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DUST MANAGEMENT PLAN **Prepared for Westwall Holdings Pty Ltd** **2038 Donnybrook Boyup Brook Road, Yabberup** **Shire of Donnybrook-Balingup**

1. INTRODUCTION

This Dust Management Plan (DMP) has been prepared in accordance with guidelines published by the Department of Environment and Conservation (DEC) (Jan. 2011), now the Department of Water and Environmental Regulation (DWER). This Dust Management Plan should be read in conjunction with the report entitled *“Extractive Industries Licence Application and Environmental Management Plan 2038 Donnybrook Boyup Brook Road, Yabberup, Shire of Donnybrook-Balingup”*, prepared for Westwall Holdings Pty Ltd by Lundstrom Environmental Consultants Pty Ltd in November 2022.

The objectives of this DMP are as follows:

- To describe the nature of the proposed operation;
- To identify any sources of dust that might arise from these operations;
- To identify the proximity of any sensitive premises in this regard;
- To identify measures that will limit the generation of dust from the operations;
- To identify measures that will limit the impact of dust on sensitive premises.

2. SITE BACKGROUND

Locality: 2038 Donnybrook Boyup Brook Road, Yabberup, Shire of Donnybrook-Balingup
Ownership: Old Valley Pty Ltd

Figure 1 is a recent aerial photograph showing the property and its surrounds. Figure 2 indicates the proposed operations areas covered by this application.

2.1 Land Use

The property is currently used as a vineyard. The extraction area will be rehabilitated back to pastures after completion of operations (Figure 1).

2.2 Geology and Soils

A thin layer of topsoil with depth approximately 100-500mm, overlies sandy gravels and laterite. The underlying geology is metamorphic/granitic rocks of the Yilgarin craton. In places, weathered granitic materials are overlain by ferruginous duricrust/laterite, which is massive to rubbly and includes iron-cemented and reworked products. ((GeoVIEW, 2022), (Dawe, 1998), (EPP, 2014)).

The soil profile comprises a thin layer of gravelly sand which overlies a gravelly loam which grades into laterite boulders and gravel.

The excavation depth would be one metre below current ground level.

2.3 Nuisance Potential of materials

The crushed material texture is predominantly gravel with moderate amounts of sand and trace amounts of fines (clays and silts), with grain size distribution (ISO 14688-1) being approximately as follows:

Gravel (>2.0mm):	44%
Sand (0.063<2.0mm):	34%
Fines (Silt & Clay; <0.063mm):	7%

(The particle size analysis laboratory report is included as Annexure 3)

During strong winds the potential exists for fine particles (including fine sand) to become airborne especially when they are disturbed by excavation activities.

In its in-situ state, the laterite is a cemented pisolitic material and has no loose fines. However, during the crushing operation very fine particles of less than PM50 (particulate matter with diameter 50 micrometers) are produced as fugitive dust and require suppression as is discussed in Section 4 below.

It is estimated from the particle size distribution graph shown in Annexure 3, that the potential for total suspended particles (TSP) less than PM50 is approximately 5.5%. Mitigation measures are discussed in Section 4 below.

Potentially significant sources of airborne particulates from the site have been assessed as being limited to:

- Dust lift-off from exposed extraction areas or rehabilitated surfaces
- Dust lift-off from stockpiles (topsoil and extracted product)
- Dust lift-off from haul roads and tracks resulting from light vehicle and heavy earthmoving traffic
- Dust generation from crushing and screening processes, loading and transportation of extracted material.

The majority of airborne particulates from the site are likely to be visible dust.

Mitigation measures for the operations are discussed in Section 4 below.

2.4 Potentially Sensitive Receptors

The Environmental Protection Authority (EPA) draft Environmental Assessment Guidelines "Separation distances between Industrial and sensitive land uses" lists the generic buffer for extractive industries grinding and milling works but no blasting as 500 - 1 000m depending on the type of processing. As this operation would be considered to be a "low scale" operation, the minimum generic buffer would be likely to apply.

The details of the closest dwellings are presented in Table 1 along with locations shown on Figure 1. There are five structures, excluding the owner's shed, which is not residential, located within 1km of the proposed extraction areas, as shown in Table 1.

