



WORKS APPROVAL APPLICATION

**LOT 62 LUDLOW-HITHERGREEN ROAD,
RUABON**

March 2025

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1 INTRODUCTION

1.1 Background

GM Giacci Family Trust acting on behalf of MGM Bulk Pty Ltd (the applicant) is proposing to extract gravel from a 9.54 ha area (herein referred to as the subject site) located within Lot 62 Ludlow-Hithergreen Road, Ruabon (refer to **Figure 1** and **Figure 2**).

The subject site is located in the municipality of the City of Busselton, approximately 16 km east-southeast of the Busselton town centre, 200 km south of Perth.

The current topography of the subject site can be described as gently sloping with the elevation ranging from approximately 24.7 m Australian Height Datum (AHD) in the northwest to 26.75 m AHD in the south east corner of Cell 2 (refer to **Appendix A**).

The available volume of gravel, *insitu* volume of approximately 176,000 m³, is to be extracted. The subject site will be excavated to an approximate maximum depth of 1.5 m below the elevation of the north west corner, 24.67 m AHD, commencing in the north and moving in a southerly direction in cells 1 and 2, followed by west to east in cells 3 and 4. The post extraction landform will be similar visually and in form with the pre-excavation landform with batter slopes of 1:3 vertical to horizontal.

The proposal involves the crushing and screening of gravel on site. These activities will require a works approval and subsequent licence under the *Environmental Protection Act 1986*. This document provides supporting information for a works approval application under the *Environmental Protection Act 1986*. The document includes an environmental assessment of emissions and discharges and their associated mitigation and management.

The works approval application is for the set-up and operation of a screening and crushing unit at the above mentioned site, located on Lot 62 Ludlow-Hithergreen Rd, Ruabon. Crushing and screening of material is an activity that is prescribed by the *Environmental Protection Regulations 1987* as follows:

Category 12: Screening, etc. of material – premises (other than premises within category 5 or 8) on which material extracted from the ground is screened, washed, crushed, ground, milled, sized or separated.

It is anticipated that a maximum of 176,000m³ of gravel will be extracted. Typical operating hours for quarries will be adopted for the subject site which involves 7am to 6pm, each Monday to Friday, 7am-1pm on Saturdays for rehabilitation works only and no activities to occur on Sundays or public holidays.

1.2 Location and Layout Plans

The subject site is located in the municipality of the City of Busselton, approximately 16 km east-southeast of the Busselton town centre, 200km south of Perth.

The Lot is wholly owned by Jamie Oates (refer to **Appendix B** for Certificate of Title). Authorisation for MGM Bulk Pty Ltd to act on the landowner's behalf for this proposal has been provided (refer to **Appendix C**).

The subject site is surrounded by rural properties.

2 EXISTING ENVIRONMENT

2.1 Regional Setting

The extraction area is located within Lot 62 Ludlow-Hithergreen Road, Ruabon. The subject site is located in the municipality of the City of Busselton, approximately 16 km east- southeast of the Busselton town centre and 200 km south of Perth.

The subject site is zoned 'Rural' pursuant to the City of Busselton's *Local Planning Scheme No.21*.

The surrounding properties in all directions are zoned 'Rural', with properties to the west and south currently running extractive industry operations. The Lot is bordered to the north by the Abba River tributary drainage reserve.

2.2 Topography and Soils

The current topography of the subject site can be described as gently sloping with the elevation ranging from approximately 24.7 m Australian Height Datum (AHD) in the northwest to 26.75 m AHD in the south east corner of Cell 2 (refer to **Appendix A**).

The subject site lies on the western side of the Swan Coastal Plain. The Plain at this point consists of a broad almost flat alluvial plain that slightly undulates, with seasonal wetlands occurring in the depressions.

The subject site is located within the Pinjarra Zone landform consisting of *"alluvial deposits between the Bassendean Dunes Zone and the Darling Scarp, consisting of colluvial and shelf deposits adjacent to the Darlings Scarp with clayey to sandy alluvial soils with wet areas"*, and the Abba System described as *"Poorly drained flats, on the southern Swan Coastal Plain with grey deep sandy duplex and wet soils."* (Tille 2006).

Within the Abba System, the subject site is located within the Abba wet ironstone flats phase consisting of *'winter wet flats and slight depressions with shallow red brown sands and loams over ironstone (i.e. bog iron ore soils)'*.

2.2.1 Acid Sulfate Soils

Acid Sulfate Soils (ASS) is the common name given to naturally occurring soil and sediment containing iron sulfides. They have become a potential issue in land development projects on the Swan Coastal Plain when the naturally anaerobic conditions in which they are situated are disturbed and they are exposed to aerobic conditions and subsequently oxidise. When oxidised, ASS produce sulfuric acid, which can result in a range of impacts to the surrounding environment. ASS that has oxidised and resulted in the creation of acidic conditions are termed "Actual ASS" (AASS), and those that have acid generating potential but remain in their naturally anaerobic conditions are termed "Potential ASS" (PASS).

ASS risk mapping (DWER 2020) indicates that there is a 'moderate to low' risk of ASS occurring within 3 m of natural soil surface across the whole subject site.

2.3 Climate

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

The closest weather recording station is Busselton Aero (Station 9603). Temperatures are highest on average in January, at approximately 30.4°C. July has the lowest average temperature of the year of 7.0°C.

Rainfall for the area is approximately 680 mm per annum with approximately 89% of the rain falling during the winter months, April to October inclusive. Evaporation exceeds rainfall in all but the wettest winter months.

Rainfall intensity has been calculated using the Bureau of Meteorology (BoM) Intensity-Frequency-Duration (IFD) data system which yields the two hour 10 year average return interval storm event for the subject site as 42 mm/hr.

Wind direction is predominately from the south east in the morning and south west in the afternoons during the summer months. During winter the winds are more variable with no dominant prevailing direction, (BoM 2024).

2.4 Vegetation and Flora

The flora and vegetation within the subject site has been subjected to prolonged land degradation processes including land clearing and grazing purposes. Vegetation within the subject site has been cleared previously to accommodate the existing land use (agriculture) and is dominated by grazing grasses. A total of seven individual *Eucalyptus rudis* (flooded gum) trees are located within the extraction area and will require clearing. A clearing permit CPS 10448/1 has been approved by DWER for this clearing.

2.4.1 Threatened Ecological Communities

An ecological community is defined as “a naturally occurring assemblage that occurs in a particular type of habitat” (PWS 2015). A Threatened Ecological Community (TEC) is one that has declined in area or was originally limited in distribution. Uncommon ecological communities that do not strictly meet TEC defined criteria, or are inadequately defined, are listed by the Department of Biodiversity, Conservation and Attractions (DBCA) as a Priority Ecological Community (PEC).

As well as protection under State legislation, selected ecological communities are also afforded statutory protection at a Federal level pursuant to the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The EPBC Act provides for the protection of TECs, which are listed under section 181 of the Act, and are defined as “Critically Endangered”, “Endangered” or “Vulnerable” under Section 182.

A search of the DBCA’s and EPBC databases found five TEC endorsed under State and Commonwealth legislation and policy recorded within proximity to the subject site. This included the Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region ecological community, Clay Pans of the Swan Coastal Plain, Epodisma peatlands of southwestern Australia, Shrublands on southern Swan Coastal Plain ironstones and the Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain ecological community.

None of the vegetation within the subject site is representative of these TECs due to its ‘completely degraded’ condition and the complete absence of key indicator species such as *Banksia* spp., *Brachysema modestum*, *Eucalyptus gomphocephala*, *Melaleuca huegelii*, *M. systena* and *Banksia sessilis*. Accordingly, the subject site does not contain any conservation significant vegetation.

2.4.2 Environmentally Sensitive Areas

Section 51B of the *Environmental Protection Act 1986* (EP Act) allows the Minister to declare an Environmentally Sensitive Area (ESA). Once declared, the exemptions to clear native vegetation under the regulations do not apply in these areas. TEC’s areas within 50 m of any Declared Rare flora (DRF) and defined wetland areas constitute ESAs. However, a number of other areas of environmental significance are also listed. Current declared ESAs are listed in the *Environmental Protection (Environmentally Sensitive Areas) Notice 2005*.

The entire subject site is mapped as occurring within an ESA based on the presence of a threatened Ecological Community (TEC). However, due to the subject sites completely degraded condition it is unlikely to be present.

2.5 Fauna

The subject site contains only seven isolated *Eucalyptus rudis* paddock trees over pasture grasses. Given the absence of any other native vegetation the subject site is not likely to provide habitat critical for the survival of conservation significant fauna species.

2.6 Hydrology

2.6.1 Groundwater

Within the subject site, the underlying aquifers are the Superficial, the Yarragadee and the Leederville. The Superficial aquifer, which is mainly unconfined and shallow, contains fresher groundwater resting on saline groundwater. The Superficial aquifer is hydraulically connected to the underlying Leederville aquifer (Deeney 1989).

Rainfall within the project area infiltrates the shallow, softer materials or permeable fractures and cavities filled with sandy material, accumulating above the more resistant ironstone layers. Water movement follows the site's natural topography before gradually percolating into the deeper levels of the Superficial Aquifer, with groundwater flow directed towards the northwest under a low hydraulic gradient, (ABEC 2022).

A groundwater investigation (ABEC 2022) which included a review of the regional hydrogeology, site specific geology and groundwater elevation, indicates the presence of a perched groundwater layer in winter. This occurs when rainfall falling within the area penetrates the shallow softer material or fractures/cavities filled with more sandy material and sites on top of the harder ironstone layers following the general topography of the site (ABEC 2022).

2.6.2 Surface Water

The subject site is located within the Wonnerup subarea of the unproclaimed South West surface water area. There are no surface water features located within the subject site, with the closest surface water feature, the Abba River tributary drain, located to the north of the property.

The subject site is not proclaimed under the *Country Areas Water Supply Act 1947* as a Public Drinking Water Source area (DWER 2024).

2.6.3 Wetlands

Wetlands within Western Australia are classified on the basis of landform and water permanence pursuant to the Semeniuk (1995) classification system (refer to **Table 1**).

Table 1. Wetland classifications (Semeniuk 1995).

Water Longevity	Landform				
	Basin	Channel	Flat	Slope	Highland
Permanent Inundation	Lake	River	-	-	-
Seasonal Inundation	Sumpland	Creek	Floodplain	-	-
Intermittent Inundation	Playa	Wadi	Barlkarra	-	-
Seasonal Waterlogging	Dampland	Trough	Palusplain	Paluslope	Palusmont

Areas of wetlands in Western Australia have been mapped and this mapping has been converted into a digital dataset that is maintained by the Department of Biodiversity, Conservation and Attractions (DBCA) and is referred to as the 'Geomorphic Wetlands of the Swan Coastal Plain' dataset. This dataset contains information on geomorphic wetland types and assigns management categories that guide the recommended management approach for each wetland area. The wetland management categories and management objectives are listed in **Table 2**.

Table 2. DBCA wetland management categories (Semeniuk 1995).

