Government of Western Australia
Department of Environment Regulation

Licence

Licence Number	L9019/2016/1
Licence Holder	Swan Gravel Pty Ltd
ACN	149 921 586
Registered business address	Suite 3 24 Muriel Avenue INNALOO WA 6018
Duration	4/04/2017 to 31/10/2023
Prescribed Premises	Category 12: Screening etc of material
Premises	Swan Gravel Pty Ltd Pit 3650 Toodyay Road BAILUP WA 6082 Lot 556 on Plan 77558

This Licence is granted to the Licensee, subject to the following conditions, on 4 April 2017, by:

Date signed: 5 April 2017

Tim Gentle
Manager Licensing – Resource Industries

an officer delegated under section 20 of the Environmental Protection Act 198

Explanatory Notes

These Explanatory Notes do not form part of this Licence.

Defined terms

Definition of terms used in this Licence can be found at the end of this Licence. Terms in the Licence which are capitalised are defined terms.

Department of Environment Regulation

The Department is the agency responsible for administering Part V of the *Environmental Protection Act 1986* (WA) (EP Act) for the regulation of Prescribed Premises. The Department also monitors and audits compliance with licences, takes enforcement action and develops and implements licensing and industry regulation policy.

Licence

Section 56 of the EP Act provides that an occupier of Prescribed Premises commits an offence if Emissions are caused or increased or permitted to be caused or increased, or Waste, noise, odour or electromagnetic radiation is altered or permitted to be altered from Prescribed Premises, except in accordance with a works approval or licence.

Categories of Prescribed Premises are defined in Schedule 1 of the *Environmental Protection Regulations 1987* (WA).

This Licence does not authorise any activity which may be a breach of another approval by another authority. For example, if the Premises have been assessed under Part IV of the EP Act, the Licence Holder is still required to comply with any conditions imposed by the Minister for Environment under Part IV.

It is the responsibility of the Licence Holder to ensure that any action or activity referred to in this Licence is permitted by, and is carried out in compliance with, statutory requirements.

The Licence Holder must comply with the Licence. Contravening a Licence Condition is an offence under section 58 of the EP Act.

Responsibilities of Licence Holder

Separate to the requirements of this Licence, general obligations of Licence Holders are set out in the EP Act and the regulations made under the EP Act.

For example, the Licence Holder must comply with the following provisions of the EP Act:

- the duties of an occupier under section 61; and
- restrictions on making certain changes to prescribed premises unless the changes are in accordance with a works approval, licence, closure notice or environmental protection notice (section 53).

Strict penalties apply for offences under the EP Act.

Reporting of incidents

The Licence Holder has a duty to report to the Department all Discharges of Waste that has caused or is likely to cause Pollution, Material Environmental Harm or Serious Environmental Harm, in accordance with section 72 of the EP Act.

Offences and Defences

The EP Act and its regulations set out a number of offences including:

- Offence of emitting an Unreasonable Emission from any Premises under section 49;
- Offence of causing Pollution under section 49;

- Offence of dumping Waste under section 49A;
- Offence of discharging Waste in circumstances likely to cause pollution under section 50;
- Offence of causing Serious Environmental Harm (section 50A) or Material Environmental Harm (section 50B);
- Offence of causing Emissions which do not comply with prescribed standards (section 51);
- Offences relating to emissions or discharges under regulations prescribed under the EP Act, including materials discharged under the *Environmental Protection (Unauthorised Discharges) Regulations 2004 (WA);*
- Offences relating to noise under the *Environmental Protection (Noise) Regulations 1997 (WA).*

Defences to certain offences may be available to a Licence Holder and these are set out in the EP Act.

Section 74A(b)(iv) provides that it is a defence to an offence for causing Pollution, in respect of an Emission, or for causing Serious Environmental Harm or Material Environmental Harm, or for discharging or abandoning Waste in water to which the public has access, if the Licence Holder can prove that the Emission or Discharge occurred in accordance with a Licence.

This Licence specifies the Emissions and Discharges, and the limits and Conditions which must be satisfied in respect of Specific Emissions and Discharges, in order for the defence to offence provision to be available.

Authorised Emissions and Discharges

Section 56 of the EP Act provides that the occupier of any prescribed premises who –

(a) causes or increases, or permits to be caused or increased, an emission; or

(b) alters or permits to be altered the nature of the waste, noise, odour or electromagnetic radiation emitted,

from the prescribed premises commits an offence unless he is the holder of a Licence issued in respect of the prescribed premises and so causes increases or permits or alters in accordance with any condition to which that Licence is subject.

The Specified and General Emissions and Discharges from Primary Activities conducted on the Prescribed Premises are authorised to be conducted in accordance the Conditions of this Licence.

Emissions and Discharges caused from other activities not related to the Primary Activities at the Premises have not been Conditioned in this Licence. Emissions and Discharges from other activities at the Premises are subject to the general provisions of the EP Act.

Amendment of Licence

Section 53 of the EP Act provides that a Licence Holder commits an offence if Emissions are caused, or altered from the Prescribed Premises unless done in accordance with a Licence.

The Licence Holder can apply to amend the Conditions of this Licence under section 59 of the EP Act.

The CEO may also amend the conditions of this Licence at any time on the initiative of the CEO without an application being made.

Duration of Licence

The Licence will remain in force for the duration set out on the first page of this Licence or until it is surrendered, suspended or revoked in accordance with section 59A of the EP Act.

Suspension or Revocation

The CEO may suspend or revoke this Licence in accordance with section 59A of the EP Act.

Fees

The Licence Holder must pay an annual licence fee. Late payment of annual Licence fees will result in the Licence ceasing to have effect.

Conditions

Emissions

1. The Licence Holder must not cause any Emissions from the Primary Activities on the Premises except for Specified Emissions and General Emissions described in column 1, subject to the exclusions, limitations or requirements specified in Column 2, of Table 1.

If the Licence Holder proves that it has acted in accordance with this Condition, it may be a defence under s 74A of the EP Act to proceedings for offences under the EP Act.

Table 1: Authorised Emissions Table

Column 1	**Column 2**
Emission Type	**Exclusions/Limitations/Requirements**
Specified Emissions	
Dust	Subject to compliance with • Rows 5, 6, 7, 10, 11 of Table 2. • Condition 8
Contaminated surface water	Subject to compliance with: • Rows 4, 20, 21 of Table 2 • Condition 10
General Emissions (excluding Specified Emissions)	
Emissions which arise from the Primary Activities set out in the General Description in Schedule 2.	Emissions excluded from General Emissions are: • Unreasonable Emissions; or • Emissions that result in, or are likely to result in, Pollution, Material Environmental Harm or Serious Environmental Harm; or • Discharges of Waste in circumstances likely to cause Pollution; or • Emissions that result, or are likely to result in, the Discharge or abandonment of Waste in water to which the public has access; or • Emissions or Discharges which do not comply with an Approved Policy; or • Emissions or Discharges which do not comply with a prescribed standard; or • Emissions or Discharges which do not comply with the conditions in an Implementation Agreement or Decision; or • Emissions or Discharges the subject of offences under regulations prescribed under the EP Act, including materials Discharged under the *Environmental Protection (Unauthorised Discharges) Regulations 2004.*

Notification of Material Change

2. The Licensee must notify the CEO of any Material Change within 14 days of a Material Change occurring and such notification (which the CEO will make publicly available) must:

(a) be in writing;

(b) include details of the changes, including duration, infrastructure details (if any); and

(c) include risk analysis of the changes, including proposed controls to mitigate risks.

Nothing in this Condition constitutes a defence to offences under the EP Act.

3. The Licensee must provide to the CEO any additional information the CEO may reasonably require to assess the Material Change under Condition 2 and in order for the CEO to determine if an amendment is required under the EP Act.

4. The Licensee must cease carrying out, or modify, a Material Change in the manner and at the time required by the CEO if:

(a) the CEO forms the view, acting reasonably, that the Material Change has or may have an unacceptable impact on public health, amenity or the environment; and

(b) the CEO has provided written notice (which the CEO will make publicly available) to the Licensee specifying the grounds for the CEO's views.

Nothing in this Condition prevents the Licensee subsequently submitting an amendment in relation to the Material Change.

Infrastructure and Activities

5. The Licence Holder must ensure that the infrastructure, equipment and activities specified in column 1 of Table 2 are maintained, operated and conducted in accordance with the requirements specified in column 2 of Table 2.

6. The Licence Holder must ensure that the equipment and infrastructure in Table 2 are maintained in good working order.

Table 2: Infrastructure equipment and activities requirements

Column 1	**Column 2**
Site infrastructure/activities	**Specified requirements**
Processing plant (crusher and screener) and processing stockpiles	Located in a depression between extraction areas Area 1 and Area 2, as depicted in Schedule 1: Map 2- Site plan, labelled 'Processing and product stockpile area'.
Extraction areas	Extraction confined to Area 1, located as depicted in with Schedule 1 Map 2 – Site plan.
Excavation	Final depth of any excavation no deeper than 285 m AHD.

Column 1	Column 2
Site infrastructure/activities	**Specified requirements**
Soak/Dam	Maintained as a water source for dust suppression and storage of stormwater, located as depicted in Schedule 1: Map 2 – Site Plan.
Water cart/sprays	Available on site at all times for purposes of dust suppression when any earthmoving, crushing, screening, or cartage activities are occurring. Operated when visible dust is generated from external ground surfaces on the Premises. Operated proactively subject to weather forecasting over a 24 hour period.
Dust suppressants (other than water)	Applied proactively. Re-apply proactively subject to visual inspection and weather forecasting over a 24 hour period.
Temporary cessation of activities	Cease an activity causing visible dust lift-off where dust management measures have not prevented dust lift-off and there is a risk of dust affecting sensitive receptors (residences).
Acoustic barrier	Dimensions sufficient to meet the requirements of the *Environmental Protection (Noise) Regulations 1997* at the nearest sensitive receptors. Located as depicted in Schedule 1: Map 3 - Location of acoustic barrier. Constructed within a 6 week period.
Acoustic barrier construction material	If constructed of earth, in accordance with the *Environmental Protection (Noise) Regulations 1997*, material (other than topsoil) used to construct the acoustic barrier shall not be excavated from Extraction Area 2.
Control of dust from trucks	The loads of trucks leaving the premises covered to prevent dust generation. Vehicle speeds limited to less than 25 km/hour on areas of unconsolidated or unsealed road.
Unsealed internal roads	Surfaced with gravel.
Crusher (TerexJ1175)	Maximum sound power level 113 dB(A)
Screening Plant	Maximum sound power level 101 dB(A)
Small excavator	Maximum sound power level 98 dB(A)
Dozer	Maximum sound power level 109 dB(A)

Column 1	Column 2
Site infrastructure/activities	**Specified requirements**
Truck and water cart	Maximum sound power level 102 dB(A)
Front end Loader x 2	Maximum sound power level 105 dB(A)
Quarry Truck x 2	Maximum sound power level 106 dB(A)
Static equipment	Provided with sound dampening and mufflers
Stormwater cut-off drains	Located in accordance with Schedule 1: Map 2 - Site Plan. Constructed at commencement of earthworks. Constructed and maintained to divert stormwater overflow from extraction areas to a soak/dam south of the premises. Constructed and maintained to divert stormwater away from Red Swamp Brook.
Rip rap and screening fabrics sediment trap	Located and maintained at gullies where stormwater flows off the works area, to trap sediment.
Diesel tanks	Tanks mounted on a concrete pad. Tanks double skinned. Hydrocarbon spill kit mounted next to the fuel tank.

Specified Actions

7. The Licence Holder must ensure hours of operation are restricted to Monday to Saturday 7 am to 5 pm, and with no operations on Sundays or public holidays.

Dust Monitoring

8. The Licence Holder must install the monitoring equipment listed in column 1 to the specifications listed in column 2 of Table 3.

Table 3: Monitoring equipment for dust

Column 1	Column 2
Site infrastructure/activities	**Specified requirements**
Dust monitors (nephelometers or equivalent)	Each located at a premises boundary, as depicted in Schedule 1: Map 4 - Dust monitors location – labelled as dust monitoring stations 101 and 201. When the acoustic barrier is installed, monitor 201 shall be located on top of the barrier. Installed in accordance with AS 3580.1.1 Installed prior to commencement of operations on the premises.
Real time weather station or anemometer	Continuous recording of wind speed and direction. Installed prior to commencement of operations on the

Column 1	Column 2
Site infrastructure/activities	**Specified requirements**
	premises.

9. The Licence Holder must utilise dust monitoring and remedial management measures including, but not be limited to the following:

(a) continuous dust monitoring for operational management purposes for particulate matter 10 micrometres or less in diameter (PM10) ;

(b) dust monitoring stations to be automatic feedback (SMS text message or equivalent) to the quarry manager or supervisor if a trigger level of 0.5 mg/m^3 of PM10 is reached over a one hour averaging period;

(c) meteorological monitoring to provide wind data to assist in determining the source of dust;

(d) the dust monitoring system is to be used at all times the quarry is in operation;

(e) in the event the trigger value is reached, and the dust is attributable to operations at the Premises, management measures (use of water cart, sprays or other appropriate methods) are to be promptly activated to control the dust to avoid further exceedance of the trigger value;

(f) the Licence Holder shall reduce the trigger level if necessary in response to verified complaints or other evidence of off-site impacts;

(g) the Licence Holder shall continuously improve site dust management through identification of dust sources and identifying and implementing improved dust controls; and

(h) the Licence Holder shall keep a written log, signed by the responsible person, of dust trigger exceedance events including identification of the sources of dust and action taken to control dust.

Surface water monitoring

10. The Licence Holder must undertake surface water monitoring at locations specified in column 1 for parameters specified in column 2 and in accordance with requirements specified in columns 3, 4, 5 of Table 4.

Table 4: Surface water monitoring

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Monitoring point reference and location on Schedule 1: Map 5.	**Parameter**	**Units**	**Averaging period**	**Frequency**	**Reportable event**
Water Sample Location 1 (upstream) and Water Sample Location 2 (downstream)	pH[1]	-	Spot sample	Monthly when water is flowing	NA
	Electrical conductivity (EC)[1]	µS/cm			NA
	Total Suspended Solids (TSS)[1]	mg/L			Water Sample Location 2 records 20% increase from Water Sample Location 1

Note1: In-field non-NATA accredited analysis permitted.

11. The Licence Holder must ensure that

(a) All water samples are collected and preserved in accordance with AS/NZS 5667.1;

(b) All surface water sampling is conducted in accordance with AS/NZS 5667.6;

(c) All samples are submitted to and tested in a laboratory with current NATA accreditation for the parameters being measured unless indicated otherwise in this licence.

12. The Licence Holder must submit to the CEO by 90 days after the anniversary date each year, the results of the monitoring required by Condition 10 for the preceding Annual Period. The results to be provided to the CEO must include, but not be limited to:

(a) Sampling dates for each location specified in column 1 of Table 4;

(b) The raw monitoring data from monitoring of each location specified in Column 1 of Table 4, for each parameter specified in column 2 of Table 4 in tabulated form.

(c) Summary of any reportable events and action taken in response to those events

13. In the event the Reportable Event value is reached in column 6 of Table 4, the Licence Holder must ensure management measures are to be promptly activated to avoid further exceedance of the Reportable event value.

14. The Licence Holder must ensure that the CEO is notified of a Reportable Event as soon as practicable but no later than 5 pm of the next usual working day.

15. The Licence Holder must provide, as soon as practicable, a monitoring report, as specified in Schedule 3, to the CEO for Reportable Events which have occurred.

Monitoring general

16. The Licence Holder must ensure that monthly monitoring is undertaken at least 15 days apart.

17. The Licence Holder must have all monitoring equipment referred to in any condition of the Licence calibrated and maintained in accordance with the manufacturer's specifications.

Information

17. The Licence Holder must maintain accurate and auditable records in relation to:

(a) the calculation of fees payable in respect of this Licence; and

(b) any Material Change.

18. If an Emission that is not a Specified Emission or General Emission occurs on the Premises, then the Licence Holder must:

(a) investigate why the Emission occurred;

(b) take all reasonable steps to prevent the Emission occurring again;

(c) record the details of the investigation and all steps taken; and

(d) provide a copy of the record to the CEO within 21 days of the date Licence Holder became aware of the Emission occurring.

