay is large and on-ground monitoring provides a snapshot of vegetation health at specific points. The option to investigate the effectiveness of remote sensing may provide opportunities to better understand changes in vegetation health at a broader scale and may better inform management and mitigation for the Proposal as well as for proposals at other salt lakes.
- Review and refinement of the Vegetation Health Monitoring Program for compliance and against regulatory conditions.

A review of this Vegetation Health Monitoring Program will be undertaken every five years, in response to adaptive management, as new technology becomes available, or as required by to achieve the environmental outcomes associated with the FVEMP. Any revisions of the Vegetation Health Monitoring Program will be submitted to the relevant State (DWER, DBCA) and Commonwealth Government (DCCEEW) for approval, or in accordance with relevant regulatory conditions or requirements.

Appendix C Weed Management Plan

C.1 Background

Introduced flora (weeds) have a detrimental effect on ecological values of communities in which they invade. Weeds outcompete native flora, alter the structure of vegetation, have an impact on fire regimes and change habitat characteristics for fauna; often leading to a decline in the quality of fauna habitat. Six introduced flora species have been recorded within the Proposal Area, all of which occur within the NIDE (Section C.6). It should be noted that not all areas of the Proposal Area could be searched for weeds and that a baseline weed mapping survey would be required to understand diversity and coverage of weeds within the Proposal Area.

In general, the diversity and abundance of weeds within the Proposal Area was considered low, and this is likely a reflection of the low level of disturbance within the Proposal Area. However, outside the Proposal Area, botanists for the surveys noted that the town of Kiwirrkurra had extensive populations of **Aerva javanica* throughout the town and likely supported multiple other weed species. Additionally, the Tanami Road was observed to support extensive grasslands of **Cenchrus* spp. along the road verge. The most likely vector for weed introduction and spread within the Proposal Area is through haulage and traffic along the proposed haul road during operations.

Agrimin is committed to managing the introduction and spread of weeds as a result of Project through the development and implantation of a Weed Management Plan and Weed Monitoring Program. However, given the extensive source populations at access points to the north and south, it is acknowledged that it is unlikely Agrimin will be able to stop the introduction and/or spread of weeds in the Proposal Area. As a result, this Weed Management Plan focuses on the management of weeds rated as having a high or very high management priority (by DBCA) and preventing their spread into the habitat for the Night Parrot populations while also managing the cover/abundance of these weeds throughout the remainder of the Proposal Area.

C.2 Purpose

This Weed Management Plan and Weed Monitoring Program has been developed to outline the control measures required to manage the potential weed impacts across the Proposal Area. The Weed Management Plan and Weed Monitoring Program applies to all exploration, design, construction, operation and decommissioning stages of the Proposal.

The purpose of the Weed Management Plan and Weed Monitoring Program are to:

- Ensure that the Proposal is carried out in a manner that minimises the direct and indirect impacts as a result of weeds.
- To actively engage with Traditional Owner (TO) groups, building capacity for Indigenous Ranger involvement, where possible.

This will be addressed by ensuring potential project-related impacts to flora and vegetation from weeds are avoided to the maximum extent practicable by:

- Identifying the risks and potential impacts from the Proposal in relation to weeds;
- Outlining management provisions for weeds, to avoid and minimise potential impacts to significant flora and vegetation;
- Preparing and implementing monitoring programs for weeds within the Proposal Area; and
- Proposing corrective actions and response actions if triggers and thresholds are exceeded to avoid adverse impacts to vegetation resulting from weeds.

C.3 Rationale and Approach

Agrimin is committed to avoiding and minimising potential impacts caused by the operations of the Proposal to flora and vegetation and their associated habitats to ensure the biodiversity and ecological integrity and function of flora and vegetation are maintained. The Proposal has been designed to avoid impacts to key environmental factors located within the footprint.

The Weed Management Plan focuses on outcome-based and objective management provisions including monitoring and evaluating success of management actions with respect to flora and vegetation within the Development Envelope, driven by triggers and thresholds.



C.4 Legislative Requirements

Legislation relevant to weed management for the Proposal includes:

- Environmental Protection Act 1986
- Agriculture and Related Resources Protection Act 1976
- Biosecurity and Agricultural Management Act 2007
- Biodiversity Conservation Act 2016

The Department of Agriculture and Food Western Australia (DAFWA) regulates weeds under the *Biosecurity and Agriculture Management Act 2007* (BAM Act), which supersedes the Agriculture and Related Resources Protection Act 1976. Plants that are prevented entry into the State or have control or keeping requirements within the State are declared pests (**Table C 1**). Declared pests can be assigned to a C1, C2 or C3 category under the BAM Act Regulations 2013 (**Table C 2**).

Table C 1: Prohibited organisms can be assigned to a C1 or C2 control categories.

Category	Description
Permitted organisms under section 11	Organisms that are allowed entry into Western Australia
Prohibited organisms under section 12	Organisms that are prohibited from entry into Western Australia
Unlisted organisms under section 14	If an organism cannot be categorised as either permitted or prohibited the organism will be unlisted
Declared pest under section 22	Pests that may be in the State but are under official containment, control or eradication

Table C 2: Categories of declared pests under the BAM Act Regulations.

Category	Description
C1 Exclusion	Plants which should be excluded from part or all of Western Australia.
C2 Eradication	Plants which should be eradicated from part or all of Western Australia.
C3 Management	Plants that should have some form of management applied that will alleviate the harmful impact of the plant,,educe the numbers or distribution of the plant or prevent or contain the spread of the plant.

C.5 Weed Classification

Weeds are classified by different government departments based on their invasiveness and the risk they pose to the environment, people or agriculture (**Table C 3**).

Table C 3: Definitions and classification of weeds.

Term	Definition
Weed	A weed is defined in the Australian Weeds Strategy (NRMMC, 2007) as 'a plant that requires some form of action to reduce its harmful effects on the economy, the
	environment, human health and amenity'.
Declared Weeds	In order to protect agricultural interests, the Department of Primary Industries and Regional Development maintains a list of "Declared Plants" (weeds): <u>https://www.agric.wa.gov.au/pests-weeds-diseases/weeds/declared-plants</u> Declared Weeds , under the Agriculture and Related Resources Protection Act 1976, are those that landowners are required by law to control. They are required to be controlled as they are considered a significant risk to the Western Australian economy. Many weed species, however, are not declared under this Act as they may have an agricultural role. They may, however, be serious environmental weeds with the potential to affect native ecosystems.



