

LOT 1, 2 AND 803 BALDIVIS ROAD, BALDIVIS

ENVIRONMENTAL MANAGEMENT PLAN (AMENDED)

Prepared for: Aigle Royal
Report Date: 17 April 2024
Version: 9
Report No. 2015-229

CITY OF ROCKINGHAM

APPROVED

**Date: 02 May 2024
to be read in conjunction with the
Conditions of Development
Approval
COR Ref: 20.2023.266**

PGV
ENVIRONMENTAL

CONTENTS

Contents i

List of Attachments iii

1 INTRODUCTION 1

 1.1 Background 1

 1.2 Purpose and Scope..... 1

2 EXISTING ENVIRONMENT 2

 2.1 Historical Land Use..... 2

 2.2 Pre-Commencement Land Use 4

 2.3 Current Land Use 5

 2.4 Surrounding Land Use..... 5

 2.5 Visual Landscape..... 5

 2.6 Topography 6

 2.7 Geology and Soils..... 6

 2.8 Hydrology 6

 2.8.1 Groundwater 6

 2.8.2 Surface Water 6

 2.9 Flora 7

 2.9.1 Bioregional Data 7

 2.9.2 Flora Database Searches..... 7

 2.9.3 Likely Occurrence of Significant Flora Species..... 7

 2.10 Vegetation..... 8

 2.10.1 Bioregional Data 8

 2.10.2 Vegetation Type 8

 2.10.3 Vegetation Condition 10

 2.11 Fauna..... 11

 2.11.1 Fauna Habitat 11

 2.11.2 Database Search Results 12

 2.11.3 Likely Occurrence of Significant Fauna Species..... 13

 2.11.4 Referral Guidelines..... 21

 2.11.5 Biodiversity Value..... 22

3 SAND EXTRACTION MANAGEMENT 23

 3.1 Visual Impact..... 23

3.2	Blasting.....	23
3.3	Adjoining Sensitive Receptors.....	23
3.4	Acoustic Assessment.....	24
3.5	Vegetation and Fauna	24
3.5.1	Vegetation	24
3.5.2	Fauna	24
3.6	Dust Management Plan	25
4	DECOMMISSIONING PLAN	26
4.1	Future Land Use	26
4.2	Decommissioning and Rehabilitation	26
5	SUMMARY OF MANAGEMENT MEASURES	27
6	REFERENCES	28

LIST OF ATTACHMENTS

Tables

- Table 1: Conservation Significant Flora known to occur near the Site
- Table 2: Likelihood of Identified Significant Flora Species occurring on the Site
- Table 3: Vegetation Condition Rating Scale
- Table 4: List of Fauna Species Identified from Database Searches
- Table 5: Likelihood of Conservation Significant Fauna species being present on the site
- Table 6: Native species recommended for Rehabilitation

Plates

- Plate 1: Aerial photography from 1953 (Landgate, 2023)
- Plate 2: Aerial photography from 1974 (Landgate, 2023)
- Plate 3: Aerial photography from 1995 (Landgate, 2023)
- Plate 4: Aerial photography from 2013 (Landgate, 2023)
- Plate 5: Aerial photography from 2022 (Landgate, 2023)
- Plate 6: Planted Tuarts
- Plate 7: Jarrah Tree on Lot 803
- Plate 8: *Acacia pulchella* and Marri tree on Lot 803
- Plate 9: Planted Trees on a Bund
- Plate 10: Parkland Cleared Habitat
- Plate 11: Planted Habitat

Figures

- Figure 1: Site Location
- Figure 2: Site Boundary and Topography
- Figure 3: Sand Extraction Footprint

Appendices

Appendix 1: Sand Extraction Development Approval

Appendix 2: Naturemap Report

Appendix 3: Protected Matters Search Tool Report

Appendix 4: Conservation Codes

Appendix 5: Excavation Management Plan

Appendix 6: Acoustic Assessment

1 INTRODUCTION

1.1 Background

Lots 1, 2 and 803 Baldivis Road, Baldivis (the site) are located in the City of Rockingham, approximately 38km south of the Perth Central Business District (Figure 1). The site is generally bounded by Baldivis Road to the east, Kulija Road to the south, the Rockingham Millar Road Landfill Site to the west and the Rockingham Memorial Park to the north (Figure 2).

An Environmental Management Plan (EMP) was prepared in 2015 to support an Extractive Industries License Application over Lots 1 and 2. The license was granted in 2015 and mining commenced in 2017.

Mining is proposed to be extended into Lot 803 to the south under Development Approval Reference No. 20. 2021. 79.1 AD21/164080 (Appendix 1).

This EMP has been amended to include a proposed extension of original extraction area into a part of Lot 803 to the south. The additional area is hereafter included in 'the site'.

1.2 Purpose and Scope

The Environmental Management Plan (EMP) has been prepared to support an Extractive Industries Application to the City of Rockingham. According to the City of Rockingham's Planning Procedure 1.10 which relates to Extractive Industries Applications the EMP is to address the following:

1. Visual impact assessment;
2. Details of any blasting;
3. The identification and location of neighbouring houses within buffer;
4. Habitat Study which includes a Spring Survey, assessment of existing vegetation and a Fauna Study (as required);
5. Dust Management Plan; and
6. Acoustic Consultants Report.

2 EXISTING ENVIRONMENT

2.1 Historical Land Use

In early historical aerial photography from 1953 the site appears to be partially vegetated and is likely have been impacted by grazing as immediately to the west appears more vegetated (Plate 1). Lot 803 to the south is similarly parkland cleared in 1953.

Plate 1: Aerial Photograph from 1953 (Landgate, 2023).



Between 1965 and 1974 (Plate 2) approximately half of Lot 1 was cleared and excavated for sand. The depth of excavation is approximately 10m. During this period Lot 2 and Lot 803 were largely cleared with a few scattered trees remaining (Plate 2).

Plate 2: Aerial Photograph from 1974 (Landgate, 2023).



The clearing over 1 Baldivis Road was extended between 1985 and 1995 to the present areas of clearing on the site and dwellings were established on both lots (Plate 3). Lot 803 remains mostly cleared with some scattered trees.

Plate 3: Aerial Photograph from 1995 (Landgate, 2023).



Construction of Kulija Road commenced in 2013 (Plate 4) and numerous trees have been planted on Lots 1 and 2.

Plate 4: Aerial Photograph from 2013 (Landgate, 2023).



The sand extraction commenced on Lot 1 Baldvis road in 2017 and extended onto Lot 2 since then to the previous extraction footprint (Plate 5).

Plate 5: Aerial Photograph from 2022 (Landgate, 2023).



2.2 Pre-Commencement Land Use

The site was inspected by PGV Environmental on 31 March 2015 to establish the site conditions. The clearing on Lot 1 Baldvis Road was done to establish a mango plantation as well as a residence in the centre of the lot. Further excavation was done to create water features, some lined and unlined.

Lot 2 Baldvis Road contained a residence and associated gardens and had planted Tuart trees, Acacias and other exotic eucalypts to the west (Plate 6). Some parkland cleared Marris occur on the eastern part of Lot 2.

Plate 6: Planted Tuarts



2.3 Current Land Use

Sand mining has progressed in Lot 1 and 2, such that the previous footprint has been cleared. Lot 803 remains cleared and parkland cleared with young Marri trees.

2.4 Surrounding Land Use

The Rockingham Millar Road Landfill Site is located to the west of the lots and the Rockingham Memorial Park is located to the north. Baldivis Road and the vegetated Baldivis Tramway Reserve abut the eastern side with a combined width of 90m. Future residential land occurs east of the tramway reserve. Kulija Road is located south of Lot 803.

2.5 Visual Landscape

The landscape amenity was examined following the methodology contained in City of Rockingham Town Planning Scheme No.2 (WAPC, 2004) and Planning Policy No. 3.1.1 - *Rural Land Strategy* (CoR, 2003). PGV Environmental aimed to identify and describe any sites or environmental features of natural:

- a) *character with high visual amenity and/or landscape value, or recognised as environmental icons and of regional and/or local significance; and*
- b) *character used for recreation.*

The visual landscape evaluation utilised methodology consistent with that in *Visual Landscape Planning in Western Australia* (WAPC, 2012). The following steps were undertaken:

1. Definition of the scope of the Visual Landscape Evaluation and setting the context. This entails determining the site boundary, planning context and baseline visual and landscape context.
2. Description of the visual landscape character. This step identifies, maps and describes individual Landscape Character Units. Landscape Character Units are areas comprised of relative homogenous characteristics in terms of factors such as landform, soil types, vegetation, built form and/or land use.
3. Evaluate the way the visual landscape character is viewed, experienced and valued. This step is a visual analysis that identifies 'how' the landscape is viewed and experienced by others. The key outputs from this analysis are key views from and to the Study Area and determination of the significance of the view.
4. Identify landscape and visual sensitivities and develop strategies for managing visual landscape character. This step assesses the constraints and opportunities affecting the Study Area, and develops a landscape management framework to address the opportunities and constraints identified.

There are no outstanding topographical and/or environmental features on the site. The topography on the site is undulating but Lot 1 was significantly altered before the current mining by previous sand extraction. The site is slightly elevated to the surrounding land but is not a significant feature of the landscape. The visual amenity on the site is limited. The site is of rural character and surrounded by roads, landfill and a memorial park. There is no public access to the site from the west due to the

landfill site or from the north due to the memorial site. The site is therefore only visible from the southern side along Kulija Road and from the eastern side from Baldivis Road.

2.6 Topography

The topography of Lots 1 and 2 have been significantly altered by the recent sand mining. The perimeter of the lots slopes up steeply to the property boundary from the pit floor. Lot 803 slopes gently down to the south towards Kulija Road. The elevation on the site varies from 4.5m Australian Height Datum (AHD) to 28m (Ochrewest, 2015).

2.7 Geology and Soils

The majority of the site is mapped on the Spearwood system which contains sand dunes and plains and consists of aeolian sand and limestone over sedimentary rocks. These soils overlay Tamala limestone (Bolland, 1998).

The Spearwood soils are mapped by the Department of Agriculture and Food Western Australia (DAFWA) as Spearwood S1b Phase (211Sp_S1b) located on dune ridges with slopes up to 15%. These soils are described as deep siliceous yellow brown sands or pale sands with yellow-brown subsoil (DAFWA, 2015).

The soils are an excellent resource for the provision of yellow fill sand, earthy yellow sand for maximisation of phosphate retention, brick laying sand and white sand.

2.8 Hydrology

2.8.1 Groundwater

The groundwater under the site has geological formations that have been grouped into three distinct aquifers:

- Superficial Aquifer (unconfined);
- Leederville Aquifer (confined); and
- Yarragadee north (confined) (DoW, 2014a).

The Superficial Aquifer is part of the Jandakot Mound and the Kardinya Shale Member of the Osborne Formation separates this from the Leederville Aquifer (DoW, 2015a).

Groundwater flows generally from the north-east to the south-west of the site. The Perth Groundwater Atlas (DoW, 2015b) shows a snapshot of groundwater levels as measured in May 2003 which are an indication of low groundwater levels and are measured at 3mAHD under the site. The depth to groundwater from the natural surface ranges from approximately 1.5 to 25m (DoW, 2015b).

2.8.2 Surface Water

The soils on the site are free draining and infiltration of rainfall is the dominant hydrological process (DAFWA, 2015). Therefore, surface water runoff is minimal.

The only surface water features on the site are man-made and are not mapped as wetlands in the Geomorphic Wetlands of the Swan Coastal Plain Dataset.

2.9 Flora

2.9.1 Bioregional Data

The site is in the Southwest Botanical Province within the South West Bioregion. The vegetation is mapped as Beard vegetation type e2Mb cbLi which is described as “Medium very sparse woodland; jarrah, with low woodland; banksia & casuarina” (Beard, 1990).

2.9.2 Flora Database Searches

A search of the Department of Biodiversity, Conservation and Attractions (DBCA) Naturemap database (Appendix 2) and the *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Tool (Appendix 3) indicates that a number of species that are listed as Endangered, Threatened or Priority have been located or are potentially located in the vicinity of the site. The results from these database searches are shown in Table 1.

Table 1: Conservation Significant Flora known to occur near the Site

Species	Common Name	Conservation Status in WA	Status Under EPBC Act 1999
<i>Andersonia gracilis</i>	Slender Andersonia	Threatened	Endangered
<i>Caladenia huegelii</i>	Grand Spider Orchid	Threatened	Endangered
<i>Centrolepis caespitosa</i>		Priority 4	Endangered
<i>Darwinia foetida</i>	Muchea Bell	Threatened	Critically Endangered
<i>Diuris micrantha</i>	Dwarf Bee-orchid	Threatened	Vulnerable
<i>Diuris purdiei</i>	Purdie’s Donkey Orchid	Threatened	Endangered
<i>Drakaea elastica</i>	Glossy-leaved Hammer Orchid	Threatened	Endangered
<i>Drakaea micrantha</i>	Dwarf Hammer Orchid	Threatened	Endangered
<i>Eucalyptus balanites</i>	Cadda Road Mallee	Threatened	Endangered
<i>Lepidosperma rostratum</i>	Beaked Lepidosperma	Threatened	Endangered
<i>Synaphea stenoloba</i>	Dwellingup Synaphea	Threatened	Endangered
<i>Cyathochaeta teretifolia</i>		Priority 3	
<i>Dodonia hackettiana</i>	Hackett’s Hopbush	Priority 4	
<i>Stylidium ireneae</i>		Priority 4	

Definitions of the Conservation Codes are in Appendix 4.

2.9.3 Likely Occurrence of Significant Flora Species

Table 2 examines the preferred habitat of each species identified in the database searches and the likelihood of the species listed in Table 1 to occur on the site.

Table 2: Likelihood of Identified Significant Flora Species occurring on the Site

Scientific Name	Preferred Habitat*	Likelihood of Presence on site
<i>Andersonia gracilis</i>	White/grey sand, sandy clay, gravelly loam near winter wet swamps	Highly Unlikely due to the wet areas on the site are not natural and disturbance
<i>Caladenia huegelii</i>	Sand or clay loam. Does not survive in disturbed areas.	Highly Unlikely due to previous land use and disturbance

Scientific Name	Preferred Habitat*	Likelihood of Presence on site
<i>Centrolepis caespitosa</i>	White sand, clay. Salt flats, wet areas	No – no suitable flats
<i>Darwinia foetida</i>	Grey-white sand on swampy, seasonally wet sites	Highly Unlikely – this species is known from a small range near Muchea
<i>Diuris micrantha</i>	Brown loamy clay. Winter-wet swamps, in shallow water	Highly Unlikely due to the wet areas on the site are not natural and disturbance
<i>Diuris purdiei</i>	Grey-black sand, moist. Winter-wet swamps	Highly Unlikely due to the wet areas on the site are not natural and disturbance
<i>Drakaea elastica</i>	Low-lying situations adjoining winter-wet swamps. Does not survive in disturbed areas	Highly Unlikely due to the wet areas on the site are not natural and disturbance
<i>Drakaea micrantha</i>	Usually found on cleared firebreaks or open sandy patches that have been disturbed in wetter soils.	Highly Unlikely due to the wet areas on the site are not natural and disturbance
<i>Eucalyptus balanites</i>	Sandy soils with lateritic gravel	No – no lateritic soils are on the site
<i>Lepidosperma rostratum</i>	Peaty and clay soils	No – no peaty clayey soils are on the site
<i>Synaphea stenoloba</i>	Sandy or sandy clay soils. Winter-wet flats, granite	Highly Unlikely due to the wet areas on the site are not natural and disturbance
<i>Cyathochaeta teretifolia</i>	Grey sand, sandy clay. Swamps, creek edges	Highly Unlikely due to the wet areas on the site are not natural and disturbance
<i>Dodonaea hackettiana</i>	Sand. Outcropping limestone	Highly unlikely due to disturbance of the site
<i>Stylidium ireneae</i>	Sandy loam. Valleys near creek lines, woodland, often with <i>Agonis</i>	No – no creeks or natural <i>Agonis</i> are present on the site

* sourced from Florabase (DPaW, 2014), DoE SPRAT Database (DoE, 2014) as well as the DBCA database searches.

The likelihood of any Conservation species occurring on the site is very low. The vegetation on the site has almost been completely cleared and the small area of native vegetation remaining on Lots 1 and 2 Baldivis Road has been significantly disturbed. Lot 803 contains a few native trees in a cleared paddock. The flora on the site is not a constraint to the proposed sand extraction.

2.10 Vegetation

2.10.1 Bioregional Data

The site is in the Southwest Botanical Province within the Swan Bioregion. According to Heddle *et al.* (1980), the site is in the Karrakatta Central and South Complex. The Karrakatta Central and South Complex is comprised of predominantly Low Open forest of *Eucalyptus marginata* – *Eucalyptus gomphocephala* – *Eucalyptus* (now *Corymbia*) *calophylla* and Woodland of *Eucalyptus marginata* – *Banksia spp.*

2.10.2 Vegetation Type

Native vegetation within Lots 1 and 2 has mostly been cleared. The vegetation on the southern boundary of Lot 2 is planted eucalypts. A site assessment undertaken by PGV Environmental on 3

February 2023 shows that native vegetation within the extraction footprint is limited to Lot 803 and is predominately a paddock of weedy pasture species. The excavation footprint contains one Jarrah (*Eucalyptus marginata*) tree (Plate 7), one Marri (*Corymbia calophylla*) tree and a small stand of *Acacia pulchella* (Prickly Moses) shrubs (Plate 8).

Plate 7: Jarrah Tree on Lot 803



Plate 8: *Acacia pulchella* and Marri tree on Lot 803



The remaining trees in the excavation footprint area have been planted and do not constitute native vegetation (Plate 9).

Plate 9: Planted Trees on a Bund



2.10.3 Vegetation Condition

Most of the site has no intact vegetation and is considered to be Completely Degraded as per the rating scale by Keighery published in Bush Forever (Government of Western Australia, 2000) shown in Table 3.

Table 3: Vegetation Condition Rating Scale.

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
Very Good	Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These are often described as 'parkland

Condition	Description
	cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Source: Government of Western Australia, 2000.

Some understorey species occur in a small area on Lot 803 but all vegetation is rated as Completely Degraded.

2.11 Fauna

2.11.1 Fauna Habitat

The majority of the site is degraded and does not have understorey species present. The area that has planted Tuarts, Acacias and other exotic eucalypt overstorey species but no understorey is described as a Parkland Cleared habitat (Plate 10) and is likely to only have habitat value for some avifauna. The areas planted with mangoes and garden exotic plants are described as Planted Habitat (Plate 11). The fauna habitat on the site in the areas that do have native vegetation present are described as an Open Woodland (Plate 3).

Plate 10: Parkland Cleared Habitat



Plate 11: Planted Habitat



Fauna habitat can be assessed using a number of factors including, the size of the habitat, the level of habitat connectivity, availability of specific resources (e.g. tree hollows) and overall vegetation quality. The habitat was assessed according to the following categories:

High quality fauna habitat – *These areas closely approximate the vegetation mix and quality that would have been in the area prior to any disturbance. The habitat has connectivity with other habitats and is likely to contain the most natural vertebrate fauna assemblage.*

Very good fauna habitat - *These areas show minimal signs of disturbance (e.g. grazing, clearing, fragmentation, weeds) and generally retain many of the characteristics of the habitat if it had not been disturbed. The habitat has connectivity with other habitats and fauna assemblages in these areas are likely to be minimally affected by disturbance.*

Good fauna habitat – *These areas showed signs of disturbance (e.g. grazing, clearing, fragmentation, weeds) but generally retain many of the characteristics of the habitat if it had not*

been disturbed. The habitat has connectivity with other habitats and fauna assemblages in these areas are likely to be affected by disturbance.

Disturbed fauna habitat – These areas showed signs of significant disturbance. Many of the trees, shrubs and undergrowth are cleared. These areas may be in the early succession and regeneration stages. Areas may show signs of significant grazing, contain weeds or have been damaged by vehicle or machinery. Habitats are fragmented or have limited connectivity with other fauna habitats. Fauna assemblages in these areas are likely to differ significantly from what might be expected in the area had the disturbance not occurred.

Highly degraded fauna habitat – These areas often have a significant loss of vegetation, an abundance of weeds, and a large number of vehicle tracks or are completely cleared. Limited or no fauna habitat connectivity. Faunal assemblages in these areas are likely to be significantly different to what might have been in the area pre-disturbance (Coffey Environments, 2009).

The habitats on the site are considered to be Highly Degraded Fauna Habitat as the vegetation is generally Completely Degraded and very little current connectivity to other habitats. There is likely to be disturbance to fauna from surrounding land uses and the close proximity of human habitation.

2.11.2 Database Search Results

A search of the Protected Matters Search Tool (Appendix 3) and Naturemap database search (Appendix 2) identified the species in Table 4 as being recorded in the vicinity of the site.

Table 4: List of Fauna Species Identified from Database Searches

Scientific Name	Common Name	Conservation Status in WA	Status under EPBC Act
<i>Bettongia penicillata</i> subsp. <i>ogilbyi</i>	Woylie	Schedule 1	Endangered
<i>Botaurus poiciloptilus</i>	Australasian Bittern	Schedule 1	Endangered
<i>Calidris ferruginea</i>	Curlew Sandpiper	Schedule 1	Marine/Migratory
<i>Calyptorhynchus banksii naso</i>	Forest Red-tailed Black-Cockatoo	Schedule 1	Vulnerable
<i>Calyptorhynchus baudinii</i>	Baudin's Black Cockatoos	Schedule 1	Vulnerable
<i>Calyptorhynchus latirostris</i>	Carnaby's Black Cockatoo (short-billed black-cockatoo)	Schedule 1	Endangered
<i>Dasyurus geoffroii</i>	Chuditch, Western Quoll	Schedule 1	Vulnerable
<i>Pseudocheirus occidentalis</i>	Western Ringtail Possum	Schedule 1	Vulnerable
<i>Setonix brachyurus</i>	Quokka	Schedule 1	Vulnerable
<i>Rostratula benghalensis</i>	Painted Snipe	Schedule 1	Vulnerable
<i>Sterna dougallii</i>	Roseate Tern	Schedule 3	Marine/ Migratory
<i>Actitis hypoleucos</i>	Common Sandpiper	Schedule 3	Marine/Migratory
<i>Apus pacificus</i>	Fork-tailed Swift	Schedule 3	Migratory
<i>Ardea alba (modesta)</i>	Great Eastern Egret, White Egret	Schedule 3	Migratory/ Wetland
<i>Ardea ibis</i>	Cattle Egret	Schedule 3	Migratory/ Wetland

Scientific Name	Common Name	Conservation Status in WA	Status under EPBC Act
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	Schedule 3	Migratory/ Wetland
<i>Calidris canutus</i>	Red Knot	Schedule 3	Marine/ Migratory
<i>Calidris melanotos</i>	Pectoral Sandpiper		Marine/ Migratory
<i>Calidris ruficollis</i>	Red-necked Stint	Schedule 3	Marine/ Migratory
<i>Calidris subminuta</i>	Long-toed Stint	Schedule 3	Marine/ Migratory
<i>Calidris tenuirostris</i>	Great Knot	Schedule 1	Marine/ Migratory
<i>Charadrius dubius</i>	Little Ringed Plover	Schedule 3	Marine/Migratory
<i>Charadrius ruficapillus</i>	Red-capped Plover		Marine/ Migratory
<i>Haliaeetus leucogaster</i>	White-bellied Sea-eagle	Schedule 3	Migratory
<i>Limosa limosa</i>	Black-tailed Godwit		Marine/ Migratory
<i>Merops ornatus</i>	Rainbow Bee-eater	Schedule 3	Migratory
<i>Pandion haliaetus</i> (also listed as <i>Pandion cristatus</i>)	Osprey		Marine/Migratory
<i>Philomachus pugnax</i>	Ruff	Schedule 3	Marine/ Migratory
<i>Plegadis falcinellus</i>	Glossy Ibis	Schedule 3	Marine/Migratory
<i>Rostratula australis</i>	Australian Painted Snipe	Schedule 3	Endangered
<i>Tringa glareola</i>	Wood Sandpiper	Schedule 3	Marine/Migratory
<i>Tringa nebularia</i>	Common Greenshank	Schedule 3	Marine/Migratory
<i>Tringa stagnatilis</i>	Marsh Sandpiper	Schedule 3	Marine/ Migratory
<i>Himantopus himantopus</i>	Black-winged Stilt		Marine/ Migratory
<i>Recurvirostra novaehollandiae</i>	Red-necked Avocet		Marine/ Migratory
<i>Falco peregrinus</i>	Peregrine Falcon	Schedule 4	Marine/Migratory
<i>Neelaps calonotos</i>	Black-striped Snake	Priority 3	
<i>Ixobrychus minutus</i> subsp. <i>dubius</i>	Little Bittern (Australian Little Bittern)	Priority 4	
<i>Macropus irma</i>	Western Brush Wallaby	Priority 4	
<i>Oxyura australis</i>	Blue-billed Duck	Priority 4	
<i>Thinornis rubricollis</i> (also listed as <i>Charadrius rubricollis</i>)	Hooded Plover	Priority 4	Marine
<i>Isodon obesulus</i> subsp. <i>fusciventer</i>	Southern Brown Bandicoot	Priority 5	

Conservation Codes are outlined in Appendix 4.

