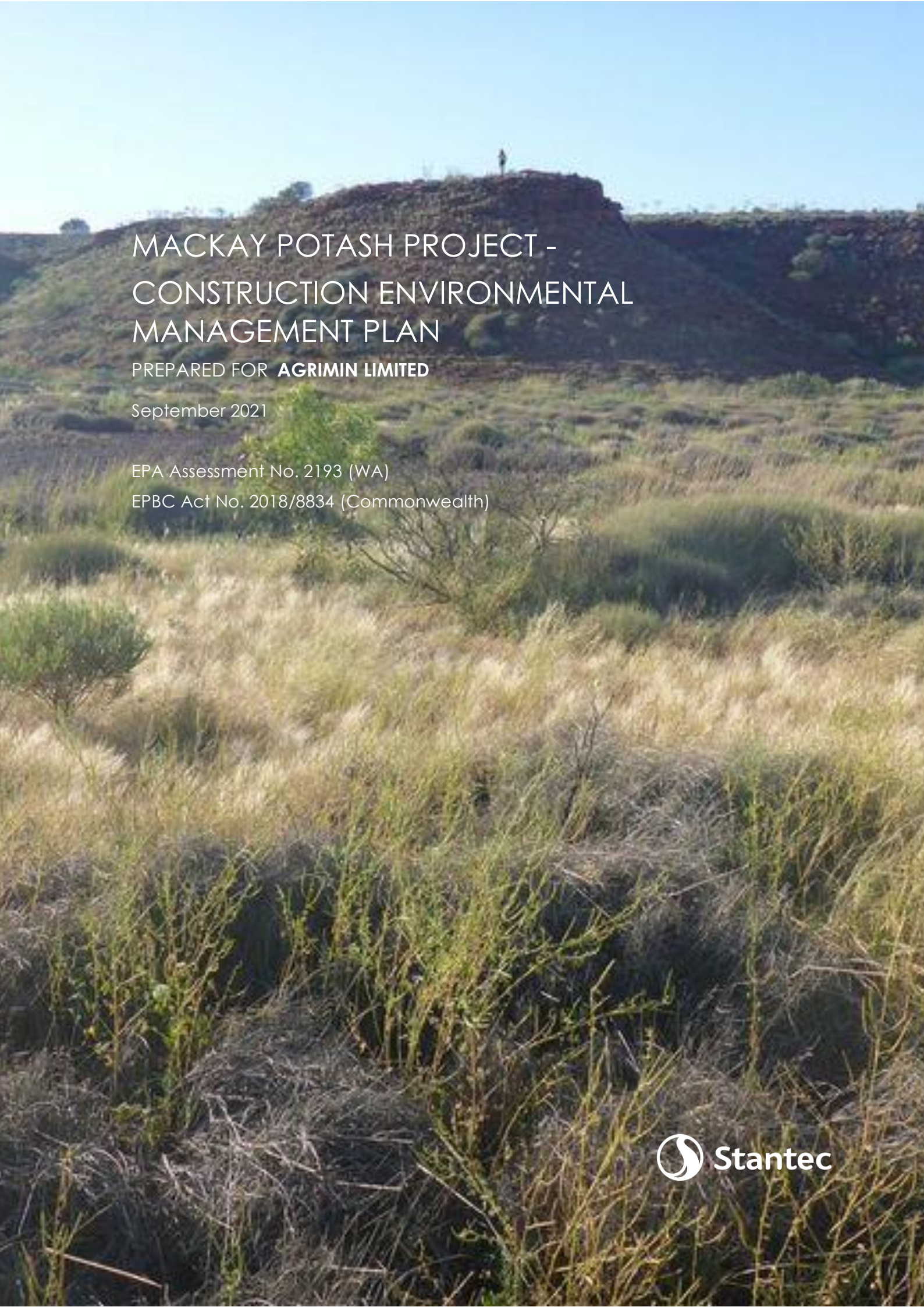


MACKAY POTASH PROJECT - CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

PREPARED FOR **AGRIMIN LIMITED**

September 2021

EPA Assessment No. 2193 (WA)

EPBC Act No. 2018/8834 (Commonwealth)

Stantec

This document has been prepared for the benefit of Agrimin Limited. No liability is accepted by this company or any employee or sub-consultant of this company with respect to its use by any other person.

This disclaimer shall apply notwithstanding that the report may be made available to other persons for an application for permission or approval to fulfil a legal requirement.

QUALITY STATEMENT

PROJECT MANAGER	PROJECT TECHNICAL LEAD
Tracy Schwinkowski	Matt Spence

PREPARED BY		
Courtney Kains and Matt Spence	.....	21/08/2021
CHECKED BY		
Paul Bolton, Alice Bott and Fiona Taukulis	.....	22/08/2021
REVIEWED BY		
Peter Tapsell	.....	31/08/2021
APPROVED FOR ISSUE BY		
Peter Tapsell	.....	31/08/2021

PERTH
Ground Floor, 226 Adelaide Terrace, PERTH, WA 6000
TEL +61 (08) 6222 7000

REVISION SCHEDULE

Rev No.	Date	Description	Signature or Typed Name (documentation on file)			
			Prepared by	Checked by	Reviewed by	Approved by
V0.1	26/11/2020	Draft for submission	MY/MS/CK/KB	SL	SO / PdSM	SO
V1.0	10/09/2021	Final Draft addressing DMA comments	MS/CK	PB/AB/FT	PT	PT

Project Name	MacKay Sulphate of Potash Project
Proponent Name	Agrimin Limited
Ministerial Statement Number	N/A – Project is under assessment (Assessment Number 2193)
Purpose of CEMP	The purpose of the CEMP is to satisfy the work requirements of Agrimin's ESD and presents a robust management framework to protect the environmental values within the Project Area and surround environment during construction.
Key Environmental Factors and objectives	**Flora and Vegetation:** The proponent shall manage the implementation of the project to meet the following management objectives: • To avoid unapproved clearing of native vegetation outside the Development Envelope during and attributable to construction • To ensure that construction impacts to flora and vegetation due to the introduction or spread of weeds are minimised as far as practicable. • To ensure that construction impacts to flora and vegetation from dust as a result of construction are minimised as far as practicable. • To ensure that construction impacts to flora and vegetation from altered fire regimes as a result of construction are minimised as far as practicable. • To ensure the likelihood of hydrocarbon spills are minimised and remediated before environmental harm occurs to flora and vegetation **Terrestrial Fauna:** The proponent shall manage the implementation of the project to meet the following management objectives: • Avoid unapproved clearing of key MNES species of concern which include Night Parrot, Greater Desert Skink and Great Bilby habitat and avoid injury or death of significant species wherever possible (i.e. Vehicle Strike and Movement) • Minimise adverse impacts to significant fauna as a result of project-related increase in feral animal abundance • Minimise adverse impacts to significant fauna as a result of project-related altered fire regime • Avoid and minimise adverse impacts to waterbirds as a result of implementing the Project • Minimise potential impacts of altered hydrological regimes to Night Parrot habitat **Inland Waters:** The proponent shall manage the implementation of the project to meet the following management objectives: • Achieve the conservation of water through minimising abstraction rates and water re-use where possible • To ensure the likelihood of contaminated material entering the environment is minimised and remediated before environmental harm occurs to inland waters **Social Surroundings:** The proponent shall manage the implementation of the project to meet the following management objectives: • Avoid otherwise minimise impacts to Aboriginal Communities – Dust • Avoid otherwise minimise impacts to Aboriginal Heritage values
Condition Clauses	N/A
Key components in the CEMP	Key provisions are detailed in Section 3

Proposed Construction Date	TBD
EMP required pre-construction?	Yes

Corporate Endorsement

I hereby certify that to the best of my knowledge, the provisions within this Mackay Potash Project Terrestrial Fauna Management Plan are true and correct.

Name: **Signed:**

Position: **Date:**

Abbreviations

Agrimin	Agrimin Limited
AH Act	*Aboriginal Heritage Act 1979*
BC Act	Biodiversity Conservation Act 2016
CEMP	Construction Environmental Management Plan
CHMP	Cultural Heritage Management Plan
Cwth	Commonwealth
DBCA	Department of Biodiversity, Conservation and Attractions
EIA	Environmental Impact Assessment
EP Act	*Environmental Protection Act 1986*
EPA	Environmental Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ERD	Environmental Review Document
ESD	Environmental Scoping Document
GL	gigalitre
GL/a	gigalitre per annuum
ha	hectare
km	kilometre
m	meters
CMCP	Conceptual Mine Closure Plan
MNES	Matter of National Environmental Significance
NIDE	Northern Infrastructure Development Envelope
NGER Act	*National Greenhouse and Energy Reporting Act 2007*
NT	Northern Territory
On-LDE	On Lake Development Envelope
Off-LDE	Off Lake Development Envelope
PEC	Priority Ecological Community
NT	Northern Territory
NT Act	*Native Title Act 1993*
RIWI Act	*Rights in Water and Irrigation Act 1914*
SIDE	Southern Infrastructure Development Envelope
SRE	Short Range Endemic
TEC	Threated Ecological Community
tpa	tonnes per annum
WA	Western Australian
WAH	Western Australian Herbarium

Agrimin Limited

Construction Environmental Management Plan

CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

1. Context, Scope and Rationale

1.1 The Project

Agrimin propose to construction and operate the Lake Mackay greenfields potash fertiliser operation (the Project) located approximately 450 km south of Halls Creek and 790km west of Alice Springs by road. The Project is located within the East Pilbara region of Western Australia (WA), adjacent to the WA and Northern Territory (NT) border (Figure 1-1).

The Project 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.

The Project is remote and extensive (263,675 ha) and therefore four development envelopes have been defined. The following terms are used throughout the CEMP (Figure 1-1):

- **Study Area** – refers to the boundary within which all investigations and field surveys were undertaken.
- **Development Envelopes** – the boundary within which the elements of the Project are situated. The development envelopes occur entirely within the Study Area and comprise four components that make up the Project. The Project 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):
    - **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 Envelope (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 production to Wyndham Port, including clearing of approximately 1,000 ha of native vegetation within the 33,928 ha NIDE.
- **Project Area** - The combined area in which the four development envelopes are contained.
- **Indicative Footprints** – the proposed Indicative Footprints (IFs) occur entirely within the Project Area and refers to the area that is proposed to be directly disturbed by the Project (e.g. clearing of native vegetation). The layout of the IF may be subject to change, however, total disturbance will not exceed the maximum extent of disturbance for each Development Envelope as presented in the Environmental Review Document (ERD). Proponent-led avoidance and minimise measures has been implemented where possible to reduce and minimise potential impacting on areas of high ecological or heritage value through the detailed design of the indicative footprints.

1.2 Purpose and Objectives

The purpose of the Construction Environmental Management Plan (CEMP) is to describe and detail how the environmental impacts relating to the construction phase of the Project can be adequately managed, after avoidance measures have been implemented. The CEMP demonstrates that the potential impacts caused by the construction of the Project have been avoided and minimised as low as practicable and that the Environmental Protection Authority's (EPA's) Environmental Objective for various key factors can be met.

It should be noted that potential impacts relating to the operational phase of the Project are addressed in the three EMPs submitted with the ERD, including:

- Terrestrial Fauna Environmental Management Plan (TFEMP),
- Flora and Vegetation Environmental Management Plan (FVEMP) and

- Inland Waters Environmental Management Plan (IWEMP).

The scope of the CEMP applies specifically to construction activities within each of the four Development Envelopes (Figure 1-1), the Project Area. The overarching objective of the CEMP is to avoid, where possible, otherwise minimise direct and indirect impacts to the key environmental factors from the construction of the Project.

This CEMP has been prepared in accordance with the '*Instructions on how to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans*' (EPA 2020a).

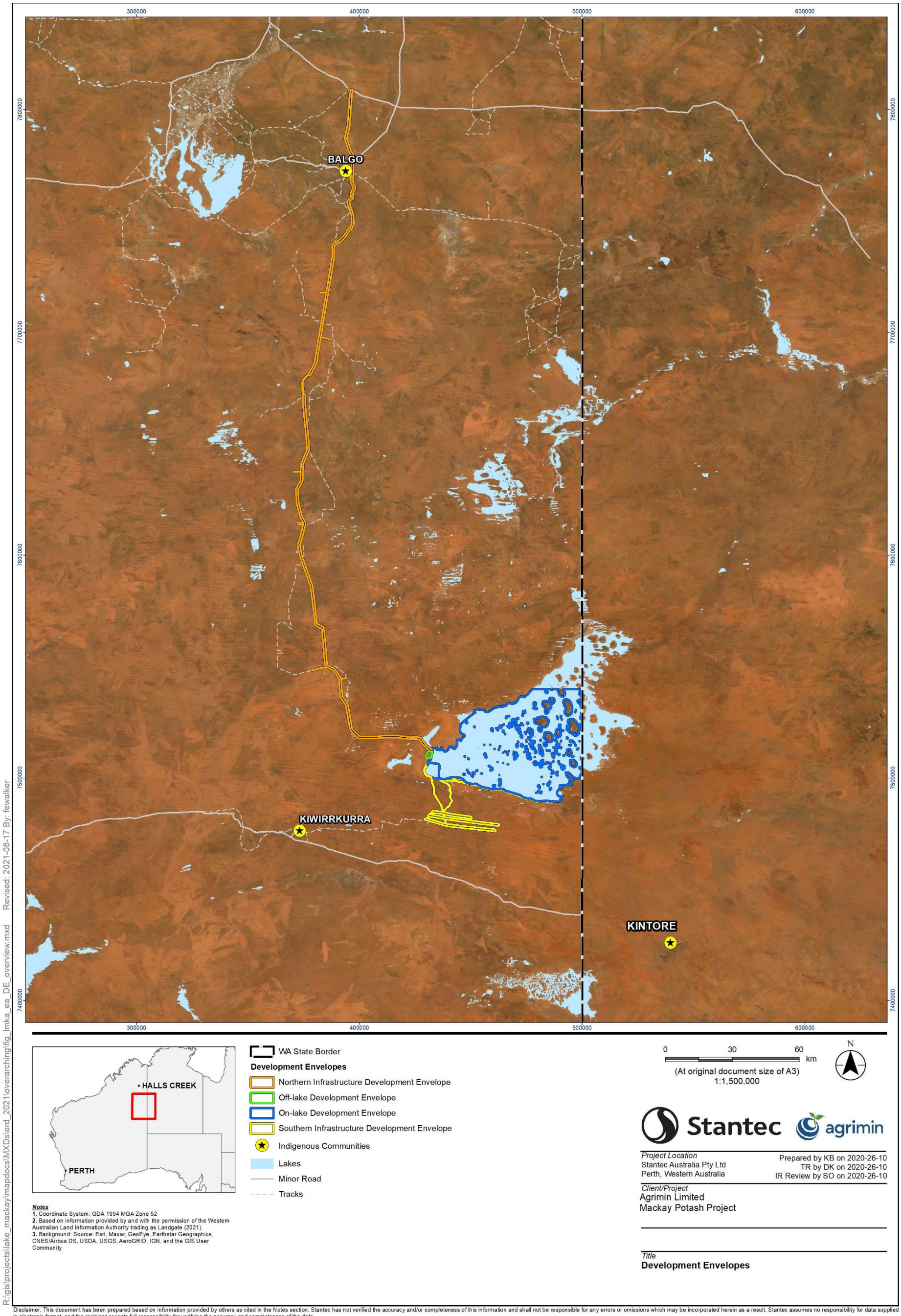


Figure 1-1: Mackay Potash Project, Project Area and Development Envelopes

1.3 Key Environmental Factors

The EPA identified five key Environmental Factors that have the potential to be impacted by the implementation of the Project. Agrimin has assessed the EPA's environmental factors in accordance with the EPA's *Statement of Environmental Principles, Factors and Objectives* (EPA 2020b) and the EPA's *Environmental Factor Technical Guidance*. The key factors relevant to the construction of the Project include:

- **Flora and Vegetation** – to protect flora and vegetation so that biological diversity and ecological integrity are maintained.
- **Terrestrial Fauna** - to protect terrestrial fauna so that biological diversity and ecological integrity are maintained.
- **Subterranean fauna -** to protect subterranean fauna so that biological diversity and ecological integrity are maintained
- **Inland Waters** – to maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.
- **Social surrounds -** to protect social surroundings from significant harm

Other preliminary environmental factors were identified in the ERD, including Air Quality, Terrestrial Environmental Quality, Landforms, and Greenhouse Gas Emissions. These environmental factors are not considered further in the scope of the CEMP. Mitigation measures for these factors are detailed in the ERD, and are considered manageable through other regulatory processes, including Part V of the EP Act.

The key factors relevant to this Project as outlined in the EPA's decision for assessment (Assessment No 2193, 30 January 2019) are considered in Table 1-1.

Table 1-1: Key environmental factors, their significance and relationship to the Project

EPA Theme	EPA Factor	Significance	Relationship to the construction of the Project
Land	Flora and Vegetation	**Key environmental factor**	There are potential impacts from the Proposal on flora and vegetation from clearing of up to1500 ha of native vegetation off the lake surface for the development of the Proposal infrastructure. Indirect impacts from the Proposal may include habitat fragmentation, impacts on habitat that supports the flora and vegetation, impacts on other species with important ecological function, introduction, or promotion of weeds, altered hydrology and changed fire regimes.
	Landforms	Not considered a key environmental factor	
	Subterranean Fauna	**Key environmental factor**	Provisions for subterranean fauna are not addressed further in this CEMP, as construction activities will not be to a depth great enough to impact subterranean fauna habitat, nor will there be direct impacts to the lake islands, where key subterranean fauna has been found. Any potential impacts that may occur as a result of the Project to subterranean fauna would be seen in the operational phase and therefore, provisions for subterranean fauna are addressed in the Inland Water Environmental Management Plan (IWEMP) that manages operational impacts.
	Terrestrial Environmental Quality	Not considered a key environmental factor	
	Terrestrial Fauna	**Key environmental factor**	Clearing of up to 1500 ha of native vegetation for the development of the Project infrastructure, is the main threat to terrestrial fauna. Construction of infrastructure may also result in fragmentation or modification of

EPA Theme	EPA Factor	Significance	Relationship to the construction of the Project
			habitat, and mortality or displacement of fauna individuals or populations.
Water	Inland Waters	**Key environmental factor**	Clearing of up to 1,500 ha of native vegetation for the development of access tracks off the lake surface and within the NIDE will impact on Inland Waters including the removal of riparian vegetation and possible impacts to hydrological regimes and quality of groundwater and surface water. Disturbance of up to 15,000 ha of the surface of Lake Mackay for the construction of trenches and evaporation ponds to extract 100 gigalitres per annum (GL/a) of brine will also impact upon Inland Waters in terms of distribution, connectivity, movement, and quantity (hydrological regimes) of Lake Mackay including its chemical, physical, biological and aesthetic characteristics (quality).
Air	Air Quality	Not considered a key environmental factor	
	Greenhouse Gas Emissions	Not considered a key environmental factor	
People	Social Surroundings	**Key environmental factor**	The Project has the potential to impact upon social surroundings due to the presence of Aboriginal heritage sites in the development envelope and proximity of the Proposal to local communities.
	Human Health	Not considered a key environmental factor	

1.3.1 Commonwealth Environmental Impact Assessment Process

Agrimin is committed to ensuring that management measures will be implemented during construction to ensure the protection of the following Matters of National Environmental Significance (MNES) that are listed threatened species and communities (section 18 and 18A of the EPBC Act) including.

- Australian Painted Snipe (*Rostratula benghalensis*) (En);
- Greater Bilby (*Macrotis lagotis*) (Vu);
- Great Desert Skink (*Liopholis kintorei*) (Vu);
- Grey Falcon (*Falcon hypoleucos*) (Vu);
- Night Parrot (*Pezoporus occidentalis*) (En); and
- Princess Parrot (*Polytelis alexandrae*) (Vu).

The key species of concern that have been identified through the impact assessment included the Great Desert Skink, Night Parrot and the Greater Bilby. These species are considered locally important as they are found in large numbers and within the Indicative Footprint which the proponent has implemented direct avoidance measures to avoid impacts. To further minimise impacts, the management approach detailed in this TFEMP centre on these three key species.

1.4 Condition Requirements

The Project is currently under assessment by the EPA (Assessment No. 2173). This CEMP has been prepared for submission with the ERD and provides a draft framework for the construction phase of the Project for the EPA to consider as part of the ERD process. As the Project is still under assessment, a Ministerial Statement has not yet been issued.

1.5 Rational and Approach

Agrimin is committed to minimising and where possible avoiding potential impacts to the environment from the Project's construction activities, taking into consideration both State and Federal regulatory requirements. The purpose of the CEMP is to document a suite of robust management measures and

monitoring protocols to mitigate and manage the potential impacts relevant to construction of the Project. It aims to provide an instrument to:

- comply with permit and approval requirements for the Project granted under Part IV of the EP Act and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- address applicable legislative and regulatory requirements;
- document the management of environmental impacts during the construction phase of the Project;
- identify roles and responsibilities; and
- provide an Environmental Management System (EMS) framework for continual improvement and application of best industry practice.

1.5.1 Environmental Surveys

The rationale for the proposed management approach in this CEMP is supported by technical survey work undertaken to date. The Development Envelopes have been subject to extensive field surveying since 2017, including desktop, reconnaissance, and detailed field surveys. The findings of the surveys have been used to inform the impact assessment in the ERD and used to develop management and mitigation measures to minimise the environmental impacts arising from construction of the Project.

1.5.2 Flora and Vegetation

The Project will directly and indirectly impact on flora and vegetation within the indicative disturbance footprints of the four development envelopes.

Trenching and project infrastructure on the surface of Lake Mackay will cause direct impacts to a maximum of 15,000 ha of the non-vegetated playa (On-LDE). There has been 0.38 ha of vegetation mapped within the On-LDE indicative disturbance footprint, consisting of two vegetation types. Earthworks within the On-LDE for the Project is likely to impact vegetation, however in relatively minimal proportions. Less than 0.01% of the two vegetation types found on the On-LDE occurs within the IF of the On-LDE.

Clearing of vegetation for processing infrastructure and associated project requirements will result in direct impact due to a loss of up to 200 ha of vegetation within the 688 ha Off-LDE.

Clearing of vegetation will result in a direct impact due to the loss of up to 1,000 ha of vegetation within the 33,928 ha NIDE. Construction of the haul road requires removal of vegetation generally within a 24 m wide corridor (of which 30% is on an existing cleared track).

Clearing of vegetation for borefield, water pipelines and access tracks will result in a direct impact of up to 300 ha of vegetation within the 11,799 ha SIDE.

1.5.2.1 Vegetation Types

Fifty vegetation types have been recorded within the Study Area, none of which represent a Threatened Ecological Community (TEC) or Priority Ecological Community (PEC) or Groundwater Dependant Vegetation (GDV). Riparian zone vegetation occurs within the Study Area, primarily in association with Lake Mackay and its islands. Chenopod shrublands, dominated by *Tecticornia* spp. fringe the lake, typically between the playa and hummock grassland communities.

1.5.2.2 Significant Vegetation

According to the EPA Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016a), vegetation may be considered significant for a range of reasons, including:

- where vegetation is identified as threatened ecological communities (TECs) or priority ecological
- communities (PECs);
- where vegetation represents a restricted distribution;
- the degree of historical impact from threatening processes to vegetation;
- where vegetation provides important refuge; and
- where vegetation provides an important function required to maintain ecological integrity of a
- significant ecosystem.

Nineteen vegetation types support Priority flora within the Project Area and are therefore considered to be locally significant. Of the 19, two support Priority 1 species and both are highly associated with the margins of Lake Mackay and dominated by chenopods including a number of *Tecticornia* species. However, given the broad vegetation type mapping and extrapolation required in relation to the extent of the significant flora, it is likely that the full extent of each of the 19 vegetation types are not locally significant. A total of 21,636 ha of riparian vegetation occurs within the Study Area; dominating the margins of Lake Mackay and its islands. Of this, 1,523 ha (0.56%) occurs within the Project Area, and 33.14 ha occurs within the collective indicative disturbance footprint.

The vegetation types considered to be of highest local significance include:

- TsppEf –Stackhousia sp. Lake Mackay (P.K. Latz 12870) (P1) was recorded on the saline margins of Lake Mackay. This vegetation type typically represented riparian vegetation at the interface between the playa and terrestrial vegetation types, and dominated by a suite of *Tecticornia* spp.
- MlGcSdFcTspp(TsaTp) – a vegetation type supporting riparian flora, and mapped in close proximity to the margins of Lake Mackay, and on most islands. This vegetation type is dominated by a number of halophilic species, including *Stackhousia* sp. Lake Mackay (P.K. Latz 12870) (P1), *Eragrostis lanicaulis* (P3) and *Stackhousia clementii* (P3)), and also supported a suite of *Tecticornia* spp.

