DEVELOPMENT APPLICATION
LIMESTONE AND SAND QUARRY

Lot 9003 Mather Drive Neerabup,
City of Wanneroo

Urban Resources Pty Ltd
33 Cocos Drive
Bibra Lake WA 6163

Contact – Stephen Elliott – 0418 950 222
stephen@urbanresources.com.au

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EXECUTIVE SUMMARY

This application has been jointly prepared by Landform Research and Urban Resources and seeks Planning Consent and Extractive Industries License for Lot 9003 Mather Drive, Neerabup, and Development Approval (DA) to conduct bulk earthworks on the northern portion of Mather Drive.

Lot 9003 Mather Drive is owned by the CoW (CoW) and is zoned and proposed for future industrial land as part of the Meridian Business Park Industrial development (Meridian Park). The extraction and earthworks are to form the land surface to the design elevations of Meridian Park.

Urban Resources (UR) has a contract from CoW to extract sand and limestone from Lot 9003 and prepare the site and the portion of Mather Drive for the industrial end use. That time frame is anticipated to take 17 years. To allow for contingencies a 20-year DA and Extractive Industries Licence is requested.

A large number of studies have been completed by the CoW with respect to developing Lot 9003 and the proposed Meridian Park.

The project already has Clearing Approval through a State Clearing Permit CPS 6359/3, valid until 15 August 2045, and a Commonwealth Approval under the EPBC Act 1999, EPBC 2007/3479.

In support of those approvals the CoW prepared two management plans;

> **AECOM, 2016, Construction Environmental Management Plan (CEMP)** prepared for the CoW. This document has undergone several revisions, the current revision being the **2020 CEMP**. The CEMP (AECOM, 2016) was prepared for the City of Wanneroo to comply with EPBC 2007/3479 and provide a prescription for the clearing and topsoil management of the extraction areas on Lot 9003 whilst minimising the impact of the environmental values of the surrounding environment and Conservation Areas.
>
> **AECOM, 2016, Conservation Area Management Plan (CAMP)** prepared for the CoW. This document has undergone several revisions, the current revision being the **2020 CAMP**. This document examines the threats, management, and mitigation measures applicable to the conservation areas associated with the Cow's Meridian Park.

Both these management plans are included and incorporated into the Development Application (DA) and Construction and Environmental Management.

A Clearing Permit will be required for the portion of Mather Drive and a DWER Works Approval - Licence under Part (V) of the Environmental Protection Act 1986 will also be required. The DWER Works Approval has been lodged, with DWER.

As part of the earthworks there is a significant amount of cut and fill, in addition to removing excess material off site.

This Management Plan forms the application for Planning Approval and Extractive Industries Licence, in addition to forming the Environmental Management Plan and some other information required by the contract between the CoW and UR.

The site is to be accessed from Mather Drive.

Up to around 500 000 tonnes of sand and limestone are to be removed from site annually, but with the cut to fill more material can be expected to be moved annually on site. Of the 500 000 tonnes around 300 000 tonnes is expected to require processing by crushing and screening and screening alone. It is also noted that in some years, to fulfil large contracts, those tonnages will be exceeded.

It is anticipated that there will be an average of 42 laden truck movements per day, with some hours busier than others, and some days when around 120 laden trucks may leave the site.

Hours of operation applied for are to be 6.00 am to 6.00 pm six days per week (Monday to Saturday inclusive) in line with most quarries.

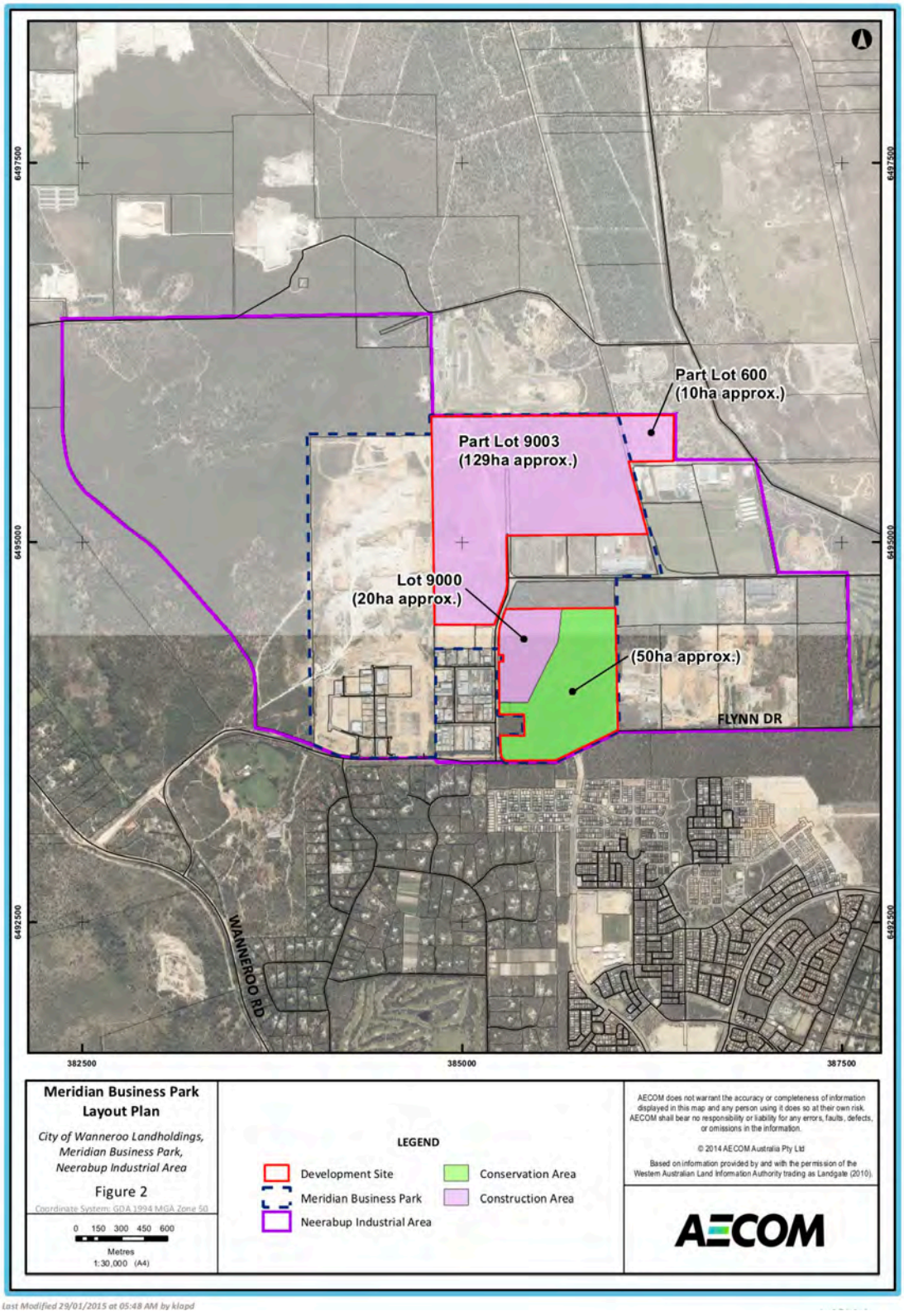


Figure 1: Location of Lot 9003

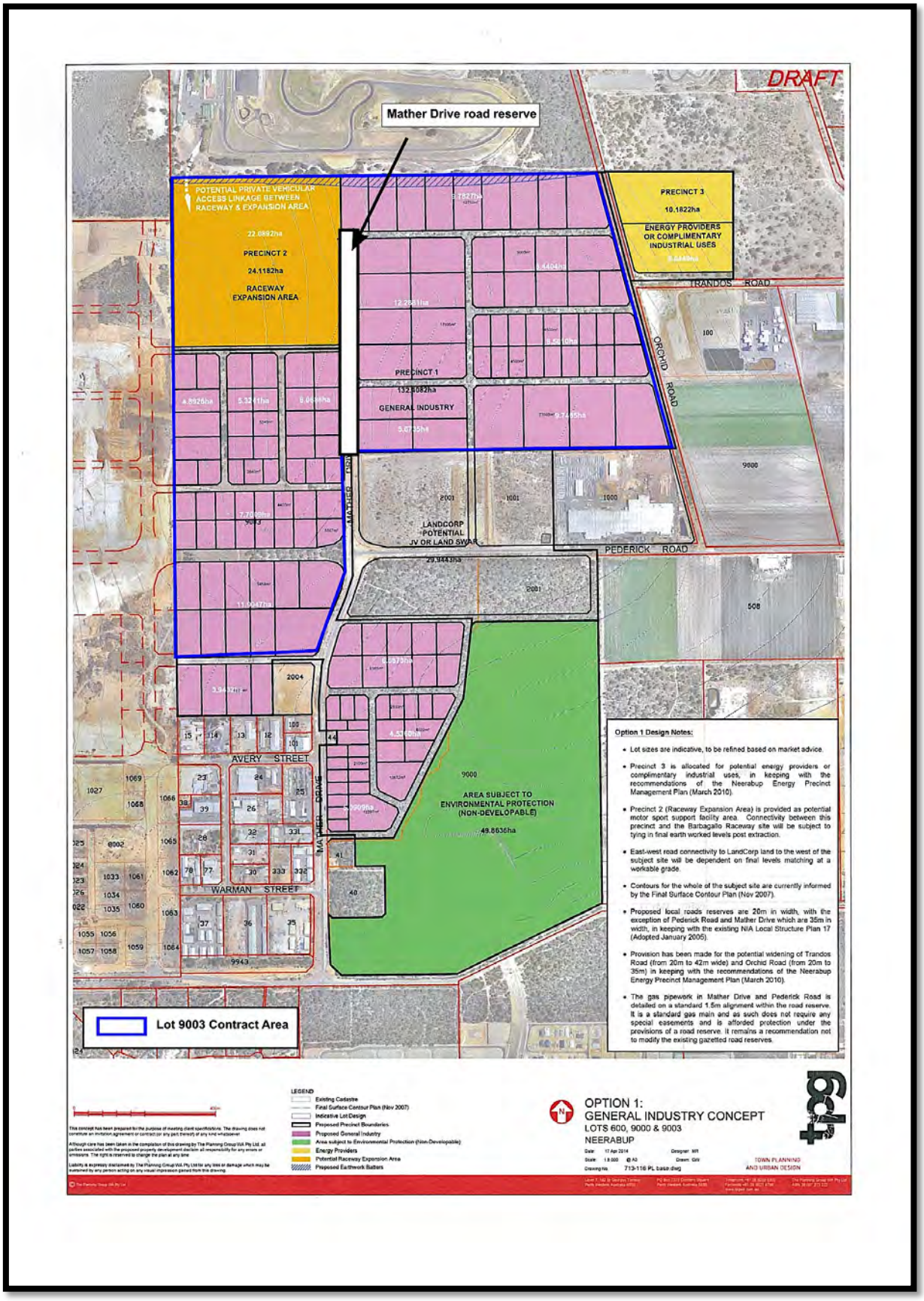


Figure 2: Construction Area on Lot 9003 (Blue Outline)

Table 1: Summary of Operations

Summary of Operations	
ASPECT	**PROPOSAL CHARACTERISTIC**
EXCAVATION	
Area	Total Area 132.8325 hectares
Total Resource	6 – 7 million m^3 sand and limestone depending on whether the extraction of limestone is maximised.
Limestone extraction	Approximately 200 000 tonnes per year. **Note** to fill large contracts there may be double this amount of limestone extracted in a particular year.
Sand extraction	Approximately 300 000 tonnes plus per year of which around 100 000 tonnes is screened. **Note** to fill some contracts, and remove all resource, more material will be taken offsite in a particular year to meet market demand. (See Wave International 2017). **Note** to fill large contracts there may be double this amount of sand extracted in a particular year.
Total estimated resource	To be determined
Life of project	17 years (allow 20-year approval)
Dewatering requirements	None
Depth of excavations	2 - 10 metres
PROCESSING	
Limestone	Up to 200 000 tonnes per year
Sand	Of the approximately 300 000 tonnes plus per year of sand it is estimated that around 100 000 tonnes is to be screened, but that depends on market demands.
Water requirements	5 000 - 20 000 kL per year in summer but could be higher for washed products or dust suppression over large areas of road and hardstand.
Water supply source	Licensed bore on property if available otherwise scheme water.
INFRASTRUCTURE	
Total area of plant and stock	To be located within the pit footprint.
Area of settling ponds	Not required
Fuel storage	Mobile tankers to bring fuel to site and will distribute fuel as necessary.
TRANSPORT	

Truck movements	Variable, but averaging around 42 laden truck movements might be expected on average per day. However, the hourly rate will vary, with times of the day such as mornings when more trucks will leave site in an hour and could be 10 – 20 laden truck movements to service large contracts.
Access	Limestone access roads to Mather Drive.
WORKFORCE	
Construction	Approximately 1 month
Operation	2 – 10 depending on the contracts and nature of the operations, which will change from time to time.
Hours of operation	Monday - Saturday 6.00 am to 6.00 pm excluding public holidays.

Management

The excavation, processing and environmental management proposed has been designed to reflect best practice and utilises Commonwealth and State Guidelines.

To better reflect the requirements of the agreement between the CoW and UR Pty Ltd, the need for Planning Approval and the requirements of a DWER Works Approval and Licence, all documents should be read in conjunction as each has specific aspects of the project and relevant figures.

Development Application Sections 1.0 to 4.0

The Development Application includes a summary of operations and the aspects of planning.

Project Extraction Plan Sections 5.0 to 7.0

The Project Extraction Plan describes the methods of extraction, processing, transport, staging, and servicing.

Project Environmental Management Plan Sections 8.0 – 22.0

The Project Environmental Management Plan describes the environmental management of the project and the closure of the site in preparation for handover to the CoW.

Safety Management

All quarries operate under the provisions of the Mines Safety and Inspection Act 1994 and Regulations 1995. These are administered by the Department of Mines Industry Regulation and Safety.

Discussions have been held between UR and Department of Mines Industry Regulation and Safety (DMIRS). This project will fall under the umbrella of the UR Safety Management Plans for the northern Perth Metropolitan Area under the supervision of their existing Registered Manager.

Officers from the Safety Division of the DMIRS will regularly inspect the operations in relation to health and safety.

Environmental Management

The environmental management is designed to reflect best practise, outlined in;

Department of Resources, Energy and Tourism (Commonwealth), 2011, A Guide to Leading Practice Sustainable Development in Mining, and guidelines produced by Environmental Protection Authority, Department of Water, Environment Regulation, Department of Mines Industry Regulation and Safety, Western Australia Planning Commission, and the Local Authority.

The Environmental Risk Matrix in this document is considered to the principles of AS/NZS ISO 14001:2015 (Environmental Management Systems) and AS/NZS ISO 19011:2014 (Guidelines for auditing Management Systems). The principles of AS/NZS 31000:2018 (Risk Management Guidelines) are also used when considering any risks.

UR is Certified as meeting the requirements of ISO 9001 Quality Management, ISO 14001 Environmental Management and AS/NZS 4801 Occupational Health and safety.

CONTENTS

TABLES

FIGURES

Appendices

1.0 INTRODUCTION

1.1 Background and Proposal

Lot 9003 Mather Drive is owned by the CoW and is zoned and proposed for future industrial land as part of the Neerabup Industrial Area; Meridian Park.

UR have a contract in place for the extraction of sand and limestone from Lot 9003 and the re-formation of the land to the design surface of the proposed industrial precinct.

UR has a lease from CoW to extract sand and limestone from Lot 9003 and prepare the site for the industrial end use. That time frame is anticipated to take 17 years. To allow for contingencies a 20 year DA and Extractive Industries Licence is requested.

As part of the earthworks there is a significant amount of cut and fill, in addition to removing excess material off site.

As part of the CoW and UR investigations and preparation for the industrial area a significant number of studies have been completed. Those studies cover all aspects of Lot 9003 from the design to the geotechnical attributes and the environmental assessments.

Meridian Park was assessed and approved under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) (EPBC 2007/3479). The approval has a number of conditions relating to the implementation of the action, including the requirement to develop and implement a CEMP to the satisfaction of the Commonwealth Minister for the Environment. This approval allows for the clearing of up to 130.7 ha of foraging habitat for the Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) within the 159 ha of native vegetation to be cleared for the development.

Existing Documentation and Approvals

A number of studies have been completed by the CoW with respect to developing Lot 9003 and the proposed Meridian Park.

Those documents include various management plans which have been approved by the CoW, and mainly relate to developing the land rather than extracting the sand and limestone.

Site Studies

A number of ***Site Studies*** have been prepared and are relevant to the extraction of sand and limestone and the preparation of the industrial area surface, including the following:

- *Golder Associates, 2014 Geotechnical and Investigation Lot 4 Mather Drive Neerabup*. This document provides data on the resource, water table and geotechnical stability and parameters, and

- *Talis, 2017 Geotechnical and Hydrogeological Investigation*. This document provides data on the resource, water table and geotechnical stability and parameters, and

- *Eco Logical Australia (ELA), 2012. Ground truthing of environmental values for Lot 4 Flynn Drive Neerabup Prepared for CoW, and*

- *Eco Logical Australia (ELA), 2013. Targeted Flora and Fauna Assessment Lot 4 Flynn Drive Neerabup Prepared for CoW. April 2013, and*

- *Wave International, 2017, Neerabup Earthworks Study, Assessment of Sand and Limestone Volumes, prepared for the CoW.*

Management Plans

The following Management Plans are relevant to the extraction of sand and limestone and the preparation of the industrial area surface.

- *2020 CEMP prepared for the CoW.*
- *2020 CAMP prepared for the CoW.*
- *Moro V, 2020, Transport Management Plan, RAV Access Route, Sand and Limestone Quarry, Lot 9003 Mather Drive Neerabup.*
- *Acoustic Engineering Solutions, 2020 Environmental Noise Assessment of Sand and Limestone Extractions at Lot 9003 Mather Drive Neerabup.*
- *Strategen-JBS&G, 2020, Bushfire Management Plan for Simple Development Applications, Lot 9003 (85) Mather Drive, Neerabup*.

The CEMP prepared for the CoW, is referenced and incorporated into this document and is provided. The documentation and procedures have been incorporated into this management plan and revised to make them workable with the changed staging, operations and work procedures.

Approvals

The following Approvals are already in place and are relevant to the extraction of sand and limestone and the preparation of the industrial area surface.

- Lease Agreement between UR Pty Ltd and CoW.
- Clearing Permit CPS 6359/3 valid until 15 August 2045.
- Approval under the EPBC Act 1999, EPBC 2007/3479

It is proposed to apply for DA and Extractive Industry Licence for 20 years to enable the resource to be taken (anticipated to be 17 years) with a 3 year contingency.

1.2 Purpose and Scope

This Environmental Management Plan (EMP) sets out the environmental process that will be used by UR to minimise harm to the environment during this project and comply with the requirements of The CoW CEMP and CAMP.

This document applies only to this project, the subject being Neerabup Industrial Area (NIA) located off Flynn Drive north of Wanneroo for the extraction of sand and limestone resources and earthworks of approximately 127ha of Lot 9003. This document is to be used in conjunction with the UR Integrated Management System (IMS) and the CoW CEMP.

In addition, it will serve to ensure that the organisation meets the obligations of its Environmental Policy and procedures (IMS) and relevant environmental legislation.

1.3 Importance and Rationale

Industrial Precinct

Lot 9003 Mather Drive is owned by the CoW and is zoned and proposed for future industrial land as part of the Neerabup Industrial Area; Meridian Park. The zoning is “General Industry”, under the Neerabup Industrial Area Structure Plan and Zoning Plan (Neerabup Industrial Area ASP 17).

That Industrial land is required and planned for to create employment in the North West Corridor.

The CoW and the North Western Corridor continue to be one of the fastest growing population centres in the state, with a need for limestone for development projects. Limestone suitable for extraction with minimal community interruption is in short supply in the Northern Perth Metropolitan Region because of restrictions imposed by Conservation nomination of land, and difficulties with obtaining clearing permits in other areas and even within the Priority Limestone Area.

The proposed excavation is to reform the land surface by cut and fill and remove excess sand and limestone from site. As part of that development, there is the opportunity to supply excess sand and limestone to other developments in line with all Government Policies where the basic raw materials are removed prior to sterilisation by development.

Basic Raw Materials

The importance of the site for basic raw materials is recognised by the Western Australian Planning Commission in State Planning Policy 2.4, Basic Raw Materials (SPP 2.4). The whole of the subject land lies within the Priority Limestone Resource area (Neerabup).

Limestone north of Perth is highly constrained by the conservation estate created by Neerabup National Park, Yanchep National Park, and highlighted extensions, Bush Forever and various other reserves and State Forest, small rural subdivisions and urban development.

DMIRS has prepared, in 2012, updated mapping of the limestone to the north of Perth. The limestone on this site is included within the Regionally Significant Basic Raw Materials area.

Some consideration of the requirements for basic raw materials is shown in the following documents.

See;

- Abeysinghe P B, 1998, Limestone and Limesand Resources of Western Australia, Geological Survey of Western Australia, Mineral Resources Bulletin 18.
- Gozzard, J R, 1987, Limesand and Limestone Resources between Lancelin and Bunbury, Geol Surv WA, Record 1987/5
- Western Australia, Western Australian Planning Commission, State Planning Policy 2.4, Basic Raw Materials.
- Chamber of Commerce and Industry, 1995 and 1996, Managing the Basic Raw Materials of Perth and the Outer Metropolitan Region, Parts 1 and 2.
- Chamber of Commerce and Industry, 2008, Basic Raw Materials Access and Availability.
- Fetherston J M, 2007, Dimension Stone in Western Australia, Volume 1, Department of Mines and Petroleum, Mineral Resources Bulletin 23.

1.4 Proponent

The proponent, Urban Resource Pty Ltd, manages the subject land on behalf of the CoW.

Contact can be made through

Urban Resources Pty Ltd
33 Cocos Drive
Bibra Lake WA 6163

Contact – ***Stephen Elliott – 0418 950 222***
stephen@urbanresources.com.au

1.5 Land Ownership

Table 2: Land Ownership

Land Ownership						
LOT	**ROAD**	**VOLUME**	**FOLIO**	**DEP PLAN**	**OWNER**	**OWNER'S ADDRESS**
9003 Extractive Industry	Mather Drive	2765	589	70103	CoW	23 Dundebar Road, Wanneroo
Bulk earthworks	Northern portion of Mather Drive Road Reserve				CoW	23 Dundebar Road, Wanneroo

1.6 Project Objectives

The proposal is to enable the construction of the Mather Drive portion of the Flynn Drive Industrial Precinct.

The aims of the proposal are to;

- Enable construction of the surface suitable for industrial Land.
- Provide a resource of strategically located limestone and sand, suited to a variety of end products.
- Help to keep the prices of local limestone products at the lowest possible levels, by maintaining small transport distances and competition. This benefits the whole community.
- Comply with State Planning Policy SPP2.4 Basic Raw Materials, which requires that basic raw materials should be taken prior to sterilisation of the area by development.

1.7 Requested Approval

Past Approvals

There has been no past DA for sand and limestone extraction.

Past Activity

There has been some activity and land disturbance on the site and on adjoining land which has been prepared for industrial land use through the extraction and movement of sand and limestone.

Requested Approval

DA and Extractive Industry Licence for 20 years to enable the resource to be taken (anticipated to be 17 years) with a 3 year contingency.

Bulk earthworks are to be completed on the northern portion of Mather Drive Road Reserve, but no extraction.

2.0 PLANNING ASSESSMENT

2.1 Current Land Use

The western portion of Lot 9003 has previously been cleared and used for vegetation and agriculture. The eastern portion has been grazed some time ago but is largely covered by local native vegetation in various condition states.

2.2 Proposed Land Use

Earthworks associated with the development to industrial land, including Limestone and sand extraction will prepare the site to meet the final design contours as provided by *Plan 2 - Final Surface Contour Plan of the Neerabup Industrial Area Structure Plan*. The excavation will be staged as outlined in the attached Staging Plan.

The Earthworks were prepared by;

- Wave International 2017, Neerabup Earthworks Study, Assessment of Sand and Limestone Volumes, prepared for the CoW.

The earthworks to prepare the site for future industrial use as part of the Neerabup Industrial Precinct have been the subject of numerous discussions between Landcorp, The State Government, the CoW, Department of Planning Land and Heritage State and Commonwealth Environmental Authorities and Department of Mines Industry Regulation and Safety.

2.3 End Use

The end use will be Industrial Land as part of the Meridian Park.

The Neerabup Industrial Area (NIA) Agreed Structure Plan No. 17 (ASP 17) was first adopted by Council on 11 January 2005.

DMIRS has worked closely with Landcorp (Development WA) and the CoW over a number of years to optimise both the extraction of limestone and the staged release of land for future industrial development within the Neerabup Industrial Area.

The created final contours will comply with the final design contours for the industrial end use.

- Plan 2 - Final Surface Contour Plan of the Neerabup Industrial Area Structure Plan, prepared for the CoW.

The proposed final contours are shown on the Concept Staging Plan and in Plan 2 - Final Surface Contour Plan of the Neerabup Industrial Area Structure Plan.

2.4 Land Zonings and Policies

2.4.1 State Government Policies and Planning Schemes

State Planning Policy 1.0, State Planning Framework Policy

The State Planning Policy Framework provides for the implementation of a planning framework through the recognition and implementation of Regional Planning Policies above Local Planning Schemes and Policies.

A number of State Policies have been released under the State Planning Framework Policy.

- State Planning Policy 2.0, Environment and Natural Resources Policy
- State Planning Policy 2.4, Basic Raw Materials

- State Planning Policy No 2.5, Agricultural and Rural Land Use Planning
- State Planning Policy No 4.1, State Industrial Buffer Policy

These are considered in turn.

Several other key State Government Policies are also relevant to the local regional planning.

State Planning Policy 2.0, Environment and Natural Resources Policy

This policy provides for the protection of all natural resources under a number of sections;

5.1 General Measures

5.2 Water Quality including stormwater and wetlands

5.3 Air Quality

5.4 Soil and Land Quality

5.5 Biodiversity

5.6 Agricultural Land and Rangelands

5.7 Minerals Petroleum and Basic Raw Materials

5.8 Marine Resources and Aquaculture

5.9 Landscape

5.10 Greenhouse Gas Emissions and Energy Efficiency.

In addition to recognising the importance of protecting air quality, soil and land quality, water and wetlands and landscapes, the importance of Basic Raw Materials to the community is identified with reference to SPP 2.4 Basic Raw Materials, State Gravel Strategy 1998 and State Lime Strategy 2001.

Section 5.7 of SPP 2.0, deals with Minerals, Petroleum and Basic Raw Materials.

Part of Section 5.7 states;

Basic raw materials include sand, clay, hard rock, limestone, and gravel together with other construction and road building requirements. A ready supply of basic raw materials close to development areas is required to keep down the cost of land development and the price of housing.

Planning strategies, schemes and decision making should:

- Identify and protect important basic raw materials and provide for their extraction and use in accordance with State Planning Policy No 10 (2.4); Basic Raw Materials.
- Support sequencing of uses where appropriate to maximise options and resultant benefits to community and the environment.

State Planning Policy 2.4, Basic Raw Materials

This policy makes many statements on the intent and actions which local authorities should use to protect and manage basic raw materials.

The policy was updated as a Draft in 2018. The update and 2000 policy are very specific in explaining that basic raw materials need identification and protection because of increased urban expansion and conservation measures.

The excavation of resources from this site is recognised by State Planning Policy No 2.4, Basic Raw Materials, (WA Planning Commission, 2000). The site is shown as a Priority Limestone Resource. State Planning Policies are to be incorporated into Local Authority Town Planning Schemes.

State Planning Policy No 2.5, Rural Planning, 2016

SPP 2.5 Rural Planning 2016 predominantly deals with the continued rural use of suitable land and its protection for the future outside the Metropolitan area but has general principles. The policy was updated in December 2016 and provides strong measures to identify, protect and use basic raw materials.

SPP 2.5 does reiterate the need to protect and use basic raw materials.

Basic Raw Materials are included in the definitions as

Sand (including silica sand), clay, hard rock, limestone (including metallurgical limestone), agricultural lime, gravel, gypsum, and other construction materials. The materials may be of State, regional or local significance depending on the resource location, size, relative scarcity, value, and demand for the product.

Amongst seeking to protect agricultural values, Policy Objective 4 (c) states

Outside the Perth and Peel Planning regions, secure significant basic raw material resources and provide for their extraction.

Section 5.9 deals with Basic Raw Materials and seeks to achieve the following in an environmentally acceptable manner;

- Protect the resources until the resource is extracted (5.9.a)
- Identify significant basic raw materials on sub-regional and local planning strategies, region, and local planning schemes (5.9.b, 5.9.c, 5.9.d)
- The extraction of basic raw materials should not be generally prohibited (5.9.e)
- Provide for sequential land use (5.9.f)
- Limit sensitive land uses to locations demonstrated to not limit existing or potential extraction of basic raw materials (5.9.g)
- Provide for the consideration of native vegetation or significant biodiversity values and may require retention and protection of vegetation and environmental assets (5.9.h)
- Have regard for the potential impacts of fragmentation and connectivity of native vegetation (5.9.i)
- Maintain adequate buffers to protect water quality in public drinking water source areas (5.9j).

SPP 2.5 also supports preventing conflicting land uses (5.12.1), supports the generic buffers recommended by other Government documents such as the EPA Guidelines for separation distances (5.12.3), and seeks to restrict subdivision from impinging on basic raw material resources.

The Policy is also supported by Guidelines that seek to protect the Landscape and secure Transport Routes.

State Planning Policy No 4.1, State Industrial Buffer Policy

SPP 4.1 discusses the need to consider adjoining land uses when locating buffers but does not prescribe set buffers for operations such as this. The development and processing of the resource has been designed to maintain maximum buffer distances. In situations where the buffers are less, actions such as the provision of perimeter bunding to provide visual and noise management, tree planting and operational procedures are used to mitigate and reduce impacts.

This is discussed further in Section 2.11 Surrounding Land uses and Buffers of this document. The proposed extraction and land sculpting comply with the buffer guidelines.

State Planning Strategy, 2050

The Western Australian Planning Commission (WAPC) released the State Planning Strategy in 2014. It comprises a range of strategies, actions, policies and plans to guide the planning and development of regional and local areas in Western Australia and assists in achieving a coordinated response to the planning challenges and issues of the future by State and Local Governments.

The main thrust is for a balanced economy that recognises and reconciles the various competing interest of development and conservation.

Basic Raw materials form part of that consideration on page 41 of the Strategy where a 2050 outcome of accessible and affordable basic raw materials is one of the strategic approaches.

The limestone resources on the subject land assist in providing those basic raw materials.

Directions 2031 and Beyond (WAPC, 2010)

Directions 2031 and Beyond provides data on the land uses and growth of the Perth Metropolitan and Peel areas over the 20 years to 2031.

Perth and Peel @ 3.5 million

Perth and Peel @ 3.5 million EPA provides strong support for the need for basic raw materials for the growth of Perth.

Perth and Peel @ 3.5million, developed by the Western Australian Planning Commission has determined that the Metropolitan Area will grow significantly to 2050 by around 650 000 dwellings.

Regionally Significant Basic Raw Materials Mapping – Geological Survey of Western Australia

The resource is part of the nominated limestone in the Western Australian Geological Survey as a Regionally Significant Basic Raw Material.

The limestone resource is a highly significant as a local resource because it is some of the last limestone available for extraction in the Metropolitan Region, with all other resources having been sterilised by conservation and planning.

2.4.2 Local Government Policies and Planning Schemes

CoW District Planning Scheme 2

Section 3.17.1b of the CoW District Planning Scheme has the objective; *"protect from incompatible uses or subdivision, basic raw materials priority areas and basic raw materials key extraction areas".*

Section3.17.3f commences "*There is a presumption in favour of applications for the extraction for basic raw materials in the basic raw materials resource areas ……"*

The subject land is zoned "*Industrial Development".*

CoW Extractive Industry Local Law

The local law regulates the extraction of basic raw materials.

East of Wanneroo District Structure Plan, September 2019 (Draft)

This Structure Plan, which is out for public comment, documents the land uses for the area to the south east of the Subject land.

Neerabup Industrial Area Structure Plan and Zoning Plan (Neerabup Industrial Area ASP 17).

This Local Structure Plan sets out the zoning of industrial land for the Neerabup Industrial Area with Lot 9003 being zoned as "General Industrial".

Neerabup Industrial Area (NIA) Agreed Structure Plan No. 17 (ASP 17) was first adopted by Council on 11 January 2005. In November 2007, the CoW prepared a bulk earthworks contour plan to guide development for the CoW's land east of Mather Drive.

In October 2011, LandCorp presented a revised earthworks concept plan to the CoW for comment. The revised plan proposed levels different to those specified by the Final Surface Contour Plan contained within ASP 17. The proposed levels satisfy the criteria contained within section 6.5 of ASP 17.

DMIRS has worked closely with LandCorp (Development WA)and the CoW over a number of years to optimise both the extraction of limestone and the staged release of land for future industrial development within the Neerabup Industrial Area. (Wave, 2017).

End Use – Sequential Planning

The extraction of limestone and sand is seen as an interim use prior to a forming the area to industrial land and some future land use, yet to be determined by planning.

Legislative Framework - Stakeholders

There have been no significant changes to the scale and nature of the local land uses over the past few years.

There has been gradual development of other parts of the Meridian Park with industries gradually establishing on the lots created.

3.0 LEGISLATION

Table 3: Legislative Framework

Legislative Framework			
Legislation	**Environmental Factor regulated/affected**	**Discussion**	**Action**
Aboriginal Heritage Act 1972	Aboriginal heritage sites	Recorded Heritage Sites A database search of DPLH has been conducted and no site recorded	A commitment is made to halt activities that may impact on a site if any is found during excavation, pending assessment by consultants.
Planning and Development Act 2005	DAs for on-site constructions and any ensuing environmental impacts.	Planning Consent is required from the CoW through the Town Planning Scheme and through the Metropolitan Region Scheme by the WAPC. These approvals are normally concurrent.	A concurrent application for DA is lodged. ***DA Required under the CoW District Planning Scheme No 2.*** ***DA is required from the WAPC under the Metropolitan Region Scheme.***
CoW Extractive Industries Consolidated Local Law	The operations of the quarry are regulated by both the Planning Approval and Extractive Industries Licence	An Extractive Industries Licence is required.	An application for an Extractive Industry Licence is concurrently lodged with this proposal. ***Extractive Industries Licence Required***
Health Act 1911	Environmental and health impacts from waste water treatment and community health.	No matters of significance that would trigger this legislation have been identified.	The proposal complies with the Health Department Guideline for Dust separation. (See Dust Management) No waste materials will be disposed of on site. Waste water disposal falls under this act. ***Approved Serviced portable facilities will be used on site.***
Department of Planning, Land and Heritage Transport Impact Guidelines 2016	New developments may need to consider transport options.	This is a new operation related to providing the land contours for industrial land use.	Access is direct to Mather Drive and Flynn Drive or along Pederick Road directly to Old Yanchep Road to the east New secured entrances will be provided. The CoW owns the subject land and has control over local road use. There is an agreement in place between the CoW and UR for the removal of excess materials and their transport from site. ***A Transport Management Plan is provided.***
Western Australian Planning Commission	New developments may need to consider fire risk and mitigation such as a bushfire policy and BAL	The pit acts as a fire management zone as it is devoid of vegetation.	No assessment is required because there are no significant changes to the fire risk on Lot 9003, only reduced fire risk.

Planning Bulletin 111/2016	attack document.		The pit will be bare open ground and no structures will be located on site.
Environmental Protection Act 1986 *Part IV* - Assessment	Referred to the EPA if the project is or may constitute a significant environmental impact.	The proposal has been assessed under the Environmental Protection Act through the provision of Clearing Permit CPS 6359/3. Apart from clearing no other significant environmental matters are noted.	Noted. No formal assessment was required under Part IV of the EP Act 1986.
Environmental Protection Act 1986 *Part V* – DWER Licence	Environmental factors that may be significantly impacted related to Prescribed Premises. Processing and Screening	A screening and crushing Licence will be required under Part V of the Environmental Protection Act 1986. The Department of Water Environment Regulation will assess and issue a Licence.	***A DWER Licence under Part V of the EP Act 1986 has been applied for.***
Environmental Protection (Noise) Regulations 1997	Noise impacts.	The site and operations meet the EPA Generic Buffer Guidelines for the Noise Regulations.	Noted. The site is remote from sensitive premises but must comply with the Noise Regulations.
Environmental Protection (Clearing of Native Vegetation) Regulations 2004	Clearing and disturbance of native vegetation.	Clearing Permit under the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* is required *under the Regulations*.	***Clearing Permit CPS 6359/3 is in place for the whole site, valid until 15 August 2045.*** ***A new Clearing Permit for the small portion of land occupying the northern portion of Mather Drive will be required. This is to be gained by the CoW.***
Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)	Matters listed on the EPBC database.	The matters listed under the *EPBC Act 1999,* which might apply to this site such as Black Cockatoo habitat, *Banksia* Woodland or Tuart Woodland.	***Approval as EPBC Permit EPBC Act 1999, EPBC 2007/3479 has been issued by the Commonwealth***
Biodiversity Conservation Act 2016	The legislation seeks to protect and manage biodiversity in all its forms through regulation, conservation and restoration.	There are no issues that trigger this legislation.	Noted All matters listed under this Act have been assessed during the application for Clearing Permit.
Heritage of Western Australia Act 1990	Heritage	No heritage matters are identified locally or on quarry footprint. DPLH databases were searched.	Noted.
Waterways Conservation Act 1976	Water quality and management of surface water	There are no watercourses on site.	Noted.
Rights in Water and Irrigation Act 1914	Water quality and management of surface water	There are no watercourses on site.	Water Management has been prepared and is included in the Project Environmental Management Plan 2020.
Country Areas Water Supply (CAWS) Act 1947	Water supplies	The site does not lie within a surface or groundwater control area.	Noted
State Agreement	Specific acts that relate	Not applicable	Noted.

Acts	to certain large projects that may impact on some locations.		
Contaminated Sites Act 2003	Contaminated materials that may arise from excavation or be used in excavation and processing.	The only factor that is likely to fall under this category is the storage and use of maintenance items and on-site maintenance.	No materials are present or to be used which would trigger this legislation apart from normal fuel and maintenance. Water Management has been included in the Environmental Management Plan that includes commitments to remove any contaminated soils or other material regularly and at the end of excavation as part of the closure actions.
Dangerous Goods Safety Act 2004	Potential for dangerous good to impact on the environment.	Refers to fuel, which is required and blasting under the *Dangerous Goods Safety (Explosives) Regulations 2007*.	Fuel and Servicing Management Plans are included in the attached Water Management Plan. ***Generally, fuel will not be stored on site, but a contingency remains for that purpose and is applied for.***
Mines Safety and Inspection Act 1994	Safety and management of mining operations which in turn may impact on the environment.		***The site is to be registered through DMIRS prior to commencement.*** Discussions with DMIRS have revealed that the site will be included in UR Northern Perth Metropolitan management zone.

4.0 BUFFERS AND SOCIAL IMACTS

4.1 Consideration of nearby sensitive premises

The quarry is designed to maximise the setbacks to the closest sensitive premises.

As part of the development of the management plans for the proposed quarry, extensive analysis of the local landform, land uses and location of sensitive premises were made by Landform Research from the available sources of published information, aerial photography, historical aerial photography, site mapping, review of the nearby and surrounding land uses, local and regional planning and local and wider environmental attributes.

The main environmental issues identified in relation to buffers and setbacks to sensitive premises, in addition to those generally recognised by the various Government and Published guidance are;

- Visual amenity
- Dust management
- Noise management
- Blasting
- Local amenity
- Cumulative impacts of quarries

4.2 Policies

Policies and Other Operations

Several Government Policies relate to buffer distances and the protection of basic raw materials. State Planning Policy No 4.1, State Industrial Buffer Policy, (draft July 2004) discusses the need to consider adjoining land uses when locating buffers but does not prescribe set buffers for operations such as this.

SPP 4.1 discusses the need to provide buffers both on-site and offsite with respect to industry, including extractive industries. It does not however specify any distance for the buffer but notes that site specific studies should be prepared that will demonstrate that the extractive industry can operate in a manner compatible with nearby sensitive premises.

The State Industrial Policy 4.1 does not specify a set buffer distance but notes that buffers are to be based on “scientific study” and are flexible. It further specifies the buffers by reference to other documentation such as the Environmental Protection Policies, EPA and DWER standards and DPLH Generic Industrial Buffer Guidelines; that is the EPA 1 000 metre generic buffer used in SPP 2.4 and SPP 2.5 that are used in the absence of supporting or scientific studies and information.

The buffer referred to can be both on-site and offsite although in this case only on site buffers are required.

SPP 2.5 supports preventing conflicting land uses (5.12.1), supports the generic buffers recommended by other Government documents such as the EPA Guidelines for separation distances (5.12.3), and seeks to restrict subdivision from impinging on basic raw material resources.

The Policy SPP 2.5 is also supported by Guidelines that seek to protect the Landscape and secure Transport Routes.

EPA guidance "Separation Distances between Industrial and Sensitive Land Uses", June 2005 lists the generic buffers for sand and limestone quarries as 300 – 500 metres depending on the extent of processing.

A generic buffer relates to the distance at which there are unlikely to be any impacts without further investigations. It does not mean that smaller buffers are not acceptable.

EPA Guidance No 3, lists the generic buffer distances as “to provide general guidance on separation distances in the absence of site specific technical studies .....”. As the proposed facility is less than the generic buffer, site specific studies are recommended. These have been undertaken for Dust, Noise, and Visual in addition to general assessments for the site.

The Guidance lists the main risks as dust and noise.

Since the production of the Guidance there have been vast advances in the design and operation of portable crushing plant. Nowadays mobile crushing plant is quiet, with high levels of dust control, and excavation methods are much better and more environmentally sensitive.

A generic buffer relates to the distance at which there are unlikely to be any problems without some further investigations and does not mean that smaller buffers are not acceptable.

The issue of appropriate buffers is a matter of the distance and protection measures to prevent impact on adjoining land users. This applies mainly to noise, dust, and visual impact, all of which are treated separately.

The walls of the pit, perimeter bunding and nature of the ridge landform will be used to reduce noise transmission.

Excavation will be worked from inside out on the floor of the pit working below natural ground level.

Available Buffers

There are no nearby sensitive premises and no nearby suitable or zoned land on which a dwelling or other such premises could be constructed.

- The Neerabup Power Station does lie east of Orchid Road and will need to be protected from dust travelling offsite.
- Adjoining to the west is industrial land and an interim quarry.
- Adjoining to the north is Barbagallo Raceway and Wanneroo International Kartway.
- Adjoining to the south is West Beam and industrial land.
- On the eastern boundary is Orchid Road and two vacant rural lots to the east
- The closest dwellings are 1.0 kilometres away to the south at Banksia Grove well in excess of the 300 – 500 metre generic buffer recommended in the absence of site specific studies.

The sand and limestone excavation therefore comply with the EPA Generic Buffer Guidelines.

The excavations will be worked from the floor of the pit with the landform and remnant vegetation assisting visual management.

These buffer distances are significantly greater than the separations between dwellings and currently operating quarries in Western Australia. For example;

- UR completing earthworks at Parklands Heights, within 40 metres of dwellings in Camelot Street Baldivis and within 50 metres of dwellings in Wattleup Road, Hope Valley.
- Cockburn Cement operates within 90 metres of several dwellings in Fanstone Avenue Munster.
- Italia Stone Group operates within 40 - 70 metres of four dwellings in Dalison and Moylan Roads, Wattleup.
- Italia and WA Limestone operate within 80 - 140 metres of two dwellings in Wattleup Road, Wattleup.
- Italia operates within 280 metres of a dwelling in Hope Valley Road, Hope Valley.
- WA Limestone operates within 40 and 160 - 180 metres to 3 dwellings in Kerosene Lane Baldivis and at similar distances to dwellings in Lusky Road Hope Valley.

All the above examples demonstrate that excavation can occur and that any potential amenity impacts can be readily managed

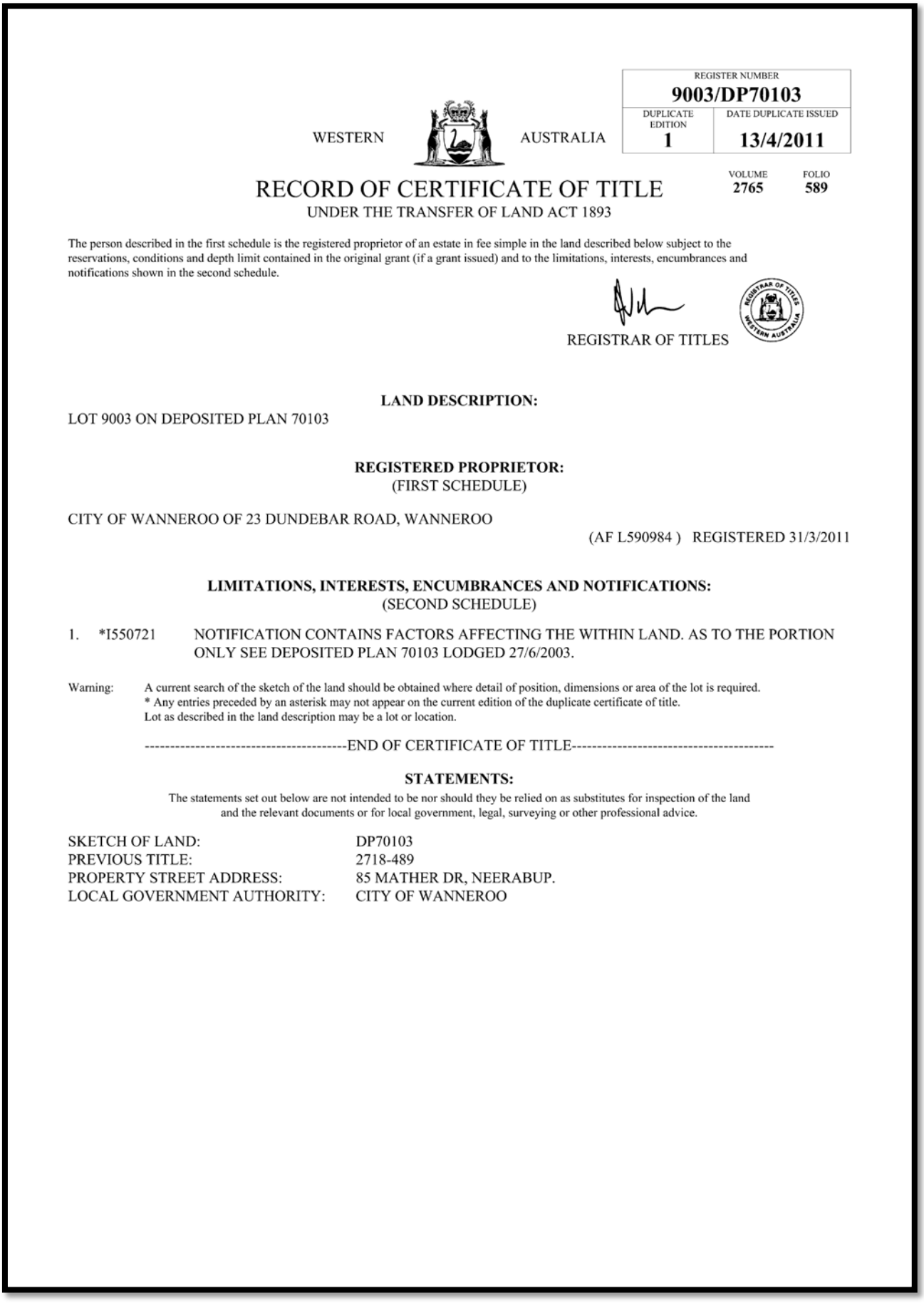
4.3 Community Consultation

The Proposal will be advertised to the local property owners as part of the consideration by the CoW.

4.4 Heritage

A search of the Department Planning Lands and Heritage database does not reveal any aboriginal sites on Lot 9003.

Should any archaeological site be uncovered, work will cease in that area pending an assessment of the site by an independent consultant, traditional owners and the Department of Planning Land and Heritage as required.