19. The Licence Holder must record the number and details of any complaints received

by the Licence Holder relating to the Premises, and any action taken by the Licence Holder in response to the complaint. Details of complaints must include:

(a) an accurate record of the concerns or issues raised, for example a copy of any written complaint or a written note of any verbal complaints made;

(b) the name and contact details of the complainant, if provided by the complainant;

(c) the date of the complaint; and

(d) the details and dates of the actions taken by the Licence Holder in response to the complaints.

20. The Licence Holder must submit to the CEO within 90 days after the Anniversary Date, a Compliance Report indicating the extent to which the Licence Holder has complied with the Conditions in this Licence for the Annual Period.

21. The Licence Holder must comply with a CEO Request, within 7 days from the date of the CEO Request or such other period specified in the CEO Request.

Definitions and Interpretation

Definitions

In this Licence, the following terms have the following meanings:

AHD means the Australian Height Datum.

Anniversary Date means 31 March of each year.

Annual Period means a 12 month period commencing from 1 April until 31 March in the following year.

Approved Policy has the same meaning given to that term under the **EP Act.**

AS 3580.1.1 means the Australian Standard AS3580.1.1 Methods for Sampling and Analysis of Ambient Air - Guide to siting air monitoring equipment.

AS/NZ 5667.1 means the Australian Standard AS/NZS 5667.1 Water Quality – Sampling – Guidance of the Design of sampling programs, sampling techniques and the preservation and handling of samples;

AS/NZS 5667.6 means the Australian Standard AS/NZS 5667.6 Water Quality – Sampling – Guidance on sampling of rivers and streams;

Compliance Report means a report in a format approved by the **CEO** as presented by the Licence Holder or as specified by the **CEO** from time to time.

CEO for the purposes of notification means:

Chief Executive Officer
Department Administering Part V Div. 3 *Environmental Protection Act 1986*
Locked Bag 33
CLOISTERS SQUARE WA 6850
Email: info@der.wa.gov.au

CEO Request means a request made by the **CEO** to the **Licence Holder** in writing, sent to the **Licence Holder's** address for notifications, as described at the front of this **Licence**, in relation to:

(a) information, records or reports in relation to specific matters in connection with this **Licence** including in relation to compliance with any **Conditions** and the calculation of fees (whether or not a breach of **Condition** or the **EP Act** is suspected); or

(b) reporting, records or administrative matters:

(i) which apply to all **Licences** granted under the **EP Act**; or

(ii) which apply to specified categories of **Licences** within which this **Licence** falls.

Condition means a condition to which this **Licence** is subject under s 62 of the **EP Act**.

Discharge has the same meaning given to that term under the **EP Act**.

Emission has the same meaning given to that term under the **EP Act**.

Environmental Harm has the same meaning given to that term under the **EP Act**.

EP Act means the *Environmental Protection Act 1986 (WA).*

EP Regulations means the *Environmental Protection Regulations 1987 (WA).*

General Description means the description of activities and operations carried out on the **Premises** as set out in Schedule 2 of this **Licence**.

Implementation Agreement or Decision has the same meaning given to that term under the **EP Act**.

Licence refers to this document, which evidences the grant of **Licence** by the **CEO** under s 57 of the EP Act, subject to the **Conditions**.

Licence Holder refers to the occupier of the premises being the person to whom this **Licence** has been granted, as specified at the front of this **Licence**.

Material Change means a change to the activities carried out on the **Premises** as described in the **General Description** set out in Schedule 2 and:

(a) that may result in an increased risk to public health, amenity or the environment; and

(b) includes the types of changes specified in Schedule 2; and

(c) does not include the Non Material Change specified in Schedule 2.

Material Environmental Harm has the same meaning given to that term under the **EP Act**.

NATA means the National Association of Testing Authorities, Australia;

NATA Accredited means in relation to the analysis of a sample that the laboratory is NATA accredited for the specified analysis at the time of the analysis;

PM means total particulate matter including both solid fragments of material and miniscule droplets of liquid;

PM10 means particles with an aerodynamic diameter of less than or equal to 10 μm;

Pollution has the same meaning given to that term under the **EP Act**.

Premises refers to the premises to which this **Licence** applies, as specified at the front of this **Licence** and as shown on the map in Schedule 1 to this **Licence**.

Reportable Event means an exceedance above the limit specified in Column 6 of Table 4.

Rip-rap means loose rock deposited to protect against scour and erosion.

Serious Environmental Harm has the same meaning given to that term under the **EP Act**.

Screening fabric means heavy duty geo fabric specifically designed to allow the free passage of water and trap sediment.

Unreasonable Emission has the same meaning given to that term under the **EP Act**.

Interpretation

In this Licence, the words 'including', 'includes' and 'include' will be read as if followed by the words 'without limitation';

(a) where any word or phrase is given a defined meaning, any other part of speech or other grammatical form of that word or phrase has a corresponding meaning;

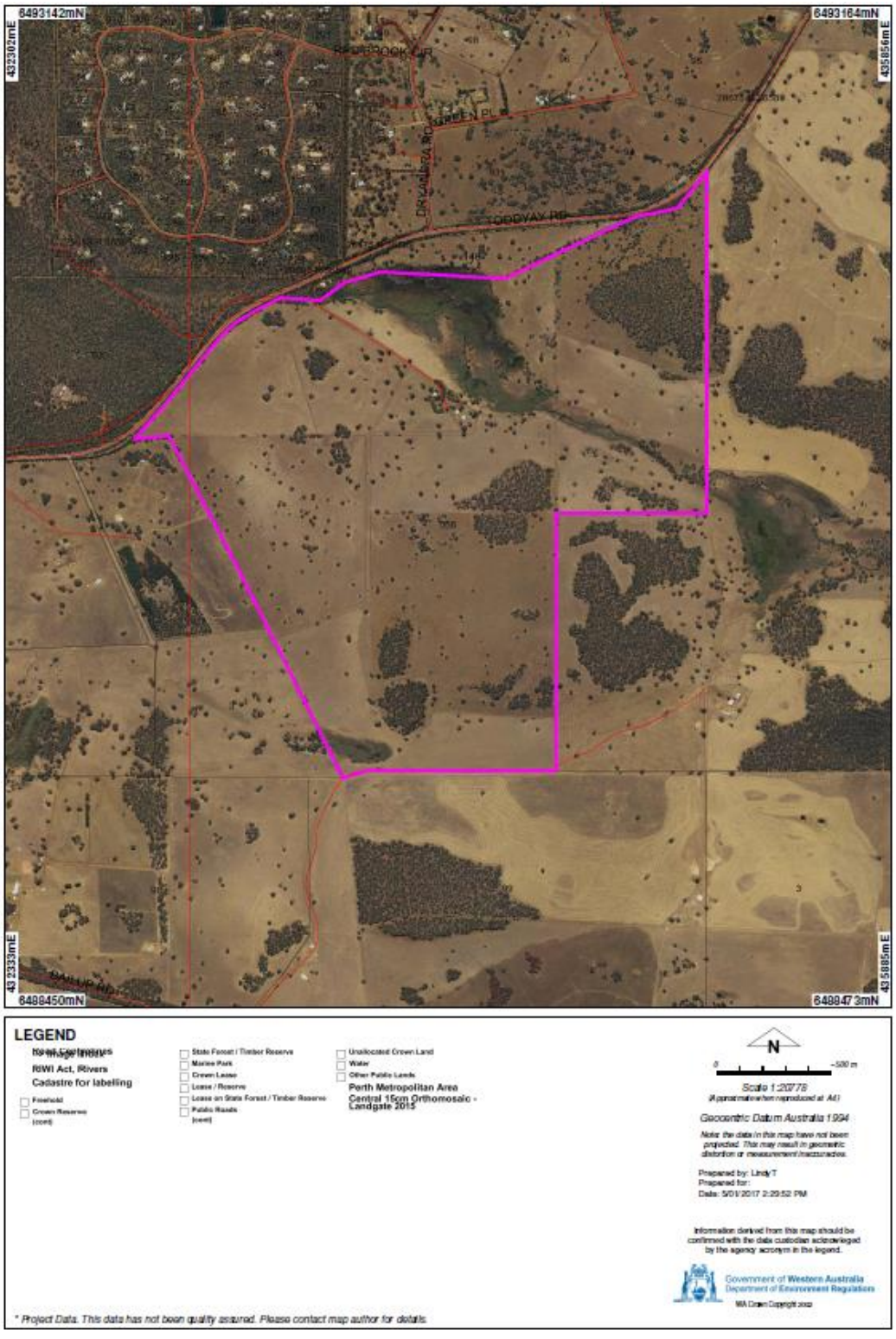
(b) where tables are used in a Condition, each row in a table constitutes a separate Condition; and

(c) any reference to an Australian or other standard, guideline or code of practice in this Licence means the version of the standard, guideline or code of practice in force at the time of granting of this Licence and includes any amendments to the standard, guideline or code of practice which may occur from time to time during the course of the Licence.

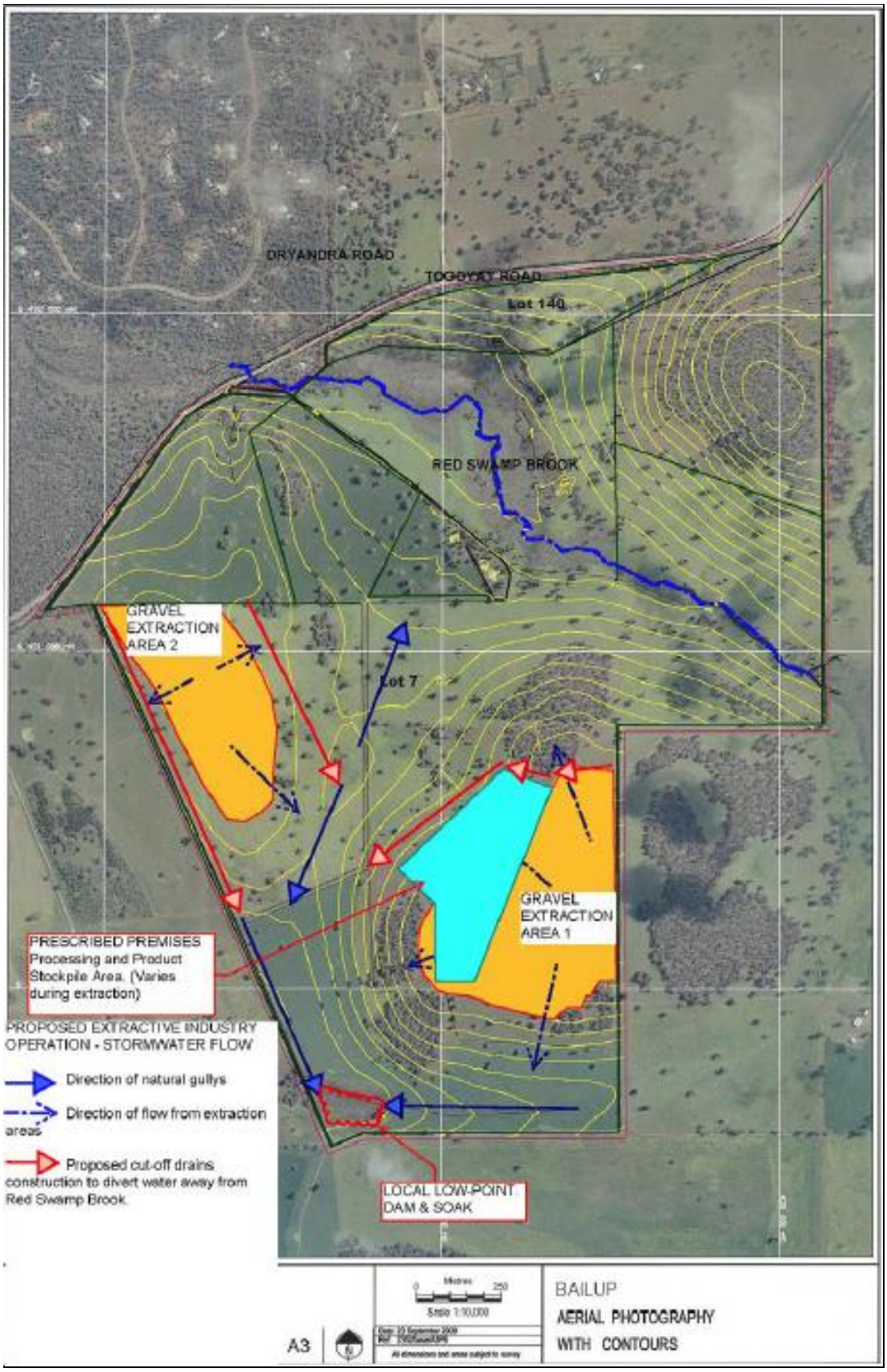
Schedule 1: Maps

Map 1: Premises boundary map

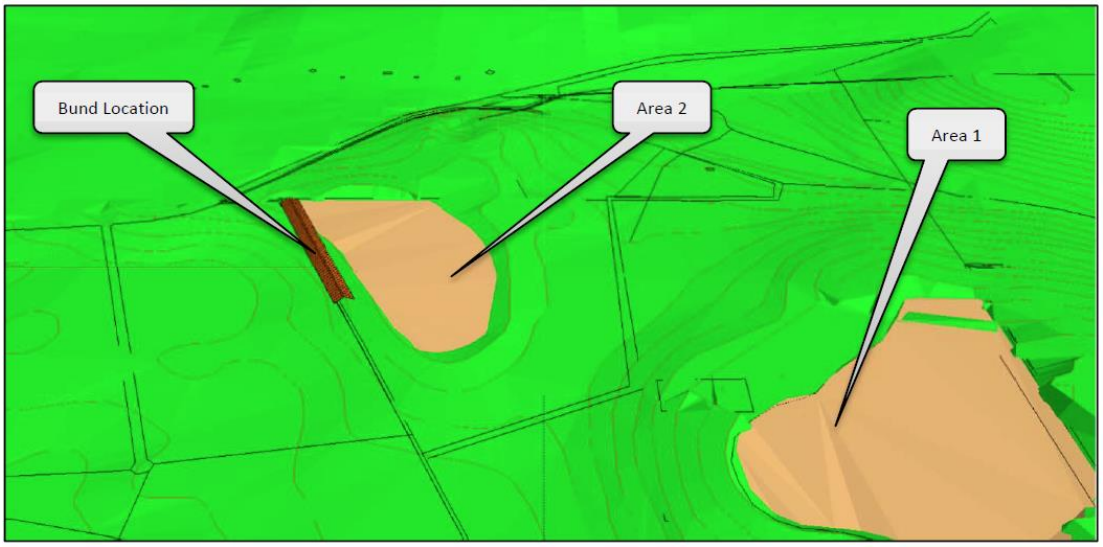
The Premises are shown in the map below. The pink line depicts the boundary to the Premises.



