



Works Approval Number	W5709/2014/1
Works Approval Holder	B. & J. Catalano Pty Ltd
ACN	008 961 975
Registered business address	2 South Western Highway BRUNSWICK JUNCTION WA 6224
Date of amendment	23 December 2016
Prescribed Premises	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 otherwise separated.
Premises	Shenton Ridge Gravel Quarry Coalfields Road ROELANDS WA 6226 Being Part Lot 501 on Plan 26892 and Lot 21 on Plan 10674, as depicted in Schedule 1

Amendment

The Department of Environment Regulation (DER) has amended the above works approval in accordance with section 59 of the *Environmental Protection Act 1986* (EP Act) as set out in this Amendment Notice.

Date signed: 23 December 2016

Agnes Tay

Director Strategy and Reform

an officer delegated under section 20 of the Environmental Protection Act 1986 (WA)

Amendment Notice

This Notice is issued under section 59 of the EP Act to amend the works approval issued under section 54 for the Premises. This notice of amendment is given under section 59B(9) of the EP Act.

Amendment Description

Works Approval W5709/2014/1 was granted by DER on 31 March 2016 to allow works for the construction of additional gravel quarries at the Shenton Ridge Gravel Quarry.

Following the receipt of two appeals, the CEO concluded that the proposed activities should be reviewed to determine, using a risk-based approach, whether or not existing works approval conditions adequately address risk.

Prior to this review process and following the appeals, B & J Catalano Pty Ltd (B & J Catalano) submitted updated management plans for dust and stormwater management. These additional management measures were considered in the risk assessment outlined in the Decision Report in Attachment 1.

The Decision Report was submitted to the Appeals Convenor to provide advice on the issues raised in the appeals. After consideration of proposed changes and the risk assessment provided in the Decision Report, the Appeals Convenor reported to the Minister for Environment (the Minister) its recommendations and conclusions.

Decision

This amendment is made pursuant to sections 59(1)(a), (b), (j) and 110(1) of the EP Act, being an amendment to remove or vary any condition to which the works approval is subject and is in accordance with the Minister's decision on the appeals.

In its reassessment of the application and additional supporting information DER concluded that the environmental risk of the proposed Shenton Ridge Gravel Quarry remain unchanged as moderate. DER's review identified that the majority of environmental risks related to potential emissions and discharges during operations and did not apply to the Works Approval. However, the review found that infrastructure requirements during operations should be specified in the Works Approval following the receipt of B & J Catalano's updated management plans. The need for additional regulatory controls during the operating period through the issue of a DER licence is considered in detail in the Decision Report (Attachment 1).

After receiving the Appeal Convenor's recommendations, the Minister considered that:

"DER's re-assessment was appropriate and that the Works Approval should be amended to include, a map indicating locations of stormwater management infrastructure, description of containment infrastructure components including detention basins, diversion drains, contour bunds and cut-off bunds, and a schedule defining the minimum storage capacity of individual detention ponds."

Infrastructure specifications and maps have been added by DER to the amended Works Approval in accordance with the Minister's decision.

In addition, in recommending that the Works Approval be amended, the Minister requested that DER give consideration to Wokalup rainfall data and review the detention pond storage capacity if required.

DER has conducted a review of the Wokalup rainfall data which is detailed in the Decision Report provided in Attachment 1.

Following the review the CEO has determined that the assessment should remain unchanged as historical rainfall and temperature data was similar to that from the Collie weather station. Further, changes to the storage capacity of detention ponds is not required as capacities have been determined using a 10 year, 2 hour Average Recurrence Interval specific to the premises location. Proposed amendments to infrastructure requirements are expected to adequately manage the risk of sediments impacting the receiving environment and public drinking water sources during operations.

Amendment History

Instrument	Issued	Amendment
W5709/2014/1	28 November 2016	Works Approval Amendment Notice 1 Works Approval amendment to remove improvement requirements and amend containment infrastructure requirement conditions in accordance with the Minister's decision.

Amendments

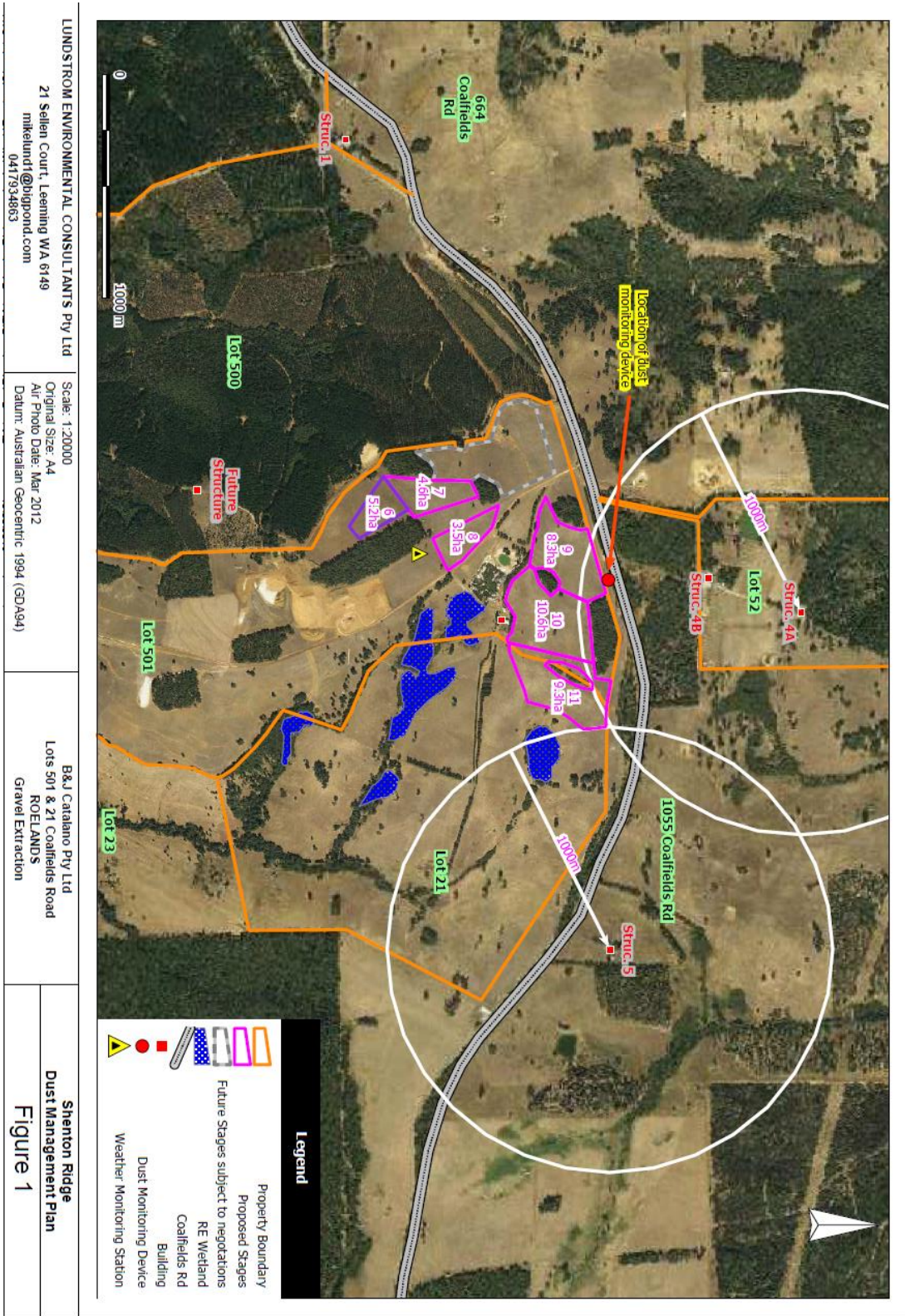
- Table 1.2.2 is amended by the deletion of the text shown in strikethrough below and insertion of the red text shown in underline below:

Table 1.2.2: Containment infrastructure		
Infrastructure	Material	Infrastructure requirements
Detention basins <u>(all)</u>	Contaminated water from the screening process	To be excavated below the working area within each stage. Constructed with a minimum 2 m separation to the maximum seasonal groundwater table. Construction capacity to hold a minimum of two hours runoff resulting from a 10-year return interval storm event; and
<u>Detention basins for Stages 7, 8, 9, 10 and 11</u>		<u>Detention basins 1a, 1b, 2a, 2b, 3a, 4a, 4b, 4c, 5a, 6a, 6b and 7a depicted in Schedule 1 must be constructed with the minimum storage capacity defined in Schedule 2.</u>
<u>Diversion drains</u>		<u>Three diversion drains depicted in Schedule 1 are constructed fit for the purpose of directing stormwater that has overflowed from detention basins to the existing Detention Pond.</u>
<u>Contour bunds</u>		<u>To be constructed to divert any surface water into the detention basins.</u> <u>To be constructed as each extraction area is completed.</u> <u>Narrow-based contour bunds to be constructed to a grade of between 0.1 and 0.4%.</u>

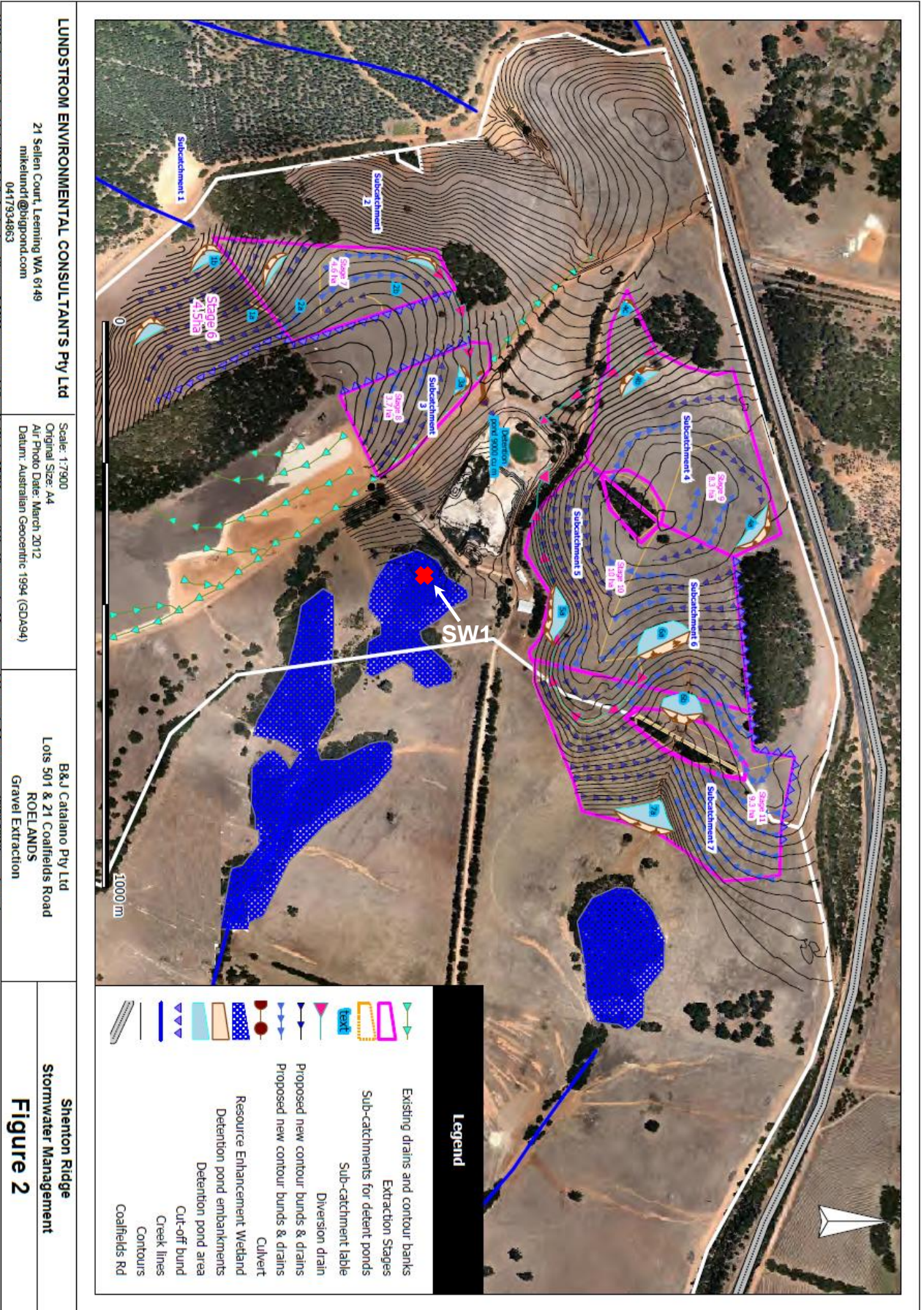
<u>Cut-off bunds</u>		<u>To be constructed along the eastern edges of Stages 6 and 7 along the western edge of Stage 8 and along the northern edges of Stages 10 and 11 as depicted in Schedule 1.</u> <u>Constructed to prevent runoff entering into mined areas.</u> <u>To be retained until vegetation cover is sufficient to stabilise the ground surface and prevent erosion.</u>
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- Schedule 1 is amended by the insertion of the following maps and red text shown in underline below:

Map of Air Quality Monitoring Infrastructure



Map of Surface Water Catchment Areas, Site Topography and Surface Water Quality Monitoring



LUNDSTROM ENVIRONMENTAL CONSULTANTS Pty Ltd
 21 Sellen Court, Leeming WA 6149
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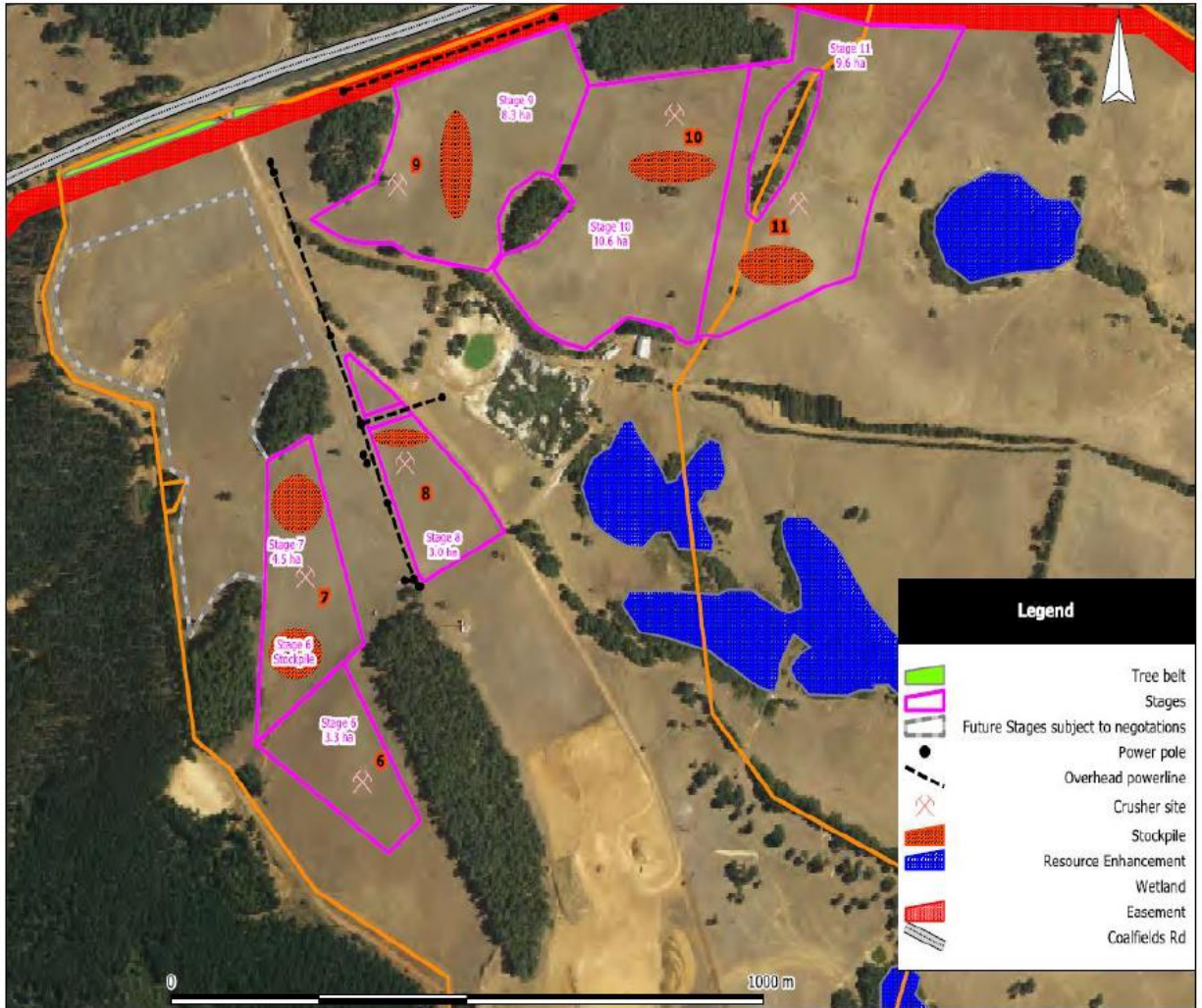
B&J Catalano Pty Ltd
 Lots 501 & 21 Coalfields Road
 ROELANDS
 Gravel Extraction

Shenton Ridge
Stormwater Management
Figure 2

- Schedule 1 is amended by deletion of the text shown in strikethrough and deletion of maps shown below:

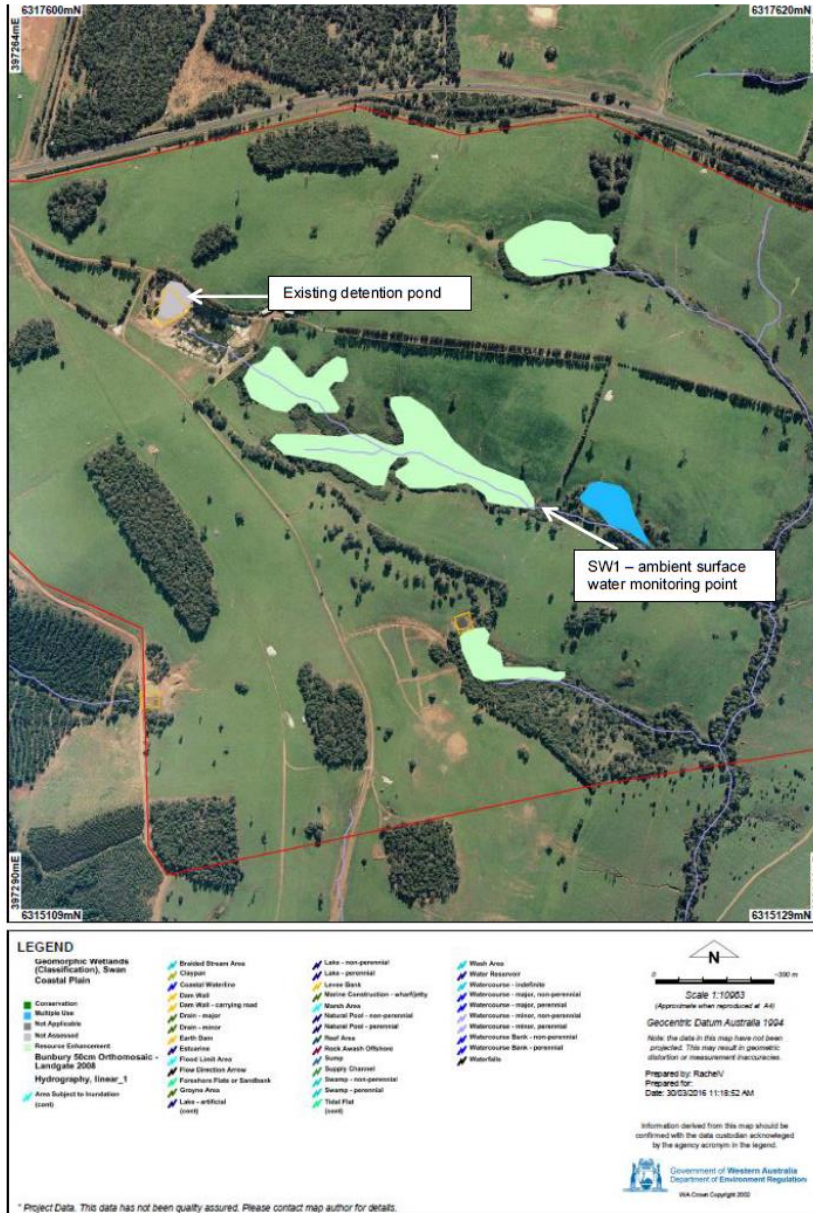
~~Map of Stages of Gravel Extraction~~

~~The stages of gravel extraction within the Premises are shown by the pink lines and titled Stage 7 to Stage 11.~~



~~Map of Surface Water Systems~~

~~The surface water systems and existing detention pond are shown in the map below.~~



4. Schedule 2 is inserted to the Works Approval as red text shown in underline below:

Schedule 2: Detention Pond Storage

<u>Detention Pond Number (depicted in Schedule 1)</u>	<u>Detention Pond Minimum Storage Capacity (m³ x 10³)</u>
<u>1a</u>	<u>0.761</u>
<u>1b</u>	<u>0.776</u>
<u>2a</u>	<u>0.633</u>
<u>2b</u>	<u>0.682</u>
<u>3a</u>	<u>1.075</u>
<u>4a</u>	<u>1.041</u>
<u>4b</u>	<u>1.714</u>
<u>4c</u>	<u>0.244</u>
<u>5a</u>	<u>2.238</u>
<u>6a</u>	<u>1.265</u>
<u>6b</u>	<u>1.219</u>

5. Section 2 is amended by deletion of the text shown in strikethrough below:

~~2~~ **Improvements**

~~2.1~~ **Improvement program**

~~2.1.1~~ The Works Approval Holder shall complete the improvements in Table 2.1.1 by the date of completion in Table 2.1.1.

~~2.1.2~~ The Works Approval Holder, for improvements not specifically requiring a written submission, shall write to the CEO stating whether and how the Works Approval Holder is compliant with the improvement within one week of the completion date specified in Table 2.1.1.