WESTERN AUSTRALIA

REGISTER NUMBER	
9003/DP70103	
DUPLICATE EDITION	DATE DUPLICATE ISSUED
1	13/4/2011

VOLUME 2765 FOLIO 589

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

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

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

LAND DESCRIPTION:

LOT 9003 ON DEPOSITED PLAN 70103

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

CITY OF WANNEROO OF 23 DUNDEBAR ROAD, WANNEROO

(AF L590984) REGISTERED 31/3/2011

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

1. *I550721 NOTIFICATION CONTAINS FACTORS AFFECTING THE WITHIN LAND. AS TO THE PORTION ONLY SEE DEPOSITED PLAN 70103 LODGED 27/6/2003.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

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

STATEMENTS:

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

SKETCH OF LAND:	DP70103
PREVIOUS TITLE:	2718-489
PROPERTY STREET ADDRESS:	85 MATHER DR, NEERABUP.
LOCAL GOVERNMENT AUTHORITY:	CITY OF WANNEROO

Figure 3: Certificate of Title

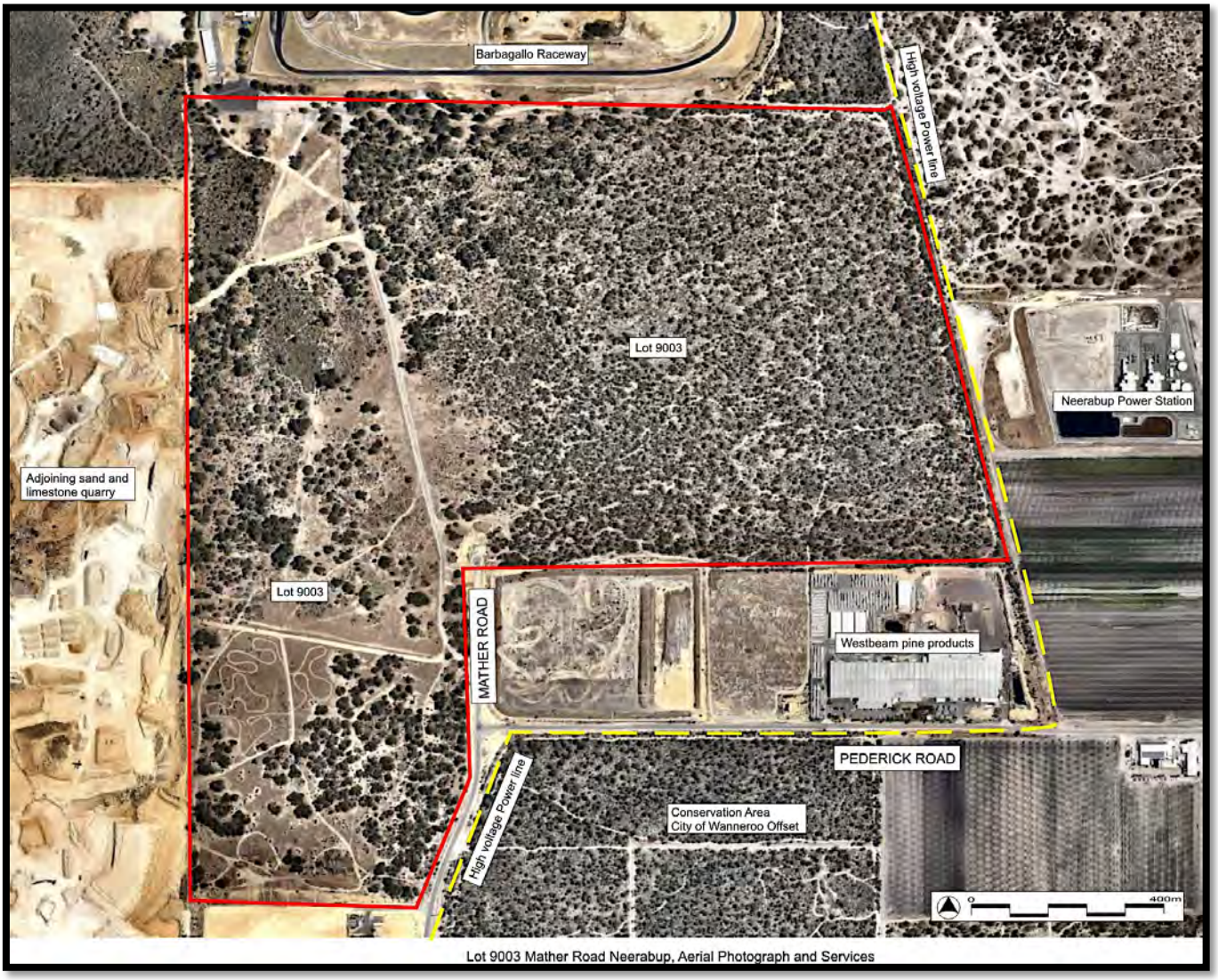


Figure 4: Aerial photograph

5.0 PROJECT DESCRIPTION

5.1 Construction

There is no significant construction required, apart from an access road to Mather Drive to the south. Transport will then be along Mather Drive to Flynn Drive or Pederick Road to Old Yanchep Road.

The clearing of the land and management of biodiversity issues is contained in the clearing of the land, topsoil and biodiversity management which are addressed in ***CEMP*** prepared for the CoW, which is referenced and incorporated into this document.

Access will be managed in accordance with ***Section 17.0 Site Access***. That will include delineation of each stage, perimeter signage, fencing and bunding as required.

The Construction of each section, and at all times, will operate to Section 20.0 Visual Management.

Construction Time

Approximately one month for initial establishment, and then progressively for each stage.

Background

The proposal is to prepare the site to form part of the Meridian Park. To prepare the earthworks, excavation of limestone and sand will be required on Lot 9003 with bulk earthworks on the northern portion of Mather Drive. There will also be an area of fill to achieve a smooth surface, suitable for development.

In all between 6 – 7 million m3 of sand and limestone will be excavated from the site over a 17 year time frame. (***Wave International, 2017, Neerabup Earthworks Study, Assessment of Sand and Limestone Volumes***, prepared for the CoW).

Figure 5: Road truck with typical limestone pit in the background

5.2 Excavation

Preparation of the Pit

The Staging will be completed in accordance with the concept working of the various stages of the approved Staging Plan as discussed in Section 5.3 Pit Design and Staging.

- The site will be surveyed and the next stage will be marked out.
- The excavation area, any sensitive features, and facilities/services will be identified, and, as applicable, a buffer applied and then marked by temporary flagging, for sensitive areas, buffer vegetation and the next stage as outlined in the CEMP.
- Clearing of vegetation is detailed in ***Section 10 Clearing***, which incorporates the requirements of the ***Construction Environment Management Plan (CEMP***).
- During land Clearing, the vegetation and trees will be managed according to ***Section 13.0 Black Cockatoo Fauna Management.***
- In summary, vegetation will be removed by bulldozer or loader by pushing it into windrows for use in final soil stabilisation or by the CoW to assist in repair of the Conservation Areas in the ***CAMP.***
- The material to be cleared will be assessed for weeds using the CEMP, which has been incorporated into ***Section 12.0 Weeds and Dieback***.
- Dieback mapping by the CoW has revealed that dieback is not present on site. If subsequent investigations determine that dieback has been introduced the vegetation and topsoil will be treated as per ***Section 12.0 Weeds and Dieback***.
- Cutting, grinding, chipping or mulching to be utilised for soil stabilisation and/or dust suppression on site, must occur behind the bunds during their construction and thereafter in an area within the bunds where possible.
- Where practicable, and if required, vegetation will be directly transferred to an area being rehabilitated. Smaller indigenous shrub material will be used in the rehabilitation process when available and suitable; for example, on batter slopes of completed areas.
- If direct transfer is not possible the vegetation that is required, will be stored in dumps, mulched or swapped with a nearby operator to try and ensure that the material is not wasted.
- Topsoil will be managed in accordance with the CEMP which has been incorporated into ***Section 11.0 Topsoil Management.*** Any topsoil will be removed for spreading directly onto areas to be revegetated and the screening or perimeter bunds. If direct spreading is not possible the top soil will be stored in low dumps, around the perimeter of the site for spreading at a later date.
- Soil and overburden, as yellow and brown sand and low grade sand and limestone, will then be removed and either directly transferred to a rehabilitation area or stored in low dumps for later rehabilitation use. Where this is not used overburden will be stored in permitter bunds for safety, visual amenity and dust protection during excavation.
- Limestone interburden, if encountered, will be incorporated into the overburden dumps for later use in re-contouring the land surface at the conclusion of excavation.

Excavation

- The excavation will be staged according to ***Section 5.3 Pit Design and Staging.***
- The amount of ground open at any one time will need to be larger, because some resources are less available and will be extracted by over excavation and backfilling in geotechnically controlled lifts as outlined in ***Section 5.3 Pit Design and Staging.***
- In addition, there are parts of the resource where resource has to be excavated and others where some fill is required. The exercise is really to develop the design surface of the proposed industrial land with the excess sand and limestone being taken offsite to achieve the design levels.

- Limestone overburden or interburden of suitable quality, if encountered, will be used for screening bunds, backfilling, and other resource swaps.
- Whilst the northern portion of Mather Drive is not proposed to be excavated under extractive industry, it will be subjected to bulk earthworks and managed in the same way as the extractive industry on Lot 9003.
- Excavation will be managed in accordance with ***Section 14.0 Erosion and Dust Management***, ***Section 15.0 Noise Management*** and ***Section 17.0 Hydrology***.

Limestone

- A bulldozer will be used to remove the cap rock and surface limestone, to produce a relatively flat cutting floor of soft limestone.
- Blasting will not be part of the normal operations, however, may be used for the production of large boulders of armour stone for coastal work if required.
- For road base excavation a bulldozer will rip out the limestone, which will then require crushing and screening.
- At the end of excavation, the floor of the quarry will be formed to the design surface of the industrial land and stabilised either by leaving the limestone to crust or by the provision of a surface cover by respreading the topsoil saved from the land clearing program pending development of the land for industry. Where topsoil is not available, or instead of topsoil, spray mulch will be used. See Section 21.0 Closure and Final Surface.
- After mining through of the faces, the final slopes are to be levelled to the design contours and in compliance with the *Mines Safety and Inspection Act (1994) and Regulations (1995).* See ***Section 23.0 Closure and Final Surface***.

Sand

- Sand will be excavated by digging with a loader and loading directly to road truck for fill sand or to a screening plant for processing.
- Whilst the largest volume of material to be removed is sand it is a much simpler operation with less potential environmental impacts.
- The same methods of preparation for excavation will be used but the sand will be taken from the face by loader and either loaded to a screening plant or a road truck.
- The loader will approach the face in a perpendicular manner and only work at the face if the face is no higher than the reach of the bucket, or the sand is free flowing and always falls to the angle of repose after taking a bucket from the face.

Processing

- Processing will consist of a mobile crusher and screening plant located on the floor of the pit in a location to maximise landform screening. A DWER Licence under Part V of the Environmental Protection Act 1986 will be applied for prior to any crushing or screening exceeding the prescribed limit of 5 000 tonnes. A DWER Works Approval has been applied for to cover processing of sand and limestone on site.
- The mobile plant normally consists of static primary, secondary and tertiary crushers together with screens, associated conveyor belts and stockpiles.
- For limestone the bulldozer track rolls the limestone to break it down to small pieces which reduces the amount of crushing that is required.
- Static and mobile processing equipment are be located on the quarry floor, with processing located within a designated processing area.

- Annual processing throughput is anticipated to be up to 500 000 tonnes of which 200 000 tonnes (mostly limestone) will require processing but this will depend on the type and number of contracts won. That processing is in addition to a significant but variable amount of sand that is to be taken as fill sand without processing.
- Processing will consist of a portable crusher and screening plant located on the floor of the pit in a location to maximise landform screening.
- The mobile plant normally consists of static primary, secondary and tertiary crushers together with screens, associated conveyor belts and stockpiles. The bulldozer track rolls the limestone to break it down to small pieces, which reduces the amount of crushing that is required.
- Static and mobile processing equipment are be located on the quarry floor, with processing located within a designated processing area.
- The processing of sand will be screening of specialty sands, which is anticipated to be a portion of the total and could be up to 100 000 tonnes or more annually depending on markets and the types of sand required.
- Fill sand, which will constitute the bulk of the sand extraction, will not require processing.
- An Acoustic Assessment has been completed by *Acoustic Engineering Solutions* and found that the operations within each stage are compliant with the Noise regulations. In ***Section 15.0 Noise Management*** a range of contingencies are listed that can be used to reduce noise levels further if required.
- Processing will operate in compliance with ***Section 14.0 Erosion and Dust Management***, ***Section 15.0 Noise Management*** and ***Section, 17.0 Hydrology- Water Quality Management***.

Figure 6: Bulldozer working in limestone

Figure 7: Loading an internal haul truck

Figure 8: Loading sand onto road truck

Figure 9: Feeding limestone to a crushing plant

Figure 10: Crushing plant located on the floor of a limestone pit

Figure 11: Screening sand

5.3 Pit Design and Staging

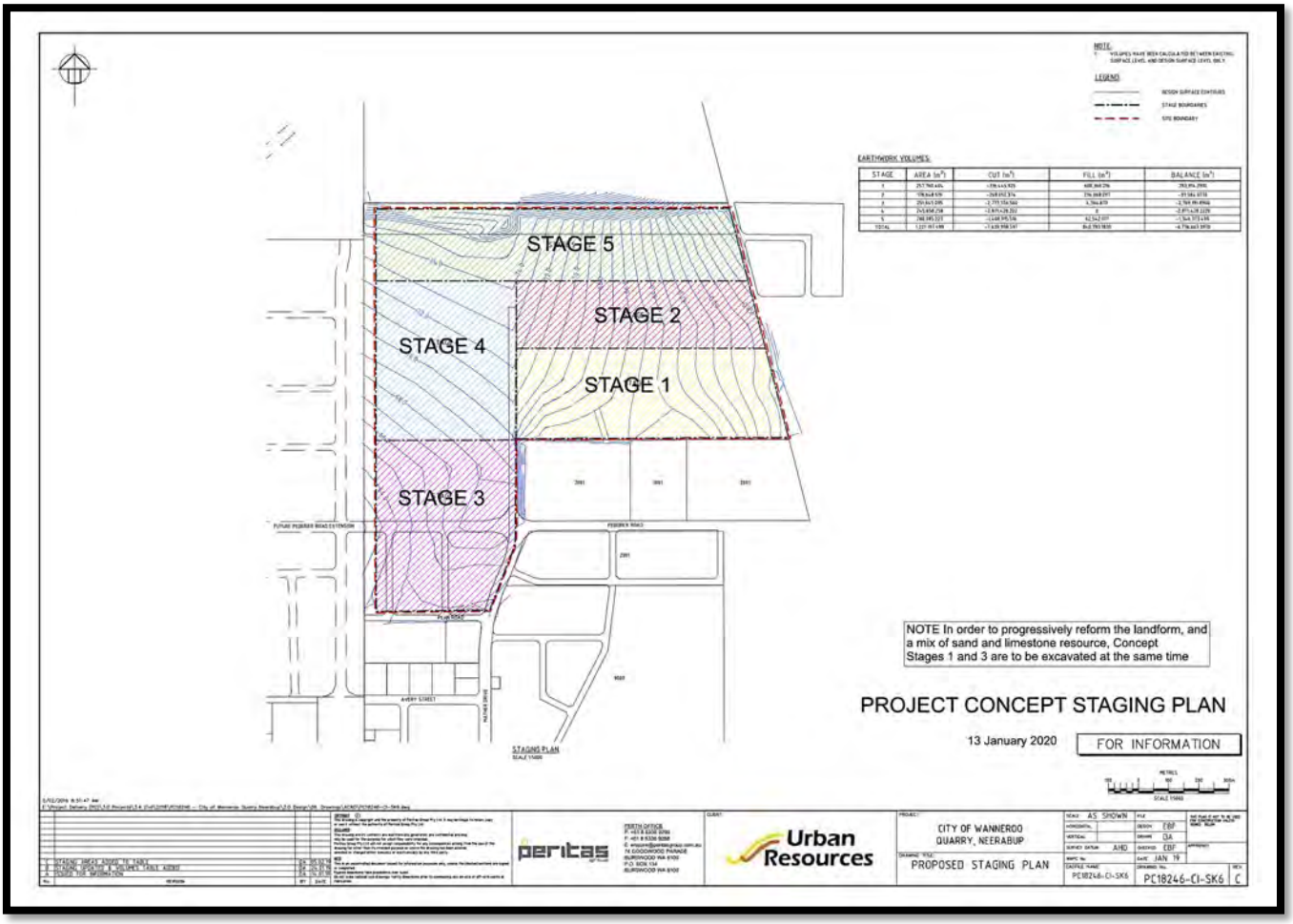


Figure 12: Staging Plan

Staging

The rate of extraction is to be designed to make the operation fit the commencement date of the final land use at 17 years, although the staging of the excavation and bulk earthworks will be designed to enable progressive development of industrial lots prior to that time.

The volume and rate of excavation is, of course, determined by the sales orders for the various contracts.

The total disturbance in the Project Summary Table at the front of this Management Plan includes the active pit in addition to the perimeter bunding.

Completed land will be stabilised progressively.

The concept staging is shown in the figure below, taken from Wave International 2017, Neerabup Earthworks Study, Assessment of Sand and Limestone Volumes prepared for the CoW.

To ensure that the pit is operated in a staged and efficient manner there will need to be activity in more than one stage at a time.

This results from;

- There being different resources within each stage,
- The next stage must be opened prior to the closure of the preceding stage,
- Bulk earthworks will be required to be undertaken in conjunction with excavation,

- The bulk earthworks require both cut and fill depending on the location.

Therefore, the operating of the various stages is summarised below. For the actual stages, refer to the Staging Plan.

Stage 1 Works

1. Clearing, grubbing out of the vegetation, removal of top soil, removal and mulching of trees, bush and shrubs over the area of stage 1.
2. Clearing, grubbing out of the vegetation, removal of top soil, removal and mulching of trees, bush and shrubs over 50% of the area of stage 3.
3. Extract the volume of resources from stage 1.
4. Extract a volume of resources from up to 50% of the area of stage 3
5. Complete rehabilitation works to Stage 1.

Stage 2 Works

1. Clearing, grubbing out of the vegetation, removal of top soil, removal and mulching of trees, bush and shrubs over the area of stage 2.
2. Clearing, grubbing out of the vegetation, removal of top soil, removal and mulching of trees, bush and shrubs over the remaining 50% of the area of stage 3.
3. Extract the volume of resources from stage 2.
4. Extract a volume of resources from the remaining 50% of the area of stage 3
5. Complete rehabilitation works to Stage 2.

Stage 3 Works

1. Extract the remaining volume of the resources from stage 3
2. Clearing, grubbing out of the vegetation, removal of top soil, removal and mulching of trees, bush and shrubs over 50% of the area of stage 4.
3. Extract a volume of resources from up to 50% of the area of stage 4
4. Complete rehabilitation works to stage 3

Stage 4 Works

1. Clearing, grubbing of the vegetation, removal of top soil, removal and mulching of trees, bush and shrubs over the remaining 50% of the area of stage 4.
2. Extract the volume of resources from stage 4.
3. Complete rehabilitation works to stage 4.

Stage 5 Works

1. Clearing, grubbing out of the vegetation, removal of top soil, removal and mulching of trees, bush and shrubs over the area of stage 5.
2. Extract the volume of resources from stage 5
3. Complete rehabilitation works to stage 5.

Final Contours

The created final contours will comply with the final design contours for the industrial end use.

The Earthworks and proposed final contours were reviewed by;

- ***Plan 2 - Final Surface Contour Plan of the Neerabup Industrial Area Structure Plan***, prepared for the CoW.

Neerabup Industrial Area (NIA) Agreed Structure Plan No. 17 (ASP 17) was first adopted by Council on 11 January 2005. In November 2007, the CoW prepared a bulk earthworks contour plan to guide development for the CoW's land east of Mather Drive.

In October 2011, LandCorp presented a revised earthworks concept plan to the CoW for comment. The revised plan proposed levels different to those specified by the Final Surface Contour Plan contained within ASP 17. The proposed levels satisfy the criteria contained within section 6.5 of ASP 17.

In May 2015 LandCorp (Development WA) presented the Department of Mines Industry Regulation and Safety (DMIRS) with the revised surface levels for comment.

DMIRS has worked closely with LandCorp and the CoW over a number of years to optimise both the extraction of limestone and the staged release of land for future industrial development within the Neerabup Industrial Area. (Wave 2017).

The final design contours are shown on *Plan 2 - Final Surface Contour Plan of the Neerabup Industrial Area Structure Plan*, but are to be agreed between Landcorp, (Development WA) the CoW, Western Australian Planning Commission and Department on Industry Regulation and Safety. The concept contours are shown on the Staging Plan.

It is possible that the final design contours might change over the length of the excavation. If they change, UR will change the final land surface contours to reflect any change, through discussions and agreement with the various stakeholders.

Geotechnical parameters

The geotechnical characteristics of the materials on site have been assessed by the drill holes associated with studies conducted by

- ***Golder Associates 2007, Geotechnical investigation Lot 4 Mather Drive Neerabup - Talis, 2017, Geotechnical*** *and*

- ***Hydrogeological Investigation Neerabup Industrial Estate, Neerabup WA*** prepared for the CoW, which provides cross sectional data on the geology and soils.

Those studies did not identify any adverse parameters for the excavation of the sand and limestone or the provision of cut and fill and the final land surface.

The final profile of the excavated surface will be to Mines Safety and Inspection Act 1994 as explained in documents such as;

- *DMIRS 2016 Geotechnical considerations open pit audit – guide and*

- *DMIRS 1991, Guidelines on Safety Bund Walls Around Abandoned Open Pits.*

The final contours and design contours for the industrial land have been designed to be geotechnically stable.

Even so there will be a maximum slope of 1:4 vertical to horizontal as a geotechnically stable landform that can be used for industrial purposes in compliance with the design floor of the Meridian Park.

Stockpiles

Stockpiles of products will be retained on the floor of the pit to reduce visual impact.

Topsoil that cannot be directly transferred will be stockpiled in low perimeter bunds, as will the small amount of overburden that consists of sub grade materials.

As fill sand will be extracted as required, no fill sand stockpiles will be required.

However, for specialty sands, such as concrete sand, brickies and plasterers sand and limestone processing will require stockpiles. Extracted sand will be stockpiled for screening and then the various screened products will require stockpiles.

The limestone dug from the ground will require crushing and screening. Stockpiles of excavated limestone and the various crushed and screened limestone products will be required.

Stockpiles will be located on the floor of the pit wherever possible and normally be around 5 metres high but on occasions, to minimise the footprint, stockpiles up to 8 metres will be used.

Formation of the stockpiles and their access can be a source of dust from crushing and screening and vehicle activity on hard stand. Dust risk management relating to stockpiles will be in accordance with ***Section 14.0 Erosion and Dust Management.***

5.4 Hours of Operation

Local Services

There are no existing facilities on site.

The facilities, power lines, water and telephone lines on site are shown in the attached Figures. There are no powerlines on site, but there are power lines along Orchid Road and along Pederick Road. These are high tension power lines.

As far as can be determined there are no gas lines, water, or phone cables. A commitment is made to complete a dial before you dig prior to any commencement.

The site will consist of mobile and transportable equipment. There will be no fixed services required. That is power will be supplied from self-contained generator, water will be brought to site as required by licensed water tanker, telephone - internet will use mobile services and self-contained on site waste water disposal will be used.

Plant and Equipment

The following equipment will continue on site from time to time;

Table 4: Likely plant to be used

Likely Plant to be Used	
Toilet system	A serviced mobile toilet system is to be used on site. There is potential for a septic system for facilities that are to stay on site for a significant time. ***Installation will be to the CoW requirements.***
Bore	A bore is to be located on site and will be used as a source of water. A water allocation is to be provided. If water is not available scheme water will be used.
Fenced compound	Located on site for the storage of mobile plant.
Site fencing and security	Signs and perimeter fencing will be provided as outlined in ***Section 16.0 Site Access.***
Loader(s)	Loading limestone to the crusher and screen, loading road trucks, excavating sand. For large contract's and sand and limestone excavation there will be several loaders on site.

Mobile crushing and screening plant(s)	To be used to produce limestone road base. A mobile screening plant may be used to produce specialty sands. See ***Acoustic Study prepared by Acoustic Engineering Solutions.***
Water tanker(s)	Used for dust suppression on the access roads and working floors as required. Alternatively, a tank with sprinklers can be used for dust suppression.
Fuel Storage	No fuel is proposed to be stored on site under normal operations, with fuel being brought to site as required. However, a fuel storage area is allocated should fuel be required to be stored on site to meet contracts. ***See Section 17.0 Hydrology – Water Quality Management***
Self-contained maintenance truck	Visits the operation as required to provide minor repairs and servicing.
Diesel Powered Generator	A diesel powered generator will be retained on site to power the weighbridge and the site facilities. The generator will have a self-contained fuel tank which will be refuelled from mobile tanker.
Weighbridge, site office and ablutions	Load weighing on the buckets will be used to assess the tonnages of material loaded to road trucks for transport offsite. That load weighing is accurate and may negate the need to a weighbridge. On the other hand, a weighbridge may be provided as a preferred means of determining tonnages and so a weighbridge is included within the site facilities. Any weighbridge will be installed near Mather Drive entrance, but in the latter stages of excavation the weighbridge may be moved closer to the face to enable the early stages to be developed. ***A Weighbridge Installation and Risk Management Plan is to be provided as appropriate.*** ***Facilities Installation and Risk Management Plan is to be provided as appropriate.***
Wheel Wash	A wheel wash bay is to be provided near the exit to minimise dust and “limestone mud” from being dragged onto the transport route. ***A Wheel Wash Installation and Risk Management Plan is to be provided as appropriate.***

5.5 Hours of Operation

Operations will be restricted to 6.00 am to 6.00 pm Monday to Saturday inclusive, excluding public holidays.

Transporting material on Saturday should not present a problem because of sealed roads, a long period of limestone extraction locally, the extensive market gardens and the relatively low numbers of dwellings.

5.6 Access and Transport

A transport Management Plan is prepared, Moro V, 2020, Transport Management Plan RAV Access Route, Limestone and Sand Quarry, Lot 9003 Mather Drive Neerabup.

External Transport Route

Any required crossover will be constructed to the requirements of CoW.

Access will be onto Mather Drive to travel to Flynn Drive and west.

For traffic to the east transport will be to Mather Drive and then Pederick Road and then Old Yanchep Road.

The end of Mather Drive has no other traffic and no crossover will be required.

The site is to be secured by locked gates when it is not being actively worked.

Appropriate signs will be erected on site, always combined with locked gates maintained when the site is not manned.

Security fencing will be used to form a compound for the parking of plant and equipment.

A wheel wash bay is to be provided near the exit to minimise dust and “limestone mud” from being dragged onto the transport route.

External Truck Movements

Locked gates will be maintained. Warning signs will be installed and maintained as required by the DMIRS and the CoW.

The rates of excavation are expected be up to 500 000 tonnes with some other years of lesser amounts and others of larger amounts to fill specific large contracts.

A range of semi-trailer truck, truck and trailer combinations is likely to be used to transport materials and manufactured products.

Assuming transport on around 300 days of the year at 40 tonnes per load, around 42 laden truck movements might be expected on average per day.

However, the hourly rate will vary with times of the day such as mornings when more trucks will leave site in an hour and could be 10 – 20 laden truck movements per hour to service large contracts.

When larger contracts are being filled there could be around laden 120 truck movements per day or 12 per hour on average with peaks of around 20 per hour likely.

Internal Vehicle Movements

Internal vehicle movements are under the umbrella of the Mines Safety and Inspection Act 1994, administered by Department of Mines Industry Regulation and Safety as a separate process.

UR has discussed the operations with DMIRS Safety Division. The proposed operation will be brought under the Mining Operations Plans that UR already has in place, covering the northern part of the Perth Metropolitan Area.

Environmental Management of Transport

The main risks from transport results from dust and dragging “limestone mud” onto the transport route in winter.

A wheel wash bay is proposed to be used when trucks are at risk of dragging dust or mud onto the transport route.

In addition, there is 250 metres of bitumen travel along the northern section of Mather Drive, prior to trucks accessing the public sections of Mather Drive and Pederick Road.

The management of dust and the potential for mud to be dragged onto the road network is considered in ***Section 14.0 Erosion and Dust Management***.

5.7 Water Use

There is no surface water available.

Water will be drawn from a licensed bore. If a water allocation is not available scheme water will be used, located on site. A Licence will be applied for, but if an allocation is not available scheme water will be used. Normally around 5 000 kL of water might be used per year, but this could rise to 20 000 kL if washing of sand is conducted or if the access roads and hardstand becomes extensive for large jobs.

In turn water usage on plant can be minimised using misting rather than spraying.

Potable water will be brought to the site as needed.

See ***Section 17.0 Hydrology - Water Quality Management***

5.8 Workforce

The workforce will vary, depending on the level of operation and market demands, but usually 2 – 10 persons will work on site plus truck drivers as they access the operations.

6.0 SAFETY

Safety Management

Excavation is conducted to Mines Safety and Inspection Act 1994 and Regulations 1995.

Health and safety issues are overseen by the Department of Mines Industry Regulation and Safety as a separate process.

UR as the Principal Employer, has discussed the operations with DMIRS Safety Division, with the proposed mining operations being brought under the Mining Operations Plans and Registered Manager, that UR already has in place, covering the northern part of the Perth Metropolitan Area.

In summary, every morning prior to start there is a daily briefing or consideration of the potential hazards, any incidents such near misses, health and safety and any other relevant issues.

UR will have procedures in place to manage safety, health, environmental impact, site completion and rehabilitation. All workers are required to be inducted, trained as necessary and wear full protective safety and high visibility gear when on site.

All vehicles have two way radio capability. No light vehicles are permitted on site without registering with mobile plant on site. Full personal protection is always required for all persons on site .

The site will have designated internal roads that will change over time as excavation proceeds across the site. Speed limits and other safety management will be applied.

All personnel are provided with site induction, safety, and environmental awareness training.

Safety Procedures are documented in the operational procedures developed by UR for their northern resources. Below is a summary of some of those procedures as they affect excavation management.

The site is within mobile phone contact and all vehicles are equipped with two way radios.

- The loader will excavate from the face using an in – out movement, only approaching the face from a perpendicular movement which is the safe option. The face will be no higher than the reach of the bucket unless the sand free falls at the angle of repose in which case the face can be higher. For higher faces, benches or an excavator will be used.
- Personal protection is worn by all persons on site, with a minimum of hi – viz, safety boots, long clothing, hearing and eye protection and helmets when near the face or operating machinery.
- Road trucks are separated from the operating loader. Site warning signs and directions will be installed as required to maintain safety.
- Signage, flagging and other means will be installed to manage trucks entering the site and to separate road traffic from mining traffic.
- Safety bunds or temporary fences will be used above any active vertical faces.
- Warning signs will be maintained as required.
- Emergency preparedness plans will be developed and implemented.
- Staff and contractors are inducted and trained as necessary and have the relevant qualifications to fulfill the tasks they are assigned to.
- Where applicable Safe Operating Procedure Sheets are made available for hazards. Workers and staff on all sites are trained in the use of the procedures and all employees provided with site induction and training as necessary prior to commencing work on the site.
- Safety management and operating procedures will be implemented.

A site specific Risk Assessment will be developed and approved by the CC and PM prior to commencement of operations.

Fire Management

The safety of workers is managed through a Safety Management Plan developed through the Mines Safety and Inspection Act 1994 and Regulations 1995.

The excavation area will form a natural firebreak; the access road will also assist. Water available on site can be used for firefighting.

Western Australian Planning Commission Planning Bulletin 111/2016 provides for an exemption of a bushfire plan requirement because there will be no structures that will burn, and the open ground will form a fire break. With excavation, the fire risk will reduce because of the large amounts of bare ground and reduced loading of flammable material. The only part of the operations where there is a changed fire risk is the location of the facilities in the south near Mather Drive.

A ***Bushfire Risk Assessment*** will be provided for that facility.

Therefore, the Department of Mines Industry Regulation and Safety (DMIRS), with the registration of all quarries, requires bushfire planning to be covered under that system.

Operational Fire Management and Occupational Risk is included in UR, Safety Management Procedures for the site that will be approved by DMIRS.

- Vehicles will be restricted to operational area, particularly on high fire risk days.
- Diesel rather than petrol powered vehicles are used.
- Perimeter fire breaks will be maintained.
- The mobile plant on site will be available to assist with emergency fire management when safe to do so.
- The on-site water cart will be available for fire control, as necessary.
- Fire risk is addressed and maintained through the site Safety Management Procedures (Project Management Plan)
- Water supplies will be drawn from a licensed bore if an allocation is available. If not scheme water will have to be used.
- The water truck will be available for fire management.
- Public access will not be permitted.
- An emergency muster area is provided.
- On site communications and worker induction and training will be provided.
- The site is within mobile phone range, the surrounding area is relatively flat, and any bushfire smoke will readily be noticed.

6.1 Training and Competency

Urban resources are committed to providing employees with the necessary training to perform their work safely and effectively. All project personnel will be trained in accordance with the requirements of UR-PRO-013 Training Procedure.

Urban Resources requires that training arrangements for all personnel provide the best approach to learning for the intended audience, such as reading and writing ability, learning style, the suitability of the learning environment, and considerations for differing abilities, backgrounds, cultures, religious beliefs and ethnicity.

General Induction

All personnel working in Urban Resources controlled areas are required to complete the UR General Induction. This induction informs participants of our company policies and commitment to meet the requirements of our environment, quality, and safety management systems.

Site Specific Induction and Commencement of Work

On completion of the General Induction, personnel shall be inducted to their work area. They shall be informed of their safety and environmental responsibilities as well as significant hazards, environmental aspects and impacts identified for this project/site.

A site induction for the worksite is to be given by the site supervisor or his representative. The supervisor will indicate the nature of the works and the employee's duties, taking into consideration.

- Special safety and environmental work instructions and directions, including those which relate to Environmental Work Procedures directly relating to this site
- Environmental objectives and targets
- the Site Risk Register, and
- attendance at Toolbox Meetings

6.2 Incident Management

Management must ensure immediate response to and timely reporting, analysis and communication of all environmental incidents which occur in areas under the control of Urban Resources in accordance with UR-PRO-002 Incident Reporting Procedure.

All personnel have a responsibility to report safety and environmental incidents regardless of severity, to their supervisor as soon as practicable.

All incidents shall be reported to the EMR as soon as practicably possible. The EMR will formally notify the CC of the incident within 24 hours.

All incidents shall be recorded in the UR incident reporting system and be investigated by the EMR and CM to a level commensurate with the actual consequence or potential impact rating, whichever is higher. Corrective Actions must be determined with consideration for the hierarchy of controls.

Examples of environmental incidents may include;

- Environmental pollution, spillages or contamination or damage
- Unapproved impacts on flora and fauna (including unapproved clearing)
- Unapproved emissions (dust, sediment, pollution) to land, air or water.

A signed investigation report for all incidents will be submitted to the PM within 5 days of the incident occurrence.

The details of the incident are to be recorded by the ERM in an Incident Register, along with corrective and preventative actions outlined in the investigation report.

Information on environmental incidents will be communicated to contractors and personnel in the next weekly toolbox meeting following the occurrence of the incident. Additional toolbox meetings may be called to specifically address an environmental incident if considered required by the Registered Manager (e.g. major breach to procedures). Recent incident reports will be displayed on site notice boards.

6.3 Complaints Reporting

The CC will maintain a register of complaints, which will include a record of any action taken with respect to the complaints. Complaints relating to environmental aspects are to be handled as incidents in terms of communication and investigation. All complaints will be reported to the PM in accordance with the CoW Complaints Process Map.

6.4 Corrective/Preventive Actions

All corrective / preventive actions identified for incidents, complaints and non-conformance audit results are to be recorded in a Corrective Actions Register by the ERM. The register will be checked weekly by the ERM to ensure that corrective actions are completed.

The register is to include the following details;

- Date & location of incident/complaint/non-conformance
- Details of incident/complaint/non-conformance
- Actions taken to control the incident/complaint/non-conformance and prevent future occurrence
- Time and date by which the corrective action will be completed (unless ongoing)

Appropriate sign-off, indicating that the incident/complaint/non-conformance was investigated and followed up appropriately is in accordance with UR-PRO-003 CAR Procedure.

7.0 TEMPORARY CLOSURE

In the event of temporary closure, the following will be applied.

Table 5: Temporary Closure

Table 4 Temporary Closure			
	CLOSURE OBJECTIVE	**Completion Criteria**	**Actions for Care and Maintenance Greater than 12 months**
1.0 COMPLIANCE			
1.1	All legally binding conditions and commitments relevant to closure and rehabilitation will be met.	1.1	Prior to undertaking temporary closure. • Review the latest documentation, including conditions of DA, the latest CEMP and CAMP documentation, current Licences and discuss with Stakeholders. • Assess compliance with the conditions and commitments. • Faces and the landform are to comply with DMIRS Guidelines and be stable for the long term.
2.0 SAFETY			
2.1	Make the site safe.	2.1	Prior to vacating. • Secure the site and any plant or structures to be left. • Mobile plant and other equipment not required will be removed from site. • The site will be cleaned, waste will be removed. • Provide fencing, bunding, signage or other measures as required to provide a safe site, particularly above any faces. **Security** • Complete activities to make the site safe. • Provide bunding, fences and warning signs above faces as required. • Provide locked gates or log access restraints as required or maintain staff on site. • Check and maintain perimeter fences and or barriers. • Visual audit of completed ground, to verify compliance.
3.0 HYDROGEOLOGY			
3.1	Ensure that there are no materials that could cause pollution or environmental harm.	3.1	• Remove service materials. • Remove fuel and other potentially polluting materials. • Remove any materials from which leaching may occur.
4.0 BIODIVERSITY			
4.1	Minimise the risk to on site or offsite biodiversity.	4.1	• Implement the Dieback Management Plan if dieback has been identified on site (currently the site has been assessed as dieback free). • Implement the Weed and Dieback Management Plan, in Section 13.0 Weeds and Dieback. • Inspect the site for Significant Environmental and Declared weeds. Treat accordingly • Inspect adjoining native vegetation and rehabilitation for edge weed effects. Treat accordingly.
5.0 STAKEHOLDERS			
5.1	Ensure stakeholder issues are considered.	5.1	• Prior to temporary closure, as necessary, consult with the relevant stakeholders (CoW) to check whether the closure planning meets the stakeholder's current criteria.

8.0 ENVIRONMENTAL MANAGEMENT

Lot 9003 Mather Drive is owned by the CoW and is zoned and proposed for future industrial land as part of the Neerabup Industrial Area; Meridian Park.

UR Pty Ltd have a contract in place with the CoW for the extraction of sand and limestone from Lot 9003 and for bulk earthworks and the re-formation of the land to the design surface of the proposed industrial precinct.

The time frame is anticipated to take 17 years. To allow for contingencies a 20 year DA and Extractive Industries Licence is requested.

There is a significant amount of cut and fill, in addition to removing excess material off site.

As part of the CoW and UR investigations and preparation for the industrial precinct a significant number of studies have been completed. Those studies cover all aspects of Lot 9003 from the design to the geotechnical attributes and the environmental assessments.

Meridian Park was assessed and approved under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) (EPBC 2007/3479).

The EPBC approval has a number of conditions relating to the implementation of the action, including the requirement to develop and implement a CEMP to the satisfaction of the Commonwealth Minister for the Environment. This approval allows for the clearing of up to 130.7 ha of foraging habitat for the Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) within the 159 ha of native vegetation to be cleared for the development.

The CEMP was prepared for the City of Wanneroo to comply with EPBC 2007/3479 and provided a prescription for the clearing and topsoil management of the extraction areas on Lot 9003 whilst minimising the impact of the environmental values of the surrounding environment and Conservation Areas.

The CAMP was prepared for the CoW to identify procedures and responsibilities to protect, maintain and enhance the conservation values of the habitats to be retained in accordance with EPBC 2007/3479. The conservation areas associated with this document include Mather Reserve and Mary Street Reserve. Mather Reserve is located adjacent to the proposed development area.

Environmental Management

The environmental management is designed to reflect best practise, outlined in;

Department of Resources, Energy and Tourism (Commonwealth), 2011, A Guide to Leading Practice Sustainable Development in Mining, and guidelines produced by Environmental Protection Authority, Department of Water, Environment Regulation, Department of Mines Industry Regulation and Safety, Western Australia Planning Commission, and the Local Authority.

The Environmental Risk Matrix in this document is considered to the principles of ***ISO 14001:2015 (Environmental Management Systems)*** and ***ISO 19011:2014 (Guidelines for auditing Management Systems).*** The principles of ***AS/NZS 31000:2018 (Risk Management Guidelines)*** are also used when considering any risks.

Purpose and Scope

This Project Environmental Management sets out the environmental process that will be used by UR to minimise harm to the environment during this project and comply with the requirements of The CoW Construction Environment Management Plan (CEMP) and CAMP.

This document applies only to this project, for the extraction of sand and limestone resources and earthworks of approximately 127 ha of Lot 9003. This document forms part of UR Integrated Management Systems and the CoW CEMP (CEMP).

In addition, the Environmental Management will serve to ensure that UR meets the obligations of its Environmental Policy and procedures, relevant environmental legislation and the commitments and requirements of the Contract between the CoW and UR Pty Ltd.

UR is Certified as meeting the requirements of ISO 9001 Quality Management, ISO 14001 Environmental Management and AS/NZS 4801 Occupational Health and safety.

8.1 Site Studies

Several Site Studies have been prepared and are relevant to the extraction of sand and limestone and the preparation of the industrial area surface.

- ***Golder Associates, 2014 Geotechnical and Investigation Lot 4 Mather Drive Neerabup.*** This document provides data on the resource, water table and geotechnical stability and parameters.

- ***Talis, 2017 Geotechnical and Hydrogeological Investigation*.** This document provides data on the resource , water table and geotechnical stability and parameters.

- ***Eco Logical Australia (ELA) 2012****. Ground truthing of environmental values for Lot 4 Flynn Drive Neerabup Prepared for CoW.*

- ***Eco Logical Australia (ELA) 2013. Targeted Flora and Fauna Assessment Lot 4 Flynn Drive Neerabup,*** *Prepared for CoW. April 2013.*

- ***Ecoscape 2019, Final Flora Survey Mary Street and Mather reserve***

- ***Ecoscape 2018, Final Kangaroo Survey Neerabup***

- ***Ecoscape 2019, Black Cockatoo Habitat Survey Report – Neerabup Industrial Area and Offset Sites***

- ***Natural Area Consulting Management Services 2020, Neerabup Weed Mapping - Lot 9003 and Lot 600***

- ***Terratree 2017, Comprehensive Phytophthora Dieback Assessment of Conservation and Development Areas***

- ***Wave International 2017, Neerabup Earthworks Study, Assessment of Sand and Limestone Volumes****, prepared for the CoW.*

- ***Acoustic Engineering Solutions, 2020, Environmental Noise Impact Assessment of Sand and Limestone Extractions at Lot 9003, Mather Drive Neerabup.***

- ***Moro V, 2020, Transport Management Plan, RAV Access Route, Limestone and Sand Quarry, Lot 9003 Mather Drive, Neerabup.***

As the environmental approvals are in place for clearing the background studies are not now relevant to this management plan as the data and findings have been incorporated into this and the other Management Plans.

8.2 Geology and Geomorphology

Elevation grades from around 80.0 metres AHD in the west, dropping to 58.0 metres AHD in the central south rising to 66 metres ASHD in the central east and then dropping to the eastern boundary at 50 – 58 metres AHD.

Tamala Limestone overlain by Spearwood Sand forms the western half of the land, with the limestone dropping away to the east and with the eastern half being silica Sand of the Spearwood System, becoming more leached to the east, and grading to the older Bassendean System.

The Spearwood Sand is yellow and earthy at depth and appears to have been blown to the east from the weathering limestone to over-run the older basal Bassendean Sands System.

The limestone is a calc-arenite made from beach sand containing predominantly shell fragments with minor and variable quartz. The limestone has been lithified, although the degree of lithification (hardness) changes over the property and determines the use to which each type of limestone can be put.

It is ascribed to the Tamala Limestone although it may well be a younger sequence than Tamala Limestone in some other locations.

In other localities dates of between 25 000 and 100 000 years have been obtained for the Tamala Limestone, or even older.

The Tamala Limestone is covered by shallow, yellow brown, calcareous earthy sands that have originated as a result of weathering of the limestone to the west.

Several studies have been conducted of the resource, to test the geotechnical properties and to assess the hydrogeology. The drill holes associated with those studies conducted by Golder Associates 2007, *Geotechnical investigation Lot 4 Mather Drive Neerabup,* Talis, 2017, *Geotechnical and Hydrogeological Investigation Neerabup Industrial Estate, Neerabup WA,* prepared for the CoW, provide cross sectional data on the geology and soils.

Description of the Resources

The limestone varies from high calcium carbonate content to lower grade material. This enables a range of limestone products to continue to be potentially produced from the site.

There are several resources on site, including limestone suited to rubble, road base and armour rock, together with sand which is suitable for fill and may also be suitable for concrete manufacture.

The degree of lithification (hardness) of the limestone changes both vertically and horizontally over the site and determines the use to which each type of limestone can be put, although the most significant limestone resource is restricted to the western edge.

There are some pinnacles and lensing of the limestone in the west with the buried lenses being of lower grade (% CaCO3).

The sand resource consists of yellow silica sand with more leached and white sand over paler yellow sand in the east. The colour of the sand varies because of the traces of clay and iron oxide coating around the yellow sand grains. Those coatings change the properties and uses of the sand, such as fill sand, concrete sand, plasterers' sand, and other sand uses.

Karst Systems

The site has been reviewed by Lindsay Stephens of Landform Research. No evidence from past excavation shows any karst formation or caves. The only limestone is present in the western half and there is no potential for karst on the eastern half.

The site lies outside and 2 km to the east of the local Karst Risk Area in Csaky 2003.

The site also lies outside the karst risk shown in the CoW Local Planning Policy 4.13, Caves and Karstic Features.

For karst to occur there must be a source of acid groundwater and as there are no lakes or swamps on site or near the east, and with a westwards flow of groundwater, there is no potential for karst development. The closest is Lake Pinjar which would have originally extended to within around 700 metres of the subject land.

There is no risk of karst being uncovered with such separation, taking into account the water table depth, historic levels, potential for cavities at the water table or historic water table, and source of the water through limestone flowing west which will result in any acidic conditions being neutralised prior to flowing to the site.

There is no evidence of "cave" karst on site or the deep excavations into limestone to the west. In addition, no cavities were recorded in the drilling conducted on site.

Regolith and Soils

Soil coverage varies from thin to deep shallow yellow sands over limestone outcrop and pinnacles in the west, where the soils are classified as Spearwood soils, which become deeper and less yellow to the east.

The eastern half of the site consists of deep yellow to pale yellow sands with some surface leaching to white sands.

8.3 Climate

The climate of the area is Mediterranean with warm to hot summers and cool wet winters.

The closest recording station was Beenyup (Wanneroo), although averages of only six years' data have been recorded. Nowadays data is recorded at Swanbourne, which is likely to be more influenced by the ocean than the actual site.

The highest average temperatures are in February with 30.0 maxima and the lowest averages are recorded in July with maxima of 18 degrees Celsius and 7.4 degrees C minima, average.

Rainfall for the area is slightly less than Perth at 722 mm compared to Perth's 869 mm, of which more than 90% falls in the months April to October inclusive. Rainfall has also been recorded at Yanchep with an annual average of 755 mm per year. Evaporation is high and exceeds rainfall in all but the four wettest months, May to September.

The prevailing winds are from the south west, particularly in the afternoon. In summer the easterly in the mornings and the sea breeze in the afternoon can be quite strong. At 3.00 pm wind speeds exceed 10 kph for 80 % of the time in summer but only 30 % to 40 % in winter. At other times the wind speed is calm for 30 % of the time in winter at 9.00 am and 10 % in summer with 40 % of the time exceeding 10 kph in summer and 20 % in excess of 10 kph in winter.