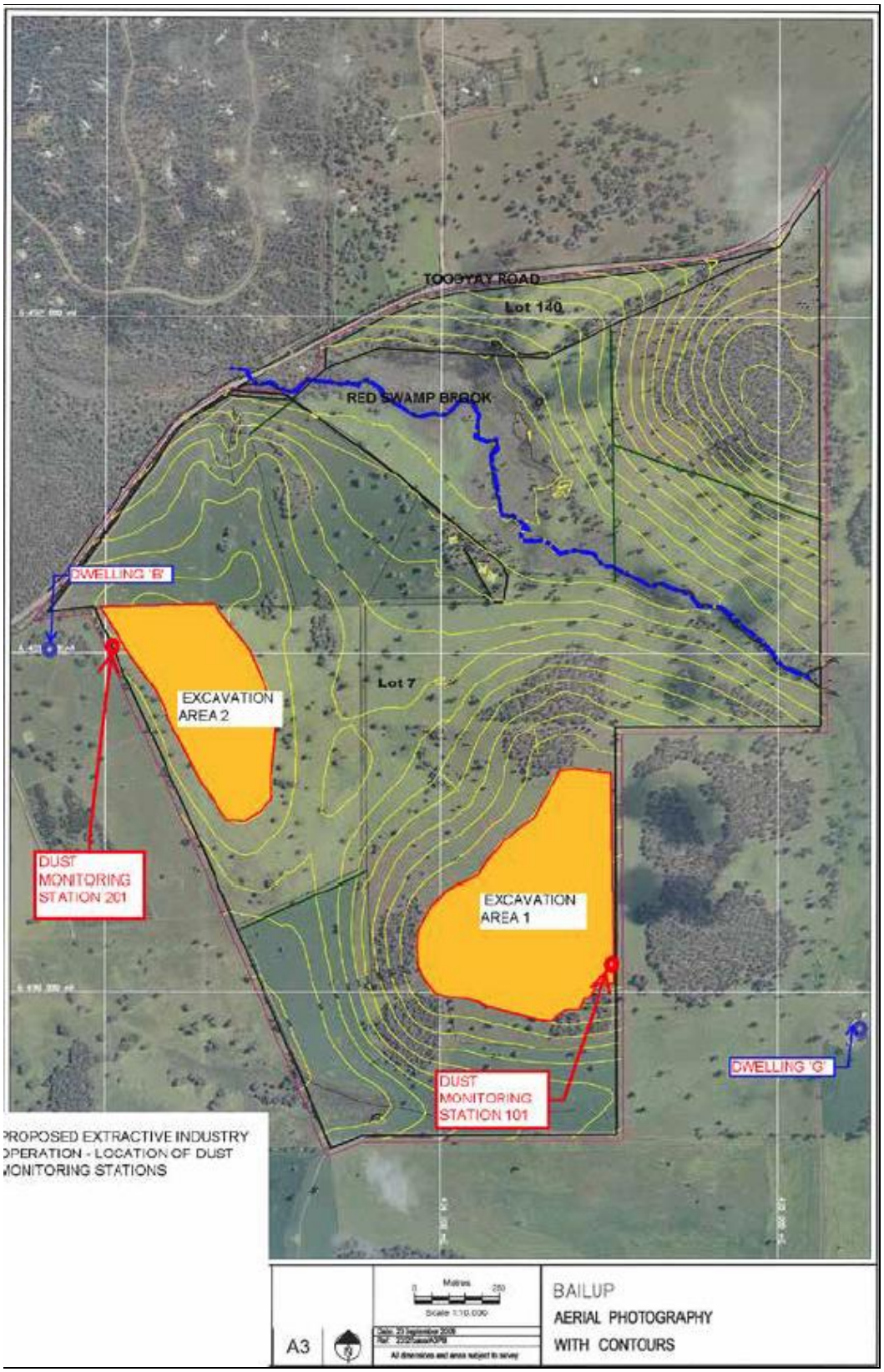
Map 2: Site Plan



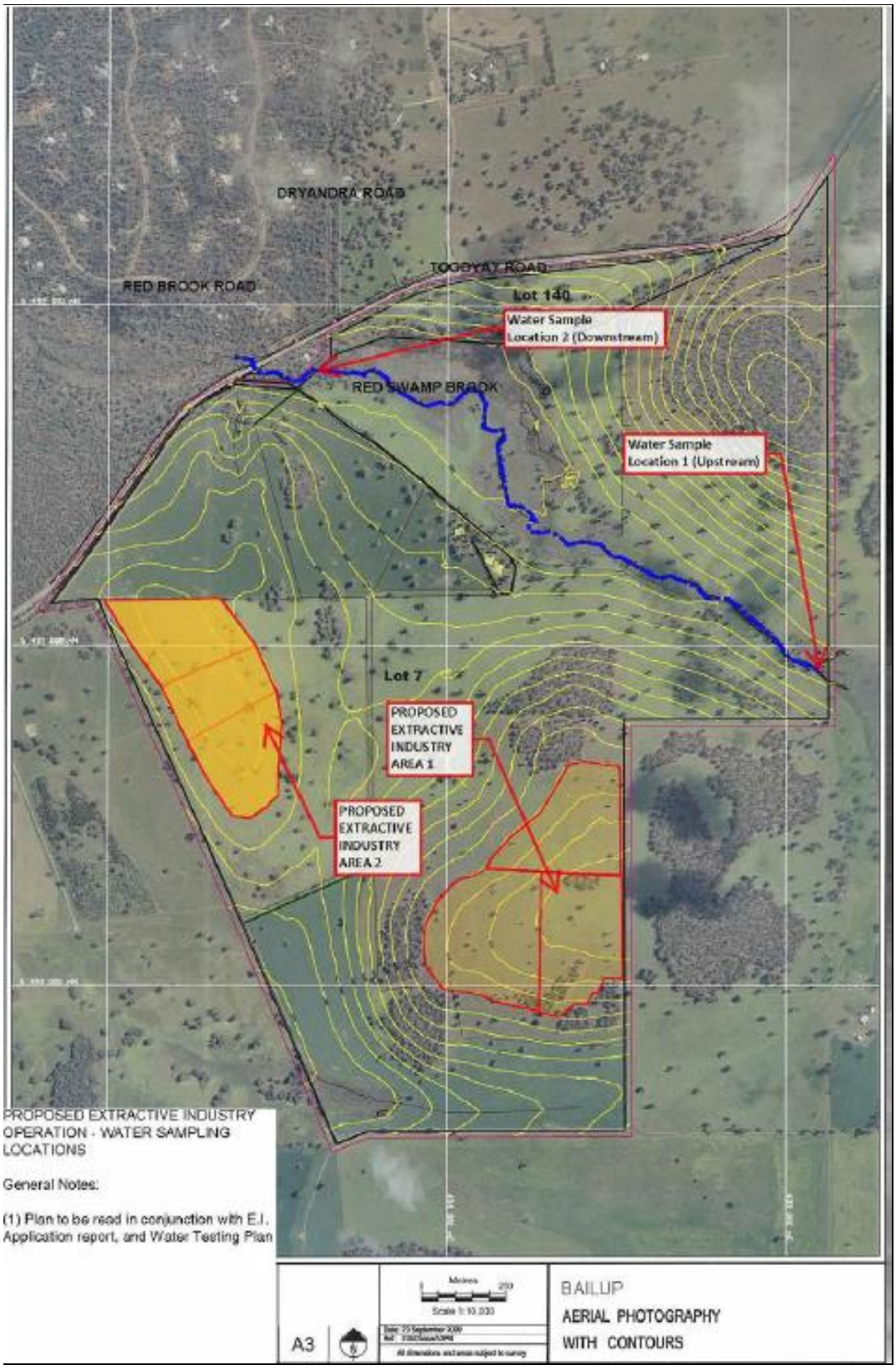
Map 3: Noise bund location



Map 4: Dust monitors location



Map 5: Red Swamp Brook sampling locations



Schedule 2: General Description

At the time of assessment, Emissions and Discharges from the following Primary Activities were considered in the determination of the risk and related Conditions for the Premises.

The Primary Activities are listed in Table 5:

Table 5: Primary Activities

Primary Activity	Premises Production or Design Capacity
Category 12 - Screening etc. of material: premises (other than premises within category 5 or 8) on which material extracted from the ground is screened, washed, crushed, ground, milled, sized or separated.	950,000 tonnes per day

Infrastructure and equipment

The following Primary Activity infrastructure and equipment specified in Table 6 are situated on the Premises:

Table 6: Infrastructure and equipment

	Infrastructure	Plan reference
1	Crusher (TerexJ1175)	Schedule 1: Map 2 – Site plan - processing area
2	Screener	Schedule 1: Map 2 – Site Plan - processing area.
9	Soak/Dam	Schedule 1: Map 2 – Site plan

Site layout

The infrastructure and equipment are set out on the Premises in accordance with the site layout specified Map 2 – Site plan, in Schedule 1.

Examples of Material Change

- Changes to the control or ownership of the Premises or changes (other than Non-Material Changes) to the infrastructure or equipment within the Premises.
- Removal of infrastructure and equipment.
- Changes to the site layout of infrastructure and equipment specified on the maps in Schedule 1.
- Changes to the material processed.

Non-Material Change

- Improvements or additions to, or replacement of, or other changes to infrastructure and equipment that do not increase the risk of emissions and discharges

Schedule 3: Reportable events

Surface water Monitoring

Monitoring Reports

Monitoring reports must contain in relation to a Reportable Event:

1. the Reportable Event date(s);
2. the sampling or measurement date;
3. the raw monitoring data for the Reportable Event in tabulated form; and
4. details of investigation and mitigation measures.

Government of Western Australia
Department of Environment Regulation

Decision Report

Application for Licence

Division 3, Part V *Environmental Protection Act 1986*

Applicant:	Swan Gravel Pty Ltd
ACN:	149 921 586
Licence Number:	L9019/2016/1
File Number:	DER2016/002300
Premises:	Swan Gravel Pty Ltd Pit Lot 556 on Plan 77558 (3650) Toodyay Road BAILUP WA 6082
Date of report:	Tuesday, 4 April 2017
Status of Report	Final

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Definitions of terms and acronyms

Term	Definition
Ambient Air Quality NEPM	*National Environment Protection (Ambient Air Quality) Measure*
ASS	Acid Sulfate Soils
Category/Categories (Cat.)	categories of prescribed premises as set out in Schedule 1 of the EP Regulations
Construction Site	Has the same meaning as defined in the Noise Regulations, being a premises or a public place on which the sole or principal activity is the carrying out of construction work
Construction Work	Has the same meaning as defined in the Noise Regulations, and for the purpose of this licence refers to site works including road works and earthworks
Decision Report	this document
Delegated Officer	An officer under section 20 of the EP Act.
DER	Department of Environment Regulation
DoW	Department of Water
EP Act	*Environmental Protection Act 1986* (WA)
EP Regulations	*Environmental Protection Regulations 1987* (WA)
m^3	cubic metres
Noise Regulations	*Environmental Protection (Noise) Regulations 1997* (WA)
Premises	Lot 556 on Plan 77558 (3650) Toodyay Road BAILUP WA
PM	Particulate Matter
PM10	Used to describe particulate matter that is smaller than 10 microns (µm) in diameter.
Prescribed Premises	Premises prescribed under Schedule 1 to the EP Regulations
Rip rap	Loose rock deposited to protect against scour and erosion.
Screening fabric	Constructed by heavy duty geo fabric specifically designed to allow the free passage of water and trap sediment.
TSS	Total Suspended Solids

1. Purpose and scope of assessment

Swan Gravel Pty Ltd has applied for a licence to crush and screen up to 950,000 tonnes per year of gravel at Lot 556 on Plan 77558 (3650) Toodyay Rd, Bailup in Western Australia.

The proposed operation is a prescribed activity **Category** 12 under Schedule 1 of the **EP Regulations** as described in Table 1.

Table 1: Prescribed Premises Categories

Classification of Premises	Description	Approved premises production or design capacity or throughput
Category 12	Screening, etc of material: premises (other than premises within category 5 or 8) on which material extracted from the ground is screened, washed, crushed, ground, milled, sized or separated.	950,000 tonnes per year

This **Decision Report** sets out **DER**'s assessment and decision making in relation to an application for works approval and licence under Division 3, Part V of the **EP Act** for the proposal.

The scope of assessment for this Decision Report relates to the risk of emissions to public health and the environment during active screening operations.

2. Background

Works Approval W5917/2015/1 was issued to Trico Resources Pty Ltd on 4 August 2016 for construction and installation of infrastructure required for crushing and screening gravel extracted from the ground, at Lot 556 on Plan 77558 (3650) Toodyay Rd, Bailup.

Trico Resources Pty Ltd is the registered proprietor of Lot 556 on Plan 77558 (Record of Certificate Title under the *Transfer of Land Act 1893,* Register Number 556/DP77558). A Gravel Extraction Agreement between Trico Resources Pty Ltd and Swan Gravel Pty Ltd dated 12 September 2016 grants Swan Gravel Pty Ltd as the 'Contractor' the right to extract gravel from the **premises** for three years from that date.

The premises was previously titled Lot 7 (3650) Toodyay Road, Bailup in planning documents and application documents. The premises is now titled Lot 556 (3650) Toodyay Road, Bailup. This Decision Report contains maps notating the premises as Lot 7 (3650) Toodyay Road, Bailup.

3. Overview of Swan Gravel premises

3.1 Infrastructure

The Swan Gravel Pty Ltd Pit (Swan Gravel Pit) facility infrastructure, as it relates to Category 12 activities, is detailed in Table 2.

Table 2: Swan Gravel Pit Category 12 infrastructure

	Infrastructure
	Prescribed Activity Category 12

	Infrastructure
Up to 950,000 tonnes per year or raw material (gravel) will be extracted, crushed and screened into various sizes and stockpiled on the premises prior to transportation off site.	
1	Processing plant – Terex J1175 crusher and McCloskey R155 screener (or similar)
2	Stormwater cut off drains
3	Soak/dam
4	Fuel storage – 5,000 Litres diesel

3.2 Operational aspects

The Swan Gravel Pit operation entails use of a Terex J1175 mobile crusher and McCloskey R155 screener (or similar) to process up to 950,000 tonnes extracted material per year.

The plant has the capacity to process 200 - 400 tonnes per hour, depending on material crushing properties. Swan Gravel expects that an average of 3,000 to 4,000 tonnes gravel will be crushed per day during peak times of spring and summer, with less production in winter months.

Gravel extraction will be staged within each of two areas named ‘Area 1’ and ‘Area 2’, which total approximately 42 hectares in size. For stage 1, the mobile processing plant and product stockpile area will be sited in a depression between the two extraction areas (refer to Figure 1 below).

Other mobile equipment will include a bulldozer, front end loader, quarry trucks, haul trucks and a water cart.

Stormwater will be diverted to a soak which is situated at the south west corner of the premises. Water for dust suppression will be accessed from the soak.

Fuel for fixed and mobile machinery (5,000 L diesel) will be stored in a double skinned tank.

Operations will be conducted between the hours of 07:00 to 17:00, Monday to Saturday. No operations will be conducted on Sundays or public holidays.

A noise barrier will be constructed at the west of Area 2 within a period not exceeding 6 weeks prior to operations commencing in Area 2.

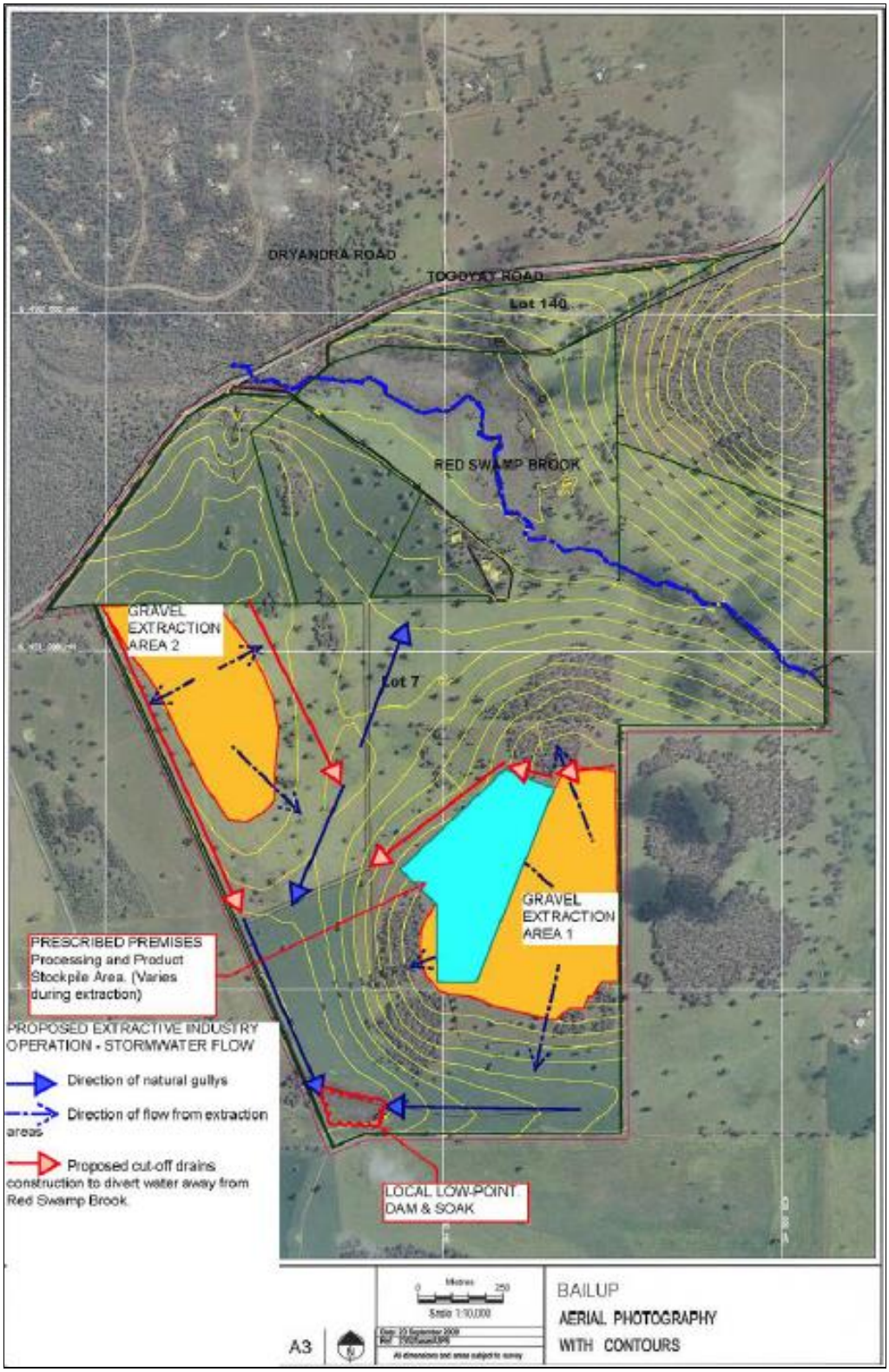

Figure 1: Site plan

4. Legislative context

4.1 Part IV of the EP Act

The proposal has not been referred to the Environmental Protection Authority and is not subject to conditions under Part IV of the **EP Act**.