Table 2.1.1: Improvement program

Improvement reference	Improvement	Date of completion
IR1	<p>The Works Approval Holder shall submit to the CEO a revised Dust Management Plan (DMP). The DMP must include, but not be limited to, information on:</p> <ul style="list-style-type: none"> a) all potential sources of dust from the premises; b) potential dust impact on sensitive receptors; c) dust control initiatives undertaken on site to manage potential dust impacts d) complaints management including recording of all complaints, investigation and remedial actions; and e) a dust monitoring program including details on: <ul style="list-style-type: none"> — continuous dust monitoring at the boundary that has automatic feedback (SMS or equivalent) if a pre-set trigger value is reached; — meteorological monitoring to provide wind data to assist in determining the source of dust; — sampling locations at the Premises boundary between operations and residences 4 and 5; — trigger values to evoke actions to manage dust generation; — management actions and timeframes in the event of a trigger values being reached including consideration of wind speed and direction and whether the exceedance is attributable to Shenton Ridge Gravel Quarry. 	30 April 2016
IR2	<p>The Works Approval Holder shall submit to the CEO a Stormwater Management Plan (SMP). The SMP must include, but not be limited to, information on:</p> <ul style="list-style-type: none"> a) detailed schematics of the drainage infrastructure (trenches, cut-off drains, bunding and detention basins, etc.); b) detailed schematics of the drainage infrastructure to direct all overflow from stages 8-11 to the 	30 April and prior to commencement of works-

	<p>existing stormwater detention pond specified in the map of surface water systems in Schedule 1 maps.</p> <ul style="list-style-type: none"> e) stages 8-11 detention basin capacity to adequately provide storage for a minimum of two hours runoff resulting from a 10-year return interval storm event; d) the diversion of clean stormwater away from operational stages; e) the revised capacity for the stage 7 detention basin to prevent overflow during a greater than 1-in-10, 2-hour storm event; and f) management actions and timeframes in the event of an exceedance of 30 mg/L for Total Suspended Solids at the monitoring point (SW1) specified in the map of surface water systems in Schedule 1 maps. This may include application of coagulants suitable for use in drinking water catchments on advice from the Department of Health. 	
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Attachment 1: Decision Report



Review of Existing Premises

Division 3, Part V *Environmental Protection Act 1986*

Applicant: B. & J. Catalano Pty Ltd

ACN: 008 961 975

Works Approval Number: W5709/2014/1

File Number: DER2014/001117

Premises: Shenton Ridge Gravel Quarry
Cells 7 to 11

Lot 501 and 21 Coalfields Road
ROELANDS WA 6266

Lot 501 on Deposited Plan 26892
Certificate of Title Volume 2530 Folio 854

AND

Lot 21 on Deposited Plan 10674
Certificate of Title Volume 1383 Folio 275

Date of report: Friday, 23 December 2016

Status of Report Final

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Appendix 4: Environmental Noise Assessment

Attachment 1: Works Approval W5709/2014/1 Amendment Notice No.1

Attachment 2: Proposed stages of mining operation

1. Purpose and Scope of Assessment

The Works Approval W5709/2014/1 (Works Approval) was granted on 31 March 2016 for B. & J. Catalano (the Applicant) at Shenton Ridge Gravel Quarry Cells 7 to 11. The Minister for Environment received two appeals in objection to the conditions imposed by the Department of Environment Regulation (DER) in the works approval (see section 2.3). Following the receipt of the appeals, and in order to provide advice to the Appeals Convenor, the CEO concluded on 3 June 2016, that the proposed activities should be reviewed to determine, using a risk-based approach, whether or not existing works approval conditions adequately address risk. This report sets out the findings of the review (Review).

The Decision Report was submitted to the Appeals Convenor to provide advice on the issues raised in the appeals. After consideration of proposed changes and the risk assessment provided in the Decision Report, the Appeals Convenor reported to the Minister for Environment (the Minister) its recommendations and conclusions. In recommending that the Works Approval be amended, the Minister requested that DER give consideration to Wokalup rainfall data and review the detention pond storage capacity if required. Consideration to the Minister's further request is provided in section 6.7.3.

2. Background

2.1 Works Approval Application

On 15 May 2014, DER received a works approval application (the application) from the Applicant for the extraction and screening of gravel and laterite cap rock on Lots 501 and 21 Coalfields Road (also known as Coalfields Highway), Roelands.

The Works Approval was granted on 31 March 2016 by a Delegated Officer under section 20 of the EP Act. Table 1 details the Prescribed Premises Category and production quantity approved in the Works Approval. The capacity of 156,000 tonnes per annual period is lower than the 170,000 tonnes per annual period applied for in the application.

A copy of the issued Works Approval is set out in Attachment 1.

Table 1. Prescribed Premises Categories

Classification of Premises	Description	Approved throughput	Schedule 1 Category Threshold
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 otherwise separated.	156,000 tonnes per annual period	50,000 tonnes or more per year

2.2 Improvement Conditions

Two improvement conditions were included in the Works Approval as follows:

- 1.1.1 The Works Approval Holder shall complete the improvements in Table 2.1.1 by the date of completion in Table 2.1.1.
- 1.1.2 The Works Approval Holder, for improvements not specifically requiring a written submission, shall write to the CEO stating whether and how the Works Approval Holder is compliant with the improvement within one week of the completion date specified in Table 2.1

Table 2.1.1: Improvement program

Improvement reference	Improvement	Date of completion
IR1	<p>The Works Approval Holder shall submit to the CEO a revised Dust Management Plan (DMP). The DMP must include, but not be limited to, information on:</p> <ul style="list-style-type: none"> a) all potential sources of dust from the premises; b) potential dust impact on sensitive receptors; c) dust control initiatives undertaken on site to manage potential dust impacts d) complaints management including recording of all complaints, investigation and remedial actions; and e) a dust monitoring program including details on: <ul style="list-style-type: none"> - continuous dust monitoring at the boundary that has automatic feedback (SMS or equivalent) if a pre-set trigger value is reached; - meteorological monitoring to provide wind data to assist in determining the source of dust; - sampling locations at the Premises boundary between operations and residences 4 and 5; - trigger values to evoke actions to manage dust generation; - management actions and timeframes in the event of a trigger values being reached including consideration of wind speed and direction and whether the exceedance is attributable to Shenton Ridge Gravel Quarry. 	30 April 2016
IR2	<p>The Works Approval Holder shall submit to the CEO a Stormwater Management Plan (SMP). The SMP must include, but not be limited to, information on:</p> <ul style="list-style-type: none"> a) detailed schematics of the drainage infrastructure (trenches, cut-off drains, bunding and detention basins, etc.); b) detailed schematics of the drainage infrastructure to direct all overflow from stages 8-11 to the existing stormwater detention pond specified in the map of surface water systems in Schedule 1 maps. c) stages 8-11 detention basin capacity to adequately provide storage for a minimum of two hours runoff resulting from a 10-year return interval storm event; d) the diversion of clean stormwater away from operational stages; e) the revised capacity for the Stage 7 detention basin to prevent overflow during a greater than 1 in 10, 2 hour storm event; and f) management actions and timeframes in the event of an exceedance of 30 mg/L for Total 	30 April and prior to commencement of works

Table 2.1.1: Improvement program

Improvement reference	Improvement	Date of completion
	Suspended Solids at the monitoring point (SW1) specified in the map of surface water systems in Schedule 1 maps. This may include application of coagulants suitable for use in drinking water catchments on advice from the Department of Health.	

The revised DMP was received by DER on 28 April 2016. This DMP did not address all of the requirements of IR1, so a further DMP was submitted to DER on 11 May 2016 and the SMP was received on 23 May 2016. Consideration of the adequacy of these revised plans has been included in section 7 of this report.

Key Finding:

- 1. The required Dust Management Plan and Surface Water Management Plan have been submitted to DER, thereby satisfying improvement conditions IR1 and IR2. Conditions IR1 and IR2 can be removed from the Works Approval as a result of this Review.**

2.3 Appeals

Two Appellants raised the following grounds of appeal in respect of the Works Approval:

- lack of Dust Management Plan at the time of granting;
- lack of Stormwater Management Plan at the time of granting; and
- insufficient consideration of nuisance noise emissions.

Details of the grounds of the Appeals and DER's consideration of the risks presented are summarised in Appendix 2.

The proposal is within the Roelands Farm and Village reservoir catchment area and is located on a boundary shared with Lot 501.

The Roelands Farm and Village reservoir is the sole water source for the Roelands Farm and Village.

Previous, unlicensed quarrying activities within Lot 501 may have increased the volume of sediment within the Roelands Farm and Village reservoir.

2.4 The Applicant

As stated in the application, the Applicant's company was established in 1962 as a transport and earth moving operation in the South West of Western Australia and since then has expanded into the Metropolitan and Midwest regions with over 300 employees. The Applicant operates a number of basic raw material quarries and its customers include large corporations, local and state government, mining companies, builders and contractors.

The Applicant currently holds the following DER licences and works approvals for similar Category 12 premises:

- Myalup Limestone Quarry (L8831/2014/1)
- Jenkins Road Gravel Pit (L8687/2012/1)

- Gidgegannup Gravel Pit (L8696/2012/1)
- Martin Road Gravel Quarry (L8550/2011/1)
- Wagerup Gravel Quarry (L8456/2010/1)
- Runnymede Road Sand Pit (W5712/2014/1)

3. Overview of Shenton Ridge Gravel Quarry Cells 7 - 11

3.1 Infrastructure

The quarry infrastructure, as it relates to Category 12 activities, is detailed in Table 2 with reference to the Site Plans (included in the granted Works Approval and the attached Amendment Notice) and Table 3 stormwater detention pond capacity. Mobile facility infrastructure as it relates to Category 12 activities is detailed in Table 4.

Table 2. Shenton Ridge Gravel Quarry fixed infrastructure

	Infrastructure	Plan Reference
1	<p>Existing (clay pit) detention pond</p> <ul style="list-style-type: none"> • Discharge of runoff from the southern portion of Stage 10 to the existing detention/infiltration basin to prevent flow into the Resource Enhancement Wetland. • The existing (clay pit) detention pond will serve as a silt trap in times of high surface runoff (storm events), and will allow for retention of water for dust suppression activities. • Topsoil and overburden bunds will also be in place along the down-slope edges of the cells during the excavation stage and this will control stormwater runoff during this period. 	Map of Surface Water Catchment Areas and Site Topography: Detention pond 9000 cu m
2	<p>Stormwater Detention Ponds</p> <ul style="list-style-type: none"> • As each extraction stage is opened, a stormwater detention pond will be excavated below the workings (but within the extraction area) with the capacity to hold at least the 1 in 10 year, 2 hour storm event (see section 6.7.3). • The storage capacities of these ponds are listed in Table 3 below. <p>Detention ponds will be retained until vegetation ground cover is sufficient to stabilise the ground surface and prevent erosion.</p>	Map of Surface Water Catchment Areas and Site Topography: 1a-b, 2a-b, 3a, 4a-c, 5a, 6a-b and 7a

	Infrastructure	Plan Reference
3	<p>Contour bunds</p> <ul style="list-style-type: none"> Contour bunds will be created to divert any surface water into the detention ponds. As each extraction area is completed, narrow-based contour bunds will be constructed to a grade of between 0.1 and 0.4%. A total length of 3.4km of contour bunds will be constructed through the life of the extraction operation. <p>Post extraction land-use will be pastures and no further cultivation will take place after the final rehabilitation of the land and planting of pastures.</p>	Map of Surface Water Catchment Areas and Site Topography: Proposed new contour bunds & drains
4	<p>Diversion drains</p> <ul style="list-style-type: none"> It is proposed to construct three diversion drains which will direct overflow water from detention ponds in Stages 7 to 10 to the existing (clay pit) detention pond. Since it is not feasible to direct overflow from the detention ponds 2a in Stage 7 and 7a in Stage 11 to the 'clay pit' dam, these detention ponds will be resized to receive at least the 1:50 year 2 hour storm event. 	Map of Surface Water Catchment Areas and Site Topography: Diversion drain
5	<p>Cut-off bunds</p> <ul style="list-style-type: none"> Will be formed along the eastern edges of stages 6 and 7 along the western edge of Stage 8 and along the northern edges of stages 10 and 11, to prevent runoff entering into mined areas. Will be retained until vegetation cover is sufficient to stabilise the ground surface and prevent erosion. 	Map of Surface Water Catchment Areas and Site Topography: Cut-off bund
6	<p>Dust monitoring device (DustTrack™ 11 Aerosol Monitor 8530)</p> <ul style="list-style-type: none"> The instrument will be calibrated according to manufacturer recommendations, with field checks carried out on a weekly basis. One dust-monitor will be placed between Structure 4A and proposed mining Stages 9, 10 and 11. 	Map of Monitoring Infrastructure: Location of dust monitoring device
7	<p>Existing weather station</p> <ul style="list-style-type: none"> This weather station will monitor the wind speed and direction on a continuous basis. 	Map of Monitoring Infrastructure: Weather Monitoring Station

Table 3. Stormwater Detention Pond Capacity

Subcatchment	Detention Pond No. (see Figure 2)	Sub-catchment Area (ha)	Design Storm Runoff (m ³ x 10 ³)	Detention Pond Storage (m ³ x 10 ³)
1	1a	2.1362	0.508	0.761
	1b	2.1763	0.517	0.776
2	2a	1.7758	0.422	0.633
	2b	1.9132	0.455	0.682
3	3a	3.0158	0.717	1.075
4	4a	3.0357	0.694	1.041
	4b	3.9927	1.143	1.714
	4c	0.6843	0.163	0.244
5	5a	6.4761	1.492	2.238
6	6a	3.5507	0.844	1.265
	6b	3.9354	0.813	1.219
7	7a	7.6405	1.743	2.615
TOTAL		43.4073	9.509	14.264

In addition to the infrastructure detailed in Table 2, the mobile infrastructure proposed to be used is summarised in Table 4 below.

Table 4. Shenton Ridge Gravel Quarry Category 12 mobile infrastructure

	Infrastructure
1	D10 Bulldozer
2	Caterpillar 980 & 950 front end loaders
3	Parker 4230 Crusher (SN1325)
4	Finlay Screen 693
5	Striker 25m Stacker
6	Caterpillar generator set
7	Caterpillar 322 Excavator
8	Single Semi-loader (24 tonnes)

3.2 Operational Aspects

The application specified that the proposal is to add eight more stages (stages 7 to 14) with a total area of 50.56ha under a new Extractive Industries Licence (EIL). At the commencement of Stage 7, an existing gravel stockpile of up to 100,000m³ remaining from previous mining activities will be progressively removed. The proposed stages of the mining operation are included in Attachment 2.

Table 5. Summary of operations (summary from the application)

	Operational features	Plan reference
1	<p>Gravel extraction:</p> <ul style="list-style-type: none"> • The extraction of gravel from an area of 55.73ha in nine stages (including carried over Stage 6). • The approximate annual gravel removal will be 100,000m³ (170,000 tonnes), but this will depend on demand. • Prior to extraction taking place in stages 10, 12 and 13, the removal of existing isolated trees will be undertaken in accordance with Regulation 5, Item 19 of the <i>Environmental Protection (Clearing of Native Vegetation) Regulations 2004</i>. No other vegetation clearing is required. • Topsoil and overburden will be removed from the extraction area in stages with only the areas targeted for immediate extraction (9ha at a time) being opened. • During the actual mining phase topsoil will be pushed up in bunds along the edges of the pit and these will serve to attenuate the noise. • Extraction activity will result in the lowering of the ground level by approximately 1.0m below original ground level. • There will be no blasting. 	Map of Stages of Gravel Extraction: Stage 7-11
2	<p>Gravel removal</p> <ul style="list-style-type: none"> • At the commencement of Stage 7, an existing gravel stockpile of up to 100,000m³ remaining from previous mining activities will be progressively removed. 	Map of Stages of Gravel Extraction: Stage 6 Stockpile
3	<p>Crushing and screening</p> <ul style="list-style-type: none"> • Crushing and screening will be undertaken in campaigns of 50,000m³ (85,000 tonnes). With the equipment specified in Table 4. • During the crushing and screening phase, a four metre high noise bund will be constructed around the plant. As the gravel stockpile grows, this will be used as an additional buffer. 	Map of Stages of Gravel Extraction: Crusher site
4	<p>Stockpiling</p> <ul style="list-style-type: none"> • Topsoil and over-burden will be stockpiled separately along the edges of the extraction area, with stockpiles being no higher than 2 metres. • Material extracted from stages 6 to 14 will be stockpiled within the future operations footprint. Stockpiles will be a standard height of 9 metres. • The crushed material will be stockpiled in a manner that will maximise the buffering of noise that may occur from the loading of trucks after mining operations have ceased. 	Map of Stages of Gravel Extraction: Stockpile

	Operational features	Plan reference
5	<p>Rehabilitation</p> <ul style="list-style-type: none"> • Progressive rehabilitation of the extraction areas will involve the following actions: <ul style="list-style-type: none"> ○ Topsoil and overburden will be removed and stored in separate stockpiles along the edges of the extraction area. Stockpiles will be no more than two metres high and ten metres wide with batters of 1:4. ○ The extraction area will be ripped when compaction has occurred. ○ All batters behind the active working face will be contoured to achieve a slope of no more than 1:6 and the base of the pit will be levelled out. ○ The final land surface will be approximately one metre below the original ground level. ○ Stockpiled topsoil/overburden will be replaced as quickly as possible in order to maintain its viability and will be re-spread over completed areas. ○ The extraction area will be seeded with pasture species and fertilised. ○ Final contour drainage furrows will be cut. ○ Stormwater infrastructure is to remain post-extraction to assist in the control of flow velocity, where downstream erosion problems are present, until vegetation is sufficiently established. ○ Weed control will be undertaken as and when required in accordance with the Weed Management Plan (LEC 2014d) prepared for the site. 	Map of Stages of Gravel Extraction: Stages 6-11
6	<p>Rehabilitation monitoring and maintenance</p> <ul style="list-style-type: none"> • Monitoring of rehabilitated areas will ensure that any areas requiring remedial work are identified. Monitoring will be carried out on an annual basis to assess: <ul style="list-style-type: none"> ○ The physical stability of the landform in the rehabilitated areas. ○ The success of pasture grass germination ○ Survival and emergence of planted and seeded endemic species within tree belts ○ The emergence of weeds. • Maintenance procedures will be carried out where necessary and may include: <ul style="list-style-type: none"> ○ Repair of any erosion damage. ○ Replanting/seeding areas that may not have regenerated. ○ Weed control. 	Map of Stages of Gravel Extraction: Stages 6-11

	Operational features	Plan reference
	<ul style="list-style-type: none"> Monitoring will continue until the completion criteria proposed for extractive operations on the site have been fulfilled. 	
7	<p>Real-time Dust Monitoring</p> <ul style="list-style-type: none"> Continuous dust monitoring will be carried out at the northern boundary of the site using a real-time dust monitoring device. Real-time dust monitoring will provide a quantitative measure of dust emissions on-site, together with an alarm system which will notify the Quarry Manager by SMS when trigger levels are reached. Background monitoring will be implemented two weeks prior to the mining of Stages 9, 10 and 11. 	Map of Monitoring Infrastructure: Location of dust monitoring device
8	<p>Meteorological Monitoring</p> <ul style="list-style-type: none"> Continuous meteorological monitoring will be carried out at the existing weather station onsite (see Table 2), which will provide wind data to assist in determining the source of fugitive dust emissions causing impacts. The weather station will monitor the wind speed and direction on a continuous basis. 	Map of Monitoring Infrastructure:: Weather Monitoring Station

4. Legislative Context

4.1 Part IV of the EP Act

The proposal was not referred to the Environmental Protection Authority (EPA).

The Applicant has referred a separate proposal to the EPA to develop a granite quarry on Lots 21 and 501 that is capable of extracting 50,000 to 100,000 tonnes of hard rock per year. On 23 March 2015, the EPA decided not to assess the hard rock quarry under Part IV of the EP Act despite acknowledging that there are a number of environmental issues associated with the proposal. An appeal was lodged seeking the Minister for Environment to direct the EPA to assess the development application. The appeal was dismissed by the Minister on 3 August 2015.

No further referrals in relation to activities on Lot 501, Coalfields Rd have been submitted to the EPA for Part IV assessment.

4.2 Contaminated Sites

The site is not listed on DER's Contaminated Sites Database.

4.3 Planning

The area is zoned as 'General Farming' in terms of the Shire of Harvey Town Planning Scheme No. 1. The Applicant submitted an application for Planning Consent and an Extractive Industries Licence on 6 February 2014. The gravel extraction will be subject to an Extractive Industries Licence from the Shire of Harvey and must adhere to the Shire of Harvey *Extractive Industries Local Law 2007*

The proposal was modified to remove cells 12, 13 and 14 in response to a submission from a nearby landowner. As taken from the Shire of Harvey Ordinary Council Minutes (Appendix 3); *“It was concluded that proposed cells 12, 13 and 14 have the potential to further exacerbate erosion on the adjoining lot and to this effect was removed from the current application”*.

Planning consent for the continuation of gravel extraction on Lots 501 and 21 Coalfields Highway, Roelands, was granted for a period of five years on 27 October 2015. Key conditions of the planning approval as taken from the Shire of Harvey Ordinary Council Minutes (Appendix 3) include:

- *“The pit is to maintain a 50m setback from Coalfields road and 20m from all other property boundaries at all times, and all vegetation located within the 20m setback areas is to be retained;*
- *The silt detention ponds are to maintain a 20m setback from all other property boundaries at all times;*
- *No extraction activities should occur within 15m of any native tree crown drip zones and a suitable temporary demarcation barrier be erected at 15m from the crown drip zone to protect the remnant vegetation and root systems from accidental machinery damage to the satisfaction of the Manager of Planning Services;*
- *Stockpiles are to be located within the approved areas and kept to a maximum height of nine (9) metres to avoid visual impact and/or material wind drift;*
- *Any proposed clearing of native vegetation is prohibited unless done under a clearing permit issued in accordance with the Environmental Protection Act 1986, or the clearing is of an exempt kind;*
- *Operating hours are restricted to 6am – 6pm Monday to Saturday with no extraction to take place on Sunday or public holidays;*
- *Activities such as screening and crushing, may be prescribed and as such, require a Works Approval, License or Registration under Part V of the Environmental Protection Act 1986. The Department of Environment Regulation is the lead agency in relation to proposals;*
- *Any refuelling activities must be undertaken in accordance with the Department’s Water Quality Protection Note – Toxic and Hazardous Substance Storage and Use. There is to be no storage of hydrocarbons on-site and no major vehicle or machinery repairs or maintenance is to take place on-site;*
- *This approval is valid for a period of five (5) years. If development is not completed within this period, a new approval must be obtained before commencing or continuing development.*
- *Requests the Applicant recommence negotiations with the adjoining landowner with a view to resolving erosion problems arising from the dam located within cell 3; and*
- *Requires the Applicant to provide engineer certification for the dam structure and associated spillway to the satisfaction of the Executive Manager Technical Services prior to June 2016”.*

4.4 Department of Mines and Petroleum

The project is currently actively registered with the Department of Mines and Petroleum since 29 September 2008 under the project name Coalfields Highway / Catalano (Project code

J03637) owned by B. & J. Catalano Pty Ltd. The registration covers the Coalfields Highway Lots 501 and 21 North / Catalano proposed open pit surface mine (site code S0231433) for the commodities of gravel and aggregate.

As obtained from the Department of Mines and Petroleum Mines and mineral deposits (MINEDEX) online system; the proposed new extraction area is comprised of eight (8) stages. At the commencement of Stage 7 operations, an existing gravel stockpile of up to 100,000m³ (170,000 tonnes) or part thereof will remain from the previous EIL activities which will be progressively removed. Material extracted from stages 6-14 under the new EIL will be stockpiled in new areas within the future operations foot print. Eight plant/equipment areas and stockpiles will be operated as part of the future EIL operations. The approximate gravel removal over the 5 year licence period for Stages 6 to 14 will be 100,000 m³ / annum but this will depend on demand.

4.5 Part V of the EP Act

Stages 1 to 6 were operated without a licence under Part V of the EP Act. The Applicant did develop and operate the Shenton Ridge Quarry under planning consent and an Extractive Industry Licence granted by the Shire of Harvey on 29 July 2009 to 22 September 2014.

In February 2014, the Applicant commenced the planning consent and EIL approvals process to expand operations to complete stages 7 to 14. It was not until the Shire of Harvey referred the application for an Extractive Industries Licence for Stages 7 to 14 that DER became aware of operations at Shenton Ridge Quarry.