Environmental Weeds	The Weed Prioritisation Process for the Department of Biodiversity, Conservation and Attractions (DBCA) (formerly the Department of Parks and Wildlife, DPaW) prioritise weeds in each Parks and Wildlife region, termed 'environmental weeds'.
	'Environmental weeds' is a secondary category of weeds, used to describe "plants that establish themselves in natural ecosystems and proceed to modify natural processes, usually adversely, resulting in the decline of communities they invade" (DEC, 1999); page iii).
Weeds of National Significance	The Australian and state and territory governments have agreed a list of twenty Weeds of National Significance (WONS), based on the weed species' invasiveness, The full list of WONS can be accessed at www.weeds.gov.au/weeds/lists/wons/html

C.6 Weeds Recorded in the Proposal Area

Six introduced flora species have been recorded within the Proposal Area, all of which occur within the NIDE (**Figure C 1**). One of these weed species, **Tribulus terrestris,* also has been recorded on an island, in close proximity to the On-LDE. None of the introduced flora species represent Weeds of National Significance (WoNS) or are listed under the *Biosecurity and Agriculture Management Act 2007* as declared pests for either the Tanami or Great Sandy Desert bioregions.

However, **Cenchrus* spp. and **Aerva javanica* are generally considered to be serious environmental weeds with the potential to proliferate and become dominant in their preferred habitats. The record of **Flaveria trinervia* within the NIDE also represented a bioregional range extension. The ecological impact and invasiveness classifications (DPaW, 2013, 2015) for these weed species are provided in **Table C 4** and **Figure C 1**.

Wood spacios	Development	Development Number of		DBCA Classification [^]		
(common name) Envelope records		records	Ecological impact	Invasiveness	Section	
* <i>Aerva javanica</i> (Kapok Bush)	NIDE	1	High	Rapid		
* <i>Cenchrus ciliaris</i> (Buffel Grass)	NIDE	19	High	Rapid	1	
* <i>Cenchrus setiger</i> (Birdwood Grass)	Birdwood NIDE 3 High		High	Rapid	Refer to the	
* <i>Flaveria trinervia</i> (Speedy Weed)	NIDE	1	n/a	n/a	Identification Checklist in	
*Malvastrum americanum (Spiked Malvastrum)	NIDE	6	High	Rapid	Appendix I	
	NIDE	2				
* <i>Tribulus terrestris</i> (Caltrop)	Island of Lake Mackay	1	Unknown	Moderate		

Table C 4: Introduced flora recorded within the Proposal Area and the DBCA Weed Prioritisation Process.

⁷In the absence of DBCA classifications for the Tanami and Great Sandy Desert bioregions, the Pilbara classifications are presented. No classification information is available for * *Flaveria trinervia*



Figure C 1: Introduced flora locations.



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C.7 Weed Management

Commitments relating to weeds that have been included in the ERD have been incorporated into **Table 4-1** and **Table 4-2** in the FVEMP. These commitments have been incorporated into Agrimin's weed management strategies as detailed within this section.

C.7.1 Potential impacts

The Proposal has the potential to spread existing weeds and to introduce new weed species into previously weed free areas. Weeds can impact the ecology and biodiversity of natural systems by out-competing native species for habitat, nutrients and water. Once established, weeds can also alter the composition and structure of vegetation communities.

Weeds may potentially impact natural systems and values through the following examples:

- Competition with native species for natural resources such as sunlight, water, nutrients and space;
- Reduction in natural biodiversity levels from smothering and out-competition (Smyth et al., 2009);
- Reduced resiliency of native species to disturbances, including the ability for regrowth following clearance and fire;
- Limited availability of native plants which provide important habitat and food sources for animals, and
- Alteration of fire regimes, with increased temperatures and intensity (DEC, 2011)

C.7.2 Application of the Mitigation Hierarchy

The Proposal will avoid impacts to significant flora and vegetation from project related weeds via the following:

• Avoid facilitating the introduction of new weed species or the spread of existing weed species in the Proposal Area as a result of the Proposal.

The Proposal will minimise impacts to significant flora and vegetation from project related weeds via the following:

- Delineate clearing boundary areas, and confirmed cleared areas via survey after clearing;
- Timely response for management of any declared weed occurrences;
- Limit vehicle and personnel movements outside of approved areas and designated tracks;
- Training for personnel to identify weed species and process for reporting weed locations;
- Incident reporting of new weed species and new locations.

C.7.3 Outcome-Based Provisions

This Weed Management Plan focuses on outcome-based provisions, which are performance-based and can be applied. The objectives developed are measurable, and the success of management actions can be monitored and reported. Outcome-based provisions specify triggers and thresholds for direct impacts that are quantifiable and specifically relate to weeds (**Table C 5**). Suitable trigger and threshold actions have been established, with potential corrective actions also recommended.

The following outcomes-based provisions to avoid or minimise project related impacts from weeds have been established:

- No proliferation or introduction of new weed species rated as high or very high management priority by DBCA in the Proposal Area as a result of the Proposal.
- No introduction of weed species rated as high or very high management priority by DBCA within the critical habitat for the known Night Parrot populations as a result of the Proposal.
- No net increase in the baseline extent of weed populations within the Proposal area as a result of the implementation of the proposal.
- No new populations of a weed species compared to baseline weed mapping within the Proposal Area.

C.7.4 Objective-Based Provisions

Objective-based provisions relate to environmental management actions that are not specifically measurable. They specify management actions according to management targets, particularly for indirect impacts that are not quantifiable. For project related weeds, as ongoing monitoring is undertaken and additional population data is gathered, these management targets may be reviewed, and quantifiable outcome-based provision(s) may be established accordingly. Two objective-based management provision have been outlined in **Table C 6** to prevent project-related adverse impacts to flora and vegetation (including significant flora species) from weeds within proximity to the Proposal with appropriate management actions and monitoring actions.



The following objectives-based provisions for weeds have been established:

- No proliferation or introduction of new weed species rated as high or very high management priority by DBCA in the Proposal Area as a result of the Proposal.
- No proliferation of buffel grass in Night Parrot avoidance buffer zones (refer to NPMP)
- No net increase in the baseline extent of weed populations within the Proposal area as a result of the implementation of the proposal.