Table 1: Aspects and Impacts of Dust Generating Activities

Reference No. on Figure 2	Lot no.	Distance to closest area of pit (metres)
Structure 1	144	502 N
Structure 2	3594	524 N
Structure 3	6	569 N
Structure 4	143	867 NW
Structure 5	1	894 S
Owner's Shed	2064	633W

There are no structures within 500m of the closest boundary of the operation area. The nearest structure S1 is 502m north from the closest boundary of Stage 4. The native vegetation is well established, along the Donnybrook Boyup Brook Road, will act as a buffer between the extractive industry activities and the sensitive receptors.

2.5 Prevailing Winds

In DWER's assessment of the previous application, which will now be superseded by this new application, the following was suggested:

"The closest DWER stations are Collie (22 kilometres NNE) and Bunbury (42 kilometres NW). While neither station is representative of the proposed site, the wind roses from recent available datasets do indicate a regional similarity in wind patterns, with increased windspeeds at Bunbury due to the proximity to the coast."

The wind roses for DWER AQMS Bunbury and Collie, indicates that the strongest wind direction is easterly/south-easterly). Structures S2 and S3 are directly to the north and S5 is to the south of the proposed extraction area and will not be impacted by any wind direction. Structure S1 and S4 are north-west of the proposed area and might be impacted by the south-easterly wind, hence the 'Dense land uses affected by one wind direction' has been selected in the site risk assessment (Annexure 2).

The Wind roses for DWER AQMS Bunbury and Collie have been included in Annexure 1.

3. PROPOSED WORKS AND POTENTIAL IMPACTS

Westwall Holdings intends to extract approximately 59,040 tonnes/year of gravel from the areas indicated on Figure 2 in Stages 1, 2, 3 and 4 of 4ha, 4.6ha, 4.6ha and 3.1ha respectively. The total area to be disturbed is approximately 16.4ha and excavation will proceed to a depth of approximately one metre. The EIL application is for 5 years.

The proposed extraction licence is required for the purpose of undertaking the following activities on the site:

- The proposed extraction area will be cleared of vine plantation in stages, with only the stage being worked on, being cleared, ensuring the disturbed area exposed at any time to a practical minimum.
- Extraction of gravel from an area of 16.4ha in four stages as shown in Figure 2. Stages 1, 2, 3 and 4 will involve extraction of 295,200 tonnes of gravel in total but will be dependent on demand.
- Topsoil will be removed from the extraction area prior to the commencement of each stage, with only the area targeted for immediate extraction being open. Topsoil will be stockpiled separately along the edges of the extraction area, with stockpiles being no more than 2 metres high and 12m wide, with batter of 1:3 meters.
- Within the current stage of extraction, a bulldozer will rip and blade material to a raw material stockpile. This material is loaded into the crusher after which a stacker creates a product stockpile. The product stockpile will be no more than 9 m high and 50m wide, with a batter of 1:3 metres.
- A mobile crushing and screening plant will be used on site for approximately three to four weeks per year, depending on the size of the campaign. Trucks will enter the pit and be loaded from the stockpile by a front-end loader.
- Product stockpiles will be placed in such a way that they will act as a noise buffer between the crusher and the sensitive receptors.
- Crusher and stockpile positions have been identified for each stage and are illustrated in Figure 2.
- Extraction activity will result in the lowering of the ground level by approximately one metre.
- At a time, only one stage of up to 5ha will be extracted and will be progressively rehabilitated back to pasture after completion of extraction activities and before moving to the next stage. This will ensure that the area of disturbed land is stabilized, and the disturbed area exposed at any time is kept to a practical minimum.
- Trucks will enter the pit via an existing gravel access road off Donnybrook Boyup Brook Road and be loaded from the stockpile by a front-end loader.
- Measures to limit dust will be undertaken.
- There will be no blasting in this operation.
- The lot boundary buffer of 20m will apply. However, the proposed extraction will excavate through the boundary between Lot 130 and 3671, thus avoiding the batter on both sides and an elevated boundary line.
- Batters of 1:6 will be maintained throughout the operation. Where possible, topsoil will be replaced and seeded with pastures on a progressive basis, in fully extracted areas, prior to the commencement of winter.