4.5.1 Works Approvals

W5709/2015/1

The Applicant applied to DER for a works approval in 15 May 2014 to prepare Stages 7 to 14 of the Shenton Ridge Quarry. A site visit conducted by the Shire of Harvey, the Applicant and the adjoining landowner on 7 August 2015, identified historical erosion from the premises leading into neighbouring property. The conclusion of this visit was that erosion would likely be exacerbated by the development of Stages 12, 13 and 14. The works approval application was subsequently amended in August 2015 to quarry stages 7 to 11 only.

Works Approval W5709/2014/1 was issued on 31 March 2016. In its Decision Report, DER identified a significant risk associated with dust and stormwater management at the premises that was not adequately addressed in the application's Dust Management Plan and Stormwater Management Plan. Therefore improvement conditions IR1 and IR2 were placed on the Works Approval to require the Applicant to better address the risk of fugitive dust emissions and stormwater contamination.

DER received the submission of a revised Dust Management Plan on 11 May 2016 and Stormwater Management Plan on 23 May 2016 in accordance with improvement conditions IR1 and IR2. These plans were not received on time being 11 and 23 days overdue respectively.

A separate licence application has been submitted to allow for the operation of the quarry (see L8877/2015/1). Following construction of works under this Works Approval, the licence will be granted to authorise operation of stages 7-11 with each stage only being authorised upon receipt of appropriate compliance documents as specified in condition 3.1.2 of the Works Approval.

W5828/2015/1

B & J Catalano's application for Works Approval W5828/2015/1 is currently being processed by DER for the development of a hard rock quarry on Lots 21 and 501, Coalfields Highway. The Applicant proposes to extract granite from the premises requiring blasting and excavation of material. As the application has not yet been approved, potential cumulative impacts associated with proposed activities have not been considered in this Decision Report.

4.5.2 Licences

L8877/2015/1

As detailed in section 4.5.1 above, DER has received an application for the Shenton Ridge Quarry's operating licence (L8877/2015/1) under Part V of the EP Act. The operating licence will not be granted until compliance documents are received and verified by DER in accordance with the Works Approval.

4.5.3 Compliance history check

There is no history of prosecution or formal statutory compliance/enforcement noticed issued under the EP Act by DER to the Works Approval holder for the Shenton Ridge Gravel Quarry.

DER's Incident and Complaints Management System (ICMS) is the system used to record complaints received and non-compliance requiring investigation. Following a review of ICMS there have been no complaints received from members of the public or surrounding operators relating to the Shenton Ridge Gravel Quarry.

4.5.4 Modelling and monitoring data

Lloyd George Acoustics, on behalf of the Applicant, conducted noise modelling for Stages 9 and 10. Stages 9 and 10 were selected as they were considered to represent a 'worst case' noise impact. Stage 7 was not considered a high enough noise risk to sensitive receptors to require modelling. At the time of modelling the property 900 m to the southwest of Stage 7 had not been approved. Quarrying at Stage 7 is expected to be completed ahead of the inhabitation of the now approved, but currently unconstructed, residential development on Lot 500. The Delegated Officer has taken into consideration the *Guidance Statement – Land Use Planning*, separation distances from sensitive receptors and current zoning.

Noise modelling of Stages 9 and 10 concluded that operations are likely to comply with assigned levels at all times except between the times of 10pm and 7am on any day Monday to Saturday and 9am on Sundays and public holidays. Should the planned development on Lot 500 become inhabited during the operation of Stage 7, there is a possibility that similar exceedances would occur at night and in the early mornings.

Proposed operating times at the Shenton Ridge Gravel Quarry are 6am to 6pm Monday to Saturday, excluding public holidays. Crushing and dozing operations will be restricted to 7am to 6pm Monday to Friday. DER's assessment and decision making is detailed in section 7.6.

Key Finding:

- 1. The Delegated Officer considers that a condition should be inserted in the licence (if granted), to mitigate against the potential noise impacts on residential development on Lot 500. The proposed condition would seek to control the hours of operation relating to Stage 7. This condition is required in the event that the residence on Lot 500 is occupied prior to the commencement of Stage 7, given Lot 500 is of a similar proximity to quarrying activities as residential premises are to Stage 9 (880m). Should the**

proposed residence be occupied before the completion of Stage 7 operations, the Delegated Officer considers that the potential impacts would remain comparable to the noise impacts of Stages 9 and 10 on sensitive receptors.

4.5.5 Clearing

Lots 21 and 501 Coalfields Road are predominately cleared of native vegetation, with some small stands of vegetation and scattered individual trees remaining. Stages 7 to 11 on Lot 21 have been designed to preserve the remaining stands of vegetation, however some individual trees fall within the extraction area. Clearing of native vegetation in accordance with a works approval is exempt from the requirement of a clearing permit under Schedule 6 Clause 2(c)(ii) of the EP Act.

A risk-based assessment of the environmental impacts of the clearing of the scattered individual trees on Lot 21 has been undertaken in accord with DER's *Regulatory Principles*.

Key Finding:

- 1. The Delegated Officer considers that the clearing is not likely to have any adverse impacts to the environment. Section 62(1) of the EP Act provides for conditions to be placed on a works approval to mitigate environmental harm. The Delegated Officer considers amended or new conditions to mitigate the clearing of native vegetation are not required as a result of this reassessment.**

5. Consultation

DER referred the application to the Shire of Harvey and the Department of Water on 28 August 2015. A summary of the comments received is as follows:

Shire of Harvey

The Shire of Harvey requested advice from DER on fugitive dust management and noise emissions. It was advised in Section 5 of the Works Approval Decision Document that noise and fugitive dust emissions are regulated under the general provisions of the Environmental Protection Act. This reassessment has further considered the impacts of noise and fugitive dust emissions on sensitive receptors (see Section 7.5 and 7.6).

Department of Water

The Department of Water expressed concerns with:

- The potential for impacts to the quality of the receiving groundwater from contamination with hydrocarbon;
- The risks of increased turbidity and salinity to groundwater through sediment (fines) and concentration of salts both at the screening plant and in the detention basins;
- The construction of detention basins that intercept groundwater; and
- The design of detention basins to prevent overflow causing erosion and highly turbid waters entering waterways.

The granted Works Approval included conditions requiring the submission of a Stormwater

and Management Plan (see section 2.2) and the requirement for a minimum two metre separation to groundwater at the base of the detention basins for each stage. This reassessment has further considered the impacts of stormwater on receiving waters (see section 7.7).

DER also publically advertised the application in the West Australian newspaper on 27 October 2014 and no submissions were received.

6. Location and Siting

6.1 Siting Context

The Shenton Ridge Gravel Quarry is located approximately 24 km east of Bunbury and 24 km west of Collie in the Southwest of Western Australia. The property is semi-cleared and zoned as 'General Farming' under the Shire of Harvey Town Planning Scheme No. 1. The quarry is located on the ridge of the Darling Scarp the property has significant slopes that lead into neighbouring properties (Shire of Harvey, 2015).

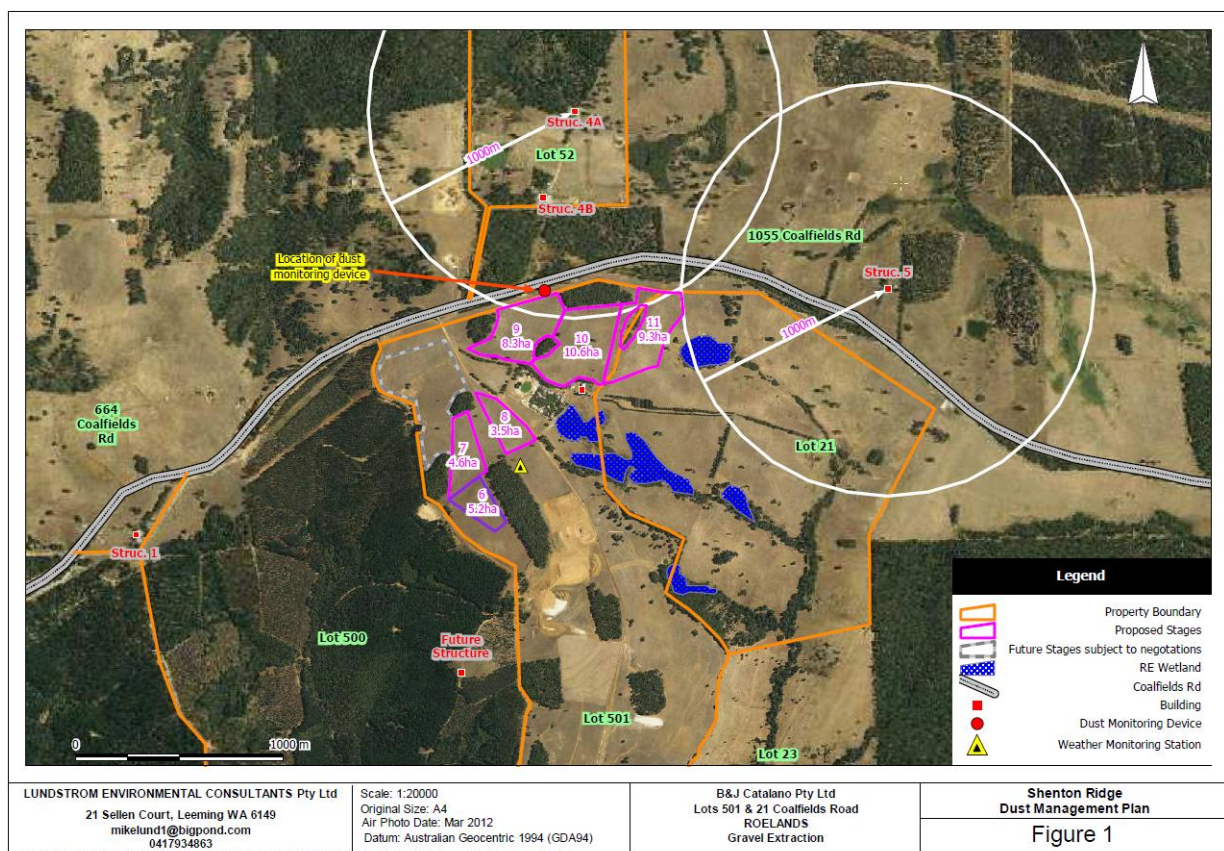


Figure 1. Location of the Premises in relation to sensitive receptors (figure from application)

6.2 Residential and Sensitive Premises

The distances to residential and sensitive receptors depicted in Figure 1 are as follows:

Table 6: Receptors and distance from prescribed activity

Residential and Sensitive Premises	Distance from Prescribed Activity
Residential premises (Res. 4)	880 m north of Stage 9
Residential premises (Res.1)	1,530 m west of Stage 6
Planned residential premises ¹	900 m south of Stage 7
Abandoned/derelict dwelling (Res. 5)	1,000 m northeast of Stage 11
Industrial premises	550 m north of Stage 9
Major highway (Coalfields Hwy)	60 m north of Stage 9

Note 1: The dwelling on this premises is not yet constructed although planning approval from the Shire of Harvey was granted for two years on 27 April 2016.

6.3 Specified Ecosystems

The Shenton Ridge Gravel Quarry is situated proximate to the following specified ecosystem:

Table 7: Specified ecosystems

Specified ecosystems	Distance from Prescribed Premises
Resource Enhancement Wetlands (4)	210 m east of Stage 10
	240 south east of Stage 8
Multiple Use Wetland	Approximately 640 m south east of Stage 11

No Priority or Threatened Ecological Communities have been identified in the vicinity of the Shenton Ridge Gravel Quarry.

6.4 Groundwater and water sources

Table 8: Groundwater and water sources

Groundwater and water sources	Distance from Premises	Environmental Value
Groundwater	Depth to groundwater is approximately 20 metres below ground level with seasonal fluctuations within a few metres.	Groundwater is not used for potable use with most water sourced from surface waters (Water Corporation, 2014). The site does not fall within a RIWI Groundwater Proclamation Area.
A small tributary of the Collie River	Approximately 200 m south of Stage 6	Surface water lies within the Collie River Irrigation District.

6.5 Other site characteristics

Table 9: Other factors or sources of concern

Other emission or sources of concern	Location
Community dam used for potable water supply for the Roelands Farm and Village. The community dam is not listed by the Department of Water as a Public Drinking Water Source Area.	5km downstream of Resource Enhancement Wetlands referred to in Table 7.

6.6 Soil Type

The whole site is underlain by the Granitoid rocks of the Darling Scarp with overlaying soils generally described as being a shallow layer of thin brown loamy gravels over local clay and clay subsoils (Catalano, 2013). Cap-rock thickness varies from 0.5 to 1.5 m, and maximum excavation depths are approximately 1.5 to 3.5m below current ground level, depending on resource thickness (Lundstrom Environmental Consultants, 2016).

The Applicant's Dust Management Plan (Lundstrom Environmental Consultants, 2016) describes the soil texture as dominantly gravel with minor sand and trace amounts of fines (clays and silts). Grain size distribution is approximately:

- Gravel (>2.0mm): 69%
- Sand (0.063<2.0mm): 27%
- Fines (Silt & Clay; <0.063mm): 4%

6.7 Meteorology

6.7.1 Wind direction and strength

Data has been extracted from two weather stations within 25 km of the site (Bunbury, 24 km west; Collie, 24 km east). Winds are strongest in this area in the afternoon prevailing from the west and northwest. Average afternoon conditions indicate that winds from the east (NE through SE) occur approximately 10% of the time.

The 3 P.M. wind roses for both Bunbury and Collie are depicted in Figures 1 and 2 (Bureau of Meteorology (BoM), 2016a).

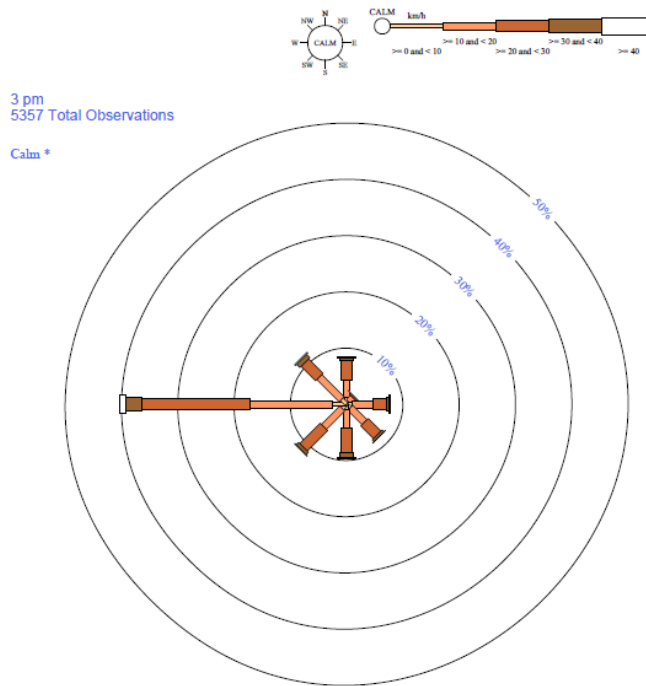


Figure 1. Bunbury 3 P.M. Wind Rose

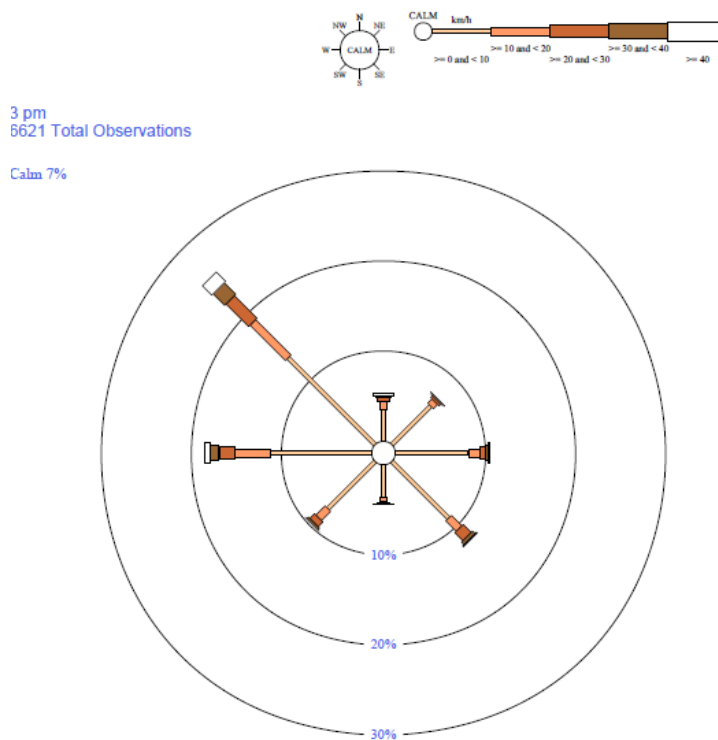


Figure 2. Collie 3 P.M. Wind Rose

Early morning winds are more likely to come from the east and south-east at the Shenton Ridge Quarry. 9 A.M. observations for Bunbury and Collie are provided in Figures 3 and 4 (BoM, 2016a).

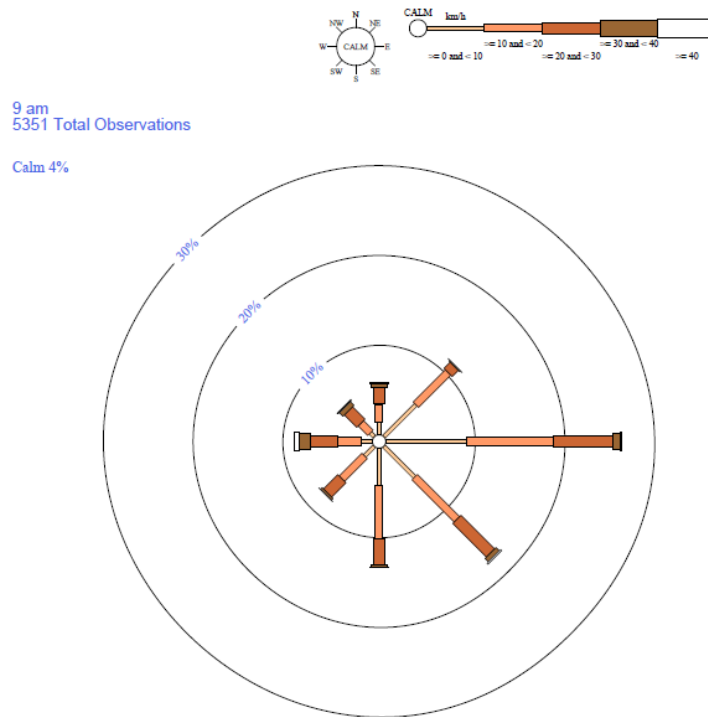


Figure 3. Bunbury 9 A.M. Wind Rose

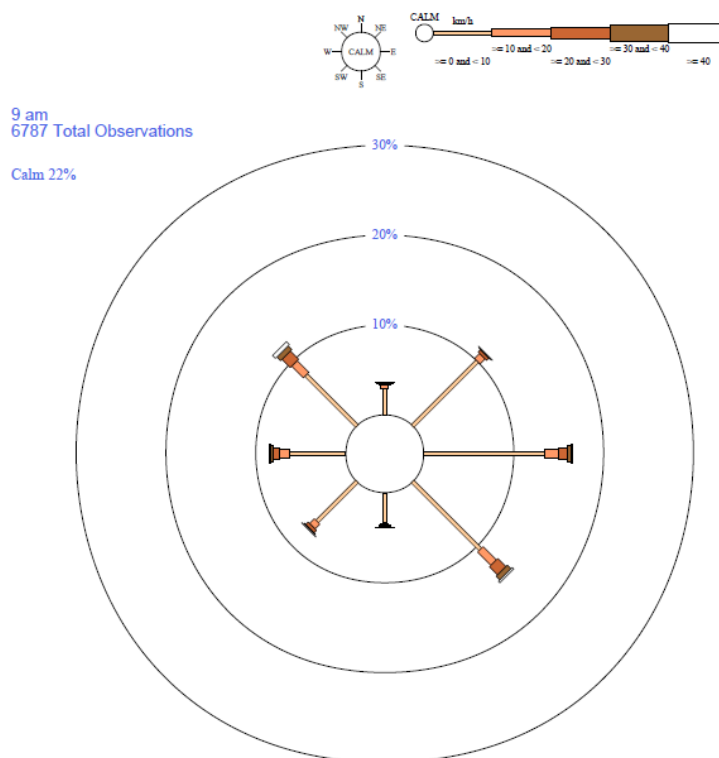


Figure 4. Collie 9 A.M. Wind Rose

It is important to note that these wind roses show historical wind speed and wind direction data for Bunbury and Collie weather stations and should not be used to predict future data.

6.7.2 Regional climatic aspects

The Shenton Ridge Quarry is located on the edge of the Darling Scarp, where climate differs slightly from that on the adjacent Swan Coastal Plain. The climate is Mediterranean with hot dry summers and cool wet winters.

6.7.3 Rainfall and temperature

Like Collie, the Shenton Ridge Quarry is located on the Darling Scarp and therefore rainfall and temperatures are likely to be well represented by the Collie weather station, approximately 24 km east of the Shenton Ridge Quarry.

The mean number of days of rainfall is greatest in winter months where more than 13 days of rainfall exceeding 1 mm is commonly experienced (BoM, 2016a). The Bureau of Meteorology (2016) provides the mean rainfall and maximum temperature for Collie (Figure 5).

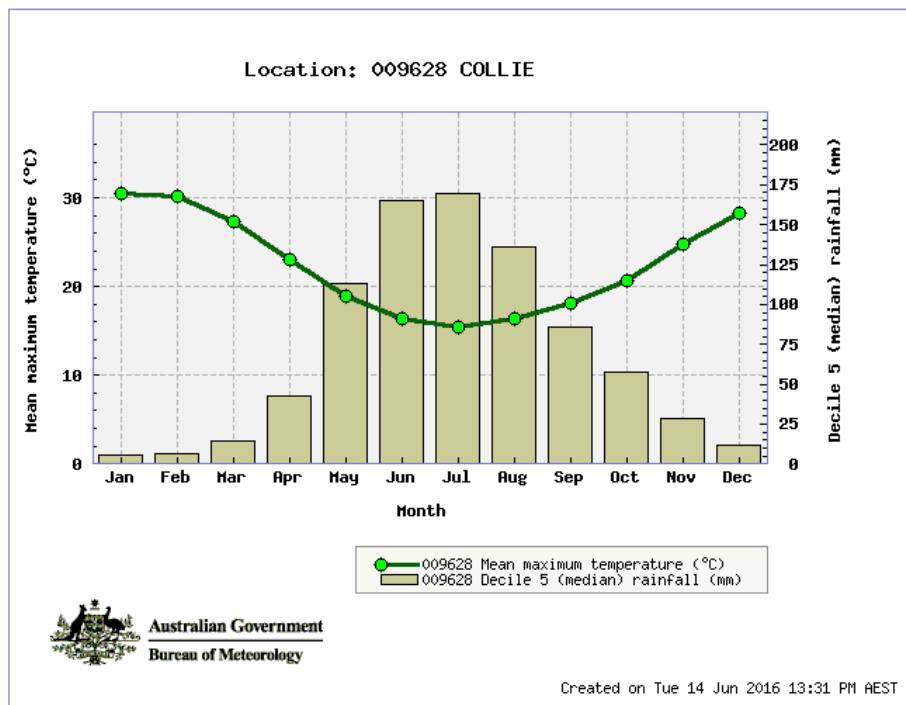


Figure 5. Collie mean temperature and rainfall

The Wokalup weather station is located approximately 18.5 km north of Shenton Ridge Gravel Quarry. As a comparison with Collie, the mean Wokalup temperature and rainfall is very similar although slightly greater for both parameters (Figure 6, BoM 2016a). Therefore data from both weather stations can be used to identify typical rainfall and temperature patterns in the area of the Shenton Ridge Gravel Quarry. Rainfall is likely to be greatest over the months of June to August.