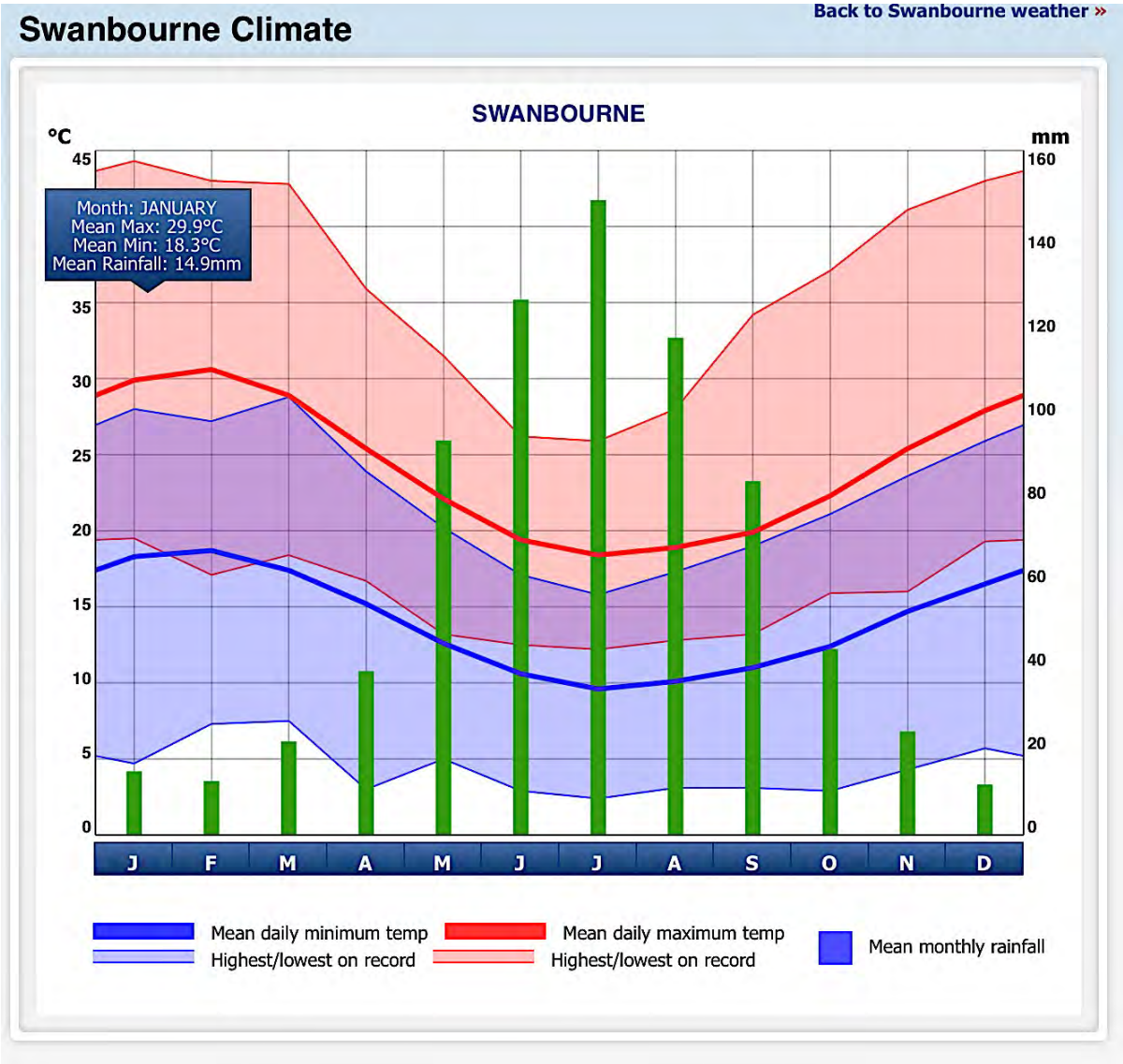


Figure 13: Climate Data

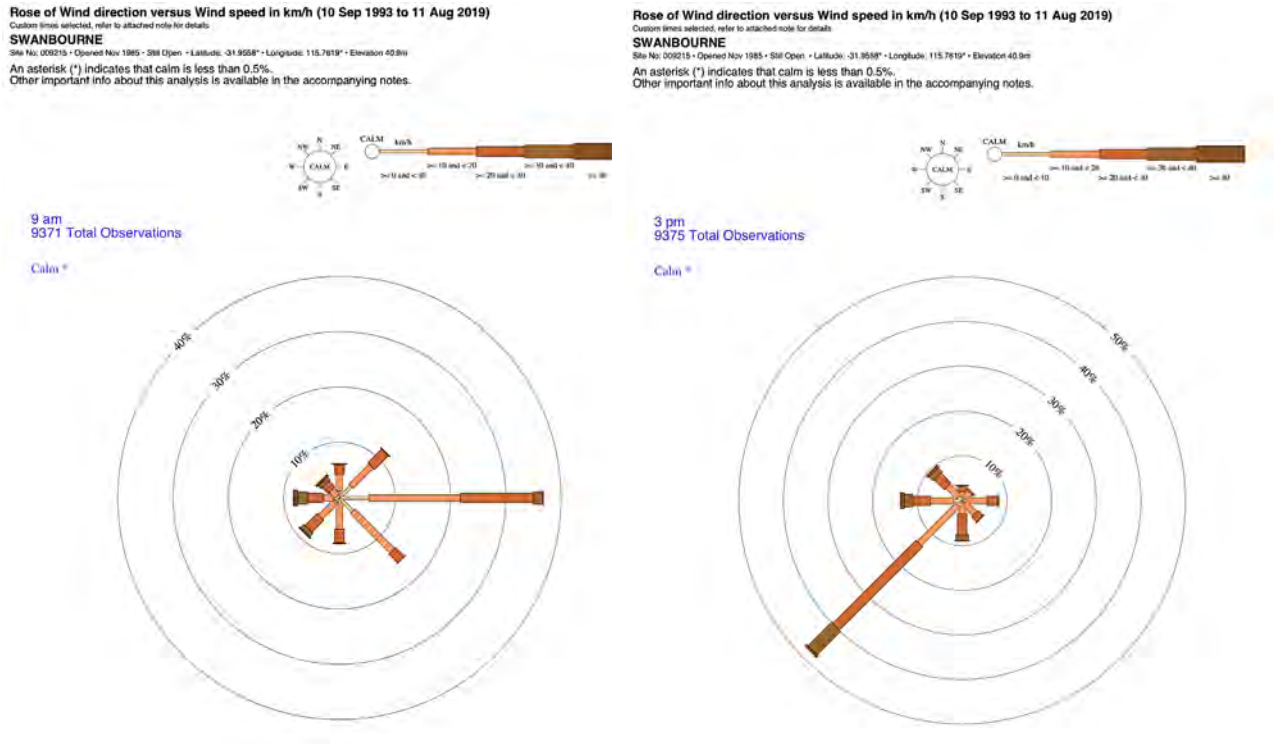


Figure 14: Wind Roses Swanbourne

8.4 Biodiversity Studies

The baseline data is summarised at the commencement of each environmental section, with the relevant research reports identified within the included management tables.

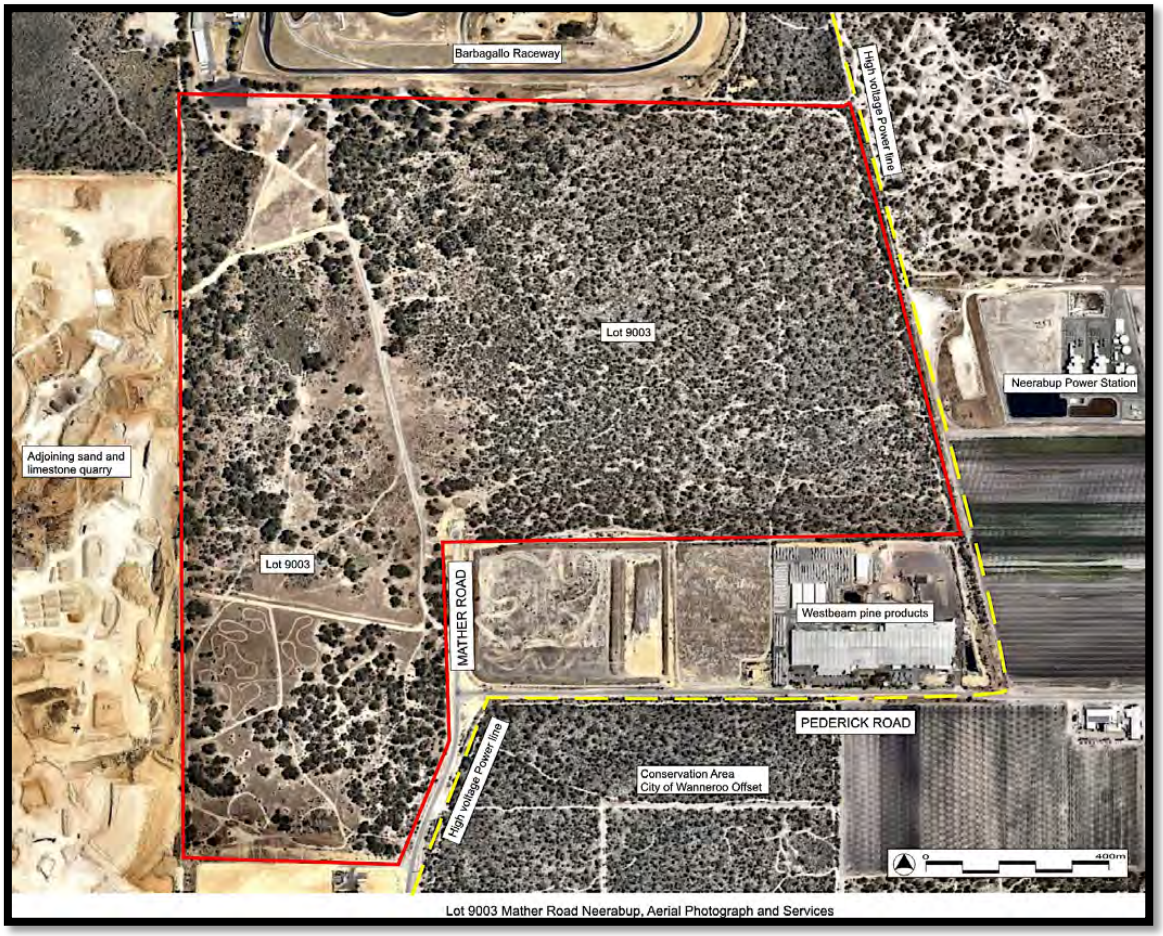


Figure 15: Aerial photograph

Vegetation

The vegetation on the resource is to be cleared under Clearing Permit CPS 6359/3, therefore whilst flora and vegetation studies have been conducted, the main document is the Clearing Permit. There will also be a requirement for a clearing permit to be issued for the northern portion of Mather Drive to enable earthworks to occur in the location.

A further small Clearing Permit will be required for clearing the northern portion of Mather Drive to enable bulk earthworks to occur within the road reserve.

A summary of the vegetation is taken from the CPS 6359/3 below.

The CAMP reviewed the subject land with respect to determining the vegetation quality for the provision of offsets. Their work added to the flora and fauna studies that had been conducted earlier;

- Eco Logical Australia (ELA) 2012. *Ground truthing of environmental values for Lot 4 Flynn Drive Neerabup Prepared for CoW.*

- Eco Logical Australia (ELA) 2013. *Targeted Flora and Fauna Assessment Lot 4 Flynn Drive Neerabup Prepared for CoW. April 2013.*

They also listed another three earlier flora and fauna studies that considered the subject land.

The clearing of the land, topsoil and biodiversity management are addressed in the CEMP prepared for the CoW, from which all commitments and actions have been incorporated into this Project Management Plan.

The vegetation on the resource is to be cleared under Clearing Permit CPS 6359/3 and therefore whilst flora and vegetation studies have been conducted, the main document is the Clearing Permit.

As all approvals are in place for clearing, and offsets have been provided by the CoW no additional management of flora is required.

A summary of the vegetation existing on site is included below. It is taken from the Clearing Permit documentation (CPS 6359/2).

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
The vegetation under application is mapped as: Beard vegetation association 6 which is described as medium woodland, tuart and jarrah (Shepherd et al., 2001).	To clear 156.156 hectares of native vegetation within Lot 9000 on Deposited Plan 60745, Lot 9003 on Deposited Plan 70103 and Lot 600 on Deposited Plan 302260, Neerabup, for the purposes of limestone extraction, industrial development and remediation.	Excellent; Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).	The majority of the application ar (102.1 hectares) has been descr as an open forest of *Eucalyptus marginata* and *Allocasuarina fraseriana* over woodland of *Ban attenuata* and *Banksia menziesii* shrubland of *Xanthorrhoea preis* over low open shrubland of *Hibb*
Heddle vegetation complex Cottesloe Complex-Central and South which is described as a mosaic of woodland of *Eucalyptus gomphocephala* and open forest of *E. gomphocephala - E. marginata - Corymbia calophylla*; closed heath on the Limestone outcrops (Heddle et al., 1980). Heddle vegetation complex Karrakatta Complex-Central and South which is described as predominantly open forest of *E. gomphocephala - E. marginata - E. calophylla* and woodland of *E. marginata - Banksia* species (Heddle et al., 1980).	To	Completely Degraded; No longer intact, completely/almost completely without native species (Keighery, 1994).	*hypericoides*, with occasional *Hypocalymma robustum* and *Bossiaea eriocarpa* over open herbland including *Mesomelaena pseudostygia*, *Desmocladus flexuosus* and *Lyginia barbata* on gr loamy sands and sandy midslopes midslopes and upper slopes in a go to excellent (Keighery, 1994) condition (Eco Logical Australia, 2013). The condition of the vegetation und application was determined via a flo and fauna assessment undertaken Eco logical (2013) and a site inspection undertaken by the Department of Environment Regulation (DER, 2015). Approximately 21.2 hectares of the application area is in a completely degraded condition, 44 hectares is i a degraded condition, 70.6 hectares is in a good condition, three hectare is in a very good condition and 16.5 hectares is in an excellent condition (DER, 2015).

Approved Clearing

The clearing will take place in five stages, which will be worked progressively but will contain some overlaps in order to achieve a balance of resources and to enable the industrial land to be sequentially prepared. See ***Section 5.3 Pit Design and Staging.***

The Clearing is to be managed according to the Construction Environment Management Plan (CEMP). All actions and commitments from the CEMP are incorporated into the UR management for clearing.

In order to avoid over-clearing of vegetation, the boundaries of the site, staging and retained vegetation will be surveyed and clearly marked prior to the commencement of clearing.

Staff will be inducted to ensure all on site personnel will be aware of the environmental values.

During the marking out phase, inspections be undertaken by suitably qualified personal appointed by UR (the Construction Contractors – CC) with advice from the CoW Environmental Supervisor (ES) prior to the commencement of clearing.

Where suitable for conservation uses, seeds and other materials, including; habitat logs, mulched vegetation and topsoil (specifically topsoil that is from vegetation mapped as being in Very Good or better condition and dieback free) will be collected and stored for later use in landscaping and/or rehabilitation of areas external to the site.

Seed collection and storage will be influenced by the staging of limestone and sand extraction, however, is likely to be undertaken in the first seed collection period (generally from September – February) and will be completed by the CoW for use in areas designated for conservation which are described in the CAMP.

Fauna

The amount of fauna is dependent on the amount and quality of the habitat. The site of the quarry is generally parkland cleared in the west with better quality vegetation in the east.

Fauna associated with the vegetation on the resource area has been considered under Clearing Permit CPS 6359/3.

The protection and management of fauna is completed by the use of offsets through the Clearing Permit. The offset is summarised in CPS 6359/3 and EPBC 2007/3479.

The survival of fauna in the area will be more related to the future land use than the operation of the quarry which is cleared industrial land.

With a 17-year time frame for the excavation only smaller stages will be impacted at any one time with the slow pace of clearing providing time for fauna to move.

The site was found by Ecological Australia, to contain approximately 177.7 ha of moderate to high value foraging habitat for Carnaby's Black Cockatoo as well as approximately 694 trees that have been identified across the site as habitat trees, on the basis of a DBH greater than 500 mm, rather than recorded nesting hollows or nesting. Approval has also been gained through Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) (EPBC 2007/3479).

The closest record of known breeding to the site is within Yanchep National Park, approximately 16 km to the north. The project area's primary attribute is therefore its Carnaby's Black Cockatoo foraging value.

The foraging habitat across the Site is generally comprised of *Corymbia, Eucalyptus* and *Banksia* communities. Some of the vegetation was considered to be in degraded condition, however, these areas are sometimes still considered of moderate to high value foraging habitat because of the presence of the important *Eucalyptus* and *Banksia* species. Evidence of foraging activity was observed throughout the Site (ELA 2013).

On the basis of the various flora and fauna studies clearing approvals were issued. A summary below is taken from the Clearing Permit documentation (CPS 6359/2).

The approvals permit the clearing of 130.7 hectares of Cockatoo habitat in Development Area (approved for clearing under EPBC 2007/3479).

The management of that clearing and potential impact on Black Cockatoos is contained in the CEMP prepared for the CoW, which is referenced and all actions and commitments have been incorporated into this Project Management Plan.

Below is a summary of the offsets used, taken from CPS 6359/2. Note that a further small Clearing Permit will be required for clearing the northern portion of Mather Drive to enable bulk earthworks to occur within the road reserve.

The application to amend CPS 6359/2 by increasing the area approved to clear by 0.156 hectares, received on 23 March 2017, has been assessed against the clearing principles, planning instruments and other matters in accordance with s51O of the *Environmental Protection Act 1986*. It has been concluded that the proposed clearing is at variance to clearing principles (a), (b) and (h) and is not likely to be at variance to the remaining clearing principles.

Through assessment it has been determined that the clearing will lead to the loss of 156 hectares of native vegetation that contains:

- contains 127.7 hectares of significant Carnaby's cockatoo feeding and potential nesting habitat;
- provides significant fauna habitat; and
- is important for fauna movement between significant areas of remnant vegetation including conservation reserves.

To mitigate the significant environment impacts identified above, and in accordance with the WA Environmental Offset Policy and Environmental Offsets Guidelines, prior to undertaking any clearing, the Permit Holder is to give a conservation covenant under section 30B of the *Soil and Land Conservation Act 1945* setting aside a four hectare area on Lot 24 on Plan 14380, Wannoeroo and a 50 hectare area on Lot 9000 on Deposited Plan 60745,Neerabup, for the protection and management of vegetation in perpetuity.

The Permit Holder is also required to purchase a 492 hectare area in the Shire of Chittering and cede it to the Department of Parks and Wildlife for conservation.

8.5 Hydrology

Surface Water

There is no surface runoff of water due to the porosity and permeability of the limestone and sand, with precipitation draining to the water table.

All water is retained in the pit by the low elevation of the floor and perimeter bunding of the pits.

Groundwater

The hydrogeology was assessed by Talis, 2017, Geotechnical and Hydrogeological Investigation Neerabup Industrial Estate, Neerabup WA prepared for the CoW.

The site is underlain by a sequence of limestone and sand of the Tamala Limestone and sand of the Spearwood Formation.

It is a highly porous sequence with fast vertical movement of water to the ground water table and then slower lateral flow of groundwater to the west. The aquifer is a sand aquifer and unconstrained.

Groundwater was identified as occurring between 45 metres AHD rising to 52 metres AHD in the east. That groundwater flow is the opposite to the flow found by Department of Water Environment Regulation. Talis recorded the groundwater on 26 October 2016 at the end of winter. The only explanation could be localised mounding of the groundwater in the west and the influence of Lake Pinjar originally as close as 700 to the north east.

The area has no surface drainage because of the permeable and porous nature of the sand and limestone. That is recharge is directly to the groundwater.

In any case the depth to groundwater is between 6.77 and 24.7 metres below the proposed base of the excavation and complies with Government policy for a 2 metre separation.

A licensed bore is to be located on site to supply water for dust suppression. If a bore is not available on site, water will be brought to site as required and scheme water used.

Talis 2017, sampled the groundwater and found that the levels of anions and cations to be within normal environmental levels.

Talis also completed analyses of the water quality, which is fresh.

There will be no addition to the salinity of the local water because the raw materials must comply with the classifications for inert materials.

Regional groundwater flow is east to west as shown by DWER Perth Groundwater Atlas. On the other hand, Talis 217 found that the groundwater gradient was from west to east. It is unclear whether this relates to local variations caused by Lake Pinjar.

Dewatering

No dewatering is proposed. All water is retained in the pit and infiltrates into the sand and limestone.

Water Source Protection Areas

This site lies outside the Public Drinking Water Areas to the east associated with the Gnangarra Mound. It however is covered by the Wanneroo Proclaimed Groundwater Area which means that bores are licensed and there can be limitations on water availability.

Water Requirements

Water will only be required for dust suppression, which will be carried out as required during drier weather. A water tanker will be used to water the access road and the pit floor whenever necessary to minimise dust generation from transport and during crushing.

A quarry is expected to require at least 20 000 kL per year depending on whether the water is just required for dust suppression, whether washing of sand is conducted and depending on the length of the access roads that require dust treatment, in addition to the amount of processing on site. That will enable around 8 loads of 10 000 litres of water to be used on around 250 days allowing for weekends, public holidays, and winter times.

Water allocations in the Wanneroo Sub Area are normally fully allocated. If bore water allocation is not available scheme water will be used and combined with misting which will reduce dust but use less water.

Potable water will be brought to the site as required.

Acid Sulfate Risk

Definitive survey procedure is produced in DEC (DWER) 2013, Identification of Acid Sulfate Soils and acidic Landscapes and within document Acid Sulfate Soil Management Advisory Committee NSW, 1998, Acid Sulfate Manual. This information forms the basis for much of the assessment procedures in Australia, including those adopted by the Western Australian Planning Commission and the Department of Environment Regulation.

The main method of assessment is based on geological examination. If at risk conditions are identified, then laboratory testing may be required but must be completed carefully because there is a high risk of false positives with the available testing regimes.

Acid sulfate only becomes a potential risk when several circumstances are present.

Acid Sulfate is a natural phenomenon, that can be exacerbated by disturbance. For it to be present there needs to be;

Rock, soil, or regolith present that is carrying sulfides.

Sulfide carrying materials from below the water table are to be exposed to the atmosphere.

Excavation below the water table is to be carried out exposing the sulfide carrying materials to oxygen in the atmosphere.

Dewatering of the sulfide carrying materials is proposed, exposing them to oxygen.

Exposure of peat or organoferricrete materials, that were permanently under reducing conditions, to the air.

Materials at risk under reducing conditions are normally grey in colour or have been grey with no brown or red brown iron oxides. Where exposed to the atmosphere there is a change to brown iron oxides, with yellow jarosite and other alteration minerals that are distinctive.

The site has been inspected by Lindsay Stephens of Landform Research on several occasions. None of the at-risk parameters occur on site and would not be expected because of the site geology. With an excavated floor elevation well above the water table and alkaline limestone, there is no risk of acid sulfate materials.

This agrees with Talis 2017 and mapping by DWER and DPLH in The Future of East Wanneroo Landuse and Water Management Strategy 2007. The drill logs completed by Talis show no evidence of acid sulfate and none would be expected in the alkaline limestone.

On site the soils are yellow sands that are oxidised and do not carry any risk of acid sulphate potential. Some minor iron induration is encountered in the faces of the pit, generally below the proposed base of the pit.

This concurs with Nattaporn-Prakongkep, R J Gilkes, B Singh and S Wong, 2011, Mineralogy and chemistry of sandy soils in the Perth metropolitan area of the Swan Coastal Plain, Department of Environment and Conservation who concluded that there is no risk of acid sulfate soils in sands unless there is peat or organoferricrete present and excavation proceeds below the water table. In such situations no testing would be required because there is no risk. None of these conditions are encountered.

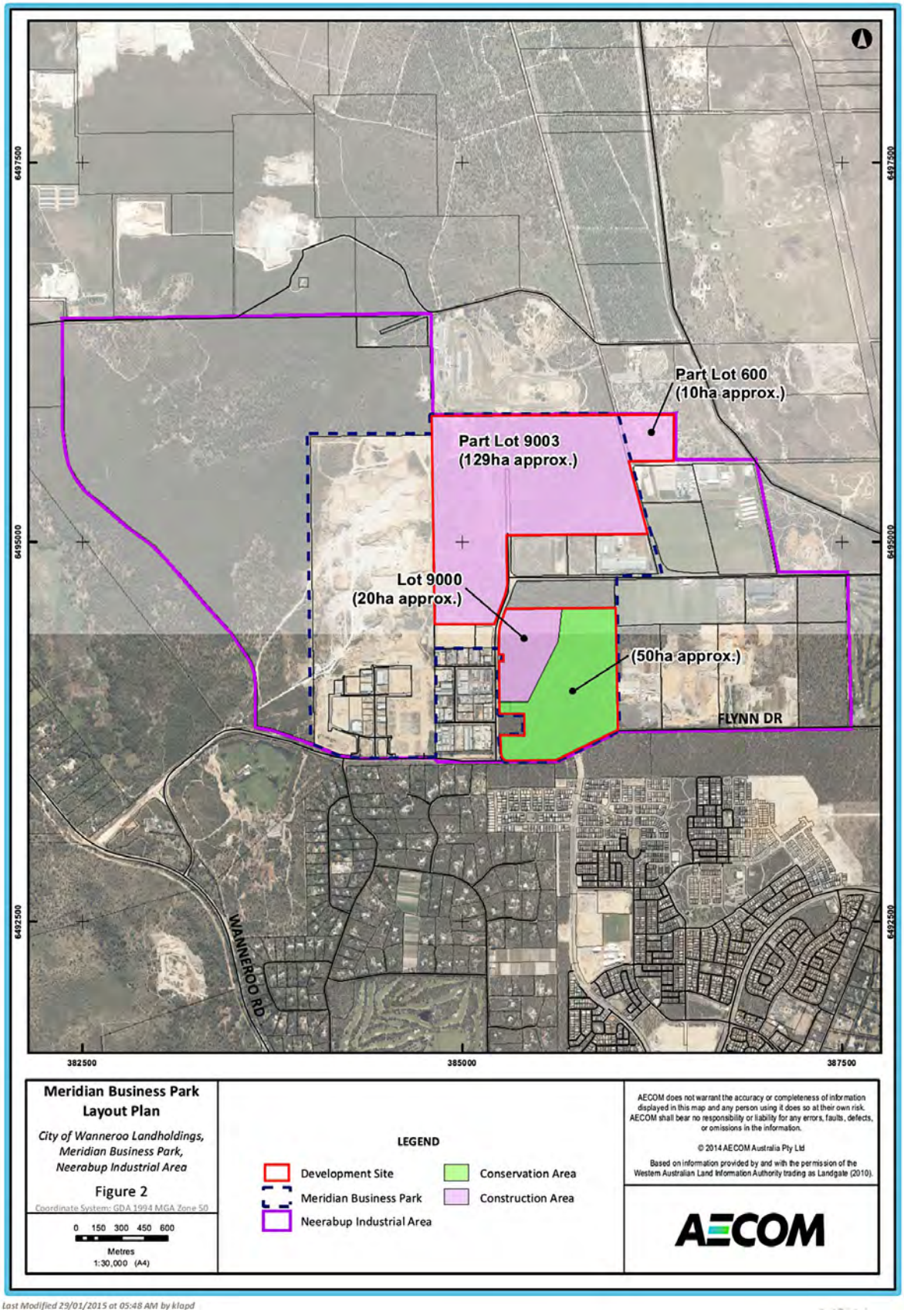


Figure 16: Lot 9003 and Closest Conservation Area – (CAMP Figure 2)

9.0 EXISTING DOCUMENTATION AND APPROVALS

9.1 Approvals

The following Approvals are already in place and are relevant to the extraction of sand and limestone and the preparation of the industrial area surface.

- Contract Agreement between UR Pty Ltd and CoW.
- Clearing Permit CPS 6359/3 valid until 15 August 2045.
- Approval under the EPBC Act 1999, EPBC 2007/3479.
- Approved occupational health and safety management systems under the Mines Safety and Inspection Act 1994, managed by the Department of Mines Industry Regulation and Safety.

Additional Approvals will be required for the following.

- Clearing Permit to cover the northern portion of Mather Drive. (Status – In Application).
- Department of Water Environment Regulation, Works Approval and Licence under Part (V) of the Environmental Protection Act 1986. (Status – Applied for).
- DA under the CoW Town Planning Scheme. (Status – under Application).
- Extractive Industries Licence under the CoW Local Law. (Status – to be issued after the issue of the DA and any required conditions complied with).

9.2 Management Plans

The following ***Management Plans*** are relevant to the extraction of sand and limestone and the preparation of the industrial area surface.

2020 CEMP prepared for the CoW.

This document mainly relates to clearing of the land and site preparation, rather than excavation or final earthworks. Not all aspects of the environmental management for site operations are covered by the CEMP, such as hydrology and water management, noise management, and site closure. Therefore, within this environmental management part of the Project Management Plan additional environmental management is provided under the headings of Project Management Plan management procedures.

All the requirements and actions of the CEMP have been included in the environmental management (Sections 8.0 – 23.0) in the following sections of this document.

2020 CAMP prepared for the CoW.

This document mainly relates to allocation and management of the biological environment of the offset areas.

In order to facilitate the development of Meridian Park, a portion of the land in Neerabup is to be retained and restored to local native vegetation and habitat with a particular emphasis on the provision and restoration of Black Cockatoo habitat.

9.3 Contracts and Commitments

To enable the development of Meridian Park the CoW was required to develop and implement the CAMP and CEMP.

UR has a contract with the CoW to extract sand and limestone from Lot 9003 in compliance with the approved plans and approvals.

Therefore UR is committed to;

- Provide a safe working environment for staff, contractors, the CoW and the local community.
- Provide an environmentally sound operation, in compliance with all relevant legislation and approvals.
- Minimise environmental impacts to vegetation within the constraints of the approved clearing, earthworks, and rehabilitation.
- Minimise onsite and offsite environmental impacts during operations including but not limited to, the management of noise, dust, erosion, topsoil management, weeds, dieback, water quality.

9.4 Roles of the Personnel

The roles of the various personal are allocated within the CEMP.

The same roles are used in this Project Management Plan but are added to as required because there is a requirement for further roles such as the appointment of a Registered Manager as defined under the *Mines Safety and Inspection Act 1994.*

To achieve the above commitments a Project Environmental Management Plan is provided as a standalone document application for development of the quarry.

The responsibilities relate only to the operations of the site.

Table 6: Roles of the Personnel

Position	Abbreviation	Roles and Responsibilities required by the CEMP	Project Management Plan - Additional Comments
Project Manager (CoW)	PM	• Ensure compliance of all parties with this CEMP and EPBC 2007/3479 through contractual arrangements in tender documentation.	• Oversees the lease agreement between the CoW and UR. • Assists where possible in the gaining of approvals for the project. • Provides a supervisory and review role of the project. • Responsible for providing the required CoW staff and expertise to enable the listed roles • UR report to the CoW Superintendent.
Environmental Manager (CoW)	EM	• Ensure that CC understands their obligations and responsibilities under applicable environmental legislation and this CEMP • Obtain all other relevant regulatory permits and approvals required outside this CEMP • Monitor and review site environmental practices and works regularly and ensure that corrective measures are immediately taken if required • Review environmental documentation received from the CC and environmental consultants • Endorse environmental documentation prior to approval • Review and conduct desktop environmental assessments of new risks identified for the project • Review and approve site plans and work method	

		statements prepared by the CC to check that they comply with this CEMP • Conduct site environmental compliance audits to check controls developed in the CEMP • Check and update the mitigation activities for each risk in the database • Ensure that the mitigation activities identified in the database are being performed • Provide updates of the CEMP to the contactors • Ensure relevant regulatory permits & approvals are in place before work commences on the site • Liaise with Commonwealth and State agencies with regard to environmental management of the site • Manage the environmental audit process for the PM • Obtain and collate evidence from the EMR for the compliance report under EPBC 2007/3479 • Submission of annual compliance report to DAWE.	
Construction Contractor (UR)	CC	• Incorporate this CEMP into the contractor environmental management plans, project-specific work procedures and construction activities • Ensure induction / briefings are provided to all personnel and contractors • Work jointly with the EM to deal with any non-conformances • Ensure remediation and preventative actions are undertaken to meet environmentaltargets • Support a performance review of the CEMP • Ensure suppliers and contractors on site comply with this CEMP • Halt construction activities in the event of substandard environmental performance or in the presence of unacceptable environmental risks • Report monthly environmental status of project to PM	Registered Manager • The *Mines Safety and Inspection Act 1994* requires certain personnel to be appointed. • UR, the Principal Employer under the Act will appoint a Registered Manager to the operations. That role is accepted by the Department of Mines Industry Regulation and Safety for this operation to be filled by the Registered Manager for several extractive industries in the northern Perth Metropolitan Area. • The on ground management and supervision will be completed by the Registered Manager and in their absence the Leading Hand on site. • The Registered Manager and the person with delegated authority, will complete the roles of the Construction Manager as outlined in the CEMP. The roles will be; • Compliance with the requirements of the CEMP in association with the Environmental Manager. • Responsible for the Day to Day management of staff, plant, and operations. • Responsible for implementing and supervising the Day to Day Operational, Environmental and Occupational Health and Safety risks and mitigation. • General management of the contract to prepare the Meridian Park. • Responsible for worker, staff and contractor site inductions,

			management, overseeing of site safety. • Provide the PM with monthly reports on environmental compliance verified by the EMR. These reports will summarise the environmental incidents that occurred during the month and provide any other relevant information relating to environmental issues. The monthly reports will include (but are not limited to) the following key items: ➢ Status of relevant KPIs ➢ Incident report numbers ➢ Improvements made to address environmental matters. • Will provide information for the completion of an annual compliance report against the CEMP to the PM at least one month prior to the due date of the report. Assists with; • Incorporate the CEMP into site operations and procedures. • Support a review of the CEMP including a performance review. • Responsible for the extraction of sand and limestone. • Responsible for all Licences, approvals, management programs and compliance with the Lease Agreement with the CoW. • Gaining and or management of the various Approvals such as, but not limited to; • *Part V Licence from DWER under Environmental Protection Act 1986.* • Registration of the operation under *Mines Safety and Inspection Act 1994.* • DA from the WAPC under the Metropolitan Region Scheme. • DA under CoW Town Planning Scheme. • Extractive Industry Licence under CoW Local Law. • Water Licence if an allocation is available from DWER. • On ground compliance with the Lease Agreement between UR and the CoW. • Keeping of relevant and required records associated with the project. • Reporting to all relevant authorities and the CoW. • Royalty payments to the CoW.

Position	Abbreviation	• Roles and Responsibilities required by the CEMP	Project Management Plan - Additional Comments
Environmental Management Representative	EMR	• Be present on site during high risk construction activities, such as clearing of vegetation • Undertake daily and fortnightly site inspections and complete environmental checklists, as required by the CEMP • Ensure construction personnel comply with the CEMP • Instruct construction personnel in the management of environmental impacts related to their work and the environmental work methods identified as standard environmental practice in this CEMP that must be adhered to • Investigate and report on any identified environmental incidents within 24hrs to the EM and implement controls to eliminate or reduce the risk of recurrence • Ensure all construction activity environmental impacts are contained on site, and within areas identified to be impacted • Record environmental risks and incidents into a risk management database • Regularly monitor the construction activities to assess the risk to the environment and implement appropriate actions to control any identified risk • Ensure environmental incidents or dangerous occurrences are promptly reported, investigated and appropriate mitigation strategies are implemented to prevent any further damage or the possibility of a recurrence • Ensure project environmental documentation is held on the project file • Undertake environmental monitoring requirements as required by the CEMP, environmental approvals, licenses and permits. • Ensure that evidence for the PM's compliance report for EPBC 2007/3479 is collected by construction staff and provide to the EM on request.	EMR role will be assigned to the UR Risk and Compliance Manager. • Undertake the CEMP listed activities. • Conduct site environmental compliance audits to check controls developed in the CEMP • Record environmental risks and incidents into a risk management database • Check and update the mitigation activities for each risk in the database • Ensure that the mitigation activities identified in the database are being performed by the EMR • Provide updates of the CEMP to the contactors via the SPT • Report any identified environmental incident within 24 hours to the UR Management and as necessary CoW and other regulatory authority. • Ensure relevant regulatory permits & approvals are in place before work commences on the site • Liaise with Commonwealth and State agencies with regard to environmental management of the site • Manage the environmental audit process for UR and the CoW. Develop the compliance report for EPBC 2007/3479 to the CoW.

Position	Abbreviation	Roles and Responsibilities Required by the CEMP	Project Management Plan - Additional Comments
Construction workers (this includes all personnel, sub-contractors, and visitors to the site)	CW	• Participate in awareness training as directed by CC • Comply with this CEMP • Ensure that work practices cause the least amount of environmental disruption to the site possible • Report any suspected or known environmental hazard or situation requiring attention • Report anyenvironmental incidents • Report plant andequipment defects • Use well maintained equipment, wherever possible • Follow the instructions of CC and EMR	CW Tasks • Applies to all on site staff and contractors. • Undertake the CEMP listed activities under the direction of the Construction Manager or Environmental Manager, under the umbrella of UR site management procedures. To be inducted to site and supervised by UR

10.0 CLEARING

10.1 Background to Clearing

EPBC 2007/3479 approval allows for the clearing of up to 130.7 ha of Carnaby's Black-Cockatoo habitat within the site.

To facilitate the clearing State Clearing Permit CPS 6359/3 is approved covering up to 159 ha total within the site, which includes 130.7 ha of Carnaby's Black-Cockatoo habitat.

A further Clearing Permit will be required to clear and lower the northern portion of Mather Drive.

The clearing will take place in five stages which will be worked progressively but will contain some overlaps to achieve a balance of resources and to enable the industrial land to be sequentially prepared.

The Clearing is to be managed according to the Construction Environment Management Plan (CEMP). All actions and commitments from the CEMP are incorporated into the UR management for clearing.

To avoid over-clearing of vegetation, the boundaries of the site, staging and retained vegetation will be surveyed and clearly marked prior to the commencement of clearing.

Staff will be inducted to ensure all on site personnel will be aware of the environmental values.

During the marking out phase, inspections be undertaken by suitably qualified personal appointed by UR (the Construction Contractors – CC) with advice from the CoW Environmental Manager (EM) prior to the commencement of clearing.

Where suitable for conservation uses, seeds and other materials including; habitat logs, mulched vegetation and topsoil (specifically topsoil that is from vegetation mapped as being in Very Good or better condition and dieback free) will be collected and stored for later use in landscaping and/or rehabilitation of areas external to the site.

Seed collection and storage will be influenced by the staging of limestone and sand extraction, however, is likely to be undertaken in the first seed collection period (generally from September – February) and will be completed by the CoW for use in areas designated for conservation which are described in the CAMP.

The closest conservation area is Lot 9000, 390 metres to the south east of Lot 9003 across Mather Drive and industrial zoned land. As UR is contracted for the construction of Lot 9003 the conservation areas do not adjoin Lot 9003.

When Clearing, all the actions committed to in the Construction Environment Management Plan (CEMP) will be applied and incorporated into UR normal operational activities.

10.2 Summary of Clearing Activities

- Comply with the CEMP
- Demarcate and classify any significant topsoil, weed and dieback management boundaries to enable them to be cleared separately.
- Induct on site staff.
- To enable revegetation at offsite locations, the CoW will be informed of the next stage of clearing to be performed and the timing to allow time for the CoW to collect seeds from areas ahead of clearing if appropriate.
- To maintain vegetation in the best quality ahead of clearing, and to comply with the requirements of the Clearing Permit, ensure no new informal tracks arise and all vehicle and personnel movement is limited to the approved project boundary.
- Prior to clearing the CoW will be informed of any significant habitat materials that the CoW may be able to use in the conservation areas such as logs, including all with hollows, for use as habitat landscaping and revegetation if required for on site for safety or for offsite rehabilitation by the CoW.
- All cleared vegetation and mulch will be stored separately into various health categories in the locations outlined on the staging plans. Mulch will either be used on-site (for stabilisation) or offsite as required through discussions with the CoW.
- The land will be cleared using earthmoving equipment by the mining operator and will largely be cleared using a front end loader and water cart to allay the dust as required.
- The vegetation will be pushed to the edges of the disturbance area or into piles for mulching for brushing or use in rehabilitation. If not required for immediate rehabilitation, the material will be mulched later use.

The CEMP required actions, monitoring and compliance are listed below, together with some additional actions to be implemented by UR which are listed under PMP Actions (Project Management Plan Actions) and in accordance with UR EWP001 Vegetation Clearing.

VEGETATION CLEARING MANAGEMENT

PRINCIPLES AND STANDARDS

- *Biodiversity Conservation Act 2016*
- *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*
- *Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth).*
- *Clearing Permit CPS 6359/3, issued15 August 2015 and extending until 15 August 2045*
- *Clearing Approval EPBC 2007/3479, issued 2 June 2014.*
- *Clearing Permit for the northern portion of Mather Drive (when issued)*

BASELINE DATA

- Eco Logical Australia (ELA) 2012. *Ground truthing of environmental values for Lot 4 Flynn Drive Neerabup Prepared for CoW .*
- Eco Logical Australia (ELA) 2013. *Targeted Flora and Fauna Assessment Lot 4 Flynn Drive Neerabup Prepared for CoW. April 2013.*
- Ecoscape, 2018, *Final Flora Survey Mary Street and Mather Reserve*
- Ecoscape, 2019, *Final Flora Survey Mary Street and Mather Reserve*
- Natural Area Consulting Management Services, 2020, *Neerabup Weed Mapping – Lot 9003 and Lot 600*
- Terratree, 2017, *Comprehensive Phytophthora Dieback Assessment of Conservation and Development Areas-Neerabup Project*

CEMP	CEMP - OBJECTIVES AND TARGETS

- Clearing of native vegetation for resource extraction and industrial development will be staged and will not exceed 130.7 ha of Carnaby's Black-Cockatoo foraging habitat.

CEMP	KPI's
8.1.1	No damage to native vegetation outside approved disturbance boundary.
8.1.2	No unauthorised clearing of native vegetation within the approved disturbance boundary.

PMP	KPI's
C1.1	Compliance with the CEMP - Clearing
C1.2	No clearing of Mather Drive Road reserve prior to obtaining all necessary Clearing approvals.

	MANAGEMENT	Responsibility	Timing	PMP ACTION AND INTERACTION
CEMP	**CEMP REQUIREMENTS**			
8.2.1	Demarcate the approved clearing area using GPS coordinates and flagged star pickets.	CC	Prior to clearing	*Incorporated into the on ground operational plans.*
8.2.2	Demarcate Mather Reserve prior to any clearing on sit, regardless of whether the clearing stage abuts the Mather reserve.	EM	Prior to clearing	*The closest conservation area is to a portion of Lot 9000, 390 metres to the south east. CoW will provide that demarcation.*
8.2.3	Demarcate topsoil, weed and dieback management boundaries.	CC	Prior to clearing	*The various qualities of vegetation will be identified in conjunction with the CoW and marked and pegged accordingly*
8.2.4	Restrict access by personnel, vehicles, and plant from entering vegetated areas adjacent to project boundary.	EMR CC	At all times	*All future stages will be off limits for personnel and equipment apart from safety, emergency, environmental or other necessary activities.*
8.2.5	Ensure trees are felled into the construction zone, not into undisturbed vegetation.	EMR CC	Prior to clearing	*UR will direct contractors on tree felling requirements and monitor their activities.*
8.2.6	Retain logs, including all with hollows, for use as habitat landscaping for offsite rehabilitation by CoW.	CC EM EMR	Prior to clearing	*UR will divide the various materials into piles of similar quality and manage those materials based on discussions to be held with the CoW.*

8.2.7	Stockpile all cleared vegetation separately and mulch for use either on-site (for stabilisation), as part of the CAMP or for other rehabilitation projects.	CC	Prior to clearing	*All future stages will be off limits for personnel and equipment apart from safety, emergency, environmental or other necessary activities. CoW representative will provide input.*
8.2.8	Ensure no new informal tracks arise and all vehicle and personnel movement are limited to the approved project boundary.	EMR CC	Prior to clearing	*All future stages will be off limits for personnel and equipment apart from safety, emergency, environmental or other necessary activities.*
8.2.9	Conduct seed collection of uncleared areas of the site (except the Conservation Area) for use in rehabilitation on site and off site. Where the vegetation condition is unfavourable or the species of seed is too difficult to collect from the development site, local provenance seed will be collected, or an alternative source of the vegetation will be sourced.	EM	Prior to clearing	*UR will inform the CoW of all future timings and provide opportunity for seed collection from the next stage prior to clearing of the next stage. CoW will organise collection.*
8.2.10	Report all incidents relating to the Vegetation Clearing Management Sub-plan to the CM and SPT within 24 hours of incident.	EMR	within 24 hours of incident	*Incorporated into reporting.*
	MONITORING	**Responsibility**	**Timing**	**PMP ACTION AND INTERACTION**
CEMP	**CEMP**			
8.3.1	Inspect clearing to ensure that only trees flagged are felled or damaged.	EMR	Prior to clearing	*Habitat trees* *UR will direct contractors on tree felling requirements and monitor their activities.*
8.3.2	Inspect project boundary to ensure flagging and temporary fencing is intact and no boundary breach has occurred.	EMR	Prior to Clearing	*Clearing boundary* *All boundaries will be marked and flagged as required and will be inspected and maintained during potential clearing or other impacts.*
8.3.3	Inspect felled timber and identify as suitable for use in rehabilitation and revegetation works.	EMR	Prior to mulching or movement	*Rehabilitation timber.* *UR will divide the various materials into piles of similar quality and manage those materials based on discussions will be held with the CoW.*

CPS	**CLEARING PERMIT – 6539/3**			
CPS 3	Not more than 156.156 hectares is to be cleared. Provide proof that the cleared area in hectares is less than or consistent with the permissible amount. Provide shape files, GPS using GDA94 and GDA2020,	EMR CoW	Immediately after clearing	*UR will keep accurate records by GPS and present as co-ordinates or shape files to the CoW. CoW representative will supervise and co-ordinate data.* *The northern end of Mather Drive will not be cleared until a Clearing Permit is in place for that location.*
CPS 5	Avoid and minimise clearing. Provide proof that there have been actions to avoid, minimise and reduce the impacts of clearing and the extent of clearing. Could be areas cleared, fauna recovery and relocation, timing of clearing etc.	EMR CoW	Prior to clearing each stage	*Only areas required for the immediate Stage will be marked out and cleared in consultation with the CoW.*
CPS 9	Dieback and Weed Control	CC		*Incorporated into the operational procedures.*
CPS 11	Records are to be kept providing proof that the clearing activities are completed within the permissible area. Use GDA 94 or GDA2020	EMR	At all times	*UR will keep accurate records by GPS and present as co-ordinates or shape files to the CoW.*
CPS 12	Reporting is to include proof that the Clearing is conducted in the allocated time and duration, including date stamped photographs, before and after.	EMR	Immediately after clearing	*UR will keep accurate records by GPS and present as co-ordinates or shape files and photographs to the CoW as required. CoW representative will supervise and co-ordinate data.*
EPBC	**EPBC APPROVAL 2007/3479**			
EPBC 1	No more than 130.7 of Cockatoo foraging habitat is to be cleared.	CC and EMR	At all times	*UR will keep accurate records by GPS and present as co-ordinates or shape files to the CoW. CoW representative will supervise and co-ordinate data.*
EPBC 2	Provide a Construction Environment Management Plan and Implement the plan that is to include management of *Phytophthora* dieback, weeds, access, erosion and dust, monitoring, performance indicators, timeframes, and descriptions of roles and implementation.	CoW	Completed but subject to review	Completed by the CoW. The CEMP is incorporated into the operational procedures.
EPBC 5	Within 30 days of commencement the person taking the action must inform the Department (Commonwealth) in writing of the actual date of	CoW EMR	Within 30 days of commence	UR will make the data available to the CoW who will report. EMR to report to the CoW.

	commencement.		ment	
EPBC 6	The person taking the action must maintain accurate records substantiating all activities associated with the conditions of approval and make them available on request by the Department or an independent auditor.	CoW EMR	At all times	UR will make the data available to the CoW who will report and maintain records. EMR to provide data to the CoW.
EPBC 7	Within 3 months of every 12 months anniversary the person taking the action is to publish on their website documentary evidence of compliance. Non-compliance must be reported within 2 business days of becoming aware of the non-compliance	CoW	Annually	UR will make the data available to the CoW who will report and maintain records. EMR will provide data to the CoW.
EPBC 8	Approval must be obtained if any action other than the approved actions and activity is considered.	CoW	As Required	CoW.
	PROJECT MANAGEMENT			
PMP C3.1	Site Induction and introduction	EMR	Daily as required and at inductions	UR will include the environmental significance, and clearing management within site inductions, toolbox meetings and daily pre-start meetings.
	CONTINGENCY AND CORRECTIVE ACTIONS	**Responsibility**	**Timing**	**PMP ACTION AND INTERACTION**
INCIDENT	CORRECTIVE ACTION			
Approved boundary is breached.	Report and investigate as an Incident.	EMR	ASAP	Comply with UR procedures for Incident Reporting.
	Report immediately to the SPT and ES.	EMR	ASAP	
	Halt activities on site until impacted area is reviewed by EM.	CC	Immediate	

	Re-establish the approved boundary with temporary fencing	EMR	Prior to re-commence ment	UR in conjunction with the CoW will maintain the fencing and marking.
	Rehabilitate impacted area.	CC	Earthworks within 2 weeks, replanting at next suitable season	Rehabilitation will be completed by UR using normal land restoration techniques of direct transfer of topsoil, seeding and tube planting at an appropriate time, to the specification in the CAMP.
	Hold additional toolbox meetings to address significance of habitat trees.	EMR	Daily as required.	These meetings are routinely programmed to occur at all UR sites and will be used at this operation,

11.0 TOPSOIL MANAGEMENT

The topsoil will be removed using a loader or scraper with appropriate dust management controls in place and in compliance with the dust management procedures as outlined in the CEMP.

The top 150mm of the surface soil will be pushed into stockpiles no more than 2.0 metres high. This may be mulched as a means of storage, depending on the end uses and through discussions with the City.

The quality of the topsoil is to be mapped and demarcated as per a Topsoil Management Plan, this plan will be developed and implemented for each stage, be approved by the CoW, and communicated to personnel.

The procedures of the CEMP will be committed to.

TOPSOIL MANAGEMENT

PRINCIPLES AND STANDARDS

- Biodiversity Conservation Act 2016
- Environmental Protection (Clearing of Native Vegetation) Regulations 2004
- Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth).

BASELINE DATA

- Eco Logical Australia (ELA) 2012. *Ground truthing of environmental values for Lot 4 Flynn Drive Neerabup Prepared for CoW.*
- Eco Logical Australia (ELA) 2013. *Targeted Flora and Fauna Assessment Lot 4 Flynn Drive Neerabup Prepared for CoW. April 2013.*
- Terratree, 2017, *Comprehensive Phytophthora Dieback Assessment of Conservation and Development Areas-Neerabup Project*

CEMP - OBJECTIVES AND TARGETS

- Retain and reuse site won topsoil for rehabilitation on-site or at another rehabilitation site

- Separate weedy topsoil from good quality (i.e. weed free) topsoil

- Compliance with the CEMP – Topsoil Management

CEMP	KPI's
9.1.1	Topsoil is mapped prior to clearing according to vegetation quality.
7.1.2	Good quality topsoil is retained for use in revegetation off-site.
7.1.3	Unsuitable topsoil (weed / dieback infested) is to be disposed of offsite to a licenced facility.