1.5.2.3 Significant Flora

The EPA (2016a) advises that flora species, subspecies, varieties, hybrids and ecotypes may be considered significant for reasons other than listing as a threatened or priority flora species, and include the following:

- a keystone role in a habitat for Threatened species, or supporting large populations representing a significant proportion of the local regional population of a species;
- relic status;
- anomalous features that indicate a potential new discovery;
- being representative of the range of a species (particularly at the extremes of range, recently discovered range extensions, or isolated outliers of the main range);
- the presence of restricted subspecies, varieties, or naturally occurring hybrids;
- local endemism/a restricted distribution; and/or
- being poorly reserved.

Seven Priority flora species have been recorded within the Project Area, none of which are listed under the EPBC Act (Table 1-2 and Figure 1-2 through to Figure 1-4). No Priority flora occur within the On-LDE. Only one Priority Flora species, *Comesperma sabulosum* (P3) occurs within an indicative disturbance footprint (NIDE). Seven flora species of other significance have been recorded within the Project Area, two of which also occur within the NIDE indicative disturbance footprint (*Goodenia* aff. *armitiana* and *Triodia* c.f. *epactia*). All three taxa are well represented beyond the indicative disturbance footprint.

Table 1-2: Priority flora within the Project Area

Taxon	Number of known records in WA (FloraBase) (WAH 2020)	Number of records within Study Area	Number of records within Development Envelopes			
			NIDE	SIDE	On-Lake	Off-Lake
Stackhousia sp. Lake Mackay (P.K. Latz 12870) P1	5	2#	9		-	7
Goodenia virgata P2	7	1	2	4	-	-
Comesperma sabulosum P3	14	0	105	-	-	-
Eragrostis lanicaulis P3	12	0	14	-	-	1
Goodenia modesta P3	27	0	44	-	-	-
Indigofera ammobia P3	15	1	2	2	-	1
Stackhousia clementii P3	21	2#	9		-	7

#One record on an island of the Lake Mackay playa

1.5.2.4 Introduced Flora

Introduced flora (weeds) have a detrimental effect on ecological values of communities in which they invade. Weeds outcompete with 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 Project Area, all of which occur within the NIDE. 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 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 1-3.

Table 1-3: Introduced flora recorded within the Project Area and the DPaW Weed Prioirtisation Process

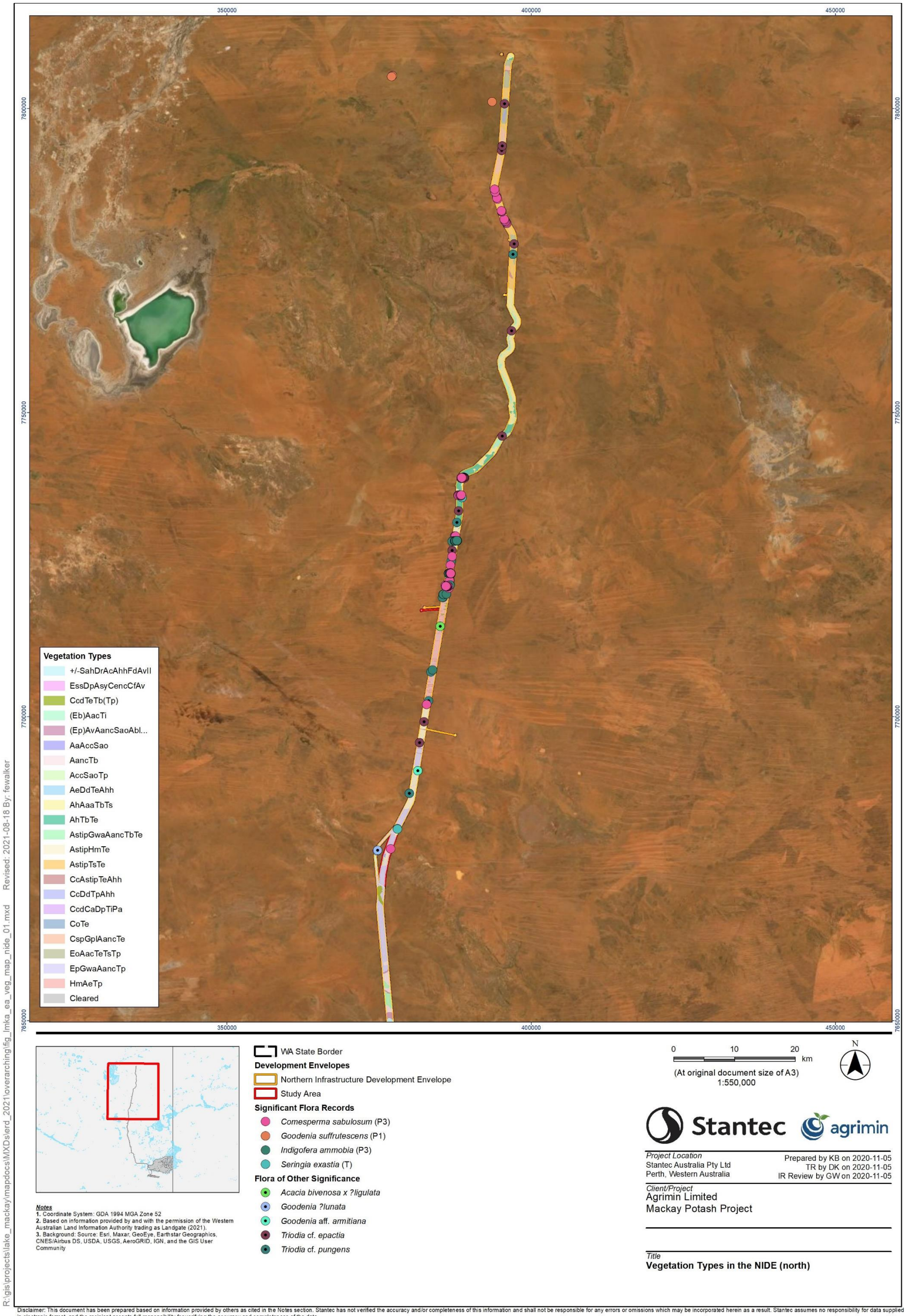
Weed species (common name)	Development Envelope	Number of records	DPaW Classification^	
			Ecological impact	Invasiveness
**Aerva javanica* (Kapok Bush)	NIDE	1	High	Rapid
**Cenchrus ciliaris* (Buffel Grass)	NIDE	19	High	Rapid
**Cenchrus setiger* (Birdwood Grass)	NIDE	3	High	Rapid
**Flaveria trinervia*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

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

1.5.2.5 Potential Impacts to Flora and Vegetation

The Project related activities and potential impacts to flora and vegetation relating to construction activities for the Project Area, include:

- Clearing of native vegetation (loss of significant flora, significant vegetation, and riparian vegetation)
- Weed introduction and proliferation
- Fugitive Dust Emissions and Deposition
- Altered fire regime
- Contaminants Spills



Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.

Figure 1-2: Vegetation Types and Locations of Significant Flora Species (Northern NIDE)

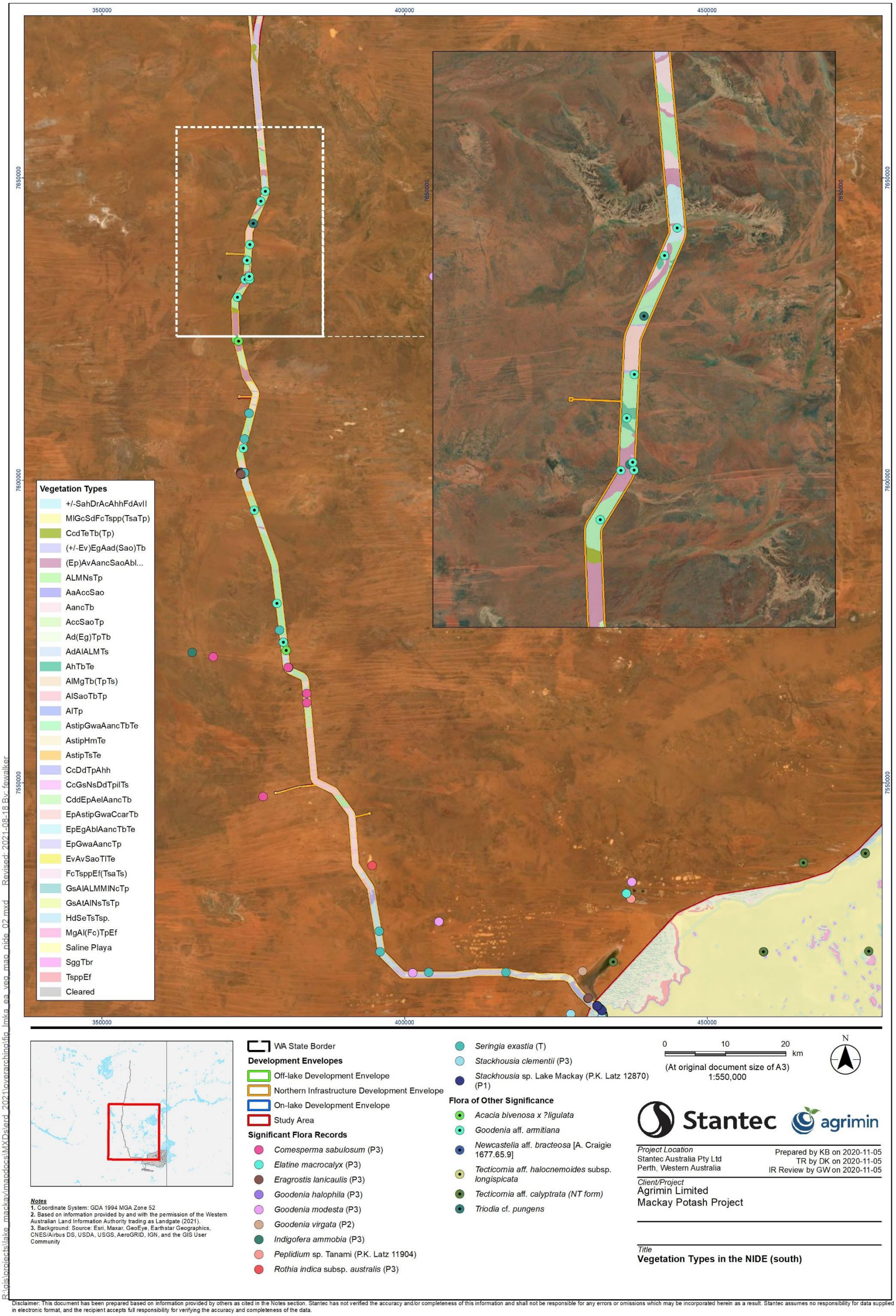


Figure 1-3: Vegetation Types and Locations of Significant Flora Species (Southern NIDE)

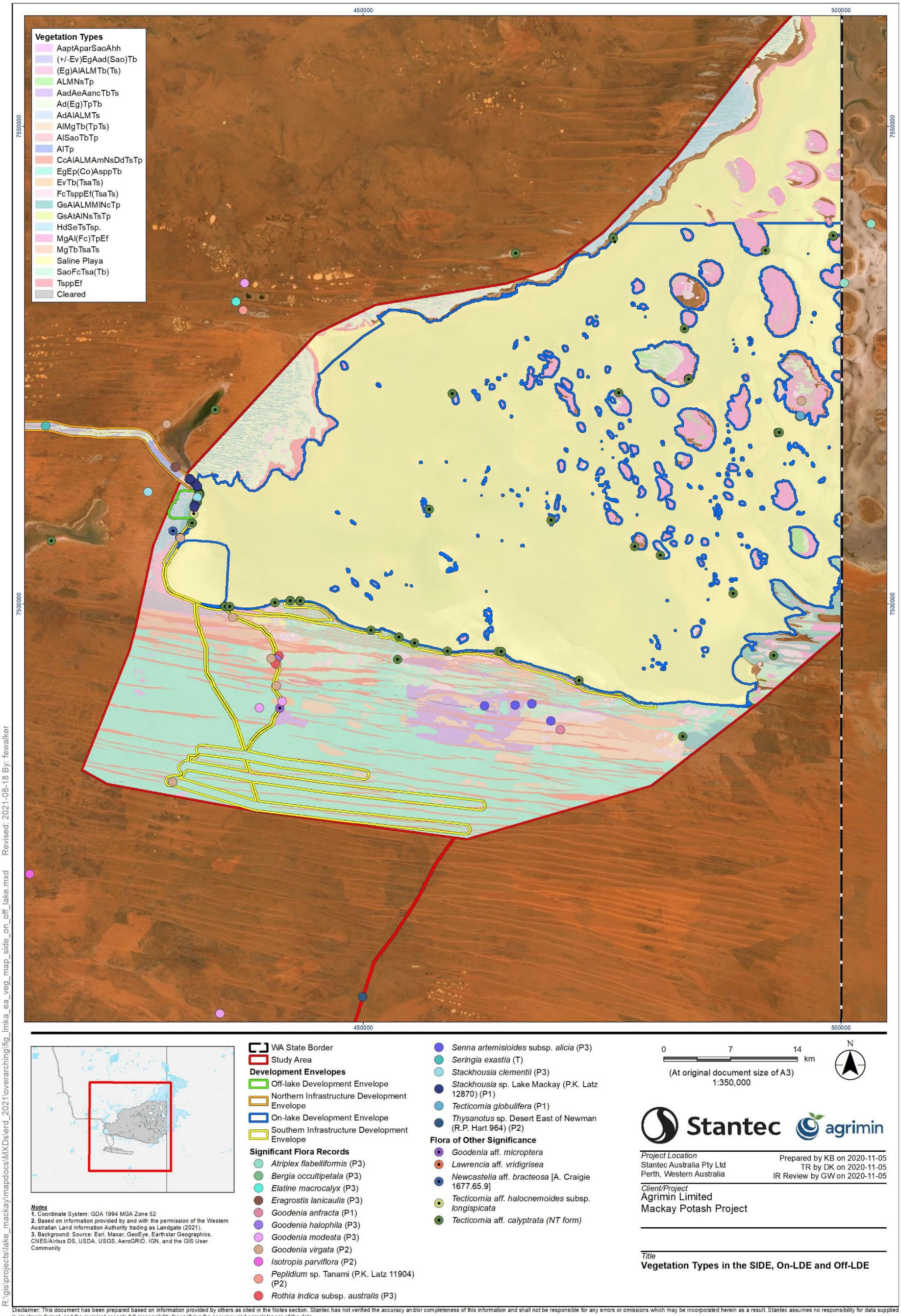


Figure 1-4: Vegetation Types and Locations of Significant Flora Species (ON-LDE, OFF-LDE and SIDE)

1.5.3 Terrestrial Fauna

1.5.3.1 Fauna Habitats

12 broad fauna habitats were mapped within the Study Area, all intersect the Project Area and have the potential to be affected by disturbance during the construction and operation of the Project. These include:

- Salt lake playa;
- Lake margin;
- Claypans and claypan mosaic;
- Saline flats and depressions;
- Dune-field;
- Dune;
- Spinifex sandplain;
- Gravel spinifex plain;
- Rocky ridge and gorge;
- Outcropping and stony rise;
- Ridge slope; and
- Drainage line

The habitat with the largest extent proposed to be disturbed for the Project is the salt lake playa within the ON-LDE. A total of 243,271 ha of the salt lake playa occurs within the Study Area, of which 216,333 ha (88.9 %) occurs within the Project Area and 13,363 ha (5.5 %) occurs within the Indicative Footprint.

Based on the Indicative Footprint, the remaining disturbance will be largely confined to three habitats with extents between 248.1 ha and 754.2 ha. These habitats include the spinifex sandplain, dune-field and gravel spinifex plain. Disturbance to these habitats is proposed to be less than 2.6% of their extent in the Study Area. Based on the Indicative Footprint, disturbance within each of the remaining habitats is likely to be 42 ha or less.

There were three unique landscape features identified within the Project Area, Lake Mackay, island outcropping and water sources, which provide important sources of shelter, food, and water for fauna, including significant fauna.

1.5.3.1.1 Lake Mackay

The playa and associated peripheral wetlands are subject to irregular and infrequent flood events, with the lake filling to a maximum depth of 2 m on average once every 5-10 years. The duration of flood events can last from several weeks up to six months (Stantec 2020). During major floods, the lake supports a range of waterbird species including shorebirds, terns and ducks. The larger islands on the lake serve as waterbird breeding habitat while the lake playa and surrounding claypans/ saline depressions support foraging resource.

1.5.3.1.2 Island Outcropping

Lake Mackay is host to more than 270 islands within the On-LDE. These range from small unvegetated formations to large formations that host extensive sand dunes. The islands range from less than 1 m in height to more than 13.5 m, with the larger islands providing the greatest topographic relief. Drilling investigations completed on six lake islands confirmed that they are surficial features of variable thickness underlain by lakebed sediments and are not linked to another subsurface geologic feature.

The lake islands are composed of unconsolidated aeolian sand at surface which is underlain by calcrete and gypsiferous sand. Clay content increases with depth and typically marks the transition from island sediments to the lakebed sediments. The thickness of the island sequences varies depending on the size of the island and topographical elevation.

1.5.3.1.3 Water Sources

Water sources are a limiting factor in arid environments and are an important feature of the arid interior, albeit typically temporarily during and following rainfall events. Specifically, birds and mammals will use these areas for drinking, amphibians will use these areas to breed, and many vertebrate fauna will benefit from increased aquatic invertebrate fauna abundance for food. A total of 13 temporary water sources were identified in the Study Area. Most were pools in exposed bedrock, associated with rocky substrates in rocky ridge and gorge (5), minor drainage line (3), and outcropping and stony rise (2) habitats. Three were identified in claypans and claypan mosaic habitat; these comprised large claypans and a soak. The location of one permanent water source supplied by Tjurabalan representatives is located approximately ~250 m west of the NIDE.

1.5.3.2 Fauna Assemblage

The desktop assessment (database searches and the literature review) identified a total of 421 species of vertebrate fauna which have previously been recorded and/or have the potential to occur within the Study Area and therefore the Project Area. In total, across all previous surveys that intersect the Study Area, a total of 245 vertebrate fauna species have been recorded, comprising 22 native mammals, 9 introduced mammals, 129 birds, 1 introduced bird, 80 reptiles and 6 amphibians.

During flood events, the Lake Mackay playa and peripheral wetlands provide habitat that supports assemblages of waterbirds which are otherwise absent from the region during dry conditions.

1.5.3.3 Significant Fauna Species

Twenty-one significant species listed under the State *Biodiversity Conservation Act 2016* (BC Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) *have* been confirmed in the Study Area included three mammals, 14 birds (9 migratory) and three reptiles. Table 1-4 present species of particular note due to their conservation status, relative abundance and/or potential to be impacted by the Project (see Figure 1-5 to Figure 1-8).

In addition, five species were considered likely to occur and comprise one mammal, the Spectacled Hare-wallaby (P3) and four waterbirds (Migratory). The Spectacled Hare-wallaby may occur throughout the year in suitable habitat within the NIDE, the waterbirds would only occur on the lake and surrounds after rainfall, particularly large flood events.

Table 1-4: Significant fauna confirmed or likely to occur within the Study Area

Scientific Name	Common Name	Likelihood of Occurrence	EPBC	BC Act
Mammalia				
Macrotis lagotis	Greater Bilby	Confirmed	Vu	Vu
Dasycercus blythi	Brush-tailed Mulgara	Confirmed	-	P4
Notoryctes caurinus / *Notoryctes typhlops**	Northern / Southern Marsupial Mole	Confirmed	-	P4
Lagorchestes conspicillatus leichardti	Spectacled Hare-wallaby	Likely	-	P3
Aves				
Pezoporus occidentalis	Night Parrot	Confirmed	En	Cr
Rostratula australis	Australian Painted Snipe	Confirmed	En	En
Polytelis alexandrae	Princess Parrot	Confirmed	Vu	P4
Falco hypoleucos	Grey Falcon	Confirmed	-	Vu
Amytornis striatus striatus	Striated Grasswren	Confirmed	-	P4
Apus pacificus	Fork-tailed Swift	Confirmed	Mi	IA
Charadrius veredus	Oriental Plover	Confirmed	Mi	IA
*Plegadis falcinellus^*	Glossy Ibis	Confirmed	Mi	IA
Calidris acuminate	Sharp-tailed Sandpiper	Confirmed	Mi	IA
Tringa stagnatilis	Marsh Sandpiper	Confirmed	Mi	IA

Scientific Name	Common Name	Likelihood of Occurrence	EPBC	BC Act
Sterna nilotica	Gull-billed Tern	Confirmed	Mi	IA
Sterna leucopterus	White-winged Black Tern	Confirmed	Mi	IA
Calidris ruficollis	Red-necked Stint	Confirmed	Mi	IA
Tringa nebularia	Common Greenshank	Confirmed	Mi	IA
Tringa nebularia	Common Sandpiper	Likely	Mi	IA
Calidris melanotos	Pectoral Sandpiper	Likely	Mi	IA
Glareola maldivorum	Oriental Pratincole	Likely	Mi	IA
Tringa glareola	Wood Sandpiper	Likely	Mi	IA
Reptilia				
Liopholis kintorei	Great Desert Skink	Confirmed	Vu	Vu
Lerista aff. *robusta*	Broad-eyed Slider	Confirmed	-	P1
Ctenotus uber johnstonei	Spotted Ctenotus	Confirmed	-	P2

Primary habitats for each significant species have been identified based on survey findings (intersects of recorded locations and habitats) and supplemented with known ecology for each species. It is acknowledged that some species may occasionally be recorded outside their primary habitats and these have been differentiated as secondary habitats.

1.5.3.4 Waterbirds

During major floods, the lake supports a range of waterbird species. The larger islands on the lake serve as waterbird breeding habitat while the lake playa and surrounding claypans/ saline depressions support foraging resource.

Ornithological surveys of Lake Mackay immediately following major rainfall and flooding events suggest Lake Mackay and surrounding smaller freshwater claypans may provide important breeding habitat for waterbird populations. A total of at least 40 waterbird species have been recorded at Lake Mackay including 16 shorebird species and 24 other waterbirds (360 Environmental 2017b; Duguid *et al.* 2015).

A survey in 2001 detected 42,473 individuals from 27 species. These included over 1% of the population for Banded Stilts (12,070), Black-winged Stilts (3,262) and Red-necked Avocets (1,295), and counts of 4,653 Grey Teals, 8,460 ducks and 4,602 White-winged or Whiskered Terns during a two hour aerial survey (Duguid *et al.* 2005). Additionally, 4,400 immature Banded Stilts were recorded on the islands demonstrating a breeding event. Another waterbird survey in 2007 recorded only seven waterbird species (682 individuals) on the playa, compared to 26 species (2,591 individuals) within the peripheral wetlands (360 Environmental 2017a). Both surveys are likely to have missed peak activity for many species.

The two waterbird surveys (360 Environmental 2017a; Duguid *et al.* 2005) also recorded a number of threatened and migratory species, including the Gull-billed Tern (Mi) (39 in 2017, 14 in 2001), Gull-billed (Mi) or Caspian Tern (Mi) (339 in 2001), White-winged Black (Mi) or Whiskered Tern (4,602 during 2001), Common Greenshank (Mi) (3 in 2017, 1 in 2001), Red-necked Stint (Mi) (502 in 2017), Sharp-tailed Sandpiper (Mi) (37 in 2017), small unidentified shorebirds (potential to include listed species) (1,934 in 2001), Australian Painted Snipe (En) (1 in 2017) and Glossy Ibis (110 in 2017).