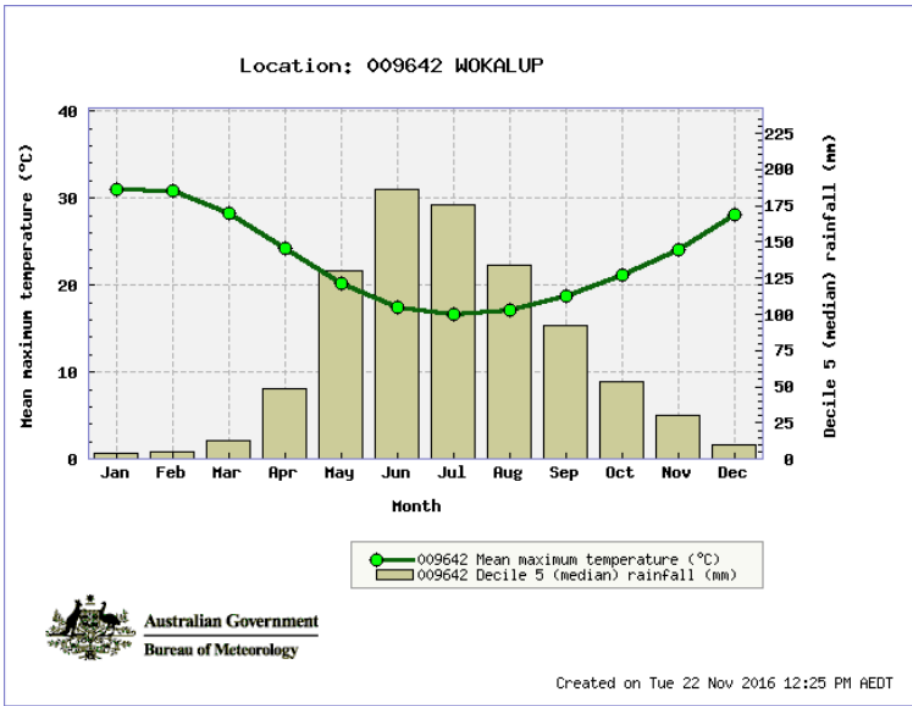


Figure 6. Wokalup mean temperature and rainfall

Using rainfall intensity frequency duration (IFD) data for the coordinates of the existing detention dam at the premises, the 1 in 10 year, 2 hour storm event has been calculated to be 19.8 mm per hour. This means that the average period in which rainfall is expected to exceed 19.8 mm per hour over 2 hours is every 10 years. The 1 in 50 year, 2 hour storm event equates to 26.5 mm per hour. It is noteworthy however, that periods between exceedances are generally random and this measure presents a measure of estimated likelihood only. Figure 7 illustrates IFD data for the Shenton Ridge Gravel Quarry (BoM, 2016b).

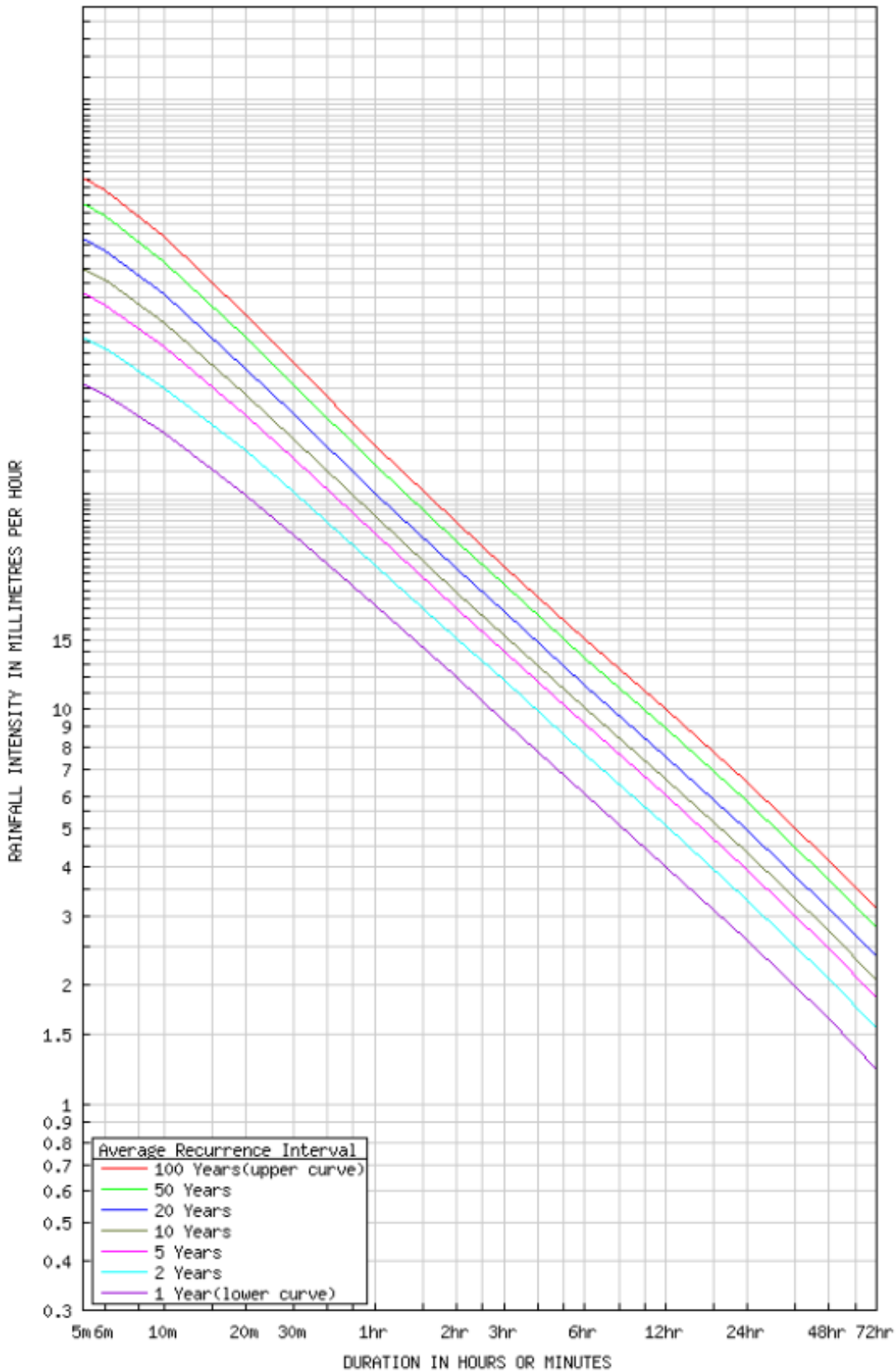


Figure 7. Intensity Frequency Duration data for the Shenton Ridge Gravel Quarry (BoM, 2016b)

Key Findings:

1. Analysis of rainfall data from single stations can be unreliable.
2. Detention pond storage capacities in Table 3 have been calculated using the Bureau of Meteorology's *Intensity Frequency Duration calculator* (BoM, 2016b) for the coordinates of the Shenton Ridge Gravel Quarry existing detention pond.
3. A comparison of storm events at Wokalup was undertaken identifying that rainfall intensities (in millimetres per hour) for 1 in 10 year and 1 in 50 year, 2 hour storm events are 19.3mm and 25.4mm respectively. This is less than the rainfall intensities calculated using coordinates at the existing detention pond. Therefore proposed minimum detention pond storage capacities listed in Table 3 would allow for the storage of stormwater from greater rainfall events than if storage pond capacities were calculated using Wokalup rainfall data.

7. Risk Assessment

7.1 Emission sources

Identification of key emissions are set out in Table 10 below. The decision document for the Works Approval identified operational issues, but with limited information on proposed management measures. Following the submission of a revised Dust Management Plan and Stormwater Management Plan the key emissions have now been identified more clearly for both the construction (Works Approval) and operation (Licence) periods. The identification of risks arising from the operations of the facility is required to ensure that any infrastructure requirements for the control of risks are appropriately conditioned under the Works Approval.

Table 10. Identification of key emissions

	Activity	Details	Frequency	Potential emissions	Key contributing factors
1	Construction Clearing and stockpiling of topsoil	The top layer of soil and vegetation (mostly grass) will be removed and stockpiled prior to the extraction of gravel material. Stockpiles will be used to divert stormwater to detention basins and the existing detention pond identified in Table 2.	At the beginning of each stage (see Attachment 2).	Dust emissions from the movement of topsoils. Noise from vehicles. The location of areas designated for excavation can impact the volume and movement of stormwater discharges beyond controlled areas during operation.	Wind speed and topsoil moisture can contribute to the scale of dust emissions. Day and time of construction activity may change how sensitive receptors are impacted by noise. Site rainfall can increase the volume of water directed to detention basins. In addition, the location and contour of topsoil material can impact the ability for the Applicant to retain stormwater onsite.
2	Operation Excavation, crushing and	Excavation, crushing and screening of target material one stage at a time (Stage	Vehicles and machinery will be operating approximately 22 days per month between	Noise is expected to be greatest from excavation and crushing of material.	Day and time of operation activity may change how sensitive receptors are

	Activity	Details	Frequency	Potential emissions	Key contributing factors
	screening of target material	7 to 11).	6.00 am and 6.00 pm excluding Sundays and public holidays. See Attachment 2 for projected stages for extraction and processing at each site (Stages 7 to 11). Crushing is limited to approximately six weeks per year.	No blasting is required. Dust from material excavation, crushing, screening and movement around site.	impacted by noise. Wind speed and product moisture can contribute to the scale of dust emissions. Operational factors such as the use of dust control infrastructure may also impact on the scale of dust emissions.
3	Operation Stockpiling product	Product stockpiles will reach a maximum height of 9 m.	Continuous.	Dust from stockpiles exposed to wind.	Wind speed and product moisture can contribute to the scale of dust emissions.
4	Operation Truck movements	Product will be removed from site via trucks exiting through the northern boundary to Coalfields Road.	Approximately 34 truck trips per day for 22 days per month dependent on demand. Busy periods may necessitate up to 40 truck movements per day.	Dust from loading trucks and lift off from exposed product as trucks exit the premises. Vehicle movements on unsealed roads may also be a source of fugitive dust. Noise from dropping product from height into trucks.	Product moisture can contribute to the scale of dust emissions. Wind speed and direction can change the level of impacts from noise and dust to receptors. Day and time of operation activity may change how sensitive receptors are impacted by noise.

The infrastructure causing emissions and their location are identified in Table 11 below.

Table 11. Emission sources by Infrastructure and Location

		Emission		
		Dust	Noise	Emission to Land
Source (see section 7.5 for infrastructure references)	Construction			
	Clearing and stockpiling topsoil Stage 7 – 11	•	•	•
	Operation			
	Excavation of target material Stage 7 – 11	•	•	•
	Crushing and screening Stage 7 – 11	•	•	
	Stockpiling product Stage 7 – 11	•		

7.2 Hazard – Pathway – Receptor Identification

The emission types have been identified with the pathways and receptors in Table 12 below.

Table 12. Emissions Risk to Receptor During Works Approval and Licence

	Emission Type		
	Dust	Noise	Stormwater discharges
Potential Receptor (see section 6 for receptor details)	Residential premises approximately 880 m to the north of Stage 9 and 1,530 m west of Stage 6. Industrial premises 550 m north of Stage 9. Future receptor (residential premises) located 900 m south of Stage 7 is not expected to be constructed/inhabited before the completion of Stage 7. Coalfields Highway approximately 60 m north of Stage 9.	Residential premises approximately 880 m to the north of Stage 9 and 1,530 m west of Stage 6. Industrial premises 550 m north of Stage 9. Future receptor (residential premises) located 900 m south of Stage 7 is not expected to be constructed/inhabited before the completion of Stage 7.	Community dam used for potable water supply for the Roelands Farm and Village located approximately 3 km downstream. A small tributary of the Collie River located approximately 200 m south of Stage 6. Four Resource Enhancement Wetlands to the east of Stages 8 and 10. Groundwater is located approximately 17 to 20 metres below the base of each pit.

	Emission Type		
	Dust	Noise	Stormwater discharges
Pathway Assessment (see section 6.7 for meteorological details)	Air (windborne)	Air	Stormwater runoff and overflows beyond designated retention basins to land.
Potential impact	<p>Amenity impacts: may include visible dust plumes including the deposition of material on vehicles, plant and equipment.</p> <p>Public health effects may include potential acute effects such as hay fever and asthma and chronic effects such as reduced respiratory function.</p>	Amenity impacts: potential impact on amenity.	<p>Ecosystem health: Flow of sediment-laden water into Resource Enhancement Wetlands and into creeks and tributaries that lead into the Collie River.</p> <p>Amenity impacts: Flow of sediment-laden water into a water supply catchment may impact the quality and taste of water.</p> <p>Potential changes to drinking water quality are not expected to exceed Australian Drinking Water Guidelines (2011) with the exception of turbidity. Therefore impacts to health are not considered likely.</p>
Continued to detailed risk assessment for construction (Works Approval)	<p>No</p> <p>There is expected to be some level of moisture in the top layer of soil being removed which will minimise dust lift-off. In addition, there will be a very limited duration of construction activity.</p>	<p>No</p> <p>There will be a very limited duration of construction activity.</p>	<p>Yes (see section 7.7)</p> <p>The design of site bunding and detention basins during construction will direct surface water flows during operations.</p>
Continued to detailed risk assessment for operation (Licence)	<p>Yes (see section 7.5)</p> <p>The risk of fugitive dust emissions is greatest during operations.</p>	<p>Yes (see section 7.6)</p> <p>The risk of noise emissions is greatest during operations.</p>	<p>Yes (see section 7.7)</p> <p>The performance of constructed bunding and detention basins will be realised during operations.</p>

7.3 Risk Criteria

During the assessment the risk criteria in Table 13 below will be applied to determine a risk rating set out in section 7.8.

Table 13 – Risk Criteria

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Severe
Almost Certain	Moderate	High	High	Extreme	Extreme
Likely	Moderate	Moderate	High	High	Extreme
Possible	Low	Moderate	Moderate	High	Extreme
Unlikely	Low	Moderate	Moderate	Moderate	High
Rare	Low	Low	Moderate	Moderate	High

Likelihood		Consequence		
The following criteria has been used to determine the likelihood of the risk / opportunity occurring.		The following criteria has been used to determine the consequences of a risk occurring:		
			Public Health	Ecosystem/ Environmental
Almost Certain	The event is expected to occur in most circumstances	Severe	<ul style="list-style-type: none"> Loss of life Exposure to hazard with permanent prolonged adverse health effects expected to large population Health criteria is significantly exceeded 	<ul style="list-style-type: none"> Irreversible impact to significant high value or sensitive ecosystem expected Irreversible and significant impact on a wide scale Total loss of a threatened species expected Ecosystem criteria is significantly exceeded
Likely	The event will probably occur in most circumstances	Major	<ul style="list-style-type: none"> Exposure to hazard with permanent prolonged adverse health effects expected to small population Significant impact to amenity for extended periods expected to large population Health criteria is exceeded 	<ul style="list-style-type: none"> Long-term impact to significant high value or sensitive ecosystem expected Long-term impact on a wide scale Adverse impact to a listed species expected Ecosystem criteria is exceeded
Possible	The event could occur at some time	Moderate	<ul style="list-style-type: none"> Exposure to hazard with short-term adverse health effects expected requiring treatment Impact to amenity expected for short periods to large population Health criteria is at risk of not being met 	<ul style="list-style-type: none"> Minor and short-term impact to high value or sensitive ecosystem expected Off-site impacts at a local scale Ecosystem criteria is at risk of not being met
Unlikely	The event is unlikely to occur	Minor	<ul style="list-style-type: none"> Exposure to hazard with short-term adverse health effects expected Impact to amenity expected for short periods to small population Health criteria are likely to be met 	<ul style="list-style-type: none"> Moderate to minor impact to ecosystem component (physical, chemical or biological) Minor off-site impacts at a local scale Ecosystem criteria are likely to be met
Rare	The event may only occur in exceptional circumstances	Insignificant	<ul style="list-style-type: none"> No detectable impacts to health No detectable impacts to amenity Health criteria met 	<ul style="list-style-type: none"> None or insignificant impact to ecosystem component (physical, chemical or biological) expected with no effect on ecosystem function Ecosystem criteria met

7.4 Risk Treatment

DER will treat risks in accordance with the Risk Treatment Matrix below:

Table 14 – Risk Treatment

Risk Rating	Acceptability	Treatment
Extreme	Unacceptable.	Risks will not be tolerated. DER will refuse proposals.
High	Acceptable subject to primary and secondary controls.	Risks will be subject to multiple regulatory controls including primary and secondary controls. This will include both outcome-based and management conditions.
Moderate	Acceptable, generally subject to primary controls.	Risks will be subject to regulatory controls with a preference for outcome-based conditions where practical and appropriate.
Low	Acceptable, generally not requiring controls beyond the proponents controls.	Risks are acceptable and will generally not be subject to regulatory controls.

7.5 Risk of Dust Impact Analysis

7.5.1 General Hazard Characterisation and Impact

Operation

Impacts to the nearest receptors are likely to be greatest during times when material is excavated, crushed, screened and stacked during windy weather. Particulate matter finer than 10 microns (PM₁₀) has the potential to be drawn deep within the lungs causing possible respiratory problems for nearby receptors. In addition, dust can cause eye irritation and reduce amenity.

Small concentrations of crystalline silica dust are common from processing sand and gravel and have potential health impacts. Safe Work Australia (2013) notes that chronic health impacts would require prolonged exposure to substantial airborne quantities such as occupational exposure levels for two to five years. Excavation (ripping and blading) will occur for approximately three weeks per year followed by a six week period of processing and stacking.

More acute health impacts from short term exposures are only likely to occur from very high silica concentrations in the lung's alveolar, similar to that experienced by a worker in a confined space where respiratory protection is not worn (Safe Work Australia, 2013). This is not representative of the expected conditions at the point of the residential receptors at least 880 m away. Accordingly, the Delegated Officer has found that the risk of long term health impacts to nearby residents is low due to the short operating periods, combined with dust mitigation measures set out in the Dust Management Plan and regulatory controls to be included in the licence.

This assessment has considered the impact of dust on the proposed Lot 500 residential premises, which is located approximately 900 m from Stage 7 operations. The operation of Stage 7 is expected to be complete by the time that the proposed residence is constructed and occupied. The proposed development on Lot 500 is of a similar proximity to quarrying

activities as Residential premises (Res. 4) is to Stage 9 (880 m) and is not impacted by prevailing winds. Should the proposed residence be occupied before the completion of Stage 7 operations, the potential dust impacts would remain comparable and would be subject to regulatory controls to be included in the licence.

Surrounding vegetation may also be impacted as dust settles on plants blocking the stomata and restricting gas exchange with plant cells. However, the Delegated Officer has found that the low concentrations of dust over confined periods means that it is not likely to result in impacts, especially in wetter environments (Matsuki *et. al*, 2016). In addition, Stages 7 to 11 are located in largely cleared land that has isolated native vegetation with the area to the west being a plantation. There is a conservation reserve approximately 1.6 km to the south east of Stage 11 with vegetation in good condition although the reserve is not considered a Priority or Threatened Ecological Community.

7.5.2 Assessment of Proponent Controls

The Applicant has submitted a revised Dust Management Plan in accordance with improvement condition IR1 of the original works approval W5709/2014/1. This assessment has reviewed this plan which contains the controls set out in Table 15 below.

Table 15: Proponent infrastructure controls for fugitive dust emissions

Site Infrastructure/ Activity	Description	Operation details
Controls for dust		
Topsoil removal	A 15kL water cart will be on site during all periods.	If and when dust occurs the water cart will be employed to the areas of concern.
	Polymer based spray-on soil stabiliser.	Applied to topsoil and overburden stockpiles if they do not stabilise by crusting and grass regrowth.
Extraction and stockpiling raw material	Ground level will be lowered to approximately 1.5 m.	Stockpiles will be arranged to create windbreaks for crushing and screening.
Crushing and screening	Spray-bar on screening equipment.	Operated as needed. Crushing and screening equipment will be located at low points against wind breaks.
Stockpiling product	Product stockpiled using a stacker.	Stockpiled at a height no greater than 9 m.
Internal roads	Unsealed, surfaced with gravel.	A 20km per hour speed limit applies to all vehicle movements on internal roads.
Removal of product from site	Product will be transported to market via trucks.	Trucks will be covered after loading so that no dust is generated in transit.

Monitoring	
Continuous monitoring	Continuous, real-time dust monitoring will be conducted at a fixed location along the northern boundary of the site, adjacent to Stage 9. A high level alarm will trigger a notification to the Quarry Manager by SMS once dust at the boundary exceeds 1,000 µg/m ³ over a 1 hour average period. The Quarry Manager will evaluate the conditions and implement necessary management measures.
Observational management	Where wind is strong and generating dust directed toward Coalfields Road, operations will be stopped until adequate wetting has occurred. Where wind is strong and generating dust that becomes airborne above native bushland along the northern boundary and directed toward the nearest human receptor, operations will be stopped until adequate wetting has occurred.

7.5.3 Consequence

Operations are only expected to be carried out over approximately nine weeks in every year. Based on current operator controls there remains a risk that nearby receptors may experience short term impacts. Therefore the consequence is **moderate**.

7.5.4 Likelihood of Consequence

The likelihood of the consequence occurring during operations is assessed as possible after proponent controls are applied. However, this has been reduced to **possible** due to the short period of operations.

7.5.5 Overall Rating

The overall rating for the risk of dust impacts on environmental receptors during operations has been determined by the Delegated Officer as **moderate**.

7.6 Risk of noise impact analysis

7.6.1 General Hazard Characterisation and Impact

Operation

Noise is generated from normal operations onsite including noise from excavations, heavy machinery, product loading and vehicle movement. The original assessment investigated the potential impacts against two residential receptors located within 1,000 m of Stages 9 and 10, although one of these residential receptors has been identified as an abandoned premise by the Applicant.

The original Decision Document and noise model did not consider the proposed residential premises located on Lot 500 and approximately 900 m to the south of Stage 7 as the premises had not yet been granted planning permission from the Shire of Harvey, which was granted on 27 April 2016. This assessment has considered the Lot 500 residential premises however the operation of Stage 7 is expected to be complete by the time that the proposed residence is constructed and occupied. Although no noise modelling was conducted specifically with respect to Stage 7, the proposed development's proximity to quarrying activities is similar to that of residential premises (Res. 4) to Stage 9 (880 m). Stage 7 is expected to have comparable noise impacts should the dwelling become inhabited prior to the completion of Stage 7 and the licence has a condition restricting the operation to day time operating hours.

Noise has the potential to impact amenity for people.