	MANAGEMENT	Responsibility	Timing	PMP ACTION AND INTERACTION
CEMP	**CEMP REQUIREMENTS**			
9.2.1	Conduct topsoil mapping to identify weedy and dieback infested topsoil.	EM	Prior to clearing	*Arranged by the CoW*
9.2.2	Demarcate topsoil boundaries with flagging.	CC	Prior to clearing	*Arranged by the UR in association with the CoW.*
9.2.3	Strip top 150 mm of soil and stockpile. Good, weedy and dieback infested topsoil is to be stockpiled separately.	CC	After clearing	*The plant operator will be instructed on the manner and location of the stripping and the treatment of the stripped topsoil*
9.2.4	Stabilise topsoil stockpiles in accordance with the Erosion and Dust sub-plan if topsoil is to be stockpiled for more than 7 days.	EMR	At all times	*Topsoil will be stored in perimeter bunds for use in site rehabilitation.*

9.2.5	Where possible, directly transport topsoil to proposed rehabilitation site immediately following extraction.	CC	After clearing	*The plant operator will be instructed on the manner and location of the stripping and the treatment of the stripped topsoil, which has been determined by the CoW*
9.2.6	Reuse topsoil within 12 months of extraction where possible.	EMR	During clearing	*Topsoil will be stored in perimeter bunds from where it can be reused as required. Good quality topsoil will be marked and can be drawn in preference to poor quality material.*
9.2.7	Dispose of weedy or dieback infested topsoil appropriately	EMR	After clearing	*Weedy soil will be stored in the perimeter bunds and retained for as long as possible to reduce the weed load.* *If dieback is introduced any affected soil will be similarly treated.*
	MONITORING	**Responsibility**	**Timing**	**PMP ACTION AND INTERACTION**
CEMP	**CEMP**			
9.3.1	Monitor clearing to ensure that weed and dieback hygiene is maintained.	EMR	Daily during clearing	*Weed and dieback hygiene programs will be maintained.* *Dieback will be assessed by independent consultant every 5 years in stages ahead of clearing.* *Weed mapping will be conducted at least annually either in or at both spring and autumn when growth and treatment is more effective.*
9.3.2	Inspect topsoil stockpiles for weed germination and record observations	EMR	Every two weeks but generally applicable in autumn and spring.	*Topsoil stockpiles will be reviewed at twice annually either in or at both spring and autumn when growth and treatment is more effective by the CM in conjunction with the EMR and ES if required, who will determine whether treatment is required*
	CONTINGENCY AND CORRECTIVE ACTIONS			
INCIDENT	CORRECTIVE ACTION			
Topsoil boundary is breached	Report and investigate as an Incident.	EMR	As soon as	*Refers to a breach of plant pathogen hygiene or mixing of low*

	Report immediately to the SPT and ES.	EMR	possible	*grade topsoil with higher grade material during land clearing and topsoil management* *UR will undertake the necessary actions to delineate, identify and provide the boundary in a new location and inform the respective plant operators of the changes to the topsoil classifications.*
Weed germination occurs within topsoil stockpiles	Report and investigate as an Incident.	EMR	Prior to seeding and spread of weeds	*This forms part of the normal weed management procedures of UR. As much of the land already has a weed load that is often not visible until disturbed, it is anticipated that several topsoil stockpile bunds will be affected.* *Affected materials will be reclassified accordingly and treated under normal weed management procedures or if dieback occurs under the plant pathogen management.* *Treatment is to occur prior to self-seeding.*
	Designate affected topsoil stockpile as the lowest class of topsoil (i.e. weedy or dieback infested).	EMR		
	Conduct weed control measures over affected area and surrounds.	EMR		
Failure in weed and dieback hygiene measures	Report and investigate as an Incident.	EMR	As soon as possible	*Refers to a breach of plant pathogen hygiene or mixing of low-grade topsoil with higher grade material during land clearing and topsoil management* *UR will undertake the necessary actions to delineate, identify and provide the boundary in a new location and inform the respective plant operators of the changes to the topsoil classifications.*
	Designate affected topsoil stockpile as the lowest class of topsoil (i.e. weedy or dieback infested).	EMR		
	REPORTING			
PMP	**PROJECT MANAGEMENT**			
PMP T4.1	Breaches of clearing regimes, Record of Weed or Dieback incidence.	EMR	As soon as possible	Breaches of clearing regimes will be reported to the CoW as soon as they are recorded. (see above) For weed growth this could be every two weeks.

12.0 WEEDS AND DIEBACK

Terratree (2016) Dieback report & (2017) Addendum concluded that part of Lot 9003 was uninfested and part was excluded from assessment due to the vegetation condition being degraded. Dieback will be managed in line with the Construction Environmental Management Plan. The site being located on the edge of the Spearwood Land system, that condition may be retained. The CEMP proposes that the CoW provide further assessments of *Phytophthora* during the life of the project, hence there is a contingency to provide *Phytophthora* management as required in this management plan.

There are a significant number of exotic species occurring in parts of Lot 9003, particularly the western portion.

Weeds recorded with a High environmental impact species in the Development Area (Natural Area Consulting Management Services, 2020) include the following species.

- *Acacia dealbata*
- *Acacia iteaphylla*
- *Carpobrotus edulis*
- *Cenchrus clandestinus*
- *Cenchrus setaceus*
- *Cynodon dactylon*
- *Ehrharta calycina*
- *Eragrostis curvula*
- *Euphorbia terracina*
- *Gazania linearis*
- *Gladiolus caryophyllaceus*
- *Leptospermum laevigatum*
- *Lupinus cosentinii*
- *Oxalis pes-caprae*
- *Stenotaphrum secundatum*

The main species that will require management are the vegetation species which were introduced to establish parkland vegetation when the land was used for rural purposes in the past. These can be very hard to control without grass specific herbicides.

It is common for grass weed load to be present in soil but suppressed by native vegetation until the soil is cleared and respread when it germinates and causes a significant issue. Mapping of the soil quality is an essential part of the classification of the soils and is incorporated into UR Project Management for the site.

The weed management procedures which are to be used are summarised below and should be read in conjunction with the weed and dieback management of the extraction and earthworks.

12.1 Summary of Weed Management

Soil Quality Classification

- Develop a Weed and Dieback Management plan for each stage of the operations, with approval by the City prior to the commencement of each stage.
- The Weed and Dieback Management Plan will include processes to implement best management practices and targeted weed control, as identified in recent and completed surveys.

Treatment of Recovered Soil

- Manage potentially weed and/or dieback affected soils onsite with spray or other recommended best practice methods, as recommended by the City.
- Do not blend affected soils with good quality soils or take offsite for use in rehabilitation.
- Stockpile good quality topsoil for rehabilitation on-site or off-site.

Ongoing Weed Management

- Inspections are to be conducted to monitor the presence and introduction of Environmental and Declared Weeds on a bi-annual or more frequent basis, or as recommended in the approved WDMP or other approved best practice. On identification, Declared and significant environmental weeds will be managed in accordance with the approved WDMP or other approved best practice.
- All vehicles and equipment to be used during land clearing or land reinstatement, are to be clean and free from soil or plant material when arriving and leaving site.
- Implement vehicle and mobile plant weed hygiene form to record vehicle and machinery movement on and off site operations where there is a risk of contamination and in accordance with the CPS requirements.
- No soil and vegetation will be brought to the site or taken off the site apart from that to be used in rehabilitation and that which is dieback and weed free.
- Illegally dumped rubbish is the major source of weeds and will be removed promptly.
- No weed contaminated or suspect soil or plant material is to be brought onto the site.

Weed Treatment

- Emerging and newly identified weeds will be managed according to best practice.

12.2 Summary of Dieback Management if it is Introduced to the site by mining

Jarrah Dieback (*Phytophthora cinnamomi*) is scattered across this part of the State, but in many cases such as this site the vegetation is not interpretable because of the levels of disturbance. Further, the site is disturbed in the west and partially disturbed in the east with native vegetation restricted to the low ridges with limestone shrubland. As the site is limestone the risk of dieback is lower. Even so the management actions for plant hygiene will still be taken.

Dieback mapping conducted by the CoW did not identify any presence of dieback on site. refer to Dieback report – Terratree (2016) and Addendum (2017) *Comprehensive Phytophthora Dieback Assessment of Conservation and Development Areas - Neerabup Project.* However, considering the life of the project it is possible that dieback could be introduced and it is proposed to minimise any activity in native vegetation ahead of mining and provide a review assessment of dieback every five (5) years.

The aim of dieback management during excavation is to minimise the risk of entry of any additional plant pathogens to the site.

Generally, the same hygiene procedures proposed for weed management will also control dieback management.

Dieback Classification

- Provide dieback mapping of the vegetation in each stage, ahead of clearing, to delineate which soils to use for dieback management offsite.
- Communicate known weed and dieback infested areas with personnel to ensure that they understand the relevant management practices and identify which soils can be used for dieback management offsite.
- Classify the soils according to dieback risk and segregate the risk soils from low risk soils in separate dumps.
- Provide a plan of dieback risk for each stage.
- As a minimum dieback assessment should be conducted every five years.
- When clearing land or firebreaks vehicles will work in conjunction with dieback principles and push from areas of better vegetation towards areas of lower quality vegetation.

Treatment of Soils

- Demarcate the dieback risk of each soil dump or bund as required, by plan or signage.
- Maintain low dieback risk soils for use offsite in conservation areas or on site in areas of rehabilitation.
- Communicate and liaise with the CoW with respect to the soil quality that the CoW will use.
- All vehicles and equipment used during land clearing or land reinstatement, will be clean and free from soil or plant material when arriving at site.
- No soil and vegetation will be brought to the site apart from that to be used in rehabilitation and that which is dieback free.
- Excavation vehicles will be restricted to the excavation and clearing areas.
- Illegally dumped rubbish is to be removed promptly.

- When clearing land or firebreaks vehicles are to work from disturbed areas towards the pit; or, in situations where dieback interpretation is not possible, from areas of higher quality vegetation to areas of lower quality vegetation.

WEEDS and DIEBACK MANAGEMENT

PRINCIPLES AND STANDARDS

- *Biodiversity Conservation Act 2016.*
- *Biosecurity and Agriculture Management Act 2007 (BAM Act)*
- *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*
- *Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth).*
- *DBCA, 2017, Dieback Interpretation Manual.*
- *Dieback Working Group 2015, Managing Phytophthora Dieback Bushland.*
- *Dieback Working Group, 2000, Managing Phytophthora Dieback, Guidelines for Local Government.*

BASELINE DATA

- Natural Area Consulting Management Services, 2020, *Neerabup Weed Mapping - Lot 9003 and Lot 600.*
- Terratree, 2016, *Comprehensive Phytophthora Dieback Assessment of Conservation and Development Areas-Neerabup Project*

CEMP **OBJECTIVES AND TARGETS**

- As a high level management target, the construction within the Development Area will aim:

  - To prevent the spread of weeds from the Offset Sites to new locations.
  - To prevent the introduction of new weeds into the Offset Sites.
  - To control, with the aim to eradicate, any Declared Pests and High to Very High priority weeds within the Offsets Sites.
  - To prevent the introduction of *Phytophthora* dieback to the sites or surrounds.
  - Control any *Phytophthora* dieback infestation within the sites.

CEMP **KPI's**

12.1.1 No introduction of new weed species into Mather Reserve.

12.1.2 Eradicate any Declared Pests and High to Very High priority weeds found within the site.

12.1.3 No evidence of *Phytophthora* dieback being introduced to Mather Reserve within 5 years of construction.

	MANAGEMENT	Responsibility	Timing	Standard
CEMP	**CEMP REQUIREMENTS**			
12.2.1	Conduct baseline surveys of the site to determine the current level of weed and *Phytophthora* dieback infestation.	EM	Prior to clearing	*CoW to provide specialists to assess the parameters.* *UR to assist as required.* *Any dieback spread management committed to by UR will relate to impacts caused by the activities of UR.* *The land is disturbed, and some areas will most likely be listed as uninterpretable or excluded from assessment. Such soil and vegetation materials will be suitable for use as a final land surface as they are being retained on site and respreads. The topsoil is required on site for land closure so uninterpretable material is required to be retained.* *In a similar manner, even if dieback is introduced the critical aspect is to prevent affected materials from contacting Conservation Areas or being take to Conservation Areas and it may be preferable to classify the soils as is required and discuss with the CoW the retention of all soil on site for stabilisation of the final land surface which will be used for industry.*
12.2.2	Conduct weed control for target species on a seasonal basis as per optimal control for each target species.	EM	NA	*CoW will provide weed control.* *UR is to provide weed control assistance as required.*
12.2.3	Conduct follow up weed and *Phytophthora* dieback infestation surveys of Mather Reserve following the completion of all clearing activities. These surveys will be compared with the original survey.	EM	NA	*This relates to the conservation area to the south east of the construction area. UR is not contracted to undertake clearing in the Conservation Area.* *Not located on Lot 9003 contract area and does not apply to this*

				site.
12.2.4	Ensure all vehicles, equipment and plant undergo a complete quarantine inspection prior to access to site and are free of plant material and soil.	EMR	At all times	*All vehicles and equipment to be used during land clearing or land reinstatement, operations* ***where there's a risk of weed spread or contamination****, are to be clean and free from soil or plant material when arriving and leaving at site and records are to be kept. UR-F-025 Vehicle Mobile Plant Weed Hygiene Form completed and retained as record of compliance.*
12.2.5	Ensure fill, soil and mulch used on site and in landscaping is uncontaminated, and free from rubble, weeds and disease as specified in the Landfill Waste Classification and Waste Definitions (DOE 1996).	CC	At all times	*Forms part of the landform reconstruction and completion criteria.*
12.2.6	Conduct herbicide spraying of weeds along the clearing line and the boundary of the Conservation Area at least annually, prior to weeds setting seed.	PM	NA	As the Lot 9003 does not interact with the Conservation area on Lot 9000 this is a CoW Management procedure.
12.2.7	Control, with the aim to eradicate, any infestation of Declared Pests or High to Very High priority weeds.	EMR		As the Lot 9003 does not interact with the Conservation area on Lot 9000 this is a CoW Management procedure. *UR is to provide weed control assistance as required.*
12.8	Transfer salvaged topsoil, from good or better-quality vegetation to be cleared, to degraded areas following the control of weed species present. Ensure that topsoil is taken from dieback free areas.	CC EMR	Transfer soil during early rains – May - June	*See Topsoil Management above and dust management.* *Movement should not conflict with any Dieback infestations at 12.11.*
12.9	Locate topsoil and cleared vegetation stockpiles away from areas where runoff from rainfall may occur.	CC	During clearing	*Topsoil and vegetation will be stored around the perimeter of the excavation area in preparation for use in rehabilitation.*
12.10	Ensure any hydro-mulching used for dust suppression or stabilisation is certified weed free.	EMR	At all times	*Only certified weed or dieback free hydro mulching will be used if required.*

12.11	No movement of soil, equipment, or personnel during wet conditions in areas suspected of dieback infestation	CC	At all times	*Currently there is no known dieback on site. Traffic ahead of clearing will be restricted to essential requirements.* *The soils are very porous and do not become wet and saturated.*
12.12	No movement of soil, equipment, or personnel between dieback free and dieback infested areas without implementing proper hygiene standards.	CC	At all times	*This relates to land clearing and not normal excavation.* *Currently there is no known dieback on site. Traffic ahead of clearing will be restricted to essential requirements. See Clearing above.*
	MONITORING	**Responsibility**	**Timing**	**Standard**
CEMP	**CEMP**			
12.3.1	Visual inspection of stockpiles, landscaping and weed spraying.	EMR	Every 3 months. The best times are spring and autumn prior to seeding.	Weed infestations - No Declared Pests - No High to Very High priority weeds. Overall weed cover estimate of <5% (1 or less on the Braun-Blanquet Scale). Visual inspections for weeds and dieback should occur 3 monthly and be recorded for active, cleared areas and stockpiles as part of a monthly inspection process against the compliance of the CPS and CEMP. Records shall be provided to the City and/or included as part of the Monthly report. These inspections shall include photographic evidence and a standard template.
12.3.2	Visual inspection with photographic records of vegetation within the Mather Reserve adjacent to the site boundary.	PM	NA	As the Lot 9003 does not interact with the Conservation area on Lot 9000 this is a CoW Management procedure. Evidence of dieback infection: - Localised plant deaths within a distinct area. - Edge effects with a clear distinction between healthy and diseased vegetation. - Evidence of a dieback front with old deaths next to recently killed plants.

CONTINGENCY AND CORRECTIVE ACTIONS				
INCIDENT	**CORRECTIVE ACTION**	EMR	As soon as possible	*Refers to a breach of plant pathogen hygiene or mixing of low grade topsoil with higher grade material during land clearing and topsoil management* *UR will undertake the necessary actions to delineate, identify and provide the boundary in a new location and inform the respective plant operators of the changes to the topsoil classifications.* *If earthmoving vehicles arrive in a substandard condition, refuse entry until vehicle has been cleaned in a hardstand designated area and treat accordingly such as disposal of the soil or provide dieback sterilisation.*
Vehicle or equipment does not meet quarantine inspection requirement (i.e. not free of plant material or soil).	Report and investigate as an Incident.	EMR		
	Arrange for vehicle / equipment to be cleaned or washed down at an external facility.	EMR		
	Re-inspect vehicle / equipment as per Action 12.2.4	EMR EMR		
New weed or Declared Pest or High to Very High priority infestation occurring onsite, on stockpiles or within landscaping areas.	Report and investigate as an Incident.	EMR	Prior to seeding and spread of weeds	*This forms part of the normal weed management procedures of UR. As much of the land already has a weed load that is often not visible until disturbed, it is anticipated that several topsoil stockpile bunds will be affected.* *Affected materials will be reclassified accordingly and treated under normal weed management procedures or if dieback occurs, under the plant pathogen management.* *Treatment is to occur prior to self-seeding.* *Treat weeds that have the potential to impact external areas or offsite, or a significant ability to spread on site, using an approved contractor or trained staff.*
	Arrange for weed control by a suitably trained contractor.			
	Increase monitoring frequency to weekly until no weed occurrence for 1 month.	EMR		
	Review hygiene measures and conduct additional toolbox meetings as required.	EMR		
Evidence of potential dieback infection. hygiene measures	Report and investigate as an Incident.	EMR	As soon as possible	*Refers to a breach of plant pathogen hygiene or mixing of low grade topsoil with higher grade material during land clearing and topsoil management.* *UR will undertake the necessary actions to delineate, identify and provide the boundary in a new location and inform the respective*
	Report immediately to SPT and ES.	EMR		
	Inspect and recommend corrective action to	EMR		

	PM/CC.			*plant operators of the changes to the topsoil classifications.* *Dieback control will be used such as Phosphite spray using a licensed contractor.*
	Implement corrective actions (i.e. phosphite application) on advice from EM.	EMR		
	Review hygiene measures and conduct additional toolbox meetings as required.	EMR		
	REPORTING			
PMP	**PROJECT MANAGEMENT**			
PMP W4.1	Breaches of clearing regimes, Record of Weed or Dieback incidence.	EMR	As soon as possible	Breaches of clearing regimes will be reported to the CoW as soon as they are recorded. (see above) For weed growth this could be every two weeks.

13.0 BLACK COCKATOO – FAUNA MANAGEMENT

The site was found by Ecoscape, (2020) to contain 0 ha of high value foraging habitat, 86.7 ha of moderate foraging habitat and 70.77 ha of low value foraging habitat for Carnaby's Black Cockatoo as well as over 600 trees that have been identified across the site as habitat trees, on the basis of a DBH greater than 500 mm, rather than recorded nesting hollows or nesting. Approval has also been gained through Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) (EPBC 2007/3479).

The clearing of the biodiversity and fauna management are addressed in the CEMP prepared for the CoW, which is referenced and incorporated into this document and is attached.

The CEMP identified several potential impacts on Carnaby's Black-Cockatoo and other fauna including:

- loss of up to 130.7 ha of Carnaby's Black-Cockatoo foraging habitat
- mortality of adult and young birds during construction and clearing activities

The mitigation measures developed in the Construction Environment Management Plan (CEMP) and committed to by the CoW are incorporated into the site management to be undertaken by UR which are summarised below.

BLACK COCKATOO AND FAUNA MANAGEMENT

PRINCIPLES AND STANDARDS

- Biodiversity Conservation Act 2016
- Environmental Protection (Clearing of Native Vegetation) Regulations 2004
- Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth).
- CEMP *prepared for the CoW. This document mainly relates to clearing of the land and site preparation, rather than excavation.*

BASELINE DATA

- Eco Logical Australia (ELA) 2012. *Ground truthing of environmental values for Lot 4 Flynn Drive Neerabup Prepared for CoW.*
- Eco Logical Australia (ELA) 2013. *Targeted Flora and Fauna Assessment Lot 4 Flynn Drive Neerabup Prepared for CoW. April 2013.*
- Ecoscape, 2018, *Final Kangaroo Survey Neerabup*
- Ecoscape, 2020, *Black Cockatoo Habitat Survey Report – Neerabup Industrial Area and Offset Sites*
- Johnstone, R. E., Johnstone, C., & Kirkby, T. (2011) *Black Cockatoos on the Swan Coastal Plain*, Department of Planning, Western Australia.
- Kabat, T. J., Barrett, G., & Kabat, A. P. (2012) *Great Cocky Count: Identification of roost sites for Carnaby's Black-Cockatoo (Calyptorhynchus latirostris) and population count for the DEC Swan Region, BirdLife Australia.*
- Terrestrial Ecosystems (2018) *Black Cockatoo Habitat Survey Report - Neerabup Industrial Area and Offset Sites, prepared for the City of Wanneroo, Perth.*

CEMP - OBJECTIVES

- To prevent injury or disturbance of Carnaby's Black-Cockatoo during construction activities
- To minimise the reduction of Carnaby's Black-Cockatoo habitat wherever possible.

CEMP	KPI's
11.1.1	No disturbance of breeding Carnaby's Black-Cockatoo.
11.1.2	No harm or injury to Carnaby's Black-Cockatoo.

	MANAGEMENT	Responsibility	Timing	PMP ACTION AND INTERACTION
CEMP	• **CEMP REQUIREMENTS**			
11.2.1	Ensure Mather Reserve is established prior to the commencement of on-site activities.	PM	NA	*The Conservation Areas have been allocated by the CoW*
11.2.2	Display contact information for Wildcare Hotline and fauna handler on the Health, Safety and Environment noticeboard.	EMR	Prior to clearing	*Part of normal UR operational procedures.*
11.2.3	Inspect site for presence of foraging Carnaby's Black-Cockatoo.	EMR	Daily during construction	*Part of normal UR operational procedures.*
11.2.4	A qualified fauna handler is to be on-call during all site activities.	EMR EM	Prior to clearing	*A Licensed fauna handler and relocator will be located on site during clearing.* *Relocation will be as determined by the handler in consultation with the CoW and DBCA.*
11.2.5	Prohibit pets or domesticated animals onsite.	EMR	After clearing	*Part of normal UR operational procedures.*
11.2.6	Prohibit personnel feeding or interacting with fauna (native or feral).	CC	During clearing	*Part of normal UR operational procedures.*
11.2.7	No firearms are permitted on site.	CC	At all times	*Part of normal UR operational procedures.*

	MONITORING			
CEMP	**CEMP**			
11.3.1	Visual inspection of site and boundaries	EMR	Prior to clearing	*Presence of foraging Carnaby's Black-Cockatoo*
11.3.2	Inspection of site and boundaries.	EMR	Every two weeks. At all times.	*Presence of injured or dead fauna.* *Staff will always be inducted and educated to look for fauna needing assistance during all parts of the operations.*
	CONTINGENCY AND CORRECTIVE ACTIONS			
INCIDENT	**CORRECTIVE ACTION**		As soon as possible	*If nesting chicks are found in vegetation that has been felled a cockatoo expert will be used such as Kaarakin Black Cockatoo Conservation Centre or similar organisation to recover and look after any chicks.*
Carnaby's Black-Cockatoo foraging on vegetation within or adjacent to site during construction	Report as an Incident.	EM		
	Halt adjacent construction activities until birds move on of their own accord; or on advice of EM if activities are deemed to not be interrupting foraging activities	EMR		
Native fauna present onsite during construction.	Report as an Incident (no investigation required).	EMR	At all times	*This forms part of the normal clearing management procedures of UR. Incorporated into UR toolbox and induction meetings*
	If animal is at risk of being impacted (i.e. in proximity to moving equipment or plant etc.) allow the animal to move on in its own time.	EMR		
	If animal is at risk of being impacted, halt construction until fauna have moved on or are removed by a qualified fauna handler.	EMR		

Injured fauna present onsite.	Report and investigate as an Incident.	EMR	As soon as possible	*This forms part of the normal clearing management procedures of UR. Incorporated into UR toolbox and induction meetings*
	If animal is at further risk, contact Wildcare or Department of Biodiversity, Conservation and Attractions (DBCA) for assistance with the injured animal.	EMR		
Feral fauna present onsite.	Notify EM of sighting.	EMR		
	REPORTING			
PMP	**PROJECT MANAGEMENT**			
PMP K4.1	Reporting on the amount of clearing, the areas trees, hollows present and available and other aspects of Cockatoo habitat to the CoW.	EMR	Ongoing liaison	Liaison between UR and the CoW will be maintained to ensure the CoW has all the available information for the recovery of Cockatoo habitat features such as hollows for timely use and that the clearing data is available to enable the CoW to report to the Commonwealth through the EPBC Approval requirements.

14.0 EROSION AND DUST MANAGEMENT

14.1 Environmental Dust

Excessive dust has the potential to impact on both the workers and the adjoining land, and its potential for generation must be taken in context. On this site there are no nearby sensitive premises. The Neerabup Power Station does lie east of Orchid Road and may need to be protected from dust travelling offsite.

There are several key aspects to dust impacts.

- What is the source of particles?
- What is the potential for the particles to be disturbed?
- What is the nature of the particles and how are they likely to behave?
- What types of impacts are the particles likely to have if they move?
- What management actions can be used to mitigate or reduce dust impacts?

Commonly called "dust," scientists and regulators refer to the term particulate matter (or PM) to describe the range of particles that exists in the air breathed in.

Particulate matter exists naturally in the atmosphere, e.g. sea-salt spray and pollens. PM can be increased due to human activities such as vehicle exhaust, industrial processes, power stations, mining, farming and wood heaters, or smoke from bushfires.

Exposure to PM can be associated with health and amenity impacts if the exposure is excessive and if the particles are harmful.

The likely risk of these impacts depends on a range of factors including the size, structure and composition of the PM and the general health of the person.

Particulate matter needs to be suspended in the air to carry any distance. The particles must be smaller than sand grains, which will only carry short distances because the grains are too large to move at any more than bouncing. The particles that can be suspended are called Suspended Particulate Matter and the total amount of that is referred to as TSP.

Dust Risk - Environmental

Occupational dust associated with the quarrying processes falls under the Mines Safety and Inspection Act 1994 and Regulations 1995 overseen by DMIRS and not under Planning legislation. Health and Safety programs are required to be provided for all operations under that legislation and approved and controlled by DMIRS.

Limestone excavation has a low risk from producing dust during excavation as the limestone taken from the face is moist with most dust being generated from vehicle movements in dry conditions.

Once wet, the limestone readily crusts and does not blow unless disturbed. The current surface is hard and crusted and sealed against dust lift off. Therefore, the perimeter batter slopes do not normally generate dust once constructed and stabilised after experiencing a winter. It is generally only the traffic and active areas that are susceptible to dust generation.

However, as vehicle movements are carried out on the floor of the pit and on the access road the limestone is crushed, and a high dust risk is generated in the drier months. Dust associated with limestone extraction is the fine calcium carbonate and any kaolin clay that occurs in the limestone. This fine material can be generated by vehicular traffic, which can crush and powder the fine particles. That fine material can be dragged onto the transport route when wet in winter.

The main risk from limestone is traffic along dry roads.

Sand carries little risk itself, although the fine coating on the grains can be liberated when the sand is dry and minor dust from traffic may be generated. Clearing, moving, and replacing topsoil is potentially the dustiest operation under dry conditions, with the fine grey organic particles in the topsoil able to be liberated and blow.

Climate and Soil Conditions

Through the winter months of May to September inclusive, there is little dust risk because rainfall exceeds evaporation. The rainfall is sufficient to wet the whole limestone profile to depth, with excess water reaching the water table.

In summer, when evaporation exceeds rainfall, the limestone roads dry when exposed to the sunlight and atmosphere and are susceptible to crushing and grinding by vehicles.

Limestone prior to excavation retains its moisture if there are no tree roots to extract moisture from depth. Without tree roots the moisture in the limestone can only be lost by capillary action and so stays moist to below 0.5 and 1 metres depth right through summer. The same applies to sand.

On active areas such as roads and hardstand that dry out, the dust can readily be generated. Normal practice is to treat this with water, which maintains the moisture content of the soil and limestone and mitigates dust generation.

Wind directions

Wind data is not recorded at many sites. The most comparable wind data is taken from Fremantle/Swanbourne. These show that the prevailing wind is from the north east and east at 9.00 am and the south west at 3.00 pm.

For the summer months, where February is a typical month, the wind directions are more variable at 9.00 am ranging from east through south. At 3.00 pm in February the winds are almost solely from the south west. The morning data shows that on some days the south westerly sea breeze is blowing at 9.00 am in February.

In July, the predominant winter wind direction at 9.00 am is from the north east with 3.00 pm winds more variable and spread from north through south west.

14.2 Assessment of Dust Risk

Dust Guidelines

Dust emissions fall under the Guidance for the Assessment of Environmental Factors, EPA, March 2000. Assessments of the potential dust risk are normally made using the Land development sites and impacts on air quality, Department of Environmental Protection and Conservation Guidelines, November 1996. These are still in place but are incorporated into the DEC 2011 Guideline for Managing the Impacts of Dust and Associated Contaminants from Land Development Sites, Contaminated Sites Remediation, and other Related Activities.

The DEC (DWER) in 2008 released a draft Guideline for the Development and Implementation of a Dust Management Plan and that was incorporated into a 2011 document.

The key Environmental Objectives for the operations are.

- Manage the potential for the generation of dust.
- Visually monitor dust levels and take steps to reduce the potential impact of dust on occupational and environmental aspects of the operation and local area.

The category of dust risk is included in *DER 2011 Guideline for Managing the Impacts of Dust and Associated Contaminants from Land Development Sites, Contaminated Sites Remediation, and other Related Activities*. This document is not really applicable to mining because it is to be used to assess the mitigation required based on no mitigation.

When making the assessments using the DEC 2011 (DWER, 2011) Guideline there are five key points.

- The prevailing winds blow from the south west to south on summer afternoons and from the east on summer mornings.
- Dust risk is generally only in the dry summer months
- The limestone readily crusts and is stabilised. It is only trafficked areas of limestone that develop fine dust from the grinding of wheels.
- The perimeter bunds and vegetation provide effective wind breaks and wind screening.
- Effective water treatment of the limestone is used to wet down and manage dust risk.

However, the document can also be used to determine the risk of potential dust impacts of earthworks such as opening new ground and the removal of overburden and rehabilitation, which only occurs about once per year when the pit is being expanded or moving forward. These risks are summarised under the Table titled Dust Management Actions below.

Environmental Dust Risk

The resource area is very large, and it is difficult to provide dust risk for all sensitive premises, so dwellings to the south are representative as is the Neerabup Power Station.

The key risk areas are from

- Land clearing and reinstatement within 250 metres of Orchid Road with the risk being dust on the Neerabup Power Station. Where possible clearing and reinstatement of land will be conducted when the soils are moist. If dust is generated, a suppressant should be used e.g. water truck . The same applies to Wesbeam to the south in that location.

  Excavation of sand behind the face in summer carries little risk apart from traffic on internal limestone roads.

- Crushing and screening of limestone on the western half of the pit with the risk being mainly occupational dust. This will be mitigated by occupational dust management.
- The closest dwellings are Banksia Grove, 1.0 km to the south, out of the influence of the prevailing winds and therefore carry no risk at that distance.

Dust Risk Assessment from DWER (DEC, 2011)

PART A Number	**Item**	**Score to the Neerabup Power Station and Westbeam. (Unmanaged Risk)**	**Score to the Neerabup Power Station and Westbeam. (Managed Risk)**
		Score	
1	Nuisance potential of the material	Medium to high for clearing and replacing topsoil in summer within 250 metres of Orchid Road- 6 Excavation of sand in that footprint - 4	Very low for operations with dust control in place of clearing when soils are moist - 1 Sand excavation - 2
2	Topography and vegetation screening	Little screening for topsoil – 12 Medium screening for sand excavation - 6	Little screening for topsoil – 12 Medium screening for sand excavation - 6
3	Area of site activities	Active trafficked areas at any one time are 1 - 5 hectares in area - 3	Active trafficked areas at any one time are 1 - 5 hectares in area - 3
4	Type of work being undertaken	Bulk earthworks - 6	Bulk earthworks - 6
	Summer total without dust measures	Topsoil disturbance Maximum = 27 Sand Excavation Maximum = 19	Topsoil disturbance Maximum = 22 Sand Excavation Maximum = 17

PART B Number	Item	Score	Score
1	Distance to premises	Premises – 12 - 18	Premises – 12 - 18
2	Effect of prevailing wind	Isolated premises affected by one wind direction - 6	Isolated premises affected by one wind direction - 6
	Total Part B	Total 18 - 24	Total 18 - 24

Unmanaged Activity	Maximum Calculated Score	Allocated Risk of Dust No Management
Clearing and replacing topsoil	648	Classification 3 Medium Risk
Sand excavation	456	Classification 1 Medium Risk

Managed Activity	Maximum Calculated Score	Allocated Risk of Dust Managed Activities
Clearing and replacing topsoil	528	Classification 3 Medium Risk
Sand excavation	408	Classification 1 Medium Risk

It is noted that this risk only applies to a small area at the extreme eastern edge of Lot 9003. All other areas carry a low dust risk.

Buffers and Setback Management

Dust is readily stopped by tree belts and distance, with which the site complies; *Planning Guidelines Separating Agricultural and Residential Land Uses, Department of Natural Resources Queensland 1997(Pages 65 – 111*) and *Department of Health WA, 2012, Guidelines for Separation of Agricultural and Residential Land Uses which uses the same criteria (Pages 112 – 118).*

The Queensland Guidelines predominantly relate to agricultural spray drift, but based on particle size, also relate to dust.

The Guidelines provide for a buffer of 300 metres for open agricultural land, dropping down to 40 metres where an effective tree belt is in place. The Western Australian Department of Health also uses the same guidelines.

The Guidelines are based on field studies and demonstrate the effectiveness of tree belts in providing screening against particulate travel.

The excavation has adequate buffers and design that will minimise any potential dust impacts and complies with the guidelines of Department of Health 2012 by way of separation distances.

The only location where the 300 metres is not met is near Orchid Drive when the *Banksia* Woodland has been removed. Considering the minimum buffer to the Neerabup Power station to the east and Wesbeam adjoining to the south there is a low risk of dust impacts when the topsoil is removed and replaced in summer and when the normal wetting down of excavation areas is carried out. The existing buffer vegetation will provide some screening for wind and dust until removal. A 20 metre wide perimeter buffer of vegetation is to be retained until the last phase of extraction and land construction.

Discussions and liaison have been held between UR and the adjoining and nearby industrial premises to explain what is being proposed and to initiate a line of communication. UR will work with the adjoining and local landowners as required to ensure that there are minimal impacts and that dust impacts are mitigated.

14.3 Occupational Dust

Occupational dust is managed under the Mines Safety and Inspection Act 1994, under the supervision of the Department of Mines Industry Regulation and Safety.

Calcium carbonate and kaolin clay are innocuous and carry no health risk. Both are used in medicines. Limestone roads are widely used for local roads and driveways and have no known health risks. Sand is silica, but has large particles that cannot be breathed in. The sand is little different to beach sand and in fact originated from windblown beach sand during formation.

However, from an aesthetic perspective the dust requires management. The main risk occurs from the stronger winds on summer mornings and summer afternoons; generally easterly and south westerly.

Dust from some materials such as ground limestone can form smaller particles that can blow further or even becoming so fine that they become invisible. The limestone is CaCO3, which is innocuous.

Little published data is available from general mining in Western Australia even though monitoring is undertaken at some sites. There is data specifically from mining, (predominantly coal) from New South Wales (NSW Health) where particulate levels have been measured to be;

PM <2.5 microns as 2 – 5% of emissions (One micron is 1 / 1000 of 1 mm).

PM< 2.5 are invisible and called “fine particles”. They are the main health issue and are caused by vehicle emissions whether they are along roads or on private land. Vehicle emissions will not occur at night or at other times when the site is not active.

PM 2.5 – PM10 microns as 15 – 45%

PM 10 (particles between 2.5 and 10 microns) are invisible and called “coarse particles”. They can be breathed in but are removed by alveoli and mucous. (NSW Health). This dust may be generated when land is cleared, and topsoil disturbed, or the site is subject to traffic in summer.

PM>10 microns as 50 – 70%

PM>10 is visible dust and will, based on the resource, be the majority of the particles.

Normally all sizes of dust are generated together, and there will be visible dust being generated when invisible dust is being formed. Therefore, any visible dust present is a good sign and early indicator of a dust risk. A summary of the sources and proportions of dust is shown in; NSW EPA and *NSW Ministry of Health Environmental Health Branch 2015*, Review of the health impacts of emission sources, types and levels of particulate matter air pollution in the ambient air in NSW.

This is backed up by occupational monitoring through the Department of Mines Industry Regulation and Safety. Unpublished data from those quarries shows quarries are compliant or can readily be made compliant with the health and safety and community standards through normal dust management practices.

Limestone is formed from sand grains bound together by grains of calcium carbonate held together by calcium carbonate cement.

Being softer than the sand grains the calcium carbonate is readily ground very fine from disturbance, particularly in dry conditions, from actions such as vehicle movements. The sand grains within the limestone are hard and are not normally reduced in size even by traffic movements.

When dry there is some minor dust from vehicle wheels, and associated ground calcium carbonate of the limestone and tiny amounts of clay with the dark yellow sands.

Water is used to manage dust and a dedicated water truck will be maintained on site to provide water for dust suppression. The access roads and hard stand are to be watered as required.

Calcium carbonate is an innocuous material that is a major component of bones and is required by all living organisms for their health and growth. Sand sized grains are too large to be breathed in and any minor kaolin or iron oxide associated with the Tamala Limestone is innocuous.

For sand, the main material is fine organic matter in topsoil, and minor clay and iron oxides from coating the yellow sand. The sand particles are composed of silica, SiO2 which are much too coarse to be breathed in and carry no risk.

What makes calcium carbonate unique is that it is readily dissolved to calcium hydrogen carbonate by weak acids in rainfall and water applied to the site. Once dissolved, the calcium hydrogen carbonate readily precipitates to calcium carbonate as the water is evaporated. The calcium carbonate deposits on the surface of the land and any exposed limestone, readily forming a crust that stabilizes the surface and is not liable to any dust lift off unless disturbed by vehicle movements. Limestone which has been left even for a week or so becomes crusted and stabilised, with the crust thickening over time. This process can even occur from dew.

Limestone also stays moist as noted below, and the main dust risk is also traffic on roads and hardstand. When excavating using a bulldozer there is very little dust even in summer.

14.4 Dust Management Plan for Excavation and Site Clearing

Most dust generated from processing and vehicle movements has a very large visible component. Lesser risks emanate from excavation and opening new ground.

Land clearing will be conducted to the requirements of the Construction Environment Management Plan (CEMP).

The CEMP requires the development of a Dust Management Plan for all stages of the project (CEMP Reference 13.2.1) and provides for some dust management, but generally restricted to land clearing and site construction, rather than quarrying operations, crushing and screening, loading and transport. This Dust management section of the Environmental Management satisfies the Dust Management Plan requirement of the CEMP, Item 13.2.1 and includes extraction and operational activities.

The CEMP commitments and actions are committed to in the tables below. To these have been added commitments relating to general on site management, particularly for excavation and processing which are not all covered by the CEMP

Clearing

- Perimeter wind fencing will be installed prior to clearing.
- Clearing will be conducted to only remove the area required for immediate mining to expose the resource and construct the operational features as required by State and Commonwealth Clearing approvals
- Removing the topsoil for use in revegetation and topping the perimeter screening bunds, followed by removal of the overburden. This can be readily managed by undertaking activities in that area when the soils are moist.
- The clearing will consist of;
    - Push vegetation to the perimeter of the stage to form low dumps.
    - Push topsoil to the perimeter of the stage into low dumps 1 – 2 metres high
    - Push overburden that can be used to reform the land surface to perimeter bunds 2 – 3 metres high to form safety bunding.
- Removal of material will be completed by covering the loads as necessary to mitigate dust generation.
- The storage of the vegetation and/or mulch and the topsoil and overburden, which are all to be retained for land restoration, will be in perimeter bunds.
- Perimeter screening bunds will be formed when the land is cleared to assist safety and dust management.
- If topsoil and overburden bunds and stockpiles are subject, to erosion risk, provide stabilisation as necessary to prevent dust lift off.
- A water truck will be maintained on site when there is a risk of dust generation.
- If winds are sufficiently strong, or other weather conditions are unacceptable to negate the effects of dust management, operations will cease until conditions improve or the dust is managed effectively and compliance can be achieved.

Excavation Activities

- Excavation will be conducted on the floor of the pit to provide maximum shelter for dust protection.
- The 20 metre wide vegetated and treed buffers will be left in place to provide additional dust screening and management.
- The perimeter wind breaks will be left in place when operational activities are within 200 metres of the nearby boundaries.
- A water truck will be maintained on site when there is a risk of dust generation.
- The access roads and hardstand are the critical risk areas from dust being generated by wheel activity. The roads and hardstand will be watered down as required to treat and settle dust.
- Once excavated, limestone readily crusts even after one rainfall event and will not blow unless that crusted surface is disturbed by vehicles or other means. The crusts increase in thickness with further rain events.
- Excavated and stockpiled sand can blow, but only blows by saltation and is readily stopped by any vegetation, pit wall screening bund or wind fencing.

Processing

- When excavated, the limestone stays moist, and is moist during crushing and screening. It is only limestone exposed to the sun that dries out, such as the roads.
- The crushed material from the track rolling of the dozer is fed to a small mobile crusher and screened to size. The various screen sizes are stockpiled separately.
- The main dust risk with processing is the movement of the loader feeding the crusher in summer months. That is negated by the use of water from the proposed bore.
- When required mister sprays will be used as they can be very effective in managing dust on processing and other loading activities. The other advantage is that they use less water than normal wetting down.
- Limit the drop heights of product.
- Protect pinch points with guards, sheets, screens, misters, and other dust management if required.
- Screening of sand can also create dust if not adequately managed.
- Crushing and screening plant will be installed with shields, curtains, covered or shielded conveyors and hoppers as appropriate.
- If weather conditions make processing too dusty the processing will cease until weather conditions improve.
- If occupational dust is managed during crushing the environmental and offsite risk will be negated.

Stockpiles

- Stockpiles are to be located on the floor of the pit. Once they have been exposed to rain the limestone stays moist and can be loaded without dust.
- The only stockpile of sand will be for specialty products which have been screened. These stockpiles will be placed on the floor of the pit in sheltered positions.
- Loading from the face produces little dust and is covered under excavation.
- It is noted that CEMP Item 12.2.5 requires stockpiles to be hydromulched or otherwise stabilised. Limestone does not blow from stockpiles. It is the traffic on the hard stand that causes limestone dust and that is managed by water. For sand there will be no movement of sand beyond the operational areas as the particle size and density of sand causes it to move by saltation only. There are no fines in the sand. The use of hydromulch is acceptable on dumps and stockpiles such as topsoil, but not on product stockpiles because it corrupts the resource in the stockpile.

Transport

- The entrance to the access road is sealed with the remainder of the road network being “dust managed” limestone.
- All loads for transport outside the pit are required to be covered prior to leaving site as is normal for all truck transport on public roads.
- The access road and crossover are to be maintained in good condition (free of potholes, rills, and product spillages).

Erosion Management

- The existing screening bunds and other features show no significant signs of wind or water erosion.
- Soil erosion occurs when soil is exposed and disturbed by wind or water. Erosion involves soil particles being detached from areas not adequately protected by vegetation and moved down-slope. This is not normally a significant problem in limestone which crusts after the first winter.
- The soils are very permeable, and runoff is normally minimal unless surface materials become non-wetting. Even so experience shows that there is minimal non wetting and surface particle movement under such conditions.
- Water erosion on the batter slopes can be avoided by the permeability of the materials and by leaving the surface soft, rough and undulating, with the undulations running along contour. The final machinery run should be along contour and not down slope.
- Limestone, when subjected to rainfall, forms a crust that is impervious to further erosion unless disturbed.
- Wind erosion may release sand particles which will be controlled by stabilising the disturbed ground as soon as practicable.
- If wind erosion and soil stability become an issue measures will be taken to stabilise the soils. These could include but not be limited to fence wind breaks or spray mulching,

Mud Management

- A wheel wash will be installed at each entrance at risk of dragging material onto public roads.
- A wheel wash is to be installed and operational at all times dust or mud is at risk of being carried onto Mather Drive or Pederick Road
- Along lead of bitumen between the wheel wash and the public roads will provide time for the water to drip of the tyres, prior to access public roads.

Monitoring

- A readily auditable trigger of no visible dust to cross the property boundary will be used, in line with DWER Licence and best practice in WA.
- The trigger for dust management is the generation of visual dust.
- This response to the generation of visible dust is instantaneous and does not rely on monitoring equipment, which normally has time delays associated with it.
- The amount and source of dust is observed before any dust monitoring could trigger. Treatment is therefore more effective and targeted.
- Visible dust is detected as it is generated and usually actions are taken to mitigate the source of the dust prior any dust arriving at a site monitor if indeed the dust arrived at a monitor. Unless controlled, it is very common on quarries for dust to be generated and yet the monitors are not triggered because of the travel distances.
- Install dust monitoring stations at the key locations of the northern boundary and southern and eastern boundaries or in vegetation ahead of excavation. The monitors are to be static monitors that will continuously monitor the amount of dust generation.
- The onsite leading hands, under the guidance of the Registered Manager, are ultimately responsible for site supervision of dust. They are anticipated to be allocated within the role of nominated Construction Contractor (CC) nominated in the CEMP
- They travel around the operations and pit frequently and are in two way radio contact with all mobile plant.
- All operators on site are instructed to be vigilant to dust generation and management and report any excessive dust or potential dust management issues.

- When trigger conditions are detected and/or alerted relevant action is taken. This can include additional water suppression, modification of procedure, delay until more favourable conditions are present, use of alternative equipment etc.
- When a significant source of dust is noticed it is dealt with by temporary or permanent changes to procedures and equipment or the treatment using water.

DUST MANAGEMENT

PRINCIPLES AND STANDARDS

- Biodiversity Conservation Act 2016
- Environmental Protection (Clearing of Native Vegetation) Regulations 2004
- Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth).
- DER (DWER) 2011 *Guideline for Managing the Impacts of Dust and Associated Contaminants from Land Development Sites, Contaminated Sites Remediation and other Related Activities.*
- *Mines Safety and Inspection Act 1994.*
- CEMP *prepared for the CoW. This document mainly relates to clearing of the land and site preparation, rather than excavation.*

BASELINE DATA

- Eco Logical Australia (ELA) 2012. *Ground truthing of environmental values for Lot 4 Flynn Drive Neerabup Prepared for CoW.*
- Eco Logical Australia (ELA) 2013. *Targeted Flora and Fauna Assessment Lot 4 Flynn Drive Neerabup Prepared for CoW. April 2013.*

CEMP - OBJECTIVES AND TARGETS

- Minimise dust lift during construction and operation
- All stockpiles are stabilised to prevent erosion and dust lift
- No adverse impacts on adjacent stakeholders

CEMP	KPI's
12.1.1	No visible signs of erosion within or at the boundaries of the site.
12.1.2	Address all complaints regarding dust and erosion.
12.1.3	No irreparable collapse or destabilisation of the final site level from erosion.

PMP	PROJECT MANAGEMENT KPI's
PMP D1.1	No visible dust to cross the property/premises boundary
PMP D1.2	No excessive dust generated on site, that will effect on site health and safety or amenity.
PMP D1.3	No excessive dust or mud dragged onto Mather Drive or Pederick Road
PMP D1.4	Comply with conditions relating to dust from other approvals.