Category	Description	Management Objectives
Conservation	Wetlands support a high level of ecological attributes and functions.	<p>Highest priority wetlands. Objective is to preserve and protect the existing conservation values of the wetlands through various mechanisms including:</p> <ul style="list-style-type: none"> • Reservation in national parks, crown reserves and State owned land, • Protection under Environmental Protection Policies, and • Wetland covenanting by landowners. <p>No development or clearing is considered appropriate. These are the most valuable wetlands and any activity that may lead to further loss or degradation is inappropriate.</p>
Resource Enhancement	Wetlands which may have been partially modified but still support substantial ecological attributes and functions	<p>Priority wetlands. Ultimate objective is to manage, restore and protect towards improving their conservation value. These wetlands have the potential to be restored to Conservation category. This can be achieved by restoring wetland function, structure and biodiversity.</p>
Multiple Use	Wetlands with few remaining attributes and functions	<p>Use, development and management should be considered in the context of ecologically sustainable development and best management practice catchment planning through landcare.</p>

The entire subject site is mapped as occurring within a Multiple Use (MU) wetland (UFI 15,809).

2.7 Aboriginal Heritage

All Aboriginal sites in Western Australia are provided protection under the *Aboriginal Heritage Act 1972* in which it is an offence for anyone to excavate, damage, destroy, conceal or in any way alter an Aboriginal site without the Minister's permission.

An online search for relevant Aboriginal heritage information was undertaken using the Department for Planning, Lands and Heritage Aboriginal Inquiry System that incorporates both the heritage site register and the heritage survey database (DPLH 2019). The Aboriginal Heritage Site Register is maintained pursuant to Section 38 of the *Aboriginal Heritage Act 1972* and contains information on over 22,000 listed Aboriginal sites throughout Western Australia.

Results of the database search revealed that no Aboriginal heritage sites are present within the subject site. The closest Aboriginal heritage site is the Abba River (ID: 17354) which is located approximately 3.4km to the west of the subject site. Nonetheless, it is important to note that Aboriginal heritage sites may still exist in or adjacent to the subject site that are not yet known or may not yet been listed on the Aboriginal Heritage Register.

3 PROJECT DESCRIPTION

3.1 Area of Disturbance

The gravel quarry will cover an area of approximately 9.54 ha with a current maximum elevation ranging between 24.7 m AHD to 26.75 m AHD. It will be excavated in four cells to depths of 24.5 m AHD in the east and 23.0 m AHD in the west for Cells 1 and 2, and for Cells 3 and 4 between 23.5 m AHD in the east and 23.0 m AHD in the west. Indicative Cells are shown within **Appendix A** to illustrate their relative scale.

The proposal involves the screening and crushing of gravel on site. Therefore, a works approval from the DWER is being sought for this activity. The duration of crushing and screening operations will be dependent on the timing and requirements of specific campaigns. The designated haulage routes will be:

- North along Ludlow- Hithergreen Road, then west along Ruabon Road to Bussell Highway; and
- South along Ludlow – Hithergreen Road, to Vasse Highway.

The planned end use of the quarry is to restore a natural soil profile and return the area to pasture, ensuring that there is no net loss of productive agricultural land.

3.2 Description Overview

All crushing and screening equipment and infrastructure at the subject site will be fully portable to facilitate movement throughout the site required for staged quarrying operations. The key project characteristics associated with the proposal are provided below in **Table 3**.

Table 3. Project characteristics.

Characteristic	Description
Quarry life	Five years
Total resource	A maximum of approximately 176,000 m ³ of gravel.
Project footprint	9.54 ha
Vegetation clearing	Clearing of seven isolated <i>Eucalyptus rudis</i> will be undertaken in accordance with CPS 10448/1.
Operating hours	7:00 am – 6:00 pm, Monday to Friday, 7:00 am – 1:00pm Saturday.
Fenced compound	A compound area will be fenced to secure equipment and restrict public access.
Water Tankers	A 30,000L water tanker or similar will be used for dust suppression on the access road and working floors as required. The water tanker will be filled at an offsite water supply.
Loader (Cat 980H or similar)	Loaders will be used for the movement of gravel and loading road trucks.
Terex J1175 Crusher (or similar)	Used for the crushing of gravel.
Screening Plan (McCloskey S190 or similar)	Used for the screening of crushed gravel.
Telestak Stockpiler (or similar)	Used for stockpiling crushed gravel.
Surface Miner – Wirtgen 2500 or similar	Use for the excavation, crushing, screening and stockpiling of gravel.

Characteristic	Description
Toilets	A portable toilet may be required onsite.
Generator	A generator may be required to provide power to a variety of equipment.
Water usage	Water will be trucked to the subject site as required.
Waste	All waste products will be stored in appropriate rubbish bins (recycling, putrescible, and hydrocarbons will be separated in lidded bins) and removed from site by a contractor at regular intervals and disposed of at the licensed landfill facilities. There will be no landfill on site

Onsite facilities will be kept to a minimum and importantly no fuel or chemicals will be stored onsite.

The commencement of operations is proposed in 2025 (subject to obtaining all approvals). The estimated construction costs to mobilise the crushing and screening equipment is approximately \$8,000 (refer to **Table 4**). The only cost associated with the infrastructure outlined in this works approval application is the mobilisation of equipment to the subject site.

3.3 Mining Operations

Using a loader, the topsoil (nominally 15 cm of the soil profile) will be stripped and placed in stockpiles less than 2 m high, as per **Appendix A**. Overburden, if present, will be removed using a dump truck and stockpiled to the perimeter of the proposed pit area.

Typical operating hours for quarries will be adopted for the subject site which involves 0700 am to 1800pm each Monday to Friday and Saturdays 0700 am to 1300 pm, with no activities to occur on Sundays or public holidays. The site will be worked by 2 - 3 persons, depending on market demand.

Access to the property will be via the designated haulage routes as follows:

- North along Ludlow- Hithergreen Road, then west along Ruabon Road to Bussell Highway; and
- South along Ludlow – Hithergreen Road, to Vasse Highway.

A maximum number of 70 truck movements (i.e. 35 trucks entering and 35 trucks exiting the site) will occur on any day as per the Development Approval. Trucks entering and exiting the site will not operate prior to 0700 am or after 1800 pm.

3.3.1 Gravel Extraction

A Wirtgen Surface Miner will be used to excavate, grind, crush and then stockpile the material to the stockpile area located in the north western portion of the subject site. The material will then be loaded on to waiting trucks for transport. A summary of the proposed gravel extraction activities is provided below:

- Prior to excavation commencing the site will be ground surveyed, the excavation footprint marked out and a 1 m contour plan developed.
- The topsoil/overburden will be stripped and used to construct earthen bunds using a loader.
- A surface miner will be used to dig the gravel, grind and crush it and then transport it to a stockpile.
- Any areas of deeper sand will also be stripped and stockpiled for reuse.
- The gravel will then be picked up by a loader and loaded to trucks for transport.
- If required, campaign crushing and screening may occur. This is likely to be intermittent, as required.
- Excavation will commence in the west of the quarry and then move in an easterly direction.
- Upon completion of each section of quarry, the last cut of approximately 400 mm will be screened with the fines left behind. These will be reformed and back filled, where subgrade material is available, to achieve the proposed final contours.
- At the end of excavation, the floor of the quarry will be deep ripped, covered by overburden and topsoil, and rehabilitated to a constructed soil.

3.3.2 Final Contours

The slope of the final contours of the quarry will be an undulating surface at approximately 1.5 m below the pre-works ground surface. This will ensure a separation of around 0.5 m between the final contours and the maximum groundwater elevation.

Slopes of the batters at the end of excavation will be retained at a minimum of 1:6 vertical to horizontal.

3.3.3 Rehabilitation

The end land use of the extraction area will be returned to pasture. Accordingly, it will be necessary to establish a safe and stable landform capable of supporting the proposed future land use.

Upon completion of quarrying, the following broad completion criteria will be achieved:

- A self-sustaining cover of pasture;
- Weed levels that are not likely to impact on the viability of the reconstructed soils; and
- A safe and stable landform suitable for the proposed future land use which will be productive, grazing pasturelands.

3.4 Crushing and Screening Equipment

3.4.1 Installation

Due to the mobile nature of the crushing and screening equipment, installation at the subject site will be very simple. The 'plug and play' equipment does not require earthworks or significant construction and therefore has a low risk of noise and dust generation during this phase.

3.4.2 Operation

The crusher and screening plant will be located to the north of the extraction area (refer to **Appendix A**). The mobile crushing and screening equipment used is modular and interchangeable. The crusher and

screens can be configured differently for the production of several sand gravel products. The plant is equipped with dust covers for dust management.

3.4.3 Resource Requirements and Regional Infrastructure

Regional resource requirements are described below as follows:

- Water supply is not required for excavation;
- Water will be required for dust suppression, water will sourced offsite and will be trucked to the subject site as required;
- Power is not required; and
- Equipment will be refuelled using mobile refuelling trucks equipped with spill kits.

4 ENVIRONMENTAL IMPACTS AND MANAGEMENT

The following factors are considered to represent the potential environmental and amenity impacts associated with the proposal:

- Hydrology;
- Weed and pathogens;
- Noise;
- Dust; and
- Uncontrolled discharge of contaminants to land.

These environmental factors are discussed in more detail below, together with the proposed management actions.

4.1 Hydrology

4.1.1 Surface Water

The current water cycle within the subject site consists of inputs from rainwater flowing in a downhill (northerly) direction into the wider drainage system. The development is not proposing to alter this process, as there are no drainage lines within the proposed extraction area.

Any surface water falling outside of the pit will be diverted around the pit by the perimeter bunds to the natural drainage system. The bunding will be installed for Cells 1 and 2 initially in an east to west direction. On completion of excavation within these cells, this bunding will be removed and a second bund will be installed to divert stormwater around Cells 3 and 4 (refer to **Figure 2**). Surface water retained within the excavated areas will either evaporate or infiltrate through the pit ensuring water quality to the drainage system is maintained.

The operation of the crushing and screening plant will be a dry operation.

4.1.1.1 Construction

The mobilisation and positioning of equipment associated with a Category 12 prescribed premises is not associated with any impacts to surface water, including stormwater runoff.

4.1.1.2 Operation

The operation of the screening and crushing plant will be a dry operation.

All stormwater drainage within the extraction area is internal and the runoff generated by direct rainfall into the pit will be fully retained within the depression basin created by the mining, as demonstrated within the *Water Management Plan* (Accendo 2024) (refer to **Appendix D**) approved by the City of Busselton. Any surface water falling outside of the pit will be diverted around the pit by the perimeter bunds to the drainage system. Surface water retained within the excavated areas will either evaporate or infiltrate through the pit ensuring water quality to the drainage system is maintained.

The pit will be monitored post rainfall events for any incidences of erosion damage and any required repairs will be undertaken as soon as practicable.

4.1.1.3 Risk Assessment

A risk assessment relating to surface water and stormwater runoff in consideration of the proposed management measures is provided below. The residual risk associated with sedimentation and erosion from stormwater runoff during the operation of the crushing and screening equipment is considered low.

