



Pioneer Sand Quarry – Environmental Effects Report

Prepared By: Barry Williams

Date: 16 July 2024

Issue	Date	Recipient	Organisation
Revision 0	6 February 2024	Mr Nicholas Palmer	Sanbar Pty Ltd
Version 1	9 February 2024		Environment Protection Authority
Revision 1	21 May 2024		Environment Protection Authority
Revision 3	16 July 2024		Environment Protection Authority

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APPENDICES

- Appendix 1 – Dorset Council communication in relation to the requirement for a development application.
- Appendix 2 – North Barker Ecosystem Services – Natural Values Assessment
- Appendix 3 – North Barker Ecosystem Services – Weed and Disease Hygiene Management Plan

PART A – PROPONENT INFORMATION

TABLE 1: PROPONENT DETAILS

Entity name	Sanbar Pty. Ltd.
ABN	64 009 564 970
Registered address	83 Poets Road WEST HOBART, Tas. 7000
Postal address	As above
Contact person	Nicholas Palmer
Mobile	0418 126 253
Email	palmern@tasweb.net.au

TABLE 2: CONSULTANT DETAILS

Name	Mr Barry Williams
Business	Integrated Land Management & Planning
ABN	67 057 193 880
Address	331 South Arm Road LAUDERDALE Tasmania 7021
Contact	Barry.williams@ilmp.com.au
Phone	0437 394 492

PART B PROPOSAL DESCRIPTION

1 DESCRIPTION OF PROPOSED ACTIVITY

TABLE 3: PROPOSED ACTIVITY

Activity	The resource is stockpiles of sand that were deposited as a by-product of an historic tin mining venture. The natural sand was washed through sluices where the alluvial tin was separated from other fine particles. The excavation resulting from the tin mining operation and the fine particle by-product were deposited on land now inundated in what is Pioneer Lake. The course particles were deposited in stockpiles on higher ground around the southern and eastern perimeter of the lake.
New or existing	This proposal is for an intensification of an existing sand recovery operation
Product	Course silica sand