4.2 Contaminated Sites

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

4.3 Other relevant approvals

4.3.1 Planning approvals

The area is zoned as 'General Rural' in terms of the Shire of Mundaring Town Planning Scheme No.3.

Planning approval for the premises was obtained from the Western Australian Planning Commission on 31 October 2013 for a period of ten years.

An Approval from the Shire of Mundaring for Extractive Industry was reissued on 18 January 2017 with expiry on 30 June 2017.

4.3.2 Department of Water

The proposed development is located within the Avon River Catchment Area, proclaimed under the *Rights of Water and Irrigation Act 1914.* DoW has advised that the Applicant "does not require a licence as water is being taken from an existing dam/soak which is not creek or bore fed" (Dust MP, 2016).

4.3.3 *Environment Protection and Biodiversity Conservation Act 1999* (Cth)

The proposal has not been referred or assessed under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth).

4.4 Part V of the EP Act

4.4.1 Guidance Statements

The overarching legislative framework of this assessment is the EP Act and EP Regulations.

DER Guidance Statements which inform this assessment are:

- Guidance Statement: Regulatory Principles (July 2015)
- Guidance Statement: Setting Conditions (October 2015)
- Guidance Statement: Land Use Planning (October 2015)
- Guidance Statement: Publication of Annual Audit Compliance Reports (May 2016)
- Guidance Statement: Decision Making (February 2017)
- Guidance Statement: Risk Assessment (February 2017)
- Guidance Statement: Environmental Siting (November 2016)

4.4.2 Works Approval

On 08/09/2015, DER received a works approval application from Trico Resources Pty Ltd for the extraction and screening of gravel on Lot 556 (3650) Toodyay Road, Bailup. Works Approval W5917/2015/1 was granted on 4 August 2016.

Four improvement conditions were included in the works approval as shown in Table 3:

Table 3: W5917/2015/1 Improvement Program

Improvement program		
Improvement reference	**Improvement**	**Date of completion**
IR1	The Licensee shall submit a revised Construction Noise Management Plan for Gravel Extraction Area 2. The	01/08/2017

	management plan shall meet the following requirements: • Total period of construction of noise abatement measures not to exceed 6 weeks; • Noise abatement measures to demonstrate compliance of L_{A10} assigned level for noise sensitive receptor B (as shown in Stakeholders Map in Schedule 1); • If compliance is not demonstrated at receptor B, details of further noise abatement measures to be implemented in order to achieve compliance at receptor B.	
IR2	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: a) complaints management including recording of all complaints, investigation and remedial actions; and b) a dust monitoring program including details on; - 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 B and G, as depicted in Schedule 1; - trigger values to evoke actions to manage dust generation; and - 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 3650 Toodyay Road.	One month after signing and prior to commencement of works
IR3	The Works Approval Holder shall submit to the CEO further information in regard to staging for the development of Gravel Extraction Area 1 and Gravel Extraction Area 2. The plans shall include: • expected monthly tonnages (product and overburden); • topographical plans for each year of production, indicating location and extent of disturbed areas and stockpiles; and • any changes to mobile equipment not consistent with those forecast by the acoustic modelling. The plans must seek to limit the amount of open disturbed areas at any one time and utilise progressive rehabilitation such that the dust impacts to sensitive receptors (in particular receptors G and B) can be demonstrated to be managed. Stockpiles must be located away from Premises boundaries, so as to increase the separation distance between disturbed areas and sensitive receptors.	Area 1 plans to be submitted at least two weeks prior to commencement of Area 1 works. Area 2 plans at least two weeks prior to commencement of works in Area 2.
IR4	The Works Approval Holder shall submit to the CEO a revised Stormwater Management Plan (SMP). The SMP must include, but not be limited to, information on: a) detailed schematics of the drainage and water storage infrastructure (trenches, cut-off drains, bunding and detention basins, existing dams etc.) such that contaminated stormwater does not enter Red Swamp Brook;	Within one month after signing and prior to commencement of works

	b) the diversion of clean stormwater away from operational stages; c) proposed impact and background monitoring locations along Red Swamp Brook[1]. Parameters to be measured shall include pH, electrical conductivity, total suspended solids and turbidity.	
IR5	The Works Approval Holder shall submit to the CEO information on the maximum seasonal groundwater level at locations of excavation.	Prior to commencement of works

Note 1: Proposed monitoring points may also be located beyond the premises boundary.

The Applicant has submitted a revised Construction Noise Management Plan (CNMP) for Gravel Extraction Area 2, a revised Dust Management Plan (Dust MP), further information in regard to staging for the development of Gravel Extraction Area 1 (Staging Plan Area 1), a revised Stormwater Management Plan (SMP) and information on ground water levels in accordance with W5917/2015/1 IR1, IR2, IR3, IR4 and IR5.

Information in regard to staging for the development Gravel Extraction Area 2 has not yet been submitted. Therefore operations will be limited to Extraction Area 1 under the current licence.

4.4.3 Noise modelling

Noise modelling submitted with the original application for the works approval W5917/2015/1 indicated that the assigned noise levels, as prescribed by the *Environmental Protection (Noise) Regulations 1997,* could not be met at receptor B (refer to Figure 2 below of this Decision Report) for works to be conducted at Gravel Extraction Area 2 without construction of a noise bund (acoustic barrier).

Noise modelling of works to be conducted at Gravel Extraction Area 1 (as shown in Figure 1 of this report) were found to meet the noise assigned levels at surrounding receptors.

The proponent sought to apply for approval to construct the noise bund under regulation 13 of the **Noise Regulations**, which allows exemption from the noise assigned levels under certain circumstances. A Construction Noise Management Plan (CNMP) for the noise bund was submitted as part of the works approval application, however it was deemed to be unacceptable, given the proposed duration of the construction period for the noise bund (acoustic barrier) was between 4 and 6 months. Consequently condition 1.2.3 of W5917/2015/1 prohibited construction of stage 2 works (works at Gravel Extraction Area 2). An improvement requirement was added to condition 3.1.1 tor require resubmission of the CNMP, with a construction period limited to six weeks and evidence supplied of compliance with the noise assigned level L_{A10} at receptor B.

4.4.4 Acoustic barrier construction

Prior to authorisation of works at Gravel Extraction Area 2, an acoustic barrier must be constructed at the western boundary of the Premises in order to ensure that noise at receptor B meets the noise assigned levels as per the *Environmental Protection (Noise) Regulations* 1997.

A revised CNMP, required by improvement requirement IR1 of condition 3.1.1 of the works approval W5917/2015/1, was submitted on 23 November 2016. DER Noise Regulation has determined that the Plan meets the requirements to satisfy regulation 13 of the *Environmental Protection (Noise) Regulations 1997*.

The key requirements are that:

- the construction of the acoustic barrier at area 2 (if made of earth) must take place in one campaign not exceeding 6 weeks duration;

- the permissible construction hours are between 0700 and 1900 hours on any day except Sundays and Public Holidays;
- the acoustic barrier is to be located on the western boundary of Area 2 as shown in Map 3 of Schedule 1;
- construction materials must be sourced from areas outside of Area 2; and
- the sound power levels of the major equipment items must meet the power levels as modelled in the Construction Noise Management Plan (and shown below in Table 4).

Table 4: Equipment Sound Power Levels As Quoted in the CNMP

Equipment Description	Sound Power Levels dB(A)
Quarry Truck (CAT740)	106
Front End Loader (CAT 988H)	105
Dozer (CAT D7)	109

5. Clearing

Much of the site has been cleared.

Clearing of 100 trees was assessed under Section 51 of the Environmental Protection Act 1986 as Clearing Assessment Report CPS 6782/1. No conditions were imposed regarding clearing of vegetation.

6. Consultation

The Application was advertised in the *West Australian* newspaper on 12 December 2016 for a comment period ending on 2 January 2017. No comments were received.

Letters inviting comment were sent to the Department of Water and Shire of Mundaring on 12 December 2016. No comments were received.

7. Location and siting

7.1 Siting context

The premises is located at Lot 556 on Plan 77558 (3650) Toodyay Road, Bailup 13 kilometres northeast of the town of Gidgegannup. The premises is bounded by Toodyay Road at the northwestern end and is surrounded by farming and semi-rural properties.

7.2 Residential and sensitive premises

Seven potentially sensitive receptors (dwellings) have been identified adjacent to the premises. These dwellings are referred to as receptors A to G as shown in Figure 2 below. Residences in a housing development located immediately north of Receiver A will not receive greater impacts than receptor A, therefore receptor A is considered to be representative of all receptors further north in this assessment.

The approximate distances of sensitive receptors to extraction Area 1 and extraction Area 2 are listed in Table 5.

Table 5: Receptors and distance from activity boundary

Sensitive Land Uses	Distance from Prescribed Activity
Residential premises B	200 m from Area 2, approximately 1,000 m from Area 1.
Residential premises G	700 m from Area 1, more than 1,000 m from Area 2
Residential premises A	730 m from Area 2, more than 1,000 m from Area 1.
Residential premises C	Approximately 1,000 m from Area 2, more than 1,000 m from Area 1.
Residential premises D	More than 1,000 m from Areas 1 and 2
Residential premises E	More than 1,000 m from Areas 1 and 2
Residential premises F	More than 1,000 m from Areas 1 and 2

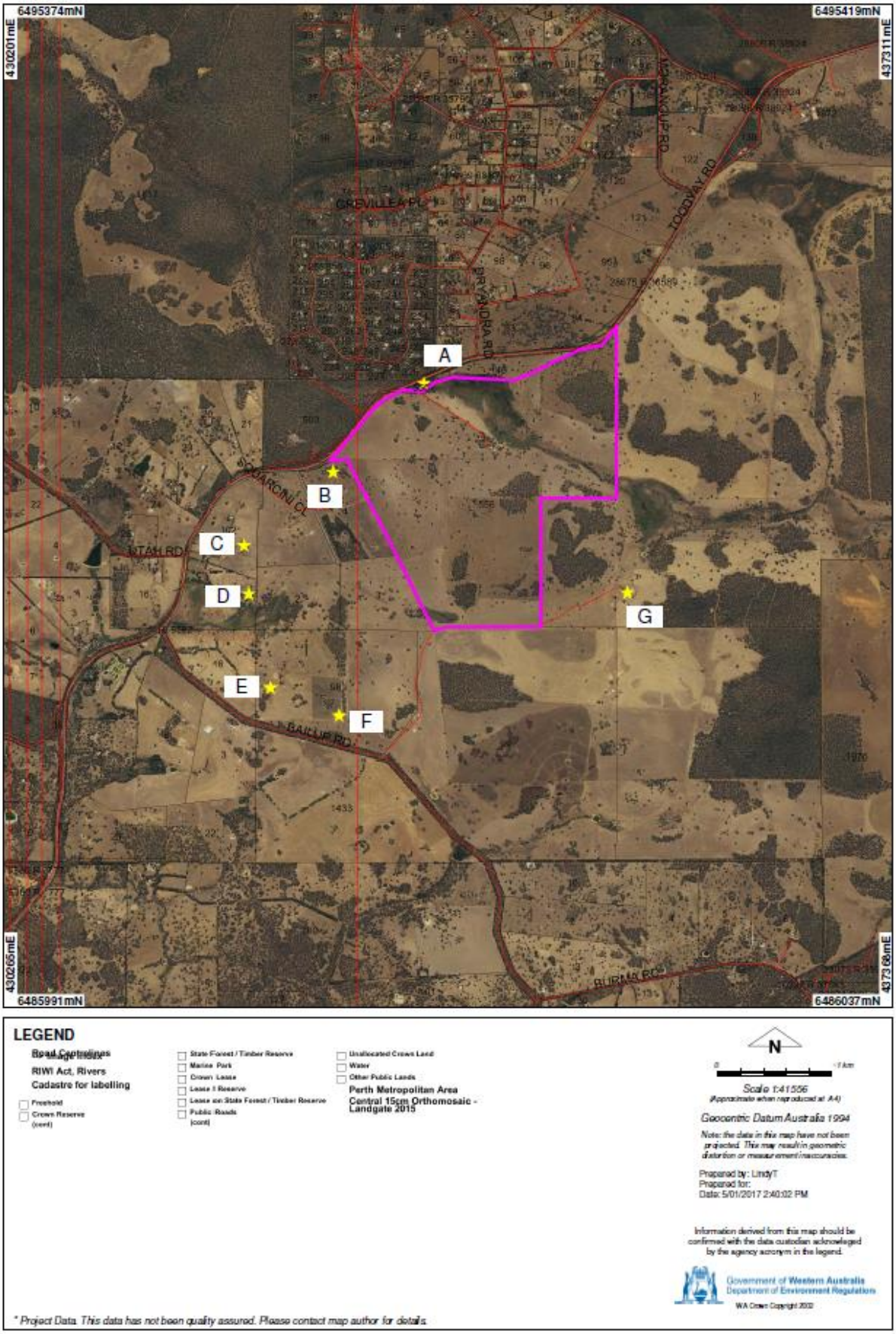

Figure 2: Premises boundary and locations of sensitive land users.

7.3 Specified ecosystems

The distances to specified ecosystems are shown in Table 6.

Table 6: Specified ecosystems

Specified ecosystems	Distance from the Premises
Red Swamp Brook, a major tributary to the Lower Avon River.	Traverses through the site (see Figure 1).
Avon River Catchment Area (proclaimed under the RIWI Act 1914)	The premises is located within the Catchment.

7.4 Surface water

Red Swamp Brook traverses through the site (see Figure 1 above). Red Swamp Brook is a tributary of the Lower Avon River.

Red Swamp Brook was assessed in June 2008 as having relatively high, fresh stream flow, and minimal bank erosion with riparian vegetation generally healthy but understorey dominated by weeds (Department of Water, 2008).

Water is accessed from Red Swamp Brook for non-potable use by residences downstream of the premises.

Bailup Creek, a minor non perennial watercourse, is approximately 1,000 m south west of the premises.

7.5 Groundwater

Groundwater found on the Darling Plateau is generally very shallow and referred to as superficial water. The superficial aquifers are generally small and yield limited supplies of fresh to brackish water (Waterdirect, 2010).