2.11.3 Likely Occurrence of Significant Fauna Species

Outlined below is a short description of each of the species that were identified in the DBCA database searches and Protected Matters Search Tool search in Table 5. The preferred habitat has been compared to the habitats on the site described above and the likelihood of each species to be present on the site (Table 5).

Table 5: Likelihood of Conservation Significant fauna species being present on the site

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
<i>Bettongia penicillata</i> subsp. <i>ogilbyi</i>	Woylie	The Woylie habitat types ranged from forest to grassland, coastal and inland. During the day the Woylie shelters under patches of dense undergrowth, logs and rock-cavities and occasionally in burrows. .	Highly Unlikely – the site is too disturbed.
<i>Botaurus poiciloptilus</i>	Australasian Bittern	The Australasian Bittern occurs mainly in densely vegetated freshwater wetlands and, rarely, in estuaries or tidal wetlands.	Highly Unlikely – The wetland habitat present is too disturbed
<i>Calidris ferruginea</i>	Curlew Sandpiper	Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms.	Highly Unlikely – No suitable habitat present
<i>Calyptorhynchus banksii</i> subsp. <i>naso</i>	Forest Red-tailed Black-Cockatoo	Forest Red-tailed Black Cockatoos frequent the humid to sub-humid south-west of Western Australia from Gingin in the north, to Albany in the south and west to Cape Leeuwin and Bunbury (SEWPaC, 2012). It nests in tree hollows with a depth of 1-5m, that are predominately Marri (<i>Corymbia calophylla</i>), Jarrah (<i>Eucalyptus marginata</i>) and Karri (<i>E. diversicolor</i>) and it feeds primarily on the seeds of Marri.	Yes – evidence of intermittent foraging in small areas of the site
<i>Calyptorhynchus baudinii</i>	Baudin's Black Cockatoos	Baudin's Black-Cockatoo mainly occurs in eucalypt forests, especially Jarrah (<i>E. marginata</i>), Marri (<i>Corymbia calophylla</i>), also Karri (<i>E. diversicolor</i>) forest, often feeding in the understorey on proteaceous trees and shrubs, especially banksias (SEWPaC, 2012).	Possible
<i>Calyptorhynchus latirostris</i>	Carnaby's Black Cockatoo (short-billed black-cockatoo)	Carnaby's Cockatoo is found in the south-west of Australia from Kalbarri through to Ravensthorpe. It has a preference for feeding on the seeds of <i>Banksia</i> , <i>Dryandra</i> , <i>Hakea</i> , <i>Eucalyptus</i> , <i>Grevillea</i> , <i>Pinus</i> and <i>Allocasuarina</i> spp. It is nomadic often moving toward the coast after breeding. It breeds in tree hollows that are 2.5 – 12m above the ground and have an entrance 23-30cm with a depth of 1-2.5m. Nesting mostly occurs in smooth-barked trees (e.g. Salmon Gum, Wandoo, Red Morrell) (SEWPaC, 2012)	Possible –very limited foraging and some potential roosting habitat on the site

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
<i>Dasyurus geoffroii</i>	Chuditch, Western Quoll	The Chuditch have been known to occupy a wide range of habitats including woodlands, dry sclerophyll forests and riparian vegetation. They prefer a dense understorey for protection against predation. They are opportunistic feeders, and forage on the ground at night, feeding on invertebrates, small mammals, birds and reptiles.	Highly Unlikely – the site is too disturbed and areas with understorey are limited.
<i>Pseudocheirus occidentalis</i>	Western Ringtail Possum	The Western Ringtail Possum is a medium sized nocturnal marsupial. This species occurs in and near coastal Peppermint Tree (<i>Agonis flexuosa</i>) forest and Tuart (<i>Eucalyptus gomphocephala</i>) dominated forest with a Peppermint Tree understorey.	Highly Unlikely – the habitat on the site is not preferred by this species
<i>Setonix brachyurus</i>	Quokka	Quokkas were originally very common on the Swan Coastal Plain, however, their distribution is now limited to Rottnest Island and a few isolated areas in the south-west of WA. On the mainland, they prefer densely vegetated areas around wetlands and streams, whereas on Rottnest Island they inhabit low scrubby coastal vegetation where water is not readily available year-round.	Highly Unlikely – this species is thought to be locally extinct
<i>Rostratula benghalensis</i>	Painted Snipe	The Painted Snipe predominately occurs on the eastern coast of Australia and inhabits inland and coastal shallow ephemeral and permanent freshwater wetlands particularly where there is a cover of vegetation, including grasses.	Unlikely – The wetland habitat present is too disturbed
<i>Sterna dougallii</i>	Roseate Tern	The Roseate Tern is a migratory coastal seabird that feeds by plunge diving. This species breeds in sites surrounded by walls and rocks or in the shelter of vegetation (in temperate regions) (Birdlife International, 2014).	No – May fly over the site
<i>Actitis hypoleucos</i>	Common Sandpiper	The Common Sandpiper is mostly found around muddy margins or rocky shores. Generally the species forages in shallow water and on bare soft mud at the edges of wetlands.	No – this is a shore bird and is not likely to be found so far inland
<i>Apus pacificus</i>	Fork-tailed Swift	The Fork-tailed Swift is almost exclusively aerial and is not known to breed in Australia. They are seen in inland plains but sometimes above foothills or in coastal areas. They often occur over cliffs and beaches and also over islands and sometimes well out to sea. They also occur over settled areas, including towns, urban areas and cities.	Highly Unlikely – may fly over the site but unlikely to land

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
<i>Ardea alba (modesta)</i>	Great Eastern Egret, White Egret	The Eastern Great Egret has been reported in a wide range of wetland habitats and usually frequents shallow waters. This species feeds on fish, insects, crustaceans, molluscs, frogs, lizards, snakes and small birds and mammals.	Unlikely – The wetland habitat present is too disturbed
<i>Ardea ibis</i>	Cattle Egret	The Cattle Egret occurs in tropical and temperate grasslands, wooded lands and terrestrial wetlands with breeding in Western Australia recorded in the far north in Wyndham in colonies in wooded swamps such as mangrove forest. This species forages away from water on low lying grasslands, improved pastures and croplands generally in areas that have livestock eating insects, frog, lizards and small mammals.	Unlikely – The habitat present is too disturbed
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	The Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.	Unlikely – The wetland habitat present is too disturbed
<i>Calidris canutus</i>	Red Knot	In Australasia the Red Knot mainly inhabit intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs.	Highly Unlikely – no beach habitat
<i>Calidris subminuta</i>	Long-toed Stint	The Long-toed Stint prefers shallow freshwater or brackish wetlands including lakes, swamps, river floodplains, streams, lagoons and sewage ponds. The species is also fond of areas of muddy shoreline, growths of short grass, weeds, sedges, low or floating aquatic vegetation, reeds, rushes and occasionally stunted samphire.	Unlikely – The wetland habitat present is too disturbed
<i>Calidris melanotos</i>	Pectoral Sandpiper	In Australasia, the Pectoral Sandpiper prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands.	Unlikely – The wetland habitat present is too disturbed

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
<i>Calidris tenuirostris</i>	Great Knot	The Great Knot winters in Australia, occurring in sheltered coastal habitats such as inlets, bays, harbours, estuaries and lagoons with large intertidal mud and sandflats, oceanic sandy beaches with nearby mudflats, sandy spits and islets, muddy shorelines with mangroves and occasionally exposed reefs or rock platforms. It roosts in refuges such as shallow water in sheltered sites, on coastal dunes or on saltflats amongst mangroves during high tides (BirdLife International, 2015a).	Highly Unlikely – the site does not have the preferred habitat of this species
<i>Charadrius dubius</i>	Little Ringed Plover	The Little-ringed Plover prefers bare or sparsely vegetated sandy and pebbly shores of shallow standing freshwater pools, lakes or slow-flowing rivers (Birdlife International, 2015b)	Unlikely – The wetland habitat present is too disturbed
<i>Charadrius ruficapillus</i>	Red-capped Plover	The Red-capped Plover is found in wetlands, especially in arid areas, and prefers saline and brackish waters (Birdlife Australia, 2014).	Unlikely – The wetland habitat present is too disturbed
<i>Haliaeetus leucogaster</i>	White-bellied Sea-eagle	The White-bellied Sea-Eagle is found in coastal habitats with large areas of open water, especially those close to the sea-shore. This species feeds opportunistically on a variety of fish, birds, reptiles, mammals and crustaceans, and on carrion and offal.	Highly Unlikely – the site does not have the preferred habitat of this species
<i>Limosa</i>	Black-tailed Godwit	The Black-tailed Godwit is found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It is found often around beds of seagrass and, sometimes, in nearby saltmarsh.	Highly Unlikely – Not coastal habitat
<i>Merops ornatus</i>	Rainbow Bee-eater	Populations that breed in northern Australia are considered to be resident, and in many northern localities the Rainbow Bee-eater is present throughout the year. The Rainbow Bee-eater nests in a burrow dug in the ground. It is found across the better-watered parts of WA including islands preferring lightly wooded, sandy country near water.	Possible – may be an intermittent visitor to the site but unlikely to rely on it for survival

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
<i>Pandion haliaetus</i> (also listed as <i>Pandion cristatus</i>)	Osprey	Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They feed on fish, especially mullet where available, and rarely take molluscs, crustaceans, insects, reptiles, birds and mammals.	No – the site does not have the preferred habitat of this species
<i>Philomachus pugnax</i>	Ruff	The Ruff is found on generally fresh, brackish of saline wetlands with exposed mudflats at the edges and is found in terrestrial wetlands including lakes, swamps, pools, lagoons, tidal rivers, swampy fields and floodlands	Unlikely – The wetland habitat present is too disturbed
<i>Plegadis falcinellus</i>	Glossy Ibis	The Glossy Ibis is the smallest ibis known in Australia. This species preferred habitat for foraging and breeding are fresh water marshes at the edges of lakes and rivers, lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation.	Unlikely – The wetland habitat present is too disturbed
<i>Rostratula australis</i>	Australian Painted Snipe	The Australian Painted Snipe is a stocky wading bird that generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans.	Unlikely – The wetland habitat present is too disturbed
<i>Tringa glareola</i>	Wood Sandpiper	The Wood Sandpiper uses well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. They are typically associated with emergent, aquatic plants or grass, and dominated by taller fringing vegetation, such as dense stands of rushes or reeds, shrubs, or dead or live trees, especially Melaleuca and River Red Gums (<i>Eucalyptus camaldulensis</i>) and often with fallen timber.	Unlikely – The wetland habitat present is too disturbed
<i>Tringa nebularia</i>	Common Greenshank	The Common Greenshank is a wader and does not breed in Australia. This species can be found in many types of wetlands and has the widest distribution of any shorebird in Australia. This species typically feeds on molluscs, crustaceans, insects, and occasionally fish and frogs.	Unlikely – The wetland habitat present is too disturbed and this species generally occurs by the shore

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
<i>Tringa stagnatilis</i>	Marsh Sandpiper	The Marsh Sandpiper lives in permanent or ephemeral wetlands of varying salinity, including swamps, lagoons, billabongs, salt pans, saltmarshes, estuaries, pools on inundated floodplains, and intertidal mudflats and also regularly at sewage farms and saltworks	Unlikely – The wetland habitat present is too disturbed
<i>Himantopus himantopus</i>	Black-winged Stilt	The Black-winged Stilt is found near coastal lagoons and shallow freshwater or brackish pools with extensive areas of mudflats, salt meadows, salt pans, coastal marshes and swamps (Birdlife International, 2014a).	No – the site does not have the preferred habitat of this species
<i>Recurvirostra novaehollandiae</i>	Red-necked Avocet	The Red-necked Avocet occurs in wetland areas including bogs, marshes, swamps and permanent saline, brackish or alkaline lakes (Birdlife International, 2014b).	Unlikely – The wetland habitat present is too disturbed
<i>Falco peregrinus</i>	Peregrine Falcon	The Peregrine Falcon is found in a variety of habitats but nests on high cliff ledges or artificial structures. It feeds primarily on small-medium sized birds, but occasionally taking insects, such as moths, cicadas and locusts (Birdlife Australia, 2012).	Highly Unlikely – may fly over the site but unlikely to be present of any length of time
<i>Neelaps calonotos</i>	Black-striped Snake	The Black-striped snake has a limited distribution, inhabiting areas with sandy soils that support heathlands and Banksia/Eucalypt Woodlands (Nevill, 2005) on the Swan Coastal Plain generally in the lower west coast from Lancelin to Mandurah (Storr <i>et al.</i> , 1999).	Unlikely – <i>the habitat</i> is disturbed and this species prefers <i>Banksia</i> woodland habitat
<i>Ixobrychus minutus</i> subsp. <i>dubius</i>	Little Bittern (Australian Little Bittern)	Little Bitterns frequent terrestrial freshwater wetlands that have dense emergent vegetation but can also use artificial wetlands, even in built-up areas. Little Bitterns eat small, aquatic invertebrates and tadpoles, and nest in dense vegetation over water (Garnett <i>et al.</i> , 2000).	Unlikely – The wetland habitat present is too disturbed
<i>Macropus irma</i>	Western Brush Wallaby	The Western Brush Wallaby is a medium sized marsupial and its optimum habitat is open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets (DEC, 2012a).	Highly Unlikely – the site is small, disturbed and generally surrounded by development

Scientific Name	Common Name	Habitat*	Likelihood to occur on the site
<i>Oxyura australis</i>	Blue-billed Duck	The Blue-billed Duck prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation and is almost completely aquatic (NSW OEH, 2015)	Unlikely – The wetland habitat present is too small and disturbed
<i>Thinornis rubricollis</i> (also listed as <i>Charadrius rubricollis</i>)	Hooded Plover	The Hooded Plover primarily inhabits sandy, ocean beaches, with the highest densities on beaches with large amounts of beach-washed seaweed that are backed by extensive open dunes. In Western Australia the species also inhabits inland and coastal salt lakes (Birdlife International 2014c)	No – the site does not have the preferred habitat of this species
<i>Isoodon obesulus</i> subsp. <i>fusciventer</i>	Quenda, Southern Brown Bandicoot	Southern Brown Bandicoots are small grey marsupials that prefer dense scrub (up to one metre high), often in or near swampy vegetation. Their diet includes invertebrates (including earthworms, adult beetles and their larvae), underground fungi, subterranean plant material, and very occasionally, small vertebrates (DEC, 2012b)	Unlikely – as the site is disturbed and no conical diggings typical to this species were observed on the site.

* Habitat descriptions from DoE SPRAT Database unless otherwise specified

Species identified in the database searches possibly present on the site were:

- *Calyptorhynchus banksii* subsp. *naso* (Forest Red-tailed Black-Cockatoo);
- *Calyptorhynchus baudinii* (Baudin's Black Cockatoos);
- *Calyptorhynchus latirostris* (Carnaby's Black Cockatoo (short-billed black-cockatoo)); and
- *Merops ornatus* (Rainbow Bee-eater).

Carnaby's Black Cockatoos and Forest Red-tailed Black Cockatoos have been recorded during other fauna surveys in the general area. Evidence of Black Cockatoo foraging on the site was also observed during the site inspection, however these areas are now cleared.

The three Black Cockatoo species that are likely to intermittently visit the site are defined as a Matter of National Environmental Significance (MNES) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Referral of a project under the act is required if a proposal is going to have a significant impact on MNES.

The *Referral guideline for 3 WA threatened black cockatoo species Carnaby's Cockatoo (Zanda latirostris), Baudin's Cockatoo (Zanda baudinii) and the Forest Red-tailed Black-cockatoo (Calyptorhynchus banksii naso)* (DAWE, 2022) (Black Cockatoo Guidelines) contain several steps to determine whether a referral is required or not.

2.11.4 Referral Guidelines

The Black Cockatoo Referral Guidelines contain several steps to determine whether or not a referral is required. These steps are:

1. Will the action directly or indirectly impact on Black Cockatoo Habitat;
2. Does your action involve loss of any habitat as defined in Section 4 and Appendix A of the guidelines;
3. Formulation of a mitigation strategy to reduce the scale of impact; and
4. A flowchart to assist in decision making on whether or not an action should be referred.

Step 1 Black Cockatoo Habitat

The excavation footprint contains less than 0.2ha of foraging habitat for Black Cockatoos. There is no known breeding or roosting on the site.

Step 2 Loss of Habitat

Breeding

According to the Black Cockatoo Referral Guidelines the clearing of any known nesting tree has a high risk of being a significant impact. A known nesting tree is defined in the Black Cockatoo Referral Guidelines as any existing tree in which breeding has been recorded or suspected. There are no known nesting trees that occur on the site and therefore there is no risk of a significant impact on known breeding habitat of Black Cockatoos.

The Black Cockatoo Referral Guidelines also consider that the clearing or degradation of any part of a vegetation community known to contain breeding habitat is likely to have a high risk of a significant impact. Breeding habitat is defined as woodlands, forests or isolated trees that contain or consist of live or dead trees of certain species with either a DBH of or greater than 300/500mm or the presence of suitable nest hollows.

There are two trees in the excavation footprint that meet the definition of breeding habitat due to their trunk diameter. The clearing of any breeding habitat trees may have a significant impact.

Roosting

The Black Cockatoo Referral Guidelines consider the clearing of a known roosting site as a high risk of being a significant impact. The site is not a known roosting site. Clearing of any trees on the site would not have a significant impact on known roosting habitat on the site.

Foraging

According to the Black Cockatoo Referral Guidelines the clearing of more than 1ha of quality foraging habitat or more than 10ha of low quality foraging habitat has a high risk of causing a significant impact. Degradation of more than 1ha of quality habitat by things such as altered hydrology or fire regimes has an uncertain risk. The significance of degradation depends on the type of degradation and the quality of the habitat.

The excavation footprint contains less than 0.2ha of foraging habitat so clearing is not likely to have a significant impact.

Step 3 Mitigation

The consideration of a mitigation strategy during the determination of the level of impact and requirement to refer is allowed by the Black Cockatoo Referral Guidelines and setting in place the best practice mitigation strategy may reduce the level of impact and in turn the risk of a significant impact. Mitigation strategies include avoiding impact, managing impact so that there is no net decline in habitat and monitoring the effectiveness of mitigation.

The proposed footprint has been refined to exclude three large Marri trees on Lot 803.

Step 4 Referral Advice

According to the Black Cockatoo Referral Guidelines a referral is recommended if more than 1 ha of the foraging habitat is proposed to be cleared or if the development impacts on any of the two potential breeding habitat trees on the site.

The site contains less than 0.2ha of foraging habitat. Therefore a referral is not required based on clearing foraging habitat. Two potential breeding habitat trees will be cleared. The Black Cockatoo Referral Guidelines do not require in a statutory sense the clearing of more than one potential breeding habitat tree to be referred. The wording in the guidelines is that "Referral Recommended". The proponent is aware of its obligations under the EPBC Act and will assess the clearing for significant impacts on Black Cockatoo species.

2.11.5 Biodiversity Value

The EPA's (2002) *Terrestrial Biological Surveys as an Element of Biodiversity Protection Position Statement No. 3* indicated an ecological assessment of a site must consider its biodiversity value at the genetic, species and ecosystem levels; and its ecological functional value at the ecosystem level.

From a fauna perspective, the vegetation within the site is considered to be mostly Highly Degraded Fauna Habitat as the vegetation has been largely cleared and the native vegetation on the site is not connected to any other areas of native vegetation. There is likely to be a paucity of native mammals and reptiles present as a result of the lack of linkage and the likely prevalence of introduced feral species such as foxes and rabbits. Domestic predators such as cats in the area would also impact on the fauna assemblage on the site.

It is not possible to assess the biodiversity value at a genetic level based on the information available, however due to the degraded nature of the site and the lack of large isolated high quality habitat the biodiversity value at the genetic level is highly unlikely to be impacted as a result of the proposed sand extraction.

3 SAND EXTRACTION MANAGEMENT

3.1 Visual Impact

The southern part of the site is partially hidden from public view due to native trees and shrubs within the Kulija Road reserve (Lot 916) (Figure 3). Retaining this vegetation would be beneficial to screening the site from public view.

The eastern part of the site is not screened from users of Baldivis Road due to the absence of any trees and shrubs in the Baldivis Road reserve. However, the proponent proposes to landscape the eastern end of Lots 1, 2 and 830 at the completion of the extraction program to create a visual screen from the road. Furthermore, the visual impact of the proposed sand mine from the new residential development to the east of the site is mitigated by the 70m wide Tram Reserve that is completely vegetated.

The excavation management plan also identifies a 5m setback to the northern part of the site and western boundary to the landfill.

3.2 Blasting

The proposed operation is a sand mining operation. There will be no blasting as part of the extraction.

3.3 Adjoining Sensitive Receptors

The intention to mine the site for sand may have implications on sensitive land uses adjoining the site.

The EPA preferred method for determining buffers to sensitive land uses involves site-specific technical studies however EPA Guidance Statement No. 3 *Separation Distances Between Industrial and Sensitive Land Uses* (EPA, 2005) does provide generic separation distances. Site specific studies are only required if a reduction of the buffer is required.

The generic distance is:

1. *Not intended to be absolute separation distances, rather they are a default distance for the purposes of:*
 - identifying the need for specific separation distance or buffer definition studies; and*
 - providing general guidance on separation distances in the absence of site specific technical studies (EPA, 2005).*

The Rockingham Millar Road Landfill Site is located to the west of the lots and the Rockingham Memorial Park is located to the north. The Rockingham Memorial Park and Landfill site are not listed as Sensitive Receptors.

A new housing development is being constructed to the east of the site. Earthworks for the residential development commenced around November 2016 which is after the granting of the original extraction industry licence in 2015.

The generic buffer distance for sand mining from a 'Sensitive Receptor' is 300-500m for operations that have no grinding or milling works. Additional acoustic studies have been undertaken for the proposed extended extraction area (Appendix 6) and is addressed in Section 3.4.