Table 5. Risk assessment associated with surface water and stormwater.

Hazard	Source of Hazard	Potential Impacts	Mitigation	Likelihood	Consequence	Residual Risk
Erosion and sedimentation	Uncontrolled and contaminated stormwater runoff	Erosion and sedimentation resulting in poor surface water quality in the Abba River	Contain any potentially sediment laden surface water within the pit. Cells constructed with a gradient to ensure that stormwater is contained within the excavation footprint.	1	2	Low

4.1.2 Groundwater

Groundwater will not be extracted or dewatered during the operation of the quarry and therefore, no impacts to groundwater levels are proposed.

Maximum excavation levels will be 1.5 m BGL. As discussed within **Section 2.6.1** no interaction with groundwater is expected during excavation works. Furthermore, a separation of at least 0.5 m, between the final contours and the maximum groundwater elevation will be maintained.

The extraction and processing of gravel is a chemically free operation with the liquids used being lubricants for machinery and refuelling. There will be no storage of chemicals or fuel on site.

4.1.2.1 Construction

The mobilisation and positioning of equipment associated with a Category 12 prescribed premises is not associated with any impacts to groundwater.

4.1.2.2 Operation

The operation of the screening and crushing plant will be a dry operation and is not associated with any impacts to groundwater.

4.2 Dieback (*Phytophthora cinnamomi*) and Weed Management

Phytophthora dieback is a soil-borne pathogen recognised as a major threat to Australian vegetation, and in particular, the vegetation and dependent biota within the southwest botanical province. *Phytophthora* dieback is known to reduce the health and species diversity of native vegetation and the disease is listed as a key threatening process under the EPBC Act.

While no evidence of dieback has been observed, no site-specific investigation has been undertaken. Therefore, it is not possible to confirm whether dieback is present or absent. On this basis, it is reasonable to classify the site as 'uninterpretable', denoting that a precautionary management approach should be adopted.

The primary objective of dieback management during operations is to minimise the risk of entry of dieback to the subject site. This can be achieved by preventing the importation of soil or plant material to and from the subject site. The risk of transportation via vehicles and equipment is low given that sealed roads will be utilised prior to entering the subject site.

4.2.1 Construction

The mobilisation and positioning of equipment associated with a Category 12 prescribed premises could be associated with the introduction/spread of dieback and weeds within the subject site. Accordingly, the management measures provided in **Table 6** are proposed.

4.2.2 Operation

The primary objective of dieback management during operations is to minimise the risk of entry of dieback to the subject site. The risk of transportation via vehicles and equipment is low given that sealed roads will be utilised prior to entering the site.

4.2.3 Management Measures

The management measures proposed for dieback control are developed in accordance with the *Dieback Working Group (DWG) – Best Practice Guidelines* (DWG, 2005) for an uninterpretable site and are provided within **Table 6**.

Table 6. Dieback and weed management measures.

<i>Phytophthora</i> dieback and weed management	
Responsibility <ul style="list-style-type: none"> Project Manager. Contractors. 	
Objectives <ul style="list-style-type: none"> To prevent the introduction and spread of <i>Phytophthora</i> dieback and weeds within the subject site. 	
Potential Impacts <ul style="list-style-type: none"> Introduction and spread of disease (<i>Phytophthora</i> spp.) and weeds. 	
Management Strategies <ul style="list-style-type: none"> Training will be provided to all personnel during the safety and environment induction course. This will include an explanation of the specific requirements relating to <i>Phytophthora</i> dieback management. All earthmoving and ground engaging equipment will be inspected and cleaned of vegetation and soil prior to entry and exit of the subject site. Access to the subject site during excavation activities will be restricted to the proposed roads and driveways. No other access points should be established. Reduce vehicle and plant movement into and within the site as much as possible, particularly during wet conditions. All material will be transported such that soil shall not fall from the vehicle onto road verges. 	Timing <ul style="list-style-type: none"> Prior to works commencing. Prior to works. Prior to and during works. During works. During and post works.

4.2.4 Risk Assessment

A risk assessment to determine the residual risk associated with dieback and weeds is provided below. The risk assessment indicates that with the application of suitable management measures the potential risk associated with dieback introduction and spread is 'Low'.

Table 7. Risk assessment associated with dieback and weeds.

Hazard	Source of Hazard	Potential Impacts	Mitigation	Likelihood	Consequence	Residual Risk
Introduction/spread of dieback and weed species	Importation of soil/plant material. Onsite movement of soil.	Impacts to the condition of remnant vegetation. Spread to offsite locations.	Refer to Management Measures provided in Table 6 .	1	2	Low

4.3 Noise

The subject site has been designed to maximise setbacks to the closest sensitive receptors. This has involved extensive analysis of the local landform, environmental characteristics, land uses and location of sensitive receptors.

The Environmental Protection Authority's (EPA) *Guidance for the Assessment of Environmental Factors* (June 2005) provides generic separation distances to assist in the determination of suitable buffers where industry may have the potential to affect the amenity of a sensitive land use. In particular, for extractive industries, a buffer distance of 300 m to 500 m is recommended from sensitive land uses.

4.3.1 Construction

The mobilisation and positioning of equipment associated with a Category 12 prescribed premises is not associated with any significant noise emissions.

4.3.2 Operation

The proposed extraction activities will be low impact in nature and the minimal noise emanating from the subject site will be indistinct from typical rural noises. Furthermore, extraction activities will only be undertaken during standard hours of operation (in accordance with the conditions of the Development Approval). A summary of potential noise generating activities is presented in **Table 8**.

Table 8. Noise generating activities.

Activity	Duration	Equipment to be used	Sound pressure Level (dB(A))	Comments
Topsoil stripping	3 weeks per year	CAT 980H FEL	105	Initial impact to closest resident which will reduce as stockpiles increase.
	6 weeks per year	CAT 980 FEL or similar	105	Noise will be muffled by stockpiles

Activity	Duration	Equipment to be used	Sound pressure Level (dB(A))	Comments
Screening and stockpiling of sand		Sand Screen	101	Noise will be muffled by stockpiles
		Surface Miner	116	Noise will be muffled by stockpiles
Crushing and stockpiling of limestone	6 weeks per year	Mobile Crusher	113	Noise will be muffled by stockpiles
		CAT 980 FEL or similar	105	Noise will be muffled by stockpiles
Loading of trucks from stockpiles	A maximum of 5 years with 6-18 loads per day, dependent on demand.	CAT 980 FEL or similar	105	Noise will be muffled by stockpiles, vehicles are new and well maintained.
Rehabilitation of completed stages	To be undertaken in conjunction with excavation works where applicable.	CAT 980 FEL or similar	105	Limited period of moderate noise levels, indistinguishable from excavation noise when undertaken concurrently.

Noise levels have been obtained from a combination of manufacturers' specifications and from the *Acoustic Assessment Ludlow-Hithergreen Road, Ruabon* (Herring Storer Acoustics 2023) prepared for Carter Farm Pty Ltd for the Extractive Industry at Lot 62 Ludlow- Hithergreen Groad, Ruabon for the extraction of gravel.

The closest sensitive receptors to the subject site are located at a distance of approximately 500 m from the southern premise boundary (refer to **Figure 4**). An acoustic assessment undertaken by Herring Storer Acoustics (2023) found that when operating on the surface there was a potential to exceed the regulatory criteria at the nearest residential locations. The inclusion of noise management in the form of 3 m high bunds at the southern boundaries of each extraction stage and to the north and west of the crushing and screening area was found to result in noise levels calculated at the nearest premises to comply with the *Environmental Protection (Noise) Regulations 1997*.

To further mitigate potential impacts associated with noise, the proposed management measures provided in **Table 9** will be applied.

Table 9. Management actions for noise.

Item	Action	Trigger/Timing	Responsibility
<i>Inductions</i>			
1	As part of site inductions, employees, contractors and visitors to the site are reminded of their responsibility to undertake work activities in an environmentally sensitive manner, including minimising noise while on site, or entering and leaving the site.	Ongoing	Site Manager
<i>Planning Controls</i>			
2	<u>Daily Planning</u> <ul style="list-style-type: none"> The use of significant noise generating equipment or activities simultaneously is avoided. The noisiest activities are scheduled to the least sensitive times of the day. 	Where possible	Site Manager
3	Regular review of meteorological data, specifically wind speed and direction, to guide decisions on quarrying activities.	As required, with consideration to the intensity of activities onsite and the prevailing weather conditions	Site Manager
<i>Operational Controls</i>			
4	<u>Equipment and Machinery</u> <ul style="list-style-type: none"> Use machinery and equipment with minimal noise output levels. Ensure all machinery is regularly serviced as per the equipment's maintenance schedule to minimise noise generation. Where appropriate, all machinery and equipment will be shut off when not in use. Use flashing lights/broadband alarms instead of tonal reversing alarms on excavators/loaders. Apply speed restrictions (30 km/hr within site) and a ban on exhaust braking. 	Continuous	All employees & contractors
5	<u>Earth Bunding</u> <ul style="list-style-type: none"> 3 m high earth bunding is required for the active stage of operation and is required at the southern side of each stage. 3 m high earth bunding will be in place to the west and north of the crusher and screener. 		

Item	Action	Trigger/Timing	Responsibility
<i>Complaints Management</i>			
5	Erect on-site signage directing public to make complaints to the relevant person.	Prior to quarrying	Site Manager
6	<p>Maintain a complaints register (refer to Appendix E). A Complaints Register will be established for the site to record the following information:</p> <ul style="list-style-type: none"> • Date, time, location and nature of the exceedance. • Identify the cause (or likely cause) of the exceedance and responsible parties. • Identify the activities that were occurring at the time of the non-compliance. • Determine the activities that were most likely contributing to the non-compliance. • Describe what action has been taken to date. • Describe the proposed measures to address the exceedance. <p>If the complaint is verified as being due to a site source, remedial action will be undertaken within 4 hours. The City of Busselton will be advised of all complaints as soon as they are received. If a complaint cannot be resolved within the 4 hour response period, it may be necessary to cease operations.</p>	Upon receiving complaint	Site Manager

4.3.3 Risk Assessment

Further to this, a risk assessment to determine the residual risk associated with noise emissions is provided below. The risk assessment indicates that with the application of suitable management measures the potential risk associated with noise emissions is 'Low'.

Table 10. Risk assessment associated with noise emissions.

Hazard	Source of Hazard	Potential Impacts	Mitigation	Likelihood	Consequence	Residual Risk
Noise emission	Excavation machinery and processing	Noise impacts to neighbouring properties	Refer to Actions provided in Table 9 .	1	2	Low

4.4 Dust Emissions

In accordance with the EPA (2005) Guidance Statement No. 3 *Separation Distances between Industrial and Sensitive Land Uses*, the recommended separation distance between an extractive industry and a residential dwelling is 300-500 m. As previously discussed in **Section 4.3**, the closest residential dwelling is located at a distance approximately 500 m from the subject site.