	MANAGEMENT	Responsibility	Timing	PMP ACTION AND INTERACTION
CEMP	• **CEMP REQUIREMENTS**			
13.2.1	Develop and implement a site-specific dust management plan (DMP) for all stages of the project in accordance with DEC (2011) guidelines and including the actions below.	CC	For provision with tender documentation	*Arranged by the CoW and UR*
13.2.2	Comply with site specific DMP as required by contractual arrangement with the CoW.	CC	At all times	*Arranged by the UR in association with the CoW.*
13.2.3	Where required, install wind fencing around the perimeter of the site, taking into consideration the use of natural wind fencing (remnant vegetation) as a natural wind barrier.	CC	At completion of initial clearing clearing	*The plant operator will be instructed on the manner and location of the stripping and the treatment of the stripped topsoil*
13.2.4	Earthwork slopes and batters are to be stabilised as soon as practicable after completion. Stabilisation may include hydro-mulch as a temporary measure, but batters and slopes should ultimately be stabilised with mulch and vegetation or hard landscaping.	CC	As required	*Topsoil will be stored in perimeter bunds from where it can be reused as required. Good quality topsoil will be marked and can be drawn in preference to poor quality material.*
13.2.5	Water trucks are to water down unsealed roads during operation to reduce dust lift.	CC	As required	*Weedy soil will be stored in the perimeter bunds and retained for as long as possible to reduce the weed load.* *If dieback is introduced any affected soil will be similarly treated.*
13.2.6	Transport of dust-prone material will be via covered trucks or dampened prior to transport to prevent dust lift off during transport.	CC	During soil transport activities	*This is standard road transport requirements.*
13.2.7	Water trucks are to be available at all times during operation to water the site on the observation of dust lift.	CC	As required	*A water truck will be available. It is calculated that around 20,000 kL of water will be required annually. A bore Licence*

				will be applied for if water allocations are available otherwise an allocation may be purchased, or water brought to site as required.
13.2.8	All complaints regarding dust and erosion are to be recorded within a Complaints Register immediately	EMR	As required	*See Contingencies and Corrective Actions below.*
13.2.9	All complaints regarding dust and erosion are to be addressed within 24 hours if severe, or within one week for minor complaints.	EMR	As required	*See Contingencies and Corrective Actions below.*
13.2.10	Implement a dust monitoring program that sets thresholds and measures dust deposition at the boundary of the site and the Conservation Area and Mather Reserve and neighbouring properties.	CC	Prior to the commencement of clearing	*See Monitoring below*
	PROJECT MANAGEMENT ACTIONS			
PMP D2.1	Implement the Dust Management Plan for excavation and mine closure and the CEMP activities for land clearing and other earthworks	EM	Prior to commencement	*UR will implement both CEMP and Project Management Dust Procedures prior to commencement and include the management of dust within site inductions and all operational procedures.*
PMP D2.2	All trucks leaving site are to be covered	EM	At all times	*This is standard practice.*
PMP D2.3	A wheel wash is to be installed and operational at all times dust or mud is at risk of being carried onto Mather Drive or Pederick Road	EM	Prior to commencement	*The wheel wash is to be located near the weighbridge. Trucks exiting the wheel wash will travel along bitumen seal road to Mather Drive which is also sealed.*
PMP D2.4	No visible dust is to cross the boundary of the premises or site.	EM	At all times	*This is the key monitoring procedure that has been found at all sites to be the most effective and instantaneous monitoring procedure.*
PMP	20 metre of perimeter vegetation is to be retained around the premises – site boundary to act as a wind break to slow wind speeds.	EM	Prior to excavation	*The 20 metre perimeter vegetation buffer is programmed to be retained and removed as the last phase of excavation.*

D2.5				
PMP D2.6	Comply with dust management conditions imposed by other approvals such as the DAs, Extractive Industry Licence and DWER Works approval and Licence.	EM	At all times	*Further conditions arising from other approvals will be incorporated into the operational procedures and complied with.*
PMP D2.7	Maintain signage with contact numbers for the Quarry Manager /Construction Manager.	EM	Prior to commencement	*The signage will comply with CoW and DMIRS signage requirements.*
PMP D2.8	Install and monitor static directional dust monitors at the key locations of the northern boundary and southern and eastern boundaries or in vegetation ahead of excavation.	EM	Prior to commencement	*The static monitors will be installed to the south and east of the site, when bulk earth activities approach within 200 metres of the boundary towards an external premise.*
	MONITORING			
CEMP	**CEMP**			
13.3.1	Visual monitoring of wind fences, stockpiles, and earthwork batters	EMR	Fortnightly	Signs of erosion, bank slumping or the formation of rills and gullies. Deposition or damage on wind fences
13.3.2	Implement dust monitoring program	EMR	Fortnightly	Dust lift off and signs of dust deposition within the Conservation Area
	PROJECT MANAGEMENT PLAN			
PMP D3.10	Install static dust monitors to the south and east of the site, when bulk earth activities approach within 200 metres of the boundary towards an external premise.	EMR	Prior to commencement of activities near the boundaries.	*The dust monitors are to be static collectors .* *Analysis of the dust will be monthly.*
PMP D3.11	Implement a site induction for dust management procedures to instruct all operators to report excessive dust at time of generation and be proactive in actioning dust management actions.	EMR CC	At induction and as required.	*Dust management is a normal part of Urban Resource management procedures in line with their quality assured status.*

CONTINGENCY AND CORRECTIVE ACTIONS				
INCIDENT	**CORRECTIVE ACTION**		As soon as possible	*When a significant source of dust is noticed it is dealt with by temporary or permanent changes to procedures and equipment or the treatment using water.*
Observation of excessive dust lift on site	Report and investigate as an Incident.	EMR		
	Halt work within proximity of the area until cause of dust is addressed.	CC		
	Apply water as an immediate dust suppressant measure	CC		
	Increase dust mitigation measures (e.g. more water trucks).	CC		
Complaint received.	Report and investigate as an Incident.	EMR	Prior to seeding and spread of weeds	*This forms part of the normal dust management procedures of UR.* *All complaints are logged in the complaints register, including the* • *Time and source of complaint.* • *The investigations undertaken.* • *Actions taken.* • *Success of the actions and review of the procedures.* • *Reporting back to the CoW in accordance with their nominated complaints procedure.* *Corrective actions for excessive dust or mud include but are not limited to.* *Provide soil stabilisation, wind break materials or take other actions as required.* • *Move the processing plant and stockpiles to an area less impacted by wind.* • *Increase wetting down or spray misting.* • *Where there is excessive road dust and mud, provide additional road sweeping and washing, or implement potential long term measures e.g. increasing the length of bitumen seal.*
	Complaint must be addressed within 24 hours if severe, or within one week for minor complaints.	CC		
	Review procedures and adjust if required.	EMR		
	Conduct additional toolbox meeting to highlight dust management issues.	CC		
	Notify the PM if the complaint escalates to a serious concern that cannot be addressed by the CC.	CC		
	If repeat incidents occur, implement boundary particulate monitoring in accordance with current DER dust management guidelines.	CC		

Signs of erosion on embankments	Report and investigate as an Incident.	EMR	As soon as possible	
	Remediate erosion and stabilise	CC		
	REPORTING			
PMP	**PROJECT MANAGEMENT**			
PMP D4.1	The complaints register will be maintained.	EMR	As soon as possible	Breaches of dust management regimes will be reported to the CoW as soon as they are recorded. (see above)

15.0 NOISE MANAGEMENT

15.1 Noise Regulation

Noise can originate from several operations and may impact on onsite workers or travel offsite and impact on external sensitive premises. Both potential noise impacts are addressed by reducing the noise generated from the quarrying and processing operations.

Offsite noise is governed by the *Environmental Protection (Noise) Regulations 1997*.

The Environmental Protection (Noise) Regulations 1997, require that sensitive premises including dwellings in non-industrial and rural areas, are not subjected to general noise levels (excluding blasting), during the hours 7.00 am to 7.00 pm Monday to Saturday that exceed 45 dBA. Allowable noise to 55 dBA is permitted for up to 10% of the time and to 65 dBA for 1% of the time. Noise levels are not to exceed 65 dBA during normal working hours.

Between 9.00 am and 7.00 pm on Sundays and Public Holidays, and between 7.00 pm and 10.00 pm on all days, the base level is 40 dBA.

At night, between 10.00 pm and 7.00 am Mondays to Saturday, and before 9.00 am on Sundays and Public Holidays the permitted level drops to 35 dBA.

The 10% and 1% “time above” allowances apply at night and on Sundays and Public Holidays as well.

There are penalties for tonality of 5 dB, modulation 5 dB and 10 dB for impulsiveness, that are added to the permitted levels. That is, if the noise is tonal or modulated the permitted levels drop by 5 dB. Impulsiveness is not likely to be relevant for the quarry under normal circumstances.

In reality, as the surrounding land is industrial land, and there is a potential for either tonality or impulsiveness, a 5 dB allowance is made, and the site compliance will therefore be 60 dB at the premises boundaries.

Influencing factors that raise the allowable noise levels are activities such as external industrial noise, some nearby land uses and busy roads. These are not relevant to this site but were considered in the noise assessment.

Processing will consist of a mobile crusher and screening plant for limestone located on the floor of the pit in a location to maximise landform screening when road base is being produced. Sand processing will consist of screening only. The solid walls of the pit perimeter will provide significant noise attenuation.

The screening plant for sand will also be located on the floor of the pit.

As excavation moves forward the processing will also move forward.

An Environmental Noise Impact Assessment has been prepared by Acoustic Engineering Solutions and is attached.

The assessment modelled the predicted noise levels with all plant operating at the same time, as a worst-case scenario. The operations were modelled from representative locations in each stage and demonstrated that compliance with the Noise Regulations would be achieved.

The plant modelled were.

- Two screening plants
- A stacker

- Two crushing plants
- A bulldozer
- Loader
- Watercart
- Excavators

The Noise Regulations provide for Construction Noise exemptions to enable construction of the site such as the building of the screening bund opening the pits, clearing and other opening or closure activities.

Under Schedule 1 of the Noise Regulations the premises on which the extraction of basic raw materials is extracted, is classified as Industrial Land for the purposes of calculating influencing factors. This was defined as the whole cadastral boundaries in State Administrative Tribunal decision {2013} WASAT 139, Bushbeach v City of Mandurah.

Noise Management is designed to comply with Best Practice, such as Institute of Quarrying Australia/Queensland Government, Noise Management.

15.2 Environmental Noise Management

A Licence will be obtained from the DWER under the Environmental Protection Regulations 1987, Prescribed Premises Category 12, (Screening 50 000 tonnes or more annually). During the assessment for a Licence, noise and dust risk will be assessed by the DWER.

Excavations and Land Reinstatement

- The perimeter screening bund is constructed around the approved perimeter of the pit and ensures that all activities are contained to the approved footprint and compliant with the Noise Assessments.
- Excavation will be conducted on the floor of the pit behind the faces and natural landform to provide maximum noise screening.
- Perimeter bunding will be used to provide maximum noise screening and safety protection in combination with vegetation buffers.
- Where possible the pit will be operated behind the face closest to the direction of any external properties such as Wesbeam or the Neerabup Power Station with the face between the operations and the facility to reduce noise.
- Blasting is unlikely but might be used to produce limestone armour rock. If used to produce armour stone from limestone, the type of blasting is called “popping” because it just splits the larger rock and produces minimal impacts that are contained within a few hundred metres. If blasting is required, UR will have an approved a “Blasting in a Townsite Permit” from the CoW prior to any blasting taking place on site.

Processing

- Annual throughput of the crushing is anticipated to be around 200 000 limestone extracted, but this will depend on the type and number of contracts won and could be more. Only a small amount of sand is anticipated to be screened for specialty purposes such as concrete or plasters sand.
- The crusher and screening plant when on site are to be located adjacent to the wall of the pit so that the pit face provides noise screening.
- A site code is to be implemented and UR is committed to site induction and training for all personnel for all parts of the operations.

- The type and amount of mobile plant operating at any one can be restricted if necessary, to minimise the noise outputs, but on this sit, with the large buffers this contingency is unlikely to be required.
- The crusher and screens will be located on the floor of the pit in locations which provide for the maximum noise screening.
- Shutdown is to be used to save fuel and maintenance costs in addition to noise minimisation
- In addition to finding that compliance could be achieved there are a range of contingencies that can be used to further reduce the noise generation on site, such as;
    - Not using all plant at the same time.
    - In some areas only using one screening plant.
    - Providing bunding around the crushing or screening plants.
    - Increasing the perimeter bunding.
    - Operating on the floor of the pit, below natural ground level.
    - Placing the crusher and screens either further away from the boundaries of the premises.
    - Placing the crushing and screen near the face
    - Limestone will be processed with a crusher and screen. Sand will only be screened or may not require screening.
    - It is unlikely that the limestone and sand processing will take place at the same location in a stage at the same time, therefore broadening the noise source.
    - Facing the fans of the generator for the processing away from the closest boundary.
    - Bunding the generator or crusher.

Vehicle Movements

- Truck movements along internal roads are to be restricted to the designated internal roads.
- Trucks enter and leave the site from Mather Drive or Pederick Roads and then the northern end of Mather Drive.
- Once on public roads, transport is exempt from the Noise Regulations.
- Ensure that all plant and equipment and road trucks are maintained in good condition.
- Airbrakes are unlikely to be required. Drivers are instructed not to use air brakes under normal situations when exiting along the access road or on other transport routes.
- High pitched reversing beepers will not be used. Broad frequency or “croaker” beepers and flashing lights will be used on all mobile plant.

15.3 Occupational Noise

Occupational noise associated with the quarrying processes falls under the Mines Safety and Inspection Act 1994 and Regulations 1995.

The management of occupational noise is normally handled by providing all necessary hearing protection, as well as conducting worker inductions and educational programs for all staff. Regular site audits of quarry and mining operations are normally conducted by the DMIRS.

As part of its commitments, UR will be pro-active with its worker safety awareness.

- by providing all necessary safety equipment such as ear protection,
- identifying sections of the plant where hearing protection is required, as well as,
- conducting induction and educational programs for its staff.

All staff are to be provided with comprehensive ongoing training on noise protection as part of UR commitment to occupational health and safety through the Project Management Plan.

Actions taken to minimise the generation of excess noise.

NOISE MANAGEMENT

PRINCIPLES AND STANDARDS

- Environmental Protection (Noise) Regulations 1997.

BASELINE DATA

- Acoustic Engineering Solutions, 2020, *Environmental Noise Impact Assessment of Sand and Limestone Extractions at Lot 9003 Mather Drive Neerabup*

CEMP - OBJECTIVES AND TARGETS

Nil

PROJECT MANAGEMENT PLAN – OBJECTIVES AND TARGETS

- Compliance with the *Environmental Protection (Noise) Regulations 1997.*
- Minimise noise generation from onsite operations

CEMP	KPI's
	Nil

PMP	PROJECT MANAGEMENT PLAN KPI's
PMP N 1.1	Compliance with the *Environmental Protection (Noise) Regulations 1997.*
PMP N 1.2	Minimise noise generation from onsite operations

	MANAGEMENT	Responsibility	Timing	PMP ACTION AND INTERACTION
CEMP	**CEMP REQUIREMENTS**			
	Nil			
PMP	**PMP REQUIREMENTS**			

PMP N2.1	Comply with the *Environmental Protection (Noise) Regulations 1997*	EMR	At all times	
PMP N2.2	Undertake the management actions listed above to minimise on site noise generation and carry.	EMR CC	At all times.	*All management actions to mitigate noise will be implemented where possible.* *The contingencies listed will be used in the event of noncompliance.*
	MONITORING	**Responsibility**	**Timing**	**PMP ACTION AND INTERACTION**
	CEMP			
	Nil			
PMP	**PROJECT MANAGEMENT PLAN**			
PMP N3.1	As required, such as from a complaint, conduct on site noise assessments to check compliance.	EMR	As required.	
	CONTINGENCY AND CORRECTIVE ACTIONS	**Responsibility**	**Timing**	**PMP ACTION AND INTERACTION**
INCIDENT	**CORRECTIVE ACTION**		As soon as possible	*UR will undertake the necessary actions to delineate, identify and provide the boundary in a new location and inform the respective plant operators of the changes to the operations that are required and ensure they are implemented to minimise noise generation and carry.*
Complaint relating to noise	Report and investigate as an Incident.	EMR		
	Report immediately to the SPT and ES	EMR		
	Investigate the operations to see what equipment was working in which locations.	EMR		
	Undertake noise measurements if required.	EMR		
	Modify the location of the operations, the number of plant and type working, provide barriers or bunding.	CC		*Implement the contingencies to reduce noise generation and cumulative noise levels.*

	REPORTING			
PMP	**PROJECT MANAGEMENT**			
PMP N4.1	Record the complaint, and the noise assessments in the normal reporting procedures.	EMR		Data will be retained for annual or other reporting.

16.0 SITE ACCESS

SITE ACCESS

STANDARDS

- *Mines Safety and Inspection Act 1994*
- *Occupational Health & Safety Act (1984)*

CEMP - OBJECTIVES AND TARGETS

- To restrict access to the site for safety reasons.
- To prevent unauthorised access to Mather Reserve

CEMP	KPI's
13.1.1	Restrict access to the site
13.1.2	Prevent unauthorised access to Mather Reserve.

	MANAGEMENT	Responsibility	Timing	PMP ACTION AND INTERACTION
CEMP	**CEMP REQUIREMENTS**			
14.2.1	Erect signs to notify public and workers of restricted areas	CC	At least 2 weeks prior to	*This forms part of UR normal operational procedures and site safety requirements under the Mines Safety and Inspection*

			construction	*Act.* *Signage is nominated in the Mines Safety and Inspection Act and the Extractive Industry Local Law.* *Normally the mine Manager (CM) will deal with security issues.*
14.2.2	Erect fencing around the perimeter with signage indicating restricted areas.	CC	Prior to clearing	*Arranged by UR in association with the CoW.* *The access roads and resource area are to be installed with locked gates and fences when the site is unmanned to prevent illegal dumping of rubbish.*
14.2.3	Install secure fencing around stockpiles and storage areas.	CM	After clearing	*Stockpiles are operational items and are the temporary source or storage of processed materials and need to be constantly access by mobile plant. They are conical in form and present a low safety risk as approved by DMIRS.* *Stockpiles of other materials such as topsoil and overburden perimeter bunds are not normally fenced unless there is a perceived additional safety risk. All are regularly reviewed by DMIRS.*
14.2.4	Ensure the boundary of the Mather Reserve is clearly marked and fenced	EM	NA	*The Conservation Area is not located on Lot 9003 or nearby.*
14.2.5	Ensure there is no access to the Mather Reserve by unauthorised persons.	EM	NA	*The Conservation Area is not located on Lot 9003 or nearby.*
14.2.6	Discuss with the CoW the details of haulage routes for large equipment.	CC	Prior to construction and as required.	*A transport plan is required by the CoW and this has been prepared by Victor Moro. The Transport Management Plan details all aspects of the movement of materials and heavy equipment.*
14.2.7	Ensure staff, vendors and related delivery drivers are aware of the designated routes for haulage and construction related traffic and the need to use them.	CC	At all times	
14.2.8	Install signs indicating speed limits and advice on traffic hazards in visible areas	CC	As required	*This forms part of UR normal operational procedures and site safety requirements under the Mines Safety and Inspection Act. Speed limits are imposed and discussed at tool box*

				meetings, site inducts and as required.
14.2.9	Record all complains relating to access matters in a Complaints Register.	EMR	At all times	*See below under contingency and corrective actions.*
	MONITORING			
CEMP	**CEMP**			
14.3.1	Visual inspection of site boundary	EMR	Minimum of monthly	*Evidence of access by public.*
14.3.2	Investigation of complaints	EMR	Within 24 hours	*The complaints procedure requires immediate investigation, action and recording.*
14.3.3	Visual inspection of the Mather Reserve boundary	EM	NA	*The Conservation Area is not located on Lot 9003 or nearby.*
	CONTINGENCY AND CORRECTIVE ACTIONS			
INCIDENT	**CORRECTIVE ACTION**	EMR CC	As soon as possible	*These actions are incorporated into all UR Sites.* *Normally the mine Manager (CM) will deal with security issues.*
Unauthorised access by a member of the public to site	Report and investigate as an Incident.			
	If required contact Police for assistance with escorting unauthorised person offsite.			
	Review the perimeter fencing and security.			
	Arrange for additional security or perimeter measures as required.			
Public complaint relating to access around the site.	Report and investigate as an Incident.	EMR	As soon as possible	*This forms part of the normal dust management procedures of UR.*

	Review existing controls and implement additional measures to reduce emissions or impacts to visual amenity	CC		*All complaints are logged in the complaints register, including the* • *Time and source of complaint.* • *The investigations undertaken.* • *Actions taken.* • *Success of the actions and review of the procedures.* • *Reporting back to the complainant if required.*
	Report incident to CoW for public information	EM		*N/A CoW*
	Facilitate community workshop if required.	EM		*N/A Cow*
	REPORTING			
PMP	**PROJECT MANAGEMENT**			
PMP A4.1	Security and complaints on security	CC		Breaches of security will be reported in the complaints register through the normal complaints procedures.

17.0 HYDROLOGY – WATER QUALITY MANAGEMENT

17.1 Management of Water and Hydrology on Lot 9003

The main risk relates to the potential for pollution to groundwater from large spills of hydrocarbon such as from a large tank failure, or small spills over a long period of time such as from a leaking tank over several years. With the depth to groundwater the potential contamination of groundwater carries a low risk.

The limestone and sand excavation complies with the documents listed in the Principles and Standards listed below. The most relevant document is DWER Water Quality Protection Note WQPN 15 (2019).

Surface Water

- There is no on site water.
- All surface water will infiltrate directly into the soil.
- Any surface water that does flow will pond in the base of the pit to infiltrate to the water table.

Groundwater

- The extraction and processing of limestone and sand is a chemically free operation with the only liquids used being lubricants and fuel for machinery.
- Talis (2017), identified groundwater as occurring between 45 metres AHD rising to 52 metres AHD in the east, which is between 6.77 and 24.7 metres below the proposed base of the excavation and complies with the State government's Water Quality Protection Notices for a 5 metre separation. That flow direction is opposite to that generally found by DWER mapping. (Perth Groundwater Atlas).
- Rubbish generated will be recycled wherever possible and periodically disposed of at an approved landfill site or other suitable site. Any illegally dumped materials will be removed promptly to an approved landfill or other suitable site, in accordance with the Environmental Protection Act 1986.
- Refuelling is carried out using mobile tankers. This will normally take place on the floor of the pit or designated area where any spills will be contained.
- The CoW will be notified of any fuel or oil spills.
- The same procedures will be used in the event of any fuel or hydrocarbon spill. Any spills will be contained by the excavation. Soil and resource will quickly be placed around the spill to contain it in as small an area as possible. When contained, the contaminated limestone will be scooped up and removed to an approved landfill or other approved site.
- The potential for rubbish to be dumped relates to unauthorised access to the site.
- Wastes generated from onsite operational activities will be recycled wherever possible and periodically disposed of at an approved landfill site.
- Any illegally dumped materials are to be removed promptly to an approved landfill or other suitable site, depending on the nature of the material.
- There appear to be a couple of small dumps of asbestos fencing near Mather Drive. These will be removed by a licensed contractor to an approved waste disposal site and in accordance with EP Act (1986) and controlled waste legislation.

HYDROLOGY

PRINCIPLES AND STANDARDS

- *Mines Safety and Inspection Act 199.*
- Minesite stormwater
- *WQPN 28 Mechanical servicing and workshop (2006)*
- *WQPN Landuse Compatibility in Public Drinking Water Source Areas (2004)*
- *WQPN 15 (2019) Basic Raw Material - Extractive Industries*.
- Mechanical servicing and workshop facilities
- Above-ground fuel and chemical storage

BASELINE DATA

- Golder Associates, 2014 *Geotechnical and Investigation Lot 4 Mather Drive Neerabup. This document provides data on the resource, water table and geotechnical stability and parameters.*
- Talis, 2017 *Geotechnical and Hydrogeological Investigation.* This document provides data on the resource, water table and geotechnical stability and parameters.
- Eco Logical Australia (ELA) 2012. *Ground truthing of environmental values for Lot 4 Flynn Drive Neerabup Prepared for CoW.*

CEMP - OBJECTIVES AND TARGETS

Nil

PROJECT MANAGEMENT PLAN REQUIREMENTS

- Groundwater quality will be protected.

CEMP **KPI's**

Nil

Prevent unauthorised access to the Conservation Areas.

PMP **PROJECT MANAGEMENT PLAN**

W 1.1 There will be no impacts on the groundwater in terms of water quality.

W 1.2 There will be no disposal of rubbish or waste on site

W 1.3 Soil quality will not be contaminated.

	MANAGEMENT	Responsibility	Timing	PMP ACTION AND INTERACTION
CEMP	• **CEMP REQUIREMENTS**			
	Nil			
PMP	**PROJECT MANAGEMENT PLAN REQUIREMENTS**			
PMP W2.1	Groundwater will not be significantly impacted.	CC	At all times	*The depth to groundwater of the final surface and the water management procedures will provide a low risk to the water table.*
PMP W2.2	The operations will comply with the water quality management procedures listed above for groundwater, Fuel Management and Servicing and Maintenance.	CC	At all times	Comply with DWER Licence DAs and Extractive Industry Licence. Comply with the *Contaminated Sites Act 2003.* *The operational procedures that are proposed will be implemented and are committed to.*
PMP W2.3	Ablutions water will be disposed through approved facilities.	CC	At all times	*Health Act 1911 administered by the CoW and Onsite Sewerage Disposal Guidelines.*
	MONITORING			
	CEMP			
	NIL			
PMP	**PROJECT MANAGEMENT**			
PMP	• Visually inspect all potential pollution areas at least weekly.	CC		*This will be performed by the Registered Manager*

W 3.1		EMR		*(CC) or the EMR*
PMP W3.2	• Investigate and actions any reported spill or potential water contamination.	EMR	As soon as recorded or alerted.	*The contamination management procedures will be actioned.*
	Contingency and Corrective actions			
INCIDENT	**CORRECTIVE ACTION**	EMR	As soon as possible	*This forms part of the normal dust management procedures of UR.* *All complaints are logged in the complaints register, including the following* • *Time and source of complaint.* • *The investigations undertaken.* • *Actions and soil testing carried out.* • *Removal of contaminated soil offsite to an approved landfill.* • *Success of the remediation of the procedures.* • *Reporting back to the CoW in accordance with their nominated complaints procedure.*
Lodgment of a complaint.	Report and investigate as an Incident. Review the perimeter fencing and security.			
Presence of significant contaminated soil	Report and investigate as an Incident. Remove any significantly affected sand,	EMR	As soon as possible	*The UR Spill Management Plan will be implemented. In summary this includes.*

	limestone or soil offsite.			➢ *Stabilising the situation by turning off any relevant hose or tap.* ➢ *Applying waterproof layer such as tarpaulin or container to capture the spill.* ➢ *Applying sand, limestone, or adsorbent material to soak up the spill.* ➢ *Dig out contaminated soil or resource and place on truck for disposal to an approved offsite facility or by placing on an impermeable membrane for later disposal.* ➢ *Replace any faulty parts.* ➢ *Conduct soil testing in accordance with best practice management and the Contaminated Sites Act 2003 if required.* ➢ *Dig out and retest if required to confirm removal of the contaminated material.*
	Visually re-assess the soil for compliance.			
	Conduct soil testing to the *Contaminated Sites Act 2003* if required.			
	Review existing controls and implement additional measures to reduce access potential.			
	Improve induction and staff training or retrain staff on fuel and hydrocarbon management			
	Report incident to CoW for public information			
	REPORTING			
PMP	**PROJECT MANAGEMENT**			
PMP A4.1	Spill or other significant incident that has the potential to cause pollution.			Report any spill in the site record book and notify the CoW and DWER if required. Document the events that led to the spill and the actions that were implemented to clean up the spill and prevent a repeat occurrence.

18.0 Fuel Management

- Fuel, Chemical and other Materials management will be managed in accordance with the relevant guidelines. The methods to be used are summarised below.
- Re fuelling and maintenance will be carried out in accordance with the DWER Water Quality Protection Guidelines.
- The main risks of contamination are the minor drips that occur during the removal of hoses or from tank or hose rupture on earth moving machines. A spill kit containing absorbent granules will be located on site for emergency use.
- Spillage will be contained in plant and working areas by shutting down plant or equipment if the plant or equipment is the source of the spill (provided it is safe to do so).
- Any spills will be contained by the excavation. Soil, sand or limestone and resource will quickly be placed around the spill to contain it in as small an area as possible. When contained, the contaminated material will be removed to an approved landfill or other approved site, in accordance with the EP Act (1986).
- All incidents are to be recorded, investigated, and remediated. A record is to be kept of incidents, and CoW notified within 24 hours of an incident. In the event of a significant spill (greater than 50L), activities will be stopped in that area until the incident is resolved.
- No potential chemical pollutants, fuel or oils will be stored on site. Minor servicing will be conducted onsite by mobile service vehicles and all lubricant wastes transferred by vacuum pumps to a storage tank on the service vehicle and recycled.
- There will be no workshop or permanent service facilities, all major servicing is conducted off site.
- Minor servicing of plant and equipment will be maintained in accordance with a maintenance schedule and in a hardstand area with spill prevention practices in place.
- Waste oil and other fluids derived from the routine maintenance of mobile machinery will be transported off site and disposed of at an approved landfill site. Grease canisters, fuel filters, oil filters and top-up oils will be stored in appropriate containers (e.g. bunded containers) protected from the weather, in a shed or brought to the site as required.
- Regular inspections and maintenance of fuel, oil and hydraulic fluids in storages and lines will be carried out for wear or faults in an appropriate location where spills can be prevented with spill controls in place e.g. work trays, hardstand area, containment.
- The site will be maintained in a tidy manner by removing all rubbish regularly offsite.
- Oil, Fuel and Chemical Spill Control & Clean Up will be managed in accordance with UR EWP013.

CEMP - OBJECTIVES AND TARGETS

Nil

PROJECT MANAGEMENT PLAN REQUIREMENTS

- Groundwater and materials quality will be protected.

CEMP	KPI's
	Nil
PMP	**PROJECT MANAGEMENT PLAN**
W 1.1	There will be no impacts on the groundwater in terms of water quality.
W 1.2	There will be no disposal of rubbish or waste on site
W 1.3	Soil quality will not be contaminated.

	MANAGEMENT	Responsibility	Timing	PMP ACTION AND INTERACTION
CEMP	• **CEMP REQUIREMENTS**			
	Nil			
PMP	**PROJECT MANAGEMENT PLAN REQUIREMENTS**			
PMP W2.1	Groundwater will not be significantly impacted.	CC	At all times	*The depth to groundwater of the final surface and the water management procedures will provide a low risk to the water table.*
PMP W2.2	The operations will comply with the water quality management procedures listed above for groundwater, Fuel Management and Servicing and Maintenance.	CC	At all times	Comply with DWER Licence DAs and Extractive Industry Licence. Comply with the *Contaminated Sites Act 2003.* *The operational procedures that are proposed will be implemented and are committed to.*
	MONITORING			
	CEMP			

	NIL			
PMP	**PROJECT MANAGEMENT**			
PMP W 3.1	• Visually inspect all potential pollution areas at least weekly.	CC EMR		*This will be performed by the Registered Manager (CC) or the EMR and recorded using UR-F-018 Weekly Site Inspection Form.*
PMP W3.2	• Investigate and actions any reported spill or potential water contamination.	EMR	As soon as recorded or alerted.	*The contamination management procedures will be actioned.*
	Contingency and Corrective actions			
INCIDENT	**CORRECTIVE ACTION**	EMR	As soon as possible	*This forms part of the normal dust management procedures of UR.* *All complaints are logged in the complaints register, including the* • *Time and source of complaint.* • *The investigations undertaken.* • *Actions and soil testing carried out.* • *Removal of contaminated soil offsite to an approved landfill.* • *Success of the remediation of the procedures.* • *Reporting back to the CoW in accordance with their nominated complaint procedure.*
Lodgment of a complaint.	Report and investigate as an Incident. Review the perimeter fencing and security.			

Presence of significant contaminated soil	Report and investigate as an Incident.	EMR	As soon as possible	*The UR EMP013 Oil, Fuel and Chemical Spill Control & Clean Up will be implemented.* ➢ *Stabilising the situation by turning off any relevant hose or tap.* ➢ *Applying waterproof layer such as tarpaulin or container to capture the spill.* ➢ *Applying sand, limestone, or adsorbent material to soak up the spill.* ➢ *Dig out contaminated soil or resource and place on truck for disposal to an approved offsite facility or by placing on an impermeable membrane for later disposal.* ➢ *Replace any faulty parts.* ➢ *Conduct soil testing in accordance with best practice management and the Contaminated Sites Act 2003 if required.* ➢ *Dig out and retest if required to confirm removal of the contaminated material.*
	Remove any significantly affected sand, limestone, or soil offsite.			
	Conduct soil testing in accordance with best practice management and the *Contaminated Sites Act 2003* if required.			
	Review existing controls and implement additional measures to reduce access potential.			
	Improve induction and staff training or retrain staff on fuel and hydrocarbon management			
	Report incident to CoW for public information			
	REPORTING			
PMP	**PROJECT MANAGEMENT**			
PMP A4.1	Spill or other significant incident that has the potential to cause pollution.			Report any spill in accordance with UR-PRO-002 Incident Reporting Procedure and notify the CoW and DWER if required. Document the events that led to the spill and the actions that were implemented to clean up the spill and prevent a repeat occurrence.

19.0 Waste Management

- A serviced portable toilet is proposed to be in place while the site is operating. Serviced means they are pumped out by a licensed contractor.
- Wastes generated will be recycled wherever possible and periodically disposed of at an approved landfill site.
- Any illegally dumped materials are to be removed promptly to an approved waste disposal site, depending on the nature of the material. There appears to be a couple of small dumps of asbestos fencing near Mather Drive. This will be removed by a licensed contractor to an approved waste disposal site and in accordance with EP Act (1986) and controlled waste legislation.
- The site will be maintained in a tidy manner by removing all rubbish regularly offsite.

20.0 DELINEATION OF CONSERVATION AREAS

There are no conservation areas on Lot 9003 under lease agreement between the CoW and UR Pty Ltd. No conservation Area adjoins the leased area, with a separation of over 300 metres.

The actions in the CEMP relating to the delineation of the Conservation Areas therefore do not apply to the leased area.

21.0 VISUAL MANAGEMENT

There are several management actions that can be taken in quarries to minimise visual impact. The general management actions are summarised below together with the visual impact issues that relate to this site. The actions will be used where applicable and as the opportunity presents to minimise visual impact.

Guidance on visual impact is contained in Department of Planning, 2007, Visual Landscape Planning in Western Australia (DoP 2007). Guidance can also be found in Forest Commission of Victoria, undated, Landscape Types of Victoria.

The site does not lie within a Landscape Enhancement Area in the CoW Policy.

From site observations and examination of contour plans and sight lines it is unlikely that the excavations will be seen from Flynn Drive or Old Yanchep Road.

What is likely to be visible will be the perimeter bunding and not the operational floor or faces. This is the same as the methodology used at the adjoining limestone quarry to the west.

Light Overspill

It is not proposed that the facility will operate at night. The only lighting that might be required at night could be security lighting. Security lighting is located to minimise light visibility from roads and will be restricted to the site facilities located adjacent to Mather Drive, and also as required to equipment that is parked or located within the pit such as the mobile crushing and screening plant. In each case the lighting will be angled back into the site to minimise the light impacts.

Visual Management

- A 20 metre strip of vegetation will be retained around the road perimeter of the site and retained until the last phase of extraction and bulk earthworks.
- The treed perimeter buffer will be maintained as the faces move outwards to the edges which will maximise screening and visual management.
- The quarry is to be located behind natural barriers and perimeter bunding of the pit and the intervening trees. The perimeter bunds are to be formed from topsoil and overburden.
- Excavation is to occur from the floor of the pit below natural ground level.
- The faces are to be orientated to minimise external visual exposure, working from the centre of each stage outwards towards the perimeter of the pit.
- The haul and access road are to be on the floor of the pit, at low elevation and truck movements are not to be visible.
- Overburden and interburden dumps are pushed into positions where they will form screening barriers.
- Progressive rehabilitation of all completed, excavated, or disturbed areas in the centre of the pit is proposed when sufficient ground is available.

VISUAL MANAGEMENT

PRINCIPLES AND STANDARDS

- *Mines Safety and Inspection Act 1994.*
- *Department of Planning, Land and Heritage, 2007, Visual Landscape Planning in Western Australia*.

BASELINE DATA

- *Existing landscape views from surrounding areas.*

CEMP	**CEMP - OBJECTIVES AND TARGETS**
	Nil

PROJECT MANAGEMENT PLAN
➢ The visual impact of the earthworks and extraction will be minimised.

CEMP	**KPI's**
	Nil

	PROJECT MANAGEMENT PLAN
PMP	Minimise the views of the disturbed ground and site activities from outside the premise's boundary

V1.1

	MANAGEMENT	Responsibility	Timing	PMP ACTION AND INTERACTION
CEMP	• **CEMP REQUIREMENTS**			
	Nil			
PMP	**PROJECT MANAGEMENT PLAN**			
PMP V2.1	Excavate from the floor of the pit	CC	At all times, where possible.	*This forms part of UR normal operational procedures and site safety requirements under the Mines Safety and Inspection Act.*
PMP V2.2	Orientate the active face to provide maximum visual screening	CC	Where possible.	*This forms part of UR normal operational procedures and assists in managing noise and visual impacts.*
PMP V2.3	Install perimeter bunds of topsoil and overburden.	CC EMR	During clearing	*This is proposed and committed to in the Clearing Management at Section 10.0.*
PMP V2.4	Provide for 20 metre of natural vegetation to be retained around the perimeter of the premises.	CC EMR	During clearing	*This is proposed and committed to in the Clearing Management at Section 10.0.*

	MONITORING			
	CEMP			
	Nil			
PMP	PROJECT MANAGEMENT PLAN			
PMP V3.1	Review the site from the perimeters and nearby roads.	EMR	Monthly	
	CONTINGENCY AND CORRECTIVE ACTIONS	**Responsibility**	**Timing**	**PMP ACTION AND INTERACTION**
INCIDENT	**CORRECTIVE ACTION**			
Disturbed areas and open ground are significantly visible.	Where excessive visual impact is present, take visual management actions where possible such as; change the orientation of the face, install additional bunding, install perimeter shade cloth fencing, rehabilitate the completed areas as soon as practicable	EMR CC	As soon as practicable	*The EM will monitor visual aspects and impacts on a regular basis and inform the CC to provide improvements to visual management, where possible.*
Public complaint relating to access around the site.	Report and investigate as an Incident. Review existing visual management and implement additional measures to reduce access potential. Undertake actions to mitigate or minimise the visibility of the disturbed ground as listed above.	EMR CC	As soon as possible	*This forms part of the normal dust management procedures of UR.* *All complaints are logged in the complaints register, including the following* • *Time and source of complaint.* • *The investigations undertaken.* • *Actions taken.* • *Success of the actions and review of the procedures.* • *Reporting back to the complainant if required.*

	REPORTING			
PMP	**PROJECT MANAGEMENT**			
PMP V4.1	Record complaints in the complaints register system.			Follow the UR complaints procedures and record reported visual impacts.

22.0 CLOSURE AND FINAL SURFACE

The area is currently partially disturbed with most vegetation being in good or better condition, with *Banksia* Woodland and taller shrubs over native ground covers and, in places such as in the west, over vegetation.

Rehabilitation will be to a stable cover by a return of topsoil, pending development as industrial land. Spray mulch or ground stabiliser will also be used in some locations where topsoil is not available.

Rehabilitation will include the Dieback and Weed Management to minimise any risks to adjoining vegetation.

Materials Inventory

The materials remaining at closure from limestone and sand mining are natural soil materials that do not produce any remaining or lingering environmental risk.

An audit of the potential materials that may be present from mining at closure is presented below and will be completed prior to closure of each stage.

Materials Inventory for Closure Risk			
Type	**Comment**	**Treatment**	**Reference**
Soil	Topsoil is natural and contains no detrimental materials.	None required. To be used in rehabilitation.	Field geological examination by Landform Research
Subsoils - Overburden	Subsoil sand and limestone is natural and contains no detrimental materials.	None required. Generally taken as resource.	Field geological examination by Landform Research
Waste rock and non-surface material and tailings	Any waste rock will be natural limestone that does not make grade. The pit bottoms in earthy yellow limestone which is a natural material normally occurring on the surface.	None required.	Field geological examination by Landform Research
Surface water	The water quality is fresh.	No treatment necessary	
Ground water	The water quality is fresh.	No treatment necessary. Covered by the contours of the closure land surface.	

Acidic materials and drainage	Not present. The limestone does not contain sulfides and there is no risk of acidic materials developing. The sand does not carry acidic materials or any at risk materials. Concurs with *Nattaporn-Prakongkep, R J Gilkes, B Singh and S Wong, 2011, Mineralogy and chemistry of sandy soils in the Perth metropolitan area of the Swan Coastal Plain, Department of Environment and Conservation.*	No treatment necessary.	Field geological examination by Landform Research and Talis 2017.
Sodic or dispersive materials	The water quality is fresh and there are no clays that could be dispersive.		Field geological examination by Landform Research and Talis 2017
Asbestos – asbestiform minerals	There appear to be a couple of small dumps of asbestos fencing near Mather Drive	Any asbestos will be removed by a licensed contractor to an approved waste disposal site.	
Radioactive materials	Not present	The sand and limestone do not contain radioactive minerals. The activity level is much lower radioactivity than other locations such as coastal locations where heavy minerals are more prevalent.	Published WA Geological Survey radiometric mapping. Field geological examination by Landform Research
Metallic or chemical materials		These materials will be sorted over time and those that cannot be reused, broken up and removed from site. All will be removed by the end of excavation on the land unless required for future land uses.	To be determined from ongoing and regular visual assessments of the ground to be closed.
Tailings storage	Not required		
Ablutions waste	Will be removed at closure.	Serviced portable toilet system is provided and will be removed at the end of excavation.	Covered by Water Management Procedures.

Dangerous Goods and Hazardous Materials	**DANGEROUS GOODS** ***None will remain on closure***.	There are normally no hazardous materials used for sand and limestone mining apart from fuel, and servicing. The only other materials are for tasks such as weed management and are dealt with under those sections. Should any hazardous materials be identified they will be removed by a licensed contractor to an approved waste disposal site and in accordance with EP Act (1986) and controlled waste legislation.	To be determined from ongoing and regular visual assessments of the ground to be closed.
	FUEL The various plant will be refueled from mobile tanker. ***None will remain on closure***.	Any soil or other materials with drips and spills will be removed offsite to an approved waste disposal site and in accordance with EP Act (1986) and controlled waste legislation.	Covered by Water Management Procedures. To be determined from ongoing and regular visual assessments of the ground to be closed.
	SERVICE MATERIALS Only minor lubrication will be conducted on site All major servicing will be conducted offsite. ***None will remain on closure***	Any wastes will be collected and removed from site promptly to an approved recycling or waste disposal area. Only minor servicing will be conducted on site. All major servicing will be conducted offsite.	Covered by Water Management Procedures. To be determined from ongoing and regular visual assessments of the ground to be closed
General waste		Regularly removed from site to an approved disposal area	To be determined from ongoing and regular visual assessments of the ground to be closed

Legal Framework

- A Rehabilitation plan and handover will be developed and approved by the CoW before the completion of each stage.
- All legal requirements and commitments and conditions of approval will be complied with.
- Compliance with all conditions and commitments and end use will be assessed. This includes Planning Approval, Extractive Industries Licence, Clearing Permit and DWER Licence and any other relevant legally binding conditions.
- All conditions and commitments will be visually assessed for compliance.
- Prior to closure, stakeholders will be consulted to check whether the closure planning, where possible, considers their interests and carry them out, as necessary.
- The latest documentation will be reviewed to determine whether there are any outstanding stakeholder issues.

Non Natural Materials

- All non-natural inert materials associated with quarrying will be collected and removed from site unless required for internal roads. This includes plant, buildings, fences and other structures or materials not required for future farming and other uses.
- All ground once occupied such as hardstand is to be deep ripped and soils reconstructed as required.
- If not required, roadbase, hardstand and any other inert materials left over from the site operations will be scraped and picked up and will be used to backfill the pit faces or reused.
- The land surface will be formed to a landform like the natural form but at a lower elevation.
- A visual audit of completed ground, will be completed to verify compliance.

Contamination

- A visual audit of completed ground, to verify compliance with “no contamination to be left” will be used.
- Soil testing will be undertaken if there is evidence of material contamination remaining such as fuel spills.
- As a result of any testing remediation will be undertaken to ensure that the site is not contaminated. This will be completed in accordance with the Contaminated Site regulations (2003); NATA; and best practice standards.
- As necessary samples will be collected to verify a lack of contamination, contaminated materials removed and the site re-tested.

Finished Levels

- The floor faces and slopes will be backfilled if required.
- UR will leave a separation of > 6 metres to the winter water table in line with the final contour plan. This will be established through site survey during excavation.
- Visual observations and survey of the landforms to confirm compliance.
- Contours are to comply with the CoW Concept Final Contour Plan and any subsequent versions.

- The batters are to be formed to comply with DMIRS and geotechnical requirements.
- Perimeter bunds will be pushed down to produce the batter slopes for the rehabilitated faces.
- Where possible the landform will be matched to the adjoining excavated and non-excavated surfaces.
- Visual observations and survey of the landforms will be used to confirm compliance.
- The disturbed land will be made safe and in compliance with the *Mines Safety and Inspection Act 1994 and* DMIRS Mine Closure Guidelines.
- Warning signs as required will be provided to the final landform.
- Fences, bunding and warning signs above slopes or other features as required for the excavation site until safe.
- Locked gates or access restraints will be provided as required.
- All areas will be inspected to ensure the land surfaces and access points, are stable to erosion from wind and water.
- Holes, sumps drains, ditches and the like will be filled and removed.
- audit of completed ground, to verify compliance.
- Visual observations of the landforms, and an audit of the completed surface will be provided.

Soil Reconstruction

- The soils will be constructed from overburden overlain by sand
- The use of topsoil may compromise the geotechnical ability of the created surface.
- Limestone will be deep ripped. Any compacted hardstand or internal roads will be deep ripped.
- Sand cover of 100 mm will be pushed to the edge of the current excavation in separate windrows where available. This is usually the top 50 mm to 100 mm. Topsoil will be respread as the final surface covering.
- Visual observations and discussions with operators.

Closure Implementation

The closure planning will be updated from time to time as the excavation progresses forwards. This will include both anticipated costs and procedures.

The following procedures will be used for final closure and rehabilitation of any stage of excavation and on completion of the sand and limestone pit.

- The closure of completed areas of the operations will be progressive with closure of all remaining ground at the end of operations.
- Maintenance and monitoring will be conducted until completion criteria is met. A three-year cut off is provided for replaced soils.
- Unexpected or early closure will be completed in the same way as permanent closure below, but final closure will be completed as one operation.

Typical excavation with a completed floor

Example of a completed stabilised sand surface

CLOSURE AND FINAL SURFACE

PRINCIPLES AND STANDARDS

- *Mines Safety and Inspection Act 1994*
- CEMP *prepared for the CoW.*
- Final Surface Contour Plan in ASP 17
- *Contaminated Site Regulations (2006)*

BASELINE DATA

- The site is registered under the *Mines Safety and Inspection Act 1994* through the Safety Division of Department of Mines Industry Regulation and Safety.
- Eco Logical Australia (ELA) 2013. Targeted Flora and Fauna Assessment Lot 4 Flynn Drive Neerabup Prepared for CoW. April 2013.
- Natural Area Consulting Management Services, 2020, Neerabup Weed Mapping – Lot 9003 and Lot 600
- Ecoscape, 2018, Final Kangaroo Survey Neerabup
- Ecoscape, 2019, Black Cockatoo Habitat Survey Report – Neerabup Industrial Area and Offset Sites
- Terrestrial Ecosystems (2018) Black Cockatoo Habitat Survey Report - Neerabup Industrial Area and Offset Sites, prepared for the City of Wanneroo, Perth.

CEMP - OBJECTIVES AND TARGETS

Nil

PMP PROJECT MANAGEMENT PLAN

- Undertake rehabilitation of the completed ground as soon as practicable.

- Reform the completed land surface to the Meridian Park design floor elevation.

CEMP	KPI's
	Nil
	Prevent unauthorised access to the Conservation Areas.

PMP	PROJECT MANAGEMENT PLAN
PMP R1.1	The amount of open ground will be minimised.
PMP R1.2	The land surface will be completed to the design floor elevations.
PMP R1.3	The final surface will be safe and geotechnically sound.