3.4 Acoustic Assessment

An Acoustic Assessment was undertaken for the proposed sand mining operation on the site by Herring Storer Acoustics (Appendix 6). The assessment was undertaken for four surrounding residences and allowed for one future residence. The calculations were based on the worst case scenario for the proposed excavation operation and included consideration of the new residential development to the east. The results of modelling for the assessment indicate that the operation of the proposed sand extraction will comply with the *Environmental Protection (Noise) Regulations 1997* for the proposed operating times for the sand extraction.

3.5 Vegetation and Fauna

3.5.1 Vegetation

The remaining native vegetation on the site is Completely Degraded and has been largely impacted by previous activity on the site. Clearing of native vegetation is subject to the *Environmental Protection Act 1986* (EP Act) and *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*.

An application to clear a small patch of vegetation on Lot 803 has been submitted to DWER (CPS 10185/1). The assessment of the application will be completed upon finalisation of the current development application.

Clearing will be carried out in accordance with the methodology prescribed by the clearing permit. No stockpiled vegetation will be burnt at any time under any circumstance.

3.5.2 Fauna

The existing vegetation is fragmented from other areas and therefore only small cryptic species are likely to be impacted on the proposed sand mining. The relocation of fauna prior to clearing will be undertaken.

A one day systematic active search will be undertaken on the small area of Completely Degraded vegetation on Lot 803 and in planted areas for reptile species by a suitably qualified zoologist prior to any clearing of native vegetation. The search for reptiles will occur as close to the planned clearing date as possible to minimise the chance of reintroduction from surrounding areas. Active searching would include digging out holes, removing bark from logs and trees, and sorting through leaf litter with rakes. Any reptiles caught during the search will be relocated under the appropriate DBCA licence. The reptiles will be relocated as directed by the licence conditions. The location selected by DBCA is usually an appropriate DBCA-managed nature reserve.

After the relocation is completed for the additional area of clearing a closeout report will be sent to the City of Rockingham.

Prior to clearing activities trees will be inspected from ground level to determine whether they contain suitable hollows or active bird nests. Where nests or hollows are discovered, the site supervisor will contact a qualified zoologist to undertake fauna relocation as required.

Trees will be bumped or gently shaken by the machine operator to encourage birds and arboreal mammals to relocate prior to the tree being felled. Felled trees with hollows will be inspected, and any vertebrate fauna caught and relocated, or where appropriate given to a wildlife carer to raise and release.

It is possible that Rainbow Bee-eaters occur on the site during late spring-early summer. Inspections prior to clearing in September to December will be undertaken to avoid impacting on Rainbow Bee-eaters.

3.6 Dust Management Plan

The potential for dust generation on the site and calculated risks are comprehensively outlined in the Excavation Management Plan and, with the appropriate dust suppression, the risk is considered to be negligible. The proposed dust management on the site is outlined in Section 14 of the Excavation Management Plan (Appendix 5) and includes, but is not limited to:

- Installation of wind fencing;
- Maintaining the vegetation in the buffers;
- Appropriate materials for access roads;
- Minimisation of open ground and appropriate surface stabilisation;
- Water carts available if dust is being generated;
- Water sprays used during screening;
- Truck load coverage; and
- Monitoring and complaints management.

The measures outlined in the Excavation Management Plan will be implemented.

4 DECOMMISSIONING PLAN

4.1 Future Land Use

The site is proposed to be developed for light industrial/commercial purposes and landscaped in accordance with a Landscape Plan. Development is intended to commence within 18 months of the completion of extraction.

4.2 Decommissioning and Rehabilitation

The decommissioning of the site will occur at the conclusion of mining.

A separate Rehabilitation Management Plan (RMP) will be submitted and approved prior to works commencing. The RMP will be cognisant of the likely future re-zoning and development of the site and will include the following:

- Shaping the batters to ensure they are safe;
- Preparation of the site to control dust for the period prior to development commencing;
- Removal of equipment and materials;
- Clean-up of any oil spills or other obvious areas of contamination; and
- Weed control measure.

Decommissioning and rehabilitation will be undertaken as per the approved Rehabilitation Management Plan.

5 SUMMARY OF MANAGEMENT MEASURES

The management measures outlined in the plan are summarised in Table 7.

Table 7: Management Measures

Factor	Management
Visual Impact	Retain 20m setback to northern and western boundary Landscape eastern boundary with shrubs and trees after mining to create a screen from Baldivis Road.
Blasting	No blasting will be undertaken as part of the excavation works
Adjoining Sensitive Receptors	The results of noise modelling indicate that the operation of the proposed sand extraction will comply with the <i>Environmental Protection (Noise) Regulations 1997</i> for the proposed operating times for the sand extraction
Vegetation and Fauna	Vegetation to be mulched and removed from the site, not burnt under any circumstance
	A native vegetation Clearing Permit has been applied for (CPS 10185/1). Assessment of the application will be completed upon finalisation of the Development Approval. Clearing will be undertaken in accordance with the requirements of the approved clearing permit.
	Completely Degraded vegetation to have a 1 day search for fauna no more than one week prior to clearing
	Inspections prior to clearing in September to December will be undertaken to avoid impacting on Rainbow Bee-eaters
	Avoid clearing in spring-early summer as much as possible
	Prior to clearing, all trees to be inspected for hollows and nests
	Any fauna found in hollows or nests will be managed by a qualified zoologist
	Trees will be bumped or shaken prior to felling
	The proponent acknowledges its referral obligations under the EPBC Act
Dust Management	Dust management to be undertaken as per Section 14 of the Excavation Management Plan
Acoustic Assessment	No further acoustic assessment is required
Decommissioning and Rehabilitation	Decommissioning and Rehabilitation will be undertaken in accordance with the approved Rehabilitation Management Plan

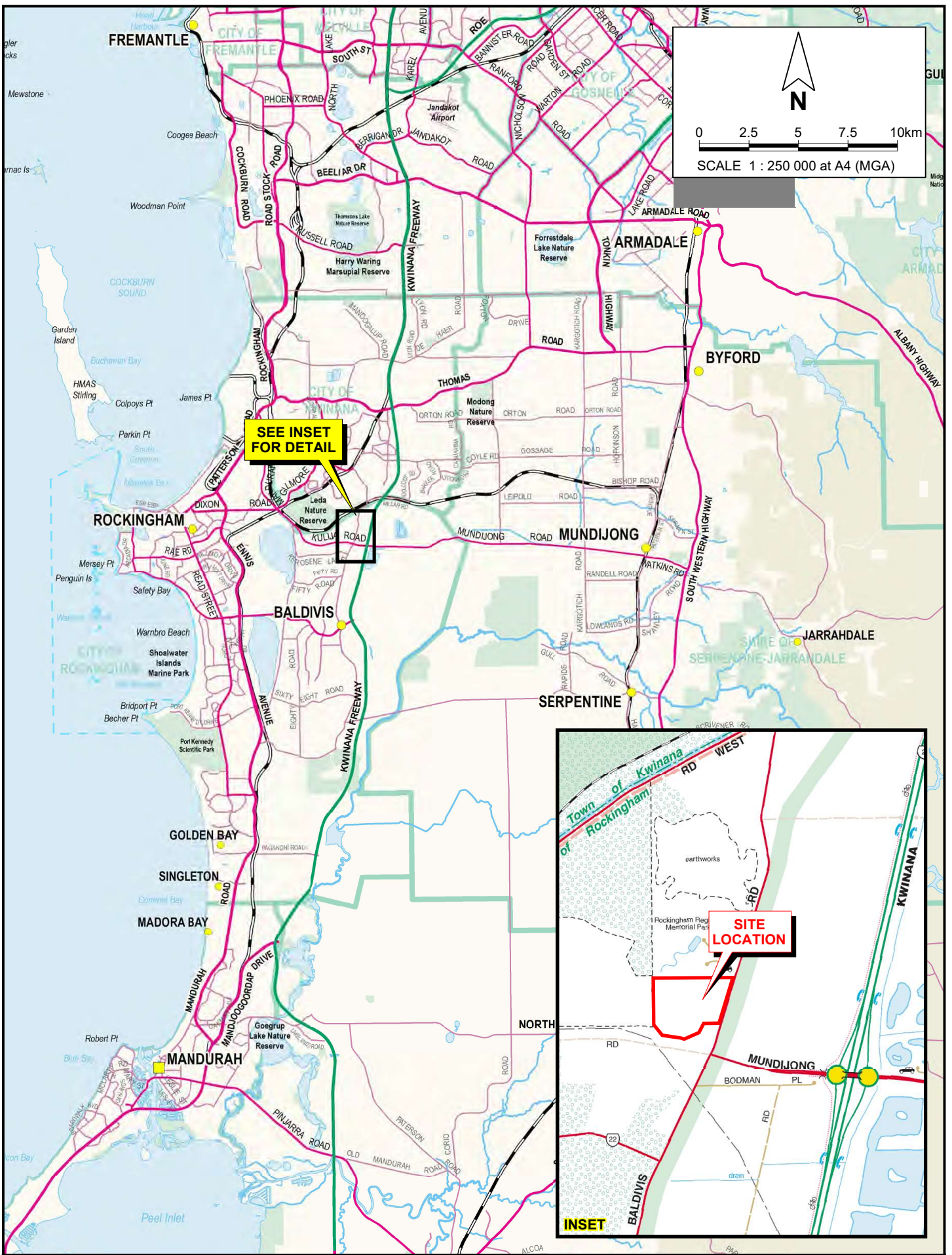
6 REFERENCES

- Beard (1990) *Vegetation Survey of Western Australia 1:1000000 Vegetation Series Swan* University of Western Australia Press
- Birdlife Australia (2014) Red Capped Plover Species Profile. Accessed January 2014 <http://www.birdlife.org.au/bird-profile/red-capped-plover> Australia.
- Birdlife Australia (2012) Peregrine Falcon Factsheet. Accessed November 2012 <http://www.birdlife.org.au/images/uploads/branches/documents/ARA-Peregrine-Factsht.pdf> Australia.
- Birdlife International (2014a) Black-winged Stilt (*Himantopus himantopus*) Species Profile. Accessed January 2014 <http://www.birdlife.org/datazone/speciesfactsheet.php?id=3101>
- Birdlife International (2014b) Red-necked Avocet (*Recurvirostra novaeh*) Species Profile. Accessed January 2014 <http://www.birdlife.org/datazone/speciesfactsheet.php?id=3109>
- Birdlife International (2014c) Hooded Plover (*Thinornis cucullatus*) Species Profile. Accessed November 2014 <http://www.birdlife.org/datazone/speciesfactsheet.php?id=3144>
- Birdlife International (2014) Roseate Tern (*Sterna dougallii*) Species Profile. Accessed January 2014 <http://www.birdlife.org/datazone/speciesfactsheet.php?id=3262>
- BirdLife International (2015a) Species factsheet: *Calidris tenuirostris*. Accessed January 2015 <http://www.birdlife.org/datazone/speciesfactsheet.php?id=3040>
- BirdLife International (2015b) Species factsheet: Little Ringed Plover *Charadrius dubius*. Accessed September 2015 <http://www.birdlife.org/datazone/speciesfactsheet.php?id=3119>
- Bolland, M. (1998) *Soils of the Swan Coastal Plain*. Department of Agriculture. Bunbury, Western Australia.
- City of Rockingham (CoR) (2003) Planning Policy No. 3.1.1 - *Rural Land Strategy* Rockingham, Western Australia
- Coffey Environments (2009) Rockingham Industry Zone Fauna Risk Assessment East Rockingham Industrial Park (IP14 Area) Report No. 2005/55. Perth, Western Australia.
- Department of Agriculture and Food Western Australia (DAFWA) (2015) NRM Info Mapping <http://spatial.agric.wa.gov.au/slip/framesetup.asp> Accessed September 2015 Perth Western Australia
- Department of Environment and Conservation (DEC) (2012a) Fauna Species Profiles http://www.dpaw.wa.gov.au/images/documents/plants-animals/animals/animal_profiles/western-brush-wallaby_2012.pdf Accessed September 2015 Government of Western Australia, Perth.

- Department of Environment and Conservation (DEC) (2012b) Fauna Species Profiles: Quenda *Isoodon obesulus* (Shaw, 1797). Perth, Western Australia.
- Department of Biodiversity Conservation and Attractions (DBCA) (2023) Florabase <https://florabase.dpaw.wa.gov.au/> Accessed September 2023 Perth Western Australia
- Department of the Environment (DoE) (2015). Species Profile and Threats (SPRAT) Database. <http://www.environment.gov.au/cgi-bin/sprat/public/publicthreatenedlist.pl> Accessed September 2015 Commonwealth of Australia
- Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) (2012). *EPBC Act referral guidelines for three threatened black cockatoo species: Carnaby's cockatoo (endangered) Calyptorhynchus latirostris Baudin's cockatoo (vulnerable) Calyptorhynchus baudinii Forest red-tailed black cockatoo (vulnerable) Calyptorhynchus banksii naso.* Commonwealth of Australia
- Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) (2013). *Matters of National Environmental Significance. Significant Impact Guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999* Commonwealth of Australia
- Department of Water (DoW) (2015a) Hydrogeological Atlas Accessed September 2015 <http://www.water.wa.gov.au/Tools/Maps+and+atlases/Perth+groundwater+atlas/default.aspx> Government of Western Australia, Perth.
- Department of Water (DoW) (2015b) *Perth Groundwater Atlas* Accessed September 2015 <http://www.water.wa.gov.au/idelve/gwa/> Government of Western Australia, Perth.
- Douglas, G.B., Dodd, M.B. and Power I.L. (2008) Potential of direct seeding for establishing native plants into pastoral land in New Zealand *New Zealand Journal of Ecology* <http://newzealandecology.org/nzie/> Accessed September 2015
- Environmental Protection Authority (EPA) (2002) *Terrestrial Biological Surveys as an Element of Biodiversity Protection - Position Statement No. 3.* Perth, Western Australia.
- Environmental Protection Authority (EPA) (2005) Guidance for Assessment No.3, *Environmental Factors, Industrial Residential Buffer Areas (Separation Distances)* Perth, Western Australia. June, 2005.
- Garnett S.T., Queensland Parks and Wildlife Service, Crowley, G.M., (2000) *The Action Plan for Australian Birds 2000.* For the Department of Sustainability, Environment, Water, Population and Communities, Australia.
- Government of Western Australia (2000) *Bush Forever - Keeping the Bush in the City. Volume 2: Directory of Bush Forever Sites.* Perth, Western Australia.
- Hedde, E.M., Loneragan, O.W. and Havel, J.J. (1980) Vegetation complexes of the Darling System, Western Australia. In *Atlas of Natural Resources of the Darling System of Western Australia.* Department of Conservation and Environment. Perth, Western Australia.

- Hinz D.A. (1992) Bauxite mining and Walyamirri: The return of the living environment. Paper two. The rehabilitation programme. In *Seventeenth Annual Environmental Workshop 1992*, Papers, Yeppoon Qld, 5–9 October 1992, Australian Mining Industry Council, Canberra, 100–114.
- Landgate (2021) Historical Aerial Photography. Accessed March 2021 <https://www.landgate.wa.gov.au/bmvf/app/mapviewer/> Government of Western Australia, Perth.
- Landgate (2015) WA Atlas Shared Land Information Platform. Accessed September 2015 <https://www2.landgate.wa.gov.au/bmvf/app/waatlas/> Government of Western Australia, Perth.
- Nevill, S (ed) (2005) *Guide to the Wildlife of the Perth Region*. Simon Nevill Publications, Perth, Western Australia
- New South Wales Office of Environment and Heritage (NSW OEH) (2015) Blue-billed Duck – Profile <http://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10580>
Accessed July 2015
- Ochrewest (2015) 142 and 148 Baldivis Road, Baldivis Sand Extraction Excavation Management Plan
Perth, Western Australia
- Storr, G.M., Smith, L.A. and Johnstone R.E. (1999) *Lizards of Western Australia I: Skinks. Revised Edition*, WA Museum, Perth, Western Australia.
- Western Australian Planning Commission (WAPC) (2004) *City of Rockingham Town Planning Scheme No. 2*. Government of Western Australia, Perth.
- Western Australian Planning Commission (WAPC) (2012) *Visual Landscape Planning in Western Australia* Perth, Western Australia

FIGURES



PINPOINT CARTOGRAPHICS (08) 9562 7136 2015-229-01.dgn

Drawn: J. Cabot	Date: 10 Mar 2023
Job: 10214 Rpt: 2015-229	Revision: A

Aigle Royal
 ENVIRONMENTAL MANAGEMENT PLAN
 LOTS 1, 2 AND 803 BALDIVIS ROAD, BALDIVIS

SITE LOCATION

Figure 1



0 10 20 30 40 50m
SCALE 1 : 1 500 at A3 (MGA)

- Legend**
- - - Site Boundary
 - Cadastral Boundary
 - - - Easement Boundary
 - Topographic Contour

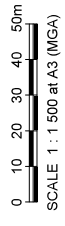
CADAstral SOURCE: Landgate, March 2023.
AERIAL PHOTOGRAPH SOURCE: NearMap, flown April 2021.
CONTOURS SOURCE: Ochs West, Dwg No. 1900b-C-003, Rev B, 11/04/2021.

PGV ENVIRONMENTAL
Aigle Royal
ENVIRONMENTAL MANAGEMENT PLAN
LOTS 1, 2 AND 803 BALDVIS ROAD, BALDVIS

Drawn: J. Cahot	Date: 10 Mar 2023
Job: 10214	Revison: A
Rpt: 2015-229	

SITE BOUNDARY AND TOPOGRAPHY

Figure 2



SCALE 1 : 1 500 at A3 (MGA)

- Legend**
- - - Site Boundary
 - Cadastral Boundary
 - Easement Boundary
 - Proposed Excavation Footprint

CADASTRAL SOURCE: Landgate, March 2023.
 AERIAL PHOTOGRAPH SOURCE: NearMap, flown April 2021.
 EXCAVATION SOURCE: Ocne West, Dwg No. 19008-C-003, Rev B, 11/04/2021.

PGV ENVIRONMENTAL

Aigle Royal
 ENVIRONMENTAL MANAGEMENT PLAN
 LOTS 1, 2 AND 803 BALDIVIS ROAD, BALDIVIS

Drawn: J. Cahot
 Date: 10 Mar 2023
 Job: 10214 Rpt: 2015-229
 Revision: A

PROPOSED EXCAVATION FOOTPRINT

APPENDIX 1

Sand Extraction Development Approval

Our Ref: 20.2021.79.1 – AD21/164080

Enquiries to: Mrs C Gillespie; Mr E Anderson



16th September 2021

Mr Kris Kennedy
Aigle Royal Developments
PO Box 7897
CLOISTERS SQUARE WA 6850

Email: kkennedy@aigleroyal.com.au

Dear Mr Kennedy

**Re: Proposed Extractive Industry (Sand Extraction) - Lots 1, 2 & 825 (No.142 & 148)
Baldivis Road, Baldivis**

Your application for Development Approval received on the 17th March 2021 and additional information received on the 9th and 14th of September 2021 for the above has been granted conditional Development Approval under clause 68(2)(b) of the deemed provisions of Town Planning Scheme No.2 in accordance with the conditions specified on the attached Notice of determination on application for Development Approval, made by delegated authority pursuant to clause 82 and 83 of the *deemed provisions*.

Development Approval does not, however, remove the need for approvals, licences and other permits that may be required under other legislation. Prior to the works commencing it may be necessary to obtain a Building Permit (pursuant to section 9 of the Building Act 2011) from the City's Building Services.

The applicant is advised that Approval to Commence Development must be separately obtained from the Western Australian Planning Commission under Clause 32 of the Metropolitan Region Scheme prior to the commencement of any development.

Planning approval does not, however, remove the need for approvals, licences and other permits that may be required under other legislation.

If the applicant is aggrieved by this determination the City may, on written application from the owner, amend the approval period, amend a condition or aspect of approval, or cancel the approval, during or after the period within which the development approval must be substantially commenced under clause 77 of the *Planning and Development (Local Planning Schemes) Regulations 2015*. Furthermore, there may be a right of review by the State Administrative Tribunal in accordance with section 252 of the *Planning and Development Act 2005*. An application to the Tribunal for review of this decision must be made within 28 days of the determination.

Should you have any enquiries with respect to this advice, please contact Mrs Casey Gillespie on 9528 0429.

Yours faithfully

M ROSS
MANAGER STATUTORY PLANNING



FORM 2

Planning and Development Act 2005

**CITY OF ROCKINGHAM TOWN PLANNING SCHEME No.2
and
METROPOLITAN REGION SCHEME**

**NOTICE OF DETERMINATION ON APPLICATION FOR
DEVELOPMENT APPROVAL**

LOCATION: No's 142 & 148 Baldivis Road, Baldivis

LOT: 1, 2 & 825

PLAN/DIAGRAM: D033168; D044878; P077705

VOL. NO:

FOLIO NO:

APPLICATION DATE: 15th March 2021 **RECEIVED ON:** 17th March 2021

DESCRIPTION OF PROPOSED DEVELOPMENT: Extractive Industry (Sand Extraction)

The application for Development Approval in accordance with the submitted plans and application received on the 17th March 2021 and additional information received on the 9th and 14th of September 2021 is:

Approved subject to the following conditions:

1. All development must be carried out in accordance with the approved plans and drawing as listed below, as amended in red:
 - Revised Sand Extraction Plan stage 2, Drawing No. 19008-c-003, Revision C, Dated 6th September 2021;

Save that, in the event of an inconsistency between the approved plans and a requirement of the conditions set out below, the requirement of the conditions shall prevail.

2. The Acoustic Assessment prepared by Herring Storer Acoustics; Revision C dated 7th September 2021 and approved by the City of Rockingham must be observed and performed in accordance with the tenor of its provisions.

If in the opinion of the City, any of the excavation operations are generating an unreasonable amount of noise, or that any of those operations are not compliant with the approved Acoustic Assessment, the City may direct that:

- (i) All operations must cease on site immediately; and/or
- (ii) Remediation works be undertaken to rectify the non-compliance within a specified time period; and/or
- (iii) An amended acoustic assessment is to be submitted and approved; and/or
- (iv) The activities on the site are brought into compliance with this approval.

3. All vehicles, equipment and machinery used on the site must not use reversing beepers unless those beepers are required for the safe conduct of operations on the site (in accordance with the provisions of the *Occupational Safety and Health Regulations 1996* (WA) and the *Environmental Protection (Noise) Regulations 1997* or it is demonstrated to the written satisfaction of the City that no acceptable alternative exists. Any reversing alarm on any vehicle, piece of equipment or machinery shall be broad-band reversing alarms, for example, 'croakers'.
4. The Excavation Management Plan prepared by Ochrewest Consulting Engineers, Revision C, dated September 2021 and approved by the City of Rockingham must be observed and performed in accordance with the tenor of its provisions at all times.
5. Dust management (provisions, contingency arrangements and monitoring) is to comply with Classification 3 requirements from 1 April to 30 September, and Classification 4 requirements from 1 October to 31 March, as specified in “*A guideline for managing the impacts of dust and associated contaminants from land development sites, contaminated sites remediation and other related activities*” (DEC 2011).