C.7.5 Environmental Criteria

The development of triggers and thresholds for outcome-based provisions within the Weed Management Plan are based on available data and information, with justification for these criteria provided in **Table C 5** and **Table C 6**. These criteria can be used to monitor and evaluate performance against the environmental objectives of this WMPMP. Due to the lack of available data in some instances, the triggers and thresholds are considered preliminary, until sufficient baseline data becomes available from the Weed Monitoring Program (**Appendix D**). During monitoring, where thresholds (outcomebased) or targets (objective-based) are exceeded, appropriate management or corrective actions have also been developed. Monitoring will inform adaptive management, with the revision of triggers and thresholds, or corrective actions where required.

C.7.6 Traditional Owner Engagement

Agrimin will actively seek opportunities to engage Traditional Owners from both the Ngururrpa, Kiwirrkurra and Tjurabalan IPAs, considered important local stakeholders of the Proposal, to participate in management and monitoring, where possible. Agrimin also acknowledges that management actions are already undertaken by Rangers as part of the Plans for Country (Parna Ngururrpa, 2019; Tjamu Tjamu Aboriginal Corporation, 2014), and will seek to align with existing programs, where possible.

Indigenous Ranger groups in desert country play an integral role in the conservation of the flora and vegetation throughout the area and are actively involved with supporting initiatives. This provides an invaluable opportunity to involve Rangers in the monitoring and management of weeds. A key component of the WMPMP is to consult, actively engage with, and build the capacity of Traditional Owners to implement management actions on IPAs. Opportunities for potential engagement are presented in **Table C 5** and **Table C 6**, and include the following:

- installation of signage which will include local indigenous language,
- assisting with site selection within impact and reference sites,
- build capacity with Indigenous Rangers through management and monitoring of weeds.

Such measures are indicative only and are to be determined following adequate consultation with Traditional Owners

Table C 5: Outcome-based management objectives for weeds.

Outcomes-Based Management	Trigger and Threshold Criteria		Trigger and Threshold Response Actions Monitoring Timing / Frequency		Reporting		
Objectives	Trigger Criteria	Threshold criteria	Trigger Level Actions	Threshold Criteria and Corrective Actions		of Monitoring	
 No proliferation or introduction of new weed species rated as high or very high management priority by DBCA in the Proposal Area as a result of the Proposal. No introduction of weed species rated as high or very high management priority by DBCA within critical habitat for known Night Parrot populations as a result of the Proposal. 	 Detection of new weed species rated high or very high management priority (by DBCA) at a potential impact site where it was not detected during baseline weed mapping of the Proposal Area (Appendix E) and a significant increase in cover or abundance over successive monitoring events. Or Detection of a weed species rated high or very high management priority (by DBCA) within the critical habitat for the known Night Parrot populations where it was not detected during baseline weed mapping of the Proposal Area (Appendix E). 	 Detection of a Declared Pest Plant or Weed of National Significance which was not detected during baseline weed mapping of the Proposal Area (Appendix E), OR A significant increase in cover or abundance of an existing* Declared Pest Plant or Weed of National Significance over successive monitoring events. OR New weed species rated high or very high management priority (by DBCA) (not detected during baseline weed mapping of the Proposal Area (Appendix E)) becomes established** and dominant within the habitat for known Night Parrot populations. * No Declared Pest Plants or WONS are known to occur within the Proposal Area, however the baseline flora and vegetation surveys were not exhaustive and these spp may potentially occur. * Where 'established' means 'A weed species which has grown to maturity and reproduced. Weeds are producing a viable second generation of individual plants signifying persistence at a given location in spite of treatment. 	 Report as incident internally. Investigate cause of occurrence and review management strategies and implement changes to prevent future weed occurrences, where possible. If exceedance is attributed to project-related activities, undertake a review of procedures to determine if impact can be minimised, develop corrective actions with consideration of the following: Revise monitoring frequency for weeds; and educate staff on weed identification and weed hygiene practices. Implement weed control as required. Undertake weed control in accordance with the weed control procedure (Appendix F) Undertake education programs in the local communities including posters of weeds of concern and reason for limiting spread. 	 Report any non-compliance to DWER within 7 days of identification. Undertake investigation to determine source of the exceedance. If project-related, undertake review to determine if impact can be minimised, develop actions to prevent recurrence and communicate findings to relevant personnel. Undertake targeted weed control in accordance with the Weed Management Procedure (Appendix E) and Weed Control Procedure Appendix F) Revise weed monitoring schedule in the Weed Monitoring Program accordingly and monitor the success of corrective actions. Undertake additional targeted weed control as required, to be informed by weed monitoring following corrective actions. 	Weed Monitoring in accordance with weed monitoring schedule within the Weed Monitoring Program.	 In accordance with weed monitoring schedule within the Weed Monitoring Program (Appendix D). 	 Monitoring reports. Annual Compliance Assessment Report (ACAR).
 No net increase in the baseline extent of weed populations within the Proposal area as a result of the implementation of the proposal. No new populations of a weed species compared to baseline weed mapping within the Proposal Area. 	A statistically significant increase (weed density) of an existing population of a weed species compared to baseline.	 New population(s) of a weed species recorded in addition to mapped baseline weed population(s). Or A statistically significant increase (weed density) of an existing population of a weed species compared to baseline weed mapping over 2 consecutive monitoring events. 	 Report internally as an incident Implement weed and hygiene protocols to prevent further spread of weed species from baseline levels Review management strategies to determine key cause for suspected spread of weed species Undertake targeted weed control in accordance with the Weed Management Procedure (Appendix E) and Weed Control Procedure (Appendix F) Revise weed monitoring schedule in the Weed Monitoring Program (Appendix D) accordingly and monitor the success of corrective actions. 	 Report any non- compliance to DWER within 7 days of identification. Undertake investigation to determine source of the exceedance. Engage with DBCA, and relevant specialists, where required to determine specific corrective actions required. If project-related, undertake review to determine if impact can be minimised, develop actions to prevent recurrence and communicate findings to relevant personnel. Undertake targeted weed control in accordance with the Weed Management Procedure (Appendix E) 	Weed Monitoring in accordance with weed monitoring schedule within the Weed Monitoring Program (Appendix D).	 Weed Monitoring in accordance with weed monitoring schedule within the Weed Monitoring Program (Appendix D). 	 Weed monitoring reporting Incident Reporting Annual Compliance Assessment Report (ACAR)

Outcomes-Based Management	Trigger and Threshold Criteria		Trigger and Threshold Response	Monitoring	
Objectives	Trigger Criteria	Threshold criteria	Trigger Level Actions	Threshold Criteria and Corrective Actions	
			Undertake additional targeted weed control as required, to be informed by weed monitoring following corrective actions.	 and Weed Control Procedure (Appendix F) Revise weed monitoring schedule in the Weed Monitoring Program (Appendix D) accordingly and monitor the success of corrective actions. Undertake additional targeted weed control as required, to be informed by weed monitoring following corrective actions. 	