In the vicinity of the waterlogged area groundwater appears to reach the surface at an elevation of approximately 280 m AHD. Extraction Area 1 is located atop a shallow hill with ground level contours varying from 320 m AHD to 343 m AHD. Extraction Area 2 is located atop a shallow hill with ground level contours varying from 295 m AHD to 307 m AHD (Waterdirect, 2010).

Based on the above information, the Applicant has estimated separation distances between the bottom of excavation and maximum ground level concluded as follows:

Extraction Area	Lowest Natural Ground Level	Highest Natural Ground Level	Max depth of excavation	Maximum ground water level	Minimum separation distances between lowest excavation and maximum groundwater
Area 1	320 m AHD	343 m AHD	15 m	280 m AHD	25 m
Area 2	295 m AHD	307 m AHD	10 m	280 m AHD	5 m

7.6 Soil type

Soil type key at the premises is JZ2, described by Northcote *et al.,*1960-1968 as: characterized by lateritic gravels and block laterite: the chief soils are ironstone gravels with sandy and earthy matrices. They overlie duricrusts of re-cemented ironstone gravels and/or vesicular laterite, and/or mottled-zone and/or pallid-zone material. These soils cover ridges

and slopes where some soils containing ironstone gravels also occur. Leached sands are a feature of the drainage-ways and basins.

7.7 Topography

There are three hills on the premises as shown in Figure 3 below. The highest, at the location of extraction Area 1, has an elevation of 340 m AHD, extraction Area 2 has an elevation of 305 m AHD, and a hill at the and the northeast of the premises is 335 m AHD.

The lowest portion of the property is north at Red Swamp Brook where the elevation drops to approximately 260 m AHD. Surface water runoff will be directed to a natural depression in the southwest corner of the site where elevation drops to 280 m AHD. This depression forms a natural soak/dam that will be a source of water for dust suppression.

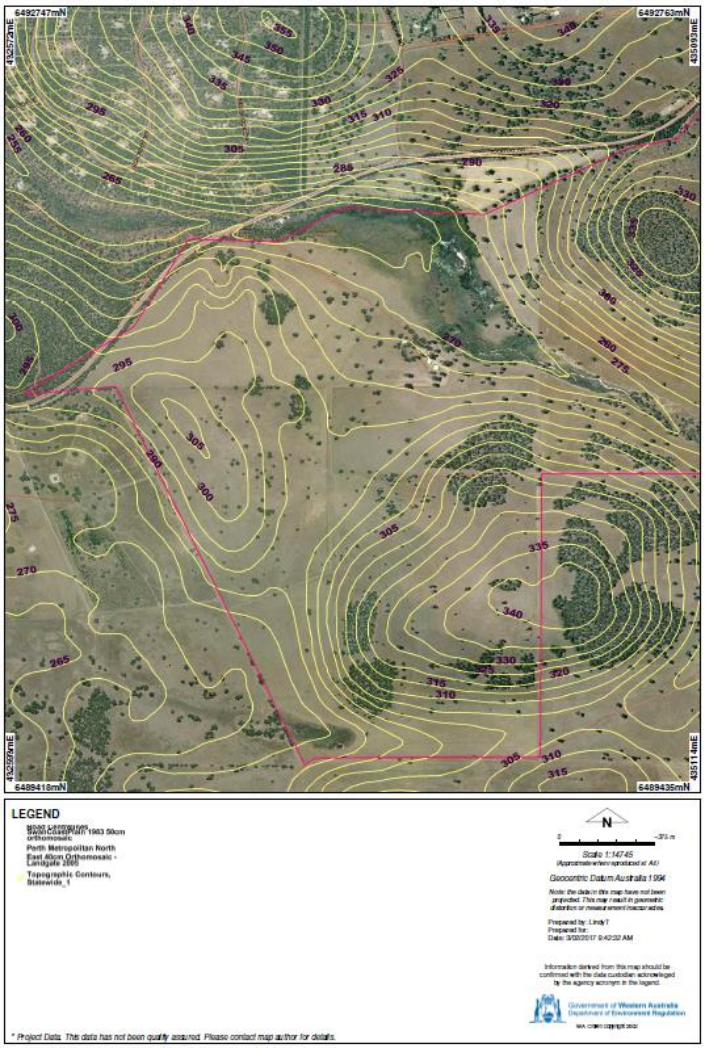

Figure 3: Topographic contours

7.8 Meteorology

The climate is Mediterranean with hot dry summers and cool wet winters.

The site is largely cleared and exposed (see Figure 3). In summer, when risk of dust is higher due to dry conditions, winds in the morning are most likely to be from the southeast, and strongest, in the morning (information derived from WA Bureau of Meteorology data).

8. Risk assessment

8.1 Confirmation of potential impacts

Identification of key potential emissions, pathways, receptors and confirmation of potential impacts are set out in Table 7 below. Table 7 also identifies which potential emissions will be progressed to a full risk assessment. Some potential emissions/impacts may not receive a full risk assessment where a potential receptor or pathway cannot be identified or where the emission/impacts are regulated under a Ministerial Statement.

Table 7: Identification of key emissions

			Potential Emissions	Potential Receptors	Potential Pathway	Potential Impacts	Continued to detailed risk assessment?	Reasoning
Source (see Section 3.1 for infrastructure references)	**Processing, movement and storage of material extracted from the ground**	Operation of crushing and screening plant, transfer and stockpiling of materials.	Fugitive dust emissions	Represented by residences A to G (see Figure 2)	Air (windborne)	Amenity impacts may include visible dust and deposition of material.	Yes	Yes (see section 8.4)
				Vegetation adjacent to mining areas	Air (windborne)	Potential smothering suppression of photosynthetic and respiratory functions	No	No specified ecosystem.
			Noise	Residences A – G and Area A (see Figure 2)	Air (windborne)	Impacts on amenity and potential impacts on mental health.	Yes	Yes (see section 8.5)
			Leaks and spills of hydrocarbons.	Ground	Direct discharges to land.	Potential contamination of soil	Yes	Yes (see section 8.8)

			Potential Emissions	Potential Receptors	Potential Pathway	Potential Impacts	Continued to detailed risk assessment?	Reasoning
	Operation of mobile and fixed equipment	Stormwater management	Stormwater contaminated with increased sediment load including screened fines.	Ground. Red Swamp Brook (500 m down gradient of Gravel Extraction Area 1).	Direct topographic discharge during significant rainfall events Overflow of soak.	Erosion and scouring of ground. Overland sedimentation inhibiting vegetation growth and survival. Increased turbidity of Swamp Brook which may limit light availability to submerged macrophytes (aquatic plants) inhibiting growth by preventing photosynthesis.	Yes	Yes (see section 8.6)
		Acid Sulfate Soils	Release of sulfuric acid metals and metalloids	Groundwater, Red Swamp Brook	Percolation down through soil to groundwater or through surface runoff	Impacts to groundwater or Red Brook Swamp due increased acidity and increased concentrations of metals and metalloids.	Yes	Yes (see section 8.7)
		Fuel storage (diesel) and use.	Breach of containment causing hydrocarbon discharge to land	Ecosystems adjacent to storage area	Direct discharge	Soil contamination inhibiting vegetation growth and consequences for survival and health of fauna.	Yes	Yes (see section 8.8)

8.2 Risk Criteria

During the assessment the risk criteria in Table 8 below will be applied to determine a risk rating set out in this section 8.

Table 8: Risk Criteria

Likelihood	Consequence				
	Slight	Minor	Moderate	Major	Severe
Almost Certain	Medium	High	High	Extreme	Extreme
Likely	Medium	Medium	High	High	Extreme
Possible	Low	Medium	Medium	High	Extreme
Unlikely	Low	Medium	Medium	Medium	High
Rare	Low	Low	Medium	Medium	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:**		
			Environment	**Public Health* and Amenity (such as air and water quality, noise, and odour)**
Almost Certain	The risk event is expected to occur in most circumstances	Severe	• **on-site impacts**: catastrophic • **off-site impacts local scale**: high level or above • **off-site impacts wider scale:** mid level or above • Mid to long term or permanent impact to an area of high conservation value or special significance^ • Specific Consequence Criteria (for environment) are significantly exceeded	• Loss of life • **Adverse health effects:** high level or ongoing medical treatment • Specific Consequence Criteria (for public health) are significantly exceeded • **Local scale impacts:** permanent loss of amenity
Likely	The risk event will probably occur in most circumstances	Major	• **on-site impacts**: high level • **off-site impacts local scale**: mid level • **off-site impacts wider scale**: low level • Short term impact to an area of high conservation value or special significance^ • Specific Consequence Criteria (for environment) are exceeded	• **Adverse health effects:** mid level or frequent medical treatment • Specific Consequence Criteria (for public health) are exceeded • **Local scale impacts**: high level impact to amenity
Possible	The risk event could occur at some time	Moderate	• **on-site impacts**: mid level • **off-site impacts local scale**: low level • **off-site impacts wider scale**: minimal • Specific Consequence Criteria (for environment) are at risk of not being met	• **Adverse health effects:** low level or occasional medical treatment • Specific Consequence Criteria (for public health) are at risk of not being met • **Local scale impacts:** mid level impact to amenity
Unlikely	The risk event will probably not occur in most circumstances	Minor	• **on-site impacts**: low level • **off-site impacts local scale**: minimal • **off-site impacts wider scale**: not detectable • Specific Consequence Criteria (for environment) likely to be met	• Specific Consequence Criteria (for public health) are likely to be met • **Local scale impacts:** low level impact to amenity
Rare	The risk event may only occur in exceptional circumstances	Slight	• **on-site impact**: minimal • Specific Consequence Criteria (for environment) met	• **Local scale**: minimal to amenity • Specific Consequence Criteria (for public health) met

^ Determination of areas of high conservation value or special significance should be informed by the *Guidance Statement: Environmental Siting.*

* In applying public health criteria, DER may have regard to the Department of Health's, *Health Risk Assessment (Scoping) Guidelines* "on-site" means within the **prescribed premises** boundary.

8.3 Risk Treatment

DER will treat risks in accordance with the Risk Treatment Matrix in Table 9 below:

Table 9: Risk Treatment

Rating of Risk Event	Acceptability	Treatment
Extreme	Unacceptable.	Risk event will not be tolerated. DER may refuse application.
High	Acceptable subject to multiple regulatory controls.	Risk event will be tolerated and may be subject to multiple regulatory controls. This may include both outcome-based and management conditions.
Medium	Acceptable, generally subject to regulatory controls.	Risk event is tolerable and is likely to be subject to some regulatory controls. A preference for outcome-based conditions where practical and appropriate will be applied.
Low	Acceptable, generally not controlled	Risk event is acceptable and will generally not be subject to regulatory controls.

8.4 Risk Assessment - Fugitive Dust

8.4.1 Hazard characterisation and impact

Fugitive dust may be generated by vehicle movement on unsealed roads, stockpiles, exposed areas, processing (crushing and screening) and during transfer of materials. Depending on length of exposure, density and material type, dust may cause health and amenity impacts.

The closest sensitive receptor (dwellings) to Area 1 is receptor G, located 700 m away. Receptors A and B are located 1,000 m or more from Area 1.

The closest sensitive receptors (dwellings) to Area 2 are receptor B located 200 m away and receptor A, located 730 m away (refer to Figure 2 above).

During construction of a noise bund (Section 8.5 below), Receptor B may be less than 200 m from the bund construction.

Information on staging for the development Gravel Extraction Area 2 has not yet been submitted as required by W5917/2015/1 Condition IR 3. Therefore operations will be limited to Extraction Area 1 under the current licence. Further risk assessment and a licence amendment will be required prior to commencement of operations in Area 2.

Dwellings north of receptor A are located within an area vegetated by trees, and are uphill of the pit. Trees will provide a natural filter and barrier to dust (refer to Figure 3).

Impacts to receptors are likely to be greatest during times when material is excavated, crushed, screened and stacked, and during acoustic barrier construction, especially during windy, dry weather conditions which is most likely to occur on summer mornings.

The Applicant expects that an average of 3 – 4,000 tonnes of gravel will be crushed per day. Peak crushing times will occur most frequently in spring and summer when dust levels may be higher due to lack of moisture and more regular higher winds.

The pit will be operated during all or most months of the year, Monday to Saturday from 7am to 5 pm, but not operated on Sundays or public holidays.

Particulate matter finer than 10 microns (**PM10**) has the potential to be drawn deep within the lungs causing possible respiratory problems for nearby people. In addition, dust can cause eye irritation and reduce amenity.

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. More acute health impacts from short term exposures are only likely to occur from very high concentrations, similar to that experienced by a worker in a confined space without respiratory protection. However, this is not representative of the expected conditions of the closest receptors (the closest receptor B a dwelling being 200 m away from the closest operating areas, see Figures 1 and 2).

Elevated Total Suspended Particulates (TSP) can also impact ambient environmental quality by visual impacts, and deposition of dust on homes and personal belongings.

8.4.2 Criteria for assessment

There are no directly applicable ambient air quality standards for the premises.

The Delegated Officer has determined the **Ambient Air Quality NEPM** provides a benchmark against which the risk of adverse health effects arising from exposure to PM10 (from any source) can be assessed (but is not considered a compliance standard), and is shown in Table 10. Note that NEPM concentrations are related to the receiving location, not concentrations of emissions discharged at the premises boundary.

Table 10: Ambient Air Quality NEPM – Standards for pollutants

Pollutant	Averaging period	Maximum concentration standard	Maximum allowable exceedances
Particulates as PM10	24 hours	50 µg/m^3	None
	Annual	25 µg/m^3	

8.4.3 Proponent controls

The Applicant has submitted a revised Dust Management Plan (Dust MP, 2016) and a Staging Plan (Area 1), 2016. This assessment has reviewed these plans which contain the controls for fugitive dust set out in Table 11 below.

Table 11: Proponent infrastructure controls for fugitive dust emissions

Site Infrastructure/Activity	Description	Operation details	Reference Figure
Controls for dust			
Extraction areas	Extraction confined to Areas 1 and 2.	Excavation will be staged with each stage's excavation area up to 3 hectares at any one time.	Site Plan – Figure 1

Site Infrastructure/Activity	Description	Operation details	Reference Figure
Disturbed Areas	Areas disturbed and exposed by extraction activities	Area of disturbed surfaces minimised by hydro-mulch and/or revegetation measures.	NA
Stockpiles of topsoil and overburden not required as noise bund material.	Topsoil and overburden removed for each excavation stage and stockpiled for later use.	Stockpiled adjacent to the corresponding stage of each excavation area.	NA
Soak/ Dam	Water source for dust suppression and storage of stormwater.	Located in southwest corner of the premises.	Site Plan – Figure 1
Water cart	NA	Available on site full time for purposes of dust suppression.	NA
Internal roads	Crossover to Toodyay Road sealed for 70 metres.	NA	NA
	Unsealed roads surfaced with gravel.	Application of water to gravel roads when under heavy use, by water cart. Occasional use of water additives/coagulates for application over gravel tracks.	NA
Trucks	After loading of final product	Trucks loaded with final product covered with suitable tarpaulins before leaving site.	NA
Crushing and screening plant and processing stockpiles.	Processing plant - Terex J1175 crusher and McCloskey R155 screener (or similar)	Plant and process stockpiles located in depression point between Extraction Area 1 and Extraction Area 2.	Site Plan Figure 1
Monitoring			
Continuous dust monitoring	Continuous dust monitoring devices (Dustrak II Aerosol Monitor or equivalent) located between Extraction Area 1 and receptor G (Station 101); and between Extraction Area 2 and receptor B (Station 201) as depicted in Figure 4. At least one of the dust monitoring stations has a real time weather station to monitor meteorological data – specifically wind speed and direction. Data logged for retrieval.		

Site Infrastructure/Activity	Description	Operation details	Reference Figure
	Dust monitoring stations equipped with SMS or equivalent automatic feedback to the quarry manager of supervisor, with a trigger value concentration for PM10 of 0.5 mg/m^3. The authorised person will evaluate the conditions and implement management measures.		
Observational management	Daily visual monitoring of weather conditions and on-going monitoring of gravel tracks, access to Toodyay Road, stockpiles and activity areas for dust lift off for preparation of requirements for dust suppression. When dust controls are ineffective, works will be temporarily suspended, with application of water to critical areas causing dust lift-off.		
Complaints	Immediate investigation and follow up. Cause of dust nuisance and eliminate/action taken. Details of the investigation, actions and resolution documented. Complainants advised of complaint handling and resolution process, including receipt of a copy of the Complaint Report.		