	MANAGEMENT	Responsibility	Timing	PMP ACTION AND INTERACTION
CEMP	**CEMP REQUIREMENTS**			
	Nil			.
PMP	**PROJECT MANAGEMENT PLAN**			
PMP R2.1	Minimise the amount of open ground	CC	As soon as practicable	*The completion of the final floor and cover with topsoil will be completed as soon as practicable upon completion of each stage.*
PMP R2.2	Operate the pit in stages.	CC	As required	*The staging plan will be adhered to unless modified in conjunction with the CoW.*
PMP R2.3	Rehabilitate completed areas as soon as practicable	EMR	As soon as practicable but no later than 6 months	*Complete the closure as outlined above.*
PMP R2.4	Complete the final floor to the design elevations for Meridian Park.	CC	As soon as practicable but no later than 6 months	*Complete the closure as outlined above.*
PMP R2.5	Provide that all batter slopes comply with the *Mines Inspection and Safety Act 1994* and DMIRS Guidelines	CC	At all times	*This forms part of UR normal operational procedures and site safety requirements under the Mines Safety and Inspection Act.* *DMIRS will periodically inspect the operations from a safety perspective.*
PMP R2.6	Provide the excavated floor in a geotechnically sound condition to the requirements of the CoW. Backfilled areas are to be completed in compacted lifts of 300 – 500 mm or as determined by a geotechnical engineer.	CC	On completion of each stage	*This forms part of UR normal operational procedures and site safety requirements under the Mines Safety and Inspection Act.*

				DMIRS will periodically inspect the operations at closure from a safety perspective.
PMP R2.7	Provide a cover of topsoil and mulch to the final floor where available.	CC	On completion of each stage	
	MONITORING			
CEMP	**CEMP**			
	Nil			
PMP	**PROJECT MANAGEMENT PLAN**			
PMP R3.1	Visually inspect each stage for closure requirements	EMR CC	Monthly	*If excess ground is open institute closure where possible.*
	Survey the final floor elevations	CC	At the end of each stage	*Survey will verify the elevation of the land and compliance with the design contours of Meridian Park*
	Provide geotechnical testing and verification of backfilled areas.	CC	During backfill and at the end of each stage	*Testing will be undertaken progressively as the ground is backfilled in compacted lifts.*
	CONTINGENCY AND CORRECTIVE ACTIONS			
INCIDENT	**CORRECTIVE ACTION**	EMR CC	As soon as practicable.	*Provide the testing and further earthworks as required.*
The final surface does not meet geotechnical requirements	Provide additional compaction.			
	Remove and relay the compacted layers.			
The final floor does not match the elevations of the Meridian	Reform the surface to achieve compliance.	EMR	As soon as	*Provide surveys by a licensed surveyor\ and reform*

Park design.	Provide additional surveys as required	CC	practicable	*the land surface.*
	REPORTING			
PMP	**PROJECT MANAGEMENT**			
PMP R4.1	Report the geotechnical results and survey plans to the CoW at the end of each stage.	CC	End of each stage	

Inherent Risk						Residual Risk				
Factor	Environmental Objective	Potential Environmental Impact	Inherent Consequence	Inherent Likeli hood	Inherent Ranking	Proposed Management	Reference	Residual Consequ ence	Residual Likeli hood	Residual Ranking

23.0 ENVIRONMENTAL RISK ASSESSMENT

LAND										
Flora	To maintain representation, diversity, viability and ecological function at the species, population and community level.	Vegetation communities and/or biodiversity may be significantly impacted by clearing, and degradation by weeds and dieback.	Moderate	Possible	H - 13	The vegetation on site is generally *Banksia* Woodland and varies from Good to Degraded. Clearing Permit 6359/3 is ion place to cover clearing of the whole resource. Offsets have been organised by the CoW to compensate for the clearing of the *Banksia* Woodland under State Clearing Permit and EPBC Approval.	CPS 6359/3 EPBC 2007/3479 11.0 Clearing, CEMP, CAMP	Moderate	Unlikely	M - 9
		Threatened or Priority Communities may be impacted by inadvertent impacts.	Moderate	Possible	H - 13	The potential for Threatened or Priority Communities was considered by the Commonwealth and State and offsets provided by the CoW. *Banksia* Woodland is listed as a Threatened Ecological Community by the Commonwealth.	CPS 6359/3 EPBC 2007/3479 11.0 Clearing, CEMP, CAMP	Moderate	Unlikely	M - 9
		Threatened or Priority Species may be impacted by inadvertent impacts.	Minor	Possible	M - 8	The potential for Threatened or Priority species was considered by the Commonwealth and State and offsets provided by the CoW.	CPS 6359/3 EPBC 2007/3479 11.0 Clearing, CEMP, CAMP	Minor	Rare	L - 9
		Weeds may become established and impact on the local and on site	Moderate	Likely	M - 12	A weed management program is proposed. The western portion of the site has previously been cleared to	13.0 Weeds and Dieback	Moderate	Unlikely	M - 9

Inherent Risk						Residual Risk				
Factor	Environmental Objective	Potential Environmental Impact	Inherent Consequence	Inherent Likeli hood	Inherent Ranking	Proposed Management	Reference	Residual Consequ ence	Residual Likeli hood	Residual Ranking
		biodiversity				vegetation and has partially regrown. It contains significant vegetation and other exotic species. The remainder of the site has much lower numbers of exotic species.				
		Dieback disease may be present and impact on the local and onsite vegetation.	Minor	Likely	M - 12	Dieback management procedures are proposed for all operations. Currently the site is assessed as Dieback Free.	13.0 Weeds and Dieback	Minor	Unlikely	L - 5
		The developments may fragment communities, biodiversity and ecological linkages.	Moderate	Likely	H - 17	The potential for biodiversity fragmentation was considered by the Commonwealth and State and offsets provided	CPS 6359/3 11.0 Clearing, CEMP, CAMP	Moderate	Rare	M - 6
Landforms	To maintain the variety, integrity, ecological functions and environmental values of landforms and soils.	The local landform may be altered to a form that is not compatible with the surrounding geomorphology.	Minor	Unlikely	L - 5	The site adjoins an approved limestone pit and has been earmarked for industrial land use. The edges of the excavated surface will match and be sympathetic with the adjoining land uses.	Attached Figures and concept sections 11.0 Clearing, CEMP, CAMP	Minor	Unlikely	L - 5
		The final land surface should be fit for its required end use.	Minor	Unlikely	L - 5	The site will be stabilised by re-spreading the topsoil with potentially some spray mulch is needed to stabilise the site in preparation for an industrial precinct.	21.0 Closure and Final Surface	Minor	Unlikely	L - 5
		The development and final landform will not lead to significant visual impacts,	Minor	Unlikely	L - 5	The site adjoins an approved limestone pit and has been earmarked for industrial land use. The edges of the excavated surface will match and be sympathetic with the adjoining land uses.	20.0 Visual Management	Minor	Unlikely	L - 5
		The final landform and soils	Moderate	Unlikely	M - 9	The excavation operations are designed to minimise	18.0	Moderate	Rare	M - 6

Inherent Risk						Residual Risk				
Factor	Environmental Objective	Potential Environmental Impact	Inherent Consequence	Inherent Likelihood	Inherent Ranking	Proposed Management	Reference	Residual Consequence	Residual Likelihood	Residual Ranking
		may be subject to erosion by wind, water or other processes.				erosion.	Hydrology and Water Quality Management			
		The project has been assessed for karst features and has been designed to mitigate impacts on known features and features that may potentially be present.	NA	NA		There is no evidence of karst features and none observed in the adjoining limestone pit to the west.	NA	NA		
Subterranean Fauna	To maintain representation, diversity, viability and ecological function at the species, population and assemblage level.	The development may have an impact on an isolated population of subterranean fauna.	NA	NA		See above	NA	NA		
		The development may fragment subterranean communities.	NA	NA		See above	NA	NA		
		The diversity of subterranean fauna may be reduced at a population or assemblage level.	NA	NA		See above	NA	NA		
		The final formed structures may not support continued subterranean fauna and their ecological functions.	NA	NA		See above	NA	NA		

Inherent Risk						Residual Risk				
Factor	Environmental Objective	Potential Environmental Impact	Inherent Consequence	Inherent Likeli hood	Inherent Ranking	Proposed Management	Reference	Residual Consequ ence	Residual Likeli hood	Residual Ranking
Terrestrial Environment Quality	To maintain the quality of land and soils so that the environment values, both ecological and social, are protected.	At the end of excavation the created soils should be deep enough or of sufficient quality to be sustainable to meet the long term end use or ecological values.	NA	NA		The site adjoins an approved limestone pit and has been earmarked for industrial land use. The edges of the excavated surface will match and be sympathetic with the adjoining land uses. The loss of biodiversity has been considered by the State and Commonwealth with the approval of the offsets and the issue of permission to clear.	Clearing permissions CPS 6359/3 EPBC 2007/3479 11.0 Clearing, CEMP, CAMP	NA	NA	
		The area of potential impacts will not impact on essential or desirable land uses.	Moderate	Unlikely	M - 9	See above. The surrounding land is already being developed to industrial land uses. This site forms a portion of a larger industrial precinct.	Aerial photography	Moderate	Low	M - 6
		The development will not adversely impact an area identified as having high agricultural or community values.	NA	NA		See above. There is no significant agricultural land quality. The sands are leached white and yellow sand. The land has already been earmarked for industrial land use.		NA	NA	
		Acid soils are not exposed or are managed to ensure that there are no long term adverse effects.	NA	NA		There is no evidence of acid sulfate conditions. There is no evidence of acid sulfate conditions. The site is elevated and the floor will be at least 6 metres above the water table.	18.0 Hydrology and Water Quality Management Talis 2017.	NA	NA	

Inherent Risk						Residual Risk				
Factor	Environmental Objective	Potential Environmental Impact	Inherent Consequence	Inherent Likeli hood	Inherent Ranking	Proposed Management	Reference	Residual Consequ ence	Residual Likeli hood	Residual Ranking
						No evidence of acid sulfate conditions were found during the drilling by Talis.				

Inherent Risk						Residual Risk				
Factor	Environmental Objective	Potential Environmental Impact	Inherent Consequence	Inherent Likeli hood	Inherent Ranking	Proposed Management	Reference	Residual Consequ ence	Residual Likeli hood	Residual Ranking
Terrestrial Fauna	To maintain representation, diversity, viability and ecological function at the species, population and assemblage level.	Communities and fauna and/or biodiversity may be significantly impacted by clearing, and degradation by weeds and dieback.	Minor	Possible	M - 8	The vegetation on site is generally *Banksia* Woodland and varies from Good to Degraded. Clearing Permit 6359/3 is in place to cover clearing of the whole resource. Fauna values were considered during the applications to clear. The key risk was Black Cockatoo habitat, but this has been offset through the Clearing Permit and EPBC Approval and detailed in the CEMP and CAMP. Offsets have been organised by the CoW to compensate for the clearing of the *Banksia* Woodland under State Clearing Permit and EPBC Approval.	CPS 6359/3 EPBC 2007/3479 11.0 Clearing, CEMP, CAMP 14.0 Black Cockatoo – Fauna Management	Minor	Unlikely	L - 5
		Threatened Faunal Communities may be impacted by inadvertent impacts.	Minor	Possible	M - 8	See above.	CPS 6359/3 EPBC 2007/3479 14.0 Black Cockatoo – Fauna Management	Minor	Unlikely	L - 5
		Priority Fauna species may be affected by clearing, disturbance, weeds	Minor	Possible	M - 8	See above. Black Cockatoo habitat has been considered in the Clearing Permits, the EPBC approval and within the CEMP and CAMP.	CPS 6359/3 EPBC 2007/3479 14.0 Black Cockatoo –	Minor	Unlikely	L - 5

Inherent Risk						Residual Risk				
Factor	Environmental Objective	Potential Environmental Impact	Inherent Consequence	Inherent Likeli hood	Inherent Ranking	Proposed Management	Reference	Residual Consequ ence	Residual Likeli hood	Residual Ranking
							Fauna Management			
		Threatened Fauna Species may be impacted by inadvertent impacts.	Minor	Possible	M - 8	See above. Black Cockatoos are listed as a Threatened species under the Commonwealth *EPBC Act 1999*. Black Cockatoo habitat has been considered in the Clearing Permits, the EPBC approval and within the CEMP and CAMP.	CPS 6359/3 EPBC 2007/3479 14.0 Black Cockatoo – Fauna Management	Minor	Unlikely	L - 5

Inherent Risk						Residual Risk				
Factor	Environmental Objective	Potential Environmental Impact	Inherent Consequence	Inherent Likelihood	Inherent Ranking	Proposed Management	Reference	Residual Consequence	Residual Likelihood	Residual Ranking
WATER										
Hydrological Processes	To maintain the hydrological regimes of groundwater and surface water so that existing and potential uses, including ecosystem maintenance, are protected.	The ecological functions of watercourses are to be maintained.	NA	NA		There is no surface water. The sand and limestone is too permeable.	18.0 Hydrology and Water Quality Management	NA	NA	
		Groundwater may be impacted by changes to recharge, over-pumping, alterations to flow paths or lead to significant evaporation and water loss.	Minor	Unlikely	L - 5	No adverse impacts on water are recorded from the past operations and none are likely. The project complies with the DWER Guidelines for Extractive Industries, 2019. Extensive fuel and fluid management is used and will be continued. Talis 2017 conducted detailed drilling and hydrogeological Studies.	18.0 Hydrology and Water Quality Management.	Minor	Unlikely	L - 5
		Wetlands may be altered by draining or flooding, potentially changing their ecological functions and biodiversity.	Insignificant	Rare	L - 1	There are no on site or nearby wetlands	18.0 Hydrology and Water Quality Management	Insignificant	Rare	L - 1
Inland Waters Environmental Quality	To maintain the quality of groundwater and surface water, sediment and biota so that the environmental values, both ecological and social, are protected.	Hydrocarbons, fuels and other chemicals are stored in a manner that they pose no risk to the environment.	Minor	Possible	M - 8	Extensive fuel and hydrocarbon management programs are proposed. A Waste inventory found no potentially adverse materials. There are no proposed changes to the methods of operation.	18.0 Hydrology and Water Quality Management	Minor	Rare	L - 3
		Runoff from operations is contained and all water is either retained or treated to removed sediment and any	Insignificant	Unlikely	L - 2	All water is to be retained on site in the base of the pit because of the permeability of the sand and limestone.	18.0 Hydrology and Water Quality Management	Insignificant ant	Rare	L - 1

Inherent Risk						Residual Risk				
Factor	Environmental Objective	Potential Environmental Impact	Inherent Consequence	Inherent Likeli hood	Inherent Ranking	Proposed Management	Reference	Residual Consequ ence	Residual Likeli hood	Residual Ranking
		deleterious materials.				Deleterious materials will be removed.				
		Water quality during and after development and operations is not adversely affected or altered.	Minor	Unlikely	L - 5	See above	18.0 Hydrology and Water Quality Management	Minor	Rare	L - 3

Inherent Risk						Residual Risk				
Factor	Environmental Objective	Potential Environmental Impact	Inherent Consequence	Inherent Likelihood	Inherent Ranking	Proposed Management	Reference	Residual Consequence	Residual Likelihood	Residual Ranking
AIR										
Air Quality	To maintain air quality for the protection of the environment and human health and amenity.	Dust emissions are minimised or controlled to ensure that the local amenity is protected.	Moderate	Possible	H - 13	The operations comply with the EPA generic buffers. The closest dwelling is 1500 metres. The Dust Assessment is provided and shows that dust can be readily managed.	15.0 Erosion and Dust Management	Moderate	Rare	M - 6
		Dust emissions will not significantly impact on local and on site personnel health or quality of life.	Moderate	Possible	H - 13	Sand and limestone quarrying must comply with the *Mines Safety and Inspection Act* for Health and Safety. Officers from the Department of Mines, Industry Regulation and Safety (DMIRS) will regularly inspect the site and the site must be registered under the DMIRS Safety Regulation System (SRS) system. If occupational dust levels are low, then environmental dust levels will be low. The greatest risk is from the clearing and reinstatement of dry topsoil, crushing and screening limestone and quarry traffic. Dust management is proposed for those situations.	15.0 Erosion and Dust Management	Moderate	Rare	M - 6
		Noise levels will comply with the *Environmental Protection (Noise) Regulations 1997.*	Minor	Unlikely	L - 5	Noise levels will comply with *Environmental Protection (Noise) Regulations 1997.* The operations are designed to minimise on site noise and the potential for offsite noise. The operations comply with the EPA generic buffers. The closest dwelling is 1 500 metres. A Noise Management Plan is provided.	16.0 Noise Management	Minor	Rare	L - 3
		Noise levels and operational procedures will be used to protect	Moderate	Possible	H - 13	Sand and limestone quarrying must comply with the *Mines Safety and Inspection Act* for Health and Safety. Officers from the DMIRS will regularly inspect the site	16.0 Noise Management	Moderate	Rare	M - 6

Inherent Risk						Residual Risk				
Factor	Environmental Objective	Potential Environmental Impact	Inherent Consequence	Inherent Likelihood	Inherent Ranking	Proposed Management	Reference	Residual Consequence	Residual Likelihood	Residual Ranking
		on site personnel health and safety.				and the site must be registered under the DMIRS SRS system. DMIRS and UR will undertake routine occupational noise assessments.				
		Emissions gases and other materials potentially adverse to human health will not be used or will be managed.	Minor	Possible	M - 8	There are no gaseous or other potential harmful emissions from the operations.	NA	Minor	Possible	L - 6
		Potential impacts from blasting will comply with the *Environmental Protection (Noise) Regulations 1997* and guidelines for ground vibration.	Insignificant	Rare	L - 1	Blasting is unlikely but might be used to produce limestone armour rock. That type of blasting is called "popping" because it just splits the larger rock	5.0 Project Description	Insignificant	Rare	L - 1
		Employ procedures and design the operations to minimise the risk of excessive greenhouse emissions.	Minor	Possible	M - 8	The operations are designed to minimise fuel use and transport routes.		Minor	Possible	M - 8
Heritage	To ensure that historical and cultural associations are not adversely affected.	Known aboriginal heritage sites will be protected.	Moderate	Unlikely	M - 9	There are no known aboriginal sites on the DAA database. The site is significantly disturbed. A commitment is made to stop and assess any site if uncovered. Heritage sites uncovered during operations will be independently assessed and managed through communication with the community, Government and traditional owners.		Moderate	Rare	M - 6
		Sites of European heritage will be protected.	Minor	Rare	L - 3	None known. The site is significantly disturbed.		Minor	Rare	L - 3

Inherent Risk						Residual Risk				
Factor	Environmental Objective	Potential Environmental Impact	Inherent Consequence	Inherent Likeli hood	Inherent Ranking	Proposed Management	Reference	Residual Consequ ence	Residual Likeli hood	Residual Ranking
Human Health Amenity	To ensure that human health is not adversely affected.	Human health is protected from adverse impacts of dust, noise, other emissions and chemicals.	Moderate	Unlikely	M - 9	Sand quarrying must comply with the *Mines Safety and Inspection Act* for Health and Safety. Officers from the DMIRS will regularly inspect the site and the site must be registered under the DMIRS SRS system. Medium to coarse silica sand grains have no known health risks.	6.0 Safety	Moderate	Rare	M - 6
	Transport routes and operations are designed to minimise local impacts	Transport may impact on local, and regional roads or school bus routes.	Major	Possible	H - 18	Transport is along the existing access road on Mather Drive and also along Pederick Road, to Flynn Drive or Old Yanchep Road.	5.7 Access and Transport. *Moro 2019 Transport Management Plan*	Minor	Unlikely	L - 5
	Local Amenity – Visual Impact	The operations have been designed to provide sufficient buffers and visual protection.	Moderate	Possible	H - 13	With the design of the pit, methods of extraction and working on the floor of the pit from inside – any visual impact will be minimised or negated.	20.0 Visual Management	Moderate	Unlikely	M - 9

Inherent Risk						Residual Risk				
Factor	Environmental Objective	Potential Environmental Impact	Inherent Consequence	Inherent Likelihood	Inherent Ranking	Proposed Management	Reference	Residual Consequence	Residual Likelihood	Residual Ranking
INTEGRATING FACTORS										
Offsets	To counterbalance any significant residual environmental impacts or uncertainty through the application of offsets	Offsets are provided as necessary to reduce or mitigate the impacts on the development and operation of the project.	Major	Possible	H - 18	If any offsets are required they will be related to vegetation and cockatoo habitat, which is minimal and will be dealt with under the Clearing Permit Application. Considered during the assessments for the permissions to clear from the Commonwealth and State.	CPS 6359/3 EPBC 2007/3479 CEMP, CAMP	Major	Rare	M - 10
		Offsets are used to enhance the local environment, habitats, biodiversity and other identified factors.	Major	Possible	H - 18	See above	CPS 6359/3 EPBC 2007/3479 CEMP, CAMP	Major	Rare	M _ 10
Rehabilitation and Closure	To ensure that premises are closed, decommissioned and rehabilitated in an ecologically sustainable manner, consistent with agreed outcomes and land uses, and without unacceptable liability to the State	All infrastructure, roads, hardstand, non natural materials are to be removed from site progressively when not required and all removed at the end of the project.	Moderate	Possible	H - 13	All infrastructure will be removed and the site prepared for industrial development. The land is owned by the CoW and will be returned to the concept final contour plan for the industrial land.	21.0 Closure and Final Surface	Moderate	Rare	M - 6
		No materials are to be left on site that may cause long term detrimental outcomes in terms of impacts to soils, water, heritage, vegetation health or other factors.	Moderate	Possible	H - 13	All materials, equipment and plant associated with their operations will be removed at the end of excavation.	21.0 Closure and Final Surface	Moderate	Rare	M - 6
		All contaminated materials are to be removed from site prior to closure.	Minor	Possible	M - 9	There are no contaminating materials apart from fuel and lubricants. Commitments are made to do this. Contingencies are in place. Extensive fuel and hydrocarbon management	18.0 Hydrology and Water Quality Management	Minor	Rare	L - 3

Inherent Risk						Residual Risk				
Factor	Environmental Objective	Potential Environmental Impact	Inherent Consequence	Inherent Likelihood	Inherent Ranking	Proposed Management	Reference	Residual Consequence	Residual Likelihood	Residual Ranking
						programs are proposed. A Waste inventory found no potentially adverse materials. There are no proposed changes to the methods of operation.				
		Soils are reconstructed to be able to sustain an ecological sustainable vegetation or other cover consistent with the end use and long term proposal for the site.	NA	NA		Topsoil and overburden will be retained for rehabilitation and soil reconstruction to sand and limestone suitable for an industrial precinct.	21.0 Closure and Final Surface	NA	NA	
		Weed levels are not to cause significant impacts on revegetation.	Moderate	Possible	H - 13	Managed during excavation.	13.0 Weed and Dieback	Moderate	Unlikely	M - 9
		Ongoing monitoring of the rehabilitation will be conducted to ensure that any areas not meeting completion criteria are added to or replaced as necessary to enable the relevant criteria to be met.	Minor	Possible	M - 8	The land is owned by the CoW and will be returned to the concept final contour plan for the industrial land. The owners are part of the group who will be excavating the site.	21.0 Closure and Final Surface	Minor	Unlikely	L - 5

Inherent Risk						Residual Risk				
Factor	Environmental Objective	Potential Environmental Impact	Inherent Consequence	Inherent Likeli hood	Inherent Ranking	Proposed Management	Reference	Residual Consequ ence	Residual Likeli hood	Residual Ranking
OTHER FACTORS										
Resource Requirements	Basic Raw Materials are required for continued use by the community and for future developments.	There is significant basic raw material on site that is suitable for community resources.	Major	Possible	H - 18	The site is nominated in Geological Survey of WA as a part of a Significant resource.	2.0 Planning Assessment	Major	Rare	M - 10
Planning Compliance	To comply with Government Policy, planning zones and procedures.	The project is designed to comply with State and Local Planning requirements.	Moderate	Unlikely	M - 9	Complies with Government Policies	2.0 Planning Assessment	Moderate	Rare	M - 6
Community Consultation	To provide a community consultation process commensurate with the size nature and time line of the project.	Community consultation will be handled by community input within the application and assessment phases, through direct community consultation as required and contact numbers being displayed at the entrance. An "Open Door Policy" is used to enable ongoing dialogue between the operator and the community.	Moderate	Unlikely	M - 9	The project will be advertised to the community during the assessment by the CoW, the Clearing Permit, EPBC approval and during the application for the DWER Licence.		Moderate	Rare	M - 6
		An effective complaints procedure is provided, combined with effective remedial procedures.	Moderate	Possible	H - 13	A complaints procedure is proposed.	15.0 Erosion and Dust Management.	Moderate	Rare	M - 6
Safety	To ensure that the project provides high levels of safety to on site personnel and the	Ensure that the project provides high levels of safety to on site personnel.	Moderate	Possible	M - 9	Sand and limestone quarrying must comply with the *Mines Safety and Inspection Act* for Health and Safety. Officers from the DMIRS will regularly inspect the site and the site must be registered under the DMIRS SRS	6.0 Safety	Moderate	Rare	M - 6

Inherent Risk						Residual Risk				
Factor	Environmental Objective	Potential Environmental Impact	Inherent Consequence	Inherent Likelihood	Inherent Ranking	Proposed Management	Reference	Residual Consequence	Residual Likelihood	Residual Ranking
	community					system. The operations are required to be registered under the DMIRS SRS system. Fire and safety management systems are part of the DMIRS SRS Project Management Plan.				
		Ensure that potential impacts are retained on site and do not cause significant risk of safety to the local and wider community.	Minor	Possible	M - 8	The site is to be secured and installed with locked gates and will be no different the adjoining limestone and sand pit to the west.	6.0 Safety	Minor	Rare	L - 3
Geotechnical Integrity	To ensure that all ground and geological materials is safe commensurate with the operations and final land surface.	The operational and final land surfaces will be made safe and not subject to subsidence, slippage or other adverse conditions.	Moderate	Unlikely	M - 6	The operations are designed to comply and operate to the *Mines Safety and Inspection Act 1994.* The land is owned by the CoW and will be returned to the concept final contour plan for the industrial land.		Moderate	Rare	M - 6
		The quarry and operations will comply with the *Mines Safety and Inspection Act 1994.*	Moderate	Unlikely	M - 9	UR are committed to complying with the relevant Acts and Regulations. The pit is to be regularly inspected by officers from the DMIRS Safety Division.		Moderate	Rare	M - 6
		The operational and final surfaces and features are designed to be not affected by extreme climate or weather events.	Minor	Unlikely	L - 5	The end use will be interim vegetation until developed as an Industrial precinct.	18.0 Hydrology and Water Quality Management	Minor	Rare	L - 3

Inherent Risk						Residual Risk				
Factor	Environmental Objective	Potential Environmental Impact	Inherent Consequence	Inherent Likeli hood	Inherent Ranking	Proposed Management	Reference	Residual Consequ ence	Residual Likeli hood	Residual Ranking

Effect / Consequence

		1	2	3	4	5
Type		Insignificant	Minor	Moderate	Major	Severe
Environmental Impact		No discernible, adverse impact, individuals of species may be affected locally.	Discernible effect on the environment but no adverse impact, minor number of individuals of species may be affected locally	Minor adverse effect to the environment (including public amenity), moderate loss of individuals of species locally.	Moderate damage to ecosystem function, major loss of individuals of species locally, loss of public amenity.	Significant long-term damage/loss to ecosystem function, extinction of a species locally
Likelihood	**A Almost Certain**	Likely that the unwanted event could occur often (once per week) during the life of an individual item or system	Medium **11**	High **16**	High **20**	Very High **23**	Very High **25**
	B Likely	Likely that the unwanted event could occur several times per year during the life of an individual item or system.	Medium **7**	Medium **12**	High **17**	High **21**	Very High **24**
	C Possible	Likely that the unwanted event could occur sometime (once per year) during the life of an individual item or system.	Low **4**	Medium **8**	High **13**	High **18**	High **22**
	D Unlikely	Unlikely, but possible for the unwanted event to occur once in the life of an individual item or system.	Low **2**	Low **5**	Medium **9**	High **14**	High **19**
	E Rare	Highly unlikely that the unwanted event could ever occur in the life of an individual item or system.	Low **1**	Low **3**	Medium **6**	Medium **10**	High **15**

Figure 117: Local area around Lot 9003 Mather Drive

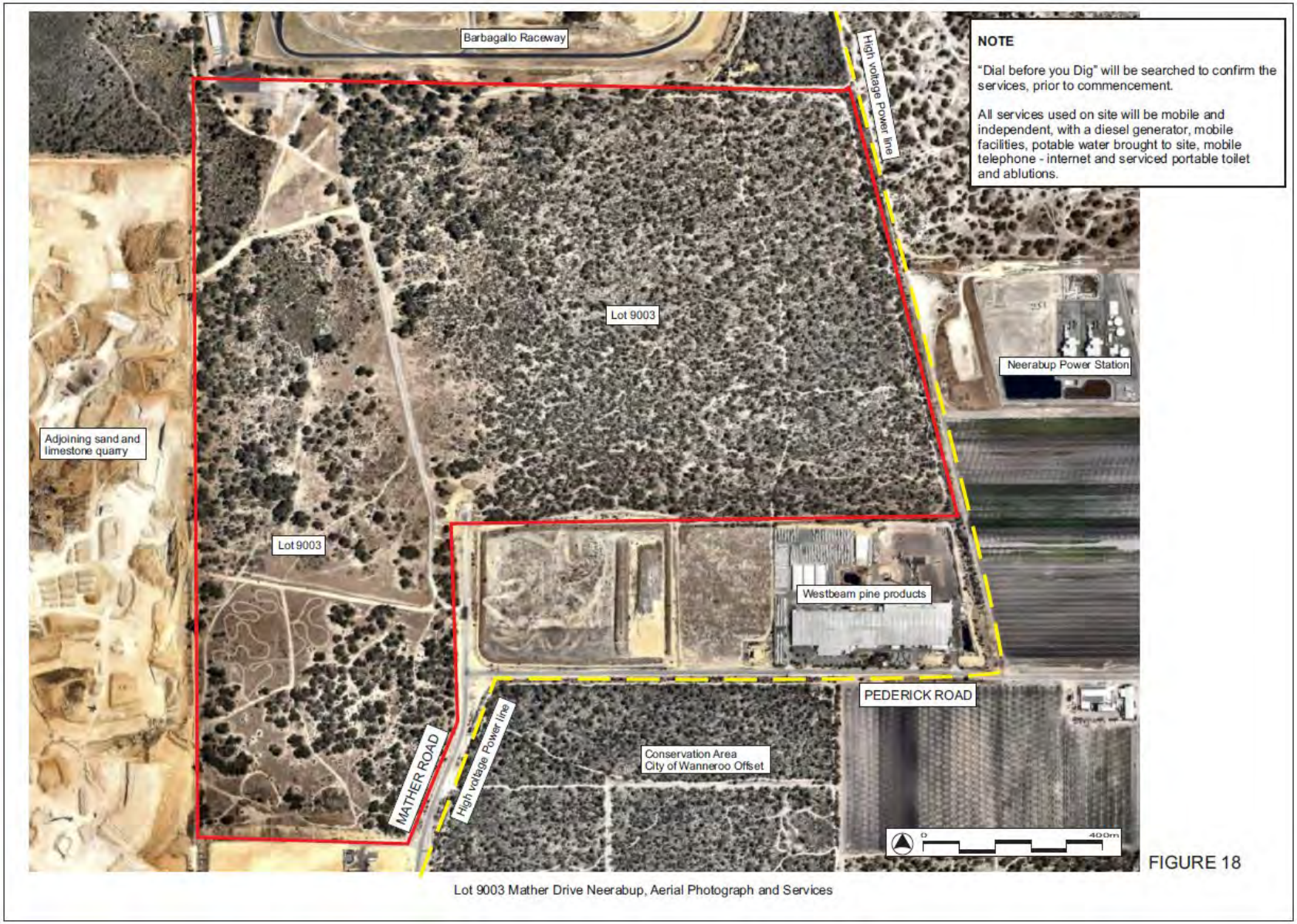


Figure 18: Lot 9003 Mather drive, Neerabup, aerial photograph and services

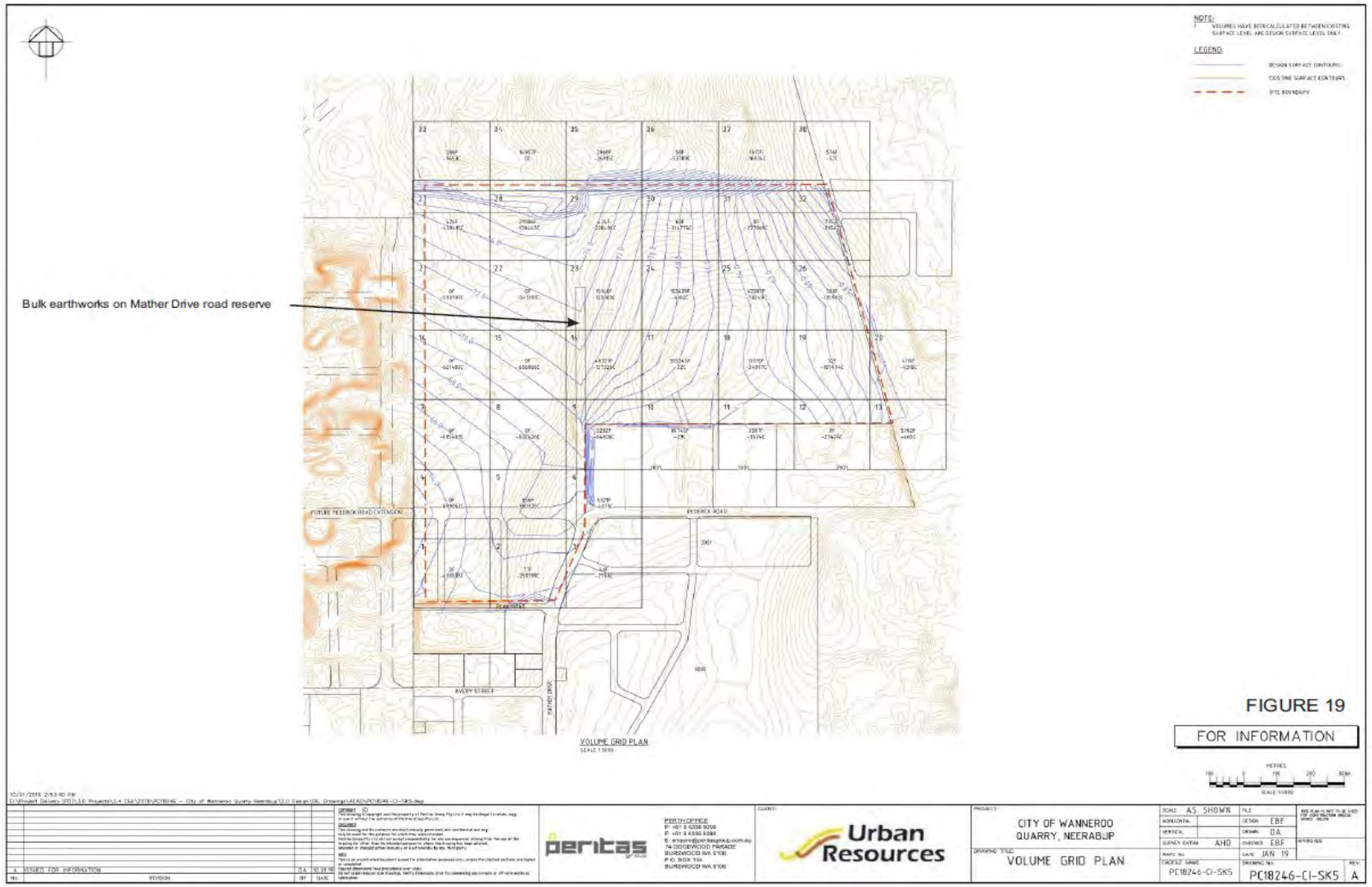


Figure 19: Existing and design floor contour plan

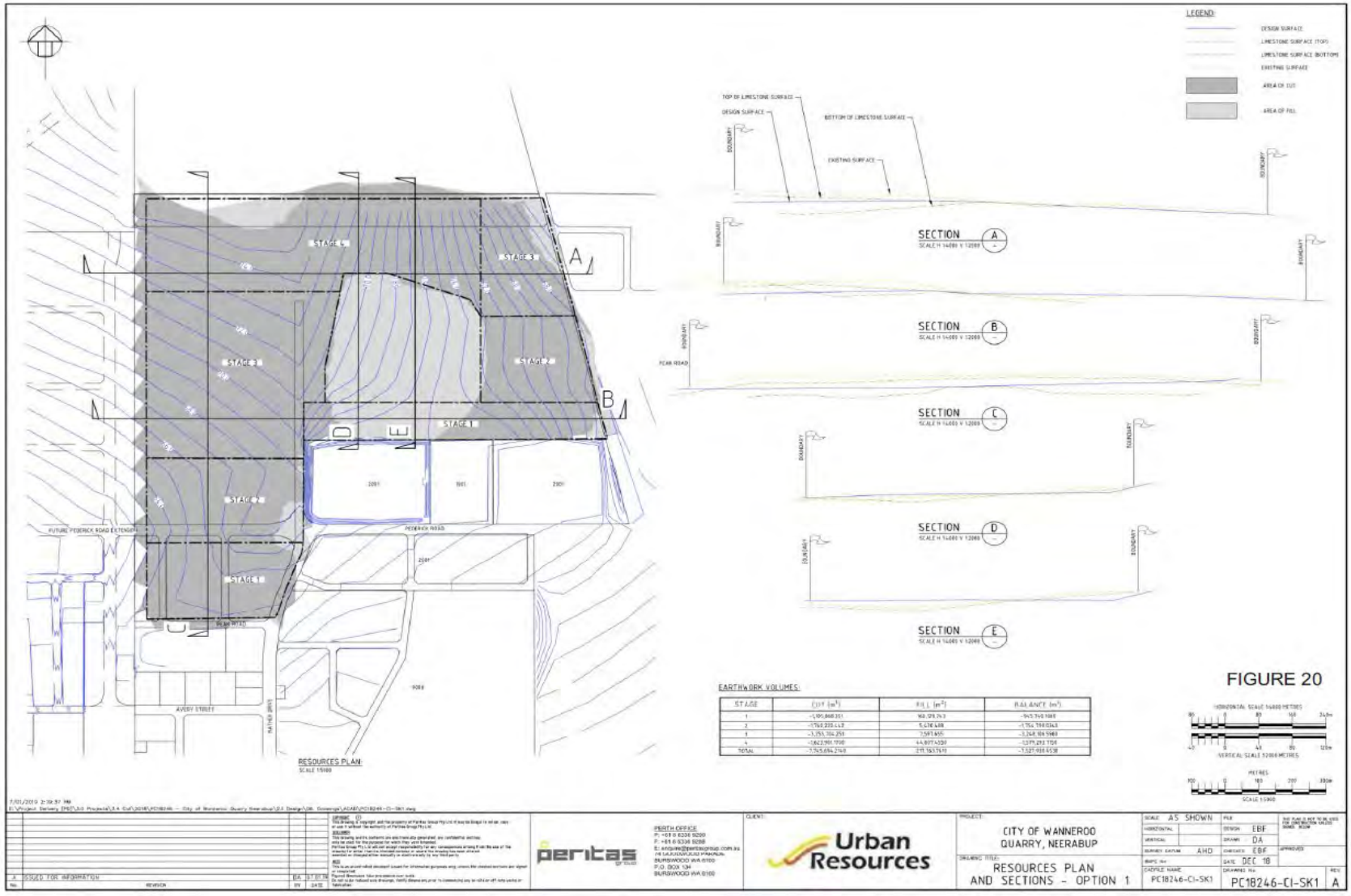


Figure 20: Section lines across the site

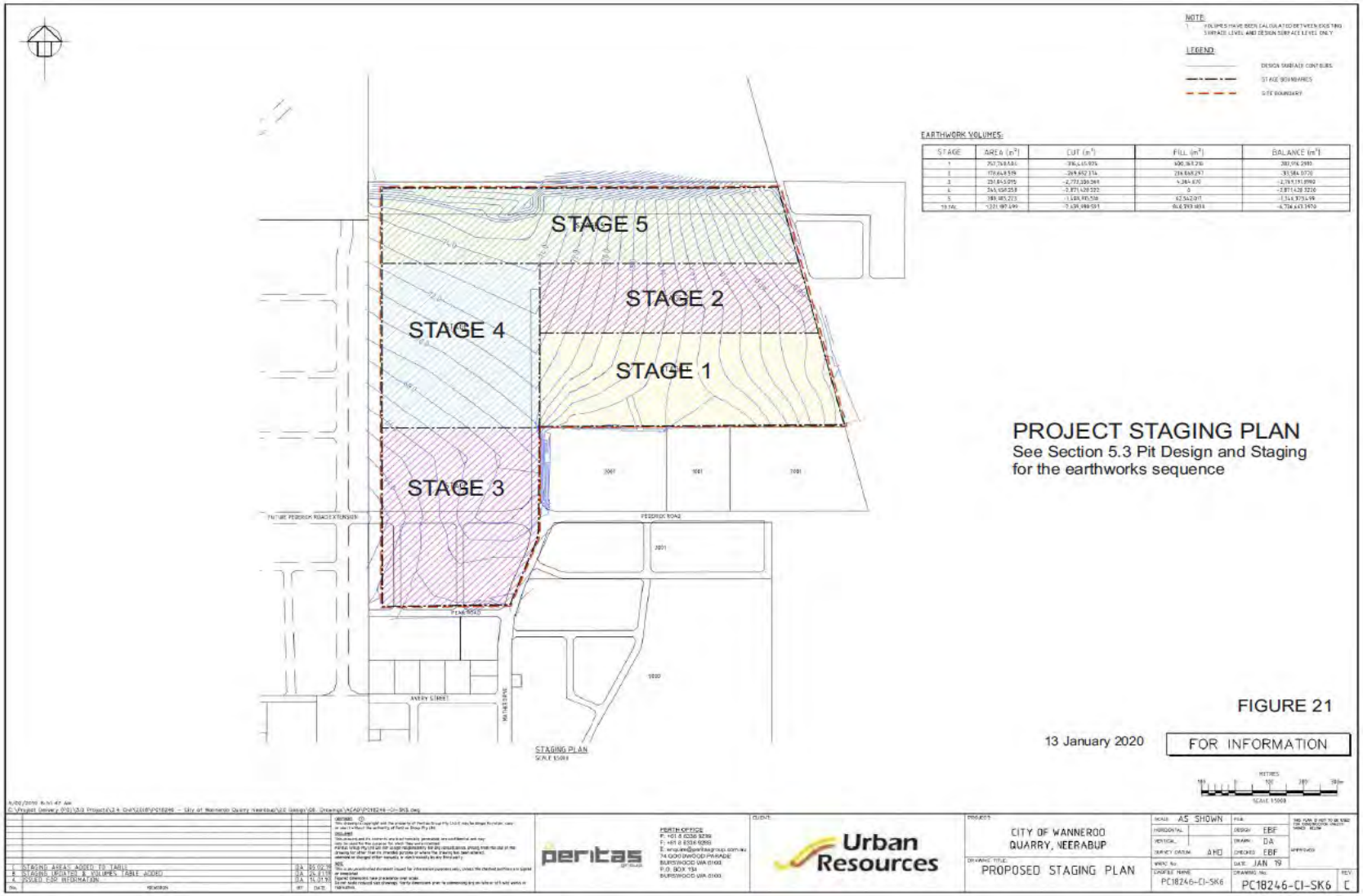


Figure 21: Project staging plan

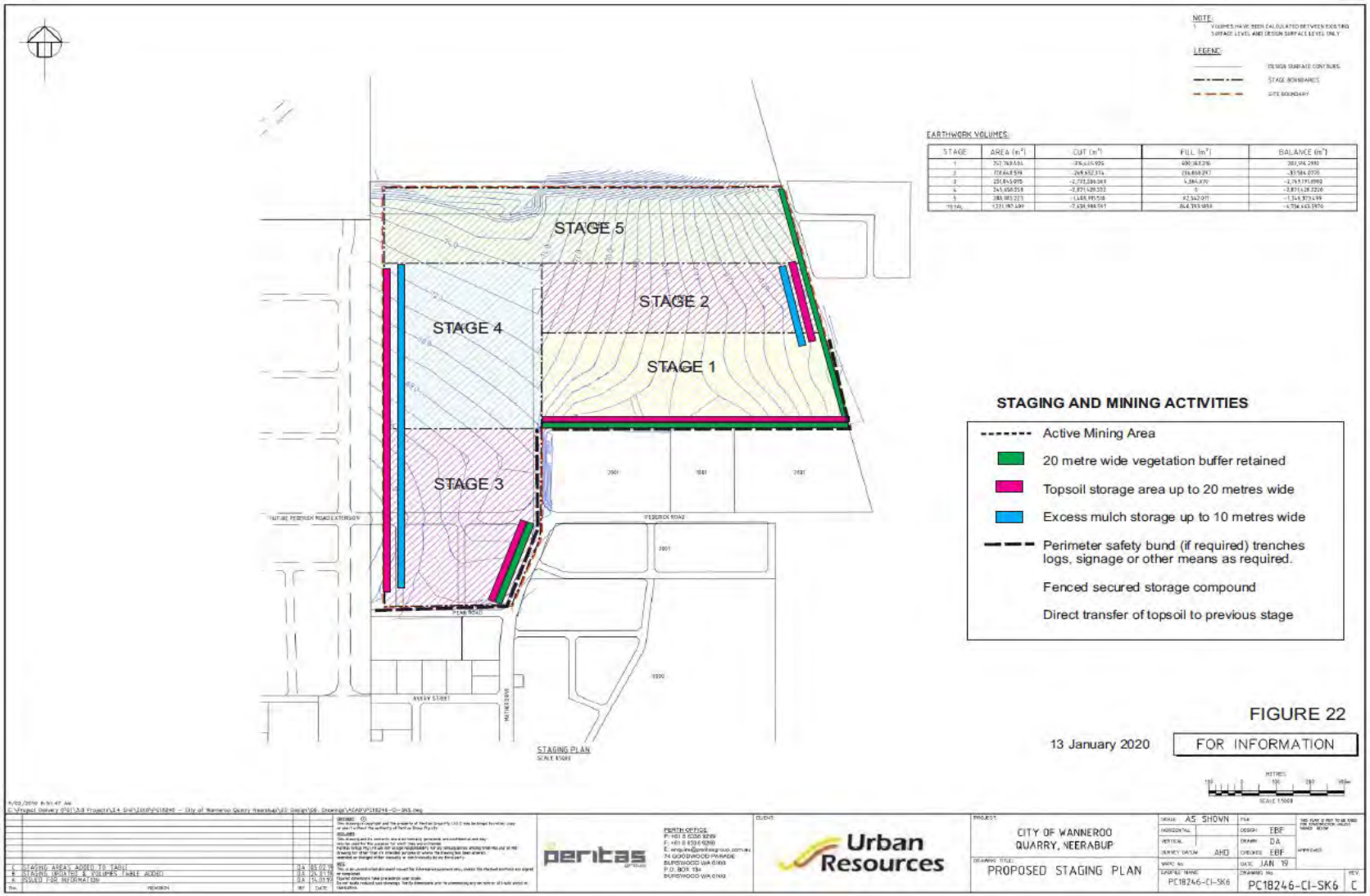


Figure 22: Staging and mining activities

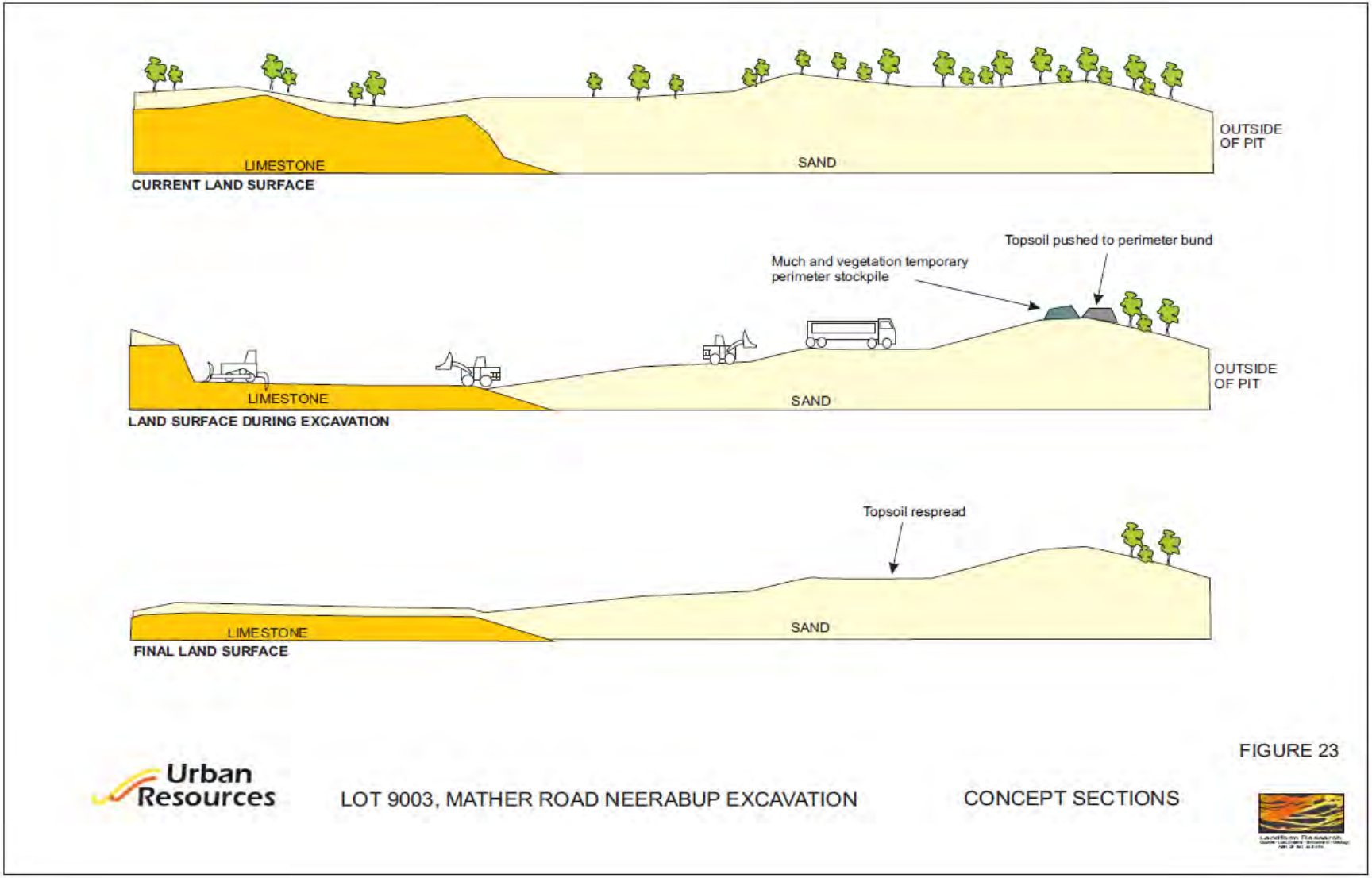


Figure 23: Concept sections

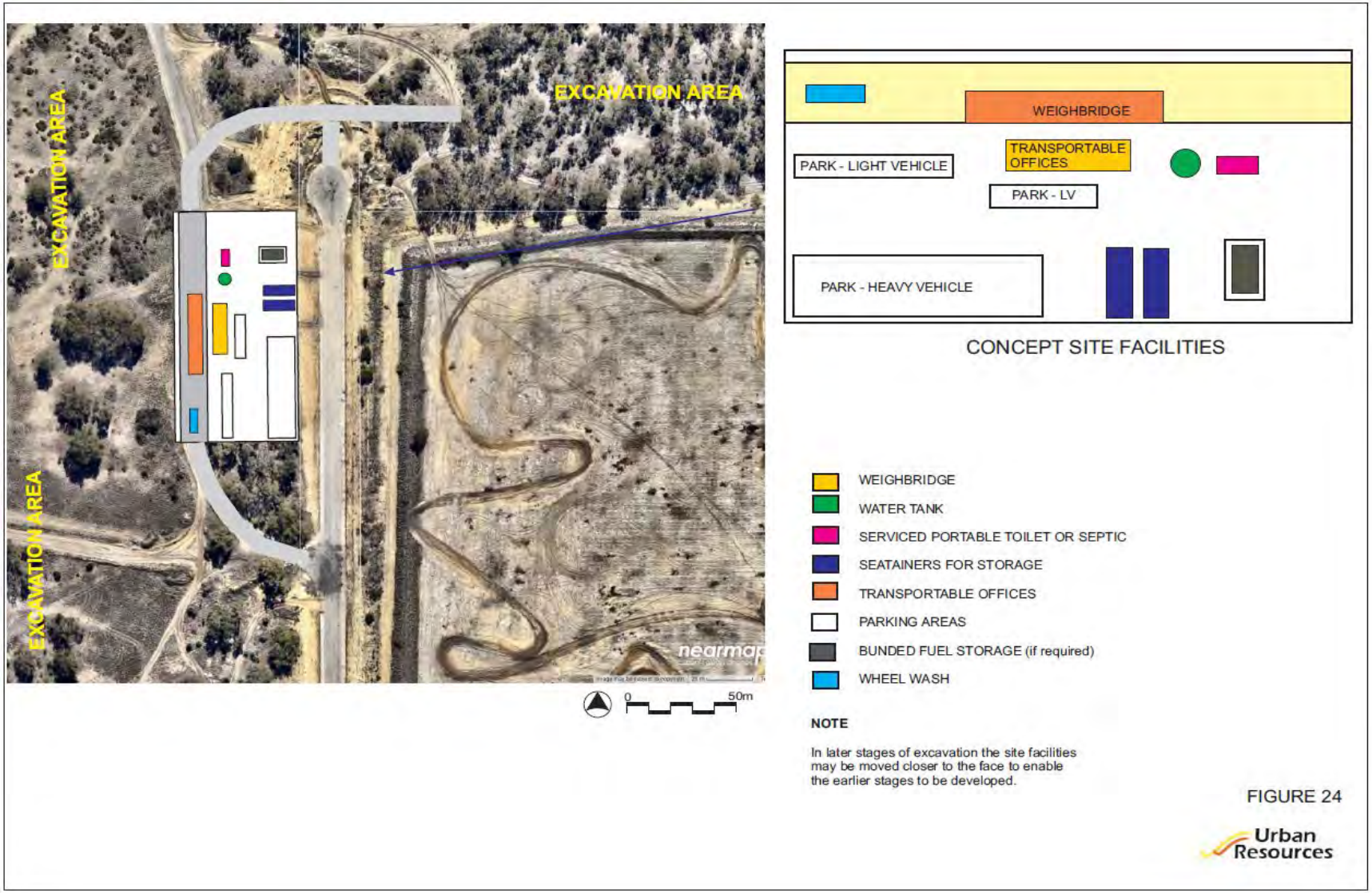


Figure 24: Concept site facilities

Figure 25: View west showing the degraded western vegetation and the existing sand and limestone quarry adjoining to the west

Figure 26: View across the site showing the more degraded western vegetation and vegetation in better condition in the east

Figure 27: Typical sand and limestone quarry to the west of Lot 9003

Figure 28: Western edge of Lot 9003 showing topsoil storage bunds and a bund of limestone

Figure 29: Typical limestone excavation on the adjoining quarry to the west

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Appendix 1

ACOUSTIC ASSESSMENT

ENVIRONMENTAL NOISE IMPACT ASSESSMENT

OF

SAND AND LIMESTONE EXTRACTIONS

AT

LOT 9003 MATHER DRIVE NEERABUP

18 June 2020

AES-890111-R01-0-18062020

Acoustic Engineering Solutions
www.acousticengsolutions.com.au

DOCUMENT CONTROL

Environmental Noise Impact Assessment

Prepared for: **Urban Resources Pty Ltd**
33 Cocos Drive
Bibra Lake WA 6163
Contact: Stephen Elliott

Prepared by: Dr. Roy Ming
Acoustic Engineering Solutions
roy.ming@acousticengsolutions.com.au
0408 944 982

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Doc NO: AES-890111-R01-0-18062020

Acoustic Engineering Solutions
ABN: 64 451 362 914

EXECUTIVE SUMMARY

Acoustic Engineering Solutions (AES) has been commissioned by Urban Resources Pty Ltd to undertake an environmental noise impact assessment for the proposed sand and limestone extractions at Lot 9003 Mather Drive Neerabup. The aim of this assessment is to determine whether or not the noise emissions from the proposed operations would comply with the Environmental Protection (Noise) Regulations 1997 (the Regulations).