3.1 Plant and Equipment to be used

Equipment to be used in these operations includes:

- D10 Bulldozer
- Large Front-End Loader (CAT 980 or equivalent)
- Striker 1320 Crusher
- Finlay Screen 693

- Striker 25m Stacker
- Standard rigid truck (14 tonnes)
- Single Semi-loader (24 tonnes)

3.2 Summary of Mining Actions

Table 2 provides a description of all activities, their duration, aspect and an assessment of potential for dust impacts.

Table 2: Aspects and Impacts of Dust Generating Activities

Activity	Duration	Aspect	Impact
Construction of internal driveway / access road	1 week	Actions may release dust into the atmosphere	Dust may create an amenity issue with nearby residents
Topsoil Stripping and stockpiling	Up to 1 week per annum in 6 stages.	Disturbance of grass and soil exposes ground to wind erosion	Dust may create an amenity issue with nearby residents
Rip and blade laterite to crusher site	Up to 3 weeks per annum in 6 stages.	Actions may release dust into the atmosphere	Fine red dust may create an amenity issue with nearby residents
Crushing, screening and stockpiling of gravel	Up to 4 weeks per annum in 6 stages.	Crushing and screening actions may release dust into the atmosphere	Fine red dust may create an amenity issue with nearby residents
Loading of trucks from stockpiles	5 years at a maximum of 13 loaded trucks per day.	Loading of gravel may release dust into the atmosphere	Fine red dust may create an amenity issue with nearby residents
Transport of gravel from site	5 years at a maximum of 13 loaded trucks per day.	Dust could escape from trucks in transit	Amenity, health, or traffic safety issue
Rehabilitation of completed stages	Up to 2 weeks per year from 2023 onwards	Disturbance of topsoil could release dust into the atmosphere	Dust may create an amenity issue with nearby residents

3.3 Site Risk Assessment and Classification

Based on the risk assessment conducted (Annexure 2), the classification derived is “Medium risk” (Classification 3). Measures for managing dust impacts are discussed in Section 4 below.

4. MEASURES PROPOSED FOR MANAGING DUST

This report has identified the potential dust generating activities associated with the proposed development and has also identified the potentially sensitive receptors. The measures that are proposed to manage dust impacts are listed below:

- Activities likely to generate the most dust including construction of access roads, topsoil stripping and crushing and screen activities will be timed to occur in winter.
- A 15kl water cart will be on site during periods when the internal access road is being constructed, material is being moved or crushing is being conducted. When dust is caused to occur during these periods, the water cart will be employed to damp down the areas of concern.
- If necessary, loads will be dampened prior to loading/unloading.

- If dust can be seen to be carried outside the Site, the source of dust will be identified, and measures implemented to prevent or minimize further dust emissions.
- If there are high winds and conditions are dusty, then operations will be stopped until such time as adequate wetting down has occurred, or conditions have changed.
- Crushing and stockpiling activities will be in topographic low points with raw and processed stockpiles arranged such that windbreaks are created to further prevent impacts from fugitive dust.
- A polymer-based spray-on-soil stabilizer will be applied to topsoil and overburden stockpiles if they do not stabilize by crusting and grass re-growth.
- Handling of materials will be kept to a minimum.
- Internal roads will be surfaced with gravel. A 20km per hour speed limit will always apply to trucks on these internal roads.
- Truck loads will always be covered by tarpaulins and dampened when fully loaded, prior to leaving the extraction area, so that no dust is generated in transit.
- At a time, only up to 5ha of land will be extracted and progressively rehabilitated back to pasture after completion of extraction activities. This will ensure that the area of disturbed land is stabilized, and the disturbed area exposed at any time is kept to a practical minimum to prevent dust emission.
- Employees and contractors working on site will be provided with information on how to minimise dust emissions.
- No burning of waste will occur.
- A notice will be erected at the front gate that provides emergency contact details for the Operations Manager.
- A complaints system will be put in place, and these will be recorded by the Operations Manager and acted on promptly.

Visual monitoring will be undertaken to confirm dust management measures are effectively maintaining dust emissions at acceptable levels.