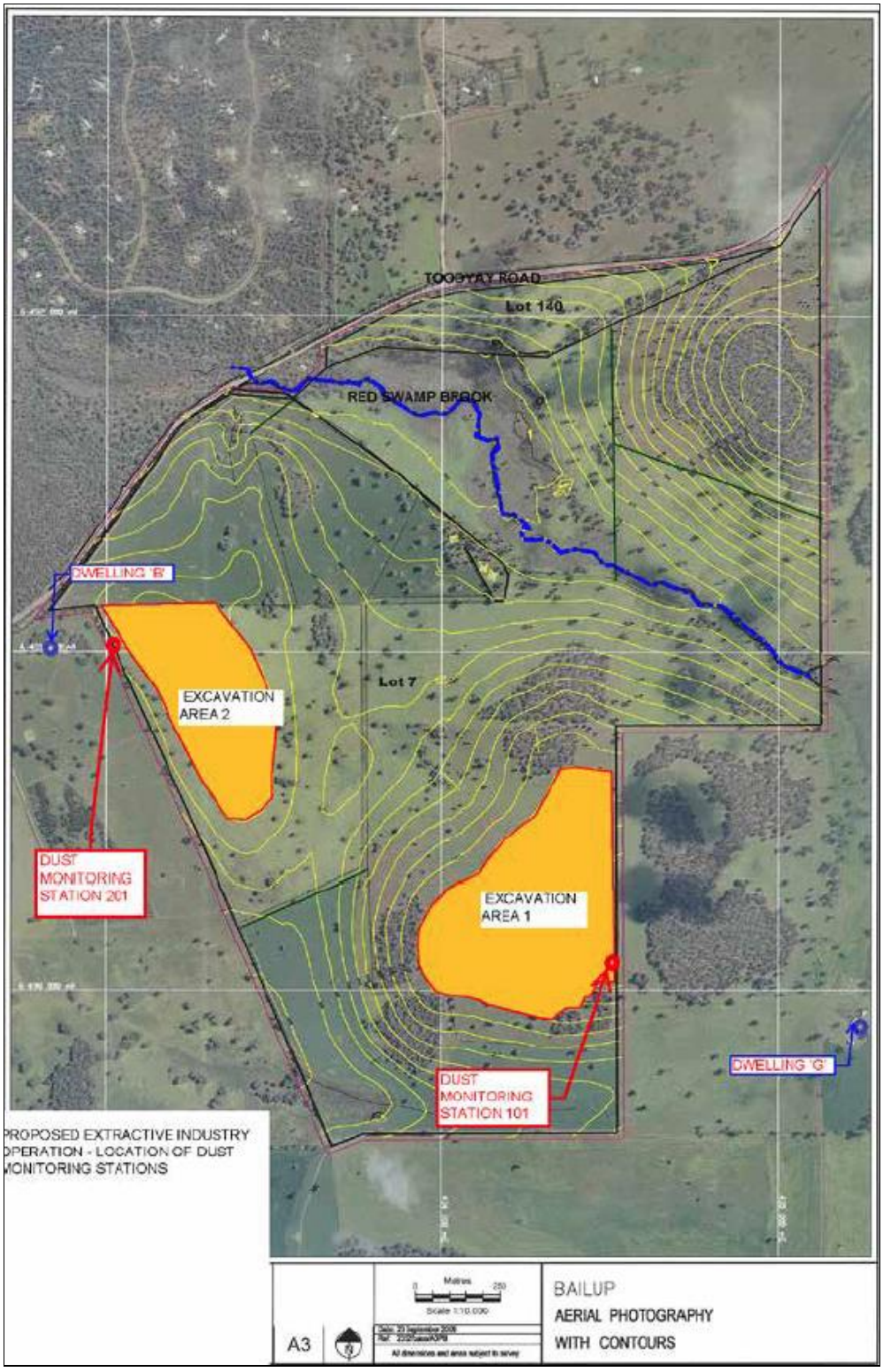

Figure 4: Location of dust monitoring devices

8.4.4 Key findings

The Delegated Officer has reviewed the information regarding fugitive dust impacts from the premises and notes the following key points:

1. Operations will be limited to Extraction Area 1 under the current licence. The closest dwelling from extraction Area 1 is approximately 700m to the

southeast. All other receptors are more than 1,000 distant.

2. A water cart will be available at all times for dust suppression purposes.
3. Water will be sourced from a soak/dam on the premises.
4. Continuous dust monitoring will be conducted with a PM10 trigger value alert of 0.5 mg/m^3 sent by SMS or equivalent to a person authorised by Swan Quarry to take management actions.
5. Complaints about dust will be investigated, actioned, and records kept.

8.4.5 Consequence

Based upon distance to the closest dwellings and the volume of material to be extracted and processed throughout the year, the **Delegated Officer** has determined that the impact of fugitive dust emissions may be mid-level impacts to amenity at a local scale. Therefore, the Delegated Officer considers the consequence to be **Moderate.**

8.4.6 Likelihood of consequence

Based upon the management controls proposed by the applicant including real time dust monitoring with SMS alert, and the distance to the closest receptors, the Delegated Officer has determined that the likelihood of moderate consequences of fugitive dust emissions could occur at some time. Therefore, the Delegated Officer considers that likelihood would be **Possible**.

8.4.7 Overall rating

The Delegated Officer has compared the consequence and likelihood ratings described above for the Risk Criteria (Table 8) and determined that the overall rating for the risk of fugitive dust emissions on sensitive receptors during operation is **Medium.**

8.5 Risk Assessment - Noise

8.5.1 Hazard characterisation and impact

Noise will be generated from normal operations on site including noise from excavations, heavy machinery, product loading and vehicle movement. Noise may impact on amenity.

Noise sensitive receptors are located near the premises. The closest are receptor B located 200 m from Area 2, receptor G, located 700 m from Area 1, and receptor A located 730 m from Area 2 (refer to Figures 1 and 2 above). Receptor A is

8.5.2 Criteria for assessment

Acoustic modelling submitted and assessed for works approval W5917/2015/1 indicated that compliance with the Noise Regulations would be met for Area 1 operations, but would not be met at receptor B when operations were conducted in Area 2.

The Applicant submitted a revised Construction Noise Management Plan (CNMP) as required by condition IR1 of the Works Approval, with measures to achieve noise compliance when operating in Area 2. The CNMP proposes that a sound attenuating bund will be constructed during a maximum 6 week time period.

DER has reviewed the revised CNMP including noise modelling provided in the plan and determined that construction of the bund will likely comply with the Noise Regulations, given the sound power ratings of the heavy machinery are consistent with the CNMP, and when topsoil is used as the bund construction material. Given the volume of the proposed bund, topsoil will be required to be sourced from outside the premises.

See Section 4.4.3 above and W5917/2015/1 and Decision Document (accessible on DER's website).

8.5.3 Applicant controls

The Applicant has proposed the following controls to reduce and manage noise emissions are set out in Table 12 below:

Table 12: Applicant's proposed controls for noise

Control	Description
Acoustic barrier	Dimensions such as to ensure that the requirements of the *Environmental Protection (Noise) Regulations 1997* can be met at the nearest sensitive receptor. Located in accordance with Figure 5 Constructed within a 6 week time period and prior to operation in Area 2. Construction work carried out in accordance with Section 4 of AS2136- 2010 *Guide to Noise and Vibration Control on Construction, Maintenance and Demolition Sites*. Material stockpiled in Area 1 until the required amount of material is available to construct the bund.
Hours of operation	Monday to Saturday 7 am to 5 pm, no operation on Sundays or public holidays.
Static equipment	Provided with sound dampening and mufflers.
Processing plant and product stockpiles	Process area located in depression between Area 1 and Area 2 (Figure 1).
Roads	Well graded to reduce suspension compression noise.
Complaints Response	Complaints investigation and response procedure, with records kept.

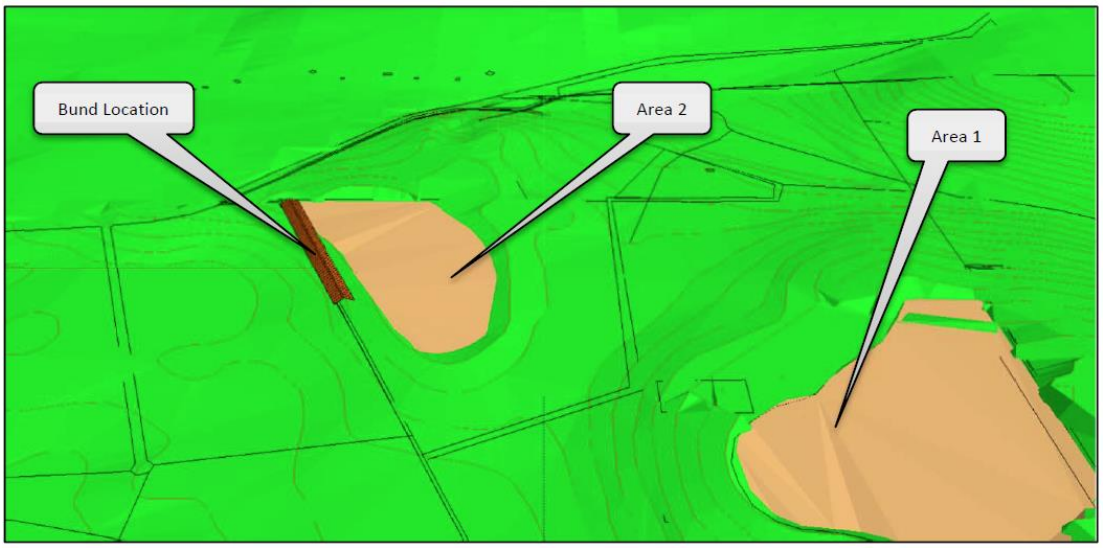

Figure 5: Location of the acoustic barrier.

8.5.4 Key findings

The Delegated Officer has reviewed the information regarding noise impacts from the premises and has found that with operations Monday to Saturday 7 am to 5 pm (not including public holidays):

1. **Noise modelling indicates that operations associated with Area 1 will likely be compliant with Noise Regulations.**
2. **An acoustic barrier will need to be installed on the western of Area 2 prior to operations commencing in Area 2 in order to meet the requirements of the Environmental Protection (Noise) Regulations 1997 at the nearest sensitive receptor (Receptor B).**

8.5.5 Consequence

Noise modelling indicates that: noise from cumulative activities when Area 1 is in operation may be compliant with the Noise Regulations; and noise from cumulative activities when Area 2 is in operation may be compliant with the Noise Regulations with the proposed acoustic barrier in place. The Delegated Officer has determined that the Noise Regulations can be met. Therefore, the Delegated Officer considers the consequence to be **minor.**

8.5.6 Likelihood of consequence

Based upon the controls proposed by the Applicant including installation of an acoustic barrier within a six week period to reduce noise received at receptor B, the Delegated Officer has determined that the event of the Noise Regulations not being met will probably not occur in most circumstances. Therefore, the Delegated Officer considers the likelihood to be **Unlikely.**

8.5.7 Overall rating

The Delegated Officer has compared the consequence and likelihood ratings described above for the Risk Criteria (Table 8) and determined that the overall rating for the risk of noise on sensitive receptors is **Medium.**

8.6 Risk Assessment - stormwater

8.6.1 Description of risk event - stormwater

Screened fines can become suspended and highly mobile in stormwater during heavy rainfall. The topography of the natural ground surface may direct stormwater in the direction of Red Swamp Brook, a tributary to the Avon River (refer to Section 7.7 for topographic map).

Sediments within stormwater have the potential to increase the turbidity of Red Swamp Brook, which is located approximately 500 m down gradient of extraction areas. Significant rainfall events may result in the transport of fine particles from the extraction areas to the Red Swamp Brook.

Red Swamp Brook was assessed in June 2008 as having relatively high, fresh stream flow, and minimal bank erosion with riparian vegetation generally healthy but understorey dominated by weeds (DoW, 2008). Large areas of cleared agricultural land surround the tributary.

High levels of turbidity in the Red Swamp Brook may limit light availability to submerged macrophytes (aquatic plants) and inhibit their growth by preventing photosynthesis. Water passing through Red Swamp Brook is also used as a non-potable water supply at the downstream Regal Hill Estate and contamination may impact its usability.

8.6.2 Criteria for Assessment

Water quality guidelines (ANZECC 2000) recommends that the trigger level for turbidity for freshwater in slightly to moderately disturbed ecosystems in south west Australia measured in NTU, is between 10 and 100 NTU depending on condition of the catchment and depth of the water body.

However the turbidity of water is easier to measure by Total Suspended Solids (**TSS**) and can be measured in the field, enabling immediate management responses where required.

Turbidity naturally varies with flow rates in streams. Therefore it is not practical to apply absolute limits for turbidity levels. Instead, limits for deviations from background turbidity levels should be applied.

The Delegated Officer considers that differences in turbidity levels between upstream and downstream of potential discharge should not vary by more than 20%. Variations above that should trigger a management response.

8.6.3 Applicant controls

The site's topography and stormwater flow directions from gullies and extraction areas, and with proposed cut off drains to divert water away from Red Swamp Brook, are shown in Figure 6 below.

The Licensee proposed the following infrastructure controls for stormwater as set out in Table 13 below.

Table 13: Applicant's infrastructure controls for stormwater

Site Infrastructure	Description	Operation details	Reference Figure
Controls for stormwater			
Cut off drains	Constructed at commencement of earthworks. Constructed to divert stormwater overflow from extraction areas to a soak/dam south of the premises. Constructed to divert stormwater away from Red Swamp Brook.	NA	Figure 6 - Stormwater flow and proposed cut off drains.
Rip-rap, and screening fabrics, or hay bales.	Located at gullies where stormwater flows off the works area.		
Soak/dam	Collection point for diverted stormwater.	Water used for dust suppression	
Surface stabilisation	Revegetation	Revegetation Management Plan	

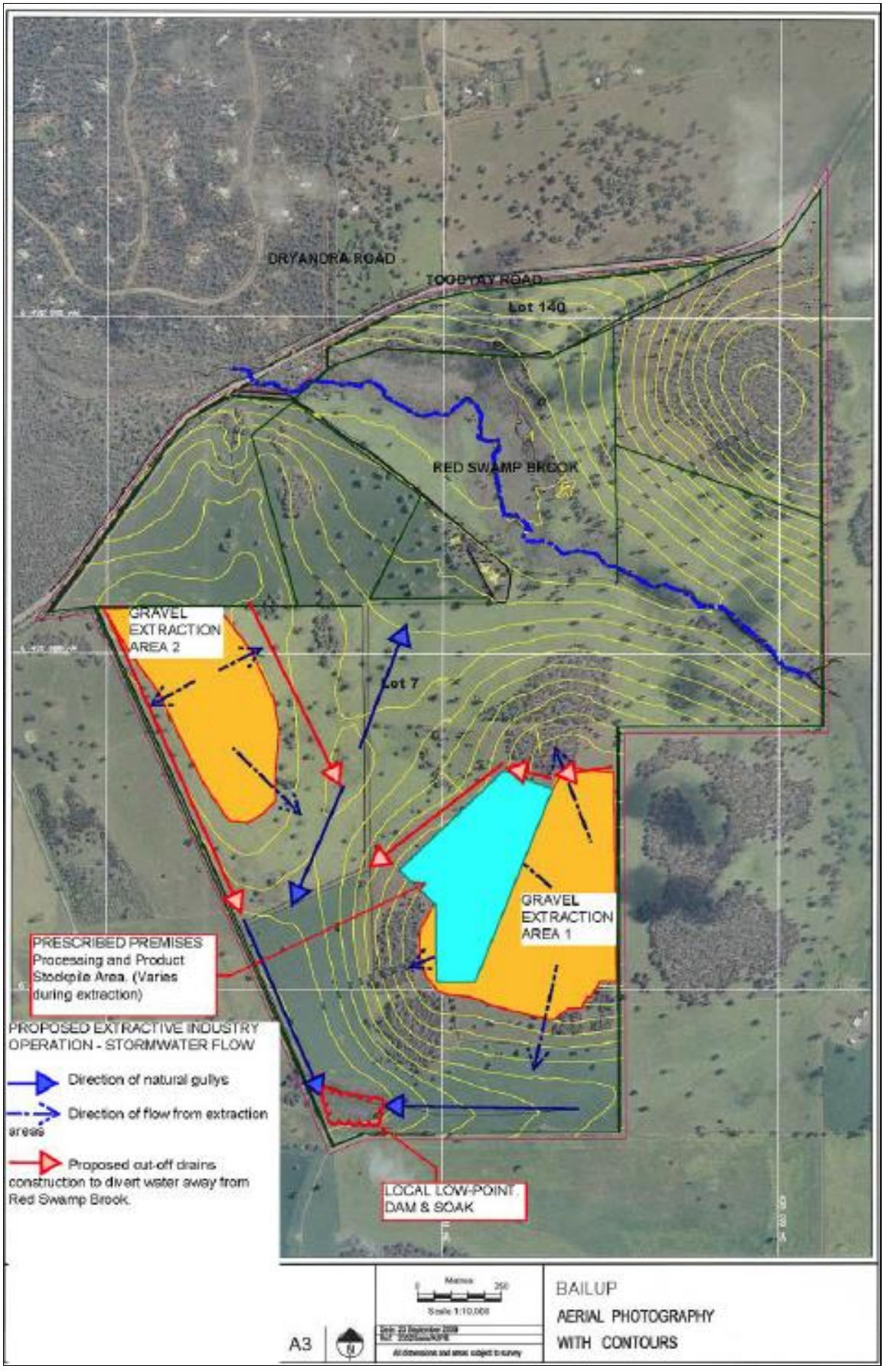

Figure 6: Stormwater flow and proposed cut off drains

The Licensee has proposed monitoring at locations indicated in Figure 7 below.