7.6.2 Criteria for Assessment

Noise modelling indicates that noise from the Shenton Ridge Gravel Quarry facility will be compliant with the Noise Regulations based on assumptions of worst-case wind conditions and all equipment operating simultaneously (see section 4.5 of this decision report).

The criteria for noise is detailed in the Noise Regulations.

7.6.3 Assessment of Proponent Controls

The Licensee has the following controls in place to reduce and manage noise emissions:

Table 16: Proponent controls for noise

Control	Description
Siting	Location of crushing and screening equipment behind a four metre high noise bund. Crushed material will be stockpiled in a manner that buffers receptors from potential noise during the loading of trucks after mining operations have ceased.
Operating times	Crushers and bulldozers will only be operated between 7am and 5pm Monday to Friday. Operating times of the quarry are proposed to be 6am to 6pm Monday to Saturday.

7.6.4 Consequence

Impacts to amenity may occur for short periods to a small population. Therefore the consequence is assessed as **minor**.

7.6.5 Likelihood of Consequence

DER is not aware of any noise complaints from the existing operation although previously mined areas were located further away from receptors.

Impacts to amenity are likely to occur where criteria within the Noise Regulations are exceeded. According to noise modelling, this would only occur if all machinery were to be operated between the hours of 6am and 7am. However, the Applicant has committed to only operating their noisiest equipment, crushers and bulldozers, between 7am and 5pm Monday to Friday. Therefore the likelihood of an exceedance against the Noise Regulations is considered **rare**.

7.6.6 Overall rating

The overall rating for the risk of noise impacts on environmental receptors during operations has been determined by the Delegated Officer as **low**.

7.7 Risk of site stormwater entering surface waters hazard analysis

7.7.1 General Hazard Characterisation and Impact

Construction and Operation

In its Decision Document DER considered the key hazard associated with the Shenton Ridge Gravel Quarry to be surface water runoff. The most common contaminant found within the site surface water of quarries is sediment. Due to the undulating topography of Lots 501 and 21, sediment laden water has the potential to runoff into one of the multiple surface water resources scattered around the premises. Sediment laden water may also negatively impact the water treatment process, quality and taste of water should it be permitted to flow into the community dam for the Roelands Farm and Village.

In July 2013, Water Corporation conducted a Source Protection visit of the Roelands Community Dam to test the quality of the dam. Spot samples identified that the turbidity levels of the two tributaries that feed into the dam that were 170 and 700 Nephelometric Turbidity Units (NTU) respectively while the dam had a turbidity level of 49 NTU.

Water Corporation concluded that the operation of Stages 1 – 6 significantly contributed to turbidity levels in the dam. Although no data was provided for upstream turbidity and the source of sediment within the Roelands Community Dam cannot be confirmed based on the samples taken, previous activities from the Shenton Ridge Quarry are likely to have been a significant contributor. However, baseline turbidity data from the dam under similar weather conditions has not been undertaken and therefore the level of contribution from the Applicant's activities cannot be determined.

As diesel powered vehicles and machinery will also be operated on site, hydrocarbons have the potential to be present in stormwater. However, vehicles will be refuelled each morning with a mobile facility equipped with automatic shutoffs. Onsite equipment will be left near-empty overnight, servicing will be conducted offsite and there will be no onsite storage of hydrocarbons. The risk of hydrocarbon spillage will be during refuelling, which is likely to be infrequent and insignificant in volume and therefore has not been further assessed.

7.7.2 Criteria for Assessment

Australian water quality guidelines (ANZECC and ARMCANZ, 2000) recommends that the trigger level of turbidity for slightly disturbed wetland ecosystems in south-west Australia, measured in NTU, is between 10 and 100 NTU depending on the condition of the catchment and depth of the wetland. The series of Resource Enhancement Wetlands can be characterised as shallow and within catchment areas that have been cleared for agriculture. Waterbodies within the premises are likely to be subject to higher turbidity levels than deeper wetlands located in undisturbed environments.

Drinking water quality parameters under the Australian Drinking Water Guidelines (2011) that may fluctuate as a result of operations include turbidity, pH and silica, each of which have not been identified as having maximum health criteria meaning that health impacts are not anticipated. Silica and pH are highly unlikely to exceed the aesthetic guideline values for silica (80 mg/L) or vary beyond the acceptable range of pH between 6.5 and 8.5 as a result of the Applicant's operations. The aesthetic guideline value for turbidity notes that 5 NTU is considered to be just noticeable in a glass but also has no consequences to human health.

7.7.3 Assessment of proponent controls

The Licensee has the following controls in place to reduce and manage stormwater discharges:

Table 17: Proponent controls for stormwater (summary from Stormwater Management Plan)

Control	Description
Stormwater catchment	<p>Detention basins capable of storing a 1 in 10 year, 2 hour storm event will be constructed prior to the development of each of the Stages 8 to 11 for the purpose of stormwater catchment. Detention basins 2a and 7a, which will be used to capture stormwater from Stages 7, 10 and 11, will be constructed to achieve a 1 in 50 year, 2 hour storm event (see section 6.7.3).</p> <p>Three diversion drains will be constructed to divert overflow water from Stage 7, 8, 9 and 10 detention basins to an existing clay pit dam.</p>
Stormwater diversion	<p>Bunding will be constructed to prevent the egress of stormwater within mined areas while natural contours will prevent the ingress of additional stormwater.</p>
Monitoring	<p>Surface water monitoring for pH and NTU will be undertaken at SW1, identified in the map of surface water catchment areas and site topography (in the attached Amendment Notice), within 48 hours of the first significant rainfall of the year and any other rainfall events that result in strong flow within local creek-lines.</p> <p>If an analysis for NTU is returned at above 100 units the Applicant will:</p> <ol style="list-style-type: none"> a) inspect bunding and retention dams for failures. If failures are identified repairs will be made to stormwater infrastructure; b) resample SW1 one week after exceedance; c) construct additional detention basins if NTU exceedances persist; and d) if NTU exceedances continue after point (c) the Applicant will use coagulants to promote sedimentation in surface waters. <p>No limit or specified actions have been proposed in respect of pH.</p>

7.7.4 Consequence

Construction and Operation

Turbid water has the potential to reduce sun availability to aquatic vegetation within Resource Enhancement and Multiple Use Wetlands and creek systems. This is likely to present minor impacts on the ability for aquatic species to grow if turbidity increases above 100 NTU. Being a series of Resource Enhancement Wetlands the consequence of the impact is assessed as moderate.

The consequence of increasing the turbidity of drinking water at the Roelands Farm and Village community dam is minor as impacts to drinking water amenity may occur for short periods to a small population.

Therefore the consequence rating is **moderate**.

7.7.5 Likelihood of consequence

Construction

Taking into consideration the larger particle size of soils being removed during construction there is likely to be less opportunity for runoff with stormwater and sediment is more likely to settle rather than remain suspended for extended periods. Therefore the likelihood of turbidity impacts during construction is considered **rare**.

Operation

With the submission of the Stormwater Management Plan that identifies management controls to address increased turbidity in nearby surface water resources, the likelihood of impacts is reduced from possible to **unlikely**. Based on proposed management controls and the significant distance for suspended solids to travel through creeks that are likely to settle and/or filter solids, the likelihood of impacts to the Roelands Farm and Village community dam is rare.

7.7.6 Overall rating

Construction

The overall rating for the risk of surface water runoff impacts on environmental receptors during construction has been determined by the Delegated Officer as **moderate**.

Operation

The overall rating for the risk of surface water runoff impacts on environmental receptors during operations has been determined by the Delegated Officer as **moderate**.

7.8 Summary of Risk Assessment and Acceptability

The risk items identified in section 7.8 including the application of risk criteria and the acceptability with treatment are summarised in Table 18 below.

Table 18. Risk rating of emissions

	Emission		Pathway and Receptor	Proponent controls	Impact	Risk Rating	Acceptability with treatment (conditions on instrument)
	Type	Source					
1.	Fugitive dust	Machinery, vehicle movement, loading trucks with product and stockpiles.	Air, moving with direction of wind	Infrastructure and management controls.	Public health and amenity	Moderate consequence Possible Moderate risk	Acceptable subject to proponent controls conditioned and additional regulatory controls.
2.	Noise	Machinery, vehicle movement, loading trucks with product.	Air, moving with direction of wind	Infrastructure and management controls.	Public health and amenity	Minor consequence Rare likelihood Low risk	Acceptable subject to proponent controls conditioned and compliance with the <i>Environmental Regulations (Noise) 1997</i> .

	Emission		Pathway and Receptor	Proponent controls	Impact	Risk Rating	Acceptability with treatment (conditions on instrument)
	Type	Source					
3a.	Discharge of contaminated stormwater to surface waters during construction	Stormwater that falls upon topsoil stockpiles and bunds.	From excavated topsoil running off to wetlands, tributaries and creeks.	Management controls.	Impacts on drinking water quality and ecosystem health.	Moderate consequence Rare Moderate risk	Acceptable subject to proponent controls conditioned and additional regulatory controls.
3b.	Discharge of contaminated stormwater to surface waters during operations	Stormwater within mining areas (contaminated stormwater).	From excavation and stockpile areas via runoff to wetlands, tributaries and creeks.	Infrastructure and management controls.	Impacts on drinking water quality and ecosystem health.	Moderate consequence Unlikely Moderate risk	Acceptable subject to proponent controls conditioned and additional regulatory controls.

8. Determined Regulatory Controls

8.1 Summary of Controls

		Controls			
		8.2 Infrastructure Requirements (Works Approval)	8.3 Infrastructure and Equipment (Licence)	8.3 Specified Action	8.3 Monitoring
Risk Items (see section 7)	1. Fugitive dust			●	●
	2. Noise			●	
	3. Discharge of contaminated stormwater to surface waters	●	●	●	●

8.2 Works Approval Amendments

The Delegated Officer has made a number of findings in the review of the Works Approval following the receipt of a revised Dust Management Plan and Stormwater Management Plan. This has resulted in amendments to the conditions in the Works Approval as set out in the Amendment Notice. The findings and amendments are set out below.

8.2.1 Infrastructure and monitoring requirements

Grounds for amendment

- The approved infrastructure and equipment will suitably minimise the risk of sediment-laden stormwater entering into Resource Enhancement wetlands during operations.
- The specified infrastructure and equipment requirements are derived from the application and Stormwater Management Plan.
- The nominated monitoring location will more accurately measure impacts to Resource Enhancement Wetlands from discharges from the existing (clay pit) detention pond.

In making this recommendation to amend the Works Approval, DER officers have considered relevant DER Guidance Statements as follows:

Guidance Statement: Setting Conditions (October 2015) sets out that: “Works approvals and licences may be granted subject to conditions that are:

- (c) risk-based, meaning that conditions will be proportionate to the level of risk (likelihood and impact) that the activity poses to public health and the environment”.

Decision

The Delegated Officer has amended the granted Works Approval as the risk of site stormwater entering surface waters is considered to be moderate and additional regulatory controls are required to mitigate this risk to acceptable levels.

Amendment 1: Infrastructure controls are specified in condition 1.2.2 of the Works Approval and are amended in the Amendment Notice. Minimum storage capacities of detention ponds have been calculated using Bureau of Meteorology rainfall intensity frequency duration (IFD) data for the coordinates of the existing detention dam (see section 6.7.3).

Amendment 2: Schedule 1 of the Works Approval is amended in the Amendment Notice by insertion of the following maps:

- Map of Monitoring Infrastructure
- Map of Surface Water Catchment Areas, Site Topography and Surface Water Quality Monitoring

Amendment 3: The nominated monitoring location, specified in the Map of Surface Water Systems of Schedule 1 of the Works Approval, has been relocated closer to the discharge source in the Amendment Notice.

Amendment 4: Schedule 1 of the Works Approval is amended in the Amendment Notice by removal of the following maps:

- Map of Stages of Gravel Extraction
- Map of Surface Water Systems

8.2.2 Removal of improvement conditions

Grounds for Amendment

- The revised Dust Management Plan and Stormwater Management Plan have been reviewed and requirements identified.

Decision

The Delegated Officer has amended the granted Works Approval as the improvement conditions have been satisfied and are no longer applicable.

Amendment 5: Removal of Section 2 Improvements from the Works Approval as specified in the Amendment Notice.

8.3 Licence Controls

The main risks of operations have been identified in Section 7 of this Report. In order to control for these risks, the licence will contain controls obtained from the DMP and SMP in relation to:

8.3.1 Dust

- Temporal extent for the duration of crushing, screening and loading of trucks limited to 12 weeks per year.
- Use of a water cart and polymer based spray-on soil stabiliser for dust suppression.
- Maximum stockpile height limits.
- Ambient air quality monitoring requirements and specified management responses to high dust alarms including:
 - wetting down stockpiles and unvegetated areas with the water cart or applying polymer based spray-on soil stabiliser; and where this is insufficient in suppressing dust,
 - ceasing operations.
- Covering of trucks prior to exiting the premises.

8.3.2 Noise

- Bulldozers and crushers to only be operated between the hours of 7am-7pm Monday to Friday during Stages 9, 10 and 11 on the grounds that risk was assessed as low based on proponent commitments.
- In the event that the planned residential premises on Lot 500 is inhabited prior to the completion of Stage 7, bulldozers and crushers for Stage 7 must only be operated between the hours of 7am-7pm Monday to Friday.

8.3.3 Stormwater

- Requirements for maintaining stormwater diversion and containment infrastructure and the capacity of the final (existing) detention pond identified in Attachment 3.
- Sampling for pH at SW1 to ensure that pH does not fall below 6.0 or rise above

8.0.

- Sampling for NTU at SW1 to ensure there are no exceedances of 100 units.
- In the event of an exceedance of NTU or pH limits:
 - All extraction areas above the monitoring point must be inspected to ascertain if sedimentation control works have failed and if so, these are to be repaired immediately;
 - Follow-up sampling will be undertaken a week after any exceedance;
 - If high sediment loads persist and are attributed to the extraction areas, additional detention areas will need to be created within the relevant extraction area;
 - Coagulants will be used if water within the natural creek remains sedimented for long periods of time.

9. Appropriateness of Works Approval Conditions

The conditions in the Works Approval, as amended by the Amendment Notice, have been reviewed and the Delegated Officer has affirmed that they have been set in accordance with DER's *Guidance Statement on Setting Conditions*. The amendments set out in the Amendment Notice have also been determined by the Delegated Officer in accordance with DER's *Guidance Statement on Setting Conditions*.

Table 19. Works Approval conditions and grounds

Works Approval Condition Ref	Grounds
Construction requirements Condition 1.2.1	This condition is valid, risk-based and contains appropriate controls.
Containment infrastructure specifications Condition 1.2.2	Following amendment by paragraph 1 of the Amendment Notice, this condition is valid, risk-based and contains appropriate controls (see section 8.2.1).
General conditions Condition 1.2.3 and 1.2.4	DER consults with public authorities and direct interest parties in granting instruments, and these parties often seek to ensure that durations between Part V approvals and their approvals are consistent. Consistent durations ensures regulatory alignment with other approving bodies.
Improvement program Conditions 2.1.1 and 2.1.2	Following amendment by paragraph 2 of the Amendment Notice, these conditions have been removed (see section 8.2.2).
Information Condition 3.1.1 to 3.1.2	These conditions are valid and are necessary administration and reporting requirements to ensure compliance.

DER notes that it may review the appropriateness and adequacy of controls at any time, and that following a review, DER may initiate amendments to the works approval under the EP Act.

10. Applicant's Comments on Risk Assessment

The Licence Holder was provided with the draft decision report and draft Revised Licence on 29 November 2016. No comments were received.

11. Conclusion

This assessment of the risks of activities on the premises has been undertaken with due consideration of a number of factors, including the Minister's decision as well as documents and policies specified in this decision report (summarised in Appendix 1).

The Delegated Officer has made a number of findings in the reassessment of the application relating to the receipt of the updated management plans, resulting in the decision to amend the granted Works Approval (W5709/2014/1) in accordance with the Amendment Notice set out in Attachment 1.

Agnes Tay

Director Strategy and Reform

delegated Officer under section 20 of the *Environmental Protection Act 1986*

Appendix 1: Key Documents

	Document Title	Availability
1	DER <i>Guidance Statement on Regulatory principles</i> (July 2015)	der.wa.gov.au
2	DER <i>Guidance Statement on Setting conditions</i> (September 2015)	
3	DER <i>Guidance Statement on Licence duration</i> (November 2014)	
4	DER <i>Guidance Statement on Licensing and works approvals processes</i> (September 2015)	
5	DER <i>Guidance Statement on Land use planning</i> (October 2015)	
6	Shire of Harvey (2015) Ordinary Council Meeting Minutes, 27 October 2015.	Accessed at www.harvey.wa.gov.au
7	Water Corporation (2014) Water Forever – South West Draft Report.	Accessed at http://www.watercorporation.com.au/~media/files/residential/water-supply-and-services/water-forever-south-west/draft-report-executive-summary.pdf?la=en
8	B & J Catalano (2013) Excavation and Rehabilitation Management Plan: Proposed Hard Rock Quarry, “Shenton Ridge” Lot 501 Coalfields Road Wellington.	DER records
9	Lundstrom Environmental Consultants Pty Ltd (2016) Revised Dust Management Plan – Prepared for B & J Catalano Pty Ltd on Lots 501 and 21 Coalfields Road, Roelands, Shire of Harvey.	DER records
10	Bureau of Meteorology (BoM) (2016a)	Accessed at www.bom.gov.au
11	Bureau of Meteorology (BoM) (2016b)	Accessed at http://www.bom.gov.au/cgi-bin/hydro/has/CDIRSWebBasic
12	ANZECC and ARMCANZ (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality. National Water Quality Management Strategy.	Accessed at https://www.environment.gov.au/system/files/resources/53cda9ea-7ec2-49d4-af29-d1dde09e96ef/files/nwqms-guidelines-4-vol1.pdf
13	National Water Quality Management Strategy (2011) Australian Drinking Water Guidelines 6.	Accessed at https://www.nhmrc.gov.au/guid

	Updated February 2016 by National Health and Medical Research Council.	elines-publications/eh52
14	International Agency for Research on Cancer (2013) Silica Dust, Crystalline, in the Form of Quartz or Cristobalite. World Health Organization.	Accessed at https://monographs.iarc.fr/ENG/Monographs/vol100C/mono100C-14.pdf
15	Safe Work Australia (2013) Crystalline silica - Hazardous Chemicals Requiring Health Monitoring.	Accessed at http://www.safeworkaustralia.gov.au/sites/SWA/about/Publications/Documents/797/Crystalline%20Silica.pdf
16	Matsuki M., Gardener, M., Smith, A., Howard, R. and Gove, A. (2016) Impacts of dust on plant health, survivorship and plant communities in semi-arid environments. Austral Ecology, Volume 41, Issue 4, pages 417–427.	Accessed at http://onlinelibrary.wiley.com/doi/10.1111/aec.12328/full
17	National Environment Protection Council (1998) Ambient Air Quality Standards. Department of Environment.	Accessed at www.environment.gov.au

Appendix 2: Summary of Appeals

	Appeal Grounds	DER Consideration
1.	Lack of Dust Management Plan	
	<p>The First Appellant raised concerns that a satisfactory DMP had not been provided to or assessed by DER prior to the Works Approval being issued. The First Appellant sought for DER to assess the revised DMP before it issues the Works Approval and that appropriate conditions be included in the Works Approval requiring adequate monitoring of the fugitive dust emissions.</p>	<p>DER has reviewed the DMP provided by the Applicant as part of this review. Relevant requirements for dust management will be conditioned in the Licence (see Section 8.3).</p>
	<p>The First Appellant raised further concerns that the DMP has not considered the effect of fugitive dust emissions on the sensitive land use residence to be located on Lot 500, Coalfields Highway.</p>	<p>The residence at Lot 500 has recently received planning approval; however the residence itself does not yet exist. Should Lot 500 become inhabited before the completion of Stage 7, the dust impacts would be comparable to those of Res 4 and Stage 9 (see Section 7.5) given the separation distance, prevailing winds and dust management controls. Relevant requirements for dust management for all stages will be conditioned in the Licence (see Section 8.3).</p>
2.	Lack of Stormwater Management Plan and Impact on Water Quality	
	<p>The First Appellant raised concerns that a SMP has not been provided to, or assessed by DER prior to the Works Approval being issued. The First Appellant also noted that there are historical concerns regarding the willingness of the Applicant to comply with such management plans.</p>	<p>DER has reviewed the SMP provided by the Applicant as part of this review. Relevant requirements from the SMP have been included as conditions in the Works Approval (see Section 8.2). Relevant requirements for dust management will also be conditioned in the Licence (see Section 8.3).</p>
	<p>The First Appellant notes that the primary environmental risks that have been identified in the Works Approval do not include reference to the significant erosion that can be caused by water runoff from the gravel quarry operations on Lot 501. The First Appellant states that DER has inadequately conditioned the Works Approval to address the serious drainage issues that already exists at Stages 6 and 7.</p> <p>The First Appellant sought more appropriate controls including prompt contouring of the mined areas to Australian Standards Specifications be conditioned to prevent the high velocity water and</p>	<p>Potential risks of erosion from stormwater runoff have been reviewed.</p> <p>Conditions have been included in the Works Approval for the management of stormwater including contouring of each stage (see Section 8.2).</p> <p>Conditions will also be included in the Licence for the management of stormwater (see Section 8.3).</p>

	Appeal Grounds	DER Consideration
	sediment run off causing erosion to Lot 500 while restoring the low velocity water flow across the common boundary down natural drainages that existed prior to the gravel mining operation.	
	The First Appellant notes that a large unapproved dam jets water through an overflow pipe into Lot 500 causing “unacceptable erosion”.	DER notes this concern and while not connected to the prescribed activities reviewed in this Decision Report, DER will be undertaking a site visit to confirm impacts.
	<p>The First Appellant states that the detention basins that have been conditioned for in the Works Approval will not properly control the existing issue of sediment run off onto Lot 500.</p> <p>The First Appellant sought that detention dams/basins described in the Application are temporary and should not be converted into permanent dams post gravel mining operations. As part of the rehabilitation, these detention ponds must be levelled and high velocity water flow post mining should be controlled by prompt contouring of the mined land at each ‘stage’ and revegetating it at the common boundary to the neighbours land.</p>	<p>DER has reviewed the revised SMP provided by the Applicant. Additional requirements for the control of stormwater and sediment run off have been included in the Works Approval (see Section 8.2) and will be included in the Licence (see Section 8.3).</p> <p>Requirements for the rehabilitation of the site are covered under condition 1(J) of the Planning Approval issued by the Shire of Harvey (see Appendix 3).</p>
	<p>The First Appellant noted that given the maximum seasonal groundwater table is unknown and no groundwater hydrology report has been undertaken, the condition of the Works Approval specifying the minimum infrastructure requirements of the detention basis to include a minimum separation of two metres to the maximum seasonal groundwater table is ‘unworkable’.</p> <p>The First Appellant submitted that DER order a hydrology report of the underground system from the Applicant and assess the findings of that report before a Works Approval is granted.</p>	<p>The Application states that ‘limited groundwater occurs at approximately twenty metres below the proposed final ground surface, with seasonal fluctuations of only a few metres expected’. As such, the risk of impacts to groundwater is considered to be low.</p> <p>The condition relating to a minimum 2 metre separation distance to groundwater for all detention basins remains to ensure this risk of exposing Acid Sulfate Soils remains low.</p>
	<p>The First Appellant also raised concern regarding the water quality given the number of unique permanent freshwater springs and creeks that are located on Lot 500 and the other neighbouring properties, feeding into the Collie River.</p> <p>The First Appellant was particularly concerned about the impact of hydrocarbons and fine sediments from the operational areas impacting on extensive freshwater stream systems which run through Lot 500 and onto other downstream users.</p> <p>The First Appellant was concerned that the Works Approval does not adequately identify the significance of the reservoir which is the only</p>	<p>DER has reviewed the revised SMP provided by the Applicant and included additional requirements from the SMP in the Works Approval. Additional requirements from the SMP will also be included in the Licence.</p> <p>DER has more clearly identified the Roelands Village Reservoir during the review.</p>