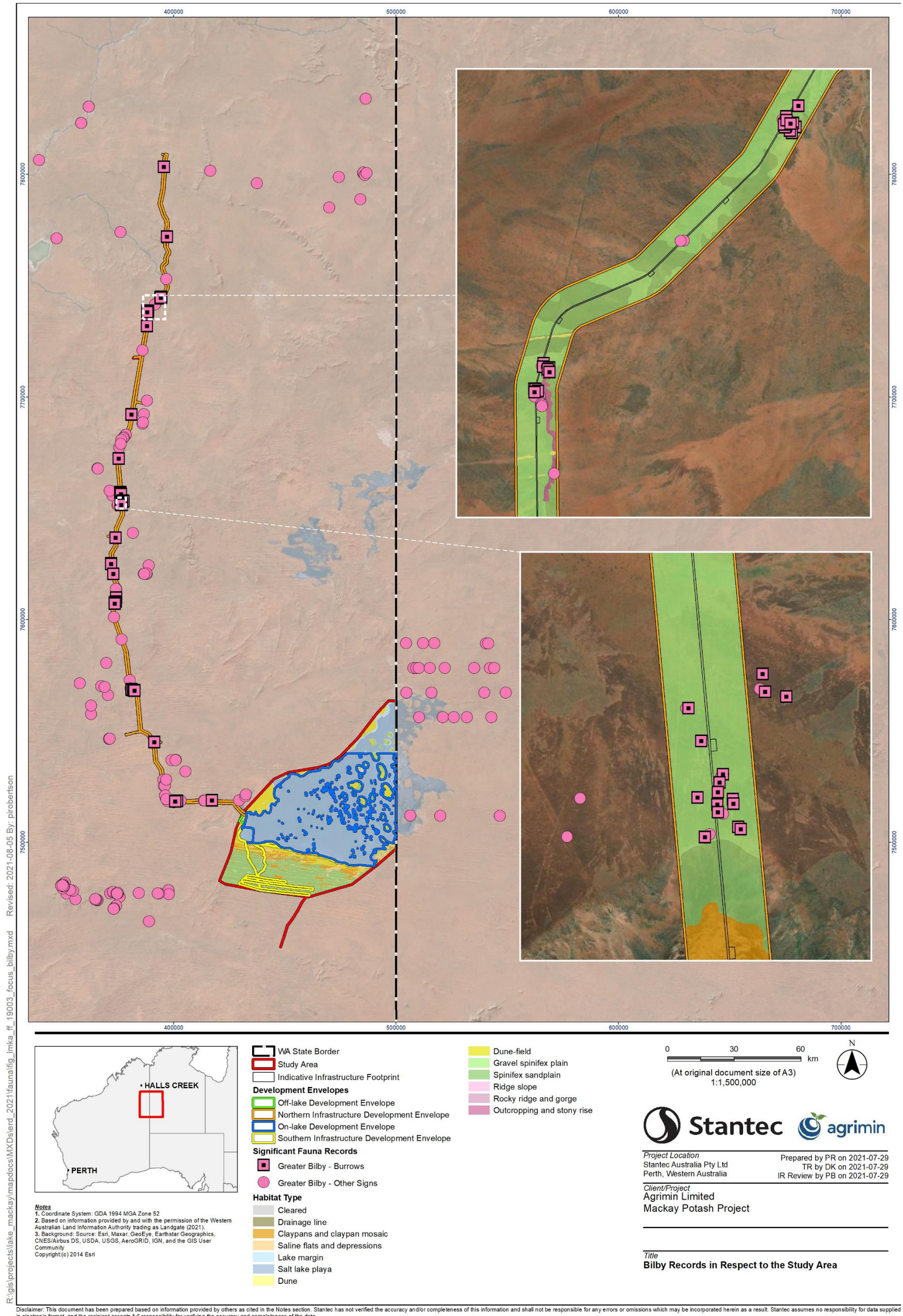


Figure 1-5 Bilby records affiliated with the Project Area

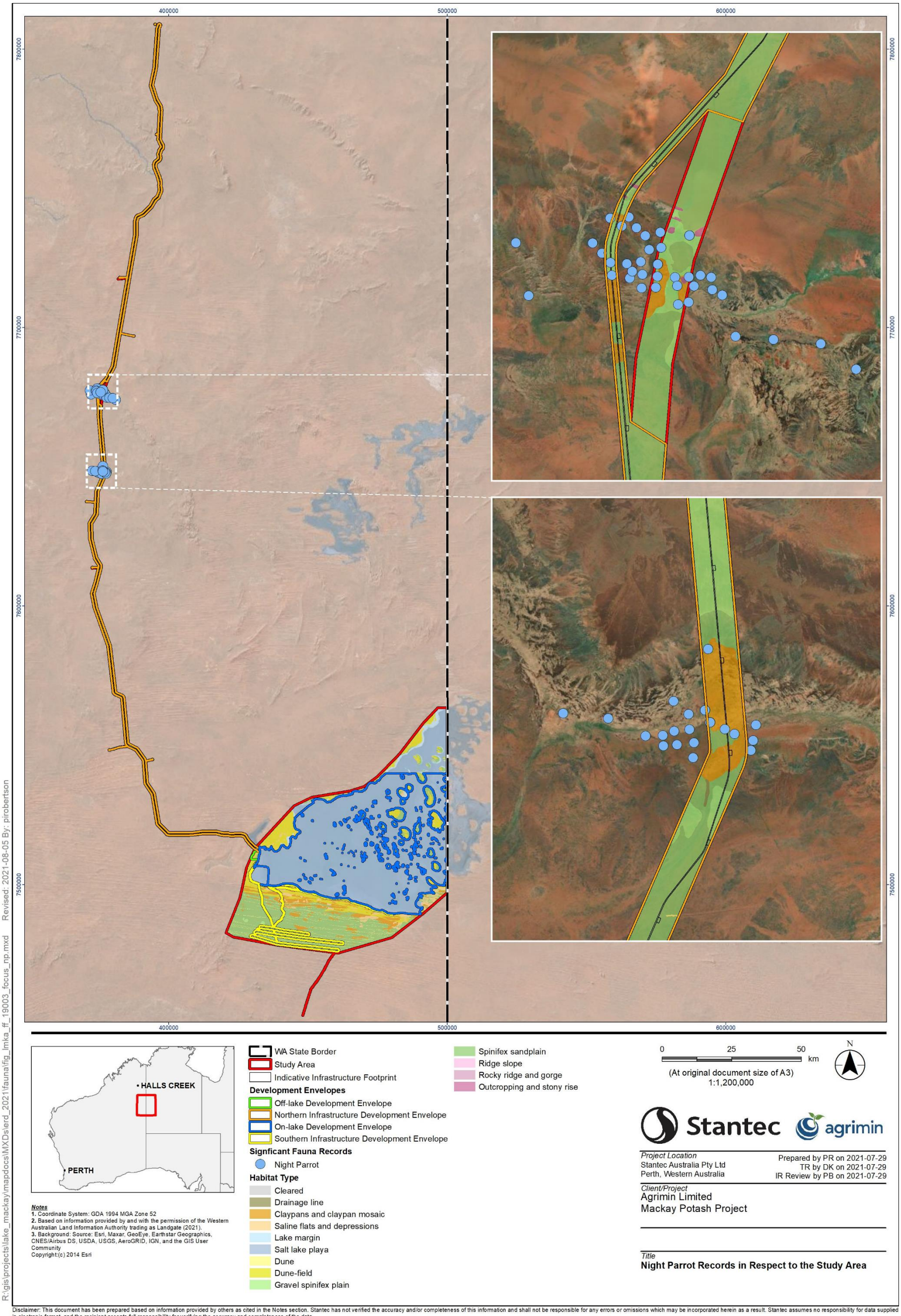


Figure 1-6 Night Parrot records affiliated with the Project Area

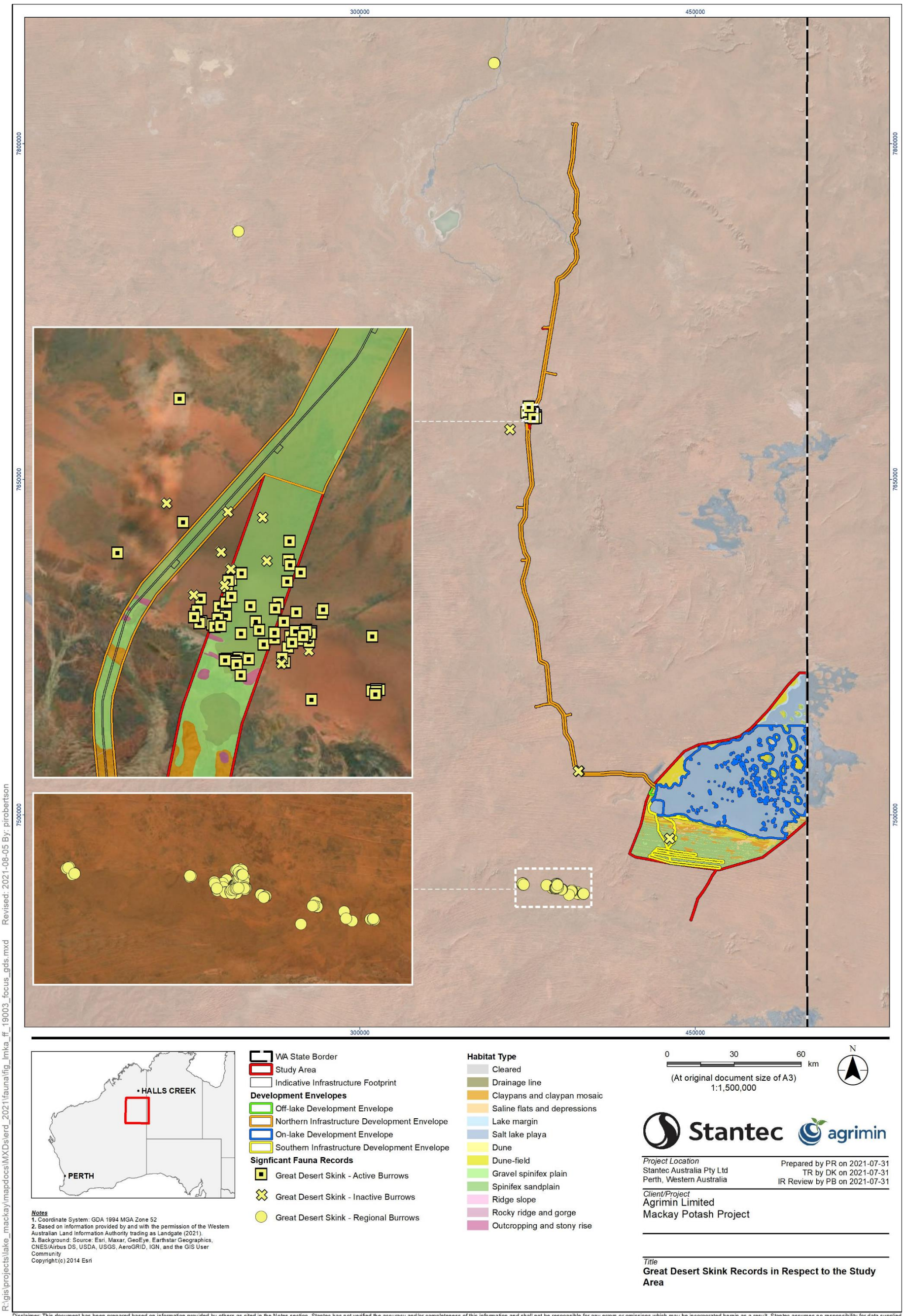


Figure 1-7 Great Desert Skink records affiliated with the Project Area

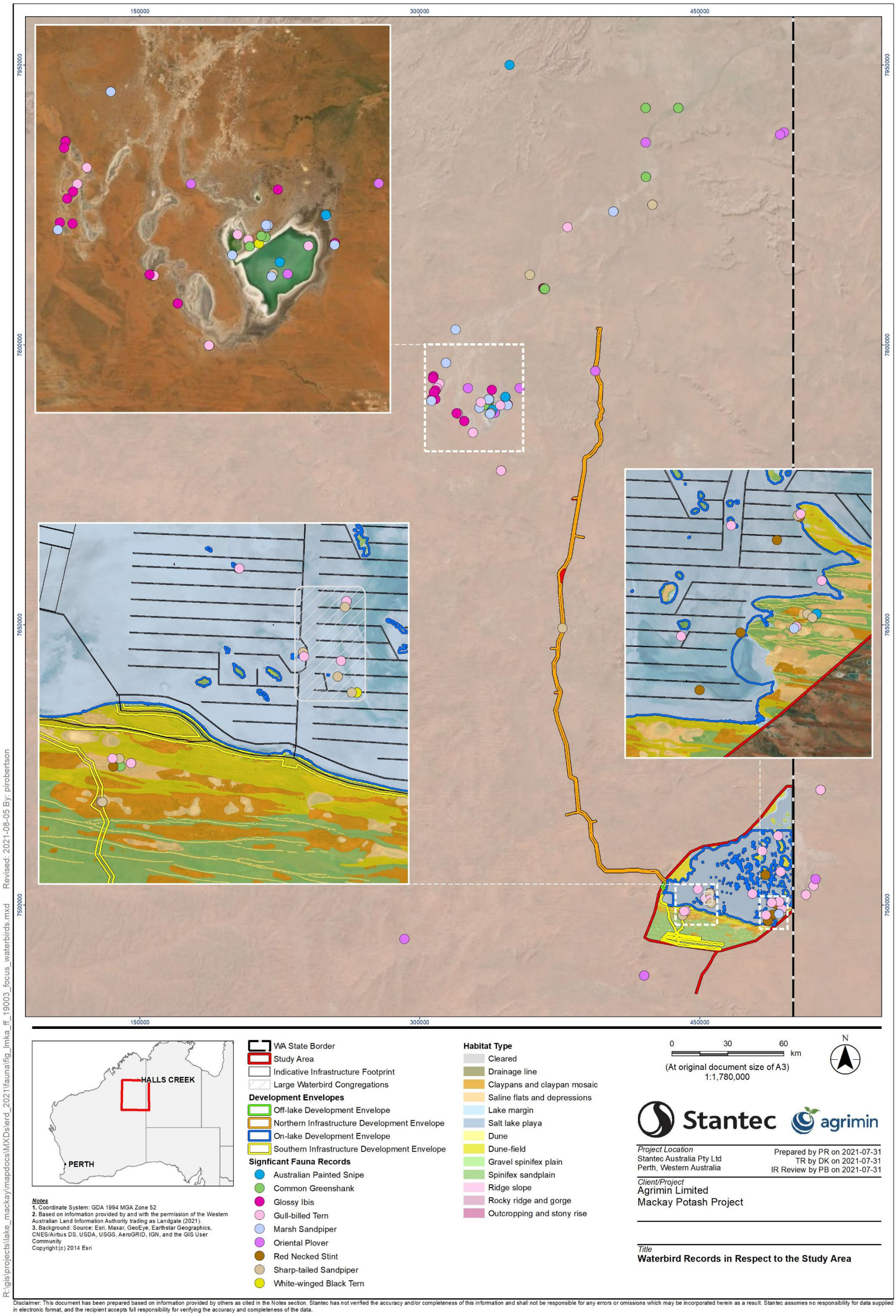


Figure 1-8 Waterbird records affiliated with the Project Area

1.5.3.5 Potential Impacts to Terrestrial Fauna

The Project related activities and potential impacts to significant fauna species relating to construction activities for the Project Area, include:

- Clearing of native vegetation and ground disturbance (fauna injury and loss of habitat)
- Introduction of Feral Animals
- Altered fire regime
- Disturbance to waterbirds
- Altered hydrology

1.5.4 Inland Waters

1.5.4.1 Lake Mackay

Lake Mackay consists of an immense playa which is divided by a series of islands supporting dune systems. The lake is ephemeral and flood events are extremely rare, filling to a maximum depth of 2 m on average once every 5-10 years, recent flood events being 2001 and 2016. The duration of flood events can last from several weeks up to six months (Stantec 2020). Numerous inflows occur from localised and close dune catchment areas relative to the lake around the lake, with a general flow occurring from the northern sections of the lake towards to the south eastern section as this is the topographical low point of the lake. Inundated (pooled water) water is then blown in a north westerly direction under prevailing south easterly winds westward flow due to prevailing east and southeast winds. The hydroperiod is largely governed by evaporation and a very high infiltration rate, particularly the east portion of the lake, due to the underlying gypsum sands.

The geology of the lakebed is characterised by sand and silt substrate, overlain with gypsum crystals in numerous areas. The topography varies greatly throughout the lake, with most sites displaying a gentle rise to low lying sandy dunes, while others, especially the island sites, are replaced by steep rocky rises.

The riparian zone was typically characterised by a range of samphires (*Tecticornia*), and other salt tolerant chenopods, with most sites dominated by shrubs.

Aquatic habitat types were limited and comprised open playa, embayments and the mouth of significant drainage lines. Lake Mackay is a mostly undisturbed playa, with only minor influences from feral animals such as camels, and from mining exploration practices.

1.5.4.2 Peripheral Wetlands

Throughout its periphery, Lake Mackay has a multitude of ephemeral wetlands and drainages, including floodplains, salinas (salt flats) and claypans. Salinas in the periphery of Lake Mackay range from 500 m to 11.5 kms in length and typically consist of a well-defined playa separate from Lake Mackay, though connectivity to the main lake seemed present through small interconnected pans suggesting diffuse drainages. Claypans are comparably smaller (400 m to 1.8 km length) and are mostly oval or semi-circular in shape, with many other claypans located nearby. A low-lying primary dune system typically surrounds the salinas, with the riparian zone similar to the Lake Mackay sites, dominated by samphires (*Tecticornia*) and several chenopod species.

1.5.4.3 Potential Impacts to Inland Waters

The potential exists for direct and indirect impacts from the construction phase of the Project to the On-LDE and the Inland Waters values that Lake Mackay supports. The risk for key activities associated with the Project has been determined as follows:

- Abstraction of groundwater for construction activities
- Contaminants Spills

1.5.5 Social Surroundings

1.5.5.1 Aboriginal Heritage

The Project Area lies within three Native Title Determination Areas established under the Commonwealth *Native Title Act 1993* (NT Act) (Figure 1-9).

- Kiwirrkurra Determination Area (Determination Number: WCD2001/002);
- Ngururrpa Determination Area (Determination Number: WCD2007/004); and

- Tjurabalan Determination Area (Determination Number: WCD2001/001).

Three Aboriginal Land Titles under the Aboriginal Land Rights Act 1976 are located within the Project Area, including the Kearney Reserve (26399), Ngaanyatjarra Central Australia Reserve (24923) and the Balgo Reserve (46573), shown in (Figure 1-9). Furthermore, a number of Aboriginal Communities and Pastoral Station are located within, or adjacent to the NIDE (Table 1-5 and Figure 1-9).

The whole Project Area lies within Aboriginal Determination Areas, entry permits from respective Traditional Owner groups are required to gain lawful access into this area.

The nearest communities to the Project is the Balgo Community located approximately 2.6 km west of the northern section of the NIDE, and the Kiwirrkurra Community, located approximately 60 km to the southwest of the SIDE (Figure 1-9).

Table 1-5: Aboriginal Communities and Pastoral Stations

Receptor	Type	Proposed Development Envelope	Distance to Development Envelope
Kiwirrkurra Community	Aboriginal community	SIDE	60 km south-west
Balgo Community	Aboriginal community	NIDE	2.6 km west
Billiluna Station	Pastoral station	NIDE	6.3 km west
Lake Gregory Station	Pastoral station	NIDE	6.3 km west

Agrimin has worked closely with Traditional Owners within and surrounding the Project Area to create the development envelopes that wherever possible, avoid disturbance to Aboriginal heritage sites and areas of cultural significance.

Agrimin is in the process of negotiating Native Title Agreements with the Parna Ngururrpa and Tjurabalan native title holders for the haul road.

1.5.5.2 Local Land Users

Local land uses are predominantly conservation and natural environment for traditional Indigenous uses, however, two pastoral stations, the Billiluna Station and the Lake Gregory Station lie within 6 km of the Project Area (Figure 1-10).

The nearest public road is the Tanami Road to the north, which is currently an unsealed road that meets the northern tip of the NIDE.

The closest active mine site to the Project Area is the Halls Creek North/Guerinoni Open Pit mine located more than 180 km to the north of the NIDE.

1.5.5.3 Potential Impacts to Social Surroundings

The Project related activities and potential impacts to social surroundings relating to construction activities for the Project Area, include Impacts to Aboriginal Heritage Values. The key impacts that have been identified include:

- Impact to Amenity – Fugitive Dust Emissions
- Direct disturbance to Aboriginal Heritage Sites

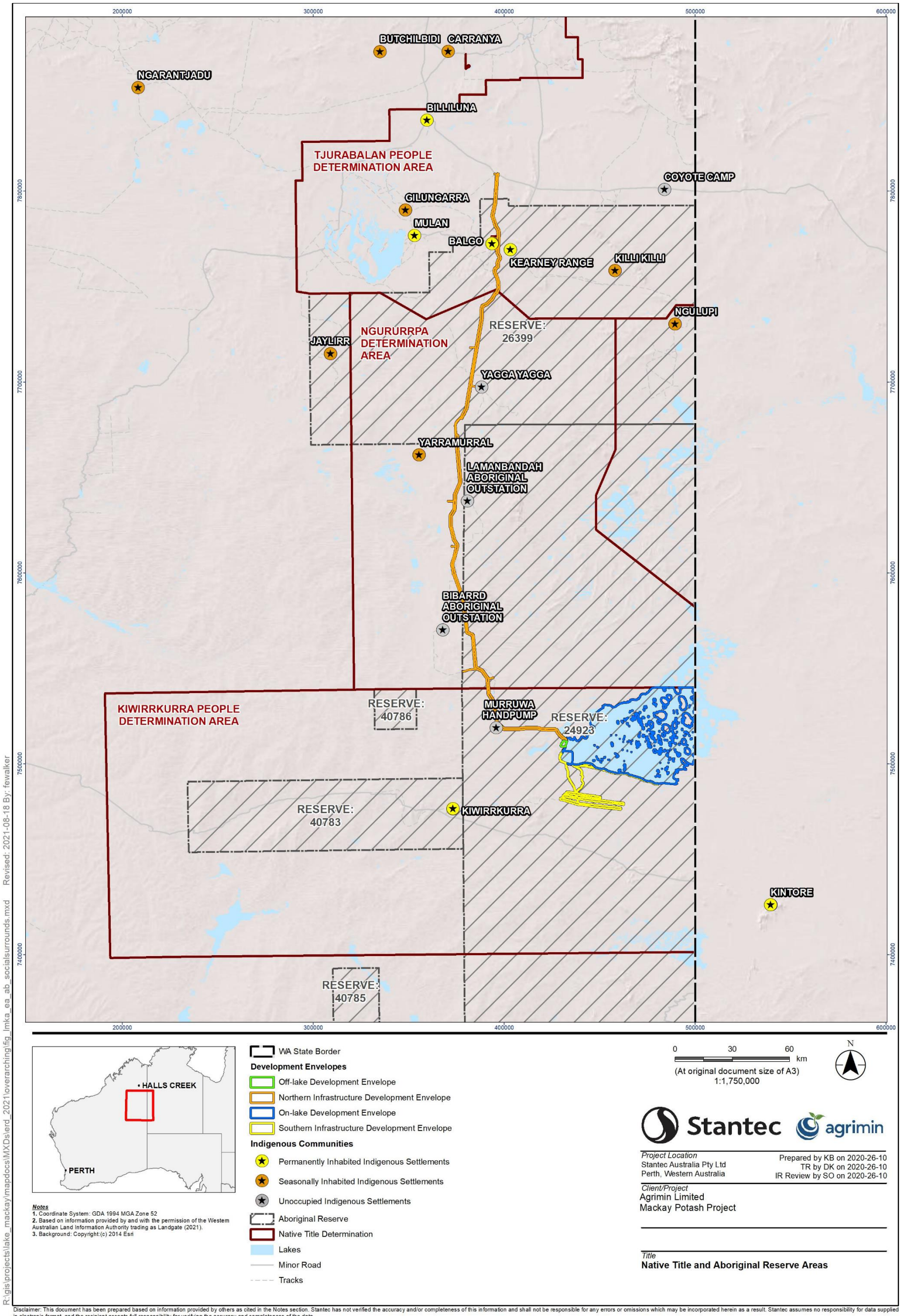


Figure 1-9: Native Title and Aboriginal Reserve Areas

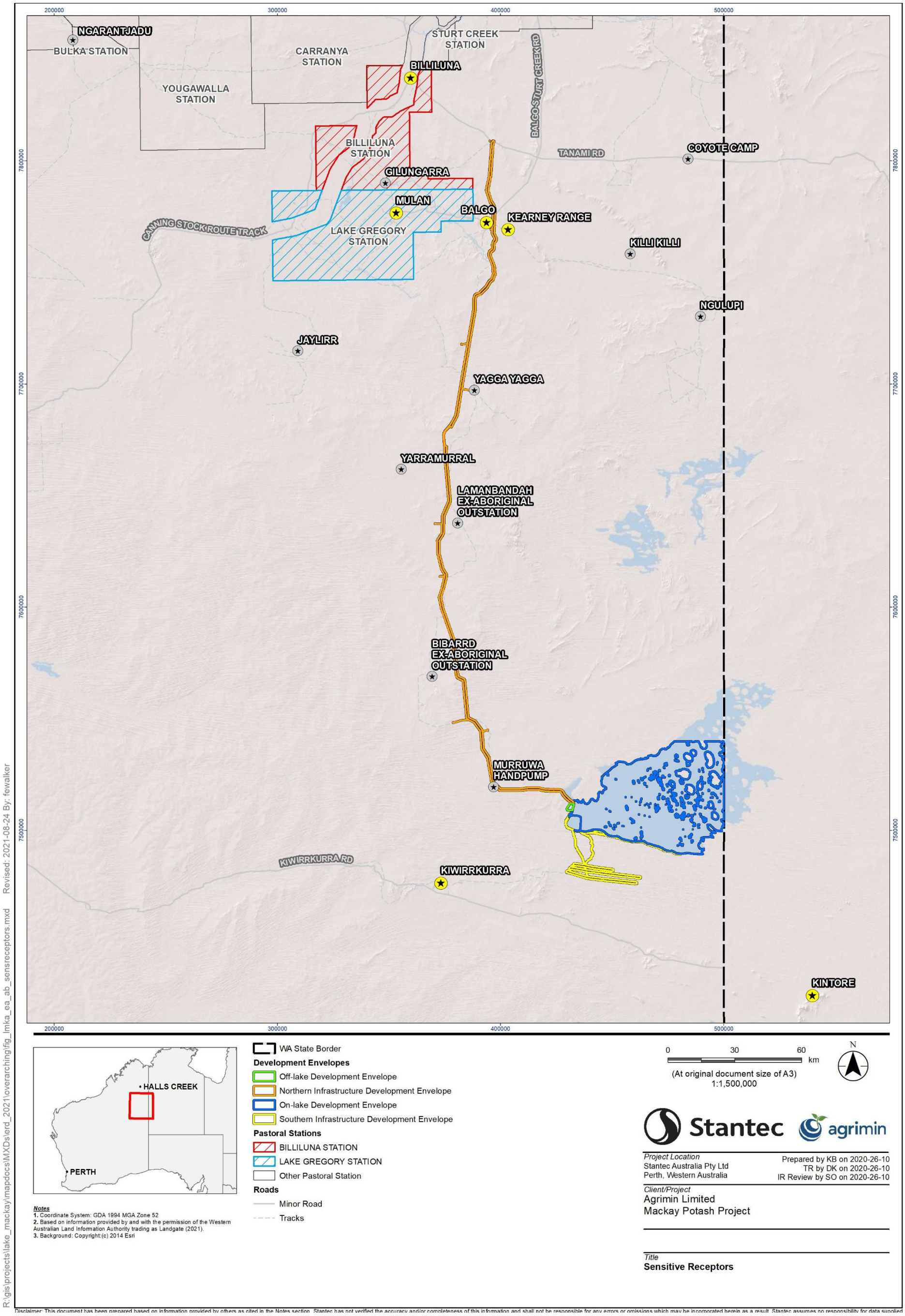


Figure 1-10: Surrounding Land Users

1.6 Key Assumptions and Uncertainties

There are a number of potential limitations and constraints that can affect the adequacy of the biological surveys undertaken for the Project that have informed this management plan. The main limitations include:

Timing, weather and season: The Project is located in the Great Sandy Desert and Tanami Bioregions where the activity and therefore the detectability of fauna and ephemeral flora species is driven by climatic conditions, in particular, rainfall events. Additionally, due to infrequent flood events on Lake Mackay, there is limited information on the aquatic biota of Lake Mackay when inundated. The lake is also known to support migratory waterbirds, however the importance of the islands as breeding habitat is not fully understood.