Table C 6: Objective-based management provisions for weeds.

Ob	jective-based Management Targets	Management Actions	Mor	nitoring	Tin	ning	Re	sponsible
1. 2.	No introduction of new weed species rated as high or very high management priority by DBCA in the Proposal Area as a result of the Proposal.* Weed management programs	 Implement appropriate vehicle hygiene and weed and seed hygiene practices for all contractors and personnel entering the site in accordance with the Weed Hygiene Procedure (Appendix G). Weed management programs will be undertaken in accordance with relevant 	1. 2.	Internal incident reporting and investigation process Inspections of cleared and rehabilitated areas to detect presence of new weed species and new	1. 2. 3. 4.	As triggered. Annual Annual In accordance with: - CEMP;	•	Construction Operations Environment Team
should be designed in accordance with relevant EPBC Act weed threat abatement plans.	undertaken in accordance with relevant EPBC Act threat abatement plans and be informed by best practice management of the weed species identified during baseline		occurrences to determine success of management actions.	– MCP				
3.	Weed management procedures informed by best practice	surveys and in accordance with:	3.	Weed monitoring and control program.				
	management of the weed species identified during weed baseline	the impacts on northern Australia's biodiversity by the five listed grasses	4.	Comply with:				
4.	Weed control measures	(DSEWPaC, 2012).		- CEMP;				
	implemented for Buffel Grass in Night Parrot avoidance buffer	Australia (DENR, 2018),						
	zones in accordance with the Weed Management Plan.	 Integrated weed management (weeds Australia, 2021). 						
5. No n exter the F	No net increase in the baseline extent of weed populations within the Proposal area as a result of the implementation of the proposal.	 Minimising the risk of invasion of buffel grass in significant fauna avoidance buffer areas in the TFEMP will be a key priority. 						
		 Timely response for management of any declared weed occurrences. 						
		 Limit vehicle and personnel movements outside of approved areas and designated tracks. 						
		Training for personnel to identify weed species and process for reporting weed locations Weed Identification Checklist (Appendix I).						
		 Incident reporting of new weed species and new locations. 						
		Rehabilitation of temporary cleared areas.						
		 Annual inspection of rehabilitated areas for weeds. 						

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Timing / Frequency of Monitoring	Reporting

Domontin

Reporting
Weed monitoring reporting
Incident Reporting
Annual Compliance Assessment Report (ACAR)

Objective-based Management Targets	Management Actions	Monitoring	Timing	Responsible
	Undertake Baseline weed mapping			
	Night Parrot avoidance buffer areas to be recorded on internal spatial databases.			
	Undertake weed control in Night Parrot avoidance buffer zones and surrounding areas to reduce the spread of buffel grass.			
	Implement Weed Hygiene Procedure (Appendix G).			
	Implement Weed Monitoring Program (Appendix D).			
	Develop a Ground Disturbance Permit System and Procedure.			
	Develop a Topsoil Stripping and Storage Procedure.			
	Develop a Waste Management Procedure.			
	Develop an Incident Reporting Procedure.			
	Comply with:			
	– CEMP – MCP			

Reporting

C.7.7 Weed Control

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A summary of preliminary weed control techniques for introduced flora species recorded in Proposal Area is provided in (Table C 7). Weed management and control will be undertaken in accordance with the Weed Management Procedure (Appendix E).

Weed Species	Chemical Control	Manual Control	Indicative seed set	Optimal timing for weed control
Cenchrus ciliaris (Buffel Grass)	Spot spray with 1- 2% glyphosate and follow-up with seedling control.	Hand remove small populations and seedlings; entire plants with dormant buds must be removed.	All year. May begin producing seeds from approximately 3 months of age	Wet season (four to six weeks after a rain event) when plants actively growing and not stressed, prior to seed set.
* <i>Aerva javanica</i> (Kapok Bush)	Foliar spray with 1- 2% glyphosate.	Remove reproductive parts and place in sealed plastic bags.	All year	All year, when plants actively growing and not stressed, prior to seed set.
* <i>Cenchrus setiger</i> (Birdwood Grass)	Spot spray with 1- 2% glyphosate and follow-up with seedling control.	Hand remove small populations and seedlings; entire plants with dormant buds must be removed.	All year	Wet season (four to six weeks after a rain event) when plants actively growing and not stressed, prior to seed set.
* <i>Flaveria trinervia</i> (Speedy Weed)	Foliar spray seedlings with 1-2% glyphosate.	Hand remove isolated and small populations, removing whole plants where possible.	-	Chemical control year-round when plants not undergoing excessive stress, prior to seed set whenever possible.
* <i>Malvastrum americanum</i> (Spiked Malvastrum)	Spot spray 0.5% glyphosate.	Hand remove seedlings and small populations, removing whole plants.	April to September	Wet season, when plants actively growing and not stressed, prior to seed set.
* <i>Tribulus terrestris</i> (Caltrop)	Basal bark spray (for stems up to 10 cm in diameter) up to 30 cm above ground level application using 2% Picloram + 2,4-D amine (Enforcer) or cut stump using undiluted chemical.	Cut plants at 10 to 20 cm below ground, remove reproductive parts. Remove whole plant if possible.	All year	Chemical control year-round when plants not undergoing excessive stress, prior to seed set whenever possible.

Table C 7: Summary of preliminary weed control techniques for introduced flora species recorded in Proposal Area.

C.7.8 Role and Responsibilities

The key personnel involved in the implementation of the Weed Management Plan and Weed Monitoring Program and their roles and responsibilities are listed in **Table C 8**

Table C 8:	Roles	and r	responsibilities	for	implementation	of the	e Weed	Management	Plan	and	Weed	Monitori	ng
Program.													