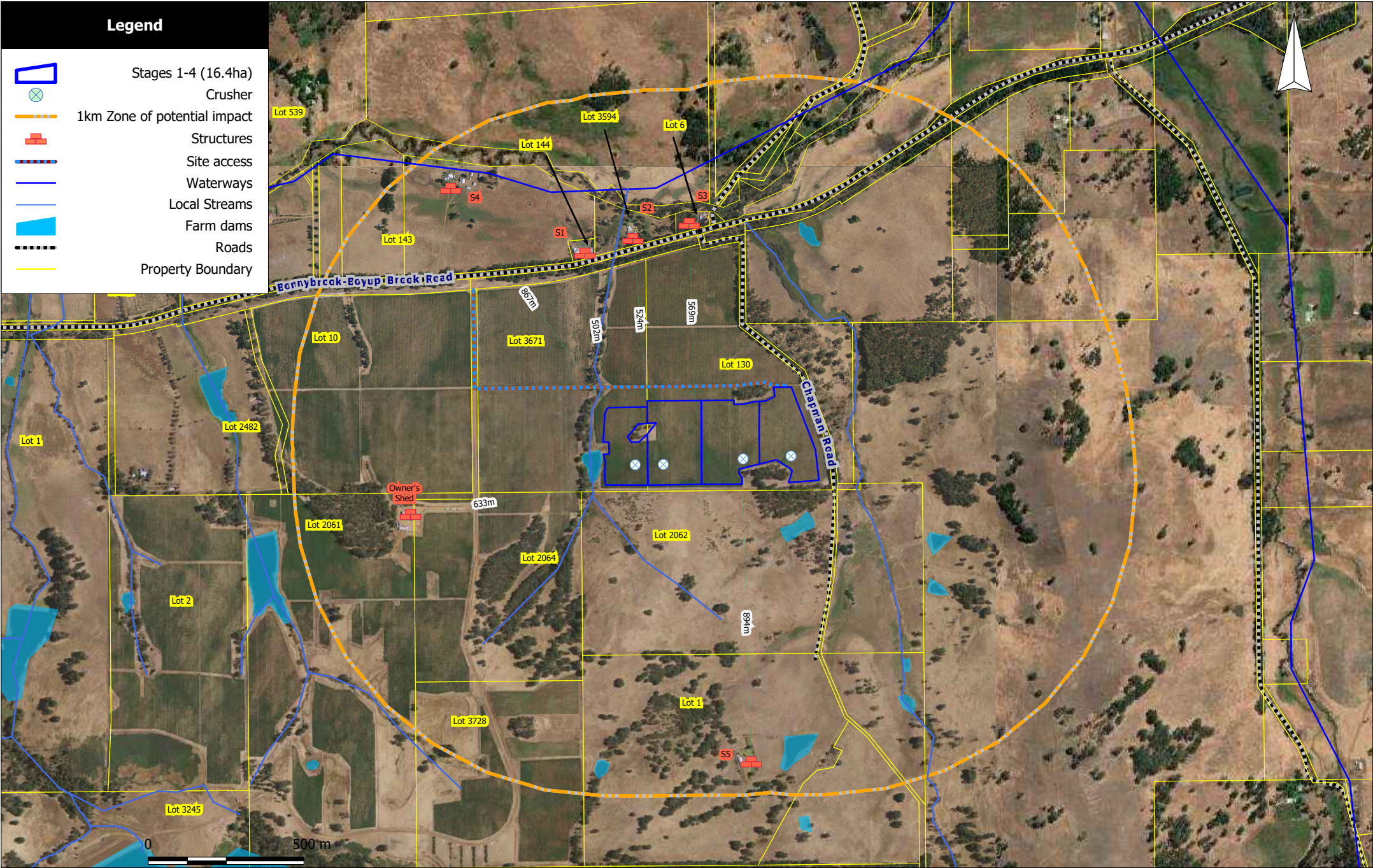
5. REFERENCES

Department of Environment and Conservation (DEC) (2011). *A guideline for managing the impacts of dust and associated contaminants from land development sites, contaminated sites remediation and other related activities*.