No significant dust emissions are expected from the set-up or operation of the crushing unit as suitable management measures will be implemented. This will include the use of water carts as required, and the operation of sprayers and sprinklers, equipped on the crushing and screening equipment, to dampen material stockpiles. This is consistent with industry accepted quarry treatment practices.

4.4.1 Topography

The current topography of the subject site can be described as gently sloping with the elevation ranging from approximately 24.7 m Australian Height Datum (AHD) in the northwest to 26.75 m AHD in the south east corner of Cell 2 (refer to **Appendix A**).

4.4.2 Wind Direction

Wind direction is predominately from the south east in the morning and south west in the afternoons during the summer months. During winter the winds are more variable with no dominant prevailing direction, (BoM 2024).

4.4.3 Dust Sources

The proposed extractive industry activities will involve the disturbance of large quantities of soil and earthen material. Specifically, this may include the following activities:

- Earthworks during extraction activities;
- Topsoil stripping;
- Loading and transportation of material;
- Crushing and screening of material;
- Vehicle movement within the site; and
- Wind erosion of exposed surfaces.

These activities have the potential to generate dust that, if not adequately controlled, can cause nuisance and safety risks. In-pit operations tend to generate less dust than surrounding activities due to the reduced airflow within the pit. The removal and replacement of topsoil material has the highest risk associated with dust generation due to the large volumes of material involved and generally lower levels of soil moisture.

4.4.4 Risk Assessment

In accordance with the DWER's "A guideline for managing the impacts of dust and associated contaminants from land development sites, contaminated sites remediation and other related activities", a risk assessment for dust emissions has been prepared.

For a site that is generating uncontaminated dust, such as extractive industry sites, the site classification chart in Appendix 1 of the DWER guideline can be used for assessing the site risk. Appendix 1 also details the provisions and contingency arrangements for dust management which apply to each site classification score.

A risk assessment, undertaken as part of the Dust Management Plan (MBS 2023) found a site classification score (DEC 2011) of 504 was calculated for the works based on the location of the closest residence to the south. This was based on the closest residence being located at approximately 488 m to the south (in a previous version of the extraction plan). Given the amendments to the extraction plan, this residence is now located approximately 500m from the subject site boundary. The inclusion of this residence in the 500 m to 1 km distance, rather than the 100 m to 500 m separation from the subject site results in a site classification score of 336 which is classified as 'low risk'.

It is also noted that the nearest property also contains an operational extractive industry site which is closer to the residence than the proposed operations within the subject site and located in between the residence and the proposed operations. This will need to be taken into consideration in any dust monitoring as an alternative source of dust (MBS, 2023).

Site Classification Score (A x B) = 360

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

Provisions:

The developer shall supply a contingency plan to the local government, which shall detail the activities to be undertaken should dust impact occur.

Contingency arrangements:

Include an allowance for water-cart operation, wind fencing and surface stabilisation during construction period for the purposes of dust suppression.

All areas of disturbed land should be stabilised to ensure that the disturbed area exposed at any time is kept to a practical minimum.

Monitoring requirements:

Complaints management system in place.

Notice to be erected at the site providing contact details of the person to be contacted.

4.4.5 Management Measures

While the potential impacts to amenity from dust emissions are considered low, standard dust suppression measures will be implemented during operation activities, as provided within **Table 11**.

Table 11. Dust management measures.

Legislation and Key Standards		
<p><i>Environmental Protection Act 1986 (EP Act)</i></p> <p><i>A guideline for managing the impacts of dust and associated contaminants from land development sites, contaminated sites remediation and other related activities (DEC 2011)</i></p>		
Objectives		
<ul style="list-style-type: none"> Minimise dust lift during all activities. No adverse dust impacts to sensitive receptors from the quarry operations. 		
Targets		
<ul style="list-style-type: none"> No visible dust beyond the property boundary. No dust complaints. 		
Management Actions		
Description	Responsibility	Timing
Notice to be erected at the site, providing contact details of the person to be contacted regarding the works. This person will also be available outside of operational hours to address any complaints.	Site Manager	Prior to extraction
<p>Induction for all employees will include information on:</p> <ul style="list-style-type: none"> Potential sources of dust Dust Management Plan Speed limits onsite and staying on designated roads Reporting procedure for dust issues 	Site Manager	Prior to extraction
<p>Topsoil stripping shall <u>not</u> occur during the following conditions:</p> <ul style="list-style-type: none"> Forecasted winds in excess of 20 km/hr; 	Site Manager	Topsoil stripping and bund construction

Ground disturbance and rehabilitation will be gradual in nature and proceed in stages.	Site Manager	At all times	
Water trucks are to water down unsealed roads during operation to reduce dust lift.	Site Manager	As required	
Topsoil stockpiles will be no greater than 2 m in height and other stockpiles will not exceed 3 m in height.	Site Manager	At all times	
No excavation works or loading of trucks is to occur in winds greater than 40 km/h.	Site Manager	At all times	
Temporary stockpiles and exposed areas will be watered and stabilised as required. Stabilisation techniques that will be considered depending on environmental conditions will include hydro-mulching.	Site Manager	As required	
Transport of material will be via covered trucks or dampened prior to transport to prevent dust lift during transport.	Drivers	During soil transport activities	
A 30,000 L water trucks will be available at all times during quarry activities to water the site on observation of dust lift.	Site Manager	As required	
Vehicle speeds will be restricted to no more than 20 km/hr on the site to minimize dust lift off.	Drivers	At all times	
Maintain a complaints register (refer to Appendix E). A Complaints Register will be established for the site to record the following information: <ul style="list-style-type: none">• Date, time, location and nature of the exceedance.• Identify the cause (or likely cause) of the exceedance and responsible parties.• Identify the activities that were occurring at the time of the non-compliance.• Determine the activities that were most likely contributing to the non-compliance.• Describe what action has been taken to date.• Describe the proposed measures to address the exceedance.	Site Manager	As required	
Monitoring			
Description	Parameter	Responsibility	Frequency
Visual monitoring of dust will be ongoing throughout the day during operations. All	Dust lift and signs of dust deposition near property boundary. Evidence of no visible dust crossing the site boundary will be used as the monitoring criteria for compliance.	Site Manager	Continuous

monitoring is to be maintained on a logging sheet for reference and proof of compliance.			
Contingency and Corrective Actions			
Incident or Consequence	Corrective Action	Responsibility	
Observation of excessive dust lift onsite	Report and investigate as incident.	Site Manager	
	Halt work within proximity of the area until cause of dust is addressed.	Site Manager	
	Increase dust mitigation measures (e.g. additional watering of exposed areas).	Site Manager	
Complaint received	Report and investigate as incident. To determine the validity of the complaint, the wind direction, wind speed and activities being undertaken on site at the time of the complaint will be established.	Site Manager	
	If required, halt work until cause of dust is addressed.	Site Manager	
	If the complaint is verified as being due to a site source, remedial action will be undertaken within 4 hours. The City of Busselton will be advised of all complaints as soon as they are received. If a complaint cannot be resolved within the 4 hour response period, it may be necessary to cease operations.	Site Manager	
	Review dust management procedures and adjust if deemed necessary.	Site Manager	

4.5 Domestic and Industrial Waste Products

No domestic or industrial waste will be stored onsite. Any waste material generated during the operational activities will be taken offsite for disposal at an approved landfill facility on a daily basis. Hydrocarbon wastes such as accidental oil spills will be mopped up with absorbent material and segregated for removal and disposal offsite by a licensed contractor.

An approved portable toilet system may be temporarily placed onsite during construction activities. Waste from the toilet system will be disposed of offsite at an approved treatment facility.

4.6 Hydrocarbons and Dangerous Goods Management

Hydrocarbons are the only dangerous goods that will be utilised within the proposed extraction area. However, storage of hydrocarbons on the site will not occur.

4.6.1 Construction

The mobilisation and positioning of equipment associated with a Category 12 prescribed premises is not associated with any uncontrolled discharges of contaminants to land.

4.6.2 Operation

There is the minor possibility for soil and water contamination as a result of incidental hydrocarbon leakages or spills during the operation/refuelling of machinery. In such instances the management measures specified below will be implemented. Servicing of machinery and equipment will not occur onsite further reducing the possibility of contamination.

Table 12. Hydrocarbon and dangerous goods management measures.

Timing	Management Measure
During quarry operations	Mobile refuelling of equipment and vehicles will be undertaken off site at the nearby MGM Bulk depot.
	Spill kits containing appropriate equipment for control, containment and cleanup of hydrocarbon and chemical spills will be available in appropriate locations onsite and maintained.
	No vehicles or machinery are to be serviced or cleaned within the extraction area.

4.6.3 Risk Assessment

A risk assessment to determine the residual risk associated with the uncontrolled discharge of contaminants is provided below. The risk assessment indicates that with the application of suitable management measures the potential risk associated with uncontrolled discharges is 'Low'.

Table 13. Risk assessment associated with the uncontrolled discharge of contaminants.

Hazard	Source of Hazard	Potential Impacts	Mitigation	Likelihood	Consequence	Residual Risk
Uncontrolled discharge of contaminants to land	Machine ry	Contamination of soils and/or water	Refer to Management Measures provided in Table 12.	1	2	Low