Weed Management	Weed Management Measures	Responsible Person(s)
Aspect Identification of Environmental weeds	 Maintain weed register Maintain records of known weed populations Conduct inspections during construction. Conduct monitoring during operation to identify new weed outbreaks Weed Risk Areas Signage and Access 	Environmental Manager Environmental Officer
Raise awareness of weed areas among staff	• Brief all staff and contractors to the Project on weed identification and management as part of the site environmental induction.	Environmental Manager
Keep up to date with weed classification and management priorities	 Review annually the classification status of weed species (that is, declared pests, environmental weeds or other), development of State and Commonwealth weed management strategies and action plans, developments in weed control methods by keeping abreast of relevant literature. Consult as appropriate 	Environmental Manager
Prevention of new project related weed occurrences	 Develop and implement weed management procedure Maintain weed and seed hygiene procedures outlined in the Weed Management Procedure Progressive rehabilitating areas as soon as possible to prevent weed proliferation Using seeds hygiene procedures and ensure seed used for rehabilitation is of native provenance and weed free. Weed areas mapped prior to disturbance. Manage vegetation and topsoil in accordance with the topsoil Management procedure Monitor for the occurrence of new weeds in accordance with the Weed Monitoring Schedule within the Weed Monitoring Program (Appendix D). 	Environmental Manager
Weed Monitoring and control	 Undertake weed monitoring in accordance with Weed Monitoring Schedule within the Weed Monitoring Program (Appendix D). Undertake, supervise and/or guide a weed control program annually based on mapped weed locations annually in accordance with the Weed management Procedure. 	Environmental Manager
Identify areas of nonconformance with respect to weeds and to take corrective action as appropriate	 Undertake regular spot inspections for weed management. Conduct annual compliance audits 	Environmental Manager

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Appendix D Weed Monitoring Program

D.1 Purpose

The purpose of this Monitoring Program is to guide the management integrated approach of weed monitoring, control, hygiene and prevention by the following objectives:

- Monitor and manage the success of management provisions (outcome- and objective-based) outlined in the Weed Management Plan.
- Develop and maintain an understanding of the extent existing weed populations within the Proposal Area.
- Assess the effectiveness of weed management techniques intended to prevent the introduction of new weed
 populations and the spread of existing weed populations within the Proposal Area.
- Provide opportunities for direct engagement of TO Rangers groups, allowing opportunities for knowledge sharing and connection to country.

D.2 Traditional Owner Engagement

The Weed Monitoring Program presents an opportunity to engage with and work alongside TO Ranger groups from the Ngururrpa, Tjurabalan, and Kiwirrkurra IPAs, given their integral local knowledge of the area. Opportunities to involve TO Rangers in monitoring may include:

- Consulting on survey design;
- Assisting with site selection within impact and references sites; and
- Undertaking weed monitoring surveys.

D.3 Monitoring

D.3.1 Overview and Timing

The schedule for weed monitoring takes into consideration the timing of when the weed species is most likely to be detected (if annual), while also considering the timing of effective control. Where possible, weed control will occur at the same time or soon after monitoring.

Existing weed species within the Proposal Area that are the focus of monitoring (and management) include **Cenchrus ciliaris* (Buffel Grass), **Cenchrus setiger* (Birdwood Grass) and **Aerva javanica* (Kapok Bush). These species are generally considered to be serious environmental weeds with the potential to proliferate and become dominant in their preferred habitats. Additionally, once established, **Cenchrus ciliaris* is known to exacerbate inappropriate fire regimes which is an existing key threat to a number of significant fauna in the Proposal Area.

Monitoring will be undertaken annually either during or soon after the wet season (four to six weeks after rain event) (**Table C 6** of the Weed Management Plan). This timing coincides with when these species are actively growing, allowing for optimal detection, while also occurring prior to seed set. The timing provides the opportunity to implement weed control either during the monitoring program, or soon after the completion of the monitoring program i.e. before seed set. Additional follow-up monitoring may be required to evaluate the effectiveness of control or alternative timing may be required to account for seasonal variation in rainfall.

D.3.2 Methods

Changes in weed cover and species diversity are detected via the on-ground method, while trigger responses will ensure Agrimin responds appropriately to any significant negative impacts. Broadly, the abundance and diversity of weeds within the Proposal Area was found to be low during the baseline surveys, relative to other resource projects (**Table C 4** of the Weed Management Plan). Additionally, the greatest risk of introduction and spread of existing and new weed species is along the proposed haul road during operations. Based on this information, methods for monitoring and management will focus on detecting new weed species and monitoring (and managing) the distributions of existing species in areas of the operation that are at higher risk. The approach of the Weed Monitoring Program will involve the following:



- Conduct baseline and annual monitoring (mapping and population size estimates) of existing weed species within the Proposal Area to:
 - Inform future exceedances of trigger and thresholds; and to
 - Inform clearing activities during construction and topsoil management for rehabilitation.
- Conduct annual surveillance monitoring (mapping and population size estimates) of representative sections of the Proposal that are at higher risk of weed introduction and spread during operations i.e. Night Parrot populations and representative sections of the haul road to:
 - Inform exceedances of trigger and thresholds; and
 - Inform areas that require weed management.

The number and location of surveillance monitoring locations to be determined based on baseline monitoring.

D.3.3 Personnel and Licensing Requirements

Current license requirements comprise a DBCA Flora Taking (biological assessment) Licenses (Regulation 62) to collect and voucher flora specimens. This license will be obtained prior to commencement of monitoring. The Weed Monitoring Program will be undertaken by suitably qualified personnel and preferably accompanied by TO Ranger groups.

TO Ranger groups have invaluable knowledge of the local area and previous experience conducting targeted surveys and data collection. The participation of TO ranger groups will provide an opportunity for meaningful engagement and contribute to two-way knowledge sharing for weed species.

D.3.4 Data Analysis

Data from the Weed Monitoring Program will be used to for the following purposes:

- Track distribution and abundance of weed species over time;
- Identify areas of operations that are at high risk of weed spread of establishment (haul road, rehabilitation areas etc);
- Identify and rank/priorities areas for weed management; and
- Track the control of weeds, particularly declared weeds (as required under the BAM Act).