Department of Agriculture, Water, and the Environment (DAWE) (1998). Assessment of Mineral and Hydrocarbon Resources in the South-West Forest Region of Western Australia. https://www.awe.gov.au/sites/default/files/sitecollectiondocuments/rfa/regions/wa/resources/wa_res_rfa.pdf
 Edge Planning and Property (EPP) (2014). Shire of Donnybrook-Balingup. Local Planning Strategy. <https://www.dplh.wa.gov.au/getmedia/dac64431-2c09-4e86-9a60-bb267ce6f71f/LST-Donnybrook-Balingup-local-planning-strategy>

Department of Water and Environmental Regulations (DWER) (2022). AQ1622-M Yabberup Gravel Extraction DMP AQ Final_(002)_DWER advice

FIGURES



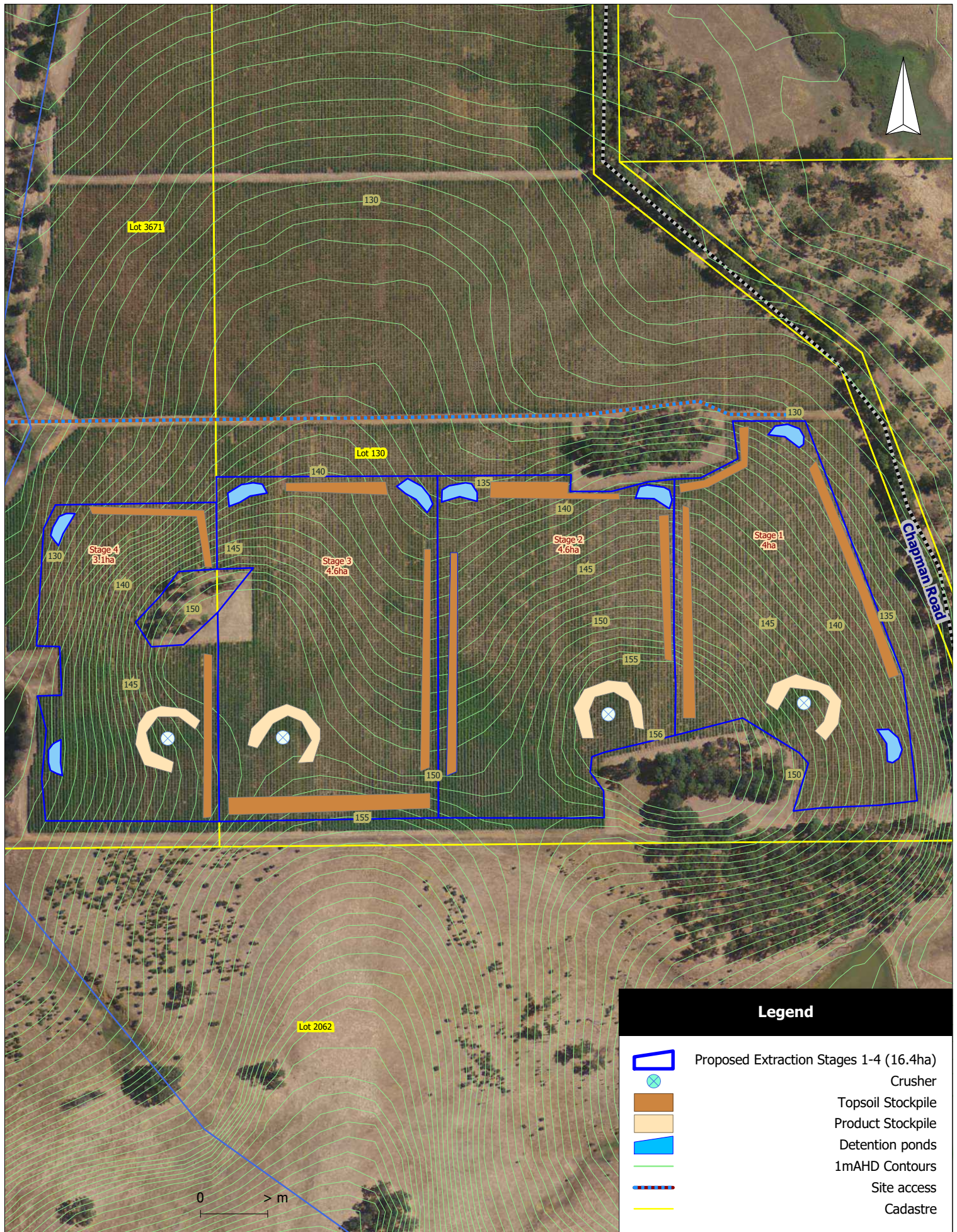
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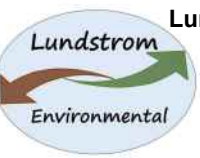
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Datum: GDA94
Projection: Australia MGA94 (50)