	Appeal Grounds	DER Consideration
	source of freshwater for the Roelands Village.	
	<p>The Second Appellant raised particular concern with the impact the activity will have on water quality. The Appellant notes that the Roelands Farm and Village community, not being connected to scheme water, source their entire water supply from the reservoir in the north-west corner of Lot 29, 575 Seven Hills Road, on a boundary shared with Lot 501. The proposed extractive industry is located up gradient of the Roelands Farm and Village reservoir and is within the reservoir's water catchment area.</p>	<p>DER has reviewed the SMP provided by the Applicant as part of this review. Requirements from the SMP have been conditioned in the Works Approval (see Section 8.2) and will be conditioned in the Licence (see Section 8.3).</p>
	<p>The Second Appellant noted that the residents of Roelands Village and Farm have noticed an increase in the amount of sediment discharged into the Roelands Village reservoir during recent earthworks to construct roads and modify stream beds and banks on Lot 501. The Second Appellant submitted that the current turbidity levels are well in exceedance of the relevant guidelines (ANZECC & ARMCANZ Water Guidelines).</p> <p>It was also noted that a high volume of sediment appears to have been discharged from the proponent's property into the Roelands Farm and Village reservoir. The Second Appellant submitted that this has significantly reduced the capacity of the reservoir, impacted the water quality and existing environmental values.</p> <p>The Second Appellant raised concern regarding the current management practices of the Applicant, noting that based on the available information and the sedimentation impact on the reservoir; it is likely that the proponent has not applied adequate control to manage the current gravel extraction operations. The Appellant suggested that the proposed expansion of the extractive industry would likely worsen existing erosion issues and lead to further infill of the dam.</p> <p>The Second Appellant sought a more detailed assessment of the current storm and waste water management and further assessment of management measures required to ensure the expanded operations do not continue to have an</p>	<p>Claims of impacts from previous quarrying activities on reservoir turbidity have not been verified by DER as no baseline data was provided to substantiate these claims. However, DER has re-reviewed the risk of sediments being transported to the Roelands Village reservoir (see Section 7.7), assessing the risk as moderate and requiring additional regulatory control.</p> <p>To address this risk for Stages 7 to 11, monitoring and stormwater management will be conditioned in the Licence (see Section 8.3). Previous proposals to monitor turbidity using the parameter Total Suspended Solids will be modified to assess turbidity impacts against NTU, aligning with ANZECC & ARMCANZ Guidelines. This satisfies recommendations from the Water Corporation following the Roelands Community Dam Source Protection visit in July 2013.</p>

	Appeal Grounds	DER Consideration
	<p>impact on the potable water supply to Roelands Village and the surface water environment.</p> <p>The Second Appellant notes that there are to be detention basins located within each stage and the existing pond is to be used for excess stormwater. The Second Appellant also notes that the proposed water sampling point SW1 is located at the point where water discharges from the resource enhancement wetland into the creek line and is located at some distance from the existing detention pond.</p> <p>The Second Appellant submitted that water sampling at the point of discharge from the detention pond should also be completed to ensure the quality of the waste water is suitable for the receiving environment before any discharges occur. The Second Appellant noted that sampling after the waste water has filtered through the wetlands appears to be inadequate to protect the wetland and its environmental values and is using the wetland as a filter for waste water discharge from commercial activities.</p>	<p>Conditions within the amended Works Approval require the construction of detention basins associated with each stage mined. Diversion drains, culverts and contour bunds are also a requirement of the amended Works Approval with all overflow water to be directed to the existing detention pond.</p> <p>Due to variances in wetland depths, exposure to winds and mobility of substrates available to wetlands across the south-west of Western Australia, there is no maximum guideline for sediment concentrations to protect ecosystem health. Therefore there are no limits on wetland turbidity proposed. Instead monitoring and trigger values with associated specified management actions will be conditioned in the Licence (see Section 8.3).</p> <p>Further, the location of the monitoring point (SW1) has been moved upstream and closer to detention ponds to more accurately measure impacts to the wetlands. These conditions are expected to reduce the risk of significantly elevated turbidity within Resource Enhancement Wetlands.</p>
	<p>The Second Appellant submitted that the location of the existing detention pond is not suitable for protecting the environment in the event that water is discharged.</p>	<p>DER has reviewed the revised SMP provided by the Applicant and included additional requirements from the SMP in the Works Approval. These requirements include the construction of multiple detention basins and diversion drains that will increase the site's capacity to capture stormwater without discharge to the environment.</p> <p>Monitoring and management action requirements from the SMP will also be included in the Licence.</p>
3.	Nuisance Noise Emissions	
	<p>The First Appellant submitted that the Works Approval has not considered the significant nuisance that will be caused by the noise emissions from the gravel quarry operations to the residence to be located close to the property boundary on Lot 500. The Works Approval</p>	<p>The residence at Lot 500 has recently received planning approval; however the residence itself does not yet exist. Although no noise modelling was conducted specifically with respect to Stage 7, the proposed development's</p>

	Appeal Grounds	DER Consideration
	<p>identifies that there are two residences located within 1000m of the noise sensitive zone however with the residence to be located on Lot 500, there will now be three.</p> <p>The First Appellant submitted that DER reassess the Works Approval and give appropriate consideration to the noise emission nuisance that will be caused to the sensitive land use located on Lot 500.</p>	<p>proximity to quarrying activities is similar to that of residential premises (Res. 4) to Stage 9 (880m). Stage 7 is expected to have comparable noise impacts, should the dwelling become inhabited prior to the completion of Stage 7 and the licence contains a condition restricting the operating hours to day time.</p>
	<p>The First Appellant noted that the Works Approval conditioned the gravel quarry by limiting its operations to normal working hours however, it goes on to specify that the operating times of the quarry are to be between 0700 to 1900 hours Monday to Saturday.</p> <p>The First Appellant submitted that these are not normal operating hours and would clearly exacerbate the nuisance caused by noise and other emissions to the nearby sensitive receptors.</p>	<p>During the hours of 0700 and 1900 hours the maximum assigned levels defined in Table 1 of the <i>Environmental Protection (Noise) Regulations 1997</i> are allowable for highly sensitive areas.</p> <p>Operating times will be Monday to Saturday 6.00am to 6.00pm, excluding public holidays. To avoid exceedances of assigned levels between 0600 and 0700 hours the licence will include a requirement for bulldozers and crushers to only be operated between these hours (see Section 8.3).</p>
	<p>The First Appellant notes that the Lloyd George Acoustic report referred to in the Works Approval has not been provided to the adjoining land owners.</p> <p>The First Appellant sought that DER proved the Lloyd George Acoustic report to the adjoining land owners for review and comments.</p>	<p>A copy of the acoustic report is attached (Appendix 4).</p>

Appendix 3: Shire of Harvey Ordinary Council Minutes 27 October 2015

Appendix 4: Environmental Noise Assessment

Attachment 1: Works Approval W5709/2014/1 Amendment Notice No.1

Attachment 2: Proposed stages of mining operation

Stage	Action	2016	2017	2018	2019	2020	2021
		New EIL					
6	Rehabilitate areas previously extracted						
7 & 8	Rip, blade and crush 50,000m ³ /yr laterite to gravel						
6, 7 & 8	Removal of 100,000m ³ /yr						
6, 7 & 8	Rehabilitate areas previously mined						
9	Rip, blade and crush 100,000m ³ /yr laterite to gravel						
9	Removal of 100,000m ³ /yr						
9	Rehabilitate areas previously mined						
10	Rip, blade and crush 100,000m ³ /yr laterite to gravel						
10	Removal of 100,000m ³ /yr						
10	Rehabilitate areas previously mined						
11	Rip, blade and crush 100,000m ³ /yr laterite to gravel						
11	Removal of 100,000m ³ /yr						
11	Rehabilitate areas previously mined						
6 - 11	Monitoring and remediation of rehabilitated areas						



Shire of Harvey

**ORDINARY COUNCIL
MEETING
MINUTES**

27th October 2015

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SHIRE OF HARVEYCOUNCIL MINUTES

MINUTES OF THE ORDINARY MEETING OF THE HARVEY SHIRE COUNCIL, HELD IN THE COUNCIL CHAMBER, MULGARA STREET, AUSTRALIND, ON TUESDAY, 27TH OCTOBER 2015, COMMENCING AT 4:00P.M.

ATTENDANCE

Shire President	Cr. T.G. Jackson	
Deputy Shire President	Cr. P.J. Beech	
	Cr. B. Adams	
	Cr. F. Burgoyne	
	Cr. C. Carbone	4.00p.m. – 4.13p.m.
		4.29p.m. – 4.52p.m.
		5.15p.m. – 5.19p.m.
		5.20p.m. – 6.32p.m.
	Cr. G. Campbell	
	Cr. P. Giancono	4.00p.m. – 4.33p.m.
		4.42p.m. – 4.50p.m.
		4.52p.m. – 6.32p.m.
	Cr. A. Lovitt	
	Cr. P. Monagle	
	Cr. A.J. Shortland	
	Cr. D. Simpson	
	Cr. K.J. Wood	

STAFF

Chief Executive Officer	Mr. M. Parker	
Executive Manager Corporate Services	Mr. R. Scantlebury	
Executive Manager Technical Services	Mr. T. Naudé	
Principal Environmental Health Officer	Mr. S. Dandridge	4.00p.m. – 5.24p.m.
Manager Planning Services	Mr. S. Hall	
Manager Community & Economic Development	Mr. P. Quinlivan	

GALLERY

Ms. L. Celisano	4.00p.m. – 4.47p.m.
Mr. D. Celisano	4.00p.m. – 4.47p.m.
Mr. D. Cullity	4.00p.m. – 5.16p.m.
Ms. K. Fletcher	4.00p.m. – 4.47p.m.
Mr. B. Godber	4.00p.m. – 4.47p.m.
Mr. A. Meese	
Mr. R. Payton	4.00p.m. – 5.17p.m.
Mr. K. Rhodes	4.00p.m. – 4.47p.m.
Mr. G. Richards	4.00p.m. – 5.16p.m.

PRESS

Harvey Reporter	Miss C. Vellinga
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SIGNED _____ DATED 17th November 2015.

A. OPENING AND WELCOME

The Shire President opened the meeting at 4.00p.m.

B. PUBLIC QUESTION TIME**Question 1**

Ms. Kathy Fletcher requested confirmation that 19 Harvey Street (place number 110) and 56 Uduc Road (place number 127) can be demolished.

Answer 1

The Manager of Planning Services, Mr. Hall advised that as each place has a management category 3, demolition can be considered.

Question 2

Mr. Rhodes advised he owned the old post office on the corner of Gibbs and Hayward Streets and that a listing will reduce the value of the property, given the additional red tape. He considered that category 3 and 4 places will be included on a Heritage List at a later stage.

Mr. Rhodes enquired how it serves Harvey to have properties listed. How does it serve the property owner?

Answer 2

The Manager of Planning Services, Mr. Hall advised that the benefit to the Shire is that it provides a documented and appropriate history of the town, in regard to the second part Mr. Hall was not able to comment on Mr. Rhodes' personal opinion about the listing.

Question 3

Mr. Rhodes also asked whether he could replace some of the existing openings with bi-fold doors on the ground floor.

Answer 3

The Manager of Planning Services, Mr. Hall advised any development could be considered on merit.

C. READING FROM A BOOK OF LEARNING AND WISDOM

Read by Cr. Jackson.

D. APOLOGIES AND LEAVE OF ABSENCE

Apology: Cr. J. Sabourne O.A.M. J.P

Cr. Campbell requested leave of absence for the Council meeting to be held on Tuesday, 15th December 2015.

Cr. Lovitt requested leave of absence for the Council meeting to be held on Tuesday, 17th November 2015.

Cr. Shortland requested leave of absence for the Council meeting to be held on Tuesday, 17th November 2015.

Cr. Adams requested leave of absence for Council meetings held between 30th November and 18th December 2015.

15/305. Carbone/Monagle

"That leave of absence be granted to Cr. Campbell for the Council meeting to be held on Tuesday, 15th December 2015, Cr. Lovitt and Cr. Shortland for the Council meeting to be held on Tuesday, 17th November 2015, and Cr. Adams for Council meetings to be held between the 30th November and 18th December 2015."

CARRIED 12-0

E. DECLARATIONS OF MEMBERS' AND OFFICERS' PERSONAL INTEREST

- **Financial Interests**

Cr. Giancono declared a financial interest in Planning Item 9.1.1 – Application for Planning Consent – B. and D. Newey – Lot 109 (No. 6) Woodquay Avenue, Australind (A009869).

Reason

Cr. Giancono advised that he operates a food van with an approved traders licence and this application is similar. Cr. Giancono declared he would leave the Chambers for the duration of the item.

Cr. Giancono declared a financial interest in the Heritage Advisory Committee Minutes for Place No. 60.

Reason

Cr. Giancono advised that he is a tenant of the building (Place No. 60). Cr. Giancono declared he would leave the Chambers whilst Place No. 60 was being considered.

Cr. Carbone declared a financial interest in Planning Item 9.1.2 – Application for Planning Consent – Extractive Industry – Catalano Pty. Ltd. – Lot 501 and 21 Coalfields Road, Roelands – General Farming (A004761/EX/002).

Reason

Cr. Carbone advised that he is a Director of Carbone Bros and his Company deals in Extractive Industries. Cr. Carbone declared he would leave the Chambers for the duration of this item.

SIGNED _____ DATED 17th November 2015.

Cr. Carbone declared a financial interest in Planning Item 9.1.3 – Request for Reconsideration of Condition of Planning Consent and Extractive Industry Licence – Lots 4 and 5 Ludlow Road, Myalup – Lundstrom Environmental Consultants Pty Ltd representing B. & J. Catalano Pty Ltd – Lots 4 and 5 Ludlow Road, Myalup (A000177/EX/004).

Reason

Cr. Carbone advised that he is a Director of Carbone Bros and his Company deals in Extractive Industries. Cr. Carbone declared he would leave the Chambers for the duration of this item.

Cr. Carbone declared a financial interest in Planning Item 9.1.4 – Proposed Extractive Industry – Sand Extraction – Lundstrom Environmental Consultants for Coast Pastoral Company Pty Ltd – Lot 2 Springhill Road, Parkfield (A002367/EX/004).

Reason

Cr. Carbone advised that he is a Director of Carbone Bros and his Company deals in Extractive Industries. Cr. Carbone declared he would leave the Chambers for the duration of this item.

Cr. Carbone declared a financial interest in Planning Item 9.1.5 – Application for Planning Consent – Transportable Asphalt Plant – BGC Asphalt – Lot 42 (No. 35) Stanley Road, Wellesley (A006340).

Reason

Cr. Carbone advised that he is a Director of Carbone Bros and his business purchases asphalt from the Proponent. Cr. Carbone declared he would leave the Chambers for the duration of this item.

• **Impartiality Interests**

Cr. Carbone declared an impartiality interest in Planning Item 9.1.9 – Subdivision Referral – Lots 39,140, 23 and 122 Sir James Avenue, Harvey – Uduc Holdings Pty Ltd - Lots 39, 140, 23 and 122 Sir James Avenue, Harvey (S152530).

Reason

Cr. Carbone advised that the Proponent of this item is his brother in law. Cr. Carbone declared he would leave the Chambers for the duration of this item.

Cr. Shortland declared an impartiality interest in Planning Item 9.1.5 – Application for Planning Consent – Transportable Asphalt Plant – BGC Asphalt – Lot 42 (No. 35) Stanley Road, Wellesley (A006340).

Reason

Cr. Shortland advised that she resides in Settlers Estate and this area may be within the buffer area for this development. Cr. Shortland declared she would deal with the matter on its merits.

Cr. Giancono declared an impartiality interest in the Heritage Advisory Committee Minutes for Place No.'s 43 and 97.

Reason

Cr. Giancono advised that the owner of Place No. 43 is his landlord for the business premise he leases and that owners of Place No. 97 are personal friends. Cr. Giancono declared he would leave the Chambers whilst these places were being considered.

Mr. Parker declared an impartiality interest in Planning Item 9.1.5 – Application for Planning Consent – Transportable Asphalt Plant – BGC Asphalt – Lot 42 (No. 35) Stanley Road, Wellesley (A006340).

Reason

Mr. Parker advised that that he resides in Settlers Estate and this area may be within the buffer area for this development. Mr. Parker declared that whilst not the author of the report if required to provide advice he would do so on its merits.

F. PETITIONS/DEPUTATIONS

Cr. Carbone, having declared a financial interest with regards to the following deputation, left the Chambers at 4.13p.m.

PLANNING ITEM 9.1.2 – – APPLICATION FOR PLANNING CONSENT – EXTRACTIVE INDUSTRY – CATALANO PTY. LTD. – LOT 501 AND 21 COALFIELDS ROAD, ROELANDS – GENERAL FARMING (A004761/EX/002).

Mr. Cullity addressed Council regarding this item and expressed appreciation to those Councillors and Staff for attending the site visit on Lot 500 Coalfields Highway which shares a common boundary with Lot 501.

Mr. Cullity confirmed that he addressed the Development Services Committee last week and did not wish to repeat himself however there are a few things he wished to clarify.

Mr. Cullity advised that he has been involved in the property since 1951 and as a consequence has been a significant employer of people within the region.

Mr. Cullity thanked the Manager of Planning Services for organising meetings between themselves and Catalanos with a view to resolving issues of erosion within his property. It is unfortunate that these meetings have not progressed to a point where an amicable outcome has been achieved. Mr. Cullity considers the major difference between the two properties is the steepness of the slope and that Lot 500 has deep rich fertile soils suitable for growing trees and despite being within a high rainfall area minimal erosion has occurred.

Mr. Cullity was surprised to read Appendix 6 in the Development Services agenda and considers that this letter should have been provided to them in advance of Council considering this item. He concluded that due process had not been followed and sought a deferral of this matter until this information had been reviewed. Mr. Cullity advised that a letter from his lawyer Mr. Glen McLeod has been sent to Council (note: this had been provided to Councillors immediately prior to the meeting).

Mr. Cullity referred back to the site meeting and reaffirmed that the erosion from cells 6 and 7 had only occurred in the last 12 months. He also noted that the silt traps developed in 2009 had significantly changed to the large dam that now exists today and considers that separate approvals should have been granted for the conversion of the silt traps to the dam. Mr. Cullity also raised concern with regard to the size and height of stockpiles.

Cr. Carbone returned to the Chambers at 4.29p.m.

G. CONFIRMATION OF MINUTES

ORDINARY COUNCIL MEETING – Tuesday, 6th October 2015.

Recommendation

That the Minutes of the Council Meeting held on Tuesday, 6th October 2015, as printed be confirmed as a true and correct record.

- 15/306. **Campbell/Wood**
“That the Minutes of the Council Meeting held on Tuesday, 6th October 2015, as printed be confirmed as a true and correct record.”
CARRIED 12-0

SPECIAL COUNCIL MEETING – Monday, 19th October 2015.

Recommendation

That the Minutes of the Special Council Meeting held on Monday, 19th October 2015, as printed be confirmed as a true and correct record.

- 15/307. **Campbell/Monagle**
“That the Minutes of the Council Meeting held on Monday, 19th October 2015, as printed be confirmed as a true and correct record.”
CARRIED 12-0

H. ANNOUNCEMENTS BY THE PERSON PRESIDING OR C.E.O WITHOUT DISCUSSION

Nil

Cr. Giancono returned to Chambers at 4.52p.m.

Cr. Carbone, having declared financial interests in the following items, left the Chambers at 4.52p.m.

Item No.	9.1.2
Subject:	Application for Planning Consent – Extractive Industry
Proponent:	Catalano Pty. Ltd.
Location:	Lots 501 and 21 Coalfields Road, Roelands
Reporting Officer:	Manager Planning Services
File No.:	A004761/EX/002
	Attachment Reg. No.15/25382

Summary

Council has received an Application for Planning Consent for the continuation of gravel extraction on Lots 501 and 21 Coalfields Highway, Roelands (refer **Attachment 1**). The proposal sought approval for cells 7 – 14 (refer **Attachment 2**) and was advertised in accordance with District Planning Scheme (DPS) No. 1 with 1 public submission and 6 submissions from referral agencies being received. In response to the submission from a nearby landowner the proposal has been modified to remove cells 12, 13 and 14. It is recommended that Council approves the modified proposal, subject to conditions.

Background

The subject lots are zoned “General Farming” under DPS No. 1 and are approximately 408ha in area. The property has historically been used for grazing and an approval (within Lot 501 only) for Cells 1 -5 was issued by Council on 29th July 2009. Whilst not directly associated with this application, legal action is being pursued in regard to breaches of that planning consent. During the progression of those proceedings Council has also granted retrospective approvals in regard to extraction within cell 5 (refer **Confidential Item** presented to Council on 11th November 2014).

An application seeking approval for the extraction of granite from Lot 501 has also been submitted. This proposal is still being assessed by the Department of Environment Regulation and the Department of Water and will be referred to Council independently.

The property is semi-cleared with significant stands of native vegetation in various locations. The property is irregularly shaped and is primarily located on the ridge of the Scarp with significant slopes to neighbouring properties. The site abuts Coalfields Highway to the north, the Shire boundary with the Shire of Dardanup to the south and shares boundaries with five (5) similarly zoned “General Farming” properties to the east and west (refer **Attachment 1**).

It should be noted that due to the topography of the subject site and that of neighbouring properties, there is potential for erosion impacts which is the focus of submissions from a nearby landowner. A site inspection was undertaken by Staff, the Applicant and the adjoining landowner on the 7th August 2015, to assess the possible impacts of the proposal on the adjacent landowner. The site visit revealed the extent of erosion which is alleged as being a result of water runoff from Lot 501. The adjacent landowner’s environmental representative claimed this was a result of the previous gravel pit operations and the construction of a dam and its associated spillway. At this meeting it was concluded that proposed cells 12, 13 and 14 have the potential to further exacerbate the erosion on the adjoining lot and to this effect was removed from the current application (modified Application (plan and report) is contained within **Attachment 3**).

SIGNED _____

DATED 17th November 2015.

The modified proposal (which excludes Cells 12, 13 and 14) is to extract gravel material in a staged development over a period of 5 years. The total extraction area is 36ha and it is anticipated that approximately 71,000m³ of material will be extracted per year, with extraction being limited to an average depth of 1.0m. It is proposed that between 15 – 20 truck movements will be accessing the site per day (Monday – Saturday 6am – 6pm), dependent on demand (refer pages 7 - 9 of **Attachment 3**).

Staff acknowledge the time that has elapsed since the lodgement of this application and it being referred to Council. However, determination of the Application has been complicated by the number of proposals/issues being considered consecutively on this site and the preference of Staff that a modified application and remediation action associated with past issues of erosion be submitted with the support of the adjoining landowner. Some resolution has been made however not all issues have been amicably determined and the modified Application is now referred to Council for determination.