REFERENCES

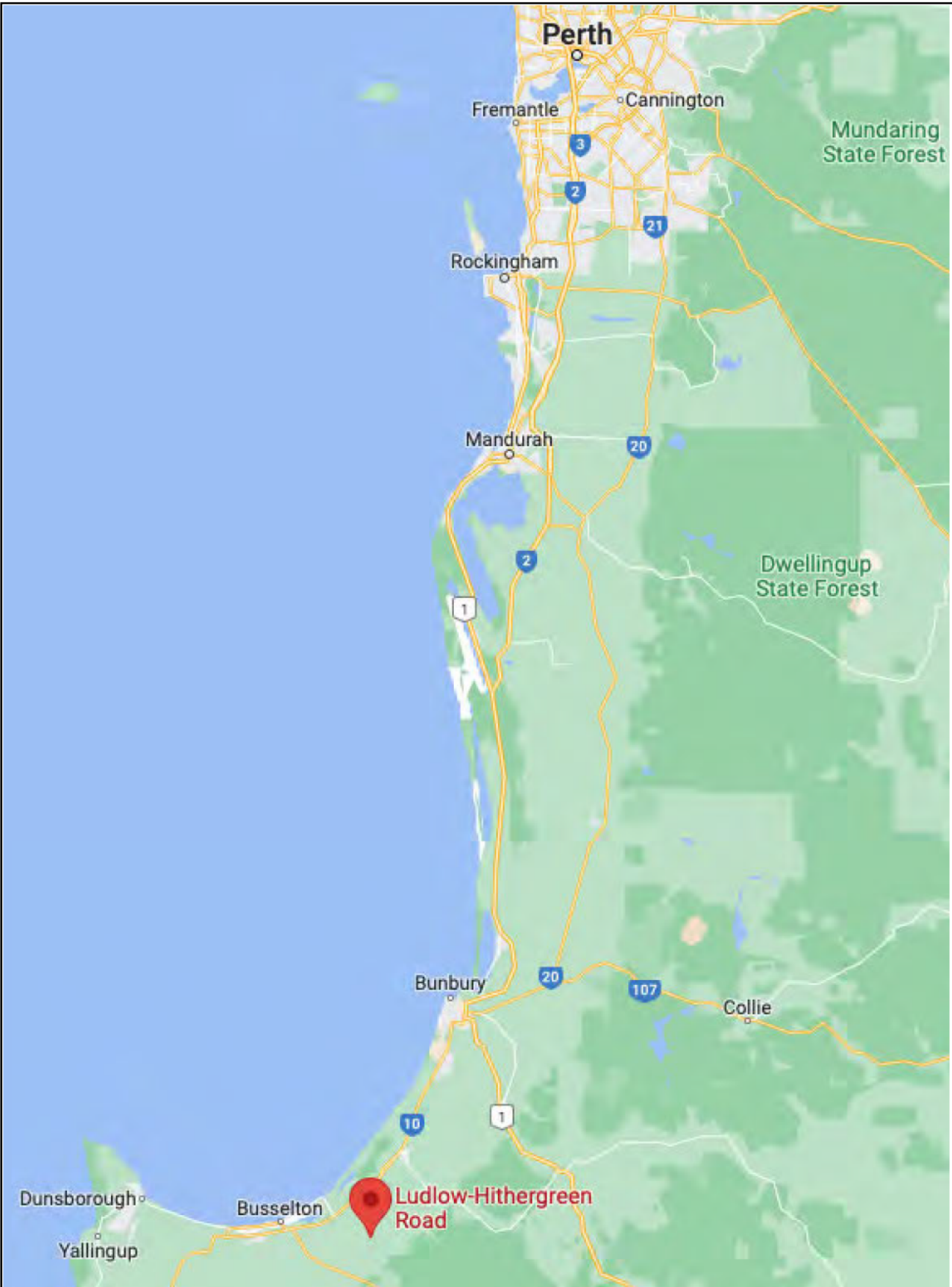
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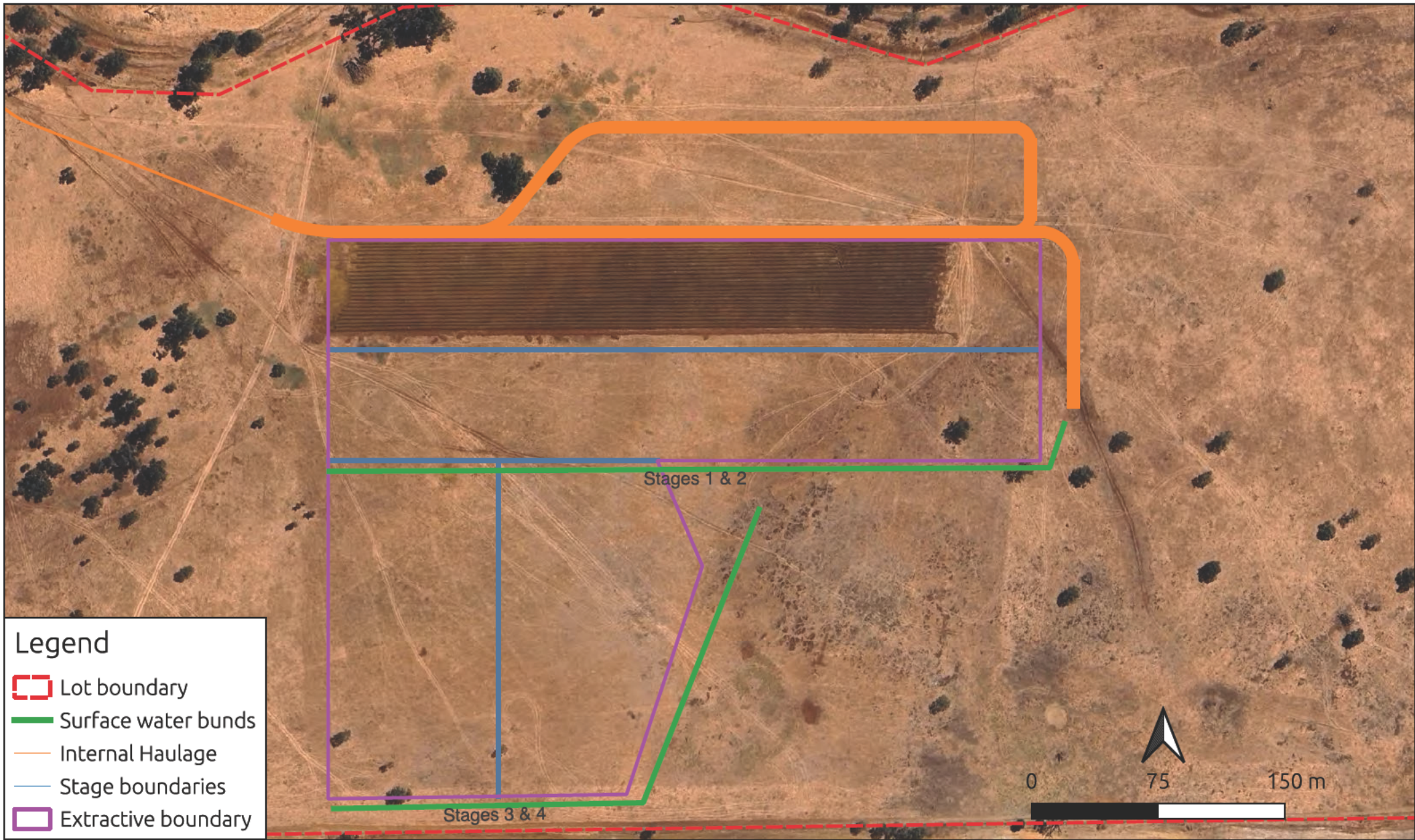
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FIGURES



PROJECT	Lot 62 Ludlow-Hithergreen Rd, Ruabon	Project Number	2507	Drawing Number	Figure 1	Revision	A
DRAWING TITLE	Figure 1 – Site Locality	Designed	PN	Checked	PN	Approved	
CLIENT	MGM Bulk Pty Ltd	Drawn	PN	Approved			





PROJECT Lot 62 Ludlow-Hithergreen Road,Ruabon

DRAWING TITLE Figure 2 - Site Extent

CLIENT MGM Bulk Pty Ltd

accendo
AUSTRALIA

PO Box 5178
West Busselton
Western Australia 6280
Mobile 0418 950 852

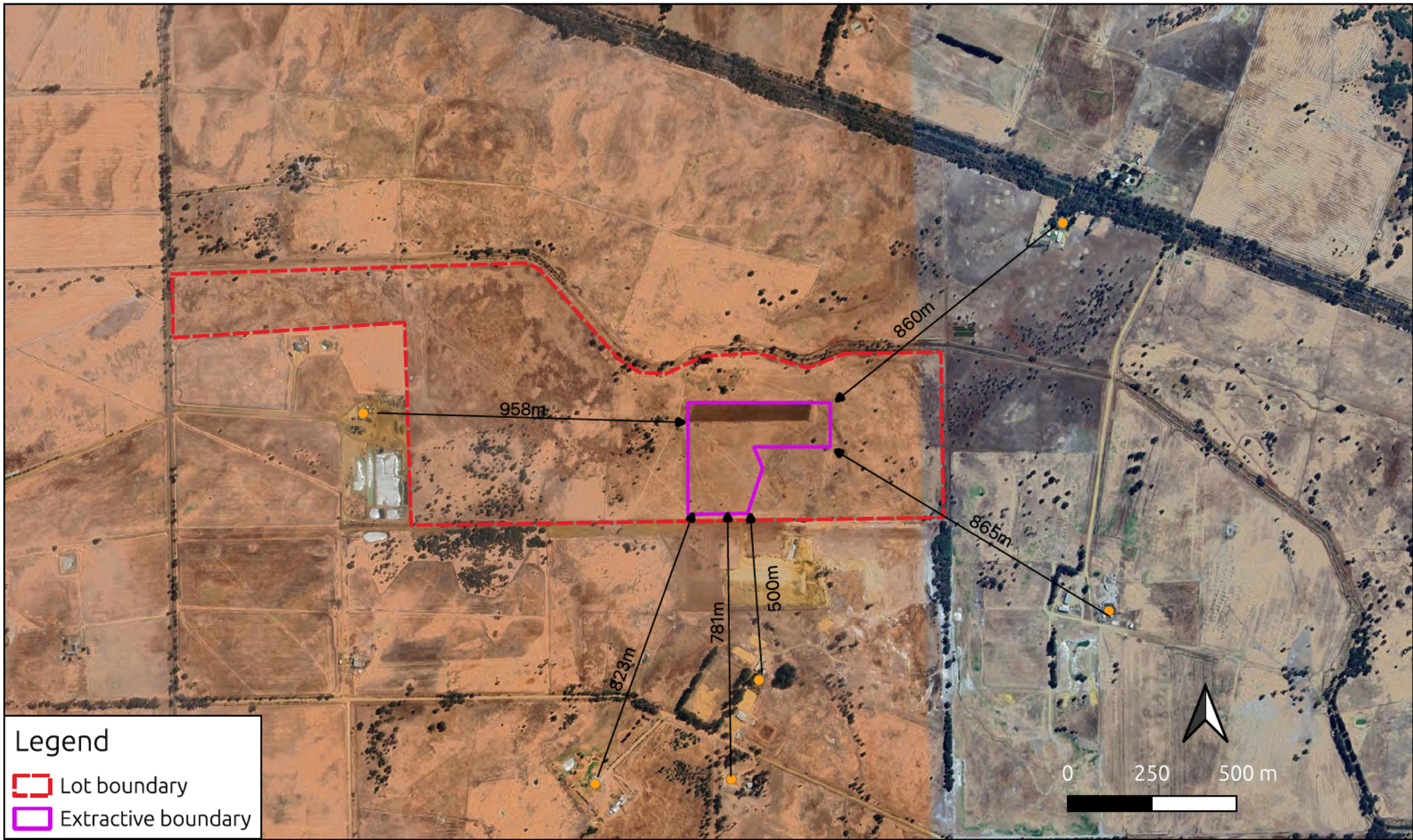
Project Number
Drawing Number
Revision
Date
Sheet 1 of 1

2507
Figure 2
A
11/03/2025


Designed
Drawn
Checked
Approved
Local Authority


PN
PN
City of Busselton

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Legend

 Lot boundary

 Extractive boundary

PROJECT Lot 62 Ludlow-Hithergreen Road,Ruabon

DRAWING TITLE Figure 3 - Sensitive Receptors

CLIENT MGM Bulk Pty Ltd

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PO Box 5178
West Busselton
Western Australia 6280
Mobile 0418 950 852