If in the opinion of the City, any of the extraction operations on the site are generating an unreasonable amount of dust, or that any of those operations are not compliant with any of the conditions of this approval the City may direct in writing that:

- (i) All operations must cease on site immediately; and/or
 - (ii) Remediation works be undertaken to rectify the non-compliance within a specified time period; and/or
 - (iii) An amended Dust Management Plan is to be submitted and approved; and/or
 - (iv) The activities on the site are brought into compliance with this approval.
6. In accordance with the approved Extraction Management Plan referred in condition 4 of this Approval, no crushing or blasting is permitted on site at anytime for the duration of the Approval.
 7. All Extractive Industry traffic access and egress must be obtained from a paved and drained access point at Lot 1 Baldivis Road. This access point shall remain free and clear at all times.
 8. All vehicle movements along Baldivis Road must not obstruct or impede the movement of funeral processions or mourner’s vehicles from entering and exiting the Rockingham Regional Memorial Park at any time. The applicant/owner is to liaise with the Metropolitan Cemetery Board to coordinate vehicle movements on Baldivis Road.
 9. Haulage vehicles are not permitted to park along Baldivis Road or Kulija Road at any time.
 10. The hours of operation for haulage of material and operation of earth moving equipment associated with the extractive industry, the subject of this approval, is only permitted between the hours of 7:00am to 5:00pm Monday to Saturday, and not at all on Sunday or Public Holidays, in accordance with the endorsed plans and management reports referred in this Approval.
 11. A minimum AHD of 8.7m shall be maintained across the extraction site at all times.
 12. No stormwater drainage is to be discharged onto the Kulija Road Reserve.

13. A vegetated earth bund shall be established and maintained for the duration of the development on the south western corner of the site, as shown on the approved plan referred to in condition 1 of this approval, to provide screening from Kulija Road. Detailed drawings of the screening treatment/s and bund shall be provided including the types, sizes, density and heights of vegetation and fencing. Elevations and sectional drawings shall be provided to the City prior to any extraction activities commencing on site.
14. A landscape plan must be submitted to and approved by the City, prior to any extraction activities occurring on site, for the revegetation of the designated boundary setbacks, and to the batters between the approved development area and the setback area.

The landscape plan must:

- (i) Be prepared by a suitably qualified and experienced Landscape Architect;
 - (ii) Identify existing vegetation to be retained within the setbacks;
 - (iii) Demonstrate sufficient screening is maintained along the eastern, northern and western boundaries;
 - (iv) Include the earth bund and treatments required by condition 13;
 - (v) Include all proposed fencing treatments for the site, inclusive of heights and any materials to be used to protect view amenity;
 - (vi) Detail the specifications of any proposed fill material and/or topsoil proposed to be applied within the development area, including depth, stabilisation measures and compaction, soil permeability and slope stabilisation and erosion management measures, including measures to mitigate potential impacts on embankment drainage;
 - (vii) Include overstorey and understorey vegetation endemic to the Baldivis area and associated with the Karrakatta, Cottesloe (Central and South) or Serpentine River Vegetation Complexes (as mapped by Heddle *et al* 1980);
 - (viii) Planting plan must include plant species list with plant size at time of planting; and
 - (ix) Implemented at an agreed time and maintained at all times to the satisfaction of the City (suggested implementation to occur at the onset of winter 2022).
15. The batter at the extraction area boundary is to be suitably stabilised with organic mulch material and planted with groundcover species endemic to the Baldivis area and associated with the Karrakatta, Cottesloe (Central and South) or Serpentine River Vegetation Complexes (as mapped by Heddle *et al* 1980).
 16. The batter slope abutting Kulija Road is to be a minimum 1:4 slope. No earth works shall encroach onto the Kulija Road Reserve. The ground levels on the Kulija Road reserve are to be maintained as existing.
 17. No vegetation removal is permitted outside the approved excavation area. The excavation area shall be clearly delineated on site and in accordance with the setbacks and site boundaries as shown on the approved plans referred to in condition 1 of this approval.
 18. Secure fencing to the extraction area shall be installed prior to extraction commencing on site. Any gateways shall be locked when not in operation. All fencing and gates shall be maintained in good repair for the duration of the use to the satisfaction of the City of Rockingham.
 19. Warning signs shall be erected and maintained along the boundaries of each area to be excavated so that each sign:
 - (i) is not more than 200m apart;
 - (ii) is not less than 1.2m in height and not less than 1m wide; and
 - (iii) bears the words "DANGER EXCAVATIONS KEEP OUT".

20. The applicant/landowner shall have a Complaints procedure in place for the duration of the Extractive Industry that addresses, but is not limited to, the following:
- (i) A telephone number or numbers and an email address or addresses must be maintained through which complaints concerning the development may be made at any time. These details shall be clearly displayed on site at the entry to the site and at the site office.
 - (ii) The owners and occupiers of properties within 500 metres of any boundary of the land must be advised not less than once every calendar year in writing of the telephone number or numbers and the email address or addresses.
 - (iii) A complaints log must be kept in which the following is to be recorded:
 - a) The date and time of each complaint made and received;
 - b) The means (telephone or email) by which the complaint was made;
 - c) Any personal details of the complainant that were provided or, if no details were provided a note to that effect;
 - d) The nature of the complaint;
 - e) The steps or actions taken in, and the time of, the response of each complaint, including any follow up contact with the complainant; and
 - f) If no actions or steps were taken in relation to the complaint or enquiry, then the reasons why no action or steps were taken.
 - (iv) A response must be made to every complaint received as soon as possible but in any event within 3 working days after receipt of the complaint.
 - (v) The complaints log must be provided to the City on demand.
 - (vi) A copy of any report prepared and submitted to the Department of Environment Regulation (as required by and forming part of the operator's monitoring and reporting requirements contained in any licence or approved issued by the Department must be provided to the City concurrently with the report being provided to the Department.
21. Within 45 days of the commencement of extraction works, a Rehabilitation Management Plan is must be prepared and submitted to the City and Main Roads WA for approval. All Rehabilitation work specified in the approved Rehabilitation Management Plan must be completed no later than 6 months after the earlier of:
- (i) the expiry of the approval period; and
 - (ii) the lapse of this approval.
- All works shall cease upon the expiry of the 45 day period where a rehabilitation management plan has not been submitted to the City for its approval.
22. In accordance with the staging of the extraction, as shown on the approved plans referred to in condition 1 of the approval, no excavation work is to be commenced on the second or any subsequent stage unless:
- (i) all excavation work on the previous stage has ceased; and
 - (ii) rehabilitation work on the previous stage has commenced.

23. Within six months of completion of all extraction works on site, the subject of this approval or the lapsing of this approval, whichever occurs first, a Report certifying that all landfill and rehabilitation works have been carried out must be submitted to the City of Rockingham.
24. Within 21 days of the date of this Approval (being 7th October, 2021), the applicant/landowner shall remove all waste/debris/rubble associated with the demolition of the pre-existing dwellings on Lot 1 and Lot 2 Baldvis Road and other stockpiles (including green waste) from the site to the satisfaction of the City. Photographic evidence shall be provided to the City demonstrating compliance.
25. If Baldvis Road is damaged from haulage vehicles attributed to the Extractive Industry, the applicant shall rectify such damage to the satisfaction and specifications of the City at their full cost.
26. This approval is valid for a period of 2 years only, commencing on the date of the issue of this approval. No further development inclusive of any works associated with this approval are to be undertaken upon expiry with the exception of rehabilitation works.
27. Approval to Commence Development must be separately obtained from the Western Australian Planning Commission under the provisions of the Metropolitan Region Scheme prior to the commencement of any development on site.

Date of determination: 16th September 2021

FOOTNOTES TO APPROVAL

1. Where an approval has so lapsed, no development must be carried out without the further approval of the local government having first been sought and obtained.
2. If an applicant or owner is aggrieved by this determination there is a right of review by the State Administrative Tribunal in accordance with the *Planning and Development Act 2005* Part 14. An application must be made within 28 days of the determination.
3. This Approval relates to the details provided in the application; to undertake the development in a different manner to that stated in the application a fresh application for Planning Approval must be submitted to the City.
4. A Building Permit must be obtained prior to construction; the applicant and owner should liaise with the City's Building Services in this regard.
5. The subject area is located in the Stakehill Groundwater area (Tamworth Swamp subarea) as proclaimed under the Rights in Water and Irrigation Act 1914. Any groundwater abstraction in this proclaimed area for purposes other than domestic and/or stock watering taken from the superficial aquifer, is subject to licensing by the Department. The issuing of a groundwater licence is not guaranteed but if issued will contain a number of conditions that are binding upon the licensee.
6. In relation to Condition 11, a minimum vertical separation distance of 2m to the highest-known water table level, must be maintained for the duration of the development.

7. Under section 51C of the Environmental Protection Act 1986 (EP Act), clearing of native vegetation is an offence unless undertaken under the authority of a clearing permit, or the clearing is subject to an exemption. Exemptions for clearing that are a requirement of written law, or authorised under certain statutory processes, are contained in Schedule 6 of the EP Act. Exemptions for low impact routine land management practices outside of environmentally sensitive areas (ESAs) are contained in the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (the Clearing Regulations).
8. In relation to Condition 8, please contact the Western Australian Metropolitan Cemeteries Board on 1300 793 109; email mcb@mcb.wa.gov.au.
9. The development must comply with the Environmental Protection (Clearing of Native Vegetation) Regulations 2004; the applicant and owner should liaise with the Department of Environment and Conservation in this regard.
10. A Permit to Take Water for the use of groundwater may need to be obtained; the applicant should liaise with the Department of Water in this regard.
11. A Works Approval may be required for Prescribed Premises from the Department of Environment Regulation. Further information on licenced is available at. The applicant is advised to liaise with the Department of Environment Regulation in this regard.
12. If the clearing of native vegetation is likely to impact on significant habitat for threatened black cockatoo species, it may be considered a controlled action under the Environmental Protection and Biodiversity Conservation Act 1999. The applicant should liaise with the Commonwealth Department of the Agriculture, Water and the Environment in this regard.
13. The remnant vegetation on the Lot is protected according to *AS4970-2009 Australian Standard – Protection of Trees on Development Sites* Existing street trees adjacent to the development site and those within the site identified for retention must be protected throughout the course of the project in accordance with Australian Standard AS 4970-2009 Protection of Trees on Development Sites.

Signed:

Date: 16th September 2021



M ROSS
MANAGER STATUTORY PLANNING

for and on behalf of the City of Rockingham

APPENDIX 2
Naturemap Report

NatureMap Species Report

Created By Jackalyn Hams on 24/08/2015

Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 115°49' 37" E, 32°17' 26" S
Buffer 5km
Group By Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	429	4062
Other specially protected fauna	1	2
Priority 3	2	3
Priority 4	6	46
Priority 5	2	40
Protected under international agreement	13	108
Rare or likely to become extinct	4	33
TOTAL	457	4294

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Rare or likely to become extinct				
1.	24784 <i>Calidris ferruginea</i> (Curlew Sandpiper)		T	
2.	24731 <i>Calyptorhynchus banksii</i> subsp. <i>naso</i> (Forest Red-tailed Black-Cockatoo)		T	
3.	24734 <i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo (short-billed black-cockatoo), Carnaby's Cockatoo)		T	
4.	24798 <i>Numenius madagascariensis</i> (Eastern Curlew)		T	
Protected under international agreement				
5.	41323 <i>Actitis hypoleucos</i> (Common Sandpiper)		IA	
6.	25554 <i>Apus pacificus</i> (Fork-tailed Swift)		IA	
7.	25558 <i>Ardea ibis</i> (Cattle Egret)		IA	
8.	41324 <i>Ardea modesta</i> (Eastern Great Egret)		IA	
9.	24779 <i>Calidris acuminata</i> (Sharp-tailed Sandpiper)		IA	
10.	24788 <i>Calidris ruficollis</i> (Red-necked Stint)		IA	
11.	24789 <i>Calidris subminuta</i> (Long-toed Stint)		IA	
12.	24293 <i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)		IA	
13.	25741 <i>Limosa limosa</i> (Black-tailed Godwit)		IA	
14.	24598 <i>Merops ornatus</i> (Rainbow Bee-eater)		IA	
15.	24843 <i>Plegadis falcinellus</i> (Glossy Ibis)		IA	
16.	24806 <i>Tringa glareola</i> (Wood Sandpiper)		IA	
17.	24808 <i>Tringa nebularia</i> (Common Greenshank)		IA	
Other specially protected fauna				
18.	25624 <i>Falco peregrinus</i> (Peregrine Falcon)		S	
Priority 3				
19.	16245 <i>Cyathochaeta teretifolia</i>		P3	
20.	25249 <i>Neelaps calonotos</i> (Black-striped Snake)		P3	
Priority 4				
21.	24376 <i>Charadrius rubricollis</i> (Hooded Plover)		P4	
22.	4763 <i>Dodonaea hackettiana</i> (Hackett's Hopbush)		P4	
23.	25563 <i>Ixobrychus minutus</i> (Little Bittern)		P4	
24.	24133 <i>Macropus irma</i> (Western Brush Wallaby)		P4	
25.	24328 <i>Oxyura australis</i> (Blue-billed Duck)		P4	
26.	17850 <i>Stylidium ireneae</i>		P4	
Priority 5				
27.	25478 <i>Isodon obesulus</i> (Southern Brown Bandicoot)		P5	
28.	24153 <i>Isodon obesulus</i> subsp. <i>fusciventer</i> (Quenda, Southern Brown Bandicoot)		P5	
Non-conservation taxon				
29.	15482 <i>Acacia pulchella</i> var. <i>goadbyi</i>			
30.	3525 <i>Acacia rostellifera</i> (Summer-scented Wattle)			
31.	3527 <i>Acacia saligna</i> (Orange Wattle, Kudjong)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
32.	30032 <i>Acacia saligna</i> subsp. <i>saligna</i>			
33.	3557 <i>Acacia stenoptera</i> (Narrow Winged Wattle)			
34.	24260 <i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill)			
35.	24261 <i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill)			
36.	24262 <i>Acanthiza inornata</i> (Western Thornbill)			
37.	1208 <i>Acanthocarpus preissii</i>			
38.	24560 <i>Acanthorhynchus superciliosus</i> (Western Spinebill)			
39.	25535 <i>Accipiter cirrocephalus</i> (Collared Sparrowhawk)			
40.	24281 <i>Accipiter cirrocephalus</i> subsp. <i>cirrocephalus</i> (Collared Sparrowhawk)			
41.	25536 <i>Accipiter fasciatus</i> (Brown Goshawk)			
42.	24282 <i>Accipiter fasciatus</i> subsp. <i>fasciatus</i> (Brown Goshawk)			
43.	25755 <i>Acrocephalus australis</i> (Australian Reed Warbler)			
44.	1791 <i>Adenanthos obovatus</i> (Basket Flower)			
45.	4582 <i>Adriana quadripartita</i> (Bitter Bush)			
46.	184 <i>Aira caryophyllea</i> (Silvery Hairgrass)	Y		
47.	1728 <i>Allocasuarina fraseriana</i> (Sheoak, Kondii)			
48.	<i>Allotrochosina karri</i>			
49.	<i>Aname mainae</i>			
50.	<i>Aname tepperi</i>			
51.	24312 <i>Anas gracilis</i> (Grey Teal)			
52.	24315 <i>Anas rhynchotis</i> (Australasian Shoveler)			
53.	24316 <i>Anas superciliosa</i> (Pacific Black Duck)			
54.	11434 <i>Anigozanthos humilis</i> subsp. <i>humilis</i>			
55.	11261 <i>Anigozanthos manglesii</i> subsp. <i>manglesii</i>			
56.	24561 <i>Anthochaera carunculata</i> (Red Wattlebird)			
57.	24562 <i>Anthochaera lunulata</i> (Western Little Wattlebird)			
58.	<i>Antichiropus variabilis</i>			
59.	6211 <i>Apium prostratum</i> (Sea Celery)			
60.	12040 <i>Apium prostratum</i> var. <i>prostratum</i> (Sea Celery)			
61.	24285 <i>Aquila audax</i> (Wedge-tailed Eagle)			
62.	<i>Araneus cyphoxis</i>			
63.	24340 <i>Ardea novaehollandiae</i> (White-faced Heron)			
64.	24341 <i>Ardea pacifica</i> (White-necked Heron)			
65.	25566 <i>Artamus cinereus</i> (Black-faced Woodswallow)			
66.	24353 <i>Artamus cyanopterus</i> (Dusky Woodswallow)			
67.	226 <i>Arundo donax</i> (Giant Reed)	Y		
68.	20350 <i>Astartea affinis</i>			
69.	20283 <i>Astartea scoparia</i>			
70.	7851 <i>Asteridea pulverulenta</i> (Common Bristle Daisy)			
71.	17234 <i>Austrostipa compressa</i>			
72.	17240 <i>Austrostipa flavescens</i>			
73.	231 <i>Avellinia michelii</i>	Y		
74.	234 <i>Avena fatua</i> (Wild Oat)	Y		
75.	24318 <i>Aythya australis</i> (Hardhead)			
76.	<i>Backbourkia brounii</i>			
77.	1800 <i>Banksia attenuata</i> (Slender Banksia, Piara)			
78.	1819 <i>Banksia grandis</i> (Bull Banksia, Pulgarla)			
79.	1830 <i>Banksia littoralis</i> (Swamp Banksia, Pungura)			
80.	1834 <i>Banksia menziesii</i> (Firewood Banksia)			
81.	32077 <i>Banksia sessilis</i> var. <i>cygnorum</i>			
82.	32080 <i>Banksia sessilis</i> var. <i>sessilis</i>			
83.	15037 <i>Bartsia trixago</i>	Y		
84.	740 <i>Baumea arthropylla</i>			
85.	743 <i>Baumea juncea</i> (Bare Twigrush)			
86.	24319 <i>Biziura lobata</i> (Musk Duck)			
87.	749 <i>Bolboschoenus caldwellii</i> (Marsh Club-rush)			
88.	4417 <i>Boronia dichotoma</i>			
89.	11381 <i>Boronia ramosa</i> subsp. <i>anethifolia</i>			
90.	3710 <i>Bossiaea eriocarpa</i> (Common Brown Pea)			
91.	42381 <i>Brachyurophis semifasciatus</i> (Southern Shovel-nosed Snake)			
92.	244 <i>Briza maxima</i> (Blowfly Grass)	Y		
93.	245 <i>Briza minor</i> (Shivery Grass)	Y		
94.	249 <i>Bromus diandrus</i> (Great Brome)	Y		
95.	250 <i>Bromus hordeaceus</i> (Soft Brome)	Y		
96.	1366 <i>Bulbine semibarbata</i> (Leek Lily)			
97.	24359 <i>Burhinus grallarius</i> (Bush Stone-curlew)			
98.	25715 <i>Cacatua roseicapilla</i> (Galah)			
99.	25716 <i>Cacatua sanguinea</i> (Little Corella)			
100.	24729 <i>Cacatua tenuirostris</i> (Eastern Long-billed Corella)	Y		
101.	25598 <i>Cacomantis flabelliformis</i> (Fan-tailed Cuckoo)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
102.	42307 <i>Cacomantis pallidus</i> (Pallid Cuckoo)			
103.	1276 <i>Caesia micrantha</i> (Pale Grass Lily)			
104.	1586 <i>Caladenia discoidea</i> (Dancing Orchid)			
105.	15348 <i>Caladenia flava</i> subsp. <i>flava</i>			
106.	2846 <i>Calandrinia calyptrata</i> (Pink Purslane)			
107.	2854 <i>Calandrinia granulifera</i> (Pygmy Purslane)			
108.	2856 <i>Calandrinia liniflora</i> (Parakeelya)			
109.	96 <i>Callitris preissii</i> (Rottnest Island Pine, Maro)			
110.	5415 <i>Calothamnus lateralis</i>			
111.	35816 <i>Calothamnus quadrifidus</i> subsp. <i>quadrifidus</i>			
112.	25717 <i>Calyptorhynchus banksii</i> (Red-tailed Black-Cockatoo)			
113.	2957 <i>Cassytha racemosa</i> (Dodder Laurel)			
114.	11242 <i>Cassytha racemosa</i> forma <i>pilosa</i>			
115.	6539 <i>Centaureum erythraea</i> (Common Centaury)	Y		
116.	6542 <i>Centaureum tenuiflorum</i>	Y		
117.	6214 <i>Centella asiatica</i>			
118.	1125 <i>Centrolepis drummondiana</i>			
119.	2889 <i>Cerastium glomeratum</i> (Mouse Ear Chickweed)	Y		
120.	24186 <i>Chalinobus gouldii</i> (Gould's Wattled Bat)			
121.	1280 <i>Chamaescilla corymbosa</i> (Blue Squill)			
122.	24373 <i>Charadrius melanops</i> (Black-fronted Dotterel)			
123.	24377 <i>Charadrius ruficapillus</i> (Red-capped Plover)			
124.	24321 <i>Chenonetta jubata</i> (Australian Wood Duck, Wood Duck)			
125.	24980 <i>Christinus marmoratus</i> (Marbled Gecko)			
126.	24431 <i>Chrysococcyx basalis</i> (Horsfield's Bronze Cuckoo)			
127.	24833 <i>Cincloramphus cruralis</i> (Brown Songlark)			
128.	24288 <i>Circus approximans</i> (Swamp Harrier)			
129.	7937 <i>Cirsium vulgare</i> (Spear Thistle)	Y		
130.	24774 <i>Cladorhynchus leucocephalus</i> (Banded Stilt)			
131.	25675 <i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
132.	24399 <i>Columba livia</i> (Domestic Pigeon)	Y		
133.	4552 <i>Comesperma confertum</i>			
134.	4555 <i>Comesperma integerrimum</i>			
135.	6217 <i>Conium maculatum</i> (Hemlock)	Y		
136.	1885 <i>Conospermum triplinervium</i> (Tree Smokebush)			
137.	6348 <i>Conostephium pendulum</i> (Pearl Flower)			
138.	1418 <i>Conostylis aculeata</i> (Prickly Conostylis)			
139.	11438 <i>Conostylis candicans</i> subsp. <i>candicans</i>			
140.	1436 <i>Conostylis juncea</i>			
141.	1455 <i>Conostylis setosa</i> (White Cottonhead)			
142.	25568 <i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
143.	<i>Cormocephalus novaehollandiae</i>			
144.	25592 <i>Corvus coronoides</i> (Australian Raven)			
145.	24671 <i>Coturnix pectoralis</i> (Stubble Quail)			
146.	25595 <i>Cracticus tibicen</i> (Australian Magpie)			
147.	24422 <i>Cracticus tibicen</i> subsp. <i>dorsalis</i> (White-backed Magpie)			
148.	25596 <i>Cracticus torquatus</i> (Grey Butcherbird)			
149.	3137 <i>Crassula colorata</i> (Dense Stonecrop)			
150.	3140 <i>Crassula glomerata</i>	Y		
151.	25399 <i>Crinia glauerti</i> (Clicking Frog)			
152.	25400 <i>Crinia insignifera</i> (Squelching Froglet)			
153.	30893 <i>Cryptoblepharus buchananii</i>			
154.	25020 <i>Cryptoblepharus plagioccephalus</i>			
155.	25027 <i>Ctenotus australis</i>			
156.	6663 <i>Cuscuta epithymum</i> (Lesser Dodder, Greater Dodder)	Y		
157.	768 <i>Cyathochaeta avenacea</i>			
158.	24322 <i>Cygnus atratus</i> (Black Swan)			
159.	30901 <i>Dacelo novaeguineae</i> (Laughing Kookaburra)	Y		
160.	7454 <i>Dampiera linearis</i> (Common Dampiera)			
161.	25673 <i>Daphoenositta chrysoptera</i> (Varied Sittella)			
162.	1218 <i>Dasypogon bromeliifolius</i> (Pineapple Bush)			
163.	3845 <i>Daviesia triflora</i>			
164.	1259 <i>Dianella revoluta</i> (Blueberry Lily)			
165.	11636 <i>Dianella revoluta</i> var. <i>divaricata</i>			
166.	25607 <i>Dicaeum hirundinaceum</i> (Mistletoebird)			
167.	1287 <i>Dichopogon capillipes</i>			
168.	17838 <i>Dielsia stenostachya</i>			
169.	<i>Dingosa serrata</i>			
170.	7054 <i>Dischisma arenarium</i>	Y		
171.	12939 <i>Diuris magnifica</i>			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
172.	3095 <i>Drosera erythrorhiza</i> (Red Ink Sundew)			
173.	3106 <i>Drosera macrantha</i> (Bridal Rainbow)			
174.	13216 <i>Drosera menziesii</i> subsp. <i>penicillaris</i>			
175.	3131 <i>Drosera stolonifera</i> (Leafy Sundew)			
176.	11485 <i>Ehrharta brevifolia</i> var. <i>cuspidata</i>	Y		
177.	347 <i>Ehrharta calycina</i> (Perennial Veldt Grass)	Y		
178.	349 <i>Ehrharta longiflora</i> (Annual Veldt Grass)	Y		
179.	1643 <i>Elythranthera brunonis</i> (Purple Enamel Orchid)			
180.	24567 <i>Epthianura albifrons</i> (White-fronted Chat)			
181.	17175 <i>Eremophila glabra</i> subsp. <i>albicans</i>			
182.	15446 <i>Eryngium pinnatifidum</i> subsp. <i>pinnatifidum</i>			
183.	24379 <i>Erythronys cinctus</i> (Red-kneed Dotterel)			
184.	5649 <i>Eucalyptus foecunda</i> (Narrow-leaved Red Mallee)			
185.	5659 <i>Eucalyptus gomphocephala</i> (Tuart, Duart)			
186.	5708 <i>Eucalyptus marginata</i> (Jarrah, Djara)			
187.	5763 <i>Eucalyptus rudis</i> (Flooded Gum, Kulurda)			
188.	3872 <i>Euchilopsis linearis</i> (Swamp Pea)			
189.	4648 <i>Euphorbia terracina</i> (Geraldton Carnation Weed)	Y		
190.	25622 <i>Falco cenchroides</i> (Australian Kestrel)			
191.	24472 <i>Falco cenchroides</i> subsp. <i>cenchrus</i> (Australian Kestrel)			
192.	25623 <i>Falco longipennis</i> (Australian Hobby)			
193.	24041 <i>Felis catus</i> (Cat)	Y		
194.	25727 <i>Fulica atra</i> (Eurasian Coot)			
195.	24761 <i>Fulica atra</i> subsp. <i>australis</i> (Eurasian Coot)			
196.	907 <i>Gahnia trifida</i> (Coast Saw-sedge)			
197.	7323 <i>Galium murale</i> (Small Goosegrass)	Y		
198.	25729 <i>Gallinula tenebrosa</i> (Dusky Moorhen)			
199.	24763 <i>Gallinula tenebrosa</i> subsp. <i>tenebrosa</i> (Dusky Moorhen)			
200.	24764 <i>Gallinula ventralis</i> (Black-tailed Native-hen)			
201.	4339 <i>Geranium molle</i> (Dove's Foot Cranesbill)	Y		
202.	25530 <i>Gerygone fusca</i> (Western Gerygone)			
203.	1520 <i>Gladiolus caryophyllaceus</i> (Wild Gladiolus)	Y		
204.	6587 <i>Gomphocarpus fruticosus</i> (Narrowleaf Cottonbush)	Y		
205.	3957 <i>Gompholobium tomentosum</i> (Hairy Yellow Pea)			
206.	24443 <i>Grallina cyanoleuca</i> (Magpie-lark)			
207.	37500 <i>Grammatotheca bergiana</i> var. <i>bergiana</i>	Y		
208.	2119 <i>Grevillea vestita</i>			
209.	12824 <i>Grevillea vestita</i> subsp. <i>vestita</i>			
210.	2175 <i>Hakea lissocarpha</i> (Honey Bush)			
211.	24295 <i>Haliastur sphenurus</i> (Whistling Kite)			
212.	3961 <i>Hardenbergia comptoniana</i> (Native Wisteria)			
213.	25410 <i>Heleioporus eyrei</i> (Moaning Frog)			
214.	3016 <i>Heliphila pusilla</i>	Y		
215.	6839 <i>Hemiandra pungens</i> (Snakebush)			
216.	25119 <i>Hemiergis quadrilineata</i>			
217.	5135 <i>Hibbertia hypericoides</i> (Yellow Buttercups)			
218.	5162 <i>Hibbertia racemosa</i> (Stalked Guinea Flower)			
219.	25734 <i>Himantopus himantopus</i> (Black-winged Stilt)			
220.	24491 <i>Hirundo neoxena</i> (Welcome Swallow)			
221.	<i>Holconia westralia</i>			
222.	445 <i>Holcus setiger</i> (Annual Fog)	Y		
223.	6222 <i>Homalosciadium homalocarpum</i>			
224.	12859 <i>Hovea trisperma</i> var. <i>trisperma</i>			
225.	5216 <i>Hybanthus calycinus</i> (Wild Violet)			
226.	6224 <i>Hydrocotyle blepharocarpa</i>			
227.	43384 <i>Hydrophis platurus</i> (Yellow-bellied Seasnake)			
228.	35070 <i>Hypocalymma angustifolium</i> subsp. <i>Swan Coastal Plain</i> (G.J. Keighery 16777)			
229.	5825 <i>Hypocalymma robustum</i> (Swan River Myrtle)			
230.	8086 <i>Hypochaeris glabra</i> (Smooth Catsear)	Y		
231.	1070 <i>Hypolaena exsulca</i>			
232.	<i>Idiomata blackwalli</i>			
233.	<i>Idiosoma sigillatum</i>			
234.	910 <i>Isolepis cernua</i> (Nodding Club-rush)			
235.	20199 <i>Isolepis cernua</i> var. <i>cernua</i>			
236.	917 <i>Isolepis marginata</i> (Coarse Club-rush)			
237.	<i>Isopeda leishmanni</i>			
238.	7396 <i>Isotoma hypoc crateriformis</i> (Woodbridge Poison)			
239.	3992 <i>Isotropis cuneifolia</i> (Granny Bonnets)			
240.	8092 <i>Ixiolaena viscosa</i> (Sticky Ixiolaena)			
241.	20454 <i>Juncus acutus</i> subsp. <i>acutus</i>	Y		