Advertising and Submissions

The modified proposal has not been readvertised, however updated comments from the Department of Water have been provided due to the nature of concerns from the adjoining landowner. Table 1 is a summary of the submissions received on the original proposal (a copy of the submissions is contained within **Attachment 4**) and are still considered appropriate in the determination of the modified Application:

While not submitted during the advertising period the adjoining landowner has provided further comments on the issues they consider Council should take into account when considering the proposal. A copy of that submission is contained within **Attachment 5**. The Applicant has recently responded to the comments raised and a copy of that submission is contained within **Attachment 6**.

In regard to ongoing correspondence between both parties Staff have maintained the position that issues of past erosion and its impact on adjoining properties, whilst acknowledged may not be solely attributed to these activities and conditions of planning consent can only be limited to the cells being applied for. It was this reason that agreement from both landowners was sought as part of the assessment process.

Table 1

Landowner/ Agency	Submission	Comment
Main Roads WA Full submission attached 14/07783	Concerned in regard to the increase in truck movements from the site and requests that the following condition be included on the application: <i>"The access/ driveway to Coalfields highway to be upgraded to the satisfaction of Main Roads including provision of a separate right turn lane and widening on the highway which is to be designed and constructed to the specifications of Main Roads at the full cost of the proponent."</i>	Noted. Staff consider the condition to be appropriate given the volume of traffic on Coalfields Road.

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DATED 17th November 2015.

Landowner/ Agency	Submission	Comment
Department of Environment and Regulation	<p>No formal response has been provided, however ongoing discussion with the Department has been held and site inspections have been undertaken.</p> <p>The DER advise that it will consider the a Works Approval and impose appropriate operational conditions following a determination by Council.</p>	Noted
<p>Adjacent Landowner's Representative (Solicitor)</p> <p>Full submission attached</p> <p>14/10595</p>	<p>The submission objects to the proposal and raises a significant number of issues in terms of past use of the land, the quality of the application and off-site impacts. It also provides a legal based argument against the granting of an approval.</p> <p>The submission combines both the extraction of Gravel and Granite and a complete copy is contained within Attachment 4.</p>	<p>As evidenced by Attachment 4 the submission includes comments in regard both the application for gravel extraction and granite extraction and to this effect many of the issues raised are not relevant to this proposal.</p> <p>Staff consider the most relevant issues associated with the submission are in regard to the 'off-site' impacts of erosion and visual amenity. These issues have been the focus of ongoing discussions between both parties and while not all resolved have significantly progressed to address the issues raised within the submission.</p> <p>Conditions of planning consent and the need for ongoing stormwater management are considered appropriate. These have been addressed by the revised submission and suggested conditions of approval.</p>
<p>Department of Water (DoW)</p> <p>Full submission attached</p> <p>15/28535</p>	<p><u>Extractive Industry Cells 1 to 14 (gravel)</u></p> <p>As it is now understood, the gravel extraction proposal can be divided into four units:</p>	<p>Staff note that the DoW has reviewed previous versions of the Stormwater Management Plan and has recently inspected the site following the removal of cells 12, 13 and 14.</p>

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DATED 17th November 2015.

Landowner/ Agency	Submission	Comment
	<ul style="list-style-type: none"> • Cells 1-5 - where extraction has been completed and rehabilitation all but completed, • Cells 6-7 - subject to current extractive industry activity, including the requirement to remove a gravel stockpile, • Cells 8-11 - currently pasture, where new extraction works are planned, • Cells 12-14 - largely pasture, where the proponent has agreed with a neighbour that extraction activities will not proceed at this point in time. <p>It is the view of DoW, gained from the site inspection, that Cells 1-5 have been rehabilitated satisfactorily and advice (on site) was that these have been 'signed off' by the Shire of Harvey (SoH), in context of the conditions of an Extractive Industry Licence (EIL).</p> <p>The proponent can be commended on rehabilitation work at Cells 1-5.</p> <p>Cells 6-11 are currently subject to obtaining a new EIL (SoH) and a Works Approval and Licence (DER).</p> <p>It is the view of DoW that current extraction works (cells 6-7), including bunding and two silt traps - a small stock pile silt trap and a down gradient silt trap - are working satisfactorily.</p> <p>The operations at view are 'neat and tidy' and appear to be undertaken whilst maintaining a minimum impact on the downstream receiving environment.</p>	<p>The conditions requested by the Dow are supported and recommended for inclusion with the proposed conditions of approval.</p>

Landowner/ Agency	Submission	Comment
	<p>In context of water source protection, DoW has no objection to the current activity continuing and, if the operations remain operating accordingly (subject to normal operating conditions), no objections to a new SoH EIL and DER Licence being issued.</p> <p>SUMMARY: the historic (cells 1-5) and current gravel extraction activities (cells 6-7) meet expectations and DoW has no objections to the new activities (cells 8-11), if the proponent is consistent with their operations methodology and they follow suit.</p>	
<p>Department of Mines and Petroleum</p> <p>14/07627</p>	<p>Support the proposal</p>	<p>Noted</p>
<p>Department of Agriculture and Food Western Australia</p> <p>14/08393</p>	<p>Support the proposal subject to the impost of conditions requiring the management of declared weeds.</p>	<p>Staff support the impost of appropriate conditions requiring the need for ongoing weed management within the property.</p>
<p>Department of Parks and Wildlife (DPaW)</p> <p>14/12027</p>	<p>Support the proposal, however raise issues associated with the need to protect the environmental attributes of the site and recommend conditions to ensure appropriate buffers and planting is undertaken.</p>	<p>Staff support the recommendations of the DPaW and consider the conditions recommended for inclusion will address its requirements.</p>

Comment

It is considered that there are a number of issues that arise from extractive industry operations including access, visual impact, spread of weeds, erosion, noise, dust, vegetation and rehabilitation.

Access

The current access to the site is off Coalfields Road, with a sealed crossover and gravel internal road enabling access to the proposed extraction areas. Due to the high number of vehicles anticipated to be entering and exiting the site, Main Roads Western Australia recommend that this access/driveway be upgraded to include the provision of a separate right turn lane and widening on the highway which is to be designed and constructed to the specifications of Main Roads at the full cost of the proponent.

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This condition is supported and recommended for inclusion in the proposed conditions of planning consent.

Staff advise that as Coalfields Road is under the care and maintenance of Main Roads WA there is no opportunity for Council to impose conditions associated with payment of contributions towards its maintenance/upgrading.

Visual Impact

The subject site is located within an "Area of Landscape Protection" under DPS No. 1. The objectives of this area are to retain the existing natural visual amenity of the Darling Scarp area through controlling building, clearing and any other use that may impact on the amenity of the area. With the removal of cells 12, 13 and 14 the closest area for extraction is approximately 50m from Coalfields Highway, however is well screened by existing vegetation and due to the topography of the site is unlikely to be visible from external the site. It is considered by Staff that the proposed extraction is set back adequately so as not to have any impact on the existing visual amenity.

The proposed stockpiles (9m in height) have been located in areas which have the greatest opportunity to screen them from Coalfields Highway. Some visual exposure of the stockpile within cell 8 may be evident.

Spread of Weeds

In response to the comments from the Department of Agriculture and Food Western Australia (DAFWA) a specific condition is recommended to be included requiring a weed management plan be prepared to the satisfaction of the DAFWA. Although weed management has been addressed in the application (Appendix 3 of Modified Application 15/25382), it is recommended that approval be subject to the condition that the weed management plan is endorsed by the DAFWA.

Erosion/Water Management

As evidenced by the submissions received, the issue of past erosion and likely erosion that may result from further extraction has been the focus of much of the assessment of this proposal.

The simplest way of considering this issues is on a cell by cell basis.

Cells 1 – 5

Cells 1 - 5 have been previously approved by Council, extraction has occurred, rehabilitation undertaken and these cells do not form part of this application. As part of the planning approval for these cells stormwater management was a significant component of the conditions and resulted in the need for extensive re-contouring within the site following extraction and the need for a 'silt detention pond' to be constructed. The Department of Water has recently confirmed that all works have been undertaken to its satisfaction.

The 'silt detention pond' is commonly referred to by the neighbours as the 'dam' and is of concern to them due to its size, proximity to the boundary and concentration of water via the spillway onto their land. Staff have advised that this dam was required to be installed as part of the approved Erosion Management Plan and no separate planning consent was required.

Its proximity to the boundary is noted, however modification to achieve a 20m setback is not considered achievable without adversely affecting its structural integrity. It must be noted that this dam is not contained within the application and to this effect conditions associated with it are problematic. The Applicant has acknowledged the issue and expressed a preparedness to obtain appropriate certification of the dams structural integrity and is willing to review the functioning of the spillway to avoid any off-site erosion issues, however at the time of writing this report this willingness has been withdrawn.

Removal of the dam or construction of additional dams within the adjoining landowners property, while desirable to that landowner are not considered appropriate by Staff.

In light of the above and more so as the dam is not contained within the Application it is considered appropriate that the two landowners recommence negotiations to resolve this matter.

Cells 6 - 11

Within Cells 6 – 11, only Cells 6 and 7 are likely to result in any issues of erosion. Cell 6 is presently being rehabilitated and the existing stockpile removed to further allow for its rehabilitation.

A Stormwater Management Plan (refer Appendix 4 of Modified Application 15/25382) has been submitted with the Application and has been supported by the Department of Water. As part of the rehabilitation within Cells 6 and 7 there is the need for 3 silt detention basins to be constructed. Construction prior to winter 2016 is considered appropriate. Approval and implementation of the Stormwater Management Plan is considered appropriate.

It is noted that during extraction from Cell 6, erosion and more specifically the depositing of silt onto the adjoining lot has occurred and must be addressed immediately. Staff note that this remediation work has commenced.

Cells 12 - 14

Proposed Cells 12 – 14 have been removed from the application to allow further time for the Applicant and the adjoining land owner to resolve matters associated with likely erosion problems. To this effect no conditions associated with these cells are required/possible.

Dust

The Applicant has supplied a Dust Management Plan (Appendix 5 of Modified Application 15/25382) which indicates that sufficient measures will be undertaken in order to minimise dust.

Separation Distance to Sensitive Landuses

It is appropriate to refer to the EPA publication *Separation Distances between Industrial and Sensitive Land Uses* when assessing extractive industry proposals. This guide stipulates the minimum distances required between sensitive land uses (including residential dwellings and industrial land uses). For extractive industries, the guide distinguishes between the different types of extractions that occur, by placing them in one of four categories. This is collated in the following table:

Extractive Industry Type	Description	Buffer distance required
Hard Rock, Darling Scarp (Relevant to this proposal)	Quarrying (including blasting), crushing and screening	1,000m
Not Hard Rock	Blasting, grinding and milling works – material processed by grinding, milling or separated by sieving, aeration etc.	Case by case
No Blasting Required	Grinding and milling works – material processed by grinding, milling or separated by sieving, aeration etc.	Case by case
Sand and Limestone	No grinding or milling works	300 – 500m depending on size

From the above table it can be seen that the minimum separation distance for this proposal should be 1,000m. The proposal complies with this distance as the nearest dwelling is over 2,000m from the proposed extraction area.

Vegetation

No vegetation is required to be cleared as part of the proposed extraction.

Rehabilitation

The Proponent has provided a rehabilitation plan with the application (Appendix 2 of Modified Application 15/25382), which is to the satisfaction of Staff and recommended for approval.

Statutory/Policy Environment

District Planning Scheme No. 1

Zones the property as “General Farming”, with which an Extractive Industry is an “SA” use which can be considered by Council following advertising.

Clause 9.1 of the Scheme – establishes the development requirements for “Places of Landscape Value”, Staff consider that the modified proposal is compliant with the Scheme provisions.

Clause 9.13 of the Scheme – establishes requirements for lodging and consideration of an extractive industry application. The proposal complies with the Scheme provisions.

Shire of Harvey Extractive Industries Local Law 2007

The Shire of Harvey Extractive Industries Local Law 2007, provide the framework against which an Extractive Industry Licence is to be determined and thereafter monitored.

Strategic Framework

Within the Shire’s Strategic Community Plan 2013 - 2023, Strategies 2.3.1 and 2.3.2 state in part:

- 2.3.1 *“Continue to implement integrated environmental, social and land use planning which will:*
- *Minimise land use conflict.*

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2.3.2 *“Ensure compliance of rehabilitation plans for extractive industry areas.”*

Budget Implications

Nil.

Officer's Recommendation

That Council:

1. Approves the proposed extraction of gravel within Cells 7, 8, 9, 10 and 11 within Lots 501 and 21 Coalfields Road, subject to the following conditions:
 - a. A person shall not without the written approval of Council, undertake a landuse in respect of which Council has granted planning consent subject to conditions, until all of those conditions have been complied with to the satisfaction of Council;
 - b. Compliance with the Modified Application 26th August 2015 (Ref: 15/25382), submitted by Lundstrom Environmental;
 - c. The pit is to maintain a 50m setback from Coalfields Road and 20m from all other property boundaries at all times, and all vegetation located within the 20m setback areas is to be retained;
 - d. The silt detention ponds are to maintain a 20m setback from all other property boundaries at all times;
 - e. No extraction activities should occur within 15m of any native tree crown drip zones and a suitable temporary demarcation barrier be erected at 15m from the crown drip zone to protect the remnant vegetation and root systems from accidental machinery damage to the satisfaction of the Manager of Planning Services;
 - f. All extraction to achieve compliance with:
 - i) The Shire of Harvey Extractive Industry Local Laws, including the holding of a valid licence for all periods of operation;
 - ii) The Department of Industry and Resources (DoIR) “Environmental Management of Quarries: Development, Operation and Rehabilitation Guidelines”;
 - iii) The Department of Environmental South West Region Guideline Series “Extractive Industries within the Coastal Strip of the Shire of Harvey (Limestone and Sand)”;
 - iv) The Department of Water’s “Water Resource Considerations for Extractive Industries 2014”.
 - g. All dust management is to comply with the plans submitted (Appendix 5 of Modified Application 15/25382) to the Executive Manager Technical Services;
 - h. All weed management is to comply with the plans submitted (Appendix 3 of Modified Application 15/25382) to the satisfaction of the Department of Agriculture and Food;

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- i. All surface water and groundwater management is to comply with the plans submitted (Appendix 4 of Modified Application 15/25382) to the satisfaction of the Executive Manager of Technical Services and the Department of Water;
 - j. All rehabilitation is to comply with the rehabilitation plans submitted (Appendix 2 of Modified Application 15/25382) to the satisfaction of the Manager of Planning Services including slopes of the batters at the end of excavation, being retained at no more than 1:6 vertical to horizontal;
 - k. A reinstatement bond of \$5,000 per hectare is to be received prior to the issue of an Extractive Industry Licence, and retained for up to three (3) years beyond the completion of rehabilitation works, to ensure success of planting;
 - l. Stockpiles are to be located within the approved areas and kept to a maximum height of nine (9) metres to avoid visual impact and/or material wind drift;
 - m. A Dieback Management Plan (prepared by a suitably qualified consultant), is to be prepared for the site, prior to the issue of an Extractive Industry Licence;
 - n. The Applicant is to provide an information brochure, which has been prepared to the satisfaction of the Department of Parks and Wildlife and Council, to all purchasers of material intended for landfill detailing the following:
 - i) The extracted material is considered to be 'uninterpretable' and may therefore contain Phytophthora Dieback;
 - ii) The material should not be used adjoining any vegetation which is known to be susceptible to Phytophthora Dieback;
 - iii) A list of vegetation which is known to be susceptible is to be attached; and
 - iv) The Applicant is to retain a list of purchasers to which the above information has been provided, a copy of which is to be included in the annual audit report.
 - o. The Applicant is to have the approved pit boundaries surveyed and pegged by a suitably qualified surveyor, with the location of such pegs being confirmed by Council Staff prior to the issue of an Extractive Industry Licence. The pegs are to remain in place for the duration of the operation;
 - p. Any proposed clearing of native vegetation is prohibited unless done under a clearing permit issued in accordance with the Environmental Protection Act 1986, or the clearing is of an exempt kind;
 - q. Operating hours are restricted to 6am - 6pm Monday to Saturday with no extraction to take place on Sunday or public holidays;
 - r. The Applicant is to engage a suitably qualified independent expert approved by Council to carry out an annual audit of compliance of the conditions of planning consent and extractive industry license. Such an audit must be submitted prior to an annual renewal licence being issued by Council;

-
- s. Activities such as screening and crushing, may be prescribed and as such, require a Works Approval, License or Registration under Part V of the Environmental Protection Act 1986. The Department of Environment Regulation is the lead agency in relation to proposals;
 - t. Any refuelling activities must be undertaken in accordance with the Department's Water Quality Protection Note – Toxic and Hazardous Substance Storage and Use. There is to be no storage of hydrocarbons on-site and no major vehicle or machinery repairs or maintenance is to take place on-site;
 - u. The Proponent to make arrangements with Main Roads to ensure the access/driveway to Coalfields Road is upgraded to the satisfaction of Main Roads including provision of a separate right turn lane and widening on the highway which is to be designed and constructed to the specifications of Main Roads at the full cost of the proponent and prior to the issue of an Extractive Industry Licence; and
 - v. This approval is valid for a period of five (5) years. If development is not completed within this period, a new approval must be obtained before commencing or continuing development.
2. Requests the Applicant recommence negotiations with the adjoining landowner with a view to resolving erosion problems arising from the dam located within cell 3.

15/314.

Giancono/Wood
"That Council:

1. **Approves the proposed extraction of gravel within Cells 7, 8, 9, 10 and 11 within Lots 501 and 21 Coalfields Road, subject to the following conditions:**
 - a. **A person shall not without the written approval of Council, undertake a landuse in respect of which Council has granted planning consent subject to conditions, until all of those conditions have been complied with to the satisfaction of Council;**
 - b. **Compliance with the Modified Application 26th August 2015 (Ref: 15/25382), submitted by Lundstrom Environmental;**
 - c. **The pit is to maintain a 50m setback from Coalfields Road and 20m from all other property boundaries at all times, and all vegetation located within the 20m setback areas is to be retained;**
 - d. **The silt detention ponds are to maintain a 20m setback from all other property boundaries at all times;**

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-
- e. No extraction activities should occur within 15m of any native tree crown drip zones and a suitable temporary demarcation barrier be erected at 15m from the crown drip zone to protect the remnant vegetation and root systems from accidental machinery damage to the satisfaction of the Manager of Planning Services;
- f. All extraction to achieve compliance with:
- i) The Shire of Harvey Extractive Industry Local Laws, including the holding of a valid licence for all periods of operation;
 - ii) The Department of Industry and Resources (DoIR) "Environmental Management of Quarries: Development, Operation and Rehabilitation Guidelines";
 - iii) The Department of Environmental South West Region Guideline Series "Extractive Industries within the Coastal Strip of the Shire of Harvey (Limestone and Sand)"; and
 - iv) The Department of Water's "Water Resource Considerations for Extractive Industries 2014".
- g. All dust management is to comply with the plans submitted (Appendix 5 of Modified Application 15/25382) to the Executive Manager Technical Services;
- h. All weed management is to comply with the plans submitted (Appendix 3 of Modified Application 15/25382) to the satisfaction of the Department of Agriculture and Food;
- i. All surface water and groundwater management is to comply with the plans submitted (Appendix 4 of Modified Application 15/25382) to the satisfaction of the Executive Manager of Technical Services and the Department of Water;
- j. All rehabilitation is to comply with the rehabilitation plans submitted (Appendix 2 of Modified Application 15/25382) to the satisfaction of the Manager of Planning Services including slopes of the batters at the end of excavation, being retained at no more than 1:6 vertical to horizontal;
- k. A reinstatement bond of \$5,000 per hectare is to be received prior to the issue of an Extractive Industry Licence, and retained for up to three (3) years beyond the completion of rehabilitation works, to ensure success of planting;

-
- i. Stockpiles are to be located within the approved areas and kept to a maximum height of nine (9) metres to avoid visual impact and/or material wind drift;**
 - m. A Dieback Management Plan (prepared by a suitably qualified consultant), is to be prepared for the site, prior to the issue of an Extractive Industry Licence;**
 - n. The Applicant is to provide an information brochure, which has been prepared to the satisfaction of the Department of Parks and Wildlife and Council, to all purchasers of material intended for landfill detailing the following:**

 - i) The extracted material is considered to be 'uninterpretable' and may therefore contain Phytophthora Dieback;**
 - ii) The material should not be used adjoining any vegetation which is known to be susceptible to Phytophthora Dieback;**
 - iii) A list of vegetation which is known to be susceptible is to be attached; and**
 - iv) The Applicant is to retain a list of purchasers to which the above information has been provided, a copy of which is to be included in the annual audit report.**
 - o. The Applicant is to have the approved pit boundaries surveyed and pegged by a suitably qualified surveyor, with the location of such pegs being confirmed by Council Staff prior to the issue of an Extractive Industry Licence. The pegs are to remain in place for the duration of the operation;**
 - p. Any proposed clearing of native vegetation is prohibited unless done under a clearing permit issued in accordance with the Environmental Protection Act 1986, or the clearing is of an exempt kind;**
 - q. Operating hours are restricted to 6am - 6pm Monday to Saturday with no extraction to take place on Sunday or public holidays;**
 - r. The Applicant is to engage a suitably qualified independent expert approved by Council to carry out an annual audit of compliance of the conditions of planning consent and extractive industry license. Such an audit must be submitted prior to an annual renewal licence being issued by Council;**

-
- s. **Activities such as screening and crushing, may be prescribed and as such, require a Works Approval, License or Registration under Part V of the Environmental Protection Act 1986. The Department of Environment Regulation is the lead agency in relation to proposals;**
 - t. **Any refuelling activities must be undertaken in accordance with the Department's Water Quality Protection Note – Toxic and Hazardous Substance Storage and Use. There is to be no storage of hydrocarbons on-site and no major vehicle or machinery repairs or maintenance is to take place on-site;**
 - u. **The Proponent to make arrangements with Main Roads to ensure the access/ driveway to Coalfields Road is upgraded to the satisfaction of Main Roads including provision of a separate right turn lane and widening on the highway which is to be designed and constructed to the specifications of Main Roads at the full cost of the proponent and prior to the issue of an Extractive Industry Licence; and**
 - v. **This approval is valid for a period of five (5) years. If development is not completed within this period, a new approval must be obtained before commencing or continuing development.**
- 2. **Requests the Applicant recommence negotiations with the adjoining landowner with a view to resolving erosion problems arising from the dam located within cell 3; and**
 - 3. **Requires the Applicant to provide engineer certification for the dam structure and associated spillway to the satisfaction of the Executive Manager Technical Services prior to June 2016."**

CARRIED 9-2



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Environmental Noise Assessment

**Gravel Extraction on Pits
Lots 501 and 21 Coalfields Road, Roelands**

Reference: 14052815-01

Prepared for:
B&J Catalano Pty Ltd



Member Firm of Association of Australian Acoustical Consultants

Report: 14052815-01

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Prepared By:	Daniel Lloyd	
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Date:	1 April 2015	

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A	Terminology	
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1 INTRODUCTION

This report has been prepared to assess the noise emissions associated with the extraction and screening of gravel and laterite caprock on Lots 501 and 21 Coalfields Road, Roelands. The assessment only considers the predicted noise levels associated with Stages 9 and 10 at Residences 4 and 5, as indicated in *Figure 1-1*, and compares the results against the *Environmental Protection (Noise) Regulations 1997*.