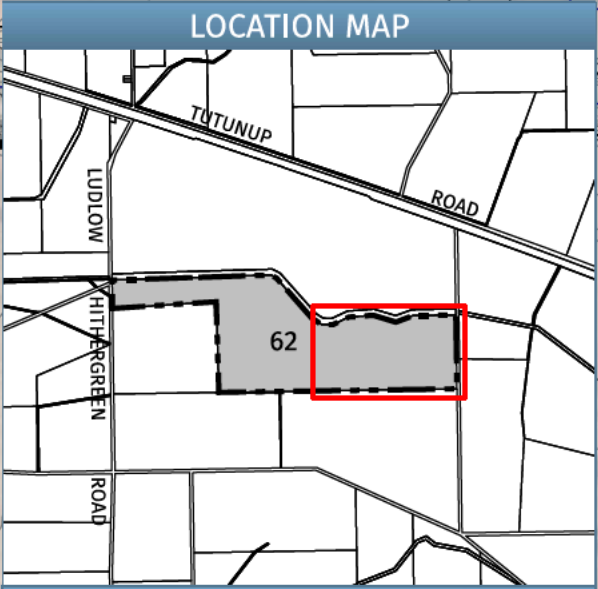
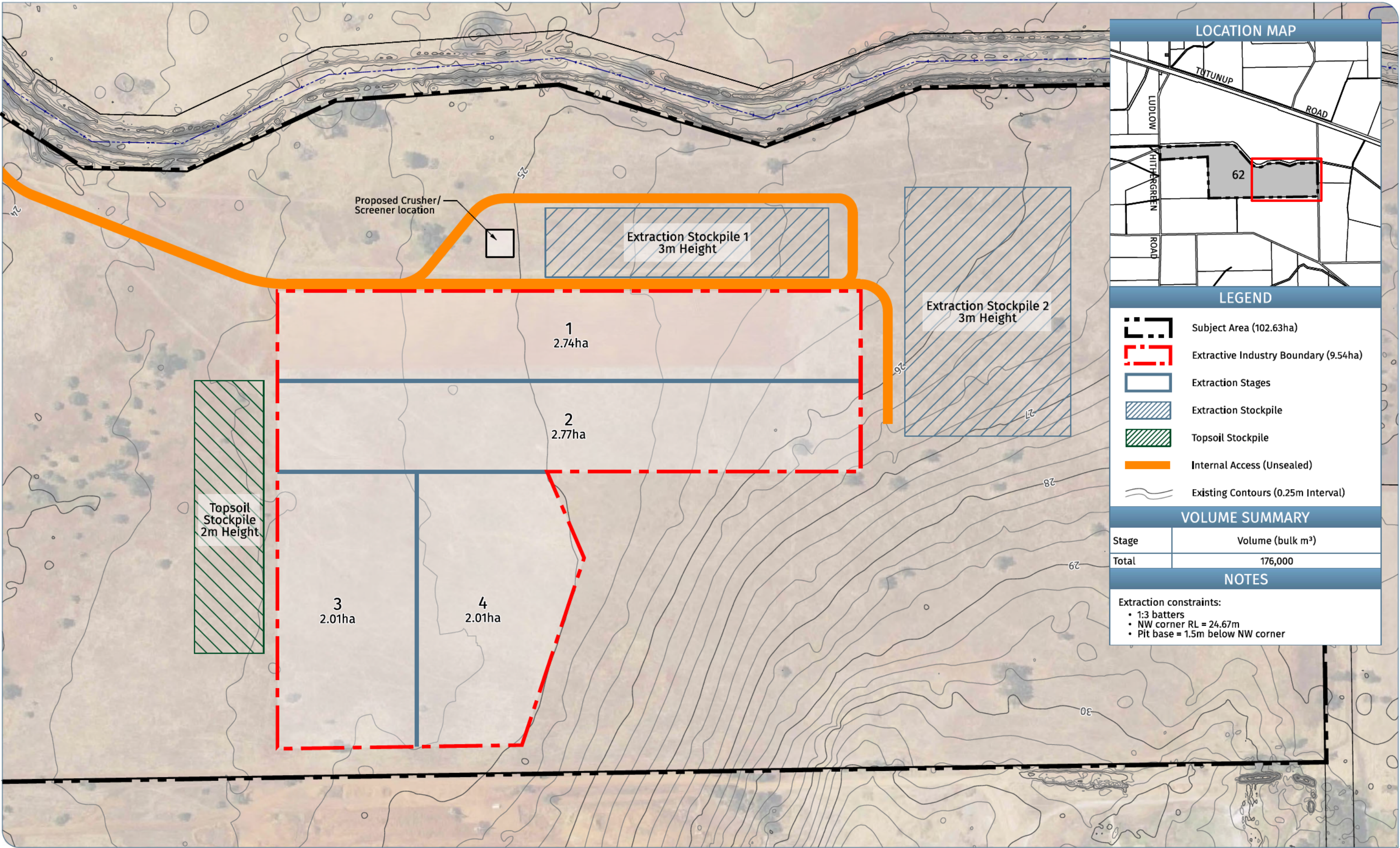
Project Number
Drawing Number
Revision
Date
Sheet 1 of 1

2507
Figure 3
A
11/03/2025

Designed
Drawn
Checked
Approved
Local Authority

PN
PN
City of Busselton

APPENDIX A – EXCAVATION WORKS PLAN



LEGEND	
	Subject Area (102.63ha)
	Extractive Industry Boundary (9.54ha)
	Extraction Stages
	Extraction Stockpile
	Topsoil Stockpile
	Internal Access (Unsealed)
	Existing Contours (0.25m Interval)

VOLUME SUMMARY	
Stage	Volume (bulk m³)
Total	176,000

NOTES	
Extraction constraints:	
• 1:3 batters	
• NW corner RL = 24.67m	
• Pit base = 1.5m below NW corner	

EXCAVATION WORKS PLAN

Lot 62 Ludlow-Hithergreen Road,
RUABON

Plan No. | 23089-03

Date | 03/11/23

Drawn | NP

Checked | LB

Revision | E

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Scale | 1:2500@A3

NOTE: This plan has been prepared for planning purposes. Areas, Contours and Dimensions shown are subject to survey

Harley Dykstra

PLANNING & SURVEY SOLUTIONS

APPENDIX B - CERTIFICATE OF TITLE

WESTERN



AUSTRALIA

REGISTERED NUMBER
62/DP49002DUPLICATE
EDITION
2DATE DUPLICATES ISSUED
12/8/2015**RECORD OF CERTIFICATE OF TITLE**
UNDER THE TRANSFER OF LAND ACT 1893VOLUME
2631FOLIO
291

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.

BG Roberts
REGISTRAR OF TITLES

LOT 62 ON DEPOSITED PLAN 49002

LAND DESCRIPTION:**REGISTERED PROPRIETOR:**
(FIRST SCHEDULE)

JAMIE ALLAN OATES OF 1098 LUDLOW HITHERGREEN ROAD, BUSSELTON

(AF J883887) REGISTERED 22/8/2006

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

1. N088143 MORTGAGE TO RURAL BANK LTD REGISTERED 10/8/2015

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:	DP49002
PREVIOUS TITLE:	1856-161
PROPERTY STREET ADDRESS:	NO STREET ADDRESS INFORMATION AVAILABLE
LOCAL GOVERNMENT AUTHORITY:	CITY OF BUSSELTON

APPENDIX C - AUTHORISATION FROM LANDOWNER

To Whom It May Concern

RE: Lot 62 1098 Ludlow-Hithergreen Road, Ruabon - Authorisation for M M Giacci (GM Giacci Family Trust) to mine.

[REDACTED] is owner hereby authorise Mario Michele Giacci (GM Giacci Family Trust) to apply for all necessary approvals, and also to mine Gravel on my land at Lot 62 1098 Ludlow-Hithergreen Road, Ruabon as per the Shire of Busselton Extraction Industry requirements for the property.

[REDACTED]

APPENDIX D – WATER MANAGEMENT PLAN



SURFACE WATER MANAGEMENT PLAN

**LOT 62 LUDLOW-HITHERGREEN
ROAD, RUABON**

MAY 2024

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ABN 11 160 028 642

www.accendoaustralia.com.au

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Limitations

This report has been prepared by Accendo Australia Pty Ltd in accordance with the scope limitations provided in this report, or as otherwise agreed, between the Client and Accendo.

This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

This report has been prepared based upon data and other information provided by the Client and other individuals and organisations, most of which are referred to in the report, which Accendo has not independently verified or checked beyond the agreed scope of work. Accendo does not accept liability in connection with such unverified information.

The conclusions and recommendations in this report are based on assumptions made by Accendo described in this report where and as they are required. Accendo disclaims liability arising from any of the assumptions being incorrect.

The report is based on site specific conditions encountered and information received at the time of preparation of this report or the time that site investigations were undertaken. Accendo disclaims responsibility for any changes that may have occurred after this time.

The preparation of this report has been undertaken and performed in a professional manner, in consideration of the scope of services and in accordance with environmental consulting practices. No other warranty is made.

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FIGURES

Figure 1. Site Locality

Figure 2. Site extent

1 INTRODUCTION

1.1 Background

Jamie Oates (the applicant) is proposing to extract gravel from a 9.54 hectare (ha) area (herein referred to as the subject site) located within Lot 62 Ludlow-Hithergreen Road, Ruabon (refer to **Figure 1** and **Figure 2**).

The available volume of gravel, *insitu* volume of approximately 176,000 m³, is to be extracted. The subject site will be excavated to an approximate maximum depth of 1.5 m below the elevation of the north west corner, 24.67 m Australian Height Datum (AHD), commencing in the north and moving in a southerly direction in cells 1 and 2, followed by west to east in cells 3 and 4. The post extraction landform will be similar visually and in form with the pre-excavation landform with batter slopes of 1:3 vertical to horizontal.

1.2 Purpose and Scope

The purpose of this Surface Water Management Plan (SWMP) is to review the risks and control measures to appropriately manage and minimise the environmental impacts of the extractive industry on surface water in proximity to the subject site.

The scope of the SWMP is to cover the following:

- Legislative and regulatory compliance;
- Existing environment;
- Risk assessment of surface water quality impacts;
- Mitigation and measurement measures; and
- Roles and responsibilities in relation to surface water management.

2 EXISTING ENVIRONMENT

2.1 Location

The subject site is located within Lot 62 Ludlow-Hithergreen Road, Ruabon. The Lot is wholly owned by Jamie Oates. The subject site is located within the municipality of the City of Busselton, approximately 15 km east of the Busselton town centre and approximately 200 km south of Perth (refer to **Figure 1**).

2.2 Land Use

The subject site is zoned 'Rural' pursuant to the City of Busselton's *Local Planning Scheme No. 21*. The proposed extraction area has largely been cleared of remnant vegetation. Properties in all directions are zoned 'Rural', with properties to the east and south currently running extractive industry operations. The Lot is bordered to the north by the Abba River tributary drainage reserve.

2.3 Topography and Soils

The current topography of the subject site can be described as gently sloping with the elevation ranging from 24 m Australian Height Datum (AHD) in the north west to 27 m AHD in the south east corner of cell 2 (refer to **Appendix A**).