D.4 Reporting

A standalone monitoring technical report will be submitted to Agrimin at the conclusion of each monitoring period, presenting the results and key findings of the Weed Monitoring Program. The report will include assessment against relevant management provisions, including outcome- and objective-based criteria, and specifically trigger and threshold criteria presented in **Table C 5** and **Table C 6** of the Weed Management Plan (**Appendix C** of the FVEMP). In the event that trigger or threshold criteria are exceeded, these will be reported in accordance with the Weed Management Plan and contingency actions will be provided for consideration. Key findings of the Weed Monitoring Program will be presented in the Annual Compliance Assessment Report (ACAR) and summarised in the Annual Environmental Report (AER), to be submitted to DWER and the EPA, in accordance with the Weed Management Plan (**Appendix C** of the FVEMP).

D.5 Review

A review of the Weed Monitoring Program will be undertaken every three years, as significant additional information becomes available, or as required to achieve the environmental outcomes associated with the Weed Management Plan **(Appendix C** of the FVEMP).

Any revision of the Weed Monitoring Program will be submitted to the relevant State (DWER, DBCA, EPA) and for approval, or in accordance with relevant regulatory conditions or requirements.

Appendix E Weed Management Procedure

E.1 Purpose and Scope

The Weed Management Procedure specifies the environmental requirements relating to the management of weed species across the Proposal area.

The procedure applies to all personnel (including employees, contractors and visitors) undertaking activities within the Proposal area.

E.2 Procedure

E.2.1 Management Procedures and Requirements

E.2.1.1 Weed Mapping and Monitoring

- Weed Monitoring in accordance with the Weed Management Plan and Weed Monitoring Program (Appendix C and Appendix D of the FVEMP)
 - Undertake weed mapping.
 - Identify locations of recorded weeds and Weed Risk Areas.
 - Methods to inspect topsoil stockpiles using the 'Topsoil Inspection Form'.
 - Follow reporting requirements for any new weed infestations.

E.2.1.2 Weed Risk Areas Signage

- Demarcate all Weed Risk Areas in the field.
- Establish clearly defined entry and exit points at any declared weed infestations located within active mining areas.
- Informative signage at designated entry/exit points at any declared weed infestations and the on entry and exit requirements.
- Treat any areas of declared weed infestations as avoidance sites wherever possible.

E.2.1.3 Weed Hygiene Requirements

- Establish procedure for importing of Equipment and Materials to the Project.
- Follow process for handling of Weed Contaminated Topsoil.
- Inspect, clean and certify mobile machinery and equipment prior to being brought into the construction and operation areas.
- Undertake regular vehicle inspections and cleaning appropriate to dry and wet conditions.
- Details of all inspections and cleaning must be completed using Vehicle and Mobile Equipment Weed Inspection Form.
- Identify Weed Risk Areas prior to disturbance and identify on Ground Disturbance Permit maps.
- Wash down facilities must be utilised, with appropriate bunding to contain wash down water.
- Prior to the movement of any soil, fill or any other weed risk material into or within the Proposal area, it must be certified by the supplier as being free from weeds prior to arrival on site.

E.2.1.4 Weed Control/Eradication Procedures

- Weed wash down requirements.
- Weed control methods, timing and safety in accordance with Weed Management Plan.
- Implement weed spraying programs each year to undertake these control programs. The eradication program will be targeted based on a risk based and strategic approach including prioritizing invasive weed species and any weed affected rehabilitation locations.



- Appropriate eradication programs will be developed for each species and engagement of technical weed control technicians for species of higher priority.
- Herbicide/chemical mix application will also be specific for each species of weed and will be based on the current best practice.
- Personnel or contractors undertaking weed treatment must be able to competently identify known weed species present on the work site and have familiarity with common weed species.
- Treatment and control are thorough and complete and to minimise off-target damage.
- Works undertaken during the program will be recorded to evaluate the effectiveness of current treatments for subsequent programs.
- Follow-up inspection programs will be carried out (within 8 weeks of initial spraying), to check on effectiveness of control program and additional control will be carried out if required.

E.2.1.5 Training and Awareness

- Promote awareness of weed management measures to all personnel through appropriate signage at workplace locations and conducting toolbox talks prior to the commencement of work.
- Provide specific training to staff in weed identification and management measures in accordance with weed management requirements.

E.3 Responsibility

The roles outlined in Table E 1 are responsible for the management requirements outlined in this procedure.

Table E 1: Roles and responsibilities for implementation of the Weed Management Procedure.

Role	Responsibility
Environmental Manager	 Weed monitoring in accordance with Weed Monitoring Program.
	Maintain Weed Risk Areas signage and access.
	 Weed hygiene inspections of mobile equipment, in accordance with Weed Hygiene Procedure.
	 Implement Weed Control in accordance with Weed Control Procedure.
	 Provide specific training to staff in weed identification and management measures as part of the site environmental induction.
Contractors	 Adhere to on-site hygiene measures, including stopping at designated hygiene checkpoint.

E.4 Review and Reporting

The Weed Management Procedure is to be reviewed as follows:

- Every three years;
- Following any modification to relevant approvals; or
- As a result of findings or actions identified through inspections, audits and incident reporting.

Reviews are to examine the appropriateness of this procedure, taking into consideration system changes since the last review was undertaken. Any deviation or non-compliance to this procedure would be considered an incident and must be reported within compliance documentation and investigated accordingly.

Appendix F Weed Control Procedure

F.1 Purpose and Scope

The Weed Control Procedure specifies the control measures required to remove and prevent the spread of weed species across the Proposal area.

The procedure applies to all personnel (including employees, contractors and visitors) undertaking activities within the Proposal area.

F.2 Procedure

F.2.1 Control Procedures and Requirements

F.2.1.1 Identification of Weed Species

- Weed species will be correctly identified in accordance with the Weed Identification Checklist, prior to the commencement of control treatment.
- Once identified, the most appropriate control measure for the weed species will be determined. The techniques used for the control of weeds are broadly described below. Species specific control measures are outlined in Section F.2.1.6.