Remoteness/access constraints: The remoteness of the Project Area limited access to many portions of the Flora, Vegetation and Fauna Survey Areas and challenging terrain constrained the intensity and completeness of the surveys. However, survey coverage was considered adequate to understand the ecological values, habitats and significant species associated with the lake environment within the Project Area.

Adequacy of the survey intensity and proportion of survey achieved: The COVID-19 pandemic lead to the early demobilisation of a number of surveys and travel restrictions also impacted other survey work including:

- Flora and Vegetation: Phase 2 of the Stantec (2020) Survey was reduced by three days
- Terrestrial Fauna: the detailed and targeted survey of the southern portion of the Stantec (2020) Survey Area (Phase 2 only) and targeted survey work within the SIDE had to be stopped while underway and was unable to be completed.

Burnt Vegetation: A large portion of the Project Area has been subject to repeated fires. This constrained the installation of quadrats in unburnt vegetation and therefore the vegetation type mapping. Some extrapolation was applied when mapping recently burnt areas. Therefore, this mapping should be considered somewhat indicative rather than an exact representation of the climax vegetation type.

Due to these limitations there are minor to moderate implications on the data used for impact assessment, however, these have been minimised as much as possible and have been taken into consideration when defining mitigation measures.

Where unacceptable residual uncertainty still exists, Agrimin are committed to undertaking pre-clearance survey work prior to ground disturbance in areas known to support significant flora, vegetation and fauna species. Additionally, Agrimin are committed to addressing knowledge gaps, and will commission flood monitoring (waterbird and aquatic biota) at the first opportunity, dependent on adequate rainfall and inundation conditions.

Flood Events: Due to infrequent flood events on Lake Mackay, there is limited information on the aquatic biota of Lake Mackay when inundated. The lake is also known to support migratory waterbirds, however the importance of the islands as breeding habitat is not fully understood.

Rewetting trials in the laboratory were undertaken to simulate flooding and document the emergence of aquatic biota (although these trials cannot completely replicate natural conditions), while several waterbird studies of the lake provide valuable baseline data. Regardless, Agrimin are committed to addressing knowledge gaps, and will commission flood monitoring at the first opportunity, dependent on adequate rainfall and inundation conditions.

There are also several heritage exclusion zones on Lake Mackay, including the Northern Territory portion, with these parts of the lake unable to be ground-truthed or sampled. However, survey coverage was considered adequate to understand the ecological values, habitats and significant species associated with the lake environment within the Proposal area.

2. Construction Phase Environmental Management Approach

Agrimin has applied the EPA's mitigation hierarchy to manage the key impacts relating to the construction activities of the Project. This CEMP and subsidiary EMPs have been prepared in accordance with the '*Instructions on how to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans*' (EPA 2020a). This environmental management approach has been informed by best practice; the project teams extensive regulatory experience and professional technical understanding of the environmental impacts associated with construction activities from the Project.

2.1 Objective-based Approach

The CEMP management approach is centred on objective-based management provisions, aimed to avoid and minimise impacts to environmental values of the Project Area. This approach has been informed by outcomes of extensive baseline studies conducted to date, and experience on similar potash infrastructure and other mining projects in Western Australia.

The following management provisions detailed in Section 3 are proposed to ensure the EPA's environmental objectives can be met and can be complied with in practice. The management provisions, as detailed below, are supported by appropriate objectives, management actions, and a monitoring program that includes clear management targets, contingency actions, and adaptive management and reporting protocols.

Outcomes-based provisions were not considered in the management approach for this CEMP due to the short duration of the construction phase. The relatively short timeframe to construct the haul road and Off-lake infrastructure are likely to result in minor and temporary impacts which can adequately managed, therefore outcome based provisions are not considered applicable to this phase.

2.1.1 Haul Road Design and Management Approach

A key component of the Project's construction phase is the development of the 348 km Haul Road which is likely to take two years to construct.

The current design requires approximately 35 active bores to be developed along the Haul Road corridor to allow for construction of the haul road and service the mobile construction camps along the route. For the purposes of road construction, bores will be drilled approximately every 10 kms along the corridor, with distancing varying based on availability of suitable groundwater. The bores will only be required for approximately one to two months per haul road construction segment (approximately 10 km). The bore infrastructure will provide an essential water supply for potable water, dust suppression, and construction requirements. Agrimin will seek the appropriate approvals through the *Rights in Water and Irrigation Act 1914 to* construct and abstract water from the bores once detailed design is complete.

Current specification for the haul road requires approximately 0.034 GL of water sourced from the 35 bores established along the 348 km Haul Road (1 segment (10km) = 0.000975 GL (.0000075 GL per day)). The volumes are considered negligible and are not considered to significantly impact the environmental values of the NIDE. The short duration and low volume of pumping (~1L/s over a 24h period for approximately 13 days) is not considered sufficient to adversely lower the water table in the vicinity of the bore or increase the salinity of existing drinking water supplies for communities in the region.

Once construction within each segment of the haul road has been completed and bores are no longer required, cleared areas will be rehabilitated. Bore infrastructure such as bore casings will remain in place and will be capped as per DMIRS requirements.

All wastewater generated at construction camps will be treated in relocatable sewage treatment plants. The clean, treated water will be dispersed in accordance with the relevant regulatory approvals. Residual solids waste (sludge) produced by the treatment plants will be trucked off site to a suitable disposal facility at Alice Springs or Halls Creek.

2.1.2 Dust Management – Balgo Community

Balgo Community is located approximately 2.6 km west of the northern section of the NIDE. Two pastoral stations, the Billiluna Station and the Lake Gregory Station lie within 6 km of the Proposal area, as detailed in Table 2-1.

Table 2-1 Distance to sensitive receptor

Receptor	Type	Proposed Development Envelope	Distance to Development Envelope
Balgo Community	Aboriginal community	NIDE	2.6 km west
Billiluna Station	Pastoral station	NIDE	6.3 km west
Lake Gregory Station	Pastoral station	NIDE	6.3 km west

Given the temporary, localised and short construction timeframes within each Haul Road segment, and sufficient distances from the communities and outstation, the impacts from dust emissions is likely to be negligible. To provide the Balgo Community with certainty that their amenity will not be impacted, additional management measures will be implemented to minimise fugitive dust emissions while constructing the segment of the Haul Road that traverse in proximity to the Balgo Community (5 km from the nearest household). A draft Balgo Community specific Dust Management Plan has been prepared and provided in Appendix B of the CEMP.

2.1.3 Trench Layout and Staging

This CEMP applies to the construction phase of the Project, which extends over two years (Year 1 and Year 2). Construction of the trenches on the On-LDE throughout the rest of the Life of Mine (Year 2 to Year 17) is considered a part of the operational phase. The implementation of each Brine Mining Unit (BMU) after Year 2 is expected to be undertaken in a staged approach that will run from Year 2 and will progressively excavate each of the 17 BMUs until year 17 of the Project's operations. The most intense phase of trench construction is in the first 2 years, when approximately 917km of trenching is required in order to deliver the brine grade and volume to the ponds necessary to start the 18 month evaporation cycle. The development of the trenching network begins at the southern end of the lake and spans approximately 60km east to west. The first 2 years construction of trenches will be achieved by implementing a 24/7 schedule and using a fleet of 14 excavators.

Following these first two years of construction, the CEMP no longer applies and the operational phase management plans (TFEMP, FVEMP and IWEMP) become the framework for managing potential impacts to environmental factors.

3. CEMP Provisions

The impact mitigation approach focuses on objective-based management provisions, aimed to avoid and minimise impacts to environmental values of the Project Area. This approach has been informed by outcomes of extensive baseline studies conducted to date, and experience on similar potash infrastructure projects in Western Australia, that were provided with approval under *Part IV* of the EP Act.

This CEMP outlines the requirements to avoid, minimise, manage, monitor, and rehabilitate as per the EPA's mitigation hierarchy. Where unacceptable environmental outcomes remain post the implementation to controls measure such as permanent loss of significant species habitat, offsets strategies will be proposed, to meet EPA guidance for Terrestrial Fauna. Offset strategies are presented in the with separate Preliminary Offset Strategy (Appendix B).

3.1 Flora and Vegetation

Objective-based EMP Provision

Purpose of EMP Provision: Management of direct and indirect impacts to flora and vegetation during construction of the project

Rationale: The management approach has been informed by best practice and recent experience on similar infrastructure projects in Western Australia. The hierarchical approach taken focuses on management aims to minimise direct and indirect impacts to flora and vegetation.

EPA Factor and Objective	Flora and Vegetation: *to protect flora and vegetation so that biological diversity and ecological integrity are maintained.*
Environmental Values	Nineteen vegetation types support Priority flora within the Proposal area and are therefore considered to be locally significant. No flora listed as Threatened under the EPBC Act have been recorded within the Study Area. Seven Priority flora species have been recorded within the Proposal area, including: • Stackhousia sp. Lake Mackay (P.K. Latz 12870) P1 • Goodenia virgata P2 • Comesperma sabulosum P3 • Eragrostis lanicaulis P3 • Goodenia modesta P3 • Indigofera ammobia P3 • Stackhousia clementii P3
Environmental Aspects	• **FV1:** Clearing of native vegetation (loss of significant flora, significant vegetation, and riparian vegetation) • **FV2:** Weed introduction and proliferation • **FV3:** Fugitive Dust Emissions and Deposition • **FV4:** Altered Fire Regime • **FV5:** Contaminants Spills
Project Objectives	The proponent shall manage the implementation of the project to meet the following management objectives: • **FV1 Objective:** To avoid unapproved clearing of native vegetation outside the Development Envelope during and attributable to construction • **FV2 Objective:** To ensure that construction impacts to flora and vegetation due to the introduction or spread of weeds are minimised as far as practicable. • **FV3 Objective:** To ensure that construction impacts to flora and vegetation from dust as a result of construction are minimised as far as practicable. • **FV4 Objective:** To ensure that construction impacts to flora and vegetation from altered fire regimes as a result of construction are minimised as far as practicable. • **FV5 Objective:** To ensure the likelihood of hydrocarbon spills are minimised and remediated before environmental harm occurs to flora and vegetation

ID / Aspect	Management Targets	Management Actions	Monitoring	Timing	Contingency Actions	Reporting
FV1	1. No clearing of vegetation to occur outside of approved demarcated clearing areas during construction 2. Significant flora species are identified and demarcated on proposed clearing plans and avoided until it can be determined that the species occurs outside of the Project Area and/or its viability will not be impacted 3. No clearing of vegetation on lake islands	• Manage clearing of vegetation in accordance with Agrimin's approved Ground Disturbance Procedure (GDP) • Environmental site induction for all workers that outlines the requirements for clearing, and specifically, the process for a GDP • Coordinates for clearing extents will be provided to the Construction Contractor. • The extent of clearing and ground disturbance works shall be pegged by qualified surveyors in the field prior to ground disturbance being carried out. • In unpegged areas, the use of GPS guided machinery can be used provided the appropriate GDP process has still been followed. • Progressively rehabilitate temporarily cleared areas • No clearing or disturbance activities to be undertaken on the lake islands or within the designated buffers.	• Visual inspections for evidence of: o the condition of boundary demarcation compliance with native vegetation clearing controls. o Unauthorised access or clearing, e.g. observations of vehicles or machinery, vehicle tracks, damage to fencing or vegetation. • Pre-clearing and post-clearing photographs of vegetation cleared. • On ground measurement (by surveyor) of clearing locations and extents within four weeks of any clearing event.	Daily	• Temporarily cease clearing activities. • Review clearing boundaries • Investigate cause and extent of unapproved clearing • Report any non-compliances according to Agrimin's approved Ground Disturbance Procedure and to DMIRS • Rehabilitate area that was over cleared	Annual Compliance Assessment Report (CAR) Internal incident reporting and investigation process Report unauthorised clearing to DWER as soon as practicable after it is identified

ID / Aspect	Management Targets	Management Actions	Monitoring	Timing	Contingency Actions	Reporting
FV2	1. No new weed species introduced into the development envelope or surrounding environment by construction activities. 2. No weeds introduced or spread by construction activities into undisturbed areas in the development envelope and surrounding environment	• Develop and implement a weed hygiene management process to control access and movement of vehicles and construction personnel to prevent the introduction and spread of weeds into the Project Area, weed free areas, and between development envelopes. This process should: o Include hygiene obligations into contracts with any contractor entering the site o Establish weed hygiene zones if conducting earthworks near known weed locations o Timely response for management of any declared weed occurrences o Weed control will be undertaken at the most appropriate time for the weed species to be controlled o Limit vehicle and personnel movements outside of approved areas o Training for personnel to identify weed species and process for reporting weed locations. o Incident reporting of new weed species and new locations o Require all personnel to complete a site induction that will include weed hygiene training, including the environmental implications of the introduction and spread of weeds and associated obligations. o Restrict movement of topsoil at known weed locations. o Source clean fill, gravel and topsoil or other materials from suppliers with appropriate weed control measures.	• Spot checks of equipment used for construction activities at entry and exit points • Post construction inspection of cleared areas to detect any new weed species or occurrences	Spot check Biannual	• Restrict access to areas with new species or occurrences of weeds • Investigate cause or source of infestation • Inspect/survey surrounding area to assess extent of infestation • Review weed hygiene measures for efficacy • Review training and implementation of, weed hygiene measures • Implement control measures (e.g. spraying, removal) • Inspect for success of control measures. • For fill, limestone, gravel and topsoil or other materials suspected to be infested with weed or weed seed, either treat prior to use, reuse at least a depth of 1.5 m under fill, or dispose	Biannual weed inspection report Incident report Annual Compliance Assessment Report (CAR)
FV3	1. No significant residual risks to flora and vegetation from dust deposition	• Utilise existing disturbed areas (~30% of the haul road will be constructed on the existing cleared track reducing total clearing) • Haul road will be sealed in the early stages of the Project, avoiding dust emissions that would otherwise be likely from an unsealed haul road • Use of dust suppression (water carts) at locations of clearing and construction activities • Vehicle speeds on construction roads will be reduced to minimise dust emissions • Rehabilitation of temporary cleared area • Implement Dust Management Plan specific to the Balgo Community (see Social Surroundings Provisions and Appendix B)	• Daily wind conditions will be taken into consideration when clearing activities are proposed.	Daily	• Investigate cause or source of excessive dust • Review dust management measures for efficacy and revise as necessary	Internal incident reporting
FV4	1. No human induced fires in the area as a result of implementing the Project 2. To ensure that construction impacts to flora and vegetation from fire are minimised as far as practicable.	• Avoid hot works in fire sensitive vegetation • 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 fires, including designated smoking areas, no fires permitted in workplace, use of extinguishers, hot works procedures • 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 and machinery and Haul Trucks • Water trucks to have fire management capabilities (pumps/hoses)	• Monitor daily wind conditions will be taken into consideration when clearing activities are proposed • Record Bushfire occurrence within Development Envelope.	Daily during construction On-going	• Alert Emergency Response Team • Implement Emergency Response Plan • Undertake post-fire weed control in the areas affected by the fire.	Internal incident reporting Annual Compliance Assessment Report (CAR)

ID / Aspect	Management Targets	Management Actions	Monitoring	Timing	Contingency Actions	Reporting
		• Develop education programs for haul road users (including Traditional Owners)				
FV5	1. Any wastewater produced as a result of construction activities will be treated to meet relevant ANZECC Guidelines and be disposed of in a controlled manner 2. No contamination or spills as a result of implementing the Project	**Wastewater:** • 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/ 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 **Contaminant 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 Emergency Spill Response Plan and ensure all personnel and contractors are trained in the correct response. • Develop an Incident Reporting Procedure and ensure all personnel are aware of the procedure.	• Routine testing of treated wastewater to ensure discharged wastewater meets minimum compliance discharge criteria • If required, sampling of soils to ensure all contaminated material has been removed and in-situ soils sediments have been remediated • Routine testing of treated wastewater to ensure discharged wastewater meets minimum compliance discharge criteria	In accordance with WWTP operating Licence As required	• In the event of accidental spillage, the Contractor should cease work immediately and ensure contamination is cleaned up prior to recommencing. • Implement Emergency Spill Response Plan to ensure adequate preparedness for haul road spill response following mitigation hierarchy • A comprehensive environmental incident report will then be completed. • Prevent chemical / hydrocarbon spill from spreading to native vegetation • Bioremediation facility for the treatment of contaminated fill, soils, or sediment	Annual Compliance Assessment Report (CAR) Internal incident reporting and investigation

3.2 Terrestrial Fauna

Objective-based EMP Provision

Purpose of EMP Provision: Management of direct and indirect impacts to terrestrial fauna during construction of the project

Rationale: The management approach has been informed by best practice and recent experience on similar infrastructure projects in Western Australia. The hierarchical approach taken focuses on management aims to minimise direct and indirect impacts to terrestrial fauna during the construction phase.

EPA Factor and Objective	Terrestrial Fauna: to protect terrestrial fauna so that biological diversity and ecological integrity are maintained
Environmental Values	Twenty-one significant species listed under the WA BC Act and the Commonwealth's EPBC Act have been confirmed in the Study Area including: • three mammals, • 14 birds (9 migratory) and • three reptiles. 12 habitat types have been delineated in the Study Area.
Environmental Aspects	• **TF1:** Clearing of native vegetation and ground disturbance (fauna injury and loss of habitat) • **TF2:** Introduction of Feral Animals • **TF3:** Altered fire regime • **TF4:** Disturbance to waterbirds • **TF5:** Altered Hydrology
Proposal Objectives	The proponent shall manage the implementation of the project to meet the following environmental objectives: • **TF1 Objective:** Avoid unapproved clearing of key MNES species of concern which include Night Parrot, Greater Desert Skink and Great Bilby habitat and avoid injury or death of significant species wherever possible (i.e. Vehicle Strike and Movement) • **TF2 Objective:** Minimise adverse impacts to significant fauna as a result of project-related increase in feral animal abundance • **TF3 Objective:** Minimise adverse impacts to significant fauna as a result of project-related altered fire regime • **TF4 Objective:** Avoid and minimise adverse impacts to waterbirds as a result of implementing the Project • **TF5 Objective:** Minimise potential impacts of altered hydrological regimes to Night Parrot habitat

ID/ Aspect	Management Targets	Management Actions	Monitoring	Timing	Contingency Actions	Reporting
TF1	1. Minimise loss, fragmentation or modification of fauna habitat 2. No loss of individuals of significant fauna species including Night Parrot, Greater Desert Skink, Bilby during construction activities 3. No more than 23.55 ha of approved Night Parrot foraging habitat to be cleared (0.2% of the total habitat area found in the Study Area)	• Pre-clearance survey work in primary habitats for the following significant species, Night Parrot, Great Desert Skink and Greater Bilby, to locate individuals and/or active burrows to allow for consideration of fauna sensitive design amendment (if achievable) • Pre-clearance Night Parrot recording surveys in suitable habitat i.e. old-growth spinifex. • Coordinates for clearing extents will be provided to the Construction Contractor. • The extent of works shall be pegged by qualified surveyors in the field. • No land clearing or ground disturbance work is to be undertaken until a Ground Disturbance Permit (GDP). • During clearing activities, have a qualified fauna spotter present to relocate fauna out of the way of machinery. • Clearing activities planned to be primarily carried out during daylight hours • Clearing activities are planned to be undertaken outside of breeding season for Night Parrot • Haul road is designed to avoid impacts to suitable breeding trees for the Grey Falcon (tall trees with raptor nests) and Princess Parrot (large stands of trees with hollows or potential to form hollows (e.g. stands of Allocasuarina sp. and Corymbia sp).	• Fauna spotter to record observations of significant fauna and burrows during project related land disturbance, including written records and photographs, where appropriate • Opportunistic identification of fauna mortalities	During Construction	**<u>Night Parrot:</u>** • If Night Parrots are detected (or are known to occur) surveys will be conducted to identify if any roost sites occur within the Indicative Footprint • In the unlikely event that a Night Parrot roost is detected within the Indicative Footprint, the following processes and procedures will be implemented: o Field staff will wait for the bird to leave the roost in the evening (confirmed by visual inspection of roost) before disturbing or removing the roost hummock to discourage the bird from returning. o As Night Parrots are likely to use several roosts within their range, and extensive similar roosting habitat is present adjacent to the clearing footprint, it is anticipated that this will not have any long-term negative effects on the individual. o If a nest is detected during pre-clearance listening surveys, these methods will not apply and the nest area will be avoided entirely until any chicks have fledged or a qualified fauna handler can relocate the nest.	Pre-clearance survey records including significant fauna observations and fauna mortality records GIS records of pre-clearance survey records, fauna exclusion zones and locations of significant fauna recorded by fauna spotter Annual Compliance Assessment Report (CAR) Report mortalities to DBCA Incident reporting

ID/ Aspect	Management Targets	Management Actions	Monitoring	Timing	Contingency Actions	Reporting
					<u>Great Desert Skink:</u> • If burrows are encountered during pre-clearance, where possible avoid active burrows, ideally with a buffer accounting for foraging behaviour (>200m). If direct impact is unavoidable relocate individual to similar habitat in the area by a suitably qualified fauna expert. **<u>Bilby:</u>** • Clear outside breeding season which extends from March to May where possible. • Dynamic nature of Bilby's means that individuals may establish burrows between the pre-clearance survey and clearing activities. During clearing activities, have a fauna spotter present to identify any new burrows. If a new burrow is detected, pause clearing activities and relocate individual as per methods below o Initially encourage burrow abandonment by disturbing entrance and monitoring (e.g. burrow sweeps and motion cameras) to confirm individual has left. Close burrow once abandoned o If burrow not abandoned, trap and cage individual at entrance and relocate before collapsing burrow, in the presence of suitably qualified fauna experts o Relocate individuals to alternative suitable habitat ideally with existing burrows. In this instance, relocation plans will be formalised with DBCA as part of fauna licences.	
TF2	1. No increase in presence of feral animals as a result of implementing the Project	• Liaise with traditional owners about the management of feral predators, particularly in habitat important to significant species and/or locations where significant species have been recorded in line with the existing IPA Ranger Programs • Ban all staff and contractors bringing any animals to site • Educate site staff and local traffic about not feeding animals • Minimise feral fauna species access to attractants (such as uncovered waste) by installing fencing around domestic waste facilities to minimise access to waste • Fence artificial water sources and progressively rehabilitate, such as turkey's nests and construction activities water holding facilities. • Comply with Feral Predator Control Program (Appendix C)	• Internal incident reporting and investigation process (opportunistic records of feral predators)	As applicable during construction	• Conduct a review of waste management practices and improve practices accordingly • Increase frequency and intensity of feral control actions	Annual Compliance Assessment Report (CAR) Incident reporting