Appendix A contains a description of some of the terminology used throughout this report.

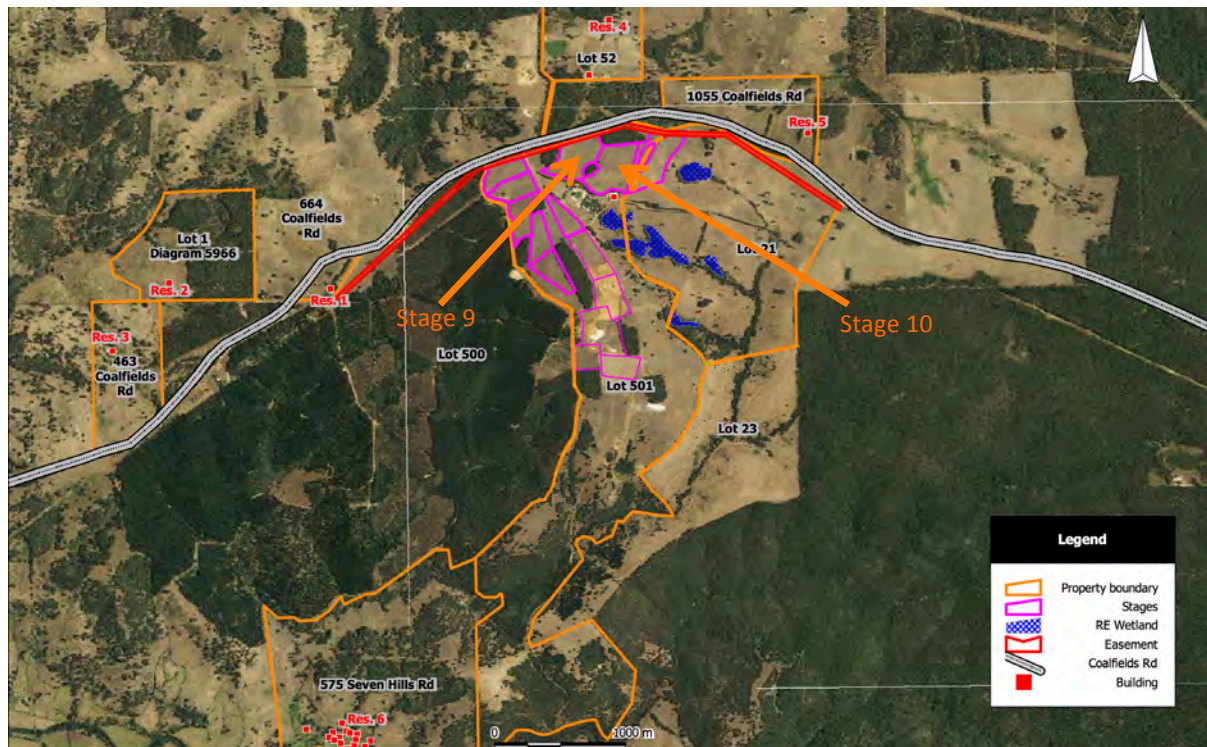


Figure 1-1 Project Locality and Receiver Locations

2 CRITERIA

Environmental noise in Western Australia is governed by the *Environmental Protection Act 1986*, through the *Environmental Protection (Noise) Regulations 1997* (the Regulations).

Regulation 7 defines the prescribed standard for noise emissions as follows:

“7. (1) Noise emitted from any premises or public place when received at other premises –

- (a) Must not cause or significantly contribute to, a level of noise which exceeds the assigned level in respect of noise received at premises of that kind; and

- (b) Must be free of –
 - i. Tonality;
 - ii. Impulsiveness; and
 - iii. Modulation”.

A “...noise emission is taken to *significantly contribute* to a level of noise if the noise emission exceeds a value which is 5 dB below the assigned level...”

Tonality, impulsiveness and modulation are defined in Regulation 9. Noise is to be taken to be free of these characteristics if:

- (a) The characteristics cannot be reasonably and practicably removed by techniques other than attenuating the overall level of noise emission; and
- (b) The noise emission complies with the standard after the adjustments of *Table 2-1* are made to the noise emission as measured at the point of reception.

Table 2-1 Adjustments for Intrusive Characteristics

Tonality	Modulation	Impulsiveness
+ 5dB	+ 5dB	+ 10dB

Note: The above are cumulative to a maximum of 15dB.

The relevant baseline assigned levels (prescribed standards) are specified in Regulation 8 and are shown in *Table 2-2*.

Table 2-2 Baseline Assigned Noise Levels

Premises Receiving Noise	Time Of Day	Assigned Level (dB)		
		L _{A10}	L _{A1}	L _{Amax}
Noise sensitive premises: highly sensitive use	0700 to 1900 hours Monday to Saturday (Day)	45 + IF	55 + IF	65 + IF
	0900 to 1900 hours Sunday and public holidays (Sunday)	40 + IF	50 + IF	65 + IF
	1900 to 2200 hours all days (Evening)	40 + IF	50 + IF	55 + IF
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays (Night)	35 + IF	45 + IF	55 + IF
Noise sensitive premises: any area other than highly sensitive area	All hours	60	75	80

Due to the rural nature of the surrounding land, we have assumed the influencing factor (IF) at all sensitive premises to be 0 dB. Therefore it is the baseline assigned noise levels of *Table 2-2* that apply.

3 METHODOLOGY

Computer modelling has been used to predict the noise levels, under worst-case conditions, to each of the receiver locations. The software used was SoundPLAN 7.3 with the CONCAWE algorithms. These algorithms have been selected as they include the influence of wind and atmospheric stability. Input data required in the model are:

- Meteorological Information;
- Topographical data;
- Ground Absorption; and
- Source sound power levels.

3.1.1 Meteorological Information

Meteorological conditions utilised are shown in *Table 3-1* and reflect those specified in the *draft EPA Guidance for the Assessment of Environmental Factors No.8 Environmental Noise*. These conditions are considered the worst-case for noise propagation. At wind speeds greater than those shown, sound propagation may be further enhanced, however background noise from the wind itself and from local vegetation is likely to be elevated and dominate the ambient noise levels.

Table 3-1 Modelling Meteorological Conditions

Parameter	Day (0700-1900)	Night (1900-0700)
Temperature (°C)	20	15
Humidity (%)	50	50
Wind Speed (m/s)	4	3
Wind Direction*	All	All
Pasquil Stability Factor	E	F

* Note that the modelling package used allows for all wind directions to be modelled simultaneously.

The EPA policy is that compliance with the assigned noise levels needs to be demonstrated for 98% of the time, during the day and night periods, for the month of the year in which the worst-case weather conditions prevail. In most cases, the above conditions occur for more than 2% of the time and therefore must be satisfied.

3.1.2 Topographical Data

Topographical data was provided by Lundstrom Environmental Consultants with contours in 1-metre intervals.

3.1.3 Ground Absorption

Ground absorption varies from a value of 0 to 1, with 0 being for an acoustically reflective ground (e.g. water or bitumen) and 1 for acoustically absorbent ground (e.g. grass). In this instance, the surrounding ground has been assumed to be acoustically absorbent, which is representative of a rural location. The affect of dense forested areas has been considered using the following attenuation values for foliage. These values are provided by SoundPLAN but are conservative when compared to other empirical data (Hoover 1961).

Table 3-2 Attenuation from Foliage

Description	Attenuation dB/m							
	31.5	63	125	250	500	1k	2k	4k
Foliage	0.02	0.02	0.03	0.04	0.05	0.06	0.08	0.09

3.1.4 Source Sound Levels

The sound power data used for this assessment are shown below in *Table 3-3*. They are based on manufacturer's data or where this is not available, measurements undertaken by Lloyd George Acoustics on similar equipment. In addition, the modelling assumes that the plant will be located at natural ground level.

Table 3-3 Source Sound Power Levels

Description	Octave Band Centre Frequency (Hz)								Overall dB(A)
	31.5	63	125	250	500	1k	2k	4k	
D9 Dozer Ripping & Blading ²	68	81	94	98	106	107	102	98	111
CAT 980 Loader ²	72	87	88	89	105	108	105	99	111
CAT 940 Loader ²	61	78	98	97	104	106	105	101	111
Mobile Crusher ¹	65	80	97	104	108	108	106	99	113
Mobile Stacker ¹	60	76	84	92	92	99	97	85	100
Truck moving at 25 km/h	67	77	86	94	95	94	92	86	100

X¹ Indicates measured data of similar equipment

X² Indicates manufacturers' published data

It is assumed that there would be 16 truck movements in one hour.

For the purposes of modelling, it has been assumed that all of the above equipment will be operating simultaneously. This, coinciding with worst-case wind conditions, is likely to be a rare occurrence and therefore the predictions are considered to be conservative.

4 RESULTS

The predicted L_{A10} noise level to Receivers Res. 4 and Res. 5, as shown in *Figure 1-1*, is provided below in *Tables 4-1 and 4-2*. The results represent either Stage 9 or 10 of the operations.

The predicted noise levels are also shown as contour lines in *Figure 4-1 and Figure 4-2*.

Table 4-1 Predicted Noise Levels Assuming Stage 9 Operations

Location	Predicted Noise Level L_{A10} dB	Noise Source Ranking	Comments
Res. 4	39	CAT 980 Loader = 34 dB(A) CAT D9 Dozer = 34 dB(A) CAT 940 Loader = 33 dB(A) Crusher = 32 dB(A) Stacker 20 = dB(A)	Complies with assigned levels at all times except 2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays No dominant source, so tonality unlikely from plant all plant operating simultaneously.
Res. 5	34	CAT 980 Loader = 28 dB(A) Crusher = 28 dB(A) CAT D9 Dozer = 27 dB(A)	Complies with assigned levels at all times. No dominant source, so tonality unlikely from plant all plant operating simultaneously.

Table 4-2 Predicted Noise Levels Assuming Stage 10 Operations

Location	Predicted Noise Level L_{A10} dB	Noise Source Ranking	Comments
Res. 4	36	CAT 980 Loader = 31 dB(A) CAT D9 Dozer = 31 dB(A) CAT 940 Loader = 30 dB(A) Crusher = 27 dB(A) Stacker 18 = dB(A)	Complies with assigned levels at all times except 2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays. No dominant source, so tonality unlikely from plant.
Res. 5	36	CAT 980 Loader = 31 dB(A) Crusher = 31 dB(A) CAT D9 Dozer = 30 dB(A)	Complies with assigned levels at all times except 2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays. No dominant source, so tonality unlikely from plant.

While tonality is not likely to be present when all plant is operating simultaneously, it is likely to be present if only one item of plant is operating (e.g. the loader or dozer). In these circumstances, the adjusted level for the loudest item of plant would be L_{A10} 39 dB (34+5) for Stage 9 operations and L_{A10} 36 dB (31+5) for Stage 10 operations.

Figure 4-1



Signs and symbols

- Point source
- ⊕ Sensitive receiver

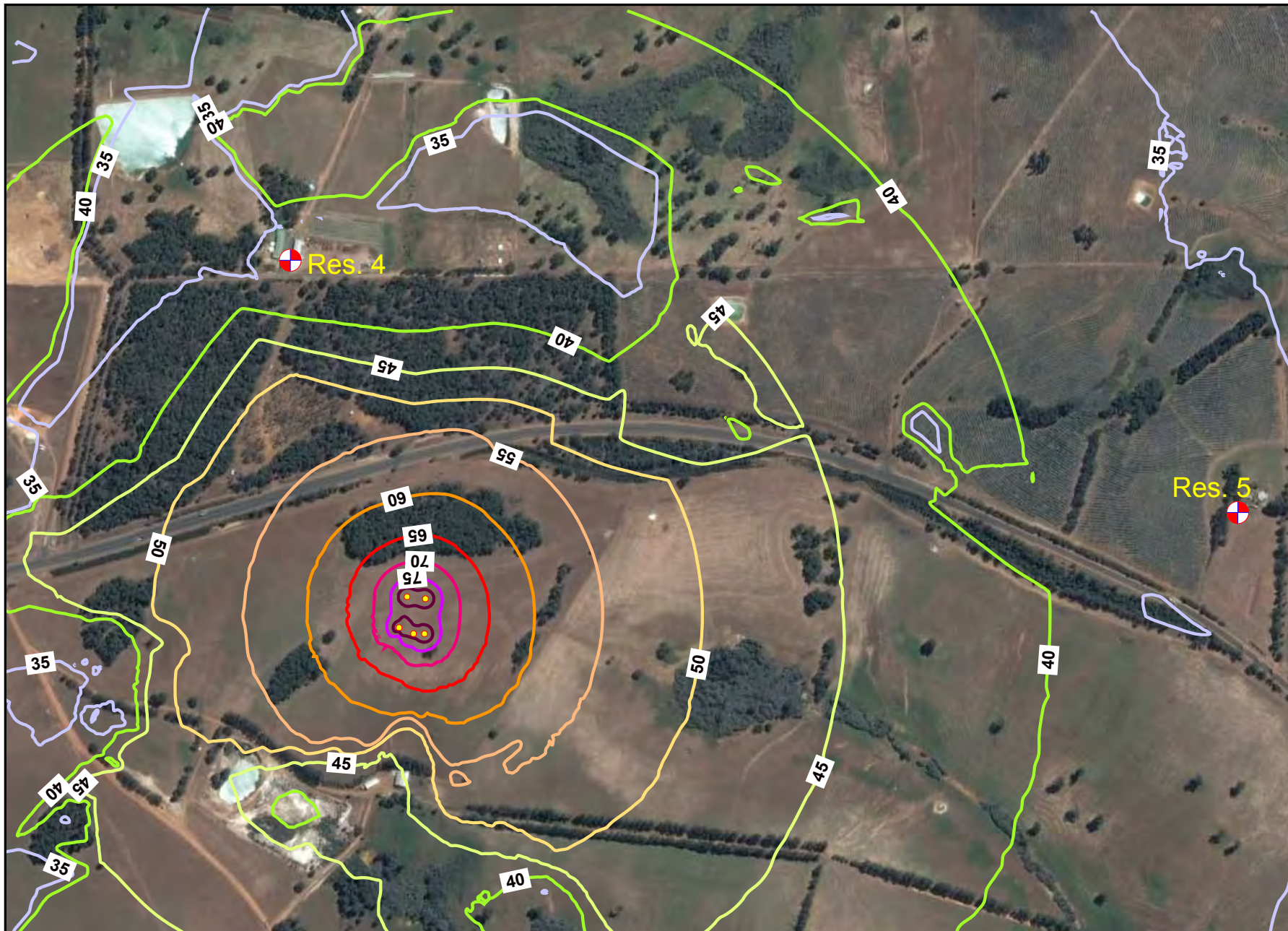


Gravel Extraction Pit - Lots 501 & 21 Coalfields Road, Roelands - Stage 9 Operations
Predicted L_{A10} Noise Levels - Assumes All Plant Operating and Wind from All Directions



Lloyd George Acoustics
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Figure 4-2



Signs and symbols

- Point source
- ⊕ Sensitive receiver



Gravel Extraction Pit - Lots 501 & 21 Coalfields Road, Roelands - Stage 10 Operations
Predicted L_{A10} Noise Levels - Assumes All Plant Operating and Wind from All Directions



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5 CONCLUSION

The results show that the proposed gravel extraction pit would result in compliance with the assigned levels under the Regulations between:

- 0700 to 1900 hours Monday to Saturday (Day);
- 0900 to 1900 hours Sunday and public holidays (Sunday); and
- 1900 to 2200 hours all days (Evening).

While noise mitigation is not required to achieve compliance during these times, it would be considered good practice to operate the crusher behind a noise bund wherever practicable.

Appendix A

Terminology

The following is an explanation of the terminology used throughout this report.

Decibel (dB)

The decibel is the unit that describes the sound pressure and sound power levels of a noise source. It is a logarithmic scale referenced to the threshold of hearing.

A-Weighting

An A-weighted noise level has been filtered in such a way as to represent the way in which the human ear perceives sound. This weighting reflects the fact that the human ear is not as sensitive to lower frequencies as it is to higher frequencies. An A-weighted sound level is described as L_A dB.

Sound Power Level (L_w)

Under normal conditions, a given sound source will radiate the same amount of energy, irrespective of its surroundings, being the sound power level. This is similar to a 1kW electric heater always radiating 1kW of heat. The sound power level of a noise source cannot be directly measured using a sound level meter but is calculated based on measured sound pressure levels at known distances. Noise modelling incorporates source sound power levels as part of the input data.

Sound Pressure Level (L_p)

The sound pressure level of a noise source is dependent upon its surroundings, being influenced by distance, ground absorption, topography, meteorological conditions etc and is what the human ear actually hears. Using the electric heater analogy above, the heat will vary depending upon where the heater is located, just as the sound pressure level will vary depending on the surroundings. Noise modelling predicts the sound pressure level from the sound power levels taking into account ground absorption, barrier effects, distance etc.

 L_{ASlow}

This is the noise level in decibels, obtained using the A frequency weighting and the S time weighting as specified in AS1259.1-1990. Unless assessing modulation, all measurements use the slow time weighting characteristic.

 L_{AFast}

This is the noise level in decibels, obtained using the A frequency weighting and the F time weighting as specified in AS1259.1-1990. This is used when assessing the presence of modulation only.

 L_{APeak}

This is the maximum reading in decibels using the A frequency weighting and P time weighting AS1259.1-1990.

 L_{Amax}

An L_{Amax} level is the maximum A-weighted noise level during a particular measurement.

 L_{A1}

An L_{A1} level is the A-weighted noise level which is exceeded for one percent of the measurement period and is considered to represent the average of the maximum noise levels measured.

 L_{A10}

An L_{A10} level is the A-weighted noise level which is exceeded for 10 percent of the measurement period and is considered to represent the "intrusive" noise level.

L_{Aeq}

The equivalent steady state A-weighted sound level (“equal energy”) in decibels which, in a specified time period, contains the same acoustic energy as the time-varying level during the same period. It is considered to represent the “average” noise level.

L_{A90}

An L_{A90} level is the A-weighted noise level which is exceeded for 90 percent of the measurement period and is considered to represent the “background” noise level.

One-Third-Octave Band

Means a band of frequencies spanning one-third of an octave and having a centre frequency between 25 Hz and 20 000 Hz inclusive.

L_{Amax} assigned level

Means an assigned level which, measured as a $L_{A\ Slow}$ value, is not to be exceeded at any time.

L_{A1} assigned level

Means an assigned level which, measured as a $L_{A\ Slow}$ value, is not to be exceeded for more than 1% of the representative assessment period.

L_{A10} assigned level

Means an assigned level which, measured as a $L_{A\ Slow}$ value, is not to be exceeded for more than 10% of the representative assessment period.

Tonal Noise

A tonal noise source can be described as a source that has a distinctive noise emission in one or more frequencies. An example would be whining or droning. The quantitative definition of tonality is:

the presence in the noise emission of tonal characteristics where the difference between -

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

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

This is relatively common in most noise sources.

Modulating Noise

A modulating source is regular, cyclic and audible and is present for at least 10% of the measurement period. The quantitative definition of modulation is:

a variation in the emission of noise that —

- (a) is more than 3 dB $L_{A\ Fast}$ or is more than 3 dB $L_{A\ Fast}$ in any one-third octave band;
- (b) is present for at least 10% of the representative.

Impulsive Noise

An impulsive noise source has a short-term banging, clunking or explosive sound. The quantitative definition of impulsiveness is:

a variation in the emission of a noise where the difference between $L_{A\ peak}$ and $L_{A\ Max\ slow}$ is more than 15 dB when determined for a single representative event;

Major Road

Is a road with an estimated average daily traffic count of more than 15,000 vehicles.

Secondary / Minor Road

Is a road with an estimated average daily traffic count of between 6,000 and 15,000 vehicles.

Influencing Factor (IF)

$$= \frac{1}{10} (\% \text{ Type A}_{100} + \% \text{ Type A}_{450}) + \frac{1}{20} (\% \text{ Type B}_{100} + \% \text{ Type B}_{450})$$

where:

% Type A₁₀₀ = the percentage of industrial land within
a 100m radius of the premises receiving the noise

% Type A₄₅₀ = the percentage of industrial land within
a 450m radius of the premises receiving the noise

% Type B₁₀₀ = the percentage of commercial land within
a 100m radius of the premises receiving the noise

% Type B₄₅₀ = the percentage of commercial land within
a 450m radius of the premises receiving the noise

+ Traffic Factor (maximum of 6 dB)

= 2 for each secondary road within 100m

= 2 for each major road within 450m

= 6 for each major road within 100m

Representative Assessment Period

Means a period of time not less than 15 minutes, and not exceeding four hours, determined by an inspector or authorised person to be appropriate for the assessment of a noise emission, having regard to the type and nature of the noise emission.

Background Noise

Background noise or residual noise is the noise level from sources other than the source of concern. When measuring environmental noise, residual sound is often a problem. One reason is that regulations often require that the noise from different types of sources be dealt with separately. This separation, e.g. of traffic noise from industrial noise, is often difficult to accomplish in practice. Another reason is that the measurements are normally carried out outdoors. Wind-induced noise, directly on the microphone and indirectly on trees, buildings, etc., may also affect the result. The character of these noise sources can make it difficult or even impossible to carry out any corrections.

Ambient Noise

Means the level of noise from all sources, including background noise from near and far and the source of interest.

Specific Noise

Relates to the component of the ambient noise that is of interest. This can be referred to as the noise of concern or the noise of interest.

Peak Component Particle Velocity (PCPV)

The maximum instantaneous velocity in mm/s of a particle at a point during a given time interval and in one of the three orthogonal directions (x, y or z) measured as a peak response. Peak velocity is normally used for the assessment of structural damage from vibration.

Peak Particle Velocity (PPV)

The maximum instantaneous velocity in mm/s of a particle at a point during a given time interval and is the vector sum of the PCPV for the x, y and z directions measured as a peak response. Peak velocity is normally used for the assessment of structural damage from vibration.

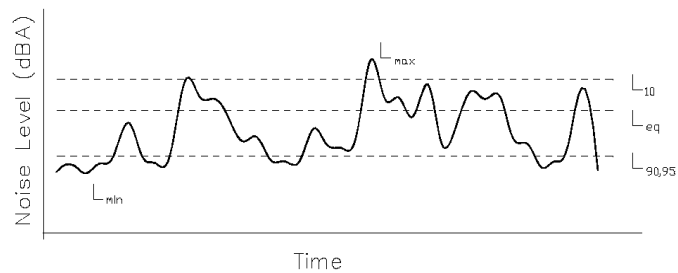
RMS Component Particle Velocity (PCPV)

The maximum instantaneous velocity in mm/s of a particle at a point during a given time interval and in one of the three orthogonal directions (x, y or z) measured as a root mean square (rms) response. RMS velocity is normally used for the assessment of human annoyance from vibration.

Peak Particle Velocity (PPV)

The maximum instantaneous velocity in mm/s of a particle at a point during a given time interval and is the vector sum of the PCPV for the x, y and z directions measured as a root mean square (rms) response. RMS velocity is normally used for the assessment of human annoyance from vibration.

Chart of Noise Level Descriptors



Typical Noise Levels