The subject site is located within the Pinjarra Zone landform consisting of *"alluvial deposits between the Bassendean Dunes Zone and the Darling Scarp, consisting of colluvial and shelf deposits adjacent to the Darlings Scarp with clayey to sandy alluvial soils with wet areas"*, and the Abba System described as *"Poorly drained flats, on the southern Swan Coastal Plain with grey deep sandy duplex and wet soils."* (Tille 2006).

Within the Abba System, the subject site is located within the Abba wet ironstone flats phase consisting of *'winter wet flats and slight depressions with shallow red brown sands and loams over ironstone (i.e. bog iron ore soils)'*.

2.4 Climate

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

The closest weather recording station is Busselton Aero (Station 9603). Temperatures are highest on average in January, at approximately 30.2°C. July has the lowest average temperature of the year of 6.9°C.

Rainfall for the area is approximately 680 mm per annum with approximately 89% of the rain falling during the winter months, April to October inclusive. Evaporation exceeds rainfall in all but the wettest winter months.

During the summer months the dominant wind in the mornings is from the south-east at 10-14 knots, swinging to the south-west at 20-25 knots in the afternoon. During winter, the winds are most commonly 10-14 knots with no dominant prevailing direction. During storms winds from the west and north-west can reach 40 knots (BoM 2020).

Rainfall intensity has been calculated using the Bureau of Meteorology (BoM) Intensity-Frequency-Duration (IFD) data system which yields the two hour 10 year average return interval storm event for the subject site as 42 mm/hr.

2.5 Hydrology

2.5.1 Groundwater

The subject site is located within the proclaimed Busselton-Capel Groundwater Area.

A groundwater investigation (ABEC 2022) which included a review of the regional hydrogeology, site specific geology and groundwater elevation, Indicates the presence of a perched groundwater layer in winter. This occurs when rainfall falling within the area penetrates the shallow softer material or fractures/cavities filled with more sandy material and sites on top of the harder ironstone layers following the general topography of the site (ABEC 2022).

2.5.2 Surface Water

The subject site is located in the Wonerup subarea of the unproclaimed South West surface water area. The subject site is not proclaimed under the *Country Areas Water Supply Act 1947* as a public drinking water source area.

There are no surface water features present within the subject site, with the closest surface water feature the Abba River tributary drain located to the north of the property

Wetlands within Western Australia are classified on the basis of landform and water permanence pursuant to the Semeniuk (1995) classification system (refer to **Table 1**).

Table 1. Wetland classifications (Semeniuk 1995).

Water Longevity	Landform				
	Basin	Channel	Flat	Slope	Highland
Permanent Inundation	Lake	River	-	-	-
Seasonal Inundation	Sumpland	Creek	Floodplain	-	-
Intermittent Inundation	Playa	Wadi	Barlkarra	-	-
Seasonal Waterlogging	Dampland	Trough	Palusplain	Paluslope	Palusmont

Areas of wetlands in Western Australia have been mapped and this mapping has been converted into a digital dataset that is maintained by the Department of Biodiversity, Conservation and Attractions (DBCA) and is referred to as the '*Geomorphic Wetlands of the Swan Coastal Plain*' dataset. This dataset contains information on geomorphic wetland types and assigns management categories that guide the recommended management approach for each wetland area. The wetland management categories and management objectives are listed in **Table 2**.

Table 2. DBCA wetland management categories (Semeniuk 1995).

Category	Description	Management Objectives
Conservation	Wetlands support a high level of ecological attributes and functions.	<p>Highest priority wetlands. Objective is to preserve and protect the existing conservation values of the wetlands through various mechanisms including:</p> <ul style="list-style-type: none"> • Reservation in national parks, crown reserves and State owned land, • Protection under Environmental Protection Policies, and • Wetland covenanting by landowners.

Category	Description	Management Objectives
		No development or clearing is considered appropriate. These are the most valuable wetlands and any activity that may lead to further loss or degradation is inappropriate.
Resource Enhancement	Wetlands which may have been partially modified but still support substantial ecological attributes and functions	Priority wetlands. Ultimate objective is to manage, restore and protect towards improving their conservation value. These wetlands have the potential to be restored to Conservation category. This can be achieved by restoring wetland function, structure and biodiversity.
Multiple Use	Wetlands with few remaining attributes and functions	Use, development and management should be considered in the context of ecologically sustainable development and best management practice catchment planning through landcare.

The subject site is mapped as occurring within a Multiple Use (MU) wetland (UFI 15,809).

MU wetlands are assessed as possessing few remaining ecological attributes and functions, which is characteristic of these mapped areas within the property. While such wetlands can still contribute to regional or landscape ecosystem management, including hydrological function, they are considered to have low intrinsic ecological value. Typically, they have minimal or no native vegetation remaining (less than 10%). Accordingly, there is no legislative requirement to protect or retain them and as such MU wetlands do not preclude development.

The management objective for MU wetlands is to preserve the hydrological functions in the context of the proposed development (EPA 2008). The current water cycle within the subject site consists of inputs from rainwater being infiltrated on site or flowing through the drainage lines into the wider drainage system. The proposed land use is not proposing to alter this process, with all surface water that falls inside the pit being retained within the excavated areas to enable infiltration to ensure water quality is maintained.

3 EXTRACTION ACTIVITIES

The gravel quarry will cover an area of approximately 9.54 ha, with a current maximum elevation ranging from 24 m AHD to 27 m AHD. It will be excavated to an approximate maximum depth of 1.5 m below the elevation of the north west corner, 24.67 m Australian Height Datum (AHD), commencing in the north and moving in a southerly direction in cells 1 and 2, followed by west to east in cells 3 and 4. The post extraction landform will be similar visually and in form with the pre-excavation landform with batter slopes of 1:3 vertical to horizontal.

It is estimated that the total maximum volume of gravel to be removed will be approximately 176,000 m³.

The planned end use of the quarry is to restore a natural soil profile and return the area to pasture, ensuring that there is no net loss of agricultural land.

3.1 Operational Works

3.1.1 Gravel Extraction

The gravel within the subject site can be removed with an excavator or loader without the need for blasting. The material will then be crushed and screened to produce products of the correct size.

A summary of the proposed extraction activities is provided below:

- Prior to excavation commencing the site will be ground surveyed, the excavation footprint marked out and a 1 metre contour plan developed.
- Soil and overburden will be removed and stored within perimeter bunds for later rehabilitation use.
- An excavator, front-end loader or surface miner will be used to excavate the gravel material.
- The material will then be picked up by a loader and fed to the mobile crusher.
- A loader will then transfer the laterite rock into the crusher where it would be reduced to smaller sizes and transferred to an adjoining screener. The screener then sorts the gravel into various sizes for stockpiling. On an as needed basis, gravel product will be loaded on to road trucks of various configurations for transport off-site.
- All static and other equipment, such as crushers and screens (where used), will be located on the floor of the quarry to provide visual and acoustic screening.
- Upon completion of excavation, the quarry will be reformed and back filled, where subgrade material is available, to achieve the proposed final contours.
- At the end of excavation, the floor of the quarry will be deep ripped, covered by overburden and topsoil, and rehabilitated to a constructed soil.

3.1.2 Water Usage

Water is only required for dust suppression within the quarry and the gravel access road. Water will be sourced from an approved onsite bore.

4 POTENTIAL IMPACTS AND MANAGEMENT

The Section provides an overview of the potential impacts to surface water resources associated with the proposed land use, and the proposed management measures to address the identified impacts.

4.1 Surface Water

The current water cycle within the subject site consists of inputs from rainwater flowing in a downhill (northerly) direction into the wider drainage system. The development is not proposing to alter this process, as there are no drainage lines within the proposed extraction area.

Any surface water falling outside of the pit will be diverted around the pit by the perimeter bunds to the natural drainage system. The bunding will be installed for Cells 1 and 2 initially in an east to west direction. On completion of excavation within these cells, this bunding will be removed and a second bund will be installed to divert stormwater around cells 3 and 4 (refer to **Appendix A**). Surface water retained within the excavated areas will either evaporate or infiltrate through the pit ensuring water quality to the drainage system is maintained.

The operation of the crushing and screening plant will be a dry operation.

4.2 Drainage

The DWER recommendation is that surface water runoff produced within the excavation area from the two hour 10 year average return interval storm event should be contained within the pit (DoW 2014). Rainfall intensity has been calculated using the Bureau of Meteorology (BoM) Intensity-Frequency-Duration (IFD) data system (BoM 2021), which yields the two hour 10 year average return interval storm event for the site as 42 mm. For every 1.0 ha of excavation open, it is calculated that a holding volume of 420 m³ is required. If the excavations are 3 m wide by 350-375 m across to a depth of at least 0.5 m, this would provide a holding volume of 525 to 563 m³ which is in excess of the required volume. Therefore, all surface water produced within the excavation area from the two hour 10 year average return interval storm event will be easily contained within the pit prior to evaporation or infiltration.

During excavation activities, the surface will be internally drained, with the gradients in the cells being constructed to ensure that no surface water runoff occurs.

A risk assessment relating to surface water and stormwater runoff in consideration of the proposed management measures is provided below. The residual risk associated with sedimentation and erosion from stormwater runoff during the operation of the extractive industry is considered low.

Table 3. Risk assessment associated with surface water and stormwater.

Hazard	Source of Hazard	Potential Impacts	Mitigation	Likelihood	Consequence	Residual Risk
Erosion and sedimentation	Uncontrolled and contaminated stormwater runoff	Erosion and sedimentation resulting in poor surface water quality in the Abba River.	Contain any potentially sediment laden surface water within the pit. Cells constructed with a gradient to ensure that stormwater is contained	1	2	Low

Hazard	Source of Hazard	Potential Impacts	Mitigation	Likelihood	Consequence	Residual Risk
			within the excavation footprint.			

4.3 Hydrocarbons and Dangerous Goods Management

Hydrocarbons are the only dangerous goods that will be utilised within the proposed subject site for the operation of machinery. However, storage of hydrocarbons on the subject site will not occur.

Servicing of machinery and equipment will not occur onsite further reducing the possibility of contamination.

There is the minor possibility for soil and water contamination as a result of incidental hydrocarbon leakages or spills during the operation of machinery. In such instances the management measures specified below will be implemented.

Table 4. Hydrocarbon and dangerous goods management measures.

Timing	Management Measure
During quarry operations	Servicing of machinery, equipment and vehicles will be undertaken off site.
	Spill kits containing appropriate equipment for control, containment and cleanup of hydrocarbon and chemical spills will be available in appropriate locations onsite and maintained.
	No vehicles or machinery are to be serviced or cleaned within the subject site.

A risk assessment to determine the residual risk associated with the uncontrolled discharge of contaminants is provided below. The risk assessment indicates that with the application of suitable management measures the potential risk associated with uncontrolled discharges is 'Low'.