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
242.	1178 <i>Juncus bufonius</i> (Toad Rush)	Y		
243.	1185 <i>Juncus kraussii</i> (Sea Rush)			
244.	1189 <i>Juncus pauciflorus</i> (Loose Flower Rush)			
245.	4044 <i>Kennedia prostrata</i> (Scarlet Runner)			
246.	5832 <i>Kunzea ericifolia</i> (Spearwood, Pondii)			
247.	20019 <i>Lachnagrostis filiformis</i>			
248.	19955 <i>Lachnagrostis plebeia</i>			
249.	467 <i>Lagurus ovatus</i> (Hare's Tail Grass)	Y		
250.	<i>Lampona cylindrata</i>			
251.	28342 <i>Landoltia punctata</i> (Thin Duckweed)			
252.	24511 <i>Larus novaehollandiae</i> subsp. <i>novaehollandiae</i> (Silver Gull)			
253.	45082 <i>Lasiopetalum glutinosum</i> subsp. <i>latifolium</i>			
254.	1309 <i>Laxmannia squarrosa</i>			
255.	925 <i>Lepidosperma angustatum</i>			
256.	937 <i>Lepidosperma longitudinale</i> (Pithy Sword-sedge)			
257.	944 <i>Lepidosperma scabrum</i>			
258.	19833 <i>Leptocarpus laxus</i>			
259.	25133 <i>Lerista elegans</i>			
260.	6374 <i>Leucopogon conostephioides</i>			
261.	6427 <i>Leucopogon parviflorus</i> (Coast Beard-heath)			
262.	6436 <i>Leucopogon propinquus</i>			
263.	7677 <i>Levenhookia stipitata</i> (Common Stylewort)			
264.	25005 <i>Lialis burtonis</i>			
265.	25661 <i>Lichmera indistincta</i> (Brown Honeyeater)			
266.	25415 <i>Limnodynastes dorsalis</i> (Western Banjo Frog)			
267.	4362 <i>Linum marginale</i> (Wild Flax)			
268.	25378 <i>Litoria adelaidensis</i> (Slender Tree Frog)			
269.	25388 <i>Litoria moorei</i> (Motorbike Frog)			
270.	9289 <i>Lobelia anceps</i> (Angled Lobelia)			
271.	7408 <i>Lobelia tenuior</i> (Slender Lobelia)			
272.	6515 <i>Logania vaginalis</i> (White Spray)			
273.	1223 <i>Lomandra caespitosa</i> (Tufted Mat Rush)			
274.	1231 <i>Lomandra maritima</i>			
275.	1232 <i>Lomandra micrantha</i> (Small-flower Mat-rush)			
276.	1234 <i>Lomandra nigricans</i>			
277.	1239 <i>Lomandra preissii</i>			
278.	1243 <i>Lomandra sericea</i> (Silky Mat Rush)			
279.	1246 <i>Lomandra suaveolens</i>			
280.	1198 <i>Luzula meridionalis</i> (Field Woodrush)			
281.	1097 <i>Lyginia barbata</i>			
282.	24132 <i>Macropus fuliginosus</i> (Western Grey Kangaroo)			
283.	85 <i>Macrozamia riedlei</i> (<i>Zamia</i> , Djiridji)			
284.	24326 <i>Malacorhynchus membranaceus</i> (Pink-eared Duck)			
285.	25654 <i>Malurus splendens</i> (Splendid Fairy-wren)			
286.	24583 <i>Manorina flavigula</i> (Yellow-throated Miner)			
287.	17747 <i>Meeboldina decipiens</i>			
288.	25758 <i>Megalurus gramineus</i> (Little Grassbird)			
289.	13271 <i>Melaleuca huegelii</i> subsp. <i>huegelii</i>			
290.	5952 <i>Melaleuca preissiana</i> (Moonah)			
291.	5959 <i>Melaleuca raphiophylla</i> (Swamp Paperbark)			
292.	5978 <i>Melaleuca teretifolia</i> (Banbar)			
293.	5980 <i>Melaleuca thymoides</i>			
294.	13280 <i>Melaleuca viminea</i> subsp. <i>viminea</i>			
295.	4084 <i>Melilotus albus</i>	Y		
296.	25184 <i>Menetia greyii</i>			
297.	955 <i>Mesomelaena pseudostygia</i>			
298.	485 <i>Microlaena stipoides</i> (Weeping Grass)			
299.	7085 <i>Misopates orontium</i> (Lesser Snapdragon)	Y		
300.	4662 <i>Monotaxis grandiflora</i> (Diamond of the Desert)			
301.	4666 <i>Monotaxis occidentalis</i>			
302.	25191 <i>Morethia lineocellata</i>			
303.	25192 <i>Morethia obscura</i>			
304.	24184 <i>Mormopterus planiceps</i> (Southern Freetail-bat)			
305.	2412 <i>Muehlenbeckia adpressa</i> (Climbing Lignum)			
306.	24223 <i>Mus musculus</i> (House Mouse)	Y		
307.	24738 <i>Neophema elegans</i> (Elegant Parrot)			
308.	25748 <i>Ninox novaeseelandiae</i> (Boobook Owl)			
309.	25252 <i>Notechis scutatus</i> (Tiger Snake)			
310.	25564 <i>Nycticorax caledonicus</i> (Rufous Night Heron)			
311.	24194 <i>Nyctophilus geoffroyi</i> (Lesser Long-eared Bat)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
312.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
313.	14292 <i>Oenothera stricta</i> subsp. <i>stricta</i>	Y		
314.	7348 <i>Opercularia hispidula</i> (Hispid Stinkweed)			
315.	18255 <i>Opercularia vaginata</i> (Dog Weed)			
316.	1372 <i>Ornithogalum arabicum</i> (Lesser Cape Lily)	Y		
317.	24085 <i>Oryctolagus cuniculus</i> (Rabbit)	Y		
318.	25679 <i>Pachycephala pectoralis</i> (Golden Whistler)			
319.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
320.	1667 <i>Paracaleana nigrita</i> (Flying Duck Orchid)			
321.	516 <i>Parapholis incurva</i> (Coast Bargrass)	Y		
322.	25681 <i>Pardalotus punctatus</i> (Spotted Pardalote)			
323.	25682 <i>Pardalotus striatus</i> (Striated Pardalote)			
324.	24630 <i>Pardalotus striatus</i> subsp. <i>westraliensis</i> (Striated Pardalote)			
325.	7090 <i>Parentucellia viscosa</i> (Sticky Bartsia)	Y		
326.	528 <i>Paspalum distichum</i> (Water Couch)	Y		
327.	1550 <i>Patersonia occidentalis</i> (Purple Flag, Koma)			
328.	4346 <i>Pelargonium littorale</i>			
329.	24648 <i>Pelecanus conspicillatus</i> (Australian Pelican)			
330.	16477 <i>Pericalymma ellipticum</i> var. <i>ellipticum</i>			
331.	2273 <i>Persoonia saccata</i> (Snottygobble)			
332.	24659 <i>Petroica goodenovii</i> (Red-capped Robin)			
333.	2299 <i>Petrophile linearis</i> (Pixie Mops)			
334.	25697 <i>Phalacrocorax carbo</i> (Great Cormorant)			
335.	25698 <i>Phalacrocorax melanoleucos</i> (Little Pied Cormorant)			
336.	24667 <i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			
337.	25699 <i>Phalacrocorax varius</i> (Pied Cormorant)			
338.	551 <i>Phalaris minor</i> (Lesser Canary Grass)	Y		
339.	552 <i>Phalaris paradoxa</i> (Paradoxa Grass)	Y		
340.	24409 <i>Phaps chalcoptera</i> (Common Bronzewing)			
341.	18529 <i>Philothea spicata</i> (Pepper and Salt)			
342.	1478 <i>Phlebocarya ciliata</i>			
343.	6734 <i>Phyla nodiflora</i> var. <i>nodiflora</i>	Y		
344.	24596 <i>Phylidonyris novaehollandiae</i> (New Holland Honeyeater)			
345.	4675 <i>Phyllanthus calycinus</i> (False Boronia)			
346.	6983 <i>Physalis peruviana</i> (Cape Gooseberry)	Y		
347.	<i>Phytophthora cinnamomi</i>			
348.	5254 <i>Pimelea leucantha</i>			
349.	18117 <i>Pimelea rosea</i> subsp. <i>rosea</i>			
350.	24841 <i>Platalea flavipes</i> (Yellow-billed Spoonbill)			
351.	24842 <i>Platalea regia</i> (Royal Spoonbill)			
352.	25721 <i>Platycercus zonarius</i> (Australian Ringneck, Ring-necked Parrot)			
353.	24750 <i>Platycercus zonarius</i> subsp. <i>semitorquatus</i> (Twenty-eight Parrot)			
354.	577 <i>Poa poliformis</i> (Coastal Poa)			
355.	578 <i>Poa porphyroclados</i>			
356.	25703 <i>Podargus strigoides</i> (Tawny Frogmouth)			
357.	25704 <i>Podiceps cristatus</i> (Great Crested Grebe)			
358.	8175 <i>Podolepis gracilis</i> (Slender Podolepis)			
359.	24681 <i>Poliocephalus poliocephalus</i> (Hoary-headed Grebe)			
360.	582 <i>Polypogon monspeliensis</i> (Annual Beardgrass)	Y		
361.	583 <i>Polypogon tenellus</i>			
362.	25722 <i>Polytelis anthopeplus</i> (Regent Parrot)			
363.	4691 <i>Poranthera microphylla</i> (Small Poranthera)			
364.	25731 <i>Porphyrio porphyrio</i> (Purple Swamphen)			
365.	24767 <i>Porphyrio porphyrio</i> subsp. <i>bellus</i> (Purple Swamphen)			
366.	25732 <i>Porzana pusilla</i> (Baillon's Crane)			
367.	24771 <i>Porzana tabuensis</i> (Spotless Crane)			
368.	10853 <i>Prasophyllum plumiforme</i>			
369.	25511 <i>Pseudonaja affinis</i> (Dugite)			
370.	25259 <i>Pseudonaja affinis</i> subsp. <i>affinis</i> (Dugite)			
371.	42416 <i>Pseudonaja mengdeni</i> (Western Brown Snake)			
372.	42340 <i>Ptilotula ornatus</i> (Yellow-plumed Honeyeater)			
373.	2751 <i>Ptilotus polystachyus</i> (Prince of Wales Feather)			
374.	24245 <i>Rattus rattus</i> (Black Rat)	Y		
375.	24776 <i>Recurvirostra novaehollandiae</i> (Red-necked Avocet)			
376.	11341 <i>Rhagodia baccata</i> subsp. <i>baccata</i>			
377.	25614 <i>Rhipidura leucophrys</i> (Willie Wagtail)			
378.	1556 <i>Romulea rosea</i> (Guildford Grass)	Y		
379.	40431 <i>Rytidosperma acerosum</i>			
380.	6483 <i>Samolus junceus</i>			
381.	6484 <i>Samolus repens</i> (Creeping Brookweed)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
382.	7595 <i>Scaevola anchusifolia</i>			
383.	7603 <i>Scaevola canescens</i> (Grey Scaevola)			
384.	13182 <i>Scaevola repens</i> var. <i>repens</i>			
385.	982 <i>Schoenus clandestinus</i>			
386.	986 <i>Schoenus efoliatus</i>			
387.	1004 <i>Schoenus nitens</i> (Shiny Bog-rush)			
388.	25878 <i>Senecio condylus</i>			
389.	25534 <i>Sericornis frontalis</i> (White-browed Scrubwren)			
390.	<i>Servaea spinibarbis</i>			
391.	2909 <i>Silene gallica</i> (French Catchfly)	Y		
392.	8225 <i>Siloxerus humifusus</i> (Procumbent Siloxerus)			
393.	25266 <i>Simoselaps bertholdi</i> (Jan's Banded Snake)			
394.	30948 <i>Smicromis brevirostris</i> (Weebill)			
395.	7022 <i>Solanum nigrum</i> (Black Berry Nightshade)	Y		
396.	7037 <i>Solanum symonii</i>			
397.	9367 <i>Sonchus hydrophilus</i> (Native Sowthistle)			
398.	8231 <i>Sonchus oleraceus</i> (Common Sowthistle)	Y		
399.	1312 <i>Sowerbaea laxiflora</i> (Purple Tassels)			
400.	635 <i>Sporobolus virginicus</i> (Marine Couch)			
401.	4828 <i>Spyridium globulosum</i> (Basket Bush)			
402.	2918 <i>Stellaria media</i> (Chickweed)	Y		
403.	2316 <i>Stirlingia latifolia</i> (Blueboy)			
404.	25597 <i>Strepera versicolor</i> (Grey Currawong)			
405.	25589 <i>Streptopelia chinensis</i> (Spotted Turtle-Dove)	Y		
406.	30951 <i>Streptopelia chinensis</i> subsp. <i>tigrina</i> (Spotted Turtle-Dove)	Y		
407.	25590 <i>Streptopelia senegalensis</i> (Laughing Turtle-Dove)	Y		
408.	7693 <i>Stylidium brunonianum</i> (Pink Fountain Triggerplant)			
409.	7774 <i>Stylidium piliferum</i> (Common Butterfly Triggerplant)			
410.	2326 <i>Synaphea polymorpha</i> (Albany Synaphea, Pinda)			
411.	2329 <i>Synaphea spinulosa</i>			
412.	15532 <i>Synaphea spinulosa</i> subsp. <i>spinulosa</i>			
413.	25705 <i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
414.	24682 <i>Tachybaptus novaehollandiae</i> subsp. <i>novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
415.	24185 <i>Tadarida australis</i> (White-striped Freetail-bat)			
416.	24331 <i>Tadorna tadornoides</i> (Australian Shelduck, Mountain Duck)			
417.	<i>Tamopsis perthensis</i>			
418.	2791 <i>Tersonia cyathiflora</i> (Button Creeper)			
419.	<i>Tetragnatha demissa</i>			
420.	<i>Tetragnatha valida</i>			
421.	5077 <i>Thomasia cognata</i>			
422.	24844 <i>Threskiornis molucca</i> (Australian White Ibis)			
423.	24845 <i>Threskiornis spinicollis</i> (Straw-necked Ibis)			
424.	1319 <i>Thysanotus arenarius</i>			
425.	1338 <i>Thysanotus manglesianus</i> (Fringed Lily)			
426.	1339 <i>Thysanotus multiflorus</i> (Many-flowered Fringe Lily)			
427.	25519 <i>Tiliqua rugosa</i>			
428.	25207 <i>Tiliqua rugosa</i> subsp. <i>rugosa</i>			
429.	25549 <i>Todiramphus sanctus</i> (Sacred Kingfisher)			
430.	6280 <i>Trachymene pilosa</i> (Native Parsnip)			
431.	1481 <i>Tribonanthes australis</i>			
432.	4383 <i>Tribulus terrestris</i> (Caltrop)	Y		
433.	39097 <i>Trichia decipiens</i>			
434.	25723 <i>Trichoglossus haematodus</i> (Rainbow Lorikeet)			
435.	25521 <i>Trichosurus vulpecula</i> (Common Brushtail Possum)			
436.	24158 <i>Trichosurus vulpecula</i> subsp. <i>vulpecula</i> (Common Brushtail Possum)			
437.	1361 <i>Tricoryne elatior</i> (Yellow Autumn Lily)			
438.	4292 <i>Trifolium campestre</i> (Hop Clover)	Y		
439.	151 <i>Triglochlin striata</i>			
440.	24849 <i>Turnix varia</i> subsp. <i>varia</i> (Painted Button-quail)			
441.	99 <i>Typha orientalis</i> (Bulrush, Cumbungi)	Y		
442.	24852 <i>Tyto alba</i> subsp. <i>delicatula</i> (Barn Owl)			
443.	8255 <i>Ursinia anthemoides</i> (Ursinia)	Y		
444.	38388 <i>Ursinia anthemoides</i> subsp. <i>anthemoides</i>	Y		
445.	24206 <i>Vespadelus regulus</i> (Southern Forest Bat)			
446.	722 <i>Vulpia bromoides</i> (Squirrel Tail Fescue)	Y		
447.	724 <i>Vulpia myuros</i> (Rat's Tail Fescue)	Y		
448.	12052 <i>Vulpia myuros</i> forma <i>megalura</i>	Y		
449.	33101 <i>Vulpia myuros</i> forma <i>myuros</i>	Y		
450.	6658 <i>Wilsonia backhousei</i> (Narrow-leaf Wilsonia)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
451.	1394 <i>Wurmbea dioica</i> (Early Nancy)			
452.	1256 <i>Xanthorrhoea preissii</i> (Grass tree, Palga)			
453.	6289 <i>Xanthosia huegelii</i>			
454.	2331 <i>Xylomelum occidentale</i> (Woody Pear, Djandin)			
455.	1049 <i>Zantedeschia aethiopica</i> (Arum Lily)	Y		
456.	<i>Zebraplatys fractivittata</i>			
457.	25765 <i>Zosterops lateralis</i> (Grey-breasted White-eye, Silvereeye)			

Conservation Codes

T - Rare or likely to become extinct
 X - Presumed extinct
 IA - Protected under international agreement
 S - Other specially protected fauna
 1 - Priority 1
 2 - Priority 2
 3 - Priority 3
 4 - Priority 4
 5 - Priority 5

¹ For NatureMap's purposes, species flagged as endemic are those whose records are wholly contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

APPENDIX 3

Protected Matters Search Tool Report



EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 24/08/15 17:56:58

[Summary](#)

[Details](#)

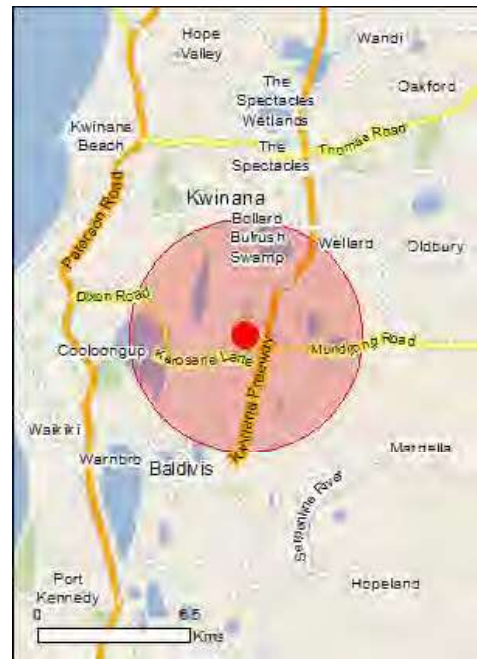
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

[Coordinates](#)

Buffer: 5.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	3
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	1
Listed Threatened Species:	22
Listed Migratory Species:	17

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage/index.html>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	23
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	2
Regional Forest Agreements:	None
Invasive Species:	36
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)	[Resource Information]
Name	Proximity
Becher point wetlands	Within 10km of Ramsar
Forrestdale & thomsons lakes	Within 10km of Ramsar
Peel-yalgorup system	Upstream from Ramsar

Listed Threatened Ecological Communities	[Resource Information]
For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.	