F.2.1.2 Manual Removal

- Identify target weed species.
- Manual control is undertaken when it is feasible and appropriate, i.e.:
 - where low numbers or isolated individuals can be removed by hand,
 - where the removal of a certain part of the plant is required, such as reproductive fruits, seeds or roots; and
 - where weeds are present within environmentally sensitive areas
- The whole plant (inclusive of the root system) or reproductive structure must be removed by hand, or by shovel where required.
- Removed weed material is to be placed in a sealed plastic bag and double bagged.
- Disposal in the appropriate landfill facility
- Adherence to manual handling procedures and provision of appropriate PPE.

F.2.1.3 Chemical Control

- Chemical control shall be undertaken by suitably trained personnel in accordance with the weed management plan equipped with appropriate PPE.
- Identify target weed species.
- Identify correct chemical application (herbicide). Chemical control may be applied via foliar spray, spot spray, basal bark spray, stem injection and cut stem methods.
- Spray (or otherwise) the chemical application directly onto the target species. Excessive spraying should be avoided to prevent potential overspray impacts to surrounding native vegetation.
- Adherence to safety instructions relating to the correct use of herbicide application as per the label.

F.2.1.4 Equipment Requirements

The following equipment will be required for manual removal and chemical control procedures:

- Weed Identification Checklist
- Site PPE, as well as additional PPE required for chemical control application.
- GPS
- Hand shovel and shovel for manual removal
- Sealable plastic bags
- Chemical treatment (e.g. herbicide) and relevant applicator.



- For basal bark, stem injection and cut stem application methods, additional equipment may be utilised, such as:
 - Cutting equipment including secateurs, saw, small axe or chisel
 - Paint brushes
 - Syringes.

F.2.1.5 Data Management

The Weed Monitoring Form will be completed each time weed control activities are undertaken, including records of the treatment type applied and treatment locations. Once complete, forms will be kept on file.

F.2.1.6 Species Specific Weed Control Treatment

A summary of species specific control techniques for introduced flora species is provided in Table F 1.

Table F 1: Summary of species	specific control techniques	s for introduced flora spec	ies recorded in the Proposal
Area.			

Weed Species	Chemical Control	Manual Control	Indicative seed set	Optimal timing for weed control
<i>Cenchrus ciliaris</i> (Buffel Grass)	Spot spray with 1- 2% glyphosate and follow-up with seedling control.	Hand remove small populations and seedlings; entire plants with dormant buds must be removed.	All year. May begin producing seeds from approximately 3 months of age	Wet season (four to six weeks after a rain event) when plants actively growing and not stressed, prior to seed set.
* <i>Aerva javanica</i> (Kapok Bush)	Foliar spray with 1- 2% glyphosate.	Remove reproductive parts and place in sealed plastic bags.	All year	All year, when plants actively growing and not stressed, prior to seed set.
* <i>Cenchrus setiger</i> (Birdwood Grass)	Spot spray with 1-2% glyphosate and follow-up with seedling control.	Hand remove small populations and seedlings; entire plants with dormant buds must be removed.	All year	Wet season (four to six weeks after a rain event) when plants actively growing and not stressed, prior to seed set.
* <i>Flaveria trinervia</i> (Speedy Weed)	Foliar spray seedlings with 1-2% glyphosate.	Hand remove isolated and small populations, removing whole plants where possible.	-	Chemical control year-round when plants not undergoing excessive stress, prior to seed set whenever possible.
* <i>Malvastrum americanum</i> (Spiked Malvastrum)	Spot spray 0.5% glyphosate.	Hand remove seedlings and small populations, removing whole plants.	April to September	Wet season, when plants actively growing and not stressed, prior to seed set.
* <i>Tribulus terrestris</i> (Caltrop)	Basal bark spray (for stems up to 10 cm in diameter) up to 30 cm above ground level application using 2% Picloram + 2,4-D amine (Enforcer) or cut stump using undiluted chemical.	Cut plants at 10 to 20 cm below ground, remove reproductive parts. Remove whole plant if possible.	All year	Chemical control year-round when plants not undergoing excessive stress, prior to seed set whenever possible.

F.3 Responsibility

The roles outlined in Table F 2 are responsible for the weed control requirements outlined in this procedure.

Table F 2: Roles and responsibilities for implementation of the weed control procedure.

Role	Responsibility
Environmental Officer	 Identification of weed species and determination of control measures.
	 Weed control in accordance with Weed Control Procedure, subject to the level of training obtained.
Environmental Manager	 Implementation of the Weed Control Procedure and review.
	 Provision of training, equipment and PPE for personnel undertaking weed control activities.
Site personnel	 Awareness of Weed Identification Checklist and reporting requirements for recording new species.
	Awareness of Weed Control Procedure.

F.4 Review and Reporting

The Weed Control Procedure is to be reviewed as follows:

- Every three years;
- Following any modification to relevant approvals; or
- As a result of findings or actions identified through inspections, audits and incident reporting.

Reviews are to examine the appropriateness of this procedure, taking into consideration system changes since the last review was undertaken. Any deviation or non-compliance to this procedure would be considered an incident and must be reported within compliance documentation and investigated accordingly.

Appendix G Weed Hygiene Procedure

G.1 Purpose and Scope

The Weed Hygiene Procedure specifies the environmental requirements relating to the management of weed species across the Proposal area. The purpose of this is to prevent the introduction of new weeds and minimise the spread of any existing weeds present within the Proposal area.

The procedure applies to all personnel (including employees, contractors and visitors) undertaking activities within the Proposal area.

G.2 Procedure

G.2.1 Hygiene Procedures and Requirements

G.2.1.1 Hygiene Inspection Procedure

- The Contract Manager will notify the Environmental Adviser (or nominated delegate) of the date and time of a pending arrival/departure of mobile equipment which will require inspection.
- Mobile equipment must stop at the designated hygiene checkpoint on arrival/prior to departure and contact the Environmental Adviser (or nominated delegate).
- The Environmental Adviser (or nominated delegate) will conduct the hygiene inspection of the mobile equipment.
- Where the hygiene inspection is determined as 'clean', the Environmental Adviser will issue a Weed Hygiene Certificate, which must be retained within the mobile equipment (or if not possible, at an appropriate location onsite). The mobile equipment can now enter the site and commence work.
- Where the hygiene inspection is determined as 'unclean' by the Environmental Adviser, such as where vegetation, seeds, soil or mud is observed, the mobile equipment must be washed down as instructed, which may be off-site, and re-inspected. The mobile equipment cannot enter the site and commence work until the hygiene inspection is determined as 'clean' and the Weed Hygiene Certificate is issued.