ID/ Aspect	Management Targets	Management Actions	Monitoring	Timing	Contingency Actions	Reporting
TF3	1. No human induced fires in the area as a result of implementing the Project 2. To ensure that construction impacts to terrestrial fauna from fire are minimised as far as practicable.	• Avoid hot works in fire sensitive habitats (i.e areas of long unburnt spinifex) • 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 fires, including designated smoking areas, no fires permitted in workplace, use of extinguishers, hot works procedures • 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 and machinery and Haul Trucks • Water trucks to have fire management capabilities (pumps/hoses) • Develop education programs for haul road users (including Traditional Owners)	• Monitor daily wind conditions will be taken into consideration when clearing activities are proposed • Record Bushfire occurrence within Development Envelope.	Daily during construction On-going	• Alert Emergency Response Team • Implement Emergency Response Plan • Undertake post-fire weed control in the areas affected by the fire.	Internal incident reporting Annual Compliance Assessment Report (CAR)
TF4	1. Avoid impacts to waterbirds during foraging and breeding events as a result of construction activities.	• Engineering design and implementation (1 km spacing, install crossovers) of suitable drainage control features to maintain natural hydrological processes. • Develop a Ground Disturbance Permit System and Procedure. • Limit disturbance On-LDE (<5%; 15,000 ha) • The location and layout of the On-LDE infrastructure has been designed to minimise impacts to the Lake Islands and the lake fringe riparian zone, including avoidance buffers ranging from 250 to 500 m • Staged development of trenches via BMUs to allow for adaptive management of the engineering design. • Avoid direct impacts to lake islands • Trench network will be outside a suitable buffer zone from island formations (buffer dependent on island size). • To avoid disturbance to foraging waterbirds, no access will be permitted to inundated portions of Lake Mackay when more than 20% of the lake is inundated. Similarly, no access will be permitted to inundated claypans or salt pans with the exception of inspections and evaporation ponds. • To avoid disturbance to breeding waterbirds, no access will be permitted to islands used for breeding by Banded Stilts or other waterbirds during inundation events	• Design a waterbird monitoring program prior to construction • Conduct waterbird surveys during inundations which are sufficient enough to trigger breeding events to monitor for potential impacts and inform management actions if required.	As applicable - during flood events	• Further analysis of flood events of a sufficient size and duration sufficient for waterbird foraging resources • Adaptive management according to findings of monitoring and analysis.	Internal incident reporting Annual Compliance Assessment Report (CAR) Waterbird survey reports
TF5	1. Minimise potential impacts of altered hydrological regimes to Night Parrot habitat	• The haul road has been designed to minimise changes to natural hydrological flow. For example, haul road crossing of drainage features known to support Night Parrot will follow natural contours so that natural hydrology is maintained downstream of the crossing. • Develop a Ground Disturbance Permit System and Procedure • Develop an Incident Reporting Procedure	• Monitor old spinifex growth along drainage features, known to be used by the Night Parrot for foraging	Annual (For the first five years post construction)	• Review road design and implement changes. • Re-evaluate monitoring duration.	Annual Compliance Assessment Report (CAR) Annual monitoring report (5 years post construction)

3.3 Inland Waters

Objective-based EMP Provision

Purpose of EMP Provision: Management of direct and indirect impacts to inland waters during construction of the project

Rationale: Ensure abstraction of potable water for construction and human use is controlled to ensure the aquifer integrity and viability along the NIDE, and ensure the controlled disposal of the treated wastewater into the surrounding environment is of a suitable quality consistent with relevant ANZECC Guidelines to avoid environmental harm.

EPA Factor and Objective	Inland Waters: To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected
Environmental Values	Aquifer integrity that supports local communities and vegetation Surface water quality enabling environmental uses
Environmental Aspects	• **IW1:** Abstraction of groundwater for construction activities • **IW2:** Contaminants Spills
Proposal Objectives	The proponent shall manage the implementation of the project to meet the following environmental objectives: • **IW1 Objective:** Achieve the conservation of water through minimising abstraction rates and water re-use where possible • **IW2 Objective:** To ensure the likelihood of contaminated material entering the environment is minimised and remediated before environmental harm occurs to inland waters

ID/ Aspect	Management Targets	Management Actions	Monitoring	Timing	Contingency	Reporting
IW1	1. Abstraction of groundwater for construction activities will be undertaken in accordance with an approved 5C Licence	• Prior to undertaking temporary dewatering activities, if required, at a minimum: o Apply for a 26D Licence, issued under the provisions of the *Rights in Water and Irrigation Act 1914* to construct or alter wells. o Install all water supply production bores in accordance with the Minimum Construction Requirements for Water Bores in Australia (2012). o Install all monitoring bores in accordance with Water Quality Protection Note No. 30; Groundwater Monitoring Bores (2006). o Apply for a 5C Licence, issued under the provisions of the Rights in Water and Irrigation Act 1914 to take water for temporary construction water supply purposes. o Development of a Groundwater Licence Operating Strategy (GLOS) in accordance with Operational Policy 5.08 o Use of Operating Strategies in Water Licensing Process (2019). • Once construction of each segment of the Haul Road has been completed and bores are no longer required, cleared areas will be rehabilitated. Bore infrastructure such as bore casings will remain in place and be capped as per DMIRS requirements.	• Construction Contractor will monitor according to the 5C Licence to take water.	As per 5C Licence	• If monitoring indicates construction water abstraction is not in compliance with license conditions, quality is deteriorating or is being used for unlicensed purposes then abstraction will cease immediately from that location. • Abstraction will not recommence until the issue is resolved to the satisfaction of the Construction Contractor and Agrimin.	Compliance Report for the GLOS
IW2	1. Any wastewater produced as a result of construction activities will be treated to meet relevant ANZECC Guidelines and be disposed of in a controlled manner 2. No contamination or spills of hazardous materials as a result of implementing the Project that might runoff into surface water bodies or seep into groundwater	• Avoid fuel/chemical storage and transfer from occurring outside of designated bunded areas (i.e. ensure there is a dedicated workshop for maintenance) activities. • Ensure spill response equipment is readily available (including on all Haul Trucks). • Maintain high standard of housekeeping around construction activities and construction sites. • Develop an Emergency Spill Response Plan and ensure all personnel and contractors are trained in the correct response. • Develop an Incident Reporting Procedure and ensure all personnel are aware of the procedure. • All wastewater generated at construction camps will be treated in relocatable sewage treatment plants. The clean, treated water will be dispersed on the ground near the camp to evaporate. Residual solids waste (sludge) produced by the treatment plants will be trucked off site to a suitable disposal facility at Alice Springs or Halls Creek.	• If required, collect and analyse soils and sediment to ensure all contaminated material has been removed and implement remediation where required • If required, monitoring of vegetation health in affected areas and adjacent areas.		• In the event of accidental spillage, the Contractor will cease work immediately and ensure contamination is cleaned up prior to recommencing. A comprehensive environmental incident report will then be completed. • Implement Emergency Spill Response Plan to ensure adequate preparedness for haul road spill response following mitigation hierarchy. • Contain any chemical / hydrocarbon spills to prevent seeping to groundwater or becoming runoff to surface water bodies.	Annual Compliance Assessment Report (CAR) Internal incident reporting and investigation, as per **FV5**

3.4 Social Surroundings

Objective-based EMP Provision

Purpose of EMP Provision: Management of direct and indirect impacts to aboriginal heritage values and minimise dust emissions as not to diminish the amenity, recreation and enjoyment of the environment during construction of the project.

Rationale: The management approach has been informed by best practice and recent experience on similar infrastructure projects in Western Australia. The hierarchical approach taken focuses on identifying and avoiding sacred heritage sites, as well as ensure dust emissions in close proximity of communities are minimise as far as practicable.

EPA Factor and Objective	Social Surroundings: to protect social surroundings from significant harm
Environmental Values	Amenity values include both visual amenity, and the ability for local people to live and recreate within their surroundings without any unreasonable interference with their health, welfare, convenience and comfort. Noise, odour and dust all have the potential to unreasonably interfere with the health, welfare, convenience and comfort of people.
Environmental Aspects	• **SS1:** Impact to Amenity – Fugitive Dust Emissions • **SS2:** Direct disturbance to Aboriginal Heritage Sites
Proposal Objectives	The proponent shall manage the implementation of the Project to meet the following environmental objectives: • **SS1 Objective:** Avoid otherwise minimise impacts to Aboriginal Communities – Dust • **SS2 Objective:** Avoid otherwise minimise impacts to Aboriginal Heritage values

ID/ Aspect	Management Targets	Management Actions	Monitoring	Timing/Frequency of Actions	Contingency	Reporting
SS1	1. No airborne fugitive dust which could impact upon the nearby Aboriginal Community amenity, particularly the Balgo Community	• Implement the Haul Road Construction, Balgo Community, Dust Management Plan (Appendix D) • Unnecessary vehicle movements on the site will be avoided as far as reasonably practicable • Vehicles will adhere to speed restrictions within the site; the appropriate speed limit will be subject to the determination of the Site Manager based on the activities being undertaken, location and site conditions at the time • Vehicles will keep to designated access roads as far as reasonably practicable • Vehicles deviating from designated access routes will do so only as required for specific work activities and under appropriate permissions • Public roadways used for access will be kept clear of deposited material tracked by vehicles • The height that soil is dumped from excavator and front-end loader buckets will be minimised as much as possible • If the soil being excavated is dry and producing dust when being worked, it will be wet down periodically to keep it damp by direct spraying of the area of active excavation • Borrow pits and stockpiles will be actively wet down during active extraction and handling • Water carts (each minimum 10,000 L capacity) will be available at active work areas and active haul roads to enable wetting of areas where vehicle movements are anticipated will be carried out (pre-wetting and re-wetting requirements to be determined on-site by the Site Manager) • Areas to act as tipping receival surfaces will be wet down prior to commencement of tipping • Balgo Community will be notified prior to construction activities commencing and supplied with contact information for the Site Manager • Stockpiles in active use will be wet down to reduce wind erosion and displacement of dust upon the addition of more material	Daily visual monitoring of airborne dust to confirm no offsite dust impacts and efficacy of dust control measures	Daily	• Respond to community complaints in a timely manner Investigate requirement for additional consultation • Should high wind speeds be forecast for wind from the east, site activities will be reviewed and suspended by the Site Manager if deemed appropriate • Water carts and canons will be available at the active work areas to provide contingency in the event of excessive dust generation	Complaints register, documenting all complaints and summarising outcome of response to complaint

ID/ Aspect	Management Targets	Management Actions	Monitoring	Timing/Frequency of Actions	Contingency	Reporting
		• Stockpiles and cleared areas will be stabilised as required using a dust suppression crusting agent or other similar material • Site personnel and contractors will be trained at induction • A complaints management system will be prepared and implemented				
SS2	1. No avoidable disturbance to Aboriginal objects identified or unearthed during construction activities	• Comply with Section 18 Notices under the *Aboriginal Heritage Act 1972*. • Preclearance survey • Only clear within the approved limits of impact to minimise disturbance to previously undiscovered or buried artefacts or other items of Aboriginal cultural significance • 30% of the haul road will be constructed on the existing cleared track reducing total clearing	Daily monitoring during vegetation clearing and initial groundworks to identify any potential objects of Aboriginal cultural significance.	Daily	Stop construction if Aboriginal objects are identified or unearthed and report the findings to the Department of Planning, Lands and Heritage (DPLH).	Report new Aboriginal objects identified during construction activities to the DPLH. Report to DPLH in accordance with conditions of the Section 18 consent(s).

4. Reporting Provisions

4.1.1 Annual Reporting

Agrimin will prepare Annual Environmental Reports (AERs) to be submitted to regulatory authorities. The format of these reports will be consistent with requirements stipulated by individual regulatory authorities.

Annual Compliance Assessment Report (CAR) will also be submitted to regulatory authorities. The report will document compliance with conditions of approval including assessment of compliance with management plan requirements where management plans form part of approval conditions.

4.1.2 Exceedance Reporting

In the event that management targets are exceeded, the DWER and DBCA will be notified within 7 days of identification of the exceedance.

4.1.3 Incident Reporting

All environmental incidents regardless of the scale and nature of the incident will be required to be reported to the Environment and Heritage Manager as soon as practicable.

All environmental near misses and incidents will be recorded within an incident management system that will be developed by Agrimin. Incidents will be recorded by the person/s who cause or identify the event, within 24 hours of the incident occurring.

Incidents will be investigated, and root causes determined and recorded within the incident investigation, within 2 weeks of the incident occurring, or as instructed by the Registered Mine Manager. Where applicable, environmental incidents will be reported to the relevant government agencies by the Environment and Heritage Manager.

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. Non-compliance and incident reports will be closed out by the Environment and Heritage Manager and/or the Registered Mine Manager.

Table 4-1is an example of how incidents might be reported and maintained in a register.

Table 4-1: Incident Reporting Register

Management Targets	Status report: Management target achieved Management actions implemented Management target not achieved Management actions not implemented

5. Adaptive Management and Review of EMP

5.1 Adaptive Management

Agrimin are committed to ensuring the management approach for the Project is adaptive and responsive to changes in the scientific understanding and advancements in best management practices. This includes changes occurring to the natural environment (e.g. future climatic changes) and will enable adjustments to the mitigation measures and monitoring protocols to meet the Project's long-term management objectives.

Through this CEMP and subsidiary EMPs, Agrimin are committed to preparing an adaptive management approach through the identification and application of early response indicators to provide information on changes that are precursors to an environmental impact and supports improved understanding and identification of trends in environmental systems. Learnings from the construction phase managed in the CEMP will help to inform adaptive management, particularly in the operational phase management plans (TFEMP, FVEMP and IWEMP).

Review processes for the CEMP will be based on:

- **Periodic reviews and evaluation of monitoring data or methodology**: Aimed to determine whether site specific monitoring program results indicate that management targets are not being achieved.
- **Increased understanding of the ecological system**: If additional information about the species use of the Project Area or region is received that would better inform management approaches.
- **External changes during the life of the Project (e.g. Project design changes, technical advances or innovation):** The relevance and effectiveness of management measures would be considered and reviewed and/or revised following any significant changes to the Project.

5.2 Auditing

The implementation of this plan will be audited by Agrimin, including audit of compliance and performance against all elements of this CEMP. The review and audit process will:

- identify issues and proposed changes to the CEMP;
- monitor and evaluate performance against outcome and management provisions and environmental criteria; and
- determine if management, mitigation and monitoring is effective or is required to be adjusted.

5.3 Corrective Actions

All environmental incidents regardless of the scale and nature of the incident will be required to be reported to the Environment and Heritage Manager as soon as practicable.

All environmental near misses and incidents will be recorded within an incident management system that will be developed by Agrimin. Incidents will be recorded by the person/s who cause or identify the event, within 24 hours of the incident occurring.

Incidents will be investigated, and root causes determined and recorded within the incident investigation, within 2 weeks of the incident occurring, or as instructed by the Registered Mine Manager. Where applicable, environmental incidents will be reported to the relevant government agencies by the Environment and Heritage Manager.

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. Non-compliance and incident reports will be closed out by the Environment and Heritage Manager and/or the Registered Mine Manager.

5.4 Review

The CEMP will be reviewed as required, throughout the construction stage. Other triggers for a review of this CEMP include trigger of early warning indicators, addressing items identified during incident investigations, audits or inspections; and new or revised information becomes available

Ongoing monitoring programs will be reviewed on a regular basis, as required, likely to be annual during the initial phases of the Project.

The Project is subject to further environmental approvals under other legislation, including assessment and approval by DWER and DMIRS. Agrimin will review this CEMP (and update if required) to ensure it achieves all identified environmental outcomes

6. Stakeholder Consultation

Agrimin is committed to ongoing stakeholder communication, engagement and consultation through the planning and approvals phase, as well as the construction, operational and closure phases of the Project. This CEMP is submitted as a draft for comment and consultation with the EPA.

6.1 Stakeholder Engagement

Agrimin has undertaken extensive community and stakeholder consultation as part of the design and feasibility assessments of the Project. These including presentations and briefings to stakeholder groups including representatives from environment, heritage, community, and Indigenous groups, local, State and Commonwealth Government agencies.

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 Project and reported through revisions of Environmental Management Plans. Stakeholder consultation will continue to be monitored and reported following revision of the CEMP as the document is finalised and implemented.

6.2 Key Stakeholders

Key stakeholders have been outlined in Table 6-1.

Table 6-1 Key Project Stakeholders

Group	Stakeholders
Commonwealth Government Agencies	• Commonwealth Department of the Environment and Energy (DoEE).
State Government Agencies	• Environmental Protection Authority (EPA); • Department of Mines, Industry Regulation and Safety (DMIRS); • Department of Water and Environmental Regulation (EPAS); • Department of Water and Environmental Regulation (DWER); • Department of Water and Environmental Regulation (DWER – Regulation); • Department of Biodiversity, Conservation and Attractions (DBCA); • Department of Planning, Lands and Heritage (DPLH); • Main Roads Western Australia (MRWA); • Department of Jobs, Tourism, Science, and Innovation (DJTSI); • Department of Fire and Emergency Services (DFES); • Civil Aviation Safety Authority (CASA); and • Members of Parliament.
Local Government Authorities	• Shire of East Pilbara; • Shire of Halls Creek; and • Shire of Wyndham-East Kimberley.
Native Title Representative Bodies	• Central Desert Native Title Services; and • Kimberley Land Council.
Indigenous Groups	• Tjamu Aboriginal Corporation and Kiwirrkurra People; • Parna Ngururrpa Aboriginal Corporation and Ngururrpa People; and • Tjurabalan Native Title Land Aboriginal Corporation.
Environmental Interest Groups	• Conservation Council of Western Australia (CCWA); • Night Parrot Recovery Team; and • Water bird Conservation Group.
Industry Groups	• Chamber of Commerce and Industry.

7. References

360 Environmental. (2017a). Waterbird Survey at Lake Mackay. Unpublished report prepared for Agrimin Limited.

360 Environmental. (2017b). Waterbird Survey for the Mackay SOP Project. Report for Agrimin Ltd, Western Australia.

DPaW, Department of Parks and Wildlife. (2013). Weed Prioritisation Process for DPaW (formerly DEC) – "An integrated approach to Weed Management on DPaW-managed lands in WA".

DPaW, Department of Parks and Wildlife. (2015). How does Parks and Wildlife manage weeds? Species-led ranking summary results by region. Available online at http://www.dpaw.wa.gov.au/plants-and-animals/plants/weeds/156-how-does-dpaw-manage-weeds. Accessed on 23 February 2016.

Duguid, A., Barneston, J., Clifford, B., Pavey, C., Albrecht, D., Risler, J. and McNellie, M. (2015). Wetlands in the Arid Northern Territory. A report to the Australian Government Department of the Environment and Heritage on the inventory and significance of wetlands in the arid NT. Northern Territory Government Department of Natural Resources, Environment and the Arts. Alice Springs.

Duguid, A., Barnetson, J., Clifford, B., Pavey, C., Albrecht, D., Risler, J. and McNellie, M. (2005). Wetlands in the Arid Northern Territory. Available online at.

EPA, Environmental Protection Authority. (2016a) Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment Environmental Protection Authority, Western Australia.

EPA. (2020a). Instructions on how to prepare *Environmental Protection Act 1986* Part IV Environmental Management Plans. Environmental Protection Authority (EPA), Western Australia.

EPA. (2020b). Statement of Environmental Principles, Factors and Objectives. Environmental Protection Authority (EPA), Western Australia.

Stantec, A. (2020). Lake Mackay Potash Project: Stage 1 and Stage 2 Surface Water Assessment.

WAH, W. A. H. (2020). FloraBase: the Western Australian Flora. Department of Biodiversity Conservation and Attractions. Available online at. Accessed on.

Appendices

Appendix A Key Regulatory Obligations

A.1 Key Regulatory Obligations

Legislation relevant to the scope of this EMP, included, but are not limited to, the following legislation:

- *Aboriginal Heritage Act 1972*
- *Australian Heritage Council Act 2003*
- *Biodiversity and Agricultural Management Act 2007*
- *Biodiversity Conservation Act 2016*
- *Biosecurity Act 2015*
- *Bush Fires Act 1954*
- *Conservation and Land Management Act 1984*
- *Contaminated Sites Act 2003*
- *Dangerous Goods (Transport) Act 1998*
- *Dangerous Goods Safety Act 2004*
- *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) (Commonwealth)*
- *Environmental Protection Act 1986*
- *Health Act 2016*
- *Heritage of Western Australia Act 1990*
- *Land Administration Act 1997*
- *Local Government Act 1995*
- *Main Roads Act 1930*
- *Mines Safety and Inspection Act 1994*
- *Mining Act 1978*
- *National Greenhouse and Energy Reporting Act 2007*
- *Native Title Act 1993*
- *Occupational Safety and Health Act 1984*
- *Planning and Development Act 2005*
- *Rights in Water and Irrigation Act 1914*
- *Soil and Land Conservation Act 1945*
- *Waste Avoidance and Resource Recovery Act 2007*
- *Water Services Act 2012*
- *Waters and Rivers Commission Act 1995*
- *Waterways Conservation Act 1976*

A.2 Regulatory Approval Requirements

Table A-7-1: Regulatory approvals relevant to the Mackay Potash Project* (this list is indicative and subject to change throughout the life of mine)

Proposal Activities	Type of Approval	Legislation Regulating the Activity	Responsible Government Agency	Additional Information
Mackay Proposal Development (including infrastructure corridors)	Grant of Mining Lease	*Mining Act 1978*	DMIRS	Grant of mining lease required for mining activities, processing, and mining infrastructure such waste landforms.
	Grant of Miscellaneous Licences	*Mining Act 1978*	DMIRS	Grant of tenure required for infrastructure.
	Native Title Agreement	NT Act	Attorney-General's Department (Cwth) DPLH	Required prior to access and works.
	Land Access Agreement		DPLH	Required prior to access of Proposal, clearing and mining activities.
	Aboriginal Heritage Sites	AH Act	DPLH	If the disturbance of any Aboriginal Heritage Sites site is required
Mining and Processing	Mining Proposal and Mine Closure Plan	Division 3 of Part IV of the *Mining Act 1978*	DMIRS	Required prior for mining and processing activities and supporting infrastructure.
	Dangerous Goods Licence	*Dangerous Goods Safety Act 2004* (DGS Act)	DMIRS	Required for the storage, transport and use of Dangerous Goods.
	Project Management Plan	*Mines Safety and Inspection Act 1994* (MSI Act) Mining Safety & Inspection Regulations 1995	DMIRS	Required prior to construction or mining operations commencing.
Clearing of native vegetation	Native Vegetation Clearing Permit	Part V of the EP Act	DMIRS (via administrative agreement with DWER)	Not required if flora and vegetation is formally assessed as a key environmental factor under s38 of the EP Act.

Proposal Activities	Type of Approval	Legislation Regulating the Activity	Responsible Government Agency	Additional Information
Processing plant construction and operations	Works Approval	Part V of the EP Act Environmental Protection Regulations 1987	DWER - Regulation	Required prior to construction of processing and other associated prescribed premises activities
	Operating Licence	Part V of the EP Act	DWER - Regulation	Required prior to the commencement of official production and shipment.
Construction of trenches, bores for process water supply	Application for 26D Licence	Section 26D RIWI Act	DWER - Water	Required prior to construction of trenches and bores.
Groundwater abstraction – brine and process water	Application for a 5C Licence	Section 5C RIWI Act	DWER - Water	Required for groundwater abstraction.
Support infrastructure (wastewater treatment)	Application to Construct or Install an Apparatus for the Treatment of Sewage	*Health Act 1911* Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulations of 1974	Shire of East Pilbara Department of Health DWER - Regulation	Requirement is dependent upon size and treatments options.