Name	Status	Type of Presence
Sedgeland in Holocene dune swales of the southern Swan Coastal Plain	Endangered	Community known to occur within area

Listed Threatened Species	[Resource Information]
---------------------------	--------------------------

Name	Status	Type of Presence
------	--------	------------------

Birds		
Botaurus poiciloptilus		
Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calyptorhynchus banksii naso		
Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat may occur within area
Calyptorhynchus baudinii		
Baudin's Black-Cockatoo, Long-billed Black-Cockatoo [769]	Vulnerable	Species or species habitat likely to occur within area
Calyptorhynchus latirostris		
Carnaby's Black-Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Breeding likely to occur within area
Leipoa ocellata		
Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
Rostratula australis		
Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area

Mammals		
---------	--	--

Bettongia penicillata ogilbyi		
Woylie [66844]	Endangered	Species or species habitat may occur within area
Dasyurus geoffroi		
Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
Pseudocheirus occidentalis		
Western Ringtail Possum, Ngwayir [25911]	Vulnerable	Species or species

Name	Status	Type of Presence
Setonix brachyurus Quokka [229]	Vulnerable	habitat likely to occur within area Species or species habitat may occur within area
Plants		
Andersonia gracilis Slender Andersonia [14470]	Endangered	Species or species habitat may occur within area
Caladenia huegelii King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat likely to occur within area
Centrolepis caespitosa [6393]	Endangered	Species or species habitat likely to occur within area
Darwinia foetida Muccha Bell [83190]	Critically Endangered	Species or species habitat likely to occur within area
Diuris micrantha Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat known to occur within area
Diuris purdiei Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat likely to occur within area
Drakaea elastica Glossy-leafed Hammer-orchid, Praying Virgin [16753]	Endangered	Species or species habitat likely to occur within area
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat likely to occur within area
Eucalyptus balanites Cadda Road Mallee, Cadda Mallee [24264]	Endangered	Species or species habitat likely to occur within area
Lepidosperma rostratum Beaked Lepidosperma [14152]	Endangered	Species or species habitat likely to occur within area
Synaphea stenoloba Dwellingup Synaphea [66311]	Endangered	Species or species habitat may occur within area

Listed Migratory Species

[[Resource Information](#)]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Sterna dougallii Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area
Migratory Terrestrial Species		
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Migratory Wetlands Species		
Ardea alba Great Egret, White Egret [59541]		Species or species

Name	Threatened	Type of Presence
Ardea ibis Cattle Egret [59542]		habitat known to occur within area Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]		Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area
Charadrius dubius Little Ringed Plover [896]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area
Philomachus pugnax Ruff (Reeve) [850]		Species or species habitat known to occur within area
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land -

Listed Marine Species [\[Resource Information \]](#)

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		

Name	Threatened	Type of Presence
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]		Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area
Charadrius dubius Little Ringed Plover [896]		Species or species habitat known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Himantopus himantopus Black-winged Stilt [870]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area
Philomachus pugnax Ruff (Reeve) [850]		Species or species habitat known to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area
Sterna dougallii Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area
Thinornis rubricollis Hooded Plover [59510]		Species or species habitat known to occur within area
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Leda	WA
Unnamed WA51658	WA

Invasive Species	[Resource Information]
Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.	

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Funambulus pennantii Northern Palm Squirrel, Five-striped Palm Squirrel [129]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		Species or species habitat may occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur

Name	Status	Type of Presence
Genista linifolia Flax-leaved Broom, Mediterranean Broom, Flax Broom [2800]		within area Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-32.2901 115.82735

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Department of Environment, Climate Change and Water, New South Wales](#)
- [-Department of Sustainability and Environment, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment and Natural Resources, South Australia](#)
- [-Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts](#)
- [-Environmental and Resource Management, Queensland](#)
- [-Department of Environment and Conservation, Western Australia](#)
- [-Department of the Environment, Climate Change, Energy and Water](#)
- [-Birds Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-SA Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Atherton and Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [-State Forests of NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

[© Commonwealth of Australia](#)
Department of the Environment
GPO Box 787
Canberra ACT 2601 Australia
+61 2 6274 1111

APPENDIX 4

Conservation Codes

Conservation Codes for Western Australian Flora and Fauna

Threatened, Extinct and Specially Protected fauna or flora are species which have been adequately searched for and are deemed to be, in the wild, threatened, extinct or in need of special protection, and have been gazetted as such.

The lists of Threatened, Extinct and Specially Protected species are listed under Part 2 of the Biodiversity Conservation Act 2016.

Categories of Threatened, Extinct and Specially Protected fauna and flora are:

T Threatened species

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

Threatened fauna is the species of fauna that are listed as critically endangered, endangered or vulnerable threatened species.

Threatened flora is the species of flora that are listed as critically endangered, endangered or vulnerable threatened species.

The assessment of the conservation status of threatened species is in accordance with the BC Act listing criteria and the requirements of Ministerial Guideline (Number 1) and Ministerial Guideline (Number 2) that adopts the use of the International Union for Conservation of Nature (IUCN) Red List of Threatened Species Categories and Criteria 4, and is based on the national distribution of the species.

CR Critically endangered species

Threatened species considered to be *“facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines”*.

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines.

EN Endangered species

Threatened species considered to be *“facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines”*.

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines.

VU Vulnerable species

Threatened species considered to be *“facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines”*.

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines.

Extinct Species

EX Presumed extinct species

Species where “*there is no reasonable doubt that the last member of the species has died*”, and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

EW Extinct in the wild species

Species that “*is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*”, and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI Migratory species

Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

CD Species of special conservation interest (conservation dependent fauna)

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Currently only fauna are listed as species of special conservation interest.

OS Other specially protected species

Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Currently only fauna are listed as species otherwise in need of special protection.

P Priority species

Priority is not a listing category under the BC Act.

All fauna and flora are protected in WA following the provisions in Part 10 of the BC Act. The protection applies even when a species is not listed as threatened or specially protected, and regardless of land tenure (State managed land (Crown land), private land, or Commonwealth land).

Species that may possibly be threatened species that do not meet the criteria for listing under the BC Act because of insufficient survey or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of prioritisation for survey and evaluation of conservation status so that consideration can be given to potential listing as threatened.

Species that are adequately known, meet criteria for near threatened, or are rare but not threatened, or that have been recently removed from the threatened species list or conservation dependent or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of priority status is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

Priority 1: Poorly-known species

Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, for example, agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation.

Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements for threatened listing and appear to be under immediate threat from known threatening processes. These species are in urgent need of further survey.

Priority 2: Poorly-known species

Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, for example, national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation.

Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements for threatened listing and appear to be under threat from known threatening processes. These species are in urgent need of further survey.

Priority 3: Poorly-known species

Species that are known from several locations and the species does not appear to be under imminent threat or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat.

Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. These species need further survey.

Priority 4: Rare, Near Threatened and other species in need of monitoring

- (a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.
- (b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as a conservation dependent specially protected species.
- (c) Species that have been removed from the list of threatened species or lists of conservation dependent or other specially protected species, during the past five years for reasons other than taxonomy.
- (d) Other species in need of monitoring.

Western Australian Ecological Communities

Threatened Ecological Communities

The BC Act provides for the statutory listing of threatened ecological communities (TECs) by the Minister.

Presumed Totally Destroyed (PD)

An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally

destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future.

Critically Endangered (CR)

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated.

Endangered (EN)

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future.

Vulnerable (VU)

An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range.

Priority Ecological Communities

Possible threatened ecological communities that do not meet survey criteria or that are not adequately defined are added to the Priority Ecological Community List under priorities 1, 2 and 3. These three categories are ranked in order of priority for survey and/or definition of the community. Ecological communities that are adequately known, and are rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.

Priority One: Poorly-known ecological communities

Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤ 5 occurrences or a total area of ≤ 100 ha).

Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.

Priority Two: Poorly-known ecological communities

Communities that are known from few occurrences with a restricted distribution (generally ≤ 10 occurrences or a total area of $\leq 200\text{ha}$). At least some occurrences are not believed to be under immediate threat (within approximately 10 years) of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.

Priority Three: Poorly known ecological communities

- (i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or:
- (ii) communities known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat (within approximately 10 years), or;
- (iii) munities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, inappropriate fire regimes, clearing, hydrological change etc.

Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.

Priority Four: Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring.

- (i) Rare. Ecological communities known from few occurrences that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These communities are usually represented on conservation lands.
- (ii) Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for a higher threat category.
- (iii) Ecological communities that have been removed from the list of threatened communities during the past five years.

Priority Five: Conservation Dependent ecological communities

Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

Commonwealth of Australia Conservation Codes

Threatened Flora and Fauna

Threatened fauna and flora may be listed under Section 178 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in any one of the following six categories:

Extinct

A native species is eligible to be included in the extinct category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.

Extinct in the wild

A native species is eligible to be included in the extinct in the wild category at a particular time if, at that time:

- a) it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
- b) it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.

Critically endangered

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing an extremely high risk of extinction in the wild.

Endangered

A taxon is Endangered when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing a very high risk of extinction in the wild.

Vulnerable

A taxon is Vulnerable when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing a high risk of extinction in the wild.

Conservation dependent

A native species is eligible to be included in the conservation dependent category at a particular time if, at that time:

- a) the species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered; or
- b) the following subparagraphs are satisfied:
 - i. the species is a species of fish;

- ii. the species is the focus of a plan of management that provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long term survival in nature are maximised;
- iii. the plan of management is in force under a law of the Commonwealth or of a State or Territory;
- iv. cessation of the plan of management would adversely affect the conservation status of the species.

The EPBC Act does not provide for listing in a data deficient category. Where sufficient data (evidence) is unavailable to allow assessment by the Threatened Species Scientific Committee against the criteria for listing, the species are found to be ineligible. A recommendation is made to the Minister to not include the species in any category under the EPBC Act. For reasons of transparency and to inform future research, the Threatened Species Scientific Committee publishes the names of those species found to be data deficient. As data deficient is not a listing category under the EPBC Act, this has no statutory implications and the species is not considered to be listed under the EPBC Act.

Threatened Ecological Communities

Threatened Ecological communities under the EPBC Act are listed in three categories.

Critically endangered

If, at that time, an ecological community is facing an extremely high risk of extinction in the wild in the immediate future (indicative timeframe being the next 10 years).

Endangered

If, at that time, an ecological community is not critically endangered but is facing a very high risk of extinction in the wild in the near future (indicative timeframe being the next 20 years).

Vulnerable

If, at that time, an ecological community is not critically endangered or endangered, but is facing a high risk of extinction in the wild in the medium-term future (indicative timeframe being the next 50 years).

APPENDIX 5

Excavation Management Plan

**Lot 1, Lot 2 and Lot 803 BALDIVIS ROAD,
BALDIVIS SAND EXTRACTION**

EXCAVATION MANAGEMENT PLAN

Document No: 19008/01 Rev K March 2024

Project: Lots 1,2 and 803 Baldivis Rd Sand Extraction

DOCUMENT HISTORY AND STATUS

Revision	Date Issued	Reviewed By	Approved By	Date Approved	Revision Type
A	11/4/2021	C.Fingher	C.Fingher	11/4/2021	Approval
B	8/09/2021	C.Fingher	C.Fingher	8/09/2021	Approval
C	14/09/2021	C.Fingher	C.Fingher	14/09/2021	Approval
D	28/09/2021	C.Fingher	C.Fingher	28/09/2021	Approval
E	3/10/2021	C.Fingher	C.Fingher	3/10/2021	Approval
F	8/10/2021	C. Gillespie E. Anderson (City of Rockingham)			
G	11/10/2021	C.Fingher	C.Fingher	11/10/2021	Approval
H	07/02/2023	R.Baird			
I	14/02/2024	K. Kennedy			
J	11/03/2024	K. Kennedy			
K	20/03/2024	K. Kennedy			

DISTRIBUTION OF COPIES

AUTHOR: COLIN FINGHER
PROJECT MANAGER: COLIN FINGHER
NAME OF ORGANISATION: OCHRE WEST PTY LTD
NAME OF PROJECT: Lots 1, 2 & 803 BALDIVIS ROAD SAND EXTRACTION
NAME OF DOCUMENT: EXCAVATION MANAGEMENT PLAN
DOCUMENT VERSION: I
PROJECT NUMBER: 19008

Revision	Copy No.	Quantity	Issued To
A	1	1	Aigle Royal Developments
B	1	1	Aigle Royal Developments
C	1	1	Aigle Royal Developments
D	1	1	Aigle Royal Developments
E	1	1	Aigle Royal Developments
F	1	1	Aigle Royal Developments
G	1	1	Aigle Royal Developments
H	1	1	Aigle Royal Developments

This document is submitted for the strict use of identities issued. No person, company or business entity may use any part of this content or description contained without the written approval of Ochre West Pty Ltd

1	EXISTING SITE CONDITIONS	1
1.1	DESCRIPTION	1
1.2	ACID SULPHATE	1
1.3	GROUNDWATER	1
1.4	EXISTING SERVICES	1
2	EXCAVATION AND PROCESSING	2
2.1	QUARRY BUFFERS AND SETBACKS	2
2.2	PROCESSING	2
2.3	FINAL CONTOURS	3
3	VEGETATION CLEARING	3
4	TOPSOIL MANAGEMENT	3
5	EXTRACTION AND TIMING	4
6	WATER MANAGEMENT	4
6.1	EXISTING SURFACE WATER	4
6.2	SITE WATER MANAGEMENT	4
6.3	DISPOSAL/REUSE	4
7	HOURS OF OPERATION	5
8	INFRASTRUCTURE	5
8.1	SITE OFFICE	5
8.2	SERVICING	5
8.3	VEHICLE/EQUIPMENT COMPOUND	5
8.4	FUEL AND LUBE STORAGE	5
8.5	ACCESS ROAD	5
9	SITE MANAGEMENT	5
9.1	FUEL MANAGEMENT	5
9.2	SERVICING AND MANAGEMENT	5
9.3	FIRE MANAGEMENT	6



10 ACCESS TRANSPORT AND SECURITY	6
10.1 SITE SECURITY/FENCING	6
11 EQUIPMENT	6
12 WORKFORCE	6
13 VISUAL IMPACT MANAGEMENT	7
14 DUST MANAGEMENT	7
14.1 POTENTIAL FOR DUST GENERATION.....	7
14.2 CALCULATED DUST RISK	8
14.3 DUST RISK ASSESSMENT FROM DEC 2011	30
14.4 OCCUPATIONAL DUST	14
14.5 DUST AMELIORATION METHOD.....	15
14.5.1 DEVELOPMENT AND INITIATION.....	15
14.5.2 EXTRACTION METHODS.....	15
14.5.3 ACCESS AND HARDSTAND.....	15
14.5.4 SCREENING.....	15
14.5.5 STOCKPILES.....	15
14.5.6 TRANSPORT.....	16
14.5.7 HEALTH AND COMMUNITY.....	16
15 SAFETY	16

APPENDICES

Appendix A: Excavation Plan



1 EXISTING SITE CONDITIONS

1.1 DESCRIPTION

The subject land is zoned "Rural" and comprises the following parcels:

- a) Lot 1 (142) Baldivis Rd,
- b) Lot 2 (148) Baldivis Rd, and
- c) Lot 803 corner of Baldivis Rd and Kulija Rd.

The land has a total area of 9.8346ha.

Intermittently, the land has been excavated for sand since 2016 in accordance with the development approval AD16/3170 granted by the City of Rockingham.

Soils on the site consist of light grey sand fine to medium grained over pale-yellow sand at depth, medium to coarse grain. The material is suitable as a source of fill for construction purposes.

Limestone, pale yellowish brown, is expected to be encountered during extraction operations.

1.2 ACID SULPHATE

The WA Atlas Acid Sulphate Soil (ASS) risk mapping classifies the site as undetermined. On the basis that the site has already been extensively excavated, it is unlikely ASS will be encountered.

1.3 GROUNDWATER

Based on existing mapping, the groundwater levels on the site vary from 2m AHD in the south-west of Lot 803 to 3m AHD in the north-east of Lot 1. Groundwater flows from the north-east to the south-west.

There is no surface runoff of water due to porosity and permeability of the sand.

The Water table is not exposed on site; aerial photography of the site available on the public database does not indicate the site holding water within the site low point depressions to the east of Lot 1 near Baldivis Road anticipated being RL 4.5m AHD. This is supported by the porosity of the site and anticipated groundwater levels at an RL of 3m AHD, well below the existing depression.

The site is not located within a priority Public Drinking Water protection area. The Department of Water requires a two-metre separation between excavation levels to the water table for sand excavation in areas not within Public Drinking Water Resource Areas. The proposal for extraction has been based on a minimum separation of 3 metres, exceeding the Department of Water requirements.

1.4 EXISTING SERVICES

1.4.1 **NEXTGEN Group**

Information provided by NEXTGEN Group advises of cables located within the east verge of Baldivis Road. The cables will not be impacted by the proposal.

1.4.2 **Western Power**

Western Power have High Voltage overhead power lines located in the west verge of Baldivis Road. The service is not impacted by the proposal.

1.4.3 **Telstra**

Telstra have confirmed the presence of telecommunication services within the Baldivis Road reserve.

1.4.4 **Wastewater**

The 200mm diameter Baldivis Road North wastewater pressure main is located in the Baldivis Road reserve. The pressure changes from the east to the west of the Baldivis Road reserve near the proximity of the Lot 1 and 2 property boundary.

1.4.5 **Potable Water**

There is no water service in Baldivis within the vicinity of the land.



2 EXCAVATION AND PROCESSING

Sand excavation will be completed as shown on the plan in Appendix A:

Extraction will be undertaken following the general sequence for excavation outlined below:

- Removal of vegetation growth, where required.
- Topsoil will be removed to a nominal 150mm, cleaned and stockpiled for future spreading directly onto areas to be revegetated or stabilised.
- Overburden will be removed and stored for future rehabilitation and backfilling.
- Sand will then be excavated in stages from the floor of the pit to the natural surface property surround as set by buffer limits.
- Where necessary the sand resource shall be screened using a portable screening plant to remove any organic material and stockpiled prior to loading into road trucks.
- If screening is not required the sand shall be excavated from the face where practicable and fill will be loaded directly to road truck by loader. When excavation heights deem loader excavation impracticable, excavation shall be by excavator stockpiled and trucks filled by loader. The loader will stay at the face and the road trucks will be restricted to access roads spreading out from the centre of the operational area. Drivers will be instructed to stay in their trucks within the loading area.
- The loader will work at the face, approaching the face in a perpendicular manner to enable the natural slump of sand to make the working face safe.
- Trucks within the pit will be confined to a dedicated ring road that will be moved as required as the face progresses. The trucks will approach in an anticlockwise direction so the driver is facing the loader. Drivers will be required to stay in their trucks while in the loading area.
- All vehicles will have radio contact.
- Operations have been staged so excavation within the pit will have maximum visual and noise screening to the closest residences.
- Reforming of the land shall be undertaken by bull dozer, loader and truck to blend with the surrounding topography and landscape.
- On completion of stages the land surface shall be graded to blend with surrounding topography and setbacks
- The final landform shall be revegetated in accordance with the Environmental Management Plan and Landscape Plan.

2.1 QUARRY BUFFERS AND SETBACKS

Setback to rear and side boundaries as per plans attached in Appendix A. Prior to the commencement of any works an earth bund shall be established and maintained near Kulija Rd as required by the City of Rockingham.

2.2 PROCESSING

A mobile processing/screening plant will be used to screen topsoil/organic material and blended sand/organics from extracted sands.

There is no other planned strategy for any additional processing of extracted sands.

Screening of sand will require a rubber tyred loader to load extracted sand into the mobile screening plant with a second similar loader primarily loading trucks from screened stockpiles.



The plant will be fitted with water sprays to wet the sand feed and conveyor transfer points to minimise dust emission.

Organic materials removed by the screen will be used for erosion stabilisation.

2.3 FINAL CONTOURS

The extraction depth varies between south west RL13.2 to RL 8.7 metres AHD in the north east. Excavation shall not occur beyond this depth with final land forms generally screened from surrounding areas however will blend with existing levels in setback zones

All batter slopes must be stabilised, drained and graded to Main Roads requirements and to the satisfaction of the City of Rockingham to ensure that finished ground levels at the boundaries of the lot(s) subject of this approval match or otherwise coordinate with the existing finished ground levels of the land abutting. This is addressed in the Environmental Management Plan and Landscape Plans as required by the conditions of Development Approval to the satisfaction of the City of Rockingham and any MRS approval issued by the Planning Commission.

3 VEGETATION CLEARING

The removal of vegetation has previously been permitted (approved) via a clearing permit issued by the Department of Water and Environmental Regulation (DWER).

An application to clear a small patch of vegetation on Lot 803 has been submitted to the DWER, reference number CPS 10185/1. The assessment of the application will be completed upon finalisation of the current development application.

Clearing will be carried out in accordance with the methodology prescribed by the permit. No stockpiled vegetation shall be burnt at any time under any circumstance.

4 TOPSOIL MANAGEMENT

Topsoil shall be removed to a nominal depth of 150mm following clearing and grubbing. To maximize topsoil retention, topsoil shall be pushed by an excavator and windrowed temporarily prior to transport to a designated stockpile cognizant of the considerations outlined in section 14.5.5. Topsoil will not be stockpiled within the setback areas as depicted on the excavation plan at Appendix A. It is anticipated topsoil will be removed during the period from April to September and not occur during windy conditions.

Topsoil stockpiles will be located in an area not designated for excavation to avoid rehandling of the material. Topsoil stockpiles will be signposted and managed to a height of no greater than 2m and monitored for the presence of weeds. The stockpile stripped shall be placed in accordance with the Environmental Management Plan.

To maximize topsoil recovery, topsoil will be tested to confirm levels of contaminants if any. Topsoil that has organic contaminants will be loaded into the mobile screening plant to separate organic material from topsoil recovered.

Overburden consisting of topsoil sand blend shall be pushed to the perimeter of the excavation base and used to assist stabilizing existing batters and rehabilitation along with site mulch.



5 EXTRACTION AND TIMING

Sand shall be extracted in accordance the extraction plan attached at Appendix A. Based on the attached plan, it is estimated that an additional 300,000 m³ of sand can be extracted from the subject land.