Quantities	Existing	Proposed																																				
Maximum extraction quantity per year	5,000 m3 (7,700 tonnes)	50,000 m3 (77,000 tonnes)																																				
Maximum processing quantity per year	1,000 m3 (1,540 tonnes)	50,000 m3 (77,000 tonnes)																																				
Bulk density	Average bulk density for all products is 1.54 tonnes/cubic metre (RNB Trading, 1995).																																					
Methods of extraction	<p>The current method of extraction will remain unchanged. Sections of the stockpiles with regrowth vegetation will be stripped and the stripping placed to one side. The sand will be excavated with a wheel loader and loaded directly into a mechanical screen. The screen will deliver clean sand to stockpiles via a conveyor. The loader will take clean sand from stockpile and load truck and trailer combinations ready for cartage.</p> <p>Once an area has had the winnable product recovered, the stripping will be replaced over the worked-out surface. Access tracks to subsequent extraction areas will be retained until final decommissioning and rehabilitation.</p> <p>All activities will be carried out in accordance with the <i>Quarry Code of Practice</i> (Environment Protection Authority, May 2017).</p>																																					
Transport	<p>The cartage task will be performed predominantly by medium combination truck and trailers with a conservative payload of approximately 39 tonnes. Trucks will enter and leave the site using the private access road leading to the junction with Racecourse Road. They will travel along Racecourse Road for a short distance (160 metres) to the junction with Gladstone Road.</p> <table> <tr> <th>Description</th><th>Quantity</th><th>Units</th></tr> <tr> <td>Annual production (m3) max.</td><td>50000</td><td>m3</td></tr> <tr> <td>average bulk density</td><td>1.54</td><td>t/m3</td></tr> <tr> <td>Annual production (t) max.</td><td>77000</td><td>t</td></tr> <tr> <td>Conservative pay load</td><td>39</td><td>t</td></tr> <tr> <td>Loads to cart production</td><td>1974</td><td></td></tr> <tr> <td>Weeks worked per year</td><td>48</td><td></td></tr> <tr> <td>Days worked per week</td><td>6</td><td></td></tr> <tr> <td>Days worked per year</td><td>288</td><td></td></tr> <tr> <td>Adjust for public holidays</td><td>280</td><td></td></tr> <tr> <td>Loads per day</td><td>7.1</td><td></td></tr> <tr> <td>Movements per day (in/out)</td><td>14.1</td><td></td></tr> </table>		Description	Quantity	Units	Annual production (m3) max.	50000	m3	average bulk density	1.54	t/m3	Annual production (t) max.	77000	t	Conservative pay load	39	t	Loads to cart production	1974		Weeks worked per year	48		Days worked per week	6		Days worked per year	288		Adjust for public holidays	280		Loads per day	7.1		Movements per day (in/out)	14.1	
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	<p>A single operator will be required to run the Pioneer Sand Quarry. On active days the operator may strip a new section of stockpile, excavate raw sand to feed the mechanical screen, build processed product stockpiles and / or load trucks on arrival.</p> <p>The operator will add a single light vehicle movement each active day.</p>		
Stockpiling	<p>Stripping materials will be temporarily stockpiled in windrows until the winnable product has been recovered from an area. Once worked out the stripping will be placed back over the ground surface to encourage regeneration.</p> <p>The screened sand will be stored on site in a series of stockpiles.</p>		
Area of disturbance	<p>The entire site has been completely disturbed by historic mining activities. The resource is sand by-product remaining after the mineral component (alluvial tin and other fine particles) has been removed. The original land surface is visible in places but the vegetation is assumed to be recruitment regeneration since the site was abandoned in 1932.</p> <p>As stockpiled sand is removed a level area will be maintained as a working stockpile area. Worked out areas not required for ongoing operations or for access to subsequent stages will be rehabilitated.</p> <p style="text-align: right;">Disturbance during the life of the quarry = 32.0 hectares Maximum disturbed area at one time = 8.0 hectares</p>		
Major equipment	During an active campaign the following types of hire equipment will be utilised.		
	Operation	Equipment	Power (kW)
	Stripping / excavating	Excavator	120
	Loading / stockpiling	Wheel loader CAT 950K	157
	Screening	Powerscreen Chieftain	72
	Actual equipment utilised will vary according to what the hire company has available at the time.		
Activities	Screening, building stockpiles	<p>It will be necessary to mobilise the screener and excavator to the site for an operational campaign. The timing of the campaigns will vary with demand and the amount of product in stockpile. The loader will remain onsite to load trucks when required to service contracts.</p> <p>Two or three campaigns will occur each year producing, at maximum production, up to 24,000 tonnes of screened sand in stockpile.</p>	

		The screener can process up to 200 tonnes per hour. A processing campaign may continue for a period of 4 to 6 weeks.
	Loading and transport	The site loader will be utilised throughout the year to load on-road truck and trailer combinations to cart the screened product to market.
Infrastructure	Access	Access road is existing but will require some improvement to facilitate smooth access for trucks.
	Security	A boom gate will be required at entrance to quarry. Access to Pioneer Lake for recreational boat users will be retained. A secure compound will be constructed to secure machinery on site.
	Amenities	Container style crib room
		Portaloo, relocatable toilet

Proposal timeline	Documents	Advertising	EPA assessment	Council assessment	Council permit
	May 2024	June 2024	August 2024	September 2024	November 2024

Project life	Estimated reserves	2,200,000 m3	Extraction years	40+
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Operating hours	Weekdays	Saturday	Sundays and holidays
Quarry operations	7.00 am to 7.00 pm	8.00 am to 4.00 pm	No work.
Cartage	7.00 am to 7.00 pm	8.00 am to 4.00 pm	No work.

TABLE 4: LOCATION AND PLANNING CONTEXT

Location	Racecourse Road, Pioneer, South Mount Cameron 10 km East of Winnaleah.
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