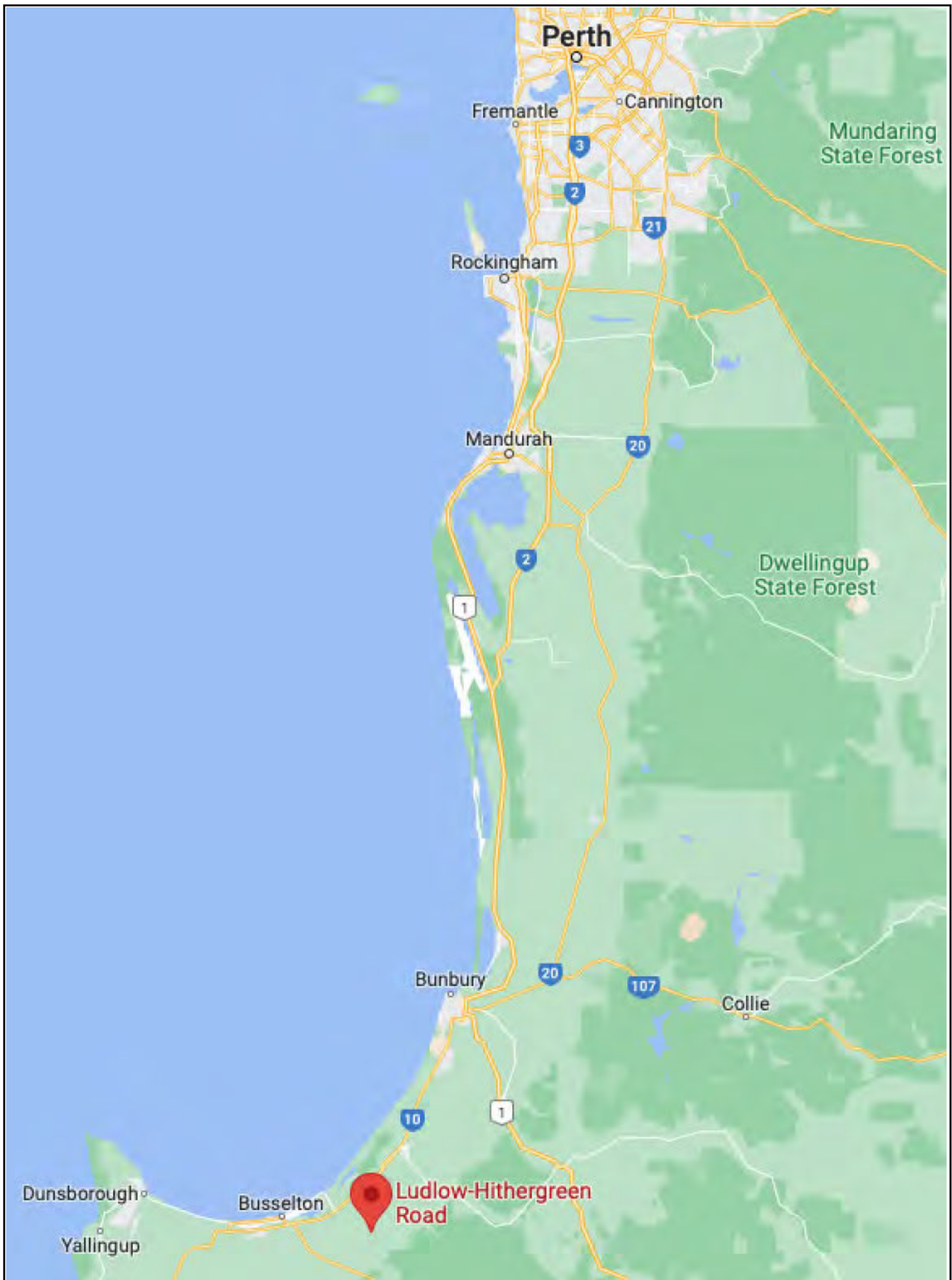
Table 5. Risk assessment associated with the uncontrolled discharge of contaminants.

Hazard	Source of Hazard	Potential Impacts	Mitigation	Likelihood	Consequence	Residual Risk
Uncontrolled discharge of contaminants to land	Machinery	Contamination of soils and/or water	Refer to Management Measures provided in Table 6 .	1	2	Low

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FIGURES



PROJECT Lot 62 Ludlow-Hithergreen Rd, Ruabon

DRAWING TITLE Figure 1 – Site Locality

CLIENT Jamie Oates



Project Number
2306

Designed PN
Drawn PN

Date
Local Authority
Sheet 1 of 1

Drawing Number
Figure 1

Checked
Approved

14/03/2023
City of Busselton

Revision
A



PROJECT Lot 62 Ludlow-Hithergreen Road,Ruabon

DRAWING TITLE Figure 2 - Site Extent

CLIENT Jamie Oates



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Project Number
Drawing Number
Revision
Date
Sheet 1 of 1

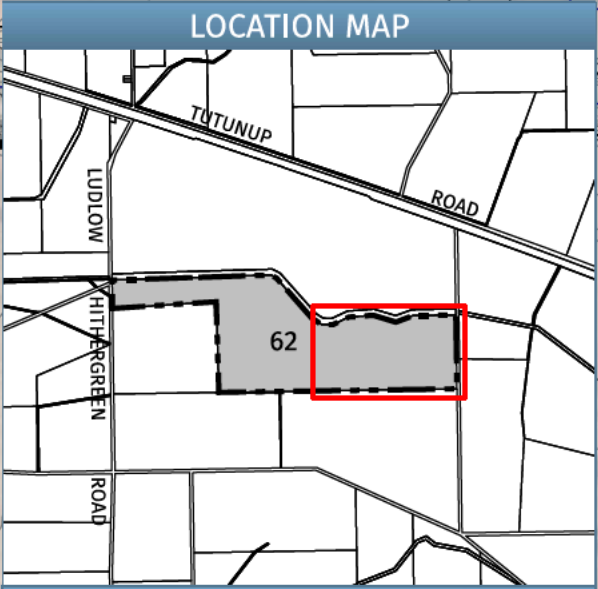
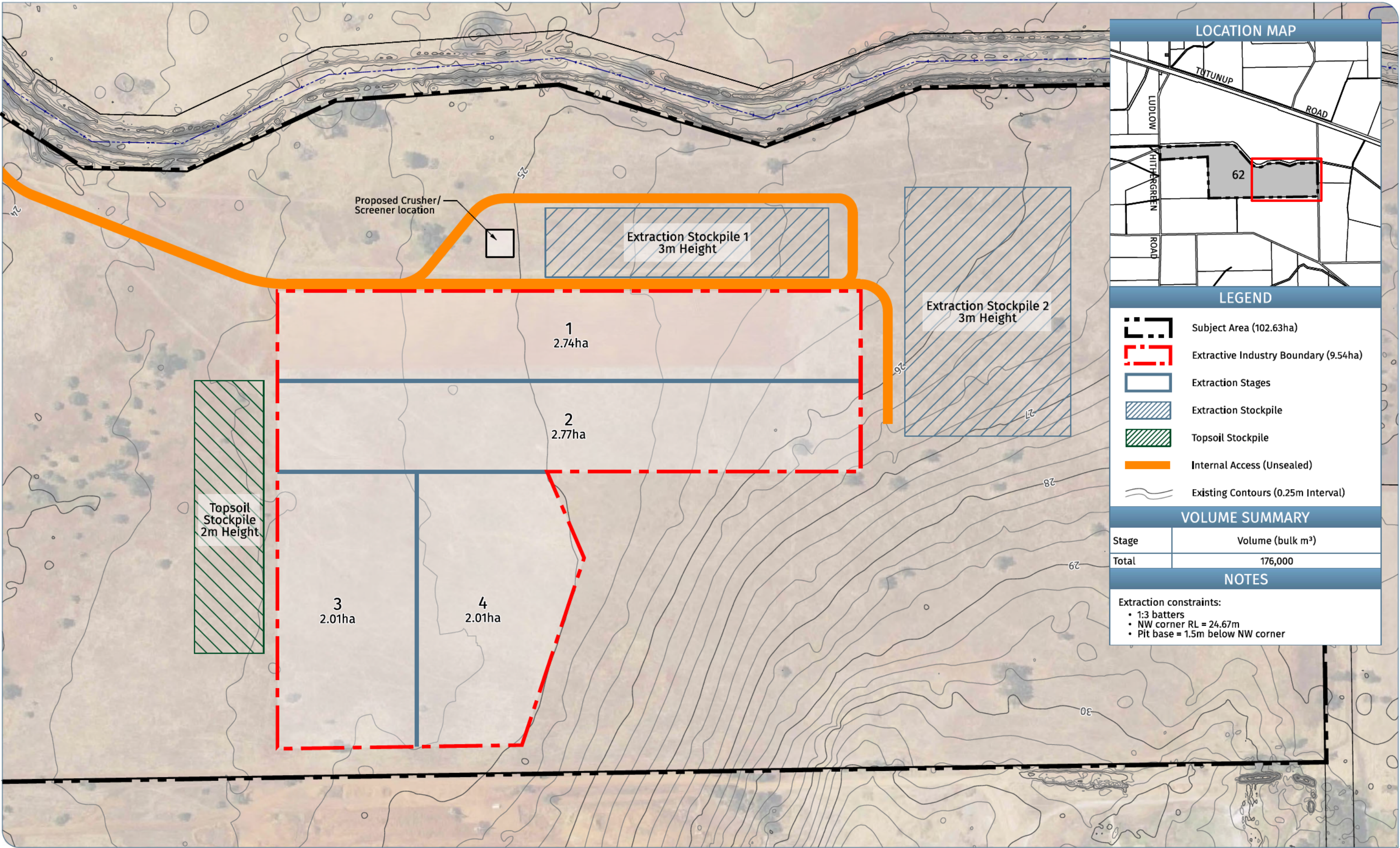
2306
Figure 2
B
29/05/2024

Designed
Drawn
Checked
Approved
Local Authority

PN
PN
City of Busselton

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APPENDIX A – EXCAVATION WORKS PLAN



LEGEND	
	Subject Area (102.63ha)
	Extractive Industry Boundary (9.54ha)
	Extraction Stages
	Extraction Stockpile
	Topsoil Stockpile
	Internal Access (Unsealed)
	Existing Contours (0.25m Interval)

VOLUME SUMMARY	
Stage	Volume (bulk m³)
Total	176,000

NOTES	
Extraction constraints:	
• 1:3 batters	
• NW corner RL = 24.67m	
• Pit base = 1.5m below NW corner	

EXCAVATION WORKS PLAN

Lot 62 Ludlow-Hithergreen Road,
RUABON

Plan No. | 23089-03

Date | 03/11/23

Drawn | NP

Checked | LB

Revision | E

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Harley Dykstra

PLANNING & SURVEY SOLUTIONS

APPENDIX E - COMPLAINTS REGISTER

Complaints Register

Ref. No.	Date	Name & Address of Complainant	Time/Date of Complaint	Detail of Complaint	Summary of Actions Taken	Shire Notified	Person Responsible