An acoustic model is created, and eight worst-case operational scenarios are modelled to represent the proposed worst-case mining activities at different stages. The proposed operations are incorporated with the following noise control measures:

- The fixed plant operates at the pit floor.
- The east parts of stages 1, 2 and 5 have shallow sand deposit. For these areas, the crusher plant will not operate.
- For stage 1, the proposed topsoil bund on the southern boundary should be built at least 3m high in the west part and 3.5m in the east part.
- When mined in the eastern (one third) part of stage 1, the screening plant should be located at locations at least 100m away from the southern pit edge and 170m from the eastern pit edge (the vegetation strip).
- For the eastern (one third) part of stage 2, mining should start from west toward east. The screening plant should be located at no more than 30m behind sand face.
- For stages 3 and 4, mining should start at the middle of the pit. When mined toward east, both the crushing plant and the screening plant should be located at no more than 40m behind sand face. When mined toward west, the crushers and the screening plant should be located at no more than 70m behind sand face.
- For stage 5, it should be mined from south toward north. The crushers and the screening plant should be located at no more than 35m behind sand face. When mined close to the west pit edge, the crushers and the screening plant should also be located at no more than 70m behind the west sand face. When mined in the east part (more than 180m from the east pit edge), the crushers and the screening plant should also be located at no more than 35m behind the east sand face.

The subject site is located within the Neerabup Industrial Area. Four point receivers are selected to represent the closest workshop/office areas in the neighbouring industrial premises. Noise levels are predicted for the worst-case meteorological conditions. The predicted worst-case noise levels are adjusted for their potential tonality according to the Regulations, and then assessed against the assigned noise levels set by the Regulations. The compliance assessment concludes that full compliance is achieved for the proposed sand and limestone extractions of stages 1 to 5.

TABLE OF CONTENTS

1.0 INTRODUCTION

Urban Resources Pty Ltd (Urban Resources) proposes the sand and limestone extractions at Lot 9003 Mather Drive Neerabup. Acoustic Engineering Solutions (AES) has been commissioned by Urban Resources to undertake the environmental noise impact assessment of the proposed operations. The objective of this assessment is to determine whether or not the noise emissions from the proposed operations would comply with the Environmental Protection (Noise) Regulations 1997 (the Regulations).

The subject site is located within the Neerabup Industrial Area, as shown in Figure 1 in APPENDIX A. The extraction activities are proposed in five stages as shown in Figure 2. A 20 metre vegetation strip is reserved on the boundary shown as green in Figure 2 and 2-metre high topsoil bunds are proposed on the 20 metre vegetation strips.

The extractions will operate the following two fixed plant onsite:

- The screening plant:
  - A Finlay 683 screen; and
  - Terex FM120 plant; and
  - A 100kva Generator.
- The crushing plant:
  - A Mcloskey J50 jaw crusher; and
  - A Kleenman Evo1100 Jaw crusher; and
  - A Finlay 693 screen; and
  - Edge 24 metre stockpiling conveyor.

The fixed plant will operate at the finished levels.

The mobile equipment on site will include a Cat D10R Dozer, two Komatsu 470 Front End Loaders, a Cat 740 watercart and a Volvo 48T Excavator.

The operation hours are proposed between 6am and 6pm on Monday to Saturday excluding public holidays.

2.0 NOISE CRITERIA

Noise management in Western Australia is implemented through the Environmental Protection (Noise) Regulations 1997 (the Regulations). The Regulations set noise limits which are the highest noise levels that can be received at noise-sensitive (residential), commercial and industrial premises. These noise limits are defined as 'assigned noise levels' at receiver locations. Regulation 7 requires that "noise emitted from any premises or public place when received at other premises must not cause, or significantly contribute to, a level of noise which exceeds the assigned level in respect of noise received at premises of that kind".

Table 2-1 presents the assigned noise levels at various premises.

Table 2-1: Assigned noise levels in dB(A)

Type of Premises Receiving Noise	Time of Day	Assigned Noise Levels in dB(A)[1]		
		$L_{A\ 10}$	$L_{A\ 1}$	$L_{A\ max}$
Noise sensitive premises: highly sensitive area	0700 to 1900 hours Monday to Saturday	45 + Influencing factor	55 + Influencing factor	65 + Influencing factor
	0900 to 1900 hours Sunday and public holidays	40 + Influencing factor	50 + Influencing factor	60 + Influencing factor
	1900 to 2200 hours all days	40 + Influencing factor	50 + Influencing factor	60 + Influencing factor
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays	35 + Influencing factor	45 + Influencing factor	55 + Influencing factor
Noise sensitive premises: any area other than highly sensitive area	All hours	60	75	80
Commercial premises	All hours	60	75	80
Industrial and utility premises other than those in the Kwinana Industrial Area	All hours	65	80	90

For highly noise sensitive premises, an "influencing factor" is incorporated into the assigned noise levels. The influencing factor depends on road classification and land use zonings within circles of 100 metres and 450 metres radius from the noise receiver locations.

[1] Assigned level L_{A1} is the A-weighted noise level not to be exceeded for 1% of a delegated assessment period.
Assigned level L_{A10} is the A-weighted noise level not to be exceeded for 10% of a delegated assessment period.
Assigned level L_{Amax} is the A-weighted noise level not to be exceeded at any time.

2.1 CORRECTIONS FOR CHARACTERISTICS OF NOISE

Regulation 7 requires that that "noise emitted from any premises or public place when received at other premises must be free of:

(i) tonality;

(ii) impulsiveness; and

(iii) modulation.

when assessed under Regulation 9".

If the noise exhibits intrusive or dominant characteristics, i.e. if the noise is impulsive, tonal, or modulating, noise levels at noise-sensitive premises must be adjusted. Table 2-2 presents the adjustments incurred for noise exhibiting dominant characteristics. That is, if the noise is assessed as having tonal, modulating or impulsive characteristics, the measured or predicted noise levels have to be adjusted by the amounts given in Table 2-2. Then the adjusted noise levels must comply with the assigned noise levels. Regulation 9 sets out objective tests to assess whether the noise is taken to be free of these characteristics.

Table 2-2: Adjustments for dominant noise characteristics

Adjustment where noise emission is not music. These adjustments are cumulative to a maximum of 15 dB.			Adjustment where noise emission is music	
Where tonality is present	Where Modulation is present	Where Impulsiveness is present	Where Impulsiveness is not present	Where Impulsiveness is present
+5 dB	+5 dB	+10 dB	+10 dB	+15 dB

2.2 INFLUENCING FACTORS

The subject site is located within the Neerabup Industrial Area. Residential premises are more than 1km away from the site boundaries.

Four point receivers R1 to R4 are selected at the neighbouring industrial premises, as shown in Figure 3 in APPENDIX A. No calculation of influencing factors is required for the selected industrial receivers.

3.0 NOISE MODELLING

3.1 METHODOLOGY

An acoustic model is developed using SoundPlan v8.0 program, and the CONCAWE[2,3] prediction algorithms are selected for this study. The acoustic model is used to predict worst-case noise levels at point receivers and generate worst-case noise contours for the areas surrounding the subject site.

The acoustic model does not include noise emissions from any sources other than from the proposed mining operations. Therefore, noise emissions from neighbouring industries, road traffics, aircrafts, animals, etc are excluded from the modelling.

3.2 INPUT DATA

3.2.1 Topography

The ground contours for the pits, subject site and surrounding area are provided by Urban Resources in AUTO-CAD dxf format. These ground contours were amended to incorporate details of mining pits and topsoil bunds at different stages.

The ground is assumed to be absorptive for the subject site and bushlands, and to have an average absorptive coefficient of 0.6 for industrial areas.

Existing buildings and sheds in neighbouring industrial premises are digitised into the acoustic model. No boundary fences are considered.

3.2.2 Noise Sensitive Premises

Four (4) point receivers are selected at the workshop/office areas of the neighbouring industrial premises, as shown in Figure 3 in APPENDIX A.

R1: represents a future industrial site.

R2: represents Wesbeam.

R3: represents Neerabup Power Station.

R4: represents Arise Racing Pty Ltd.

[2] CONCAWE (Conservation of Clean Air and Water in Europe) was established in 1963 by a group of oil companies to carry out research on environmental issues relevant to the oil industry.

[3] The propagation of noise from petroleum and petrochemical complexes to neighbouring communities, CONCAWE Report 4/81, 1981.

3.2.3 Source Sound Power Levels

Table 3-1 presents the overall source sound power levels, which are calculated from the information provided by Urban Resources. The sound power spectrum shapes are obtained from the AES database for similar equipment.

Table 3-1: Sound power levels

Equipment	Overall Sound Power Level in dB(A)
Finlay 683 Screen	114
Finlay 693 Screen	115
Edge 24m Slewing Stacker RTS 80	109
Terex FM120 Plant	107
100 KVA Generator	101
McCloskey J50 Jaw Crusher	115
Kleenman Evo1100 Jaw Crusher	116
Cat D10R Dozer	109
Komatsu 470 Front End Loader	108
Cat 740 Watercart	107
Volvo 48T Excavators	99

3.3 METEOROLOGY

SoundPlan calculates noise levels for defined meteorological conditions. In particular, temperature, relative humidity, wind speed and direction data are required as input to the model. For this study the worst-case meteorological conditions[4] are assumed, as shown in Table 3-2.

[4] The worst case meteorological conditions were set by the EPA (Environmental Protection Act 1986) Guidance note No 8 for assessing noise impact from new developments as the upper limit of the meteorological conditions investigated.

Table 3-2: Worst-case meteorological conditions.

Time of day	Temperature Celsius	Relative Humidity	Wind speed	Pasquill Stability Category
Day (0700 --- 1900)	20° Celsius	50%	4 m/s	E
Night (2200 --- 0700)	15° Celsius	50%	3 m/s	F

3.4 NOISE MODELLING SCENARIOS

Urban Resources advised that:

- The sand and limestone extractions are progressed in five stages.
- The operation hours are between 6am and 6pm on Monday to Saturday excluding public holidays.
- A 20 metre vegetation strip is reserved on the boundary shown as thick green lines in Figure 2 in APPENDIX A and 2m high topsoil bunds (shown as yellow lines) will be built inside the vegetation strip.
- The extraction depth ranges from 2m to 10m.
- The fixed plant operates at the pit floor.
- The following fixed plant and mobile equipment will operate on site:
  - The screening plant; and
  - The crushing plant; and
  - Mobile equipment of a Cat D10R Dozer, two Komatsu 470 Front End Loaders, a Cat 740 watercart and a Volvo 48T Excavator.
- The east parts of stages 1 and 2 have shallow sand deposit. For both of the stages (1 and 2) the crusher will only be used in the western third of the area. The eastern side will only have the screening plant being used.

Based on the provided information, the following operational scenarios are modelled to represent the worst-case operational activities:

Scenario 1: represents the worst-case operations at the western part of stage 1.

Scenario 2: represents the worst-case operations at the eastern part of stage 1.

Scenario 3: represents the worst-case operations at the eastern part of stage 2.

Scenario 4: represents the worst-case operations at the south-eastern part of stage 3.

Scenario 5: represents the worst-case operations at the south-western part of stage 3.

Scenario 6: represents the worst-case operations at the south-eastern part of stage 4.

Scenario 7: represents the worst-case operations at the north-western part of stage 5.

Scenario 8: represents the worst-case operations at the north-eastern part of stage 5.

All items of the mobile equipment are assumed to operate at the same level as the fixed plant for scenarios 1 to 3 but at middle levels of the sand layers for the other scenarios.

3.4.1 Noise Control and Recommendations

Urban Resources wants to find the conditions for compliant operations. To do so, several modelling exercises were undertaken for each of stages 1 to 5.

Preliminary modelling results indicate that full compliance is achieved for the proposed activities without any restrictions on the locations of the crushers and the screening plant at:

- The western (two third) part of stage 2.
- The north-eastern part of stage 4.
- The southern middle part of stage 5.

To achieve full compliance for the operations on the other stages/areas, the following noise control measures are recommended:

- For stage 1 (scenarios 1 and 2), the proposed topsoil bund on the southern vegetation strip needs to be increased to 3m high in the west part and 3.5m in the east part, as shown in Figure 2 in APPENDIX A.
- For scenario 2, the screening plant should be located at locations at least 100m away from the southern pit edge and 170m from the eastern pit edge.
- For the eastern (one third) part of stage 2, mining should start from west toward east. The screening plant should be located at no more than 30m behind sand face.
- For stage 3, mining should start at the middle of the pit. When mined toward east (scenario 4), the crushers and the screening plant should be located at no more than 40m behind sand face. When mined toward west (scenario 5), the crushers and the screening plant should be located at no more than 70m behind sand face.
- For stage 4, mining should start at the middle of the pit. When mined toward west, the crushers and the screening plant should be located at no more than 70m behind sand face. When mined toward south-east (scenario 6), the crushers and the screening plant should be located at no more than 40m behind sand face.
- For stage 5, it should be mined from south toward north. The crushers and the screening plant should be located at no more than 35m behind sand face. When mined close to the west pit edge, the crushers and the screening plant should also be located at no more than 70m behind the west sand face. When mined in the east part (more than 180m from the east pit edge), the crushers and the screening plant should be located at no more than 35m behind the east sand face.
  In the east part (within 180m from the east pit edge) of stage 5, the sand deposit is shallow. Similar to the east parts of stages 1 and 2, the crusher should not operate. Only the screening plant operates with the mobile equipment.

4.0 MODELLING RESULTS

4.1 POINT CALCULATIONS

Table 4-1 presents the predicted worst-case noise levels in dB(A) at the selected receivers for the worst-case operational scenarios incorporated with the recommended noise control measures stated in section 3.4.1. The predicted day and night-time noise levels are similar with differences of less than 0.4 dB. The highest noise level of 58.1 dB(A) is predicted at R2 for scenario 2.

Table 4-1: Predicted worst-case noise levels in dB(A).

Receivers	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8
Day-time Noise Levels in dB(A)								
R1	26.9	38.1	35.1	48.6	47.5	34.9	27.0	27.8
R2	50.3	58.1	49.4	33.9	41.8	27.3	31.1	46.9
R3	44.7	48.9	46.4	29.3	37.2	23.1	41.0	49.6
R4	45.5	37.2	38.5	41.0	40.8	47.2	48.0	40.9
Night-time Noise Levels in dB(A)								
R1	26.9	38.3	35.5	48.2	47.4	34.7	27.3	28.2
R2	50.3	57.9	49.4	34.1	42.0	27.4	31.5	47.0
R3	44.9	48.8	46.4	29.6	37.6	23.3	41.3	49.6
R4	45.6	37.4	38.7	41.3	41.1	47.3	47.9	41.1

4.2 NOISE CONTOURS

Figure 4 to Figure 11 in APPENDIX B present the worst-case day-time noise level contours at 1.5m above the ground. These noise contours represent the worst-case day-time noise propagation envelopes, i.e., worst-case propagation in all directions simultaneously.

Table 4-1 indicates the predicted day and night-time noise levels are very similar. Therefore, the noise contours in Figure 4 to Figure 11 in APPENDIX B also represent the worst-case night-time (6am to 7am) noise propagation envelopes at 1.5m above the ground.

Figure 4 to Figure 11 indicate that all of the 60 dB(A) noise contours are kept within the site boundaries. This means that if the noise control measures stated in section 3.4.1 are implemented, the noise level at any locations of any neighbouring industrial premises is below 60 dB(A).

5.0 COMPLIANCE ASSESSMENT

5.1 ADJUSTED NOISE LEVELS

The noises emitted from the proposed fixed plant and mobile equipment are expected to exhibit tonality. According to Table 2-2, the predicted noise levels shown in Table 4-1 should be adjusted by adding 5 dB.

Table 5-1 presents the adjusted worst-case noise levels in dB(A). The adjusted noise levels are below 63.1 dB(A).

Table 5-1: Adjusted worst-case noise levels in dB(A).

Receivers	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8
Adjusted Day-time Noise Levels in dB(A)								
R1	31.9	43.1	40.1	53.6	52.5	39.9	32.0	32.8
R2	55.3	63.1	54.4	38.9	46.8	32.3	36.1	51.9
R3	49.7	53.9	51.4	34.3	42.2	28.1	46.0	54.6
R4	50.5	42.2	43.5	46.0	45.8	52.2	53.0	45.9
Adjusted Night-time Noise Levels in dB(A)								
R1	31.9	43.3	40.5	53.2	52.4	39.7	32.3	33.2
R2	55.3	62.9	54.4	39.1	47.0	32.4	36.5	52.0
R3	49.9	53.8	51.4	34.6	42.6	28.3	46.3	54.6
R4	50.6	42.4	43.7	46.3	46.1	52.3	52.9	46.1

5.2 COMPLIANCE ASSESSMENT

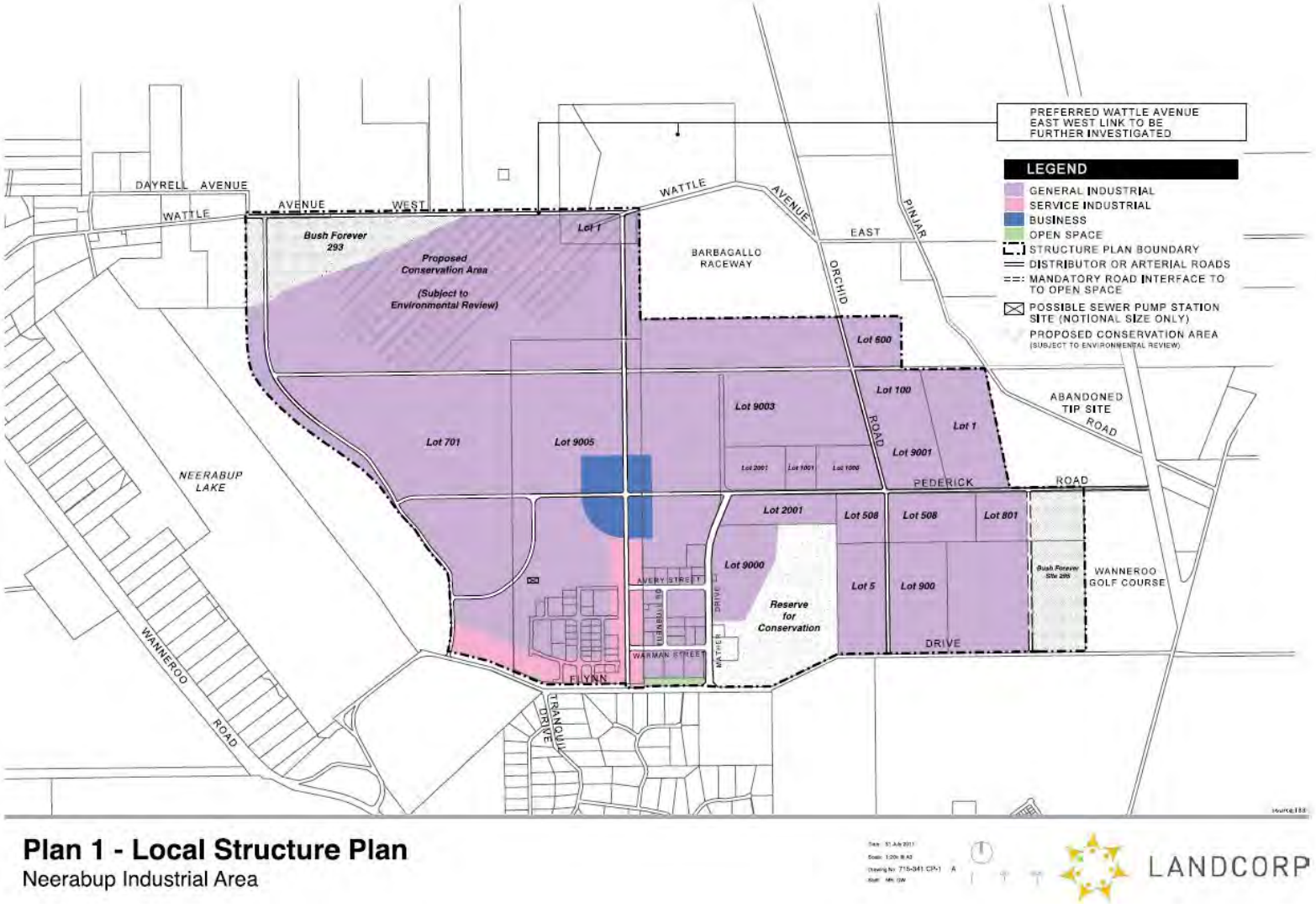
All activities proposed in this project will be undertaken during the night (between 6am and 7am) and day (between 7am and 6pm) on Monday to Saturday excluding public holidays. As shown in Table 2-1, the assigned noise level for industrial premises is 65 dB(A) for both the day and the night.

Table 5-1 indicates that all of the adjusted noise levels are below the assigned noise level of 65 dB(A). This indicates that compliance is achieved at all of the selected receivers for all of the worst-case operational scenarios.

Noise contours in APPENDIX B, which do not include the 5dB tonality adjustment, shows that the noise contours of 60dB(A) (corresponding to the adjusted noise level of 65 dB(A)) and above are kept within the site boundaries for all of the operational scenarios. This means that the adjusted noise level at any locations of any neighbouring industrial premises is below the assigned noise level of 65 dB(A) for all stages. Compliance is achieved at the boundaries of the neighbouring industrial premises.

Both the point modelling results and the noise contours domestrate that full compliance is achieved for all of the proposed operations (of stages 1 to 5).

APPENDIX A PLANS AND MAPS



Plan 1 - Local Structure Plan
Neerabup Industrial Area

Figure 1: Local structural plan.

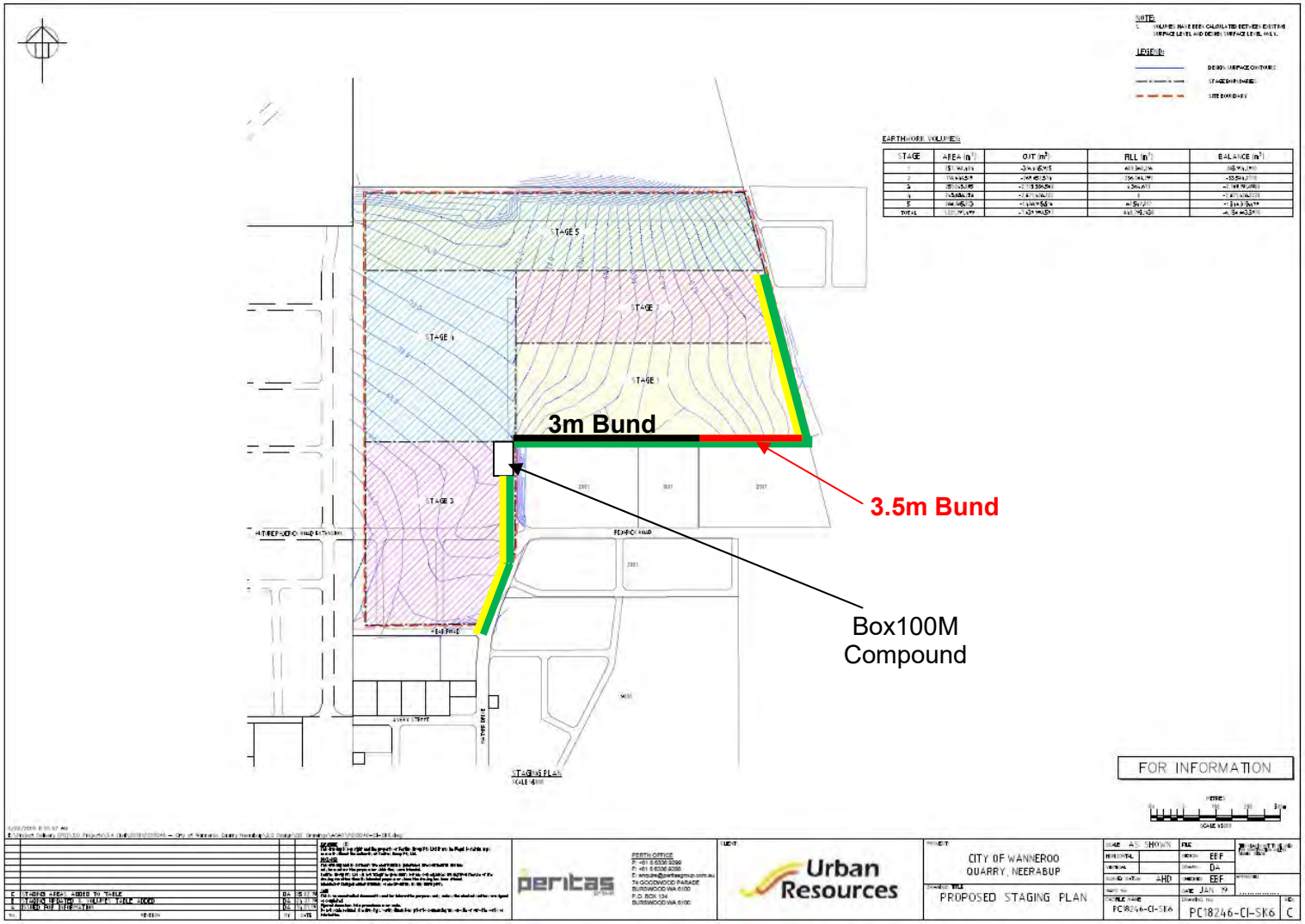


Figure 2: Proposed mining stage plan.

Figure 3: Selected point receivers.

APPENDIX B NOISE CONTOURS

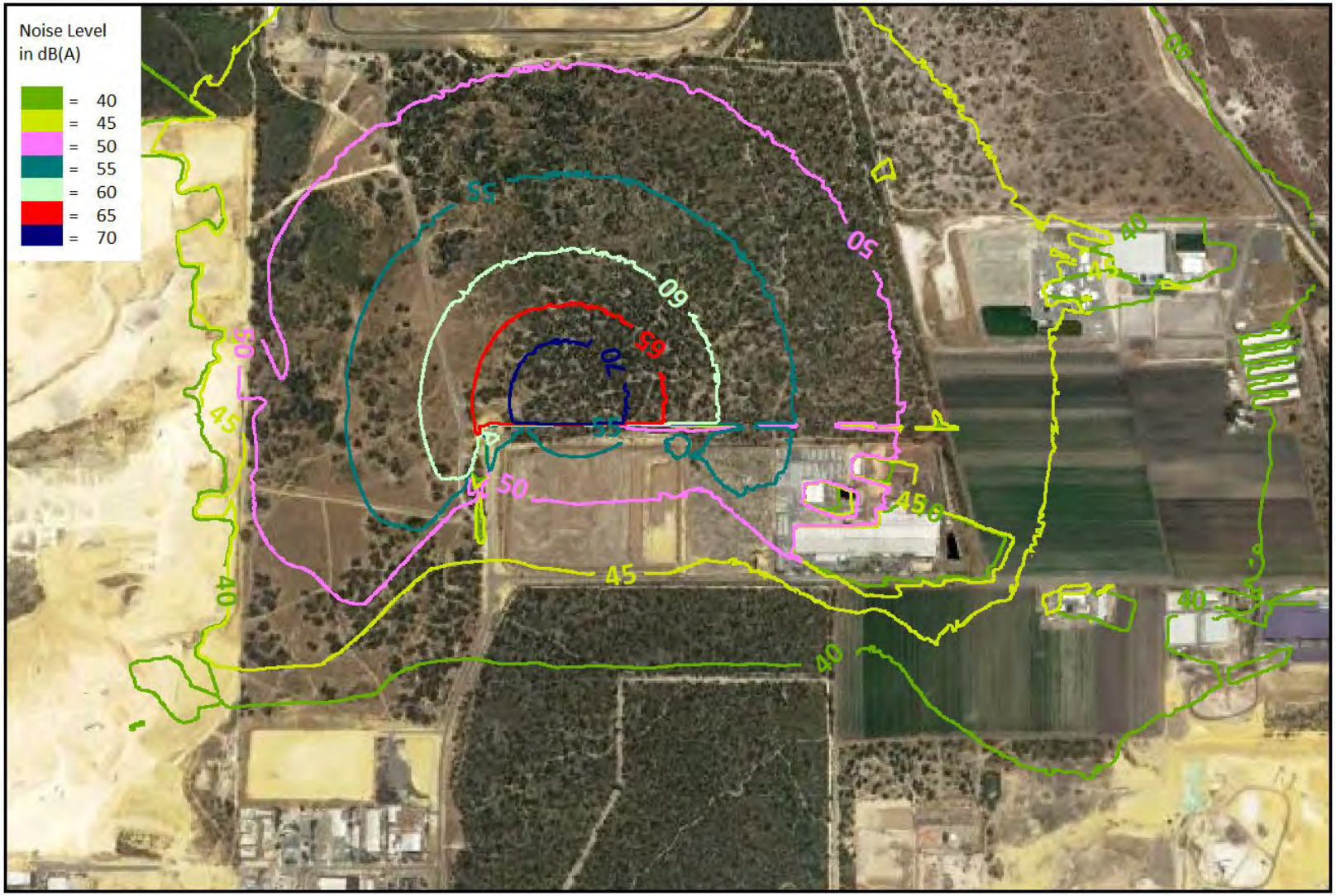


Figure 4: Worst-case noise contours for scenario 1 – mining at the western part of stage 1 pit.

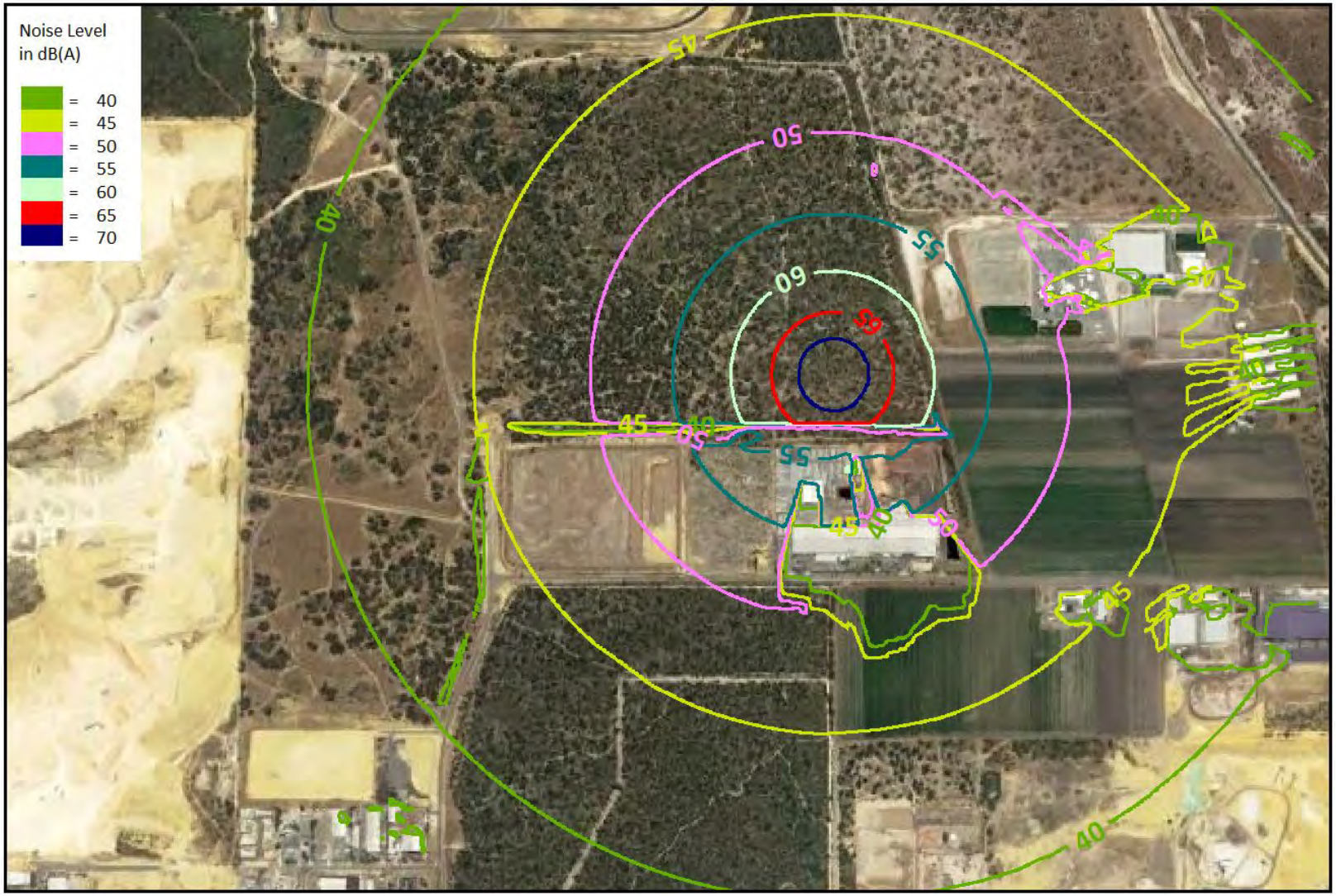


Figure 5: Worst-case noise contours for scenario 2 – mining at the eastern part of stage 1 pit.

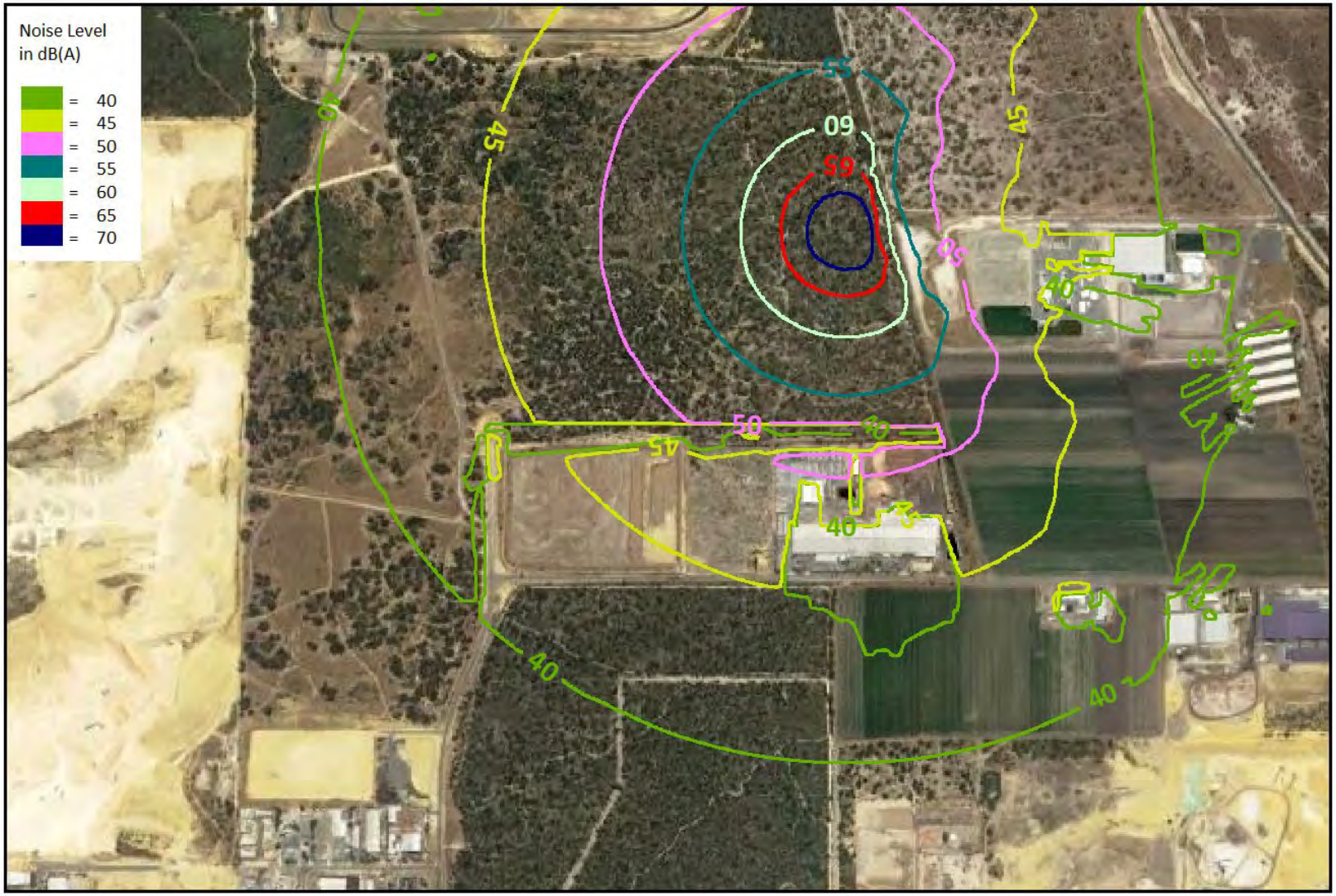


Figure 6: Worst-case noise contours for scenario 3 – mining at the eastern part of stage 2 pit.

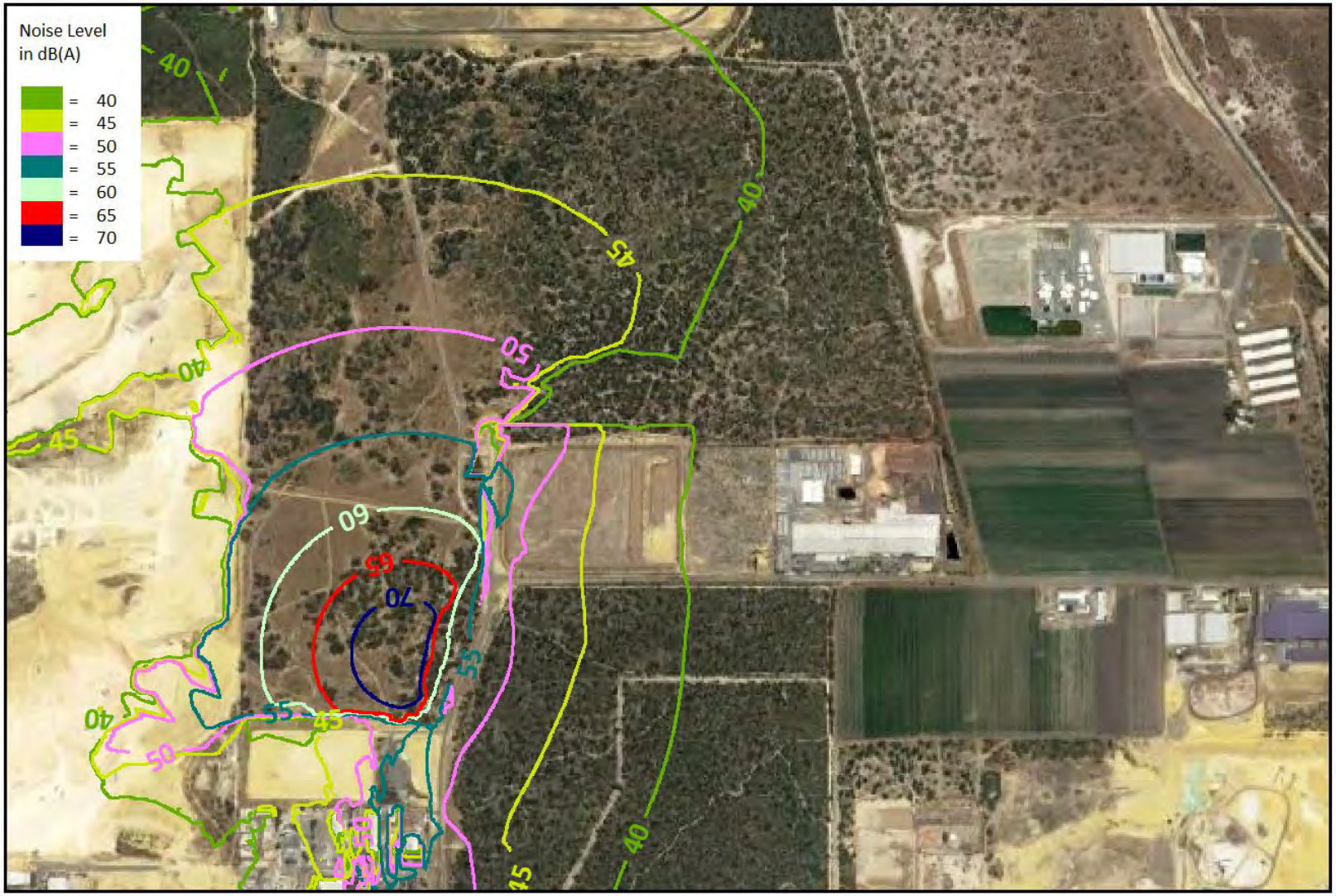


Figure 7: Worst-case noise contours for scenario 4 – mining at the south-eastern part of stage 3 pit.

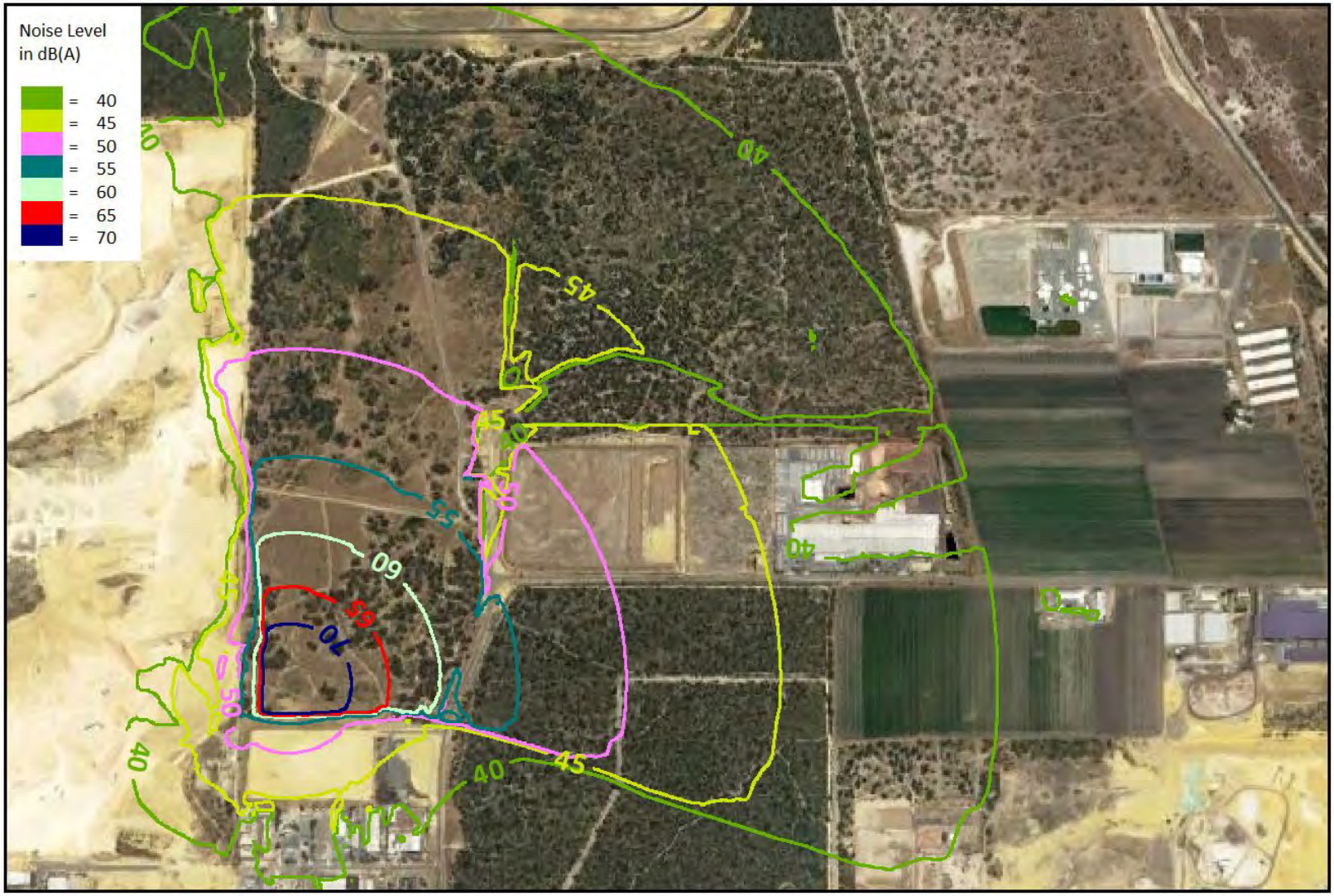


Figure 8: Worst-case noise contours for scenario 5 – mining at the south-western part of stage 3 pit.

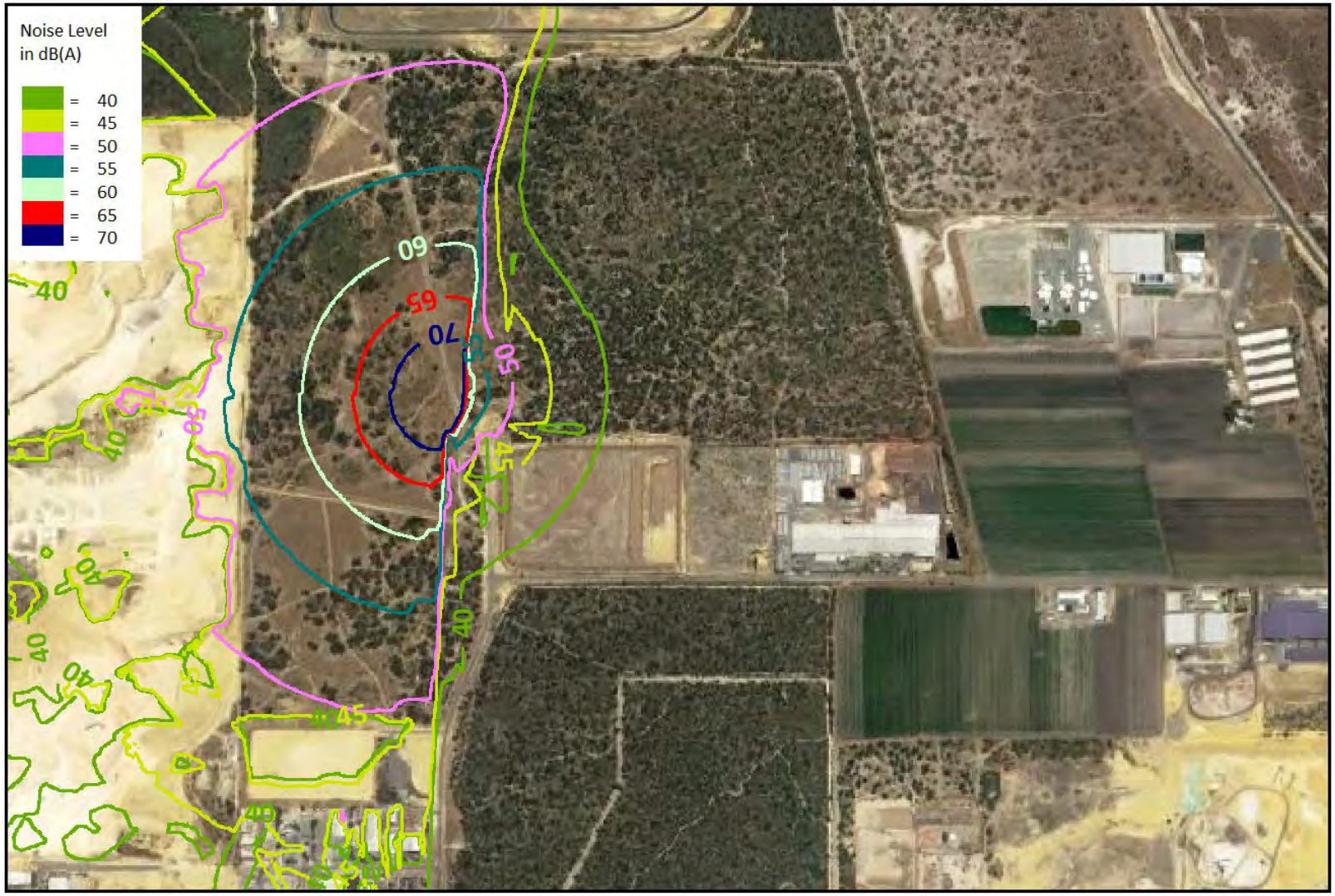


Figure 9: Worst-case noise contours for scenario 6 – mining at the south-eastern part of stage 4 pit.

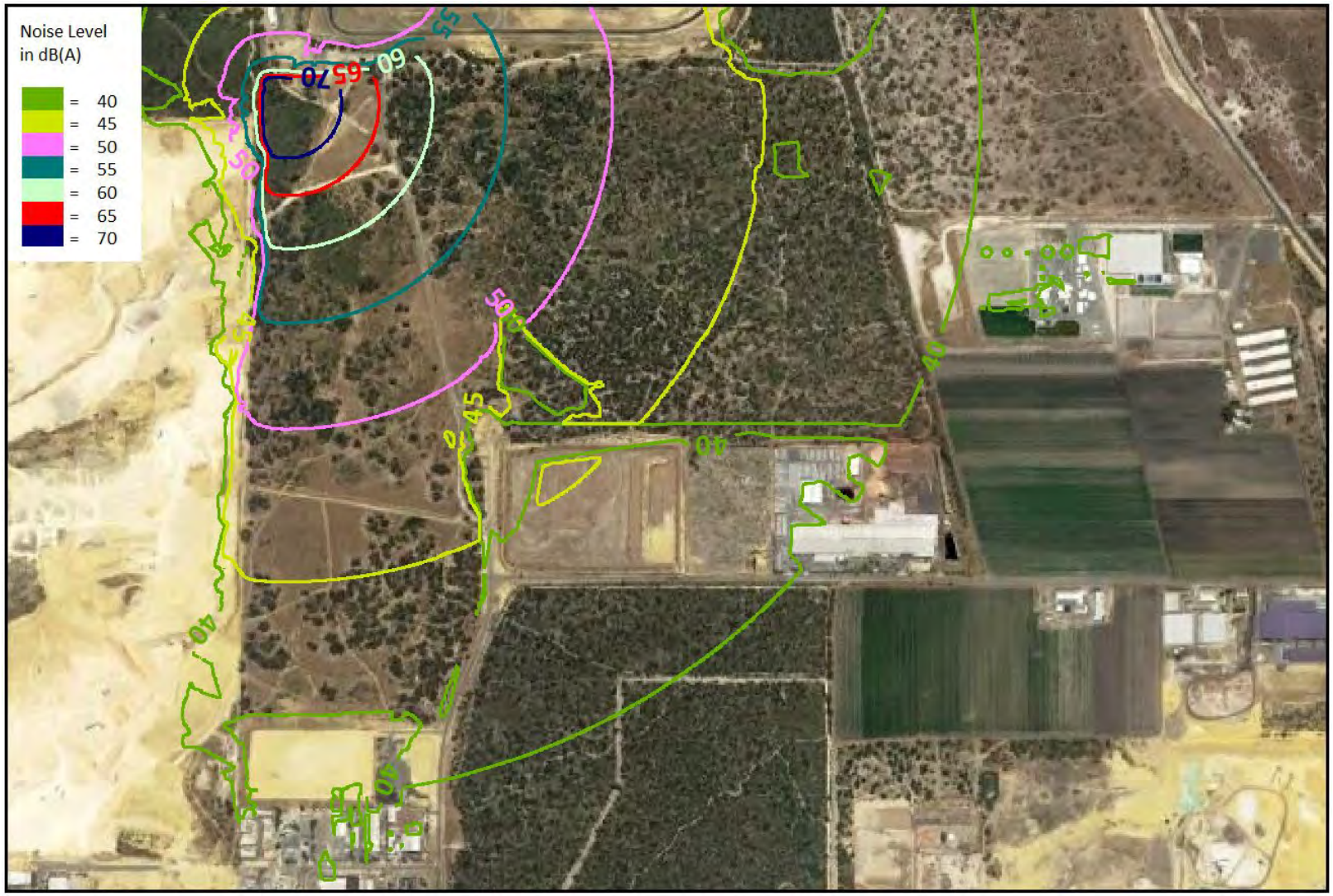


Figure 10: Worst-case noise contours for scenario 7 – mining at the north-western part of stage 5 pit.

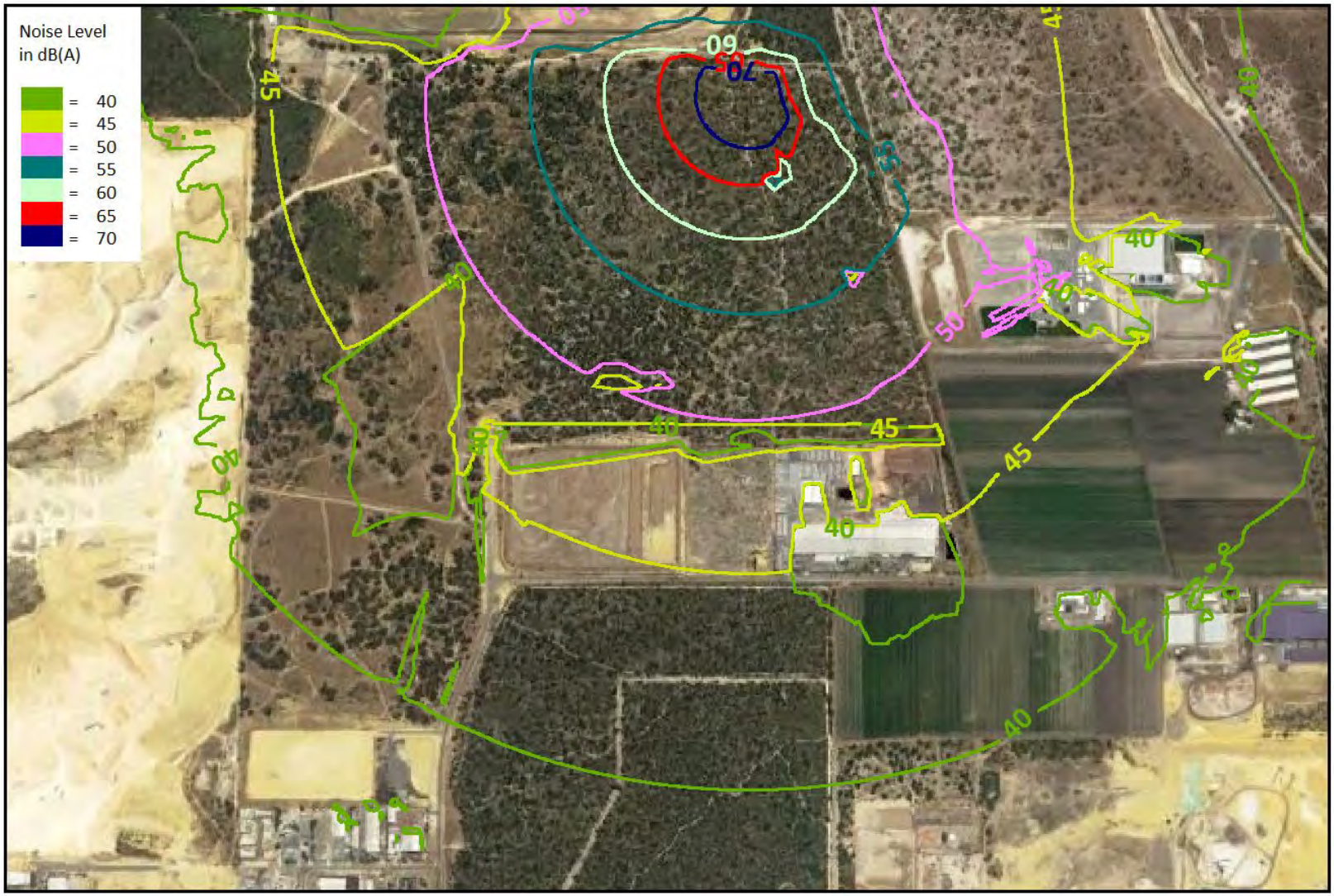


Figure 11: Worst-case noise contours for scenario 8 – mining at the north-eastern part of stage 5 pit.

Appendix 2

Transport Management Plan

TRANSPORT MANAGEMENT PLAN

RAV ACCESS ROUTE
LIMESTONE and SAND QUARRY

LOT 9003 Mather Drive,
NEERABUP,

City of Wanneroo

Date: May 15, 2020

Client:

Urban Resources

Urban Resources Pty Ltd
33 Cocos Drive
Bibra Lake WA 6163

Contact – Stephen Elliott
M: 0418 950 222
E: stephen@urbanresources.com.au

Declaration

I Victor Moro (AWTM Cert No. KTS-AWTM-17-15762-03) declare that I have designed this Transport Management Plan has been prepared in accordance with Main Roads Western Australian heavy vehicle, NHVR including Heavy Vehicle National Law Road Traffic (Administration) Regulations 2014 Road Traffic (Vehicles) Act 2012 rules and regulations.

Signature: .....Date: 18/03/2020

	Name / Company	Accreditation Details	Date	Signed
TMP Designed by	Victor Moro ITS	AWTM-KTS 17-15762-03	15/05/2020	
TMP Reviewed by	Paul Ashfold ITS	AWTM 19-01738-03	15/05/2020	
Road Authority Authorisation	Signed ..... Date..... Authorised Officer (Print Name).....Position.....			

Revision Register

Item No	Rev. No	Comment	Date

TABLE OF CONTENTS

1. PROJECT DESCRIPTION

Lot 9003 Mather Road is owned by the City of Wanneroo and is zoned and proposed for future industrial land as part of the Meridian Business Park, Neerabup Industrial Area

Urban Resources has a lease from City of Wanneroo to extract sand and limestone from Lot 9003 and prepare the site for the industrial end use. That time frame is anticipated to take 17 years. To allow for contingencies a 20-year development Approval and Extractive Industries Licence is requested.

The site is to be accessed from Mather Road.
Up to around 500 000 tonnes of sand and limestone are to be removed from site annually, but with the cut to fill more material can be expected to be moved annually on site.

Of the 500 000 tonnes around 300 000 tonnes is expected to require processing by crushing and screening and screening alone. It is also noted that in some years to fulfill large contracts, those tonnages will be exceeded.

It is anticipated that there will be an average of 42 laden truck movements per day with some hours busier than others, and some days when around 120 laden trucks may leave the site.

Hours of operation applied for are to be 6.00am to 6.00pm six days per week (Monday to Saturday inclusive) in line with most quarries.

2. PLANNING

2.1 Authority

In Western Australia, Main Roads WA issues permits for combinations that exceed the normal as of right dimensions. This includes oversize loads. It is important that Main Roads Heavy Vehicles Operations be involved in the planning for the movement of exceptional loads from early in the process.

Approvals Waiting

- Main Roads
- City of Wanneroo

2.2 Public Notification

No public notification required due to normal transport situation.

2.3 Project Location

This project is located at Lot 9003 Mather Road, Neerabup Industrial Area.
Refer Digigram 1.0 below

Diagram 1.0

2.4 Project Management

ITEM	DESCRIPTION
Project Title	Transporting of Limestone and Sand Materials
Road Classification, Existing Speed Limit	Mather Drive – Access Road – 70km/hr
Road Authority	City of Wanneroo / Main Roads WA
Local Government	City of Wanneroo
Client	City of Wanneroo
Prime Contractor	Urban Resources P/L
Sub-Contractor	N/A
Scope of Works	Transportation of limestone and sand materials to clients Transportation route will vary based on clients
Staging of Work	Stage 1 - Collection of materials Stage 2 - Delivery of materials Stage 3 - Truck return to material collection point Stage 4 – Repeat process
Project Dates	In accordance with operational licences
Hours / Days of Work	Monday to Friday from 6.00am to 6.00pm Saturday Friday from 6.00am to 6.00pm
Duration of Work	N/A
Other Constraints	• City of Wanneroo approval • MRWA Heavy Haulage Permits and approvals.
Concurrent/adjacent Works or Projects	Land developments at Peak Road.

2.5 Project Representatives

Key Personnel	
Urban Resources P/L Stephen Elliott Project Manager	33 Cocos Drive, Bibra Lake WA 6163 08 9418 8607 Stephen@urbanresources.com.au
City of Wanneroo Simon Hempsell Project representatives	23 Dundebar Road Wanneroo WA 6065 08 9405 5000 Simon.Hempsell@wanneroo.wa.gov.au
Main Roads Heavy Vehicle Services Officer (Heavy Vehicle Operations)	138 486 hvopermitsuser@mainroads.wa.gov.au
Main Roads Peter Lewis Heavy Vehicle Technical Officer	138 486 peter.lewis@mainroads.wa.gov.au
Emergency – Police	000
Emergency – Ambulance	000
Emergency – Fire	000
Non-Emergency Police	131 444
SES	132 500 1300 130 039

2.6 Transport Route Details

The delivery of soil materials will vary based on the current clients location which will be within the Perth metropolitan area.

Main transport routes will be via

East Bound
Mather Drive, Pederick Road and Old Yanchep Road then north or south

West Bound
Mather Drive, Flynn Drive and then north or south via Wanneroo Road or Mitchell Fwy

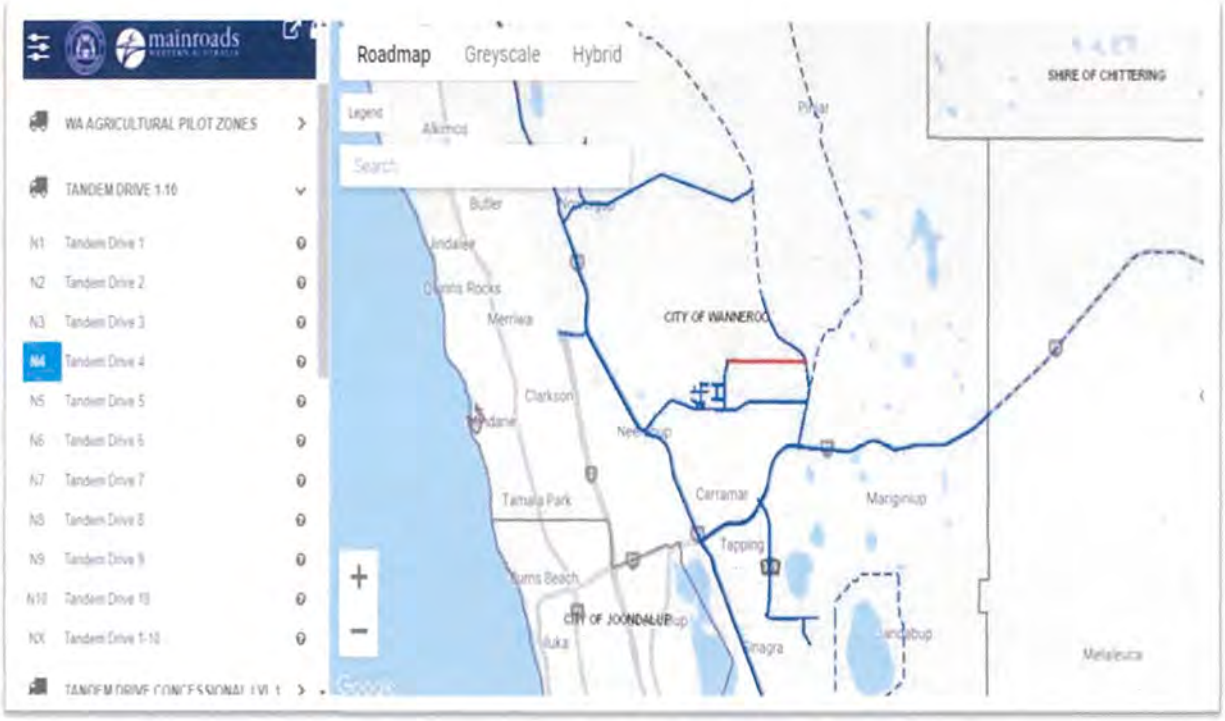
South Bound
Mather Drive, Flynn Drive.

North Bound
Mather Drive, Flynn Drive or Pederick Road

2.7 RAV CORRIDORS

TANDEM DRIVE N4
Tandem Drive Network 2 Without Conditions
Mather Dr & Flynn Dr

Tandem Drive Network 2 With Conditions
PEDERICK RD



2.8 Contraflows

No contra flow is applicable.

2.9 OSOM Load Details

Not applicable

2.10 Load Module Details

Standard extracted Limestone and Sand materials. No oversize, length, width or height

2.11 Height and Width Limits

The following table shows the level of control needed to move different size of loads.

Length under m	Width under m	Location	Escort	Comments
25	3.5	City/country	Nil	Most locations accessible
30	4.5	City/country	1 Licensed Pilots	Many locations accessible
30	5.5	Within 30 km of Perth GPO	2 Licensed Pilots	Often accessible
40	5.5	Beyond 30 km of Perth GPO	2 Licensed Pilots	Often accessible
thereafter			2 Licensed Pilots plus MRWA Traffic Escort Warden	Access reduces as size increases

This load is greater that the listed limits and therefore suitable precautions will be undertaken.

2.12 Strength limits

No bridges that will be affected by the material transportation. Standard Main Roads WA & LGA road design strengths are suitable for transported loads and will have no affect on current bridges, road surface or integrity of the road.

2.13 Use of designated route

The route has been surveyed by the Project Manager and the load width or height will not affect on distances between traffic lights and other items such as poles and road signs.

2.14 Use of other roads

Standard gazetted roads will be used. New or future roads will be assessed prior to approval or use.

2.15 Radio Communications

Standard radio communication procedures and policies apply.

2.16 Fatigue Management

Standard fatigue management policy, standards and procedure apply.

2.17 Night Work Provisions

Transport movement operation should be between the hours of 6.00am and 6.00pm Monday to Saturday. Transport movements outside of these hours are to be approved by management.

3. ENVIRONMENT CONDITIONS

Weather conditions will be monitored and addressed prior to transport commencement.
If Abhorrent or critical weather conditions are forecast then transportation may be halted.

3.1 Wind Conditions

Not applicable.

3.2 Rainfall

It is well known that tyre/road friction decreases when the road surface is wet. Water acts as a lubricant and reduces fraction of the tyre/road contact area where friction forces are generated.

In the event of heavy rains are present for the movement will discuss a contingency with their client and communicate any changes with the relevant authorities

3.3 Severe Weather

In the event of severe weather, the management team will assess the situation and will only proceed with movement if it is safe and reasonable to do so.

3.4 Visibility

Management team will review transport movement and communicate with relevant authorities.

4. ACCESS FOR THE LOAD

4.1 Weight

Standard vehicle governed weight shall apply.

4.2 Width

Standard transport vehicle and trailer width shall apply and in accordance with road networks in WA (State and local roads).

4.3 Height

Standard transport vehicle load height limit shall apply and in accordance with current height levels.

4.4 Transport Vehicle Information

4.4.1 Transport Truck

Standard prime mover towing a semi trailer meeting current vehicle regulations Category 1 and Tri Drive Network 2.

5. EMERGENCY CONTACT

In the event of an emergency the following relevant authorities must be contacted and advised of the nature of works, location, type of emergency and contact details for the site supervisor.

Emergency Service	E-mail/Website	Phone (Emergency)
WA Police Service	State.Traffic.Intelligence.Planning.&.Co-ordination.Unit@police.wa.gov.au	000
St. John Ambulance	ambulanceoperations@stjohnambulance.com.au	000
DFES	www.dfes.wa.gov.au/contactus/pages/dfesoffices.aspx	000
Power	http://www.westernpower.com.au/customerservice/contactus/	13 13 51
Gas	enquiries@atcogas.com.au	13 13 52
MRWA RNOC	RNOC.Control.Room.Information.Desk@mainroads.wa.gov.au	138 111

6. SAFETY

Safety to other road users and lack of damage to the road and road surroundings are major items in a successful plan.

Operators will operate under their code of practice.

7. OCCUPATIONAL SAFETY AND HEALTH

All persons and organisations undertaking these works have a duty of care under statute and common law to themselves, their employees and all road users, lawfully using the public roads, to take all reasonable measures to prevent accident or injury.

This TMP forms part of the overall project Safety Management Plan, and provides details on how all road users considered likely to pass through, past, or around the movement will be safely and efficiently

managed for the full duration of the movement. All traffic management works and control devices shall be in accordance with;

- AS/NZS ISO 31000– Risk Management – Principles and Guidelines
- AS/NZS 4602– High visibility safety garments
- Local Government Act
- Main Roads Act
- Main Roads Western Australian HVS
- NHVR Heavy Vehicle National Law
- Road Traffic (Administration) Regulations 2014
- Road Traffic (Vehicles) Act 2012
- Occupational Safety & Health Act
- Occupational Safety & Health Regulations
- Road Traffic Act
- Road Traffic Code
- Traffic Management for Works on Roads Code of Practice
- Utility Providers Code of Practice for Western Australia

7.1 Workers and Subcontractors

Workers and Subcontractors shall

- Correctly wear high visibility vests, in addition to other protective equipment required (e.g. footwear, eye protection, helmet sun protection etc), at all times whilst on the worksite
- Comply with the requirements of the TMP and ensure no activity is undertaken that will endanger the safety of other workers or the general public
- Enter and leave the site by approved routes and in accordance with safe work practices

7.2 Personal Protective Equipment

All personnel associated with the transportation shall correctly wear high visibility vests to AS/NZS 4602, including protective footwear

8. INCIDENT/ACCIDENT PROCEDURES

In the event of an incident or accident, whether or not involving traffic or road users, all work shall cease and traffic shall be stopped as necessary to avoid further deterioration of the situation. First Aid shall be administered as necessary, and medical assistance shall be called for if required. For life threatening injuries an ambulance shall be called on telephone number 000.

The Police shall also be called on 000 for traffic crashes where life threatening injuries are apparent. Any traffic crash resulting in non-life threatening injury shall immediately be reported to the WA Police Service on 131 444.

Broken down vehicles and vehicles involved in minor non-injury crashes shall be temporarily moved to the verge as soon as possible after details of the crash locations have been gathered and noted. Suitable recovery systems shall be used to facilitate prompt removal of broken down or crashed vehicles. Assistance shall be rendered to ensure the impact of the incident on the network is minimised.

Details of all incidents and accidents shall be reported to the Site Supervisor and Project Manager using the incident report form at Appendix "C" (or similar)

Urban Resources Pty Ltd to be advised immediately of any injuries, dangerous events or incidents giving rise to notification requirements under applicable safety and health laws that may occur.

9. TRAFFIC ASSESSMENT & ANALYSIS.

9.1 Existing & Proposed Speed Zones

Main Roads WA registed and posted speed limits will apply including any roadworks speed limit.

9.2 Existing Traffic Environment

9.2.1 Volume and Composition

It is vital to determine the traffic volumes and composition of the impacted network before implementing any traffic management to ensure all road users (including pedestrians, cyclists, buses, heavy vehicles, etc.) are catered for with minimum inconvenience.

9.3 Traffic Guidance Schemes

The Traffic Guidance Scheme outlined in Appendix "E" and listed below have been provided for the following stages to demonstrate the type of controls that will be implemented throughout the term of the contract

Drawing Number	Version	Details
UR006-01	1	Advance notification

10. INSURANCE OR GUARANTEE

The transport company shall be covered for any injury, damage or loss caused to roads, roadside furniture or road users that will cover him during the transport of the load against claims resulting from the transport of the load

11. METROPOLITAN / REGIONAL STRUCTURES

Standard approved transport weight will apply to the journey there are structures of concern, inclusive of bridges, railways. (Ref Western Australian Planning Commission, 2018)

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12. HAZARD IDENTIFICATION, RISK ASSESSMENT AND LEGAL REQUIREMENTS.

The following details the preliminary assessment of site hazards likely to be encountered, the level of risk associated with each and the control proposed. Note that the risk level is the level of assessed risk *without* the controls in place. The controls listed have been determined as being appropriate in reducing the risk to a level that is acceptable.

12.1 Risk Classification Tables

QUALITATIVE MEASURES OF CONSEQUENCE OR IMPACT

Level	Consequence	Description
1	Insignificant	Mid-block hourly traffic flow per lane is equal to or less than the allowable lane capacity detailed in AS1742.3. No impact to the performance of the network. Affected intersection leg operates at a Level of Service (LoS) of A or B. No property damage.
2	Minor	Mid-block hourly traffic flow per lane is greater than the allowable road capacity and less than 110% of the allowable road capacity as detailed in AS1742.3. Minor impact to the performance of the network. Intersection performance operates at a Level of Service (LoS) of C. Minor property damage.
3	Moderate	Midblock hourly traffic flow per lane is equal to and greater than 110% and less than 135% of allowable road capacity as detailed in AS1742.3. Moderate impact to the performance of the network. Intersection performance operates at a Level of Service (LoS) of D. Moderate property damage.
4	Major	Midblock hourly traffic flow per lane is equal to and greater than 135% and less then170% of allowable road capacity as detailed in AS1742.3. Major impact to the performance of the network. Intersection performance operates at a Level of Service (LoS) of E. Major property damage.
5	Catastrophic	Midblock hourly traffic flow per lane is equal to and greater than 170% of allowable road capacity as detailed in AS1742.3. Unacceptable impact to the performance of the network. Intersection performance operates at a Level of Service (LoS) of F. Total property damage.

OSH QUALITATIVE MEASURES OF CONSEQUENCE OR IMPACT

Level	Consequence	Description
1	Insignificant	No treatment required
2	Minor	First aid treatment required.
3	Moderate	Medical treatment required or Lost Time Injury
4	Major	Single fatality or major injuries or severe permanent disablement
5	Catastrophic	Multiple fatalities.

QUALITATIVE MEASURES OF LIKELIHOOD

Level	Likelihood	Description
A	Almost certain	The event or hazard: is expected to occur in most circumstances, will probably occur with a frequency in excess of 10 times per year.
B	Likely	The event or hazard: Will probably occur in most circumstances, will probably occur with a frequency of between 1 and 10 times per year.
C	Possible	The event or hazard: might occur at some time, will probably occur with a frequency of 0.1 to 1 times per year (i.e. once in 1 to 10 years).
D	Unlikely	The event or hazard: could occur at some time, will probably occur with a frequency of 0.02 to 0.1 times per year (i.e. once in 10 to 50 years).
E	Rare	The event or hazard: may occur only in exceptional circumstances, will probably occur with a frequency of less than 0.02 times per year (i.e. less than once in 50 years).

IMPORTANT NOTE: The likelihood of an event or hazard occurring shall first be assessed over the duration of the activity (i.e. "period of exposure"). For risk assessment purposes the assessed likelihood shall then be proportioned for a "period of exposure" of one year.

Example: An activity has a duration of 6 weeks (i.e. "period of exposure" = 6 weeks). The event or hazard being considered is assessed as likely to occur once every 20 times the activity occurs (i.e. likelihood or frequency = 1 event/20 times activity occurs = 0.05 times per activity). Assessed annual likelihood or frequency = 0.05 times per activity x 52 weeks/6 weeks = 0.4 times per year. Assessed likelihood = Possible.

QUALITATIVE RISK ANALYSIS MATRIX – RISK RATING

	Consequence				
Likelihood	Insignificant (1)	Minor (2)	Moderate (3)	Major (4)	Catastrophic (5)
Almost certain (A)	Low 5	High 10	High 15	Very High 20	Very High 25
Likely (B)	Low 4	Medium 8	High 12	Very High 16	Very High 20
Possible (C)	Low 3	Low 6	Medium 9	High 12	High 15
Unlikely (D)	Low 2	Low 4	Low 6	Medium 8	High 10
Rare (E)	Low 1	Low 2	Low 3	Low 4	Medium 7

MANAGEMENT APPROACH FOR RESIDUAL RISK RATING

Residual Risk Rating	Required Treatment
Very High	Unacceptable risk. **HOLD POINT**. Work cannot proceed until risk has been reduced.
High	High priority, OSH MR and Roadworks Traffic Manager (RTM) must review the risk assessment and approve the treatment and endorse the TGS prior to its implementation.
Medium	Medium Risk, standard traffic control and work practices subject to review by accredited AWTM personnel prior to implementation.
Low	Managed in accordance with the approved management procedures and traffic control practices.

12.2 Risk Register.

Item	Risk Event	Consequence	Pre – treatment Risk			Treatment	Residual Risk		
			L	C	RR		L	C	RR
1	Vehicle or loaded vehicle leaving yard and entering road network.	Crash into oncoming vehicle or pedestrians causing injury or damage	C	3	M9	• Vehicle driver / operator to undertake vehicle safety and maintenance check. • Notify management of proposed route and communicate with gate personnel. • Check for traffic or pedestrians prior to entering road network and drive in a safe manner. • Communicate w	D	3	L6
2	Vehicles try to overtake transport unit or while workers checking on load.	Cause crash with other vehicles or injury to personnel	B	3	H12	Operator to check surroundings prior to exiting vehicle and use flashing beacons if vehicle is broken down.	C	3	M9
3	Transport rig tyre failure due to explosion or damage	Causing injury to workers or damage to road	B	2	M8	Spare tyres to be available and transport to stop in a safe location and replace tyre in a safe manner.	B	2	L4
4	Transport truck mechanical failure during transport	Engine failure causing congestion of traffic on road way.	B	2	M8	Like for Like Backup truck to be available at transporters compound to quickly replace broken down truck to move load.	B	2	L4
5	Road user braking quickly to turn onto side street or stopping at traffic lights.	Cause rear end collision and injury to personnel	C	3	M9	Truck operator to be alert and monitor traffic and maintain suitable stopping distance in case of emergency	C	2	L6
6	Transport truck overloaded with materials and spill contents on roadway.	Cause traffic delays or damage to passing vehicles	C	3	M9	Operator to check on overloading or filling and ensure trailer is not spilling over.	C	2	L6

12.3 Legal and other requirements

The Contractor recognises that the transport management plan has been developed and shall be implemented with due consideration and in

13. CONCLUSION

The main points to be addressed prior to movement are as follows;

- Speed shall be adhered to
- Truck load limits shall apply
- Approval from governing bodies
- Back up prime mover available for in case of a breakdown

14. APPENDIX A - PRE MOVEMENT

All relevant paperwork is completed and relevant to the task and submitted to management and will include the following;

- Transport vehicle to be maintenance check list be undertaken prior to movement.
- All suitable PPE,s to be available.
- Route direction plans.
- Weighbridge documents.

15. APPENDIX B – ROUTE HAZARDS

Transport vehicle operator shall be aware of the standard vehicle height and be observant to monitor any possible height restrictions

15.1 Route Overhead Restrictions

There are no overhead obstacles currently noted. New obstruction shall communicate to management who will inform if transport is to continue or halted
Any new hazards to be noted in diary and reported to management

Location	Description/ Action	Photo
Add restrictions if noted		

15.2 Route Overhead Obstructions

Any new restriction to be noted in diary and reported to management

Metres	Road	Obstruction	Posted Speed	Traffic Lanes	Action
	Add obstructions if noted				

Additional Notes

- There are suitable passing points for opposing vehicles to pass.
- There is sufficient width between traffic lights.
- Turning swept path is suitable.
- No obstructions.

15.3 Sign Removal Register

Any sign to be removed shall be noted in the register listed below.

Road	SLK	Distance	Item	Position	Removed	Installed
Complete of any items are removed						

LEFT BLANK INTENTIONALLY

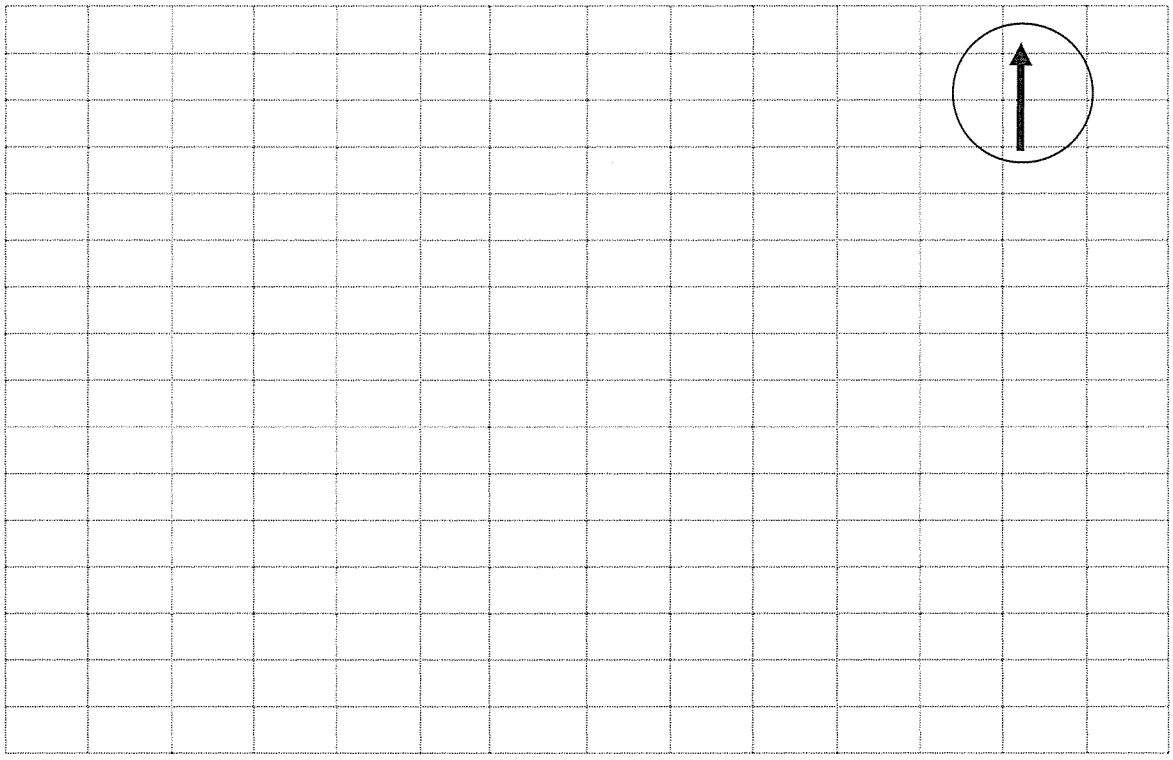
16. APPENDIX C – INCIDENT REPORT FORMS

Any incident occurring onsite shall be reported using the following incident report format.

Region Contract Number	Incident Report No. Contractor

Major Incident Reports must be forwarded to the Superintendent within 48 hours of the incident occurring or becoming apparent.
Contractors shall use this Form for reporting of Traffic incidents on works under Contract and this form supplements the OSH Incident Reporting Form.

A Details of Incident	Reported to: ☐ Supervisor ☐ TMR ☐ Other						
OSH Incident Report No				**Atmospheric Conditions**		**Light Conditions**	
Fatality ☐				Clear ☐		Day Light ☐	
Injury ☐	**Road Surface**			Overcast ☐		Night Time ☐	
Property Damage ☐	Unsealed ☐			Raining ☐		Dawn/Dusk ☐	
Police Attended **Yes/No**	Sealed ☐			Fog/Smoke/Dust ☐		**Street Lighting**	
Time and Date of incident	**AM / PM**			**Road Condition**		On ☐	
	Day	Month	Year	Wet ☐		Off ☐	
				Dry ☐		Not Provided ☐	
Other relevant details, (Last maintenance grade, watering and dust conditions):							
B Details of Traffic Management in place:							
TGS No:				Name of individual that prepared the TGS			
Time last inspected:				Accreditation No:			
TGS Approved:	Day	Month	Year	TMP Approved:		Day	Month	Year
C Descriptions of Vehicles:							
Detail (make, model/ped/cyclist/VRU)				Registration No	Direction of Travel	Age of Driver	
Vehicle 1							
Vehicle 2							
Vehicle 3							
Comments:							
D Description of Incident:							
Draw the incident including the direction of travel, traffic control signs, fixed structures and north point.							



E **Attachments:**	The following copies MUST be submitted with this Incident Report.	

Approved TMP ☐ Approved TCP ☐ Approvals for temporary speed restrictions ☐ Daily Diary ☐

F Police Report:

Accident reported to Police: ☐ YES ☐ NO Report made by ☐ Phone ☐ Fax ☐ Mail or E-mail

Date Report Made Day Month Year Police WA Reference Number

G Details of Person Completing this Incident Form:

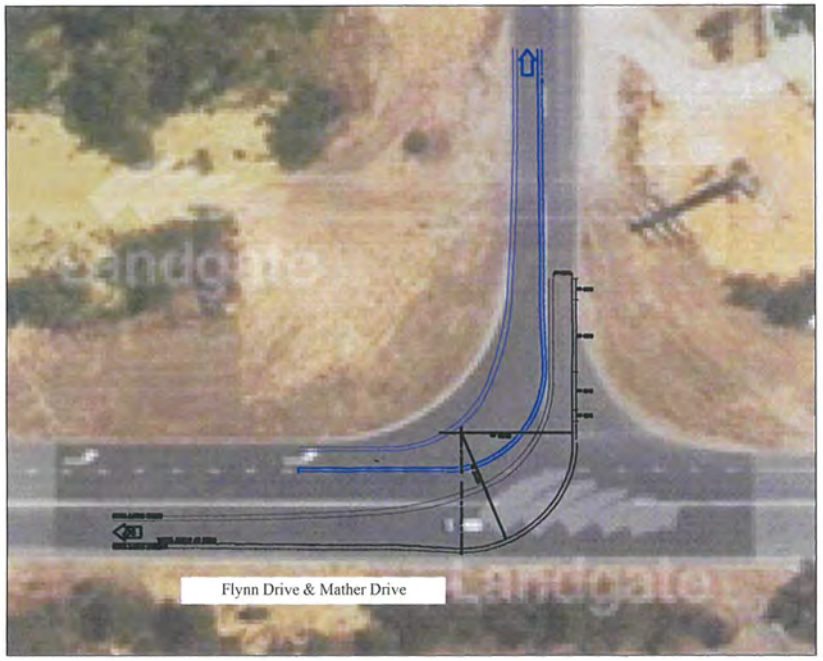
Name: Contractor Name:

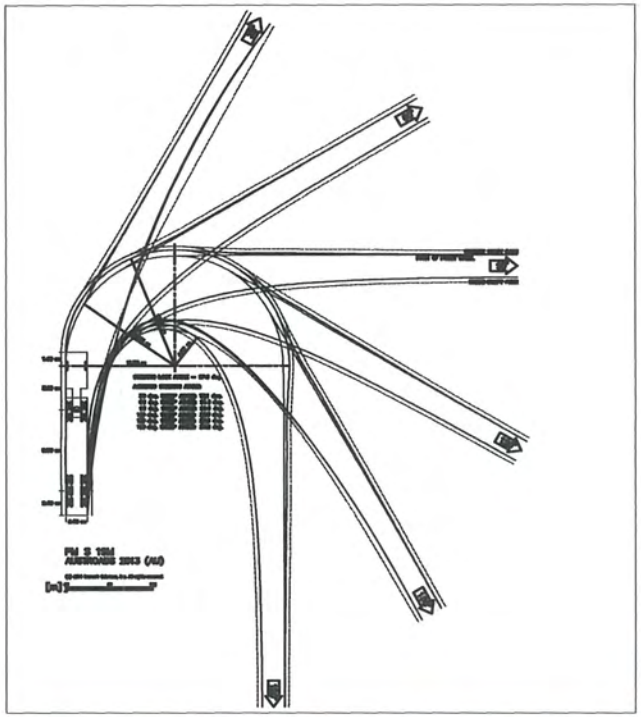
Position:

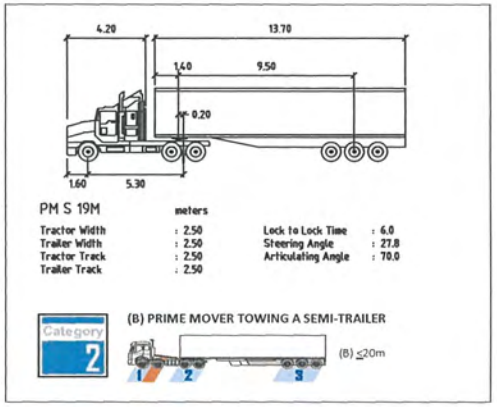
Date: Signature:

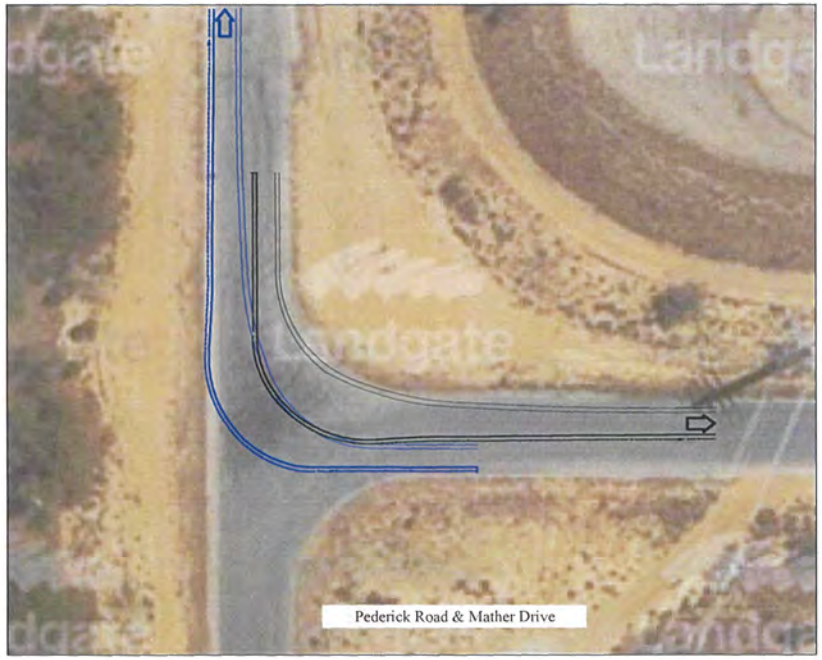
17. APPENDIX D – TURNING SWEPT PATHS

Standard swept paths for class 9 prime mover and trailer with 6 axles and standard GVM ratings.









CLIENT: Urban Resources

PROJECT:
Lot 9003 Quarry Works
85 Mather Drive
Neerabup
City of Wanneroo

TITLE:
Swept Paths

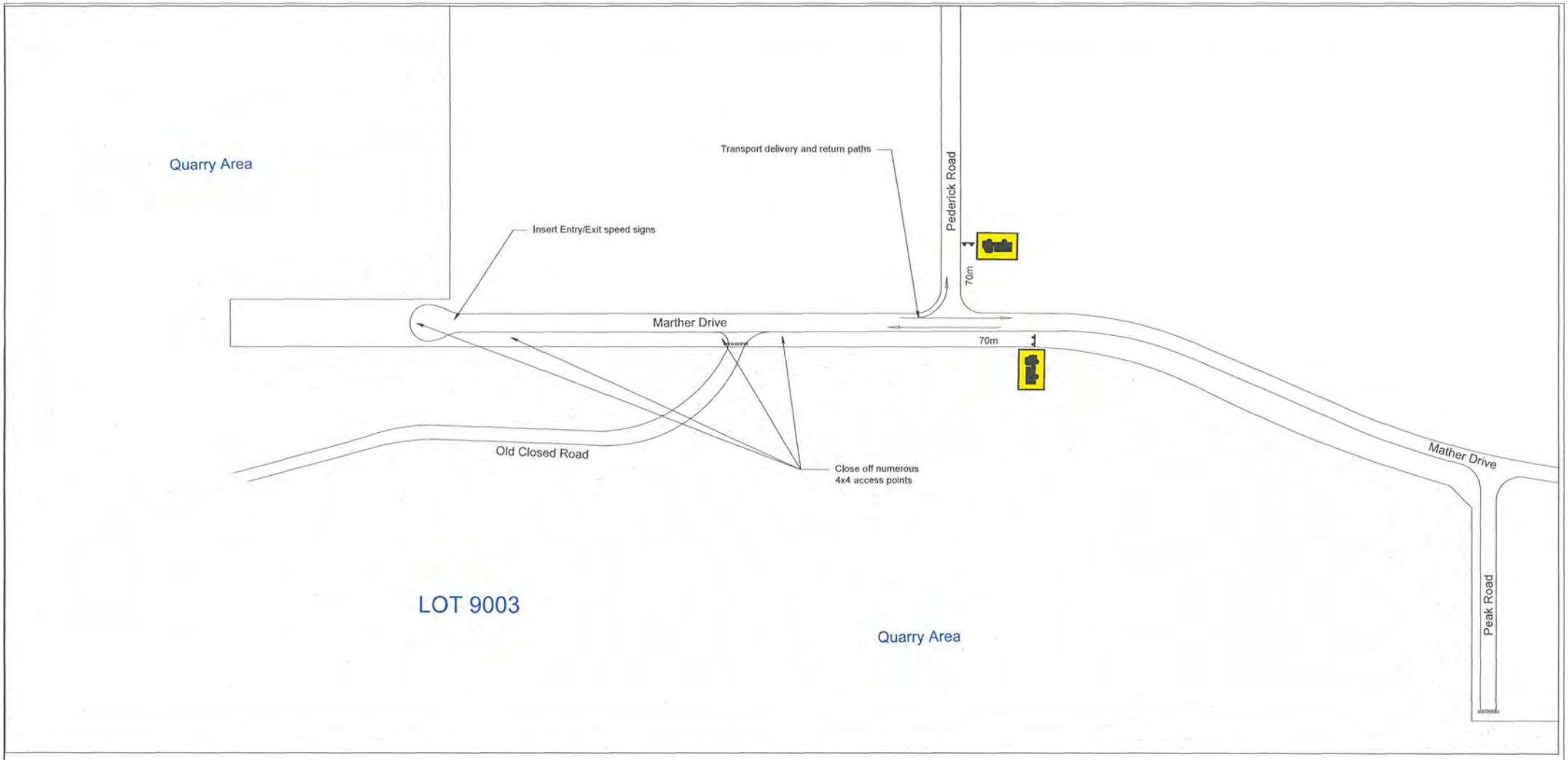
DELIVEY TRUCK ROUTE

RETURN TRUCK ROUTE

SITE INSPECTION
DATE 12/05/2020
BY V MORO
AWTM KTS-AWTM 17-15762-03

SCALE	NTS
DATE	14/05/20
DESIGN	V MORO
DRAWN	V MORO
REVIEWED	P ASHFOLD
FILE NAME	TMP UR06
DRAWING No	TGS - UR06-02
REV No	0
SHEET No	2
DRAWING SIZE	A3

18. APPENDIX E – TRAFFIC GUIDANCE SYSTEMS



SIGN Qty.
2 - Symbolic Trucks - (W5-22) - B Size
4 - Sign legs

ADDITIONAL NOTES

1. Class 1 Reflective Signs to be used.
2. Warning & Advisory signs to be in accordance with AS 1742.1
3. Entry/Exit speed signs to be installed.
4. Haulage roads to be speed limited.
5. Boundary fence to be installed to prevent 4x4 access.

CLIENT: Urban Resources

PROJECT:
Lot 9003 Quarry Works
85 Mather Drive
Neerabup
City of Wanneroo

TITLE:
Quarry Works
Mather Drive
Traffic Management

TRUCK ROUTE

SPEED of TRAFFIC km/h	SIGN SPACING m
55 or less	15
56 to 65	45
Greater than 65	Equal to speed of traffic in km/h

SITE INSPECTION
DATE 12/05/2020
BY V MORO
AWTH KTS-AWTM 17-15762-03

SCALE: NTS
DATE: 14/05/20
DESIGN: V MORO
DRAWN: V MORO
REVIEWED: P ASHFOLD
FILE NAME: TMP UR06

DRAWING No: TGS - UR06-01
REV No: 0
SHEET No: 1
DRAWING SIZE: A3