Appendix B Preliminary Offset Strategy

MACKAY POTASH PROJECT
OFFSET STRATEGY

PREPARED FOR **AGRIMIN LIMITED**

September 2021

EPA Assessment No. 2193 (WA)

EPBC Act No. 2018/8834 (Commonwealth)

Stantec

This document has been prepared for the benefit of Agrimin Limited. No liability is accepted by this company or any employee or sub-consultant of this company with respect to its use by any other person.

This disclaimer shall apply notwithstanding that the report may be made available to other persons for an application for permission or approval to fulfil a legal requirement.

QUALITY STATEMENT

PROJECT MANAGER	PROJECT TECHNICAL LEAD
Tracy Schwinkowski	Peter Tapsell

PREPARED BY		
Leanne Jones, Courtney Kains	.....	21/08/2021
CHECKED BY		
Matt Spence	.....	21/08/2021
REVIEWED BY		
Peter Tapsell	.....	22/08/2021
APPROVED FOR ISSUE BY		
Peter Tapsell	.....	23/08/2021

PERTH
Ground Floor, 226 Adelaide Terrace, PERTH, WA 6000
TEL +61 (08) 6222 7000

REVISION SCHEDULE

Rev No.	Date	Description	Signature or Typed Name (documentation on file)			
			Prepared by	Checked by	Reviewed by	Approved by
0.1	03/06/2021	Draft for Internal Review	LJ	MS	PT	
1.0	06/08/2021	Draft for Client Issue	LJ	MS	PT	PT
2.0	23/08/2021	Final for Submission	LJ/CK	MS	PT	PT

Executive Summary

Agrimin Limited (Agrimin) proposes to develop a greenfields potash fertiliser operation, the Mackay Potash Project (the Project or Mackay Potash Project), approximately 490 kilometres (km) south of Halls Creek, adjacent to the Western Australia (WA) and Northern Territory (NT) border.

The purpose of this preliminary offset strategy (Offset Strategy or Strategy) is to support the assessment of the Proposal undertaken by the Western Australian Environmental Protection Authority (EPA) under Part IV of the *Environmental Protection Act 1986* (EP Act), and by Commonwealth's Department of Agriculture, Water and the Environment (DAWE) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This document should be read in conjunction with the Environmental Review Document (ERD) submitted 10 September 2021.

Following Decision Making Authorities (DMAs) review and commentary of the first draft of the ERD provided to Agrimin on 9 March 2021, Agrimin understands the key residual impacts and offset requirements that were raised by the DAWE specifically relate to Matters of National Environmental Significance (MNES). It is noted that no State based comments were received during the review.

Agrimin understands its obligations to offset the significant residual impacts of the Proposal that may remain after the mitigation hierarchy of avoidance and minimisation has been implemented and applied within the management framework.

Since the time of submitting the first draft of the ERD, further fauna and flora survey work has been conducted to characterise the environment and inform the next revision of the ERD. The outcomes of these surveys have allowed Agrimin to further identify opportunities to apply the EPA's mitigation hierarchy to avoid and minimise potential impacts on MNES and State listed species, and thereby addressing a large number of the key DMA comments.

Furthermore, the proponent-led avoidance measures that have been implemented demonstrate Agrimin's on-going commitment to protecting the environmental values of the Great Sandy Desert region. These have included:

- Realigning the haul road corridor and the Northern Infrastructure Development Envelope (NIDE) to avoid the Yagga Yagga Great Desert Skink population. This has resulted in the closest known active burrow being at least 300 m away from the development centreline, exceeding the distance the species tends to travel from a burrow while foraging (<200m). This realignment avoids bisecting the core of the described population with a high density of recorded burrows;
- Reducing the width of the haul road and not permitting borrow pits in this sensitive area;
- Utilising existing cleared areas where possible; 30% of the haul road is on existing cleared track;
- Clearing will only be permitted in approved ground disturbance areas. Where possible, clearing and earthwork disturbance will be limited; and
- Night-time travel relating to the Proposal will not be permitted (removing a key impact pathways on nocturnal conservation significant species).

Despite Agrimin's efforts to identify and implement effective control measures, it has been concluded that the Proposal may still result in a residual impact to the conservation significant Night Parrot through the clearing and removal of important habitat located in the Proposal's linear infrastructure corridor.

Therefore, Agrimin has developed this Offset Strategy as part of the public review process of the ERD to counterbalance the potential significant residual risks associated with clearing within the NIDE. The Offset Strategy has been prepared in accordance with the Commonwealth's Environmental Offsets Policy 2012 (SEWPaC 2012), and where required, the WA EPA's Environmental Offset Policy 2011 (Government of Western Australia 2011) and WA Environmental Offsets Guidelines 2014 (Government of Western Australia 2014).

Noting the above, the objective of this Offset Strategy is to outline the potential residual impact to the Night Parrot and propose appropriate offsets. The Strategy will:

- Outline proposed measures to avoid, mitigate, manage and monitor significant impacts to the Night Parrot;
- Describe significant residual impacts to the Night Parrot, including the estimated quantum of impacts;
- Estimate the total quantity of offsets that may be required to meet regulatory guidelines using the Commonwealth Offsets Assessment Guide (Australian Government 2012); and

- Outline the proposed strategy to offset the Proposal's significant residual environmental impacts on the Night Parrot in accordance with State and Commonwealth environmental offsets policy and guidance.

In accordance with State and Government offset polices, the Offset Strategy proposes the development of a *Governance Fund Model* allowing for offset funds to be distributed directly conservation programs (including research initiatives) to local Indigenous rangers who currently undertake on-ground conservation management within their respective Indigenous Protection Areas (IPA). Justification for this approach is provided in Section 5, noting:

- On-ground management, including rehabilitation, revegetation and restoration of existing Department of Biodiversity, Conservation and Attractions (DBCA) managed land, and
- The proposed offsets have been selected to be permanent, achievable, and provide a long-term strategic outcome that benefits both the environment and the land manager.

The Offset Strategy will be finalised following comments from regulators and to meet the approval conditions imposed by the respective State and Commonwealth Ministers for Environment.

Abbreviations

Agrimin	Agrimin Limited
CEMP	Construction Environmental Management Plan
CMCP	Conceptual Mine Closure Plan
Cwth	Commonwealth
DAWE	Commonwealth Department of Agriculture, Water and the Environment
DMA	Decision Making Authority
EP Act	*Environmental Protection Act 1986*
EPA	Environmental Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ERD	Environmental Review Document
ESD	Environmental Scoping Document
FVEMP	Flora and Vegetation Environmental Management Plan
ha	hectare
km	kilometre
m	metres
MNES	Matter of National Environmental Significance
NIDE	Northern Infrastructure Development Envelope
NT	Northern Territory
Off-LDE	Off Lake Development Envelope
On-LDE	On Lake Development Envelope
SEWPaC	Department of Sustainability, Environment, Water, Population and Communities
SIDE	Southern Infrastructure Development Envelope
TFEMP	Terrestrial Fauna Environmental Management Plan
WA	Western Australian

Agrimin Limited

Offset Strategy

CONTENTS

LIST OF TABLES

LIST OF FIGURES

1. Introduction

1.1 Project Overview

Agrimin Limited (Agrimin) proposes to develop a greenfields potash fertiliser operation, the Mackay Potash Project (the Project or Mackay Potash Project), approximately 490 kilometres (km) south of Halls Creek, adjacent to the WA (WA) and Northern Territory (NT) border (Figure 1-1).

The Project 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 up to 15,000 hectares (ha) of the lake's surface and clearing of approximately 1,500 ha of native vegetation are required for Project development.

The Project is remote and extensive (263,675 ha) and therefore four development envelopes have been defined. The following terms are used throughout the FVEMP (Figure 1-1):

- **Study Area** – refers to the boundary within which all investigations and field surveys were undertaken.
- **Development Envelopes** – the boundary within which the elements of the Project are situated. The development envelopes occur entirely within the Study Area and comprise four components that make up the Project. The Project 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):
    - **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 production to Wyndham Port, including clearing of approximately 1,000 ha of native vegetation within the 33,928 ha NIDE.
- **Proposal area**: The combined area in which the four development envelopes are contained.
- **Indicative Footprints** – the proposed Indicative Footprints (IFs) occur entirely within the Proposal Area and refers to the area that is proposed to be directly disturbed by the Proposal (e.g. clearing of native vegetation). The layout of the IF may be subject to change, however, total disturbance will not exceed the maximum extent of disturbance for each Development Envelope as presented in the Environmental Review Document (ERD). Proponent-led avoidance and minimise measures has been implemented where possible to reduce and minimise potential impacting on areas of high ecological or heritage value through the detailed design of the indicative footprints.

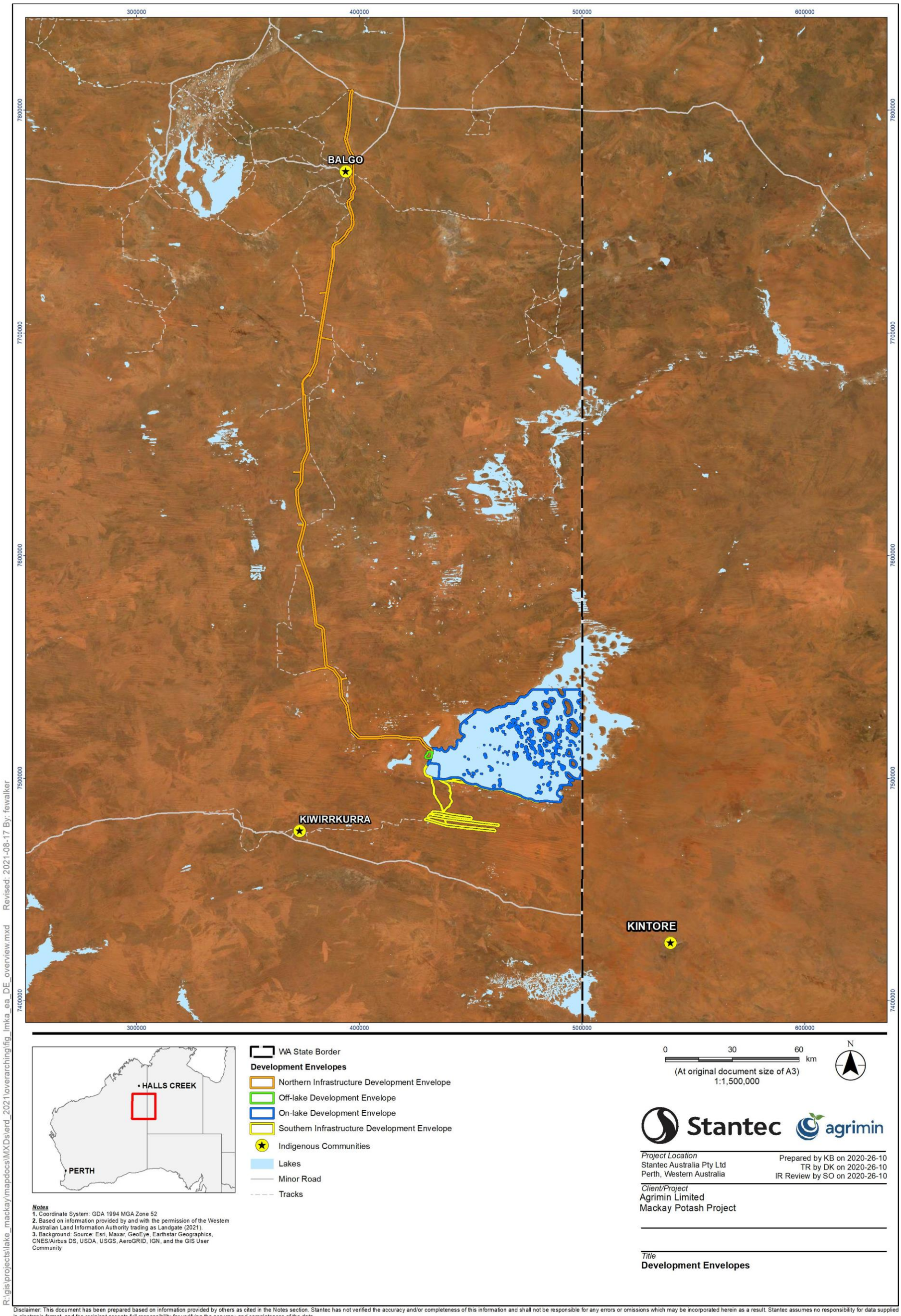


Figure 1-1 Overview of Mackay Potash Project, Proposal area and Development Envelopes

1.2 Purpose and Scope of Report

The purpose of this preliminary offset strategy (Offset Strategy or Strategy) is to support the assessment of the Proposal undertaken by the Western Australian Environmental Protection Authority (EPA) under Part IV of the *Environmental Protection Act 1986* (EP Act), and by Commonwealth Department of Agriculture, Water and the Environment (DAWE) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This document should be read in conjunction with the Environmental Review Document (ERD) submitted 27 November 2020.

Following a review of the first draft of the ERD by Decision Making Authorities (DMAs) in March 2021, the Commonwealth DAWE highlighted key residual impacts and offset requirements related to Matters of National Environmental Significance (MNES). This Offset Strategy directly addresses comments provided by DAWE specifying that a strategy is required to define the potential residual significant impact and proposed offsets; outline proposed monitoring and management measures, and conservation mechanisms; and describe how the proposed environmental offsets meet the requirements of the Commonwealth's Environmental Offsets Policy 2012 (SEWPaC 2012).

It is noted that no State based comments were received. Nonetheless, this Offset Strategy has also taken into regard the requirements of the WA EPA's Environmental Offset Policy (Government of Western Australia 2011) and WA Environmental Offsets Guidelines 2014 (Government of Western Australia 2014).

The only MNES identified with the potential to experience significant residual impacts after avoidance and mitigation measures have been applied is the Night Parrot (*Pezoporus occidentalis*). The scope of this Offset Strategy therefore specifically addresses the impact on the Night Parrot through the clearing and removal of important habitat located in the Proposal's linear infrastructure corridor within the NIDE. The Strategy will:

- Outline proposed measures to avoid, mitigate, manage and monitor significant impacts to the Night Parrot;
- Describe significant residual impacts to the Night Parrot, including the quantum of impacts;
- Estimate the total quantity of offsets that may be required to meet regulatory guidelines using the Commonwealth Offsets Assessment Guide (Australian Government 2012); and
- Outline the proposed strategy to counterbalance the Proposal's significant residual environmental impacts on the Night Parrot in accordance with State and Commonwealth environmental offsets policy and guidance.

2. Impact and Mitigation Hierarchy

The EPBC Act Environmental Offsets Policy states that offsets will not be considered until all reasonable avoidance and mitigation measures are considered. Section 7.6.3.2 of the ERD details the measures proposed to avoid, mitigate, manage, and monitor potential impacts to the Night Parrot, with the key measures summarized in

Table 2-1.

Table 2-1: Proposal Impact and Mitigation Hierarchy

Key Proposal Impact: Night Parrot (EN, CR): loss of individuals and / or habitat loss, fragmentation, or modification	
Avoid	• 30% of the haul road will be constructed on the existing cleared track reducing total clearing • Clearing will only occur in approved ground disturbance areas • Avoid clearing old growth spinifex and primary foraging habitats where possible (as identified by the fine scale mapping) • After implementing stringent proponent-led avoidance measures including the realignment of the Haul Road, clearing will be restricted to a maximum of 23.55ha of old growth spinifex (0.20% of the habitat found within the Study Area) critical to the survival of the species • No evidence of roosting or breeding has been detected within the Study Area, however Agrimin will avoid breeding season during construction
Mitigate	• Where possible, minimise disturbance to primary habitats of significant species • Clearing activities will only be carried out during daylight hours • Buffer and avoid any confirmed roost sites, if known and encountered
Manage	• Comply with Flora and Vegetation Environmental Management Plan (FVEMP • Comply with Terrestrial Fauna Environmental Management Plan (TFEMP) • Comply with Construction Environmental Management Plan (CEMP) • Comply with Mine Closure Plan (MCP) • Develop a Ground Disturbance Permit System and Procedure • Develop a Feral Predator Control Program • Develop a Fire Management Procedure • Develop an Emergency Response Plan • Develop a Traffic Management Plan • Develop a Hot Works Permit System • Develop an Incident Reporting Procedure
Monitor	• Conduct a pre-clearance survey (four weeks prior to clearing) within Indicative Footprint using acoustic recorders where primary roost habitat has been identified from the fine scale desktop habitat mapping and from ground truthing • Monitor any confirmed roost sites (if encountered) to determine success of mitigation • Monitor foraging activity at known locations to determine success of mitigation • Monitor vegetation heath / hydrology along drainage features within suitable Night Parrot habitat to determine success of mitigation • Internal incident reporting and investigation process
Rehabilitate	• Rehabilitation of temporary cleared areas

3. Significant Residual Impacts to the Night Parrot

After the hierarchy of control measures has been implemented, the Proposal may still cause a residual impact to the Night Parrot through loss of individuals and/or habitat loss, fragmentation, or modification from native vegetation clearing.

The following sections describe the assessment of the quantum of impact for the Night Parrot.

3.1 Quantum of Significant Residual Impact to Night Parrot

3.1.1 Profile of Species

The Night Parrot is a small, green, highly cryptic parrot. They are primarily ground-feeding and inhabit remote arid and semi-arid Australia. The species roosts in clumps of dense vegetation, primarily long unburnt Triodia hummocks with roost sites tending to be permanent. The species is likely to feed on seeding grasses, forbs, herbs, and succulents, particularly in low-lying areas that are seasonally inundated promoting diverse, seeding ephemerals. Refer to ERD Section 7.6.3.2 for more detailed information about the Night Parrot.

Importantly, the Night Parrot is nocturnal so is unlikely to travel through the vicinity of the haul road during daylight hours when haulage is conducted.

3.1.2 Quantum of Residual Impact for the Night Parrot

The EPBC Act Environmental Offsets Policy and associated guidelines have been used to assess the quantum of residual impact associated with the Proposal and quantify offset requirements. The policy considers an impact on habitat not only in terms of spatial extent (ha) but also considers the relative quality of that habitat. The term 'Quantum of Impact' is used to describe the integrated consideration, and is a numerical value that is calculated as follows:

Quantum of Impact (ha) = Area of impact (ha) x Habitat Quality score

3.1.3 Area of Impact

As detailed in the ERD (Section 7.6.3.2) the loss of primary foraging habitat for the Night Parrot will occur during clearing. Based on fine scale mapping, it is estimated that a total of 11,522 ha of old growth spinifex occurs within the Study Area, of which 646.62 ha (5.61%) occurs within the Proposal area and 23.55 ha (0.20 %) occurs within the Indicative Footprint and has the potential to be disturbed.

Therefore, the total area of impact within the Indicative Footprint that should be considered in this offset package is 23.55ha.

3.1.4 Habitat Quality Score

Confirmed Night Parrot foraging calls were recorded within the Proposal area, however roosting sites have yet to be found. Notably, Night Parrot foraging and roosting habitats are not restricted to the Proposal area and are considered well represented in the local and regional contexts

As detailed in the ERD (Section 7.4.1), all habitats within the Study Area are relatively untouched and assessed as being in excellent condition. However, as noted in DAWE's Offsets Assessment Guide, the assessment of quality for threatened species habitat and ecological communities is not simply a scoring of vegetation 'pristineness'. Rather, there are three components that contribute to the calculation of habitat quality: site condition, site context and species stocking rate, see Table 3-1.

Table 3-1 Scoring of Night Parrot Habitat Attributes

Habitat Attribute	Score	Basis of Score
Condition	9	This high score reflects the results of habitat mapping in both locations where the species was recorded in broad drainage basins which extend for more than 5 km either side of the NIDE. The proposed clearing contains most, if not all, of the ecological requirements for the Night Parrot, including claypans and claypan mosaic, in association with gravel spinifex

Habitat Attribute	Score	Basis of Score
		plain and spinifex sandplain. Both areas supported old-growth spinifex and a high cover of diverse seeding tussocks and herbs, and limited shrubs and trees. Such sites are likely to provide natural protection to old-growth spinifex rings from fire and be productive foraging areas for Night Parrots. (ERD Section 7.6.3.2).
Context	9	It is acknowledged that the species is likely to occur widely in other suitable habitats in the landscape. However, this score reflects the results of habitat mapping which indicates the proposed clearing area likely represents important habitat for Night Parrot in the Study Area, due to the presence of mosaic habitats in broad drainage basins (ERD Section 7.6.3.2)
Stocking Rate	6	The Night Parrot was recorded foraging from two locations 25 km apart via four acoustic units (two at each location) within the NIDE. The foraging calls were detected during long-term deployments after Phase 2 of the Stantec 2020 Survey, which occurred after rainfall. No calls were recorded at these same locations during the Phase 1 or during Phase 2 survey which suggests the species was not roosting in the area. At least three individuals were estimated at each location. These individuals represent the 6th population in Western Australia. Based on current knowledge, the birds appear to be moving through the two areas on a semi regular basis, with activity being highest in the weeks after rainfall (ERD Section 7.6.3.2). A low stocking rate has therefore been applied.
Overall Score	9	The overall score has been weighted predominantly toward the context of the habitat, as the area contains claypan mosaic in broad drainage channels, likely representing the most important habitat for Night Parrot in the Study Area.
Night Parrot Quantum of Impact Calculation		23.55ha foraging habitat (refer Appendix A)

4. Environmental Offsets

Environmental offsets are conservation actions which provide environmental benefits intended to counterbalance the significant residual environmental impacts associated with a Proposal (Government of Western Australia 2014). Offsets differ to mitigation measures in that they are undertaken outside of the area of development/impact (Mine Development Envelope).

Environmental offsets for the Proposal have been developed with consideration of the Commonwealth Government's EPBC Act Environmental Offsets Policy (SEWPaC 2012), and the Principles of the WA Government's Environmental Offset Policy (Government of Western Australia 2011).

4.1 Commonwealth Guidance

The Commonwealth EPBC Act Environmental Offsets Policy (SEWPaC 2012) states that a minimum of 90 percent of offset requirements for any given impact must be met through direct offsets. Direct offsets are defined as those actions that provide a measurable conservation gain for an impacted protected matter. Conservation gain is the benefit that a direct offset delivers to the protected matter, which maintains or increases its viability or reduces any threats of damage, destruction, or extinction.

Deviation from the required 90% will be considered where it can be demonstrated that there will likely be a greater benefit to the protected matter, through increasing the proportion of indirect offsets or where scientific uncertainty is so high that it is not possible to determine a direct offset likely to benefit the protected matter.

Following review of the first draft of the ERD by DMAs, DAWE specifically requested Agrimin to describe how the proposed environmental offsets meet the requirements of the EPBC Act Environmental Offsets Policy. This is demonstrated in Table 5.3.

4.2 State Guidance

The WA Environmental Offsets Policy (Government of Western Australia 2011) requires the following Principles are considered when developing an offset proposal:

- Environmental offsets will only be considered after avoidance and mitigation options have been pursued.
- Environmental offsets are not appropriate for all projects.
- Environmental offsets will be cost effective, as well as relevant and proportionate to the significance of the environmental value being impacted.
- Environmental offsets will be based on sound environmental information and knowledge.
- Environmental offsets will be applied within a framework of adaptive management.
- Environmental offsets will be focussed on longer term strategic outcomes.

Agrimin has considered these Principles in development of this draft Offset Strategy.

5. Draft Offsets Proposal

In the event that the State and Commonwealth departments determine the residual impacts significant enough to warrant an offset consideration, Agrimin will develop an Offset Proposal based on this Strategy, during the statutory assessment process. The Offset Strategy will be prepared in consultation with relevant Government departments and stakeholder groups to ensure the quantum of offsets is proportionate to the level and significance of the environmental impacts (Principle 3 of the WA Offset Policy). The Commonwealth's Offset Assessment Guide will be used where relevant, to assist the State assessment process in determining the offset quantum for the final Offset Proposal (noting Principle 3 and 4 of the EPBC Offsets Policy).

5.1 Direct Offsets

As discussed in Section 4.1, a minimum of 90 percent of the offset requirements for any given impact must be met through direct offsets.

Habitat mapping in the Study Area indicates the Night Parrot is likely to occur widely in other suitable habitats in the landscape, outside of the Indicative Footprint. Therefore, Agrimin proposes direct offsets focussed on maintaining or increasing the viability of the Night Parrot in habitats located outside of the Indicative Footprint by reducing threats of damage, destruction, or extinction.

The Night Parrot, like other significant species recorded within the Study Area, is impacted by key threatening processes including predation by feral animals, and alteration of habitat by weed spread and fire. As such, the proposed Offset Strategy has great potential to positively impact other fauna species occurring within the Study Area.

5.2 Calculation of Direct Offset Value

A summary of the offset value and proposed direct and indirect offsets is detailed in Table 5-1.