Client: Westwall Holdings
Project: Gravel Extraction
Location: 2038 Donnybrook Boyup Brook Road
Yabberup

**Figure 1:
Site and Surrounds**



Legend	
	Proposed Extraction Stages 1-4 (16.4ha)
	Crusher
	Topsoil Stockpile
	Product Stockpile
	Detention ponds
	1m AHD Contours
	Site access
	Cadastral



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Scale: 1:3800
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 Air Photo Source: Arcgis Dec 2021
 Datum: GDA94
 Projection: Australia MGA94 (50)

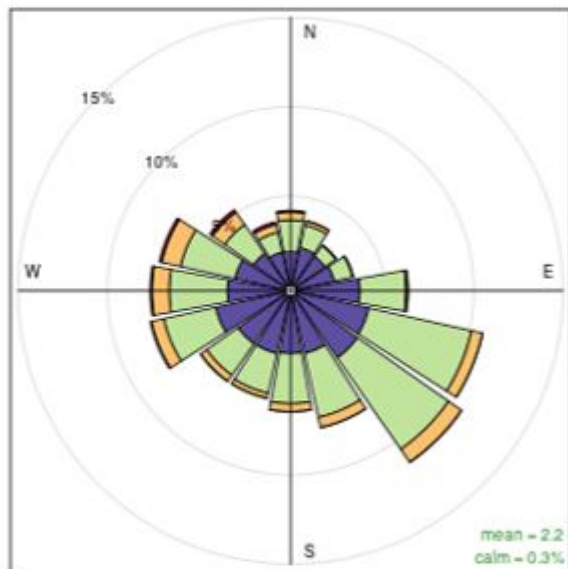
Client: Old Valley Pty Ltd
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Figure 2:
Proposed Extraction

ANNEXURE 1

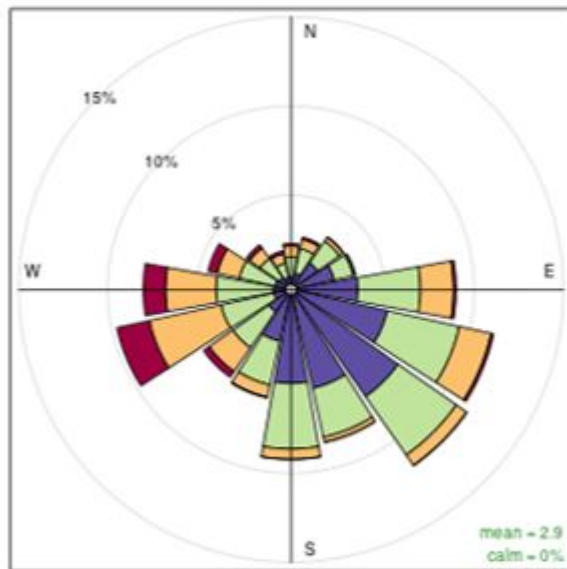
DWER AQMS wind roses

collie_mobile_met_2017



0 to 2 2 to 4 4 to 6 6 to 12
(m s^{-1})
Frequency of counts by wind direction (%)

bunbury_aqms_2011



0 to 2 2 to 4 4 to 6 6 to 19
(m s^{-1})
Frequency of counts by wind direction (%)