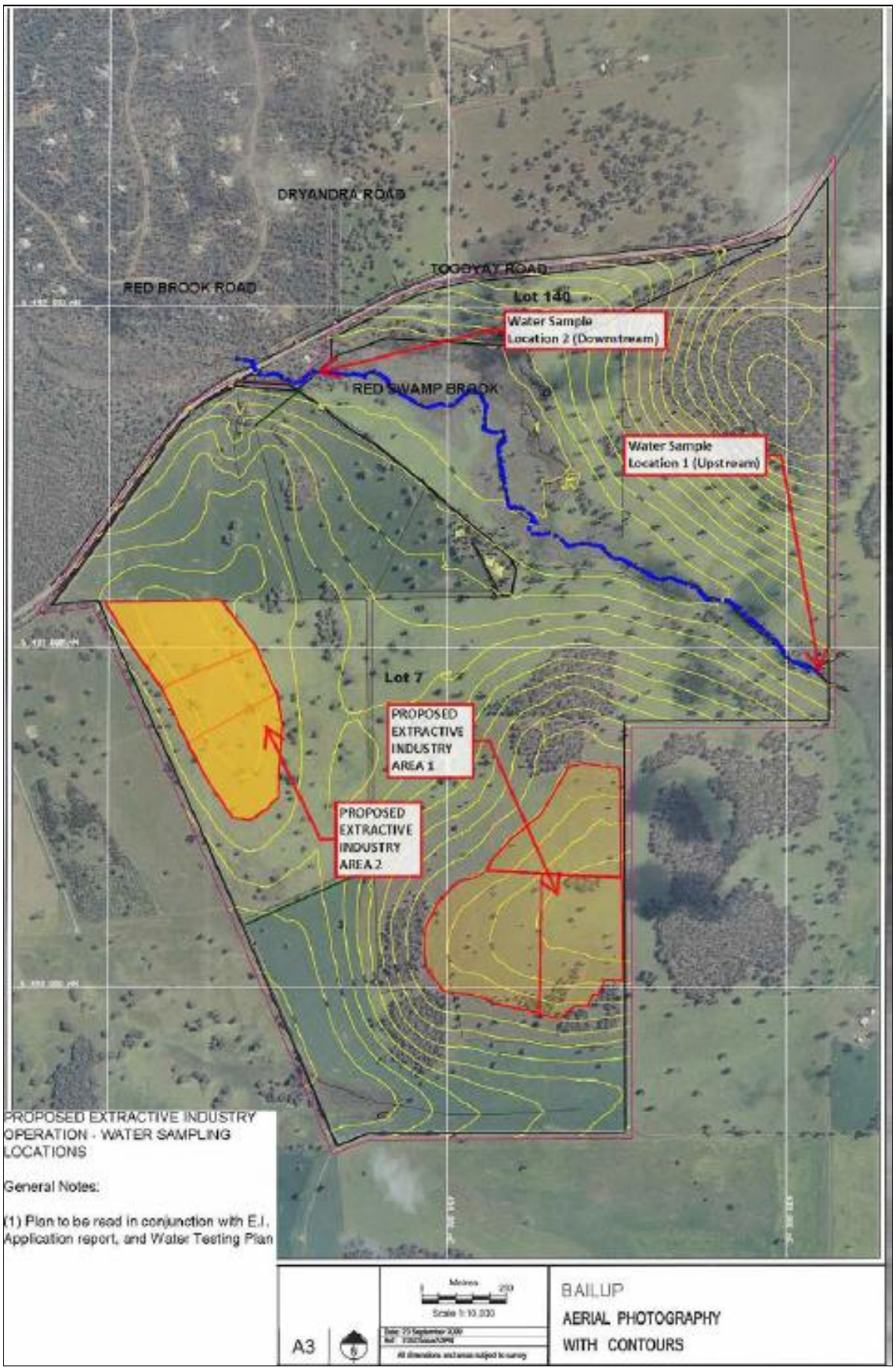

Figure 7: Proposed monitoring locations Red Swamp Brook

8.6.4 Key findings

The Delegated Officer has reviewed the information regarding risk of contaminated stormwater and notes the following key points:

1. Red Swamp Brook, which has beneficial use and amenity values, is located 500m north and 950 m north east of the extraction areas.
2. Stormwater loaded with sediment may move overland to Red Swamp Brook if uncontrolled.
3. The Applicant proposes to divert stormwater to a soak/dam and trap sediments by construction of cut-off drains and sediment traps.
4. Sediment in stormwater flowing from the extraction areas should be attenuated by rip-rap and screening fabrics.
5. Turbidity can most practically be measured by TSS, in the field. Variations between upstream and downstream of any discharge should not be more than 20%.

8.6.5 Consequence

If contaminated stormwater flows into Red Swamp Brook, this would constitute environmental impacts off site at a local level with specific consequence criteria not being met, and amenity impacts at a local scale with mid-level impacts to beneficial use. Therefore, the Delegated Officer considers the consequence of impact from contaminated stormwater to be **Moderate.**

8.6.6 Likelihood of consequence

The Delegated Officer has determined with consideration to the controls proposed by the applicant including use of riprap and screening fabrics for sediment attenuation, that impact from stormwater occurring will probably not occur. Therefore, the Delegated Officer considers the likelihood of Risk Event 1 to be **Unlikely**.

8.6.7 Overall rating of risk of stormwater

The Delegated Officer has compared the consequence and likelihood ratings described above with the Risk Rating Matrix (Table 8) and determined that the overall rating for the risk of Stormwater contamination is **Medium.**

8.7 Risk Assessment – Acid Sulfate Soils (ASS)

8.7.1 Identification and general characterisation of emission

The Applicant has identified the northern section of the premises surrounding Red Swamp Brook as having a high risk of **ASS** occurring within 3 m of the natural soil surface. Figure 7 depicts the proximity of high risk ASS areas to the proposed Gravel Extraction Area 1.

ASS remain benign until the soils are exposed to air. As can be seen in Figure 7, the northern boundary of Gravel Extraction Area 1 straddles the estimated boundary for high risk ASS suggesting that there is a risk that proposed activities will result in the exposure of ASS, potentially releasing sulfuric acid, metals and metalloids to groundwater. ASS could also reach Red Swamp Brook with stormwater overflow, with potential downstream impacts.

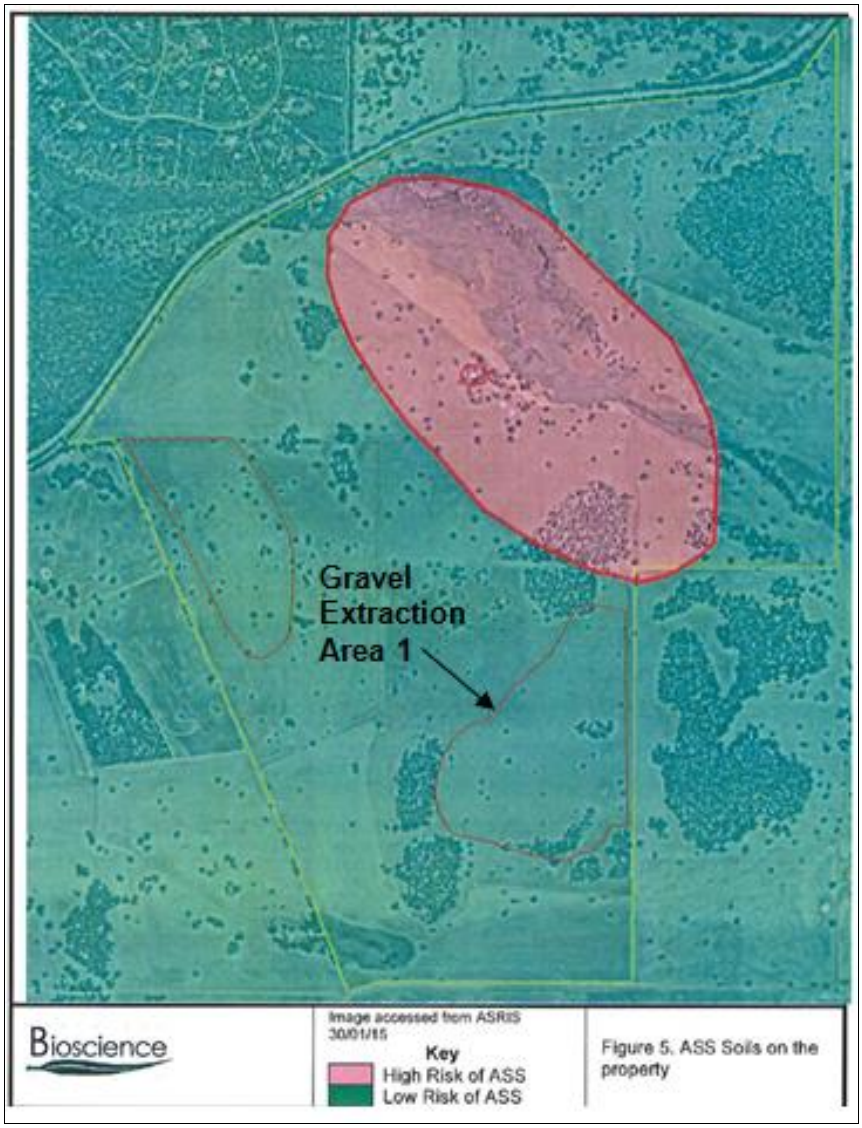

Figure 7: ASS high risk area

8.7.2 Applicant controls

Works Approval W5917/2015/1 improvement condition IR5 required the applicant to map groundwater levels at locations of excavation, to enable distances from groundwater to extraction depths.

Swan Gravel has provided information (Section 7.5 above) indicating that planned extraction levels will provide a minimum of 25 m separation from groundwater at extraction Area 1 and a minimum of 5 m separation from groundwater at Extraction Area 2.

8.7.3 Key findings

The Delegated Officer has reviewed the information regarding Acid Sulfate Soils and notes the following key points:

1. The northern boundary of Area 1 is near the estimated boundary for high risk ASS.
2. Excavation will allow at least 5 m separation above estimated highest groundwater levels so that activation of ASS can be avoided.

8.7.4 Consequence

If exposure to air of saturated ASS occurs, then the Delegated Officer has determined that the environmental impact to groundwater may extend to offsite at a local scale. Therefore, the Delegated Officer considers the consequence of Acid Sulfate Soils impact to be **moderate.**

8.7.5 Likelihood of consequence

Given the distance from groundwater to lowest proposed extraction depths, the Delegated Officer has determined that contamination of groundwater by acid sulfate soils will probably not occur in most circumstances. Therefore, the Delegated Officer considers the likelihood to be **Unlikely.**

8.7.6 Overall rating of Acid Sulfate Soils

The Delegated Officer has compared the consequence and likelihood ratings described above with the Risk Rating Matrix (Table 8) and determined that the overall rating for the risk of Acid Sulfate Soils is **Medium.**

8.8 Risk Assessment – hydrocarbon contamination

8.8.1 Identification and general characterisation of emission

5,000 litres diesel will be stored on the premises. Spills or leaks of hydrocarbons may contaminate soils and infiltrate to groundwater, and be transported by stormwater flow.

Red Swamp Brook traverses the premises and has beneficial non potable use to downstream residents. Red Swamp Brook is also a tributary of the Avon River, providing a pathway for hydrocarbons reaching the Avon River.

8.8.2 Applicant controls

The Applicant has the following controls set out in Table 14 below.

Table 14: Applicant's controls for hydrocarbon spill

Site Infrastructure	Description
Diesel storage tanks	Storage of diesel in tanks compliant with the Dangerous Goods (Storage and Handling of Non-explosives) Safety Regulations 2007 and Australian Standard 1940.2004. Tanks mounted on a concrete pad. Tanks double skinned.
Spill kits	Hydrocarbon spill kit mounted next to the fuel tank.

8.8.3 Key findings

The Delegated Officer has reviewed the information regarding risk of hydrocarbon spills and has found:

1. Storage will be in accordance with required legislation and standards.
2. Spill kits will be available.
3. The *Environmental Protection (Unauthorised Discharges) Regulations 2004* will apply.

8.8.4 Consequence

Diesel tanks may rupture or spill with discharges and impacts to Red Swamp Brook and the Avon River. The Delegated Officer has determined that the environmental impact of hydrocarbon discharges may be contamination off site at a local scale. Therefore, the Delegated Officer considers the consequence may be **Moderate.**

8.8.5 Likelihood of consequence

Legislation and standards manage storage of diesel. The Delegated Officer has determined that the likelihood of environmental impact occurring from diesel spill may only occur in exceptional circumstances. Therefore, the Delegated Officer considers the likelihood of Risk Event 1 to be **Rare.**

8.8.6 Overall rating of risk of hydrocarbon spill

The Delegated Officer has compared the consequence and likelihood ratings described above with the Risk Rating Matrix (Table 8) and determined that the overall rating for the risk of hydrocarbon spill is **Medium.**

8.9 Summary of risk assessment and acceptability

A summary of the risk assessment and the acceptability or unacceptability of the risk events set out above with the appropriate treatment and control are set out in Table 15 below. Controls are described further in section 9.

Table 15: Risk assessment summary

	Emission		Pathway and Receptor	Proponent controls	Impact	Risk Rating	Acceptability
	Type	**Source**					
1.	Fugitive dust	Internal roads, stockpiles, exposed areas, processing (crushing and screening) and transfer of materials.	Air/Wind Closest dwellings 200 m from Area 2 and 730 m from Area 1.	Infrastructure and management controls by Dust Management Plan.	Amenity impacts	Moderate consequence Possible **Medium risk**	Acceptable subject to regulatory controls.
2.	Noise	Machinery and vehicles	Air/Wind Closest dwellings 200 m from Area 2 and 730 m from Area 1.	Noise bund and Construction Noise Management Plan.	Amenity impacts	Minor consequence Unlikely **Medium risk**	Acceptable subject to regulatory controls.
3.	Contaminated stormwater	Surface runoff	Direct discharge along flow path. Soil/ground Red Swamp Brook	Infrastructure controls by Stormwater Management Plan.	Reduced water quality of Red Brook Swamp.	Moderate consequence Unlikely **Medium risk**	Acceptable subject to regulatory controls.