G.2.1.2 Weed Hygiene Requirements

- Procedure for importing of Equipment and Materials to the Project.
- Process for handling of Weed Contaminated Topsoil.
- Inspect, clean and certify mobile machinery and equipment prior to being brought into the construction and operation areas.
- Undertake regular vehicle inspections and cleaning appropriate to dry and wet conditions.
- Details of all inspections and cleaning must be completed using Vehicle and Mobile Equipment Weed Inspection Form (to be developed).
- Identify Weed Risk Areas prior to disturbance and identify on Ground Disturbance Permit maps.
- Wash down facilities must be utilised, with appropriate bunding to contain wash down water.
- Prior to the movement of any soil, fill or any other weed risk material into or within the Proposal area, it must be certified by the supplier as being free from weeds prior to arrival on site.

G.2.1.3 Certification Records

• Weed Hygiene Certificates will be retained by the Environmental Manager and kept on record within the internal document management system.

G.2.1.4 Training and Awareness

- Promote awareness of weed hygiene requirements to all site personnel through appropriate signage at workplace locations and conducting toolbox talks prior to the commencement of work.
- Provide specific training to staff in weed identification and hygiene requirements in accordance with weed management requirements.

G.3 Responsibility

The roles outlined in Table G 1 are responsible for the hygiene requirements outlined in this procedure.

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Role	Responsibility				
Environmental Manager	Undertake (or nominate a suitable delegate to undertake) weed hygiene inspections.				
	Provide advice on suitable / alternative wash down options.				
	• Ensure weed hygiene requirements are adequately and regularly communicated.				
	 Retain a copy of all Weed Hygiene Certificates on the internal document management system. 				
	• Ensure all breaches of this procedure are reported and investigated with appropriate actions assigned.				
Contract Manager	• Communication of the arrival/departure of mobile equipment to site to notify the Environmental Adviser for hygiene inspections.				
Mobile Equipment Operator	 Adhere to on-site hygiene measures, including stopping at designated hygiene checkpoint. 				
	• Must not enter site or commence work until the equipment obtains a Weed Hygiene Certificate.				

G.4 Review and Reporting

The Weed Hygiene Procedure is to be reviewed 3 yearly or as follows:

- Following any modification to relevant approvals; or
- As a result of findings or actions identified through inspections, audits and incident reporting.

Reviews are to examine the appropriateness of this procedure, taking into consideration system changes since the last review was undertaken. Any deviation or non-compliance to this procedure would be considered an incident and must be reported within compliance documentation and investigated accordingly.

Appendix H Weed Monitoring Form

Weed Monitoring Form							
Date		Site ID			Operator		
Location			Easting/I	Vorthing			
Inspection	Y	N	NA	Photo Take	n	Y	N
Monitoring	Y	N	NA	Weather Co	onditions		
Direct Control	Y	N	NA				
Weed Species							
Number of Budding / F	lowering						
Total Cover % in a 50 m	area						
Chemicals Used							
Information Recorded i	n Weeds [Database			Y	N	NA
Comments							
Site Map							

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Appendix IWeed Identification Checklist

Weed species	Development Envelope	DBCA Cla	ssification [^]	Description/Classification	Photo (WAH, 2023)
(common name)		Ecological impact	Invasiveness		
* <i>Aerva javanica</i> (Kapok Bush)	NIDE	High	Rapid	An erect, much-branded perennial herb between 0.4-1.6 m high. The species flowers between January to October with white flowers. It is often found along sandy soils along drainage lines (WAH, 2023).	Aerva javanica
*Cenchrus ciliaris (Buffel Grass)	NIDE	High	Rapid	A tufted, or sometimes stoloniferous, perennial herb or grass-like species between 0.2-1.5 m high. The species flowers between February to October with purple flowers. It is found in white/red/ brown sand, stony red loam or black cracking clay (WAH, 2023).	Cenchrus ciliaris



Weed species	Development Envelope	DBCA Cla	ssification	Description/Classification	Photo (WAH, 2023)
(common name)		Ecological impact	Invasiveness		
*Cenchrus setiger (Birdwood Grass)	NIDE	High	Rapid	An erect, tussocky, stoloniferous perennial herb or grass-like species up to 0.5 m high. The species flowers between April to May with cream- purple flowers. It is often found in brown sands, red loam, pindan spoils in sand dunes, plains, rangelands, stony hillsides or floodplains (WAH, 2023).	Cenchrus setiger
* <i>Flaveria trinervia</i> (Speedy Weed)	NIDE	n/a	n/a	An annual herb species up to 0.5 m high with yellow flowers. Often found in light brown sand, limestone or flat saline sandy clay-loam (WAH, 2023).	



Weed species (common name)	Development Envelope	DBCA Classification [^]		Description/Classification	Photo (WAH, 2023)
		Ecological impact	Invasiveness		
* <i>Malvastrum americanum</i> (Spiked Malvastrum)	NIDE	High	Rapid	An erect perennial herb or shrub between 0.5-1.3 m high. It flowers between April to July with yellow- orange flowers. It is found in orange/red/yellow sand, gritty alluvial sand, black/brown clay, alluvial cracking clays, limestone or calcrete throughout stony ridges and hillsides, floodplains or along drainage lines (WAH, 2023).	Advastrum americanum
* <i>Tribulus terrestris</i> (Caltrop)	NIDE Island of Lake Mackay	Unknown	Moderate	A prostrate annual villous herb with 4- 7 paired leaflets distinct divergent cocci and median spines 3-8 mm long. The species flowers between January to December with yellow flowers. It is often found on sandy soils throughout waste places (WAH, 2023).	Tribulus terrestris



DESIGN WITH COMMUNITY IN MIND

Communities are fundamental. Whether around the corner or across the globe, they provide a foundation, a sense of place and of belonging. That's why at Stantec, we always design with community in mind.

We care about the communities we serve—because they're our communities too. This allows us to assess what's needed and connect our expertise, to appreciate nuances and envision what's never been considered, to bring together diverse perspectives so we can collaborate toward a shared success.

We're designers, engineers, scientists, and project managers, innovating together at the intersection of community, creativity, and client relationships. Balancing these priorities results in projects that advance the quality of life in communities across the globe.

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