Figure 2 - wind roses for DWER AQMS Bunbury and Collie

ANNEXURE 2

Site Classification Assessment Chart

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

Sheet 1: Site classification assessment chart

Part A. Nature of site

Item	Score options				Allocated score
1. Nuisance potential of soil. when disturbed	Very low1	Low.....2	Medium.....4	High.....6	2
2. Topography and protection provided by undisturbed vegetation	Sheltered and screened.....1	Medium screening....6	Little screening.....12	Exposed and wind prone.....18	12
3. Area of site disturbed by the works	Less than 1ha.....1	Between 1 and 5ha..3	Between 5 and 10ha.....6	More than 10ha.....9	3
4. Type of work being done	Roads or shallow trenches.....1	Roads, drains and medium depth sewers.....3	Roads, drains, sewers and partial earthworks.....6	Bulk earthworks and deep trenches.....9	9
TOTAL score for Part A					26

Part B. Proximity of site to other land uses

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

SITE CLASSIFICATION SCORE (A X B) = 468

ANNEXURE 3

Particle size analysis laboratory report



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Material Test Report

Report No: MAT:MC21-03614-S09

Issue No: 1

Client: Nick Stroud

Project: Quality Control(Nick Stroud)

Location: Project : Prestonvale Gravel and Sand

Preliminary Report Issued - Issue:
 The results in this report relate only to the
 items/samples that were tested.

Signatory: Alex Briggs

(Laboratory Supervisor)

Date of Issue: 16/12/2021

THIS DOCUMENT SHALL NOT BE REPRODUCED EXCEPT IN FULL

Sample Details

Sample ID MC21-03614-S09
 Date Sampled 15/11/2021
 Sampling Method Tested as received
 Soil Description Gravel
 Specification Table 501D1: Pavements - 04/10110-05 - 04/10/2021
 Sample Location Southside Row 167/166
 Surface Dirt
 0.1m - Gravel

Particle Size Distribution

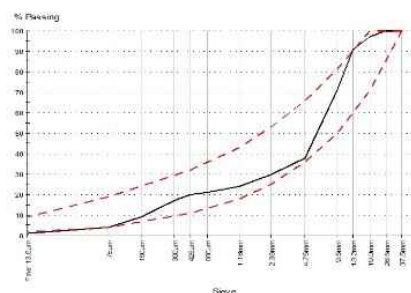
Method: WA115.1
 Drying by: Oven
 Date Tested: 15/12/2021

Sieve Size	% Passing	Limits
37.5mm	100	100 - 100
26.5mm	100	
19.0mm	97	71 - 100
13.2mm	91	
9.5mm	71	50 - 81
4.75mm	38	36 - 66
2.36mm	30	25 - 53
1.18mm	24	18 - 43
600µm	21	
425µm	20	11 - 32
300µm	17	
150µm	9	
75µm	4	4 - 19
Finer 13.5µm	1	2 - 9

Other Test Results

Description	Method	Result	Limits
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Chart



Comments

Preliminary results issued on the 16/12/2021



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Material Test Report

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(Laboratory Supervisor)

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Sample Details

Sample ID MC21-03614-S10
 Date Sampled 15/11/2021
 Sampling Method Tested as received
 Soil Description Gravel
 Specification Table 501D1: Pavements - 04/10110-05 - 04/10/2021
 Sample Location 1 hole in Borsh
 4cm Surface Dirt
 Gravel 1.6m

Particle Size Distribution

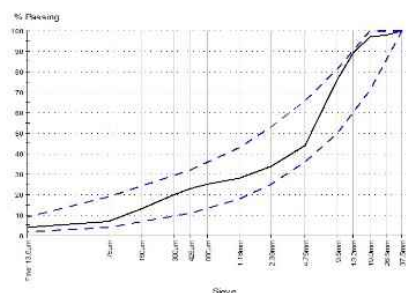
Method: WA115.1
 Drying by: Oven
 Date Tested: 15/12/2021

Sieve Size	% Passing	Limits
37.5mm	100	100 – 100
26.5mm	98	
19.0mm	97	71 – 100
13.2mm	89	
9.5mm	76	50 – 81
4.75mm	44	36 – 66
2.36mm	34	25 – 53
1.18mm	28	18 – 43
600µm	25	
425µm	23	11 – 32
300µm	20	
150µm	13	
75µm	7	4 – 19
Finer 13.5µm	4	2 – 9

Other Test Results

Description	Method	Result	Limits
-------------	--------	--------	--------

Chart



Comments

Preliminary results issued on the 16/12/2021.