Continuation and completion of sand extraction will involve:

- Bunding to Kulija Road in accordance with the landscape plan as per the requirements of the City of Rockingham;
- Removal of vegetation between Lot 2 & Lot 803;
- Establish and maintain truck access ramps;
- Excavation of sand;
- Removal of existing buildings and facilities;
- Rip and remove hardstand areas;
- Final landform contouring on completion of excavation;
- Loading and transport of topsoil from storage pile;
- Respreading topsoil/topsoil blend to a depth of 100mm;
- Rehabilitation monitoring;
- Deep ripping to facilitate rehabilitation after final landform contouring; and
- Rehabilitation of final batters.

Vegetation removed between Lot 2 and Lot 803 will be mulched for re-use in the rehabilitation of the land post extraction. The material will be stockpiled in accordance with the considerations outlined in clause 14.5.5 below.

Extraction activities will be completed within 2 years of approval and will be completed within this timeframe as per the conditions of the Development Approval issued by the City of Rockingham and MRS approval issued by the Western Australian Planning Commission.

6 WATER MANAGEMENT

Potable water will be brought to site as needed.

Water will be required for screening operations when used and environmental management (Dust suppression) and will need to be supplied externally or by the use of the groundwater water source licensed from Department of Water for water usage in sand operations.

The existing pond will be retained and used for water storage and maintained by either groundwater extraction by license or water trucked in.

6.1 EXISTING SURFACE WATER

No stormwater runoff will leave the site, with all water being infiltrated at the source due to the high porosity and permeability of the sand. This was collaborated by site observations, in which there was no retention of water within the site low point depression to the east of Lot 1 at RL 4.5 m AHD, 1.5 metres above the groundwater levels.

An existing stormwater retention basin has been previously constructed and will be retained for this work.

6.2 SITE WATER MANAGEMENT

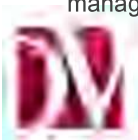
The excavation floor, and 'v' drains located at the base of the excavation floor will be graded towards the stormwater retention basin and lined water dam at 1 in 200 and 1 in 300 respectively.

All surface water not infiltrated will flow overland with a culvert being installed beneath the access ramp in the north east.

Drinking water will be brought to the site as needed with the existing potable water tanks located on Lot 1 to remain on site until completion of works.

6.3 DISPOSAL/REUSE

The water collected in the lined water dam will be utilised for the screening plant and environmental management including dust suppression.



7 HOURS OF OPERATION

Hours of operation will be 7.00 am to 5.00 pm Monday to Saturday inclusive, excluding public holidays.

8 INFRASTRUCTURE

8.1 SITE OFFICE

It is proposed to establish a new office and amenities.
The office will have power and telecommunication connection and is connected to an on-site waste disposal system.
Potable water is supplied from storage tanks also to be retained to the completion of works.

8.2 SERVICING

The workshop to be retained is suitable for minor servicing requirements and it is proposed to undertake all vehicle maintenance servicing and repairs on site. Should major repairs be required necessitating heavy crane lifting etc. this work shall be undertaken off site.

8.3 VEHICLE/EQUIPMENT COMPOUND

All site vehicles will be securely stored within a fenced vehicle compound. The compound will be initially located in the vicinity of the workshop.
It is expected that the compound will be relocated as needed to meet future staging requirements.

8.4 FUEL AND LUBE STORAGE

It is proposed Fuel and Lube shall be stored on site for refuelling and maintenance. Refuelling facilities will be contained in a purpose made self-bunded storage facility in case of an emergency any spill will be contained and contamination of substrata avoided.

8.5 ACCESS ROAD

There is an existing paved access road connecting the existing dwelling to Baldivis Road. The width of road varies but is approximately 4.0 to 5.0 metres in width.

Where practicable the existing access road will be retained and widened for light and heavy vehicle access. It is proposed the new access road will have an 8.0 metre wide trafficable width with 1.0 metre shoulders either side of the road to allow the safe passing of trucks in opposite directions.

The alignment of the access road and ramp location within the site will vary throughout the life of sand extraction in accordance with approved traffic management plans.

9 SITE MANAGEMENT

9.1 FUEL MANAGEMENT

Fuel management will be stored in a dedicated area in an approved tank located in a lined and bunded secured enclosure. These procedures are the same as those used on all mine sites, industrial areas and farms.

Refuelling will be conducted in dedicated areas on the natural land surface with a separation to the seasonal perched water table of 3 metres.

The protection of water from fuels and other chemicals is an important part of the management of quarries. Different types of quarries have different potential impacts which are listed below in general terms.

9.2 SERVICING AND MANAGEMENT

Extraction of sand is a clean operation with little risk to groundwater. No chemicals are used in the extraction process. Sand excavation is one of the few industries that are permitted to operate in a Priority 1 Public Drinking Water Source Area, indicating the clean nature of the activity. See Department of Water *Land Use Compatibility in Public Drinking Water Source Areas*. Those areas being more sensitive require either 2 or 3 metre buffer to the drinking water.



The only chemicals used within the operation will be for vehicle maintenance such as Lube and fuels. Maintenance works using Lube and fuels will be undertaken usually within the retained shed workshop or on impermeable hard stand areas.

9.3 FIRE MANAGEMENT

The sand pit will form a natural fire break.

The water tanker or other dust management actions will be available when excavation is in progress in drier months, as part of the dust management program.

Normal rural requirements for fire protection will be maintained, such as the requirement for perimeter fire breaks, requirements for fire protection facilities on farm vehicles, such as tanks, pumps and fire extinguishers.

10 ACCESS TRANSPORT AND SECURITY

The quarry will be accessed direct off Baldivis Road approximately 350 metres north of the Baldivis Millar Road Roundabout as shown on Appendix A.

The proposed Baldivis Road access will be sufficiently wide to allow the safe passage of trucks entering and exiting the site simultaneously.

10.1 SITE SECURITY/FENCING

The lot boundary fencing shall be retained and consistent with a post and wire design and construction as per the Landscape Plan.

Perimeter fencing to the extraction areas shall be provided for security and safety and shall be sign posted as required by the City of Rockingham. The perimeter security fence will be lined with Enviro Mesh to enhance dust amelioration and containment. The enviro mesh will be maintained and attached to the perimeter fence at all times in good repair.

11 EQUIPMENT

All static and operational equipment will work on the quarry floor to provide maximum sound and visual screening.

Storage shed	A storage and work shed structure will be utilised for the storage of minor service items and lubricants.
Toilet system	A serviced portable or other approved toilet system will be available when the site is operating.
Weighbridge	Not proposed at this stage but may be required.
Mobile Screening plant	Proposed on an as needed basis during topsoil and overburden removal
Loaders	Loading and excavating sand.
Excavator	Excavating sand.
Water Cart Truck	Dust suppression when needed
Semi Truck and Trailer	Used for sand delivery
Fuel storage	Fuel will be stored on site in a lined impermeable bunded area, protected by security fencing to Department of Water and Department of Mines and Petroleum guidelines.

12 WORKFORCE

The workforce will vary, depending on the level of operation and market demands, but usually 3 to 4 persons can be expected to be working on site.



13 VISUAL IMPACT MANAGEMENT

The defined setbacks for each stage shall be adhered to as shown on the plans in Appendix A. Retention of vegetation within the setback areas will maintain a level of visual amenity. An earth bund shall be established within Lot 803 in prior to the re-commencement of extraction works as required by the City of Rockingham.

14 DUST MANAGEMENT

Dust is more conventionally referred to as 'particulates' or 'airborne particulates'.

Airborne particulates are generated during sand extraction mainly by mechanical disturbances such as earthmoving and movement of road traffic on unsealed surfaces as well as generated during the screening process.

In dry and windy conditions airborne particulates can be lifted from open or disturbed area, resulting in visible dust emissions. Most airborne particulates that originate from these activities are larger than 10µm (PM10) and are associated with nuisance than with public health problems.

The degree of dust generation is a factor of the sand type and the degree of fines generated in handling. i.e. topsoil removal, stockpiles and transportation.

The site has already been extensively quarried within Lot 1 and Lot 2. With the recommencement of extraction works dust management will be enhanced by:

- Boundary setbacks
- Existing vegetation within setback areas
- Extraction occurring well below existing ground levels

Dust generated can be effectively managed as per the guideline "A guideline for managing the impacts of dust and associated contaminants from land development sites, contaminated sites remediation and other related activities – March 2011" published by the Department of Environment & Conservation (DEC).

The operation of this mine within a confined area maybe considered appropriately covered by this Guideline although the Guideline is not specifically referred for mining but rather land development activities.

The category of dust risk is included in DEC 2011 Guideline for Managing the Impacts of Dust and Associated Contaminants from Land Development Sites, Contaminated Sites Remediation and other Related Activities.

Occupational dust associated with the quarrying processes falls under the *Mines Safety and Inspection Act 1994 and Regulations 1995* overseen by the Department of Mines and Petroleum.

14.1 POTENTIAL FOR DUST GENERATION

As previously mentioned sand airborne particulates will be trapped by vegetation and the perimeter bunding.

The main risk from dust is not sand, but rather the fine particles that are generated from topsoil management, screening and transport activities.

There is little dust risk through the winter months of April to November inclusive, because of air humidity and moisture when rainfall exceeds evaporation. The rainfall during this period is sufficient to maintain the surface soil profile damp and stable.

The risk of airborne particulates increases through summer, when evaporation exceeds rainfall, soils dry out as well as access road pavements.

Sand will not necessarily generate airborne particulates when undisturbed and does not degrade.

Topsoil by nature is generally finer than sand and can generate airborne particulates particularly while subject to mechanical activities. Additionally, airborne particulates can be generated from unsealed



access roadways under truck movements or during the loading process into trucks. This airborne particulate can be regarded as nuisance dust.

The risk in winter will be substantially lower.

14.2 CALCULATED DUST RISK

Dust emissions fall under “A guideline for managing the impacts of dust and associated contaminants from land development sites, contaminated sites remediation and other related activities – March 2011” published by the Department of Environment & Conservation (DEC).

It is recognized that while this document is not specifically applicable to mining but is used to assess the management required prior to any dust suppression measures being implemented. However, the owner is committed to undertaking effective dust management measures.

The major activities to potentially create airborne particulates are as follows:

Activity	Duration (weeks)	Aspect	Impact
Clearing		Clearing of vegetation exposes topsoil to wind erosion. Mulching of vegetation releases fine organic debris to air.	Nuisance dust may impact of nearby businesses and may impact on health of people.
Stripping Topsoil & Stockpiling		Stripping topsoil disturbs and creates a potential for particles to be released into the air. Stockpiling topsoil releases dust particles to the air.	Dust concentrations may impact visibility on nearby roads and/or pedestrian walkways. Dust may impact of nearby residents / businesses depositing on roofs and buildings May impact on health of people.
Screening		Screening of topsoil and sand blends of soil creates a potential for particles to be released to the air.	Dust concentrations may impact visibility on nearby roads or reserves. Dust may impact of abutting land uses / businesses depositing on pathways and roads May impact on health of people.
Transport Activities		Truck and plant movements movement open excavation and unsealed vehicle roadways may create airborne particulates	Dust concentrations may impact visibility on nearby roads or reserves. Dust may impact of abutting land uses / businesses depositing on pathways and roads May impact on health of people.
Backfill / Cleanup		Movement of soil creates a potential for particles to be released to the air.	Dust may impact of abutting Land uses depositing on pathways and roads. May impact on health of people



14.3 DUST RISK ASSESSMENT FROM DEC 2011

- Refer to Appendix 1: Site risk assessment / classification for activities generating uncontaminated dust.
- Sites generating contaminated dust, the DOH HRA methodology can be used, as indicated in Section 2.5 of "A guideline for managing the impacts of dust and associated contaminants from land development sites, contaminated sites remediation and other related activities – March 2011" DEC guideline.

Appendix 1: Site risk assessment / classification for activities generating uncontaminated dust

Sheet 1: Site classification assessment chart

Part A. Nature of site with effective management in place

Item	Score options			Allocated score
1. Nuisance potential of soil, when disturbed	Very low 1	Low 2	High 6	2
2. Topography and protection provided by undisturbed vegetation	Sheltered and screened 1	Medium screening 6	Exposed and wind prone 18	6
3. Area of site disturbed by the works	Less than 1ha 1	Between 1 and 5ha 3	More than 10ha 9	9
4. Type of work being done	Clearing	Topsoil stripping and stockpiling 3	Bulk earthworks 9	9
Total score for part A				26

Part B. Proximity of site to other land uses

Item	Score options				Allocated score
	More than 1km	Between 1km and 500m	Between 100m and 500m	Less than 100m	
1. Distance of other land users	1	6	12	18	18
2. Effect of prevailing winds (at time of construction) on other land uses	Not affected	Isolated land uses affected by one wind direction	Dense land uses affected by one wind direction	Dense/sensitive land uses, highly affected by prevailing winds	9
Total score for part B					27

Activity	Calculated Score	Allocated Risk of Dust
Land Clearing and excavation without dust suppression	378 - 252	Classification 2 Low Risk. No recommended actions or contingencies required for the dwellings. Dust management will be required for pit best practice and worker environment.
With dust suppression	234 - 198	Classification 1 Negligible Risk. No recommended actions or contingencies required for the dwellings. Dust management will be required for pit best practice and worker environment.

Dust mitigation measures are to be maintained on a regular basis and updated as necessary.

The management of environmental and occupational dust requires the same techniques and actions. If occupational dust is managed, then there will be minimal risk of dust impacting on the external or onsite environment.

Sheet 3: Notes relating to 'site assessment classification chart'

- The site assessment chart is used to differentiate between Classifications 1, 2, 3 and 4, as defined within these guidelines. Classifications 2 and 3 are subject to Note 4, below.
- Sites may be divided into two or more classifications depending mainly on the proximity of existing land uses.
- In assessing the relevant score level, the 'effect of prevailing winds' must be carefully considered. While houses, commercial areas, market gardens, schools and factories have high sensitivity ratings, roads, parks and recreational areas have lower sensitivity ratings.
- Construction during dry period (1 October – 31 March).
 - (a) Where other land uses are within 100 metres of the site:
 - sites assessed as Class 3 will automatically become Class 4, and
 - Sites assessed as Class 2 will automatically become Class 3.
 - (b) Where other land uses are situated between 100 metres and 500 metres from the site, an on-site re-evaluation of Class 3 sites shall be conducted by the engineer for the developer, the local government or the DEC to determine the extent of additional Class 4 requirements considered necessary (if any).

Sheet 4: Dust management and monitoring requirements for each site classification score

Based on the total score obtained from the 'SITE CLASSIFICATION ASSESSMENT CHART' and notwithstanding any allowance for special site conditions during the dry period, (refer to Sheet 3, Appendix 1) the following site classification will apply:

Site classification 1 — under 199;
Site classification 2 — 200 to 399;
Site classification 3 — 400 to 799, and
Site classification 4 — over 800.

Note:

- Unique sites may need special assessment.
- It is essential that any contracts for construction work on site include the relevant contingency arrangements appropriate for the site classification.

Classification 1 (score under 199, considered negligible risk)

Provisions:

- None required.

Contingency arrangements:

- None required.

Classification 2 (score between 200 and 399, considered low risk)

Provisions:

- The commit to a contingency plan, which shall detail the activities to be undertaken should dust impacts occur.



Contingency arrangements:

- Include an allowance for water-cart operation, wind fencing and surface stabilisation during the construction period for the purposes of dust suppression.
- All areas of disturbed land should be stabilised to ensure that the disturbed area exposed at any time is kept to a practical minimum.

Monitoring requirements:

- Complaints management system in place (complaints recorded and acted on promptly).
- Notice to be erected at the site, providing contact details of the person to be contacted and works.

Classification 3 (score between 400 and 799, considered medium risk)

Provisions:

- Appropriate wind fencing of a length specified in the air quality management programme needs to be stored on site or available within one hour of being required by the engineer for the developer/local government/DEC.
- All areas of disturbed land should be stabilised to ensure that the disturbed area exposed at any time is kept to a practical minimum to prevent exceedance of dust standards (see Section 4.2).
- The engineer for the developer shall maintain close control of works with dust creating potential (for example, allowable length of open trenching).
- After all site works are completed, and before the contractor has vacated the site, the developer should ensure that the entire site is stable. The operator then retains responsibility for site stability until change of ownership/control takes place. After the change of ownership/control has taken place, the new owner or controlling party will inherit responsibility for site stabilisation.

Contingency arrangements:

- Suitable water-carts in good working condition and of not less than 10,000 litres capacity per 7.5 hectares of disturbed site, or other suitable alternatives, shall be available to commence watering on the site within 18 hours of being required to do so by the engineer for the developer/local government/DEC.
- Surface stabilisation equipment shall be available to commence operation on site within 48 hours of being required to do so by the engineer for the developer/local government/DEC and with sufficient capacity to cover the disturbed site area within a further 48 hours.
- Wind fencing shall be erected within 18 hours of the contractor being required to do so by the engineer for the developer/local government/DEC. Dust generating works on the site shall cease in the interim.
- If dust-related complaints are generated due to activities on the site, the developer may be required by the local government or an authorised DEC officer to distribute advisory notices to adjoining land occupiers within 48 hours. A notice form is provided in Sheet 5 of Appendix 1.
- If dust-related complaints are generated due to material which has been excavated for trenching, the developer shall ensure this material is stabilised within 48 hours of being requested to do so by the engineer for the developer, local government or an authorised DEC officer.
- Include an allowance for water-cart operation, wind fencing and surface stabilisation during the construction period for the purposes of dust and wind-borne material suppression.
- Include an allowance for surface stabilisation for the purposes of dust and wind-borne material suppression to be maintained after the construction period and until change of ownership/control takes place.



Monitoring requirements

- Site dust management system in place.
- On-site dust monitoring against short term criteria.
- Off-site (compliance) dust monitoring at site boundary (if close to sensitive receptors) or at sensitive receptors. See Section 4 and Appendix 4.
- Complaints management system in place (complaints recorded and acted on promptly).
- Exceedance to be reported to the relevant authority – DEC, Local Government or DOH.
- Notice to be erected at the site, providing contact details of the person to be contacted regarding the works.

14.4 OCCUPATIONAL DUST

Occupational dust associated with the quarrying processes falls under the Mines Safety and Inspection Act 1994 and Regulations 1995 overseen by the Department of Mines and Petroleum.

The proponent will provide induction and protective equipment for all persons on site.

The DMP require personal dust monitoring to ensure dust levels comply with health risk guidelines.

The dust management procedures used on site complies with these guidelines.

There are a number of management actions that can be taken in quarries to minimize dust generation or travel and these will be used wherever possible. The general management actions are summarised below together with the potential dust issues that relate to this site. The actions will be used where applicable and as the opportunity presents to minimise dust on this site.

A water tanker or other means of water treatment will be available on site for watering the access road and internal work areas as necessary to minimise dust generation.

Dust could be a potential problem during summer months particularly on the gravel access roads. The access roads will be watered or treated as necessary to reduce the generation of dust in the drier months.

Excavation will be conducted from behind perimeter bunding generated by pushing the topsoil and overburden into a perimeter bund. In, addition vegetation with setback buffers has been retained and these will be left in place until that portion of ground is prepared for rehabilitation and revegetated accordingly.



14.5 DUST AMELIORATION METHOD

14.5.1 DEVELOPMENT AND INITIATION

- Minimising the amount of ground open.
- Minimising the amount of ground being subject to traffic.
- Locating access roads away from sensitive premises.
- Working areas of the pit close to residences in winter if dust lift off becomes significant in summer depending on the weather and wind.
- Design of the pit to reduce wind speed and potential dust lift off.
- Maintaining effective setbacks.
- Constructing perimeter bunds to reduce wind speed.
- Planting and maintaining tree buffers.
- Providing wind break fencing generally and on top of bunds as required.
- Maintaining a secure, fenced site, to prevent illegal access.
- Rehabilitate and stabilise all completed areas as soon as practicable.
- Clearing and replacing topsoil and overburden during wetter times; April to October.

14.5.2 EXTRACTION METHODS

- Undertake activities in areas away from windy locations.
- Locate active areas away from sensitive premises.
- Working on the floor of the pit.
- Operate some parts of the pit only when conditions are suitable.
- Locating mobile plant and stockpiles in sheltered areas.
- Design staging to minimise dust risk.
- Conduct higher dust risk operations such as topsoil clearing and placement during more favorable conditions.
- Completed sections of the quarry are to be stabilised and not subject to traffic as soon as practical to reduce the area of open ground and help reduce wind speed.
- Shut down equipment that is not required.

14.5.3 ACCESS AND HARDSTAND

- Constructing the access roads from hard materials that resist dust generation.
- Maintaining a water truck on site for road and other wetting down.
- Using a sealant such as a polymer, chemical or emulsified oil or bitumen on the access road to reduce water use.
- Using sprinklers and water canon on roads, traffic areas and stockpiles.

14.5.4 SCREENING

- Applying water sprays and additives to crushing and screening cycles.
- Providing screening and shielding of mobile plant.
- Use and maintain filters on all suitable plant.
- Ensure regular appropriate emptying of filter collection devices.

14.5.5 STOCKPILES

- Minimise the number of stockpiles.
- Maintain stockpiles in sheltered areas.
- Reduce the elevation of stockpiles.
- Limit the drop height to stockpiles and loading.
- Locate finer products AT BASE OF EXISTING BATTERS
- Locate stockpiles away from sensitive premises.



14.5.6 TRANSPORT

- Cover all loads.
- Ensure all trucks are dust free and not carrying pebbles and other materials outside the tray.
- Choose the best transport routes.
- Wet down or sweep the cross over and access roads.

14.5.7 HEALTH AND COMMUNITY

- Maintain air conditioned cabins on all vehicles.
- Provide a readily auditable trigger of no visible dust to cross the property boundary in line with DER License and best practice in WA.
- Provide a comprehensive visual monitoring program.
- Conduct effective site induction and awareness training for all staff.
- Training should include observation and mitigation where possible of all dust emissions.
- Providing a complaints investigation, mitigation and recording procedure.
- Liaising with the owners/operators of the two nearby sensitive premises.
- Ceasing operations when conditions are not favorable or when visible dust is crossing the boundary.
- Obtain the latest weather conditions to increase the awareness of dust risk.
- Cease operations during adverse weather conditions.
- Operate during wetter months or when the soils are moist.
- In the event of dust management not being able to be achieved, and to minimise impact on adjoining land holders, the dust generating activities will be stopped until conditions improve, to minimise impact on adjoining land holders.
- A record of all dust complaints is retained together with the mitigation measures used to reduce the dust impacts.

15 SAFETY

The site will operate under the Mines Safety and Inspection Act 1994

The site will have registered the site under the Safety Regulations System conducted by the Department of Mines and Petroleum. The nominated operating Contractor will be required to have appropriate industry systems in place and will provide a registered mine manager to cover the commitments under the Act. They have operational procedures, guidance, induction and documentation to cover their responsibilities and these will be made site specific for this operation.

Faces will be left in compliance with the act, at times when the site is unattended.

Signs are to be erected, speed limits will be applied to the access road and works area, the site will be within mobile phone contact and all vehicles are to be equipped with two-way radio.

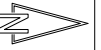
There will be policies implemented regarding entrance to the site, movement of vehicles and operational procedures

The deepest excavation is approximately 22 metres below natural ground level. No slope will be left at an angle greater than 1:2 vertical to horizontal at times when the site is unattended. Faces will be left in compliance with the Mines Safety and Inspection Act 1994, at times when the site is unattended.



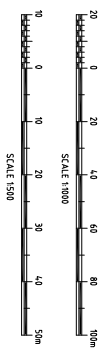
APPENDIX A
EXCAVATION PLAN





LEGEND

- EXISTING CADASTRAL BOUNDARY
- EXISTING CONTOURS
- DESIGN CONTOURS
- FINISHED SURFACE LEVEL
- TOP OF BATTER
- BOTTOM OF BATTER
- VEGETATION AREA
- BATTER SYMBOL



PRELIMINARY
NOT FOR CONSTRUCTION

REV	DATE	BY	CHKD	DESCRIPTION
F	8/2/2024	JF	CF	FINAL AMENDMENTS
E	3/9/2021	JF	CF	NOTES AMENDED
D	24/9/2021	JF	CF	DEVELOPED STAGED
C	6/9/2021	JF	CF	SETBACK AMENDED
B	10/3/2021	JF	CF	RE-SUBMITTED AND
A	25/12/2020	JF	CF	ISSUED FOR COMMENT
Rev	DATE	BY	CHKD	Issue Description

CLIENT
AIGLE ROYAL DEVELOPMENTS
PTY LTD



DATE	REVIEWED	DATE
22/12/2020	<i>John Finigher</i>	22/12/2020
22/12/2020	<i>John Finigher</i>	22/12/2020

APPROVED FOR ISSUE
John Finigher

SCALE	SIZE	DRAWING No	REV
1:1000	A1	19/008-C-003	F

TITLE
PROPOSED EXTRACTION

THIS DRAWING IS THE PROPERTY OF OCHREWEST PTY LTD. IT IS TO BE USED ONLY FOR THE PROJECT AND SITE SPECIFICALLY INTENDED AND NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM. UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN METERS.



APPENDIX 6
Acoustic Assessment

DOCUMENT CONTROL PAGE

**ACOUSTIC ASSESSMENT
BALDIVIS**

Job No: 21035

Document Reference: 27432-4-21035

FOR

AIGLE ROYAL DEVELOPMENTS

DOCUMENT INFORMATION				
Author:	Paul Daly	Checked By:	Tim Reynolds	
Date of Issue:	17 March 2021			
REVISION HISTORY				
Revision	Description	Date	Author	Checked
1	Revised Plan	13/04/2021	PLD	
2	Increase Boundary Separation	27/08/2021	PLD	
3	Council Clarifications	7/09/2021	PLD	
DOCUMENT DISTRIBUTION				
Copy No.	Version No.	Destination	Hard Copy	Electronic Copy
1	1	Aigle Royal Development Att: Kris Kennedy Email: kkennedy@aigleroyal.com.au		✓
1	2	Aigle Royal Development Att: Kris Kennedy Email: kkennedy@aigleroyal.com.au		✓
1	3	Aigle Royal Development Att: Kris Kennedy Email: kkennedy@aigleroyal.com.au		✓
1	4	Aigle Royal Development Att: Kris Kennedy Email: kkennedy@aigleroyal.com.au		✓

CONTENTS

1.	INTRODUCTION	1
2.	SUMMARY	1
3.	CRITERIA	2
4.	CALCULATED NOISE LEVELS	3
5.	RESULTS	5
6.	ASSESSMENT	5
7.	CONCLUSION	6

APPENDICIES

A	Site Layout
B	Noise Contours

1. INTRODUCTION

Herring Storer Acoustics was commissioned by Agile Royal Developments to undertake an acoustic assessment of noise emissions from a proposed sand extraction operation site located at 825 Baldivis Road, Baldivis.

The sand extraction component of the operation entails the usage of a front-end loader / excavator and screen.

This assessment takes into account the cumulative noise level of both the sand extraction in each of the stages, and the transport of sand off site via semi-trailer. The assessment is provided to support the works approval process.

Operational hours for the site are proposed to be Monday to Saturday 07:00 to 17:00 hours (excluding Public Holidays).

As part of the study, the following was carried out:

- Identification of individual operations and the associated noise levels.
- Assess the predicted noise levels at the nearest surrounding noise sensitive premises for compliance with the appropriate criteria.
- If exceedances are predicted, comment on possible noise amelioration options for compliance with the appropriate criteria.

For information, a locality plan is shown in Appendix A.

2. SUMMARY

Assessment has been conducted on the proposed sand extraction operation at Lot 825 Baldivis Road, Baldivis.

The applicable criterion for this assessment is an L_{A10} of 45-47 dB(A) for the nearest residential locations.

Noise received at the existing residential premises has been determined, to be 37 dB(A) for the sand extraction operations, for the worst-case operating scenario (i.e. operations up to the boundary of the premise).

To allow for a complete assessment, noise levels have been assessed at the potential future residences on the eastern side of Baldivis Road. Noise received at these residential premises has been determined, to be 38 dB(A) for the sand extraction operations, for the worst case operating scenario.

The above noise levels have been considered not to contain tonal characteristics, due to ambient noise levels masking any tonal component. This is based on monitoring conducted with in the vicinity of the site where average daily noise levels are 57 dB(A).

Given these operating parameters, noise levels received at the nearest premises has been calculated to comply with the *Environmental Protection (Noise) Regulations 1997* for the operating times as outlined in this assessment.

3. CRITERIA

The allowable noise level for noise sensitive premises in the vicinity of the proposed site is prescribed by the *Environmental Protection (Noise) Regulations 1997*. Regulations 7 and 8 stipulate maximum allowable external noise levels or assigned noise levels that can be received at a premise from another premises. For residential premises, this noise level is determined by the calculation of an influencing factor, which is then added to the base levels shown below. The influencing factor is calculated for the usage of land within two circles, having radii of 100m and 450m from the premises of concern. The base noise levels for residential premises are listed in Table 3.1.

TABLE 3.1 - BASELINE ASSIGNED OUTDOOR NOISE LEVEL

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		L _{A 10}	L _{A 1}	L _{A max}
Noise sensitive premises	0700 - 1900 hours Monday to Saturday (Day)	45 + IF	55 + IF	65 + IF
	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day Period)	40 + IF	50 + IF	65 + IF
	1900 - 2200 hours all days (Evening)	40 + IF	50 + IF	55 + IF
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night)	35 + IF	45 + IF	55 + IF

Note: L_{A10} is the noise level exceeded for 10% of the time.
 L_{A1} is the noise level exceeded for 1% of the time.
 L_{Amax} is the maximum noise level.
 IF is the influencing factor.

It is a requirement that received noise be free of annoying characteristics (tonality, modulation and impulsiveness), defined below as per Regulation 9.

“impulsiveness” means a variation in the emission of a noise where the difference between L_{Apeak} and L_{Amax Slow} is more than 15 dB when determined for a single representative event;

“modulation” means a variation in the emission of noise that –

- (a) is more than 3dB L_{A Fast} or is more than 3 dB L_{A Fast} in any one-third octave band;
- (b) is present for more at least 10% of the representative assessment period; and
- (c) is regular, cyclic and audible;

“tonality” means the presence in the noise emission of tonal characteristics where the difference between –

- (a) the A-weighted sound pressure level in any one-third octave band; and
- (b) the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands,

is greater than 3 dB when the sound pressure levels are determined as L_{Aeq,T} levels where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as L_{A Slow} levels.

The nearest potential noise sensitive premises to the proposed development have been identified using the area map in Figure 3.1.

The usage of the surrounding land use varies from intensive horticulture, residential land use and industrial use (this development and adjoining landfill sites). Therefore, the assigned noise levels for operational times are as noted in Table 3.2.



FIGURE 3.1 – RECEIVER LOCATION MAP

TABLE 3.2 – ASSIGNED NOISE LEVELS

Premises Receiving Noise	IF dB	Time of Day	Assigned Level (dB)		
			L _A 10	L _A 1	L _A max
Receiver A and Cl	0	0700 - 1900 hours Monday to Saturday (Day)	45	55	65
Receiver B	15% Ind Outer +1.5		46	56	66
Future Receivers	25% Ind Outer +2.5		47	57	67

4. CALCULATED NOISE LEVELS

Noise immissions¹ at the nearest neighbouring residential premises, due to noise associated with the proposed sand extraction operations, were modelled with the computer programme SoundPlan. Sound power levels used for the calculations are based on measured sound pressure levels of similar equipment proposed for use on site.

The modelling of noise levels has been based on noise sources and sound power levels shown in Table 4.1.

1 Immissions – noise received at a source
 2 Emissions – noise emanating from a source and / or location

TABLE 4.1 – SOUND POWER LEVEL - NOISE SOURCES dB(A)

Element name	Frequency Hz										dB(A)
	31.5	63	125	250	500	1k	2k	4k	8k	16k	Sum
Screening Plant	66	80	84	90	93	95	95	95	87	-	101
Truck and Water Truck	42	60	62	66	72	81	85	90	70	62	95
	45	59	61	73	76	82	84	76	68	59	
	54	58	63	71	78	84	86	73	66	53	
Loader CAT 950	46	72	73	80	86	93	90	87	82	69	105
	48	60	70	81	89	93	91	86	78	63	
	58	68	76	85	91	91	89	88	73	54	
Excavator PC450	58	78	91	92	92	94	91	83	68	-	99

Based on noise emissions² from the above equipment, an overall, worst case operating scenario has been developed. This scenario allows for all equipment to be operating at the same time, within the centre of the proposed pit.

Note : No barriers other than the sides of the extraction pit were included in the modelling.

The design layout and site configuration, including source location is shown in Appendix A, Figure 2.

This is understood to be representative of the maximum noise levels associated with the proposed sand extraction site.

The following input data was used in the calculations:

- a) Provided plans;
- b) Sound Power Levels listed in Table 4.1;
- c) Ground contours and receiver point provided by client.

Weather conditions for modelling were as stipulated in the Environmental Protection Authority's "Draft Guidance for Assessment of Environmental Factors No. 8 - Environmental Noise" and for the day period are as listed in Table 4.

TABLE 4.2 – WEATHER CONDITIONS

Condition	Day
Temperature	20°C
Relative humidity	50%
Pasquill Stability Class	E
Wind speed	4 m/s*

* From sources, towards receivers.

1 Immissions – noise received at a source
 2 Emissions – noise emanating from a source and / or location

5. RESULTS

Calculated noise levels associated with the noise emissions from the proposed sand extraction for the assumed scenario is summarised below in Table 5.1. Appendix B contains the noise contour plot.

TABLE 5.1 – CALCULATED NOISE LEVEL

Receiver	All Equipment Operating
A	28
B	37
C	30
D	24
Future	38
Industry Nth	37
Industry West	42

6. ASSESSMENT

Based on calculated noise levels at the nearest premises, noise levels have been considered as not being tonal in characteristics. This is based on monitoring conducted around the site in 2011 and again in 2020. The average day time noise level on the eastern side of Baldivis road (opposite the proposed site) was L_{Aeqday} of 57 dB(A). Similar noise levels were recorded further south on Baldivis Road. As the calculated noise levels were considerably less than the ambient, and that the highest contribution of noise source for the proposed site would be associated with truck movements at the entrance of the site, tonality has been assumed to be masked by ambient noise. For information purposes, Appendix C contains the graphical plot of the 2020 noise monitoring.

Hence, Table 6 summarises the applicable Assigned Noise Levels, and assessable noise level emissions, for the scenario considered.

TABLE 6 – ASSESSMENT OF NOISE LEVELS (STAGE 1)

Receiver	All Equipment Operating
A	28
B	37
C	30
D	24
Future	38
Industry Nth	37
Industry West	42

The above noise levels all comply with the applicable L_{A10} assigned noise level of 45-47 dB(A) at the nearest residential locations.

7. CONCLUSION

Assessment has been conducted on the proposed sand extraction operation at Lot 825 Baldivis Road, Baldivis.

The applicable criterion for this assessment is an L_{A10} of 45-47 dB(A) for the nearest residential locations.

Noise received at the existing residential premises has been determined, to be 37 dB(A) for the sand extraction operations, for the worst-case operating scenario (i.e. operations up to the boundary of the premise).

To allow for a complete assessment, noise levels have been assessed at the potential future residences on the eastern side of Baldivis Road. Noise received at these residential premises has been determined, to be 38 dB(A) for the sand extraction operations, for the worst case operating scenario.

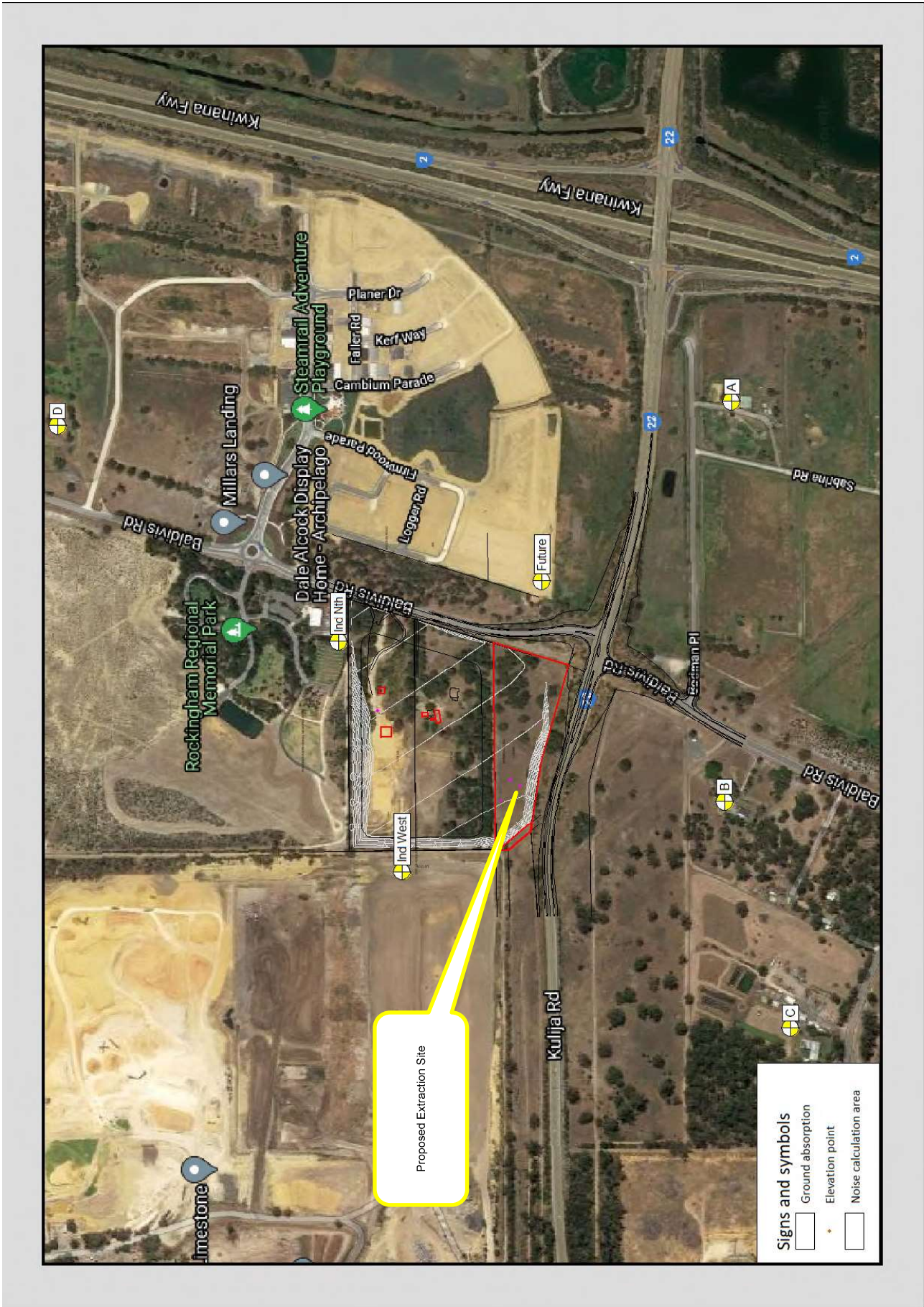
The above noise levels have been considered not to contain tonal characteristics, due to ambient noise levels masking any tonal component. This is based on monitoring conducted with in the vicinity of the site where average daily noise levels are 57 dB(A).

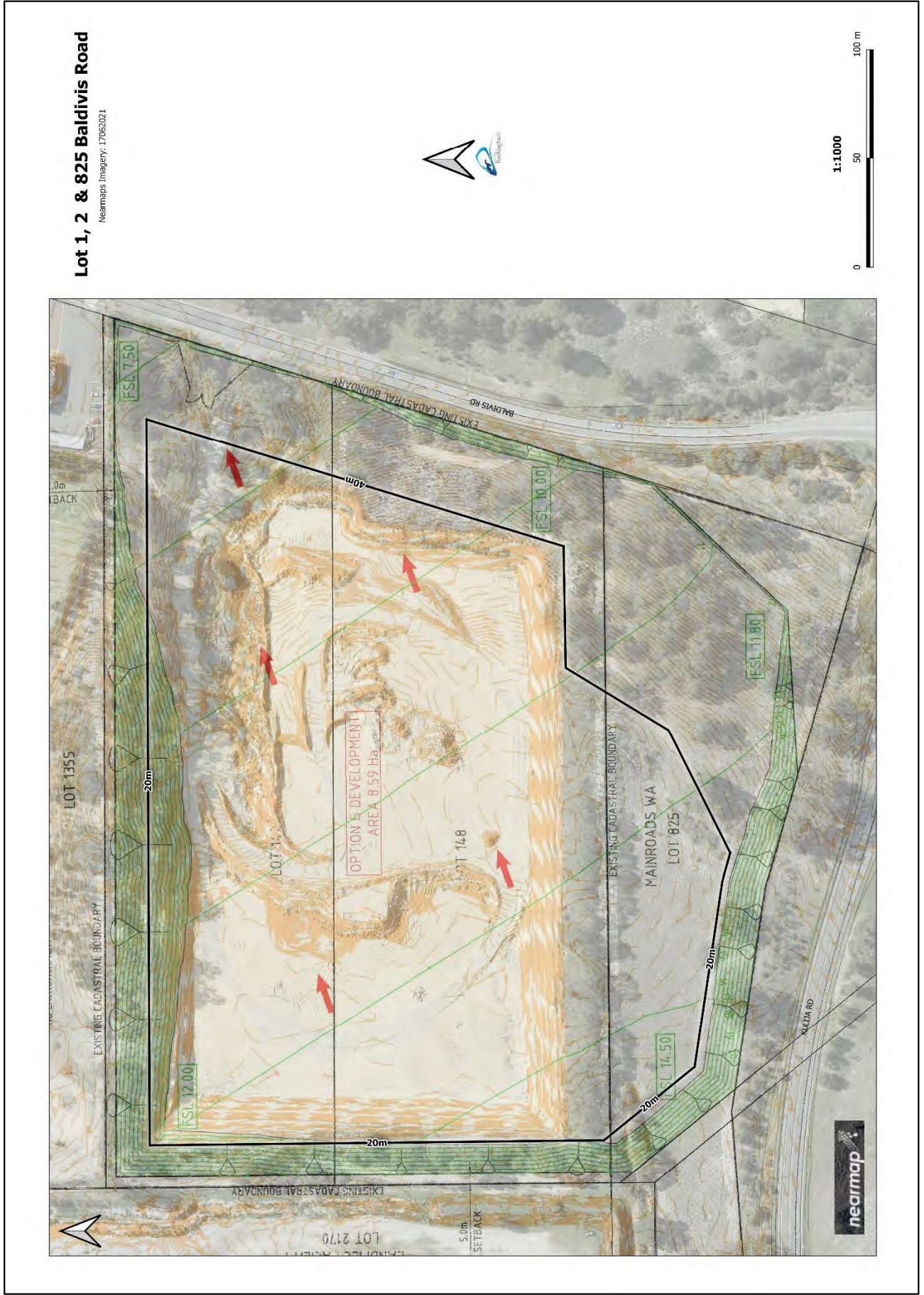
Given these operating parameters, noise levels received at the nearest premises has been calculated to comply with the *Environmental Protection (Noise) Regulations 1997* for the operating times as outlined in this assessment.

APPENDIX A

FIGURE A1 – LOCATION MAP

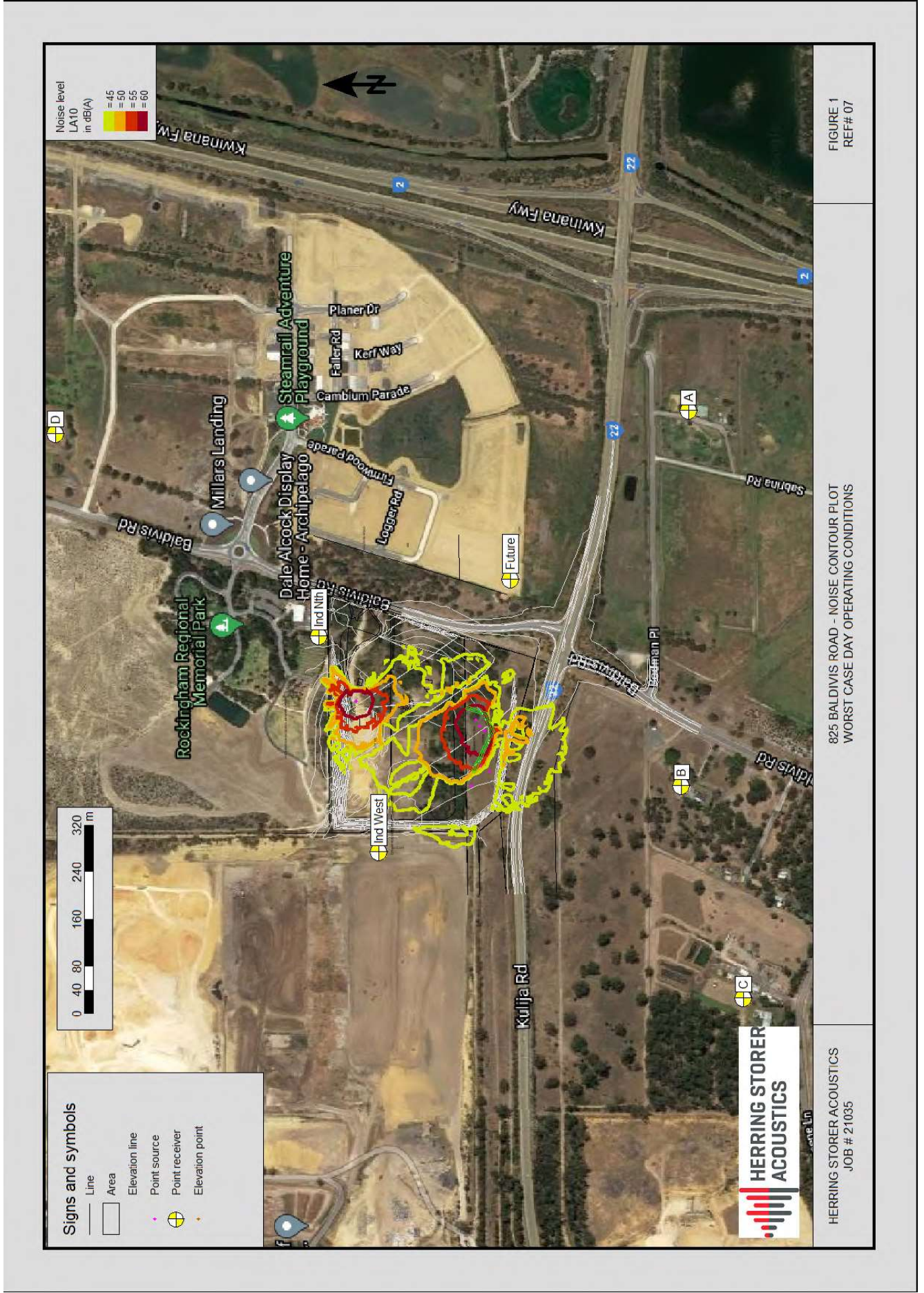
FIGURE A1 – SITE LAYOUT





APPENDIX B

Noise Contours



APPENDIX C

Noise Monitoring