Table 5-1: Draft Offset Summary

Environmental value (listing)	Total Quantum of Impact	Offset required[1]	Offset Value (Range)[2]	Direct offset area provided	Indirect offset provided	Percentage of offset met
Night Parrot Habitat	23.55 ha	105 ha	$81,900 to $346,500	On-ground conservation IPA Rangers management	10% of that Offset Value to Night Parrot research	100%

Note 1: Calculated using the Commonwealth Offset Calculator.

Note 2: Based on Pilbara Environmental Offsets Fund 2019/20 base rates of $780 to $3300 per ha.

5.3 Draft Offset Strategy

As the Proposal area is located within the State's Extensive Land-use Zone, and the NIDE intercepts three Native Title Determination Areas, it is not possible to direct funds towards land acquisition to be used for direct environmental offset. Agrimin therefore proposes a strategic approach (Principle 6 of the WA Offset Policy) through establishing a managed offset fund within the bioregion to support conservation activities in the relevant Title Areas that support known populations of Night Parrot. A managed fund model is considered an appropriate mechanism to enable funding of a third party to undertake agreed offset actions, such as on-ground conservation management (i.e. feral animal control, fire management and weed monitoring/eradication) and research of the species affected by the Proposal. A draft managed fund model is summarised in Table 5-2.

Table 5-2 Draft Managed Fund Model

Managed Fund		
Proposed Governance Model The Offset Proposal's Managed Fund Governance Agreement Model will be developed in consultation with relevant Government departments and stakeholder groups, and include consideration for the following provisions: • Decision making arrangements; • Approval requirements set out in the Ministerial conditions; • Objectives; • Key offset actions and strategies; • Rules of expenditure; • Principle amount; • Probity standards; • Reporting requirements that demonstrate how the approval conditions have been met; and • Legislative requirements.		
Offset Type	Offset Summary	Location
On-ground Management	**On-ground management -** This includes revegetation (re-establishment of native vegetation in degraded areas) and rehabilitation (repair of ecosystem processes and management of weeds, disease or feral animals). The objective of on-ground management actions is tangible improvement to environmental values in the offset area (Government of Western Australia 2014). Agrimin proposes to offset the direct impact to the Night Parrot through on-ground management options in collaboration with Traditional Owner groups. On-ground management is proposed to be implemented throughout the Proposal area and surrounds including remote communities to mitigate and manage impacts from altered fire regimes, spread of weeds and feral animal control, given the potential cumulative impacts from such activities.	Ngururrpa and Kiwirrkurra IPAs Great Sandy Desert Bioregion
Research	**Research projects -** Research project offsets can only be applied under Part IV of the EP Act and must be reasonably related to the impact (Government of Western Australia 2014). The research projects will be prepared in consultation with key stakeholders and designed to increase the knowledge base where lacking for significant fauna species located within Proposal area. It will so aim to result in positive conservation outcomes, targeted at improving the management and protection of terrestrial fauna species impacted by the Proposal.	Great Sandy Desert Bioregion

5.3.1 Indigenous Protected Area

The NIDE traverses three Indigenous Protected Areas (IPA). The locations where the Night Parrot was detected are within two of these IPAs, the Ngururrpa and Kiwirrkurra (Figure 5-1), therefore this Offset Strategy specifically applies to these two IPAs.

IPAs are voluntarily dedicated by Indigenous groups on Indigenous owned or managed land or sea country. 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.

IPA management plans describe how Indigenous groups 'care for country' using a combination of traditional Indigenous knowledge and contemporary western science. These plans identify an International Union for Conservation of Nature (IUCN) management category to ensure that their management is in line with international standards.

Agrimin is of the view that the offset contributions required by this Proposal are provided directly into a regional fund that support both the Kiwirrkurra and Ngururrpa IPA on-ground conservation work. The distribution of these fund can be discussed further relevant parties during the finalisation of the Offset Proposal, which support the principles of the IUCN management category, including:

- Protection of natural ecosystems and promotion of sustainable use must be integrated and mutually beneficial; category VI can potentially demonstrate best management practices that can be more widely used.
- New skills and tools need to be developed by management authorities to address the new challenges that emerge from planning, monitoring and managing sustainable use areas.
- There is also need for development of appropriate forms of governance suitable for category VI protected areas and the multiple stakeholders that are often involved. Landscape-scale conservation inevitably includes a diverse stakeholder group, demanding careful institutional arrangements and approaches to innovative governance.

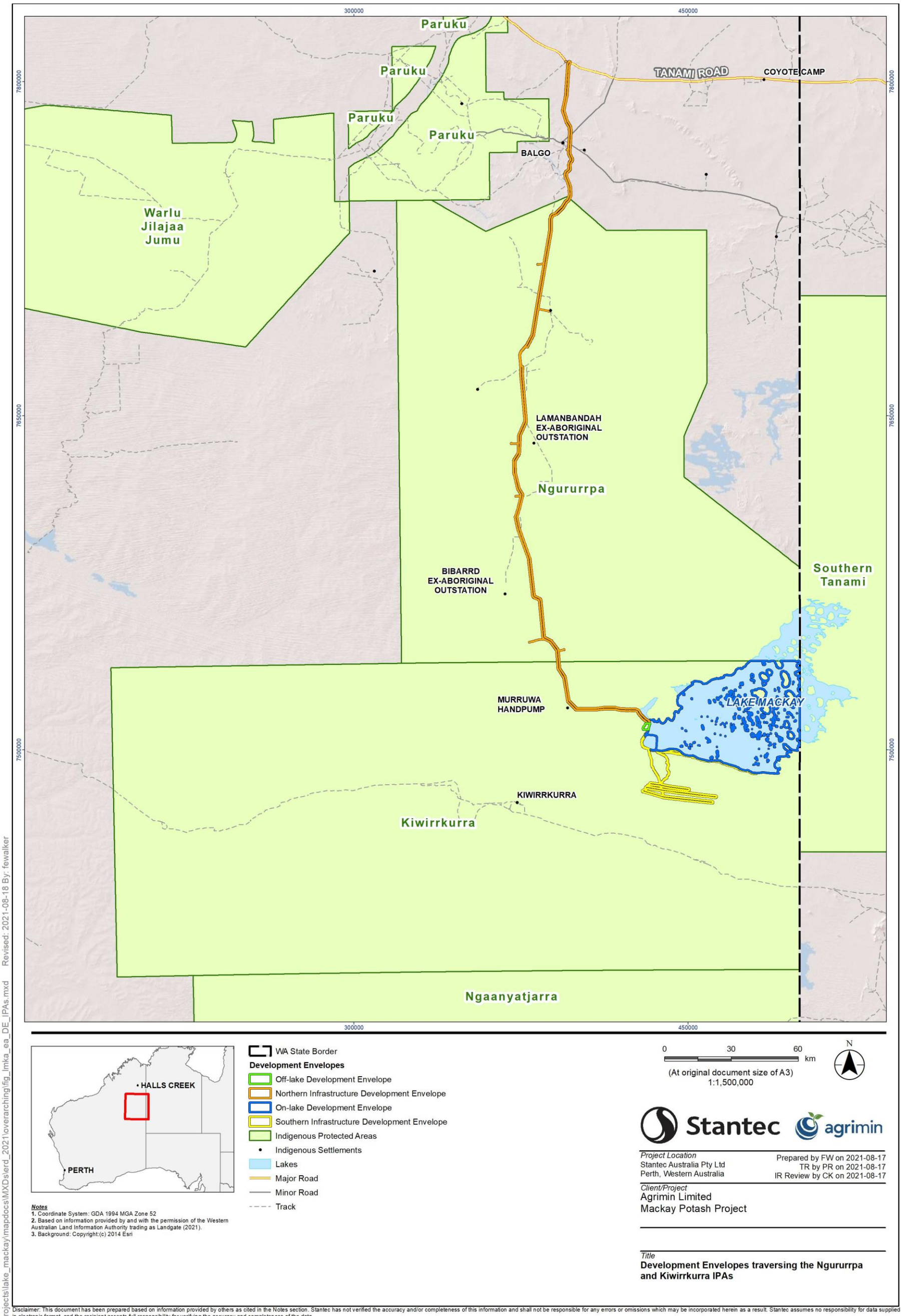


Figure 5-1 Development envelopes traversing the Ngururrpa and Kiwirrkurra IPAs

5.3.2 Tjamu Tjamu Aboriginal Corporation – Kiwirrkurra IPA (Plan for Country)

The Proposal area traverses the remote Kiwirrkurra IPA located in the Great Sandy and Gibson Deserts in the far southeast corner of Western Australia's Pilbara region (Figure 5-1). It extends from the northern edge of Lake Mackay on the Northern Territory border south to Lake Macdonald and approximately 300km to the west, extending beyond Jupiter Well.

The nearest major town is Alice Springs in the Northern Territory, 700kms east on a mostly dirt road. The nearest Aboriginal communities are Kintore (about 150 kms east) and Balgo (400 kms north). Service provision is complex, coming mainly from either Alice Springs or the Ngaanyatjarra region to the south.

The IPA covers the whole of the Kiwirrkurra Native Title determination, an area of 42,857 square kilometres. It therefore contributes about 3.6% to Australia's National Reserve System (based on 2012 protected areas data). It shares its southern boundary with the Ngaanyatjarra IPA and most of its eastern boundary with the Southern Tanami IPA, thereby contributing to a continuous network of protected lands in the region. The Kiwirrkurra IPA increases the level of protection of the Great Sandy Desert bioregion from 15 to 20%, and that of the Gibson Desert bioregion from 36 to 51% (again based on 2012 data).

The Kiwirrkurra IPA is owned and managed by traditional owners through their prescribed body corporate, Tjamu Tjamu Aboriginal Corporation. The area is managed to protect biodiversity and cultural resources, based on Indigenous perspectives of connecting to and looking after country and complemented by Western knowledge and management principles (Tjamu Tjamu Aboriginal Corporation 2014).

The Kiwirrkurra IPA – Plan for Country sets out management actions to protect both natural and cultural values, and provide a range of economic, educational, health and wellbeing benefits for the community. The priorities for managing country are grouped into four key areas, although these are closely inter-related:

- Looking after Culture;
- Looking after Country;
- Keeping our People Strong; and
- Economic Development.

Agrimin proposes to provide support to the IPA's key conservation program of 'Looking after Country', which includes objectives focused on maintaining and improving biodiversity and environmental health across the Kiwirrkurra IPA, through two-way management, including:

- Looking after water places;
- Right way fire;
- Looking after plants and animals, especially threatened species and bush foods and medicines;
- Managing feral animals: cats, foxes, camels, and rabbits; and
- Managing weeds.

These objectives are further supported by the Kiwirrkurra IPA Science and Monitoring Plan (SMP) (Paltridge and Crossing 2016). The SMP provides more detail on some of the management strategies identified in the IPA Plan, particularly the 'Looking after Country' theme. Objectives and actions have been developed to manage, monitor, and reduce key threats, and improve the condition of land within the IPA. A key focus of the SMP is building the capacity of the Traditional Owners to implement the management actions required.

Providing offset funding via a Model Fund will result in the key benefit of building the capacity of the Kiwirrkurra Rangers to undertake conservation activities on their prescribed land. The management approach can be formalised and endorsed in the revision of the IPA's Plan for Country.

5.3.3 Ngururrpa Aboriginal Corporation – IPA (Plan for Country)

The longest stretch of road corridor (approximately 220 km) supporting the Project is located within the Ngururrpa Native Title Determination Area. The Ngururrpa IPA was formally launched on 6 May 2021.

The nearest town to Ngururrpa country is Halls Creek, approximately 500 kms north along the Tanami Road. The IPA is connected to Paruku IPA in the north, Kiwirrkurra IPA to the south, and Southern Tanami IPA to the east, contributing to a contiguous network of protected areas in the region.

Located within the Great Sandy Desert bioregion, the land is comprised of a network of sandplains and dunefields. Prior to 2015, very little was known about the biodiversity of this IPA (Parna Ngururrpa 2019). Since that time, three main surveys have increased knowledge about biodiversity values and the area is known to contain a number of state and nationally listed threatened species, including the Night Parrot and other EPBC Act listed species such as Greater Bilby, Great Desert Skink and Red-tailed Phascogale. However, there is a need to learn more about biodiversity in this area, particularly in less accessible country (Parna Ngururrpa 2019).

The *Ngururrpa Indigenous Protected Area Plan for Country 2020-2025* (Parna Ngururrpa 2019) sets out strategies and actions aimed at conserving the Night Parrot and other threatened species, including:

- Rangers to work with elders and scientists to undertaken regular tracking surveys, and other surveys, to monitor fauna.
- Rangers to learn from other ranger groups that have experience in conservation of the same fauna.
- Carefully burn country to maintain good habitat.
- Manage feral animals including cats, foxes, rabbits, and camels.

As with the Kiwirrkurra Rangers, providing offset funding to the Ngururrpa IPA will result in the key benefit of building the capacity of rangers to undertake conservation activities.

5.4 Compliance with EPBC Act Environmental Offsets Policy Requirements

In the process of developing this Offset Strategy, Agrimin has applied the Offset Principles as specified in the EPBC Act Environmental Offsets Policy. As requested by DAWE following their review of the first draft of the ERD March 2021, Table 5.3 demonstrates how the proposed environmental offsets meet the requirements of the policy.

Table 5-3 Compliance with Offset Principles

Principle	How this Offset Strategy applies the Principle
Suitable offsets must deliver an overall conservation outcome that improves or maintains the viability of the protected matter.	Supporting on-ground conservation activities by the Kiwirrkurra and Ngururrpa Rangers has the potential to deliver an overall conservation outcome for the Night Parrot in these IPAs. Additionally, providing funding to Night Parrot research will deliver conservation outcomes for Night Parrot populations in the region.
Suitable offsets must be built around direct offsets but may include other compensatory measures.	The Strategy proposes 90% direct offsets to support on-ground conservation by IPA Rangers and 10% indirect offsets towards Night Parrot research.
Suitable offsets must be in proportion to the level of statutory protection that applies to the protected matter.	In Western Australia, the Night Parrot is listed as Critically Endangered fauna under the *Biodiversity Conservation Act 2016*. Nationally it is listed as Endangered under the EPBC Act, and internationally on the IUCN Red List of Threatened Species as Endangered. The Night Parrot is therefore considered to be facing a very high risk of extinction in the wild. The proposed direct offsets to support on-ground conservation activities will enable further protection of the Night Parrot population in the Kiwirrkurra and Ngururrpa IPAs. Indirect offsets directed to Night Parrot research has the potential to discover more populations of Night Parrots in the region.

Principle	How this Offset Strategy applies the Principle
Suitable offsets must be of a size and scale proportionate to the residual impacts on the protected matter.	The offset value has been calculated using the Commonwealth Offset Calculator to ensure the offset proposed is of a suitable size and scale.
Suitable offsets must effectively account for and manage the risks of the offset not succeeding.	Risk management strategies will be included in the formalised managed fund agreements to minimise the risk of offsets failing. These risk management strategies may include objectives, targets, monitoring, thresholds and contingencies.
Suitable offsets must be additional to what is already required, determined by law or planning regulations, or agreed to under other schemes or programs.	Proposed offsets are in addition to conservation actions already required by relevant legislation.
Suitable offsets must be efficient, effective, timely, transparent, scientifically robust, and reasonable.	Proposed on-ground conservation actions will be based upon management plans developed for Kiwirrkurra IPA Rangers, and under development for the Ngururrpa IPA Rangers.
Suitable offsets must have transparent governance arrangements including being able to be readily measured, monitored, audited, and enforced.	Agrimin proposes a strategic approach (Principle 6 of the WA Offset Policy) through establishing a managed offset fund within the bioregion. A formalised managed fund model is considered an appropriate mechanism to enable funding of a third party to undertake agreed offset actions, such as on-ground conservation management (i.e. feral animal control, fire management and weed monitoring/eradication) and research of the species affected by the Proposal.

5.5 Stakeholder consultation

The scope, objectives and quantum of the Offset Proposal will be prepared in consultation with relevant Government departments and stakeholders and presented in a Preliminary Offset Strategy as part of the assessment process.

5.6 Finalisation and implementation of offsets

A final Offset Proposal will then be prepared and finalised for implementation during the construction and operational phases of the Proposal.

6. References

Australian Government (2012). Commonwealth Offsets Assessment Guide, 2012.

Government of Western Australia (2011) WA Environmental Offset Policy, 2011.

Government of Western Australia (2014) WA Environmental Offsets Guidelines, 2014.

Paltridge, R., and Crossing, K. (2016). Kiwirrkurra IPA Science and Monitoring Plan 2016-2020. Prepared for Central Desert Native Title Services, 2016.

Parna Ngururrpa (2019). Ngururrpa IPA Plan for Country 2019 to 2024. Prepared by Parna Ngururrpa Aboriginal Corporation and Desert Support Services, WA, 2019.

SEWPaC (2012). Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy. Department of Sustainability, Environment, Water, Population and Communities, October 2012.

Tjamu Tjamu Aboriginal Corporation (2014). Kiwirrkurra IPA – Plan for Country 2014-2019. Prepared by Tjamu Tjamu Aboriginal Corporation and Central Desert Native Title Services, Kiwirrkurra, WA, 2014.

Appendices

Appendix A Quantum of Impact Calculations

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Night Parrot
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	**1.2%**

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	Yes	The loss of primary foraging habitat for the Night Parrot will occur during clearing, comprising claypans and claypan mosaic, and saline flats and depresssions	**Area**	23.55	Hectares	ERD Section 7.6.3.2 and 7.4.1
			Quality	**9**	Scale 0-10	
			Total quantum of impact	21.20	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
Threatened species habitat																				
Area of habitat	Yes	21.20	Adjusted hectares	Trust Fund Model	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	105	**Risk of loss (%) without offset**	15%	**Risk of loss (%) with offset**	5%	10.50	100%	10.50	8.27	21.48	101.33%	Yes	
									Future area without offset (adjusted hectares)	89.3	**Future area with offset (adjusted hectares)**	99.8								
					Time until ecological benefit	2	**Start quality (scale of 0-10)**	6	**Future quality without offset (scale of 0-10)**	5	**Future quality with offset (scale of 0-10)**	7	2.00	90%	1.80	1.76				
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
Threatened species																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Perth
Ground Floor, 226 Adelaide Terrace,
PERTH, WA 6000
Tel +61 (08) 6222 7000

Please visit **www.stantec.com** to learn more about how Stantec design with community in mind.

Appendix C Feral Predator Control Program

C.1 Pest Animals Management Guidelines

The Department of Agriculture, Water and Environment (DAWE) (2017) document, *Australian Pest Animal Strategy 2017-2027,* is applicable to the control of feral predators at the Mackay Potash Project as it involves human presence in a remote location creating more accessibility, generating waste and potentially causing artificial ponding of water, all of which could attract introduced species to the area. The guideline provides guidance on the following;

- identification of the stages of pest management;
- roles and responsibilities of pest management;
- national goals for pest prevention; and
- implementation of pest management.

C.2 Potential Impacts

Feral predators, especially feral cats and Red Foxes have contributed to the decline and extinction of many species in Australia (Abbott 2002, Burbidge and McKenzie 1989, Ford *et al.* 2001, Short and Smith 1994, Woinarski *et al.* 2014, 2015). Feral predators are also likely to negatively impact upon fauna assemblages, in particular on small and medium-sized native vertebrates in Australia (Dickman 1996). With respect to the Project, predation by feral animals is listed as a key threatening process for the following significant species that have been recorded in the vicinity of the Project:

- Greater Bilby (*Macrotis lagotis*) (Vu, Vu)
- Brush-tailed Mulgara (*Dasycercus blythi*) (P4)
- Night Parrot (*Pezoporus occidentalis*) (En, CR)
- Princess Parrot (*Polytelis alexandrae*) (Vu, P4)
- Striated Grasswren (inland) (*Amytornis striatus striatus*) (P4)
- Australian Painted Snipe (*Rostratula benghalensis*) (En, IA)
- Great Desert Skink (*Liopholis kintorei*) (Vu, Vu)
- Marsupial Mole spp (P4)
- Gull-billed Tern (*Sterna nilotica*^) (Mi, IA)

Additionally, when the lake is in flood, the islands on Lake Mackay provide suitable breeding habitat for waterbirds such as the Banded Silt. During these waterbird breeding events, the eggs and chicks are particularly vulnerable to predation.

Feral predators, particularly feral cats are already known to occur within the Project Area and surrounding region. However, the operation of the Project could attract and lead to an increased abundance of feral predators in the vicinity of the Project through an increase of available foraging resources. Foraging resources may include access to putrescible wastes and landfill, freshwater sources but may also result from access to carcasses from road strike.

C.3 Feral and Pest Vertebrate Fauna

Through the consolidated Survey efforts of terrestrial fauna around the Lake Mackay area, eight introduced fauna species were recorded within the Study Area, and which have potential to occur in the Project area, including European Cattle (*Bos taurus*), the Camel (*Camelus dromedarius*), Feral Cat (*Felis catus*), Feral Dog (*Canis lupus*), Horse (*Equus caballus*), Red Fox (*Vulpes vulpes*), House Mouse (*Mus musculus*), and the Rabbit (*Oryctolagus cuniculus*). Of particular importance, cats and foxes have been found to pose the greatest risk to the area as predators of significant native species, and so will be addressed in this Feral Predator Control Program (Paltridge and Crossing 2016).

An increase in the abundance of feral predators (cats, foxes) may occur in certain areas due to ease of access along established roads, scavenging opportunities relating to increased human activity (e.g. food waste, landfills, etc) and increased road-kill on access roads. Population of fauna of significance, such as Great Desert Skink, Bilby, Night Parrot and the Brush-tailed Mulgara are particularly susceptible to impacts from feral predators.

Following implementation of the Project, feral animals may be attracted to the accommodation village and/or landfill and any freshwater sources. Management actions and monitoring protocols for feral predators will be undertaken, with a specific focus on high risk areas, such as landfill sites, camp site/waste disposal and water storage areas.

Agrimin proposes to investigate options to engage traditional owners to assist in managing feral predators, particularly in habitat important to significant species and/or locations where significant species have been recorded.

C.3.1 Feral Cat (*Felis catus*)

Feral cats are now found all over Australia, the same species as domestic cats, however living and reproducing in the wild and hunt and scavenge to survive. Mostly solitary animals with nocturnal behaviour and a carnivorous diet of small mammals, birds, reptiles, amphibians, fish and insects. Since their proliferation, feral cats have threatened the survival of over 100 native Australian animals through predation or competition for food and shelter. This feral species has also been known to carry infectious diseases that could be transmitted to native animals, domestic livestock and humans (DAWE n.d).

C.3.2 European Red Fox (*Vulpes vulpes*)

Introduced to Australia in 1855 for hunting purposes, the Red Fox has since become a feral found across most of Australia. Mainly active at night, feral foxes are scavengers, who prey on anything available. This introduced species poses a threat to the environment as is preys on ground nesting birds and small to medium sized mammals and often undermines recovery efforts for threatened species. Although the fox presents an additional threat to already declining populations of native animals (Commonwealth of Australia 2010).

C.3.3 Silver Gulls (*Chroicocephalus novaehollandiae*)

While not feral, Silver Gulls are known to predate Banded Stilt chicks during breeding events and have considerable influence on breeding success {Pedler, 2017}. Silver Gull populations will potentially increase in response to the same foraging resources as feral predators, due to the Project operations (particularly food and waste availability in accommodation village)

C.4 Management Provisions

In line with the DAWE's *Australian Pest Animal Strategy 2017-2027,* the management actions that will be implemented at the Mackay Potash Project will follow the following stages:

- Prevention
- Eradication
- Containment
- Asset Protection and Monitoring

This Control Program also outlines contingency actions that will be implemented if the actions of the above four stages fail, and monitoring shows increased feral predator population.

The following control measures will be implemented at the site as part of standard controls to control feral predators and provide contingency arrangements should their populations be found to be increasing in the Project Area.