	Emission		Pathway and Receptor	Proponent controls	Impact	Risk Rating	Acceptability
	Type	**Source**					
4	Acid drainage with elevated concentrations of metals and metalloids	Acid Sulfate Soils	Percolation downwards through soil or in surafec water runoff.	Limit excavation to 5 metres above highest groundwater level Groundwater.	Increased acidity and concentrations of metals and metalloids ingroundwater and Red Swamp Brook	Moderate consequence Unlikely **Medium risk**	Acceptable subject to regulatory controls
5	Hydrocarbons	Diesel spill	Direct to ground and by stormwater. Soils and Red Swamp Brook	Infrastructure controls (double skinned tanks and spill kits).	Contaminated soils and reduced water quality of Red Brook Swamp.	Moderate consequence Rare **Medium risk**	Acceptable subject to regulatory controls

9. Determined Regulatory Controls

A summary of the risks with corresponding controls are set out in Table 16. The risks are set out in the assessment in section 8 and the controls are detailed in this section 9. Controls will form the basis of conditions in the licence set out in Attachment 1.

Table 16: Summary of regulatory controls to be applied

		Controls (references are to sections below setting out details of controls)			
		9.1 Infrastructure and Equipment	**9.2 Specified Action**	**Monitoring**	**Limits**
Risk Items (see risk analysis in section 8)	**1. Fugitive dust**	•	•	•	•
	2. Noise	•	•		
	3. Stormwater	•	•	•	
	4. Acid Sulfate Soils		•		•
	5. Bulk fuel storage, and diesel spills	•			

9.1 Siting of infrastructure

Siting of infrastructure is derived from final Application documents and management plans. The Delegated Officer considers that the siting of the infrastructure as listed below is required to ensure compliance with the Noise Regulations, to manage dust and stormwater, and to provide regulatory oversight of commitments made by the Applicant.

Infrastructure	**Siting requirements**
Processing plant (crushing and screening) and processing stockpiles	Located in a depression point between extraction Area 1 and extraction Area 2 as indicated in Figure 1.
Dust monitors	Monitors located on the premises boundary between extraction Area 1 and closest residence to the east (Dwelling G), and extraction Area 2 and the closest receptor to the west (Dwelling B) as indicated in Figure 4 as dust monitoring stations 101 and 201 respectively. Monitor 201 to be located on top of the acoustic barrier..

Soak/Dam for collection of stormwater	Located at south west of premises for collection of stormwater as depicted in Figure 1.
Acoustic barrier	Located as depicted in in Figure 5.
Cut off drains	Located to divert stormwater overflow from extraction areas to the soak/dam at the southwest of the premises. Located to divert stormwater away from Red Swamp Brook. Located as depicted in Figure 6.
Rip rap / screening fabrics	Located in drainage lines to trap sediment and slow down water flow. Located in drainage lines where stormwater flows off the works area.

9.1.1 Dust control infrastructure requirements

The Delegated Officer considers that the dust control infrastructure requirements listed below are required to manage dust, and to provide regulatory oversight of commitments made by the Applicant.

The following infrastructure and equipment should be constructed, maintained and operated onsite for dust management:

Infrastructure	Requirements
Water cart	Available at all times when earthmoving, crushing, screening, or cartage activities is being conducted.
Soak/Dam	Maintained as a water source for dust suppression.
Dust monitors	Continuous dust monitoring for monitoring particulate matter 10 micrometres or less in diameter (PM10) and able to provide automatic alert (SMS or equivalent) to the quarry manager or supervisor if dust level reach a pre-set trigger level Installed in accordance with AS/NZS3580.1.1
Meteorological station (anemometer)	Able to provide wind monitoring data to assist in determining the source of dust.

9.1.2 Noise infrastructure requirements

Noise emitted from premises has been assessed through W5917/2015/1 as likely compliant with the Noise Regulations with infrastructure constructed and equipment operating with the sound power levels listed. Infrastructure and equipment controls are derived from W5917/2015/1 Application documents and the CNMP, submitted as required by W5917/2015/1.

The following infrastructure and equipment should be constructed, maintained and operated onsite for noise management.

Infrastructure	Requirements
Acoustic barrier	Location, construction and dimensions adequate to ensure operations meet the requirements of the *Environmental Protection (Noise) Regulations 1997.* Construction of the barrier with materials excavated from Extraction

	Area 2 (other than topsoil) is not permitted. Acoustic barrier constructed within a 6 week period and prior to commencement of operation in Area 2.
Crusher (TerexJ1175)	Maximum sound power level 113 dB(A)
Screening Plant	Maximum sound power level 101 dB(A)
Small excavator	Maximum sound power level 98 dB(A)
Dozer	Maximum sound power level 109 dB(A)
Truck and water cart	Maximum sound power level 102 dB(A)
Front end Loader x 2	Maximum sound power level 105 dB(A)
Quarry Truck x 2	Maximum sound power level 106 dB(A)

9.1.3 Stormwater infrastructure requirements

The Delegated Officer considers that the stormwater infrastructure requirements listed below is required to ensure risk of stormwater impact to Red Brook Creek is appropriately managed. The stormwater infrastructure controls are derived from Application documents and the Applicant's Stormwater MP submitted as required by W5917/2015/1. The Applicant has agreed that rip rap and screening fabrics will be required as sediment traps, rather than hale bales which may decompose with time.

The following infrastructure and equipment should be constructed, maintained and operated onsite for stormwater management.

Infrastructure	**Requirements (operation)**
Cut off drains	Constructed at commencement of earthworks. Constructed and maintained to divert stormwater overflow from extraction areas to the soak/dam at the southwest of the premises. Constructed and maintained to divert stormwater away from Red Swamp Brook.
Rip rap and screening fabrics	Installed and maintained to trap sediment, located at drainage lines where stormwater flows off the works area.
Soak/dam	Maintained as the collection point for diverted stormwater.

9.1.4 Hydrocarbon infrastructure requirements

The Delegated Officer considers that the infrastructure requirements for diesel listed below is required to be maintained to ensure risk of contamination of soil and contaminated stormwater impact to Red Brook Creek is appropriately managed. *The Dangerous Goods (Storage and Handling of Non-explosives) Safety Regulations 2007* and the *Environmental Protection (Unauthorised discharges) Regulations 2004* will also apply.

Site Infrastructure	Description
Diesel storage tanks	Tanks mounted on a concrete pad. Tanks double skinned.
Spill kits	Hydrocarbon spill kit mounted next to the fuel tank.

9.2 Specified actions

9.2.1 Specified actions – dust

The Specified actions below are considered by the Delegated Officer to be required controls to manage risk of dust.

Note: Staging Plan for Area 2 is required by works approval W5917/2015/1 prior to assessment of operations in Area 2.

Site infrastructure/activities	Specified requirements
Excavation	Limited to excavation Area 1 as indicated in Figure 1.
Water carts / sprays	Operated when visible dust is generated from external ground surfaces on the Premises. Operate proactively subject to weather forecasting over a 24 hour period.
Dust suppressants	Applied proactively. Re-apply proactively subject to visual inspection and weather forecasting over a 24 hour period.
Vehicles	Vehicle speeds limited to less than 25 km/h on areas of unconsolidated or unsealed road. All loaded trucks leaving the premises are to be covered to prevent dust generation.
Cessation of activities	Cease an activity causing visible dust lift-off where dust management measures have not prevented dust lift-off and there is a risk of dust affecting sensitive receptors (residences).
Management response to a trigger exceedance	In the event the trigger value is reached based on real-time dust monitoring and dust is confirmed as attributable to operations at Swan Quarry, management measures (use water carts, sprays or other appropriate methods) are to be promptly activated to control the dust to avoid further exceedance of the trigger value.
Complaints management system	As a minimum, records the number and details of complaints received concerning the environmental impact of the activities undertaken at the Premises and any action taken in response to the complaint.

9.2.2 Specified actions - noise

The Delegated Officer considers the specified actions below are required for compliance with the Noise Regulations. Specified actions for noise are derived from Application documents.

Specified actions for noise bund construction are derived from the Applicant's CNMP submitted as required by works approval W5917/2015/1, and following discussion with the Applicant and DER.

The Delegated Officer considers records of complaint procedure should be kept for possible review by DER for compliance and enforcement purposes and to inform any future risk assessment as regulatory oversight.

Site infrastructure/activities	Specified requirements
Acoustic barrier	Construction of the barrier with material excavated from Extraction Area 2 (other than topsoil) is not permitted.
Hours of operational activity.	Monday to Saturday 7 am to 5 pm, with no operations on public holidays.
Complaints management system	As a minimum, records the number and details of complaints received concerning the environmental impact of the activities undertaken at the Premises and any action taken in response to the complaint.

9.2.3 Specified actions - acid sulfate soil risk

The Delegated Officer considers a 5m separation of soil from groundwater is adequate separation distance to manage risk of acid sulfate soils. Therefore excavation should not not be deeper than 5 m above 280 AHD (the maximum groundwater level estimated by groundwater expression at the soak on the premises).

Site infrastructure/activities	Specified requirements
Excavation	Must be at least 5m AHD above 280 AHD.

9.3 Monitoring requirements

9.3.1 Dust

The Delegated Officer considers the following monitoring controls should be included in the licence to ensure and confirm dust management is effective.

Dust monitoring controls to include:

(a) continuous dust monitoring for operational management purposes for particulate matter 10 micrometres or less in diameter (PM10);
(b) the dust monitoring stations to be as shown in Figure 4 as dust monitoring stations 101 and 201;
(c) automatic feedback (SMS text message or equivalent) to the quarry manager or supervisor if a trigger level of 0.5 mg/m^3 of PM10 is reached over a one hour averaging period;
(d) meteorological monitoring to provide wind data to assist in determining the source of dust;
(e) the dust monitoring system to be used at all times the quarry is in operation;
(f) dust monitoring data logged for retrieval;
(g) the Licensee shall reduce the trigger level if necessary in response to verified complaints or other evidence of off-site impacts; and
(h) the Licence Holder shall keep a written log, signed by the responsible person, of dust trigger exceedance events including identification of the sources of dust and action taken to control dust.

9.3.2 Surface water – Red Swamp Brook

The Delegated Officer considers that monitoring for acidity, electrical conductivity and TSS should be conducted to detect potential impacts to Red Brook Swamp from the proposed operation. Comparison between water samples entering and leaving the site will be determined with a limit of 20% increase in TSS. Monthly sampling of water taken (when Red Swamp Brook is flowing) at monitoring points as identified in Figure 6.

In the event the limit is reached based on in field sampling and analysis, management measures are to be promptly activated to avoid exceedance of the limit value.

9.4 Appropriateness of Licence conditions

The conditions in the Issued Licence in Attachment 1 have been determined in accordance with DER's *Guidance Statement: Setting Conditions*.

Condition Ref	Grounds
Emissions condition 1	This condition is valid, risk-based and consistent with the EP Act.
Notification of Material Change conditions 2, 3 and 4	These conditions are valid, risk-based and enable flexibility in operations.
Infrastructure and Activities conditions 5 and 6	These conditions are valid, risk-based and contain appropriate controls (see section 9).
Specified actions condition 7	This condition is valid, risk-based and contains appropriate controls (see section 9).
Dust Monitoring conditions 8 and 9.	These conditions are valid, risk-based and contain appropriate controls (see section 9).
Surface water monitoring – conditions 10, 11, 12, 13, 14 and 15.	These conditions are valid, risk-based and contain appropriate controls (see section 9).
Monitoring general – conditions 16 and 17	These conditions are valid, risk-based and contain appropriate controls (see section 9).
Information conditions 17, 18,19, 20 and 21	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 licence under the EP Act.

10. Applicant's comments

The applicant was provided with the draft decision report and draft issued licence on 16 February 2017. Applicant comments and DER's considerations are summarised in Appendix 2.

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 documents and policies specified in this decision report (summarised in Appendix 1). The assessment was informed by a site visit by DER officers on 10 May 2016.

Based on this assessment, it has been determined that the Issued Licence will be granted subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

Tim Gentle
Manager Licensing – Resource Industries
Delegated Officer
under section 20 of the *Environmental Protection Act 1986*

Appendix 1: Key Documents

Document Title	In text ref	Availability
Atlas of Australian Soils, Sheets 1 to 10. With explanatory data Northcote,K.H. with Beckmann,G.G., Bettenay,E., Churchward,H.M., Van Dijk,D.C., Dimmock,G.M., Hubble,G.D., Isbell,R.F., McArthur,W.M., Murtha,G.G., Nicolls K.D., Paton,T.R., Thompson,C.H., Webb,A.A. and Wright,M.J, (CSIRO Aust. and Melbourne University Press: Melbourne) (1960-1968).	Northcote *et al.* 1960-1968	External publication - CSIRO
Australian and New Zealand Guidelines for Fresh and Marine Water Quality, National Water Quality Management Strategy, Australian and New Zealand and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, 2000	ANZECC 2000	Accessed at www.environment.gov.au
Clearing Assessment Report CPS 6782/1	CPS 6782/1	accessed at http://www.der.wa.gov.au
Crystalline silica – Hazardous Chemicals Requiring Health Monitoring, Safe Work Australia, 2013	Safe Work Australia (2013)	Accessed at http://www.safeworkaustralia.gov.au/sites/SWA/about/Publications/Documents/797/Crystalline%20Silica.pdf
DER *Guidance Statement: Regulatory principles*, July 2015	NA	Accessed at http://www.der.wa.gov.au
DER *Guidance Statement: Setting conditions*, September 2015	NA	
DER *Guidance Statement: Licence Duration,* November 2015	NA	
DER *Guidance Statement: Land Use Planning,* October 2015	NA	
DER *Guidance Statement: Risk Assessments,* February 2017	NA	

DER *Guidance Statement: Decision Making*, February 2017	NA	
DER *Guidance Statement: Environmental Siting*, November 2016	NA	
Dust Management Plan for Trico Resources Pty Ltd at Lot 7 Toodyay Road, Bailup, Trico Resources Pty Ltd, amended10 August 2016	Dust MP, 2016	Application documents
Environmental Protection (Unauthorised Discharges) Regulations 2004	EP (UD) Regulations	Assessed at https://www.slp.wa.gov.au/legislation/statutes.nsf/default.html
Environmental Protection (Noise) Regulations 1997	Noise Regulations	
Environmental Protection Regulations 1987	EP Regulations 1987	
Lower Avon River recovery plan: Incorporating foreshore and channel assessment, Department of Water River recovery plan series, Report No. RRP 13, Department of Water, June 2008	DoW, 2008	Assessed at https://www.water.wa.gov.au/__data/assets/pdf_file/0007/3202/74943.pdf
Staging Plan (Area 1) for Trico Resources Pty Ltd at Lot 7 Toodyay Road, Bailup, Trico Resources Pty Ltd, 17 August 2016	Staging Plan (Area 1)	Application documents
Stormwater Management Plan for Trico Resources Pty Ltd at Lot 7 Toodyay Road, Bailup, Trico Resources Pty Ltd, amended10 August 2016,	Stormwater MP	Application documents
Trico Resources Pty Ltd Construction Noise Management Plan, Herring Storer Acoustics, November 2016,	CNMP	Application documents
Letter to Estwick Developments Pty Ltd Subject: Lot 7 Toodyay Road, Bailup, Waterdirect Pty Ltd, dated 25 August 2010.	Waterdirect, 2010	Application documents
Works Approval W5917/2015/1 and Decision Document	W5917/2015/1	accessed at http://www.der.wa.gov.au

Appendix 2: Summary of Applicant's Comments on Risk Assessment and Draft Conditions

Comments received	DER consideration
Expiry date should match WAPC approval expiry	Agreed
Request that water cart be on site when earthmoving, crushing and cartage activities are occurring, not all times.	Agreed, due to the campaign nature of the operation.
Request monthly surface monitoring conducted when quarrying and surface water flowing.	Monthly monitoring when surface water is flowing should continue when quarrying is not being conducted as there may be sediment runoff following rainfall even if quarrying is not actively operating at that time.

Attachment 1: Issued Licence L9019/2016/1