Table C-7-2 Management Actions for Feral Predator Control

Stage of control	Strategy	Timing	Responsibility
Prevention	Implement the Feral Predator Control Program which works towards controlling the numbers, of introduced predators within the Project.	Life of Mine	General Manager
	Domestic cats and dogs will be banned at the Project.	Life of Mine	General Manager
	Take measures to limit the attraction of introduced fauna to the Project, including proper hygiene and landfill management practices (cover and fence waste disposal sites)	Life of Mine	General Manager
Eradication	Investigate options to engage traditional owners to manage feral predators, particularly in habitat important to significant species and/or locations where significant species have been recorded. See Section C.4.1.	Life of Mine	General Manager
Containment	Fence landfill areas and secure all waste bins.	Life of Mine	Environmental Manager
Asset Protection and Monitoring	Undertake monitoring to determine changes in occupancy rates of feral animals. See Section C.4.2.	Life of Mine	Environmental Manager
	Report sightings on introduced fauna to the site environmental department. See Section C.4.3.	Life of Mine	All staff, contractors and site visitors
	Make data available to Traditional Owners to contribute to their Management Practices detailed in their Plan for Country	Life of Mine	General Manager
Contingency	Increase frequency of feral control actions	Only if other stages of control fail	General Manager
	Investigate new opportunities in feral control methods		General Manager

C.4.1 Investigate options to engage Traditional Owners

Agrimin plan to investigate options to engage Traditional Owners identified as important and local stakeholders of the Project to participate in feral predator control. Management actions are already underway by Indigenous Ranger groups, Agrimin will participate in and help to facilitate their programs where possible. The Project Area traverses three Indigenous Protected Areas (IPA), including the Ngururrpa and Kiwirrkurra IPAs. Indigenous Protected Areas (IPAs) are voluntarily dedicated by Indigenous groups on Indigenous owned or managed land or sea country. 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.

IPA management plans describe how Indigenous groups 'care for country' using a combination of traditional Indigenous knowledge and contemporary western science. These plans identify an International Union for Conservation of Nature (IUCN) management category to ensure that their management is in line with international standards.

C.4.1.1 Kiwirrkurra IPA – Plan for Country

The Kiwirrkurra IPA is owned and managed by traditional owners through their prescribed body corporate, Tjamu Tjamu Aboriginal Corporation. The area is managed to protect biodiversity and cultural resources, based on Indigenous perspectives of connecting to and looking after country and complemented by Western knowledge and management principles (Tjamu Tjamu Aboriginal Corporation 2014).

The Kiwirrkurra IPA's – Plan for Country sets out management actions to protect both natural and cultural values, and provide a range of economic, educational, health and wellbeing benefits for the community. The priorities for managing country are grouped into four key areas, although these are closely inter-related:

- Looking after Culture;

- Looking after Country;
- Keeping our People Strong; and
- Economic Development.

Agrimin proposes to provide support to the IPA's key conservation program of 'Looking after Country', which includes objectives focused on maintaining and improving biodiversity and environmental health across the Kiwirrkurra IPA, through two-way management, including:

- Looking after water places;
- Right way fire;
- Looking after plants and animals, especially threatened species and bush foods and medicines;
- Managing weeds; and
- Managing feral animals: cats, foxes, camels, and rabbits as applicable to this Feral predator Control Program.

These objectives are further supported by the Kiwirrkurra IPA Science and Monitoring Plan (SMP) (Paltridge and Crossing 2016). The SMP provides more detail on some of the management strategies identified in the IPA Plan, particularly the 'Looking after Country' theme. Objectives and actions have been developed to manage, monitor, and reduce key threats, and improve the condition of land within the IPA. A key focus of the SMP is building the capacity of the Traditional Owners to implement the management actions required.

The conservation activities undertaken by the Kiwirrkurra Rangers on their prescribed land specifically address the control of feral predators. Table C-7-3 outlines the management measures implemented in the Kiwirkurra IPA to control feral predators. The plans seek to avoid baiting programs for foxes and cats as they are not so effective (particularly for cats) and is more likely to impact populations of Dingos (the main predator of feral cats).

Table C-7-3 Management measures for feral animals as detailed in the Kiwirrkurra IPA Plan for Country and Science and Monitoring Plan

Feral Species	Management Actions
General	Establish >15 permanent 2 ha plots in each Kiwirrkurra Priority Management Zone (PMZ) (of which there are three, Kiwirrkurra, Murruwa and Nyinmi) to conduct annual broadscale monitoring of predators. The monitoring should capture: • Frequency of Occurrence of sign of each feral animal species (% of 2 ha plots) in each PMZ. • Frequency of Occurrence of key threatened species (% of 2 ha plots) in each PMZ. • Number of feral animals removed through hunting, shooting, trapping and poisoning. • Impact of feral predators (cats and foxes) on key animal species (e.g. by tracking, analysing scats or checking stomach contents) • Collect and analyse predator scats from threatened species sites. Record the number of predator scats analysed. • Number of rangers trained to conduct pest animal control safely, humanely, legally and effectively. Provide all Rangers with training in animal welfare and OH&S protocols to ensure all feral animal control is conducted safely, legally and humanely Where required, undertake works to minimise feral animal damage. E.g. physical barriers (fencing or rockhole spiders) and/or removal of camels Additional measures include: Trial other predator control techniques including leghold trapping and grooming traps in the Kiwirrkurra PMZ Monitor Predation Pressure at Bilby and Great Desert Skink burrows using motion-detector cameras to record frequency of predator visitation to burrows, in sites with and without predator control

Feral Species	Management Actions
Cats	Kiwirrkurra and other Pintupi people historically hunted cats for food and continue to do so today. Anecdotal evidence suggests that this hunting, along with regular patch burning, may be a factor in the continued survival of threatened species near these communities. The key management action for feral cats is to integrate Traditional Hunting skills with new control technologies to produce a multi-skilled feral animal strike-force team who will undertake traditional hunting of feral cats, rabbits and foxes with a focus on priority Bilby and Great Desert Skink sites in the Kiwirrkurra Priority Management Zone (PMZ). Record traditional hunting results. Additional measures include: Introduce tools to improve the efficiency of cat hunting, such as expert dog training for hunters with hunting dogs
Fox	Integrate Traditional Hunting skills with new control technologies to produce a multi-skilled feral animal strike-force team who will undertake traditional hunting of feral cats, rabbits and foxes with a focus on priority Bilby and Great Desert Skink sites in the Kiwirrkurra Prioirty Management Zone (PMZ). Record traditional hunting results. Additional measures include: Continue to explore methods of fox control that don't affect dingo populations such as tracking foxes to dens and targeting these with baits, bait deployment via fox-specific bait stations and conducting ground baiting in areas at least 20 km from water where dingoes are generally absent

C.4.1.2 Ngururrpa Aboriginal Corporation – IPA (Plan for Country)

The longest stretch of road corridor (approximately 220 km) supporting the Project is located within the Ngururrpa Native Title Determination Area. The Ngururrpa IPA was formally launched on 6 May 2021.

Located within the Great Sandy Desert bioregion and comprising of a network of sandplains and dunefields, Ngururrpa IPA is known to contain a number of state and nationally listed threatened species, including the EPBC Act listed Night Parrot, Greater Bilby, and Great Desert Skink. The IPA is connected to IPAs in the north, south, and east, contributing to a contiguous network of protected areas in the region. On ground management will be undertaken by Indigenous rangers according to the Ngururrpa Indigenous Protected Area Plan for Country 2019-2024.

The plan outlines 12 targets and priorities that management actions will address:

- Cultural knowledge & sites;
- Kids (young people);
- Rangers;
- Tourism;
- Bush foods and medicine;
- Burning country right way;
- Special animals;
- Water places;
- Outstations, camps & water bores;
- Resources (buildings, vehicles, equipment);
- Mining and exploration; and
- Feral animals and weeds as applicable in this Feral Predator Control Program.

Integrating the management practices of this Plan for Country with Agrimin's Feral Predator Control Program is beneficial for all of the Ngururrpa priorities, two in particular; rangers and feral animals. By undertaking the monitoring and management measures detailed in this Program, results can be used to inform further development of the Ngururrpa Plan for Country and help Rangers to plan and undertake their work.

C.4.2 Monitoring

Agrimin plan to monitor feral animal presence in and around their operations as part of their Control Program. The data that is collected from this monitoring will help to inform and update management actions as well as contribute to the IPAs' Plan for Country management and monitoring detailed in Section C.4.1. Agrimin's monitoring program will focus on recorded sightings of feral animals in key areas.

Prior to and/or during construction of the Project, a baseline value of feral animal occupancy will be obtained. The monitoring program will then aim to record and monitor the presence of feral predators compared to the determined baseline levels to determine the effectiveness of the Feral Predator Control Program.

Monitoring will involve the use of camera traps that will be setup at potential impact areas including the accommodation village, landfill and other areas in close proximity to operations where there is potential for feral predator access to water, food or shelter. Camera traps will also be set up in areas where control programs have been implemented to assist with determination of effectiveness of the programs (Robley 2010). If the results of monitoring indicate an increase / proliferation of feral animals, management actions will be reviewed and if required, the contingency actions detailed in Table C-7-2 will be implemented.

C.4.3 Opportunistic visual observations

Site personnel and contractors will be required to record sightings of feral predators at the site, including date, time, location and species. Those observations will be considered in relation to the annual monitoring results, to inform management of site activities.

C.4.4 Employee education

Site personnel and contractors will be trained at induction. Training will include the identification of species considered feral predators, the measures detailed in this Feral Predator Control Program, the importance of and responsibility of individuals to implement the above mitigation measures and reporting of feral predators.

C.4.5 Complaints management

A complaints management system will be implemented at the site. The system will, at a minimum, record:

- the number and details of complaints received concerning the presence of feral predators in the Project's surrounding areas (such as an increase in the presence of these species at the Balgo or Kiwirrkurra communities)
- any action taken in response to the complaints to reduce or eliminate the risk of future events.

A notice will be erected at the site entrance providing contact details of the person to be contacted regarding any complaint (e.g. Site Manager).

C.5 References

Abbott, I. (2002) Origin and spread of the Cat, *Felis catus*, on mainland Australia, with a discussion of the magnitude of its early impact on native fauna. *Wildlife Research* 29: 51-74.

Burbidge, A. A. and McKenzie, N. L. (1989) Patterns in modern decline of Western Australia's vertebrate fauna: causes and conservation implications. *Biological Conservation* 50: 143-198.

Commonwealth of Australia 2010, European Red Fox (Vulpes Vulpes), <https://www.environment.gov.au/system/files/resources/1910ab1d-a019-4ece-aa98-1085e6848271/files/european-red-fox.pdf> accessed 16 August 2021

Commonwealth of Australia 2011, Feral European Rabbit (Oryctolagus Cuniculus) <https://www.environment.gov.au/system/files/resources/7ba1c152-7eba-4dc0-a635-2a2c17bcd794/files/rabbit.pdf> accessed 16 August 2021

Department of Agriculture, Water and Environment (DAWE) 2010, National Feral Camel Action Plan <https://www.environment.gov.au/system/files/resources/2060c7a8-088f-415d-94c8-5d0d657614e8/files/feral-camel-action-plan.pdf> accessed 16 August 2021

Department of Agriculture, Water and Environment (DAWE) 2010, Feral Cats <https://www.environment.gov.au/biodiversity/invasive-species/feral-animals-australia/feral-cats> accessed 16 August 2021

Department of Agriculture, Water and Environment (DAWE) 2017, Australian Pest Animal Strategy 2017 to 2027

Ford, H. A., Barrett, G. W., Saunders, D. A. and Recher, H. F. (2001) Why have birds in the woodlands of Southern Australia declined? *Biological Conservation* 97(1): 71-88.

Paltridge, R., and Crossing, K. (2016). Kiwirrkurra IPA Science and Monitoring Plan 2016-2020. Prepared for Central Desert Native Title Services

Pedler, D. R. (2017) *Banded Stilt Movement and Breeding Ecology in Arid Australia*. Deakin University.

Short, J. and Smith, A. (1994) Mammal decline and recovery in Australia. *Journal of Mammalogy* 75(2): 288-297

Tjamu Tjamu Aboriginal Corporation (2014). Kiwirrkurra IPA – Plan for Country 2014-2019. Prepared by Tjamu Tjamu Aboriginal Corporation and Central Desert Native Title Services, Kiwirrkurra, WA

Woinarski, J. C. Z., Burbidge, A. A. and Harrison, P. L. (2014) *The Action Plan for Australian Mammals 2012*. CSIRO Publishing, Collingwood, Victoria.

Appendix D Dust Management Program

HAUL ROAD CONSTRUCTION
BALGO COMMUNITY
DUST MANAGEMENT PLAN

Document History

Document Accountability

TERM	DEFINITION	POSITION / NAME
Owner	Accountable for approval and authorised discretion to implement or significantly change the system	Tom Lyons, General Manager
Custodian	Accountable for monitoring the application of the system and advising the owner of the monitoring outcomes	Rhys Bradley, Chief Commercial Officer
Facilitator	Accountable for proposing system design or redesign and facilitation of conformance	TBA, Construction Manager

Document Version Control

REVISION	DATE	AUTHOR	CHANGE DESCRIPTION	APPROVED BY
A	11/05/2021	Matthew Spence	Issued for Comment	Tom Lyons

1. Purpose and Scope

The construction activities of the Haul Road within the Northern Infrastructure Development Envelope (NIDE) has the potential to generate and release fugitive dust emissions during its construction phase. Agrimin is proposing to manage construction related impact through the implementation of an approved Construction Environmental Management Plan (CEMP), which will form part of the ERD package that is submitted to the EPA as part of the Part IV assessment process. The CEMP presents a robust management approach to protect the environmental values within the NIDE. The overarching objective of the CEMP is to avoid, where possible, otherwise minimise direct and indirect impacts to the key environmental factors from the construction of the Project, including mitigating the release of fugitive dust emissions that may impact on the amenity of sensitive receptors along the route (i.e. Balgo Community).

To further demonstrate Agrimin's commitments to minimize dust emissions effecting these sensitive receptors, Agrimin propose implementing specific management measures for fugitive dust emissions while constructing segments of the Haul Road that traverse in proximity to the Balgo Community (10 km segment of the Haul Road as shown in Figure 1). As the construction of the Haul Road moves north towards the Balgo Community, the site manager will undertake the following key measures, which are further detailed below:

- Inform the Community that construction is due to commence and the timeframes for completion
- Provide key contact details to the Community and maintain a complaint register
- Implement dust management measures as detailed in the CEMP

The ERD will be updated to include a commitment to implement the management approach detailed below, in addition to the current management approach detailed in the CEMP, as the Haul Road construction approaches the Balgo Community (comes within 5 km's of the nearest household).

The additional management measures have been informed through the application of the risk assessment detailed in the Department of Environment and Conservation (2011) guidelines - *A guideline for managing the impacts of dust and associated contaminates from land development sites, contaminated sites remediation and other related activities*.

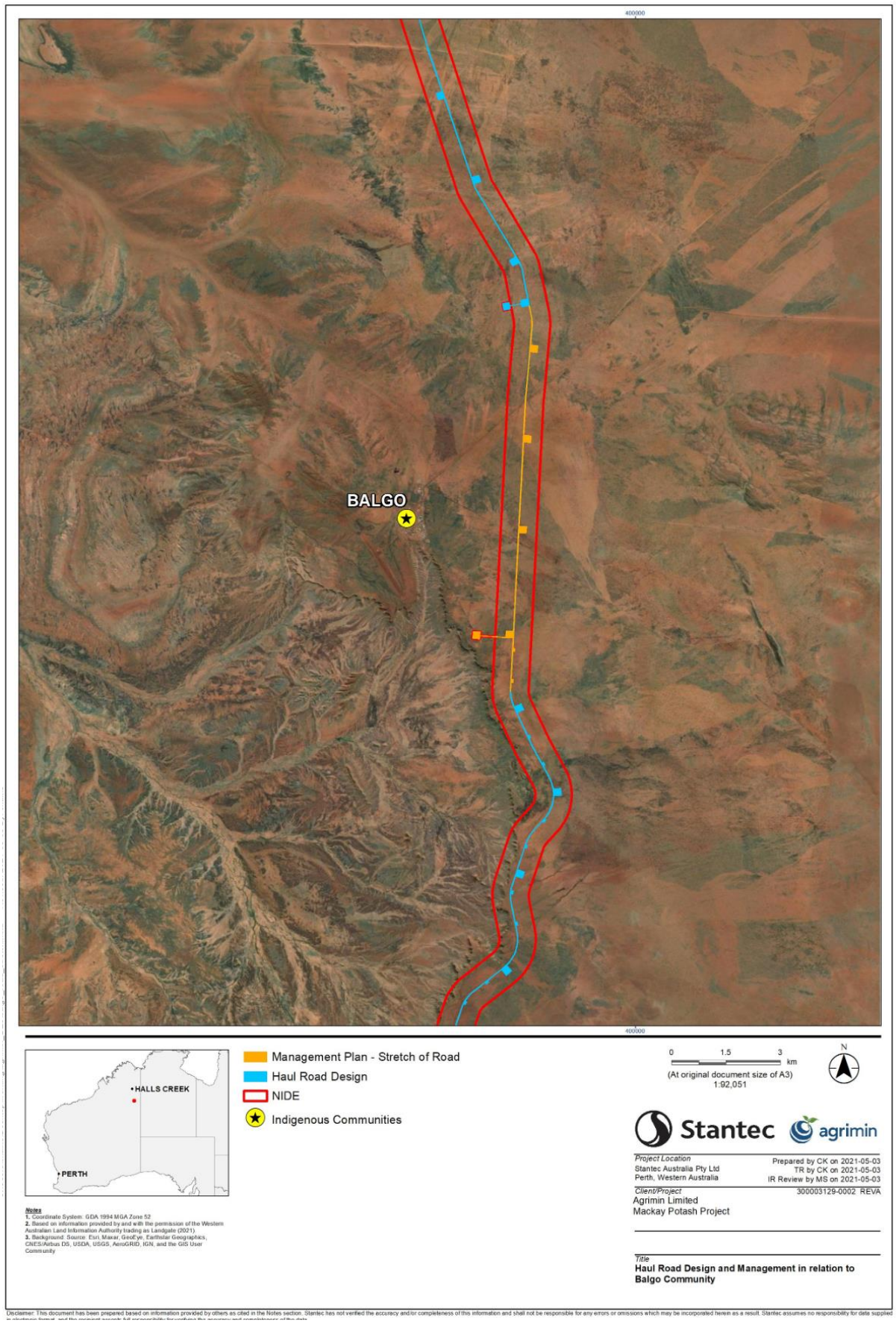


Figure 1 – Balgo Community Dust Management Zone

.

2. Potential Impacts

Construction of the Haul Road in close proximity of the Balgo Community has the potential to result in airborne fugitive dust which could impact upon the Community's amenity.

3. Emissions Sources

Emissions of dust from construction of the proposed Haul Road may result from three main processes:

- excavation and ground disturbance;
- materials handling and stockpiling; and
- construction vehicular movements.

The dust-generating sources and activities associated with the construction of the Haul Road are described in Table 1. The section of the Haul Road that presents a risk to the Balgo Community will remain unused after excavation until the road is sealed to reduce dust emissions from vehicle movements. Agrimin will explore the opportunity to seal this section of the road as a priority to ensure the potential for dust emissions is minimized.

Table 1: Potential dust sources and dust generating activities within a 5 km radius of the Balgo Community:

Item	Activity	Duration of works near to the Balgo Community (days)	Aspect	Dust generation and exposure potential
1.	Work area clearing	6 days	Presence of un-stabilised exposed surfaces during construction.	Dust generated by wind action on any surficial dry material.
2.	Dozer activity during trace line construction	6 days	Vegetation removal, creating dune cuttings, bulk earthworks, recontouring, spreading soil, trimming of slopes	Dust generated during manipulation ofsoil/sediments; Increased exposed areas due to vegetation removal.
3.	Excavation of borrow areas	14 days	Excavation of soil material from the borrow pit locations using hydraulic excavator.	Dust from movement of excavator overdry areas; Dust generation potential from physical disturbance of dry material during excavation and transfer.
4.	Stockpiling	14 days	Interim stockpiles of borrow material during construction	Dust generated during the placement of soil on dry stockpiles; Dust generated by action of wind on stockpile surfaces.
5.	Transport and materials transfer	14 days	Use of trucks to convey material from borrow pits to the work front.	Dust generation potential during loading and unloading activities from dry transported material or dry tipping surface.
6.	Construction of road pavement	14 days	Tipping, levelling and compaction of road base material.	Dust generation potential from disturbance of dry material during excavation.
7.	Vehicles traversing site	84 days	Movement of earthworks vehicles, trucks and light vehicles on unsealed areas.	Dust generation potential due to soil disturbance during movement of vehicles over the site.
8.	Spray seal with bitumen and aggregate	6 days	Movement of equipment, trucks and light vehicles on unsealed areas.	Dust generation potential due to soil disturbance during movement of vehicles over the site.

Items 1 and 2 above will be undertaken concurrently ahead of the main construction work. Items 3 to 6 will involve the most intensive portion of activities and will be undertaken concurrently. The total expected duration of construction and related activities on the haul road within 5km of Balgo Community is 96 days.

4. Dust Risk Assessment

A site risk assessment/classification was conducted in accordance with the framework provided in the DEC (2011) guidance to determine the level of dust management and monitoring required for the site. The site classification chart for uncontaminated dust was utilised.

Part A – Nature of site

Item	Comment	Score
Nuisance potential of soil when disturbed	Soils are expected to be uncontaminated particles predominantly larger than 50 µm diameter; therefore, the nuisance potential is considered primarily to amenity	2
Topography and protection provided byundisturbed vegetation	Medium Screening	6
Area of site disturbed by the works	More than 10ha	9
Type of work being done	Roads or shallow trenches	1
Total part A score		**18**

Part B – Proximity of site to other land uses

Item	Commentary	Score
Distance of other land uses from site	More than 1km	1
Effects of prevailing wind direction (at time of construction) on other land uses	Isolated land uses affected by one wind direction	6
Total Part B score		**7**

The site classification score is the product of the Part A and Part B scores (18 x 7 = 126). A site classification score under 199 is considered negligible risk. In accordance with guidelines the requirement for dust management provisions, monitoring and modelling are considered not required. The justification for this assessment will be further detailed in the ERD. However, Agrimin propose the following management provisions specific to the Balgo Community which will be incorporated into the CEMP, as detailed in Section 5.

5. Management Provisions

In accordance with the approved CEMP, the following control measures will be implemented to ensure standard controls to mitigate dust generation affecting the Balgo Community (5 km from the nearest household) as shown in **Figure 1**.

5.1 Movement of Vehicles

Vehicle movements across the site may disturb soils and generate dust. The following measures will be adopted during all construction activities to prevent excessive dust generation:

- unnecessary vehicle movements on the site will be avoided as far as reasonably practicable;
- vehicles will adhere to speed restrictions within the site; the appropriate speed limit will be subject to the determination of the Site Manager based on the activities being undertaken, location and site conditions at the time;
- vehicles will keep to designated access roads as far as reasonably practicable;
- vehicles deviating from designated access routes will do so only as required for specific work activities and under appropriate permissions; and
- public roadways used for access will be kept clear of deposited material tracked by vehicles.

5.2 Active Dust Suppression

To prevent excessive dust generation, the following wetting procedures of work areas and haul roads within 5 km of permanently habitable structures will be undertaken:

- borrow pits and stockpiles will be actively wet down during active extraction and handling;
- water carts (each minimum 10,000 L capacity) will be available at active work areas and active haul roads to enable wetting of areas where vehicle movements are anticipated will be carried out (pre-wetting and re-wetting requirements to be determined on-site by the Site Manager); and
- areas to act as tipping receival surfaces will be wet down prior to commencement of tipping.

5.3 Materials Handling Activities

Materials handling activities will be conducted using good work practices to mitigate dust generation, including:

- the height that soil is dumped from excavator and front-end loader buckets will be minimised as much as possible; and
- if the soil being excavated is dry and producing dust when being worked, it will be wet down periodically to keep it damp by direct spraying of the area of active excavation.

5.4 General Provisions

General provisions to mitigate dust impacts from the site will include:

- the Balgo Community will be notified prior to construction activities commencing and supplied with contact information for the Site Manager;
- water carts and canons will be available at the active work areas to provide contingency in the event of excessive dust generation;
- stockpiles in active use will be wet down to reduce wind erosion and displacement of dust upon the addition of more material;
- stockpiles and cleared areas will be stabilised as required using a dust suppression crusting agent or other similar material; and
- Should high wind speeds be forecast for wind from the east, site activities will be reviewed and suspended by the Site Manager if deemed appropriate.

5.5 Employee Education

Site personnel and contractors will be trained at induction. Training will include mechanisms of the generation of dust emissions, the importance of and responsibility of individuals to implement the above mitigation measures and reporting of visible dust emissions.

5.6 Complaints Management

A complaints management system will be prepared and implemented in consultation with the Balgo Community. The system will, at a minimum, record:

- Signage in the community – phones contact details
- the number and details of complaints received concerning the dust impacts from the activities undertaken at the site; and
- any action taken in response to the complaints to reduce or eliminate the risk of future events.

The Balgo Community will be provided with contact details of the person to be contacted regarding the works (e.g. Site Manager).

Perth
Ground Floor, 226 Adelaide Terrace,
PERTH, WA 6000
Tel +61 (08) 6222 7000

Please visit **www.stantec.com** to learn more about how Stantec design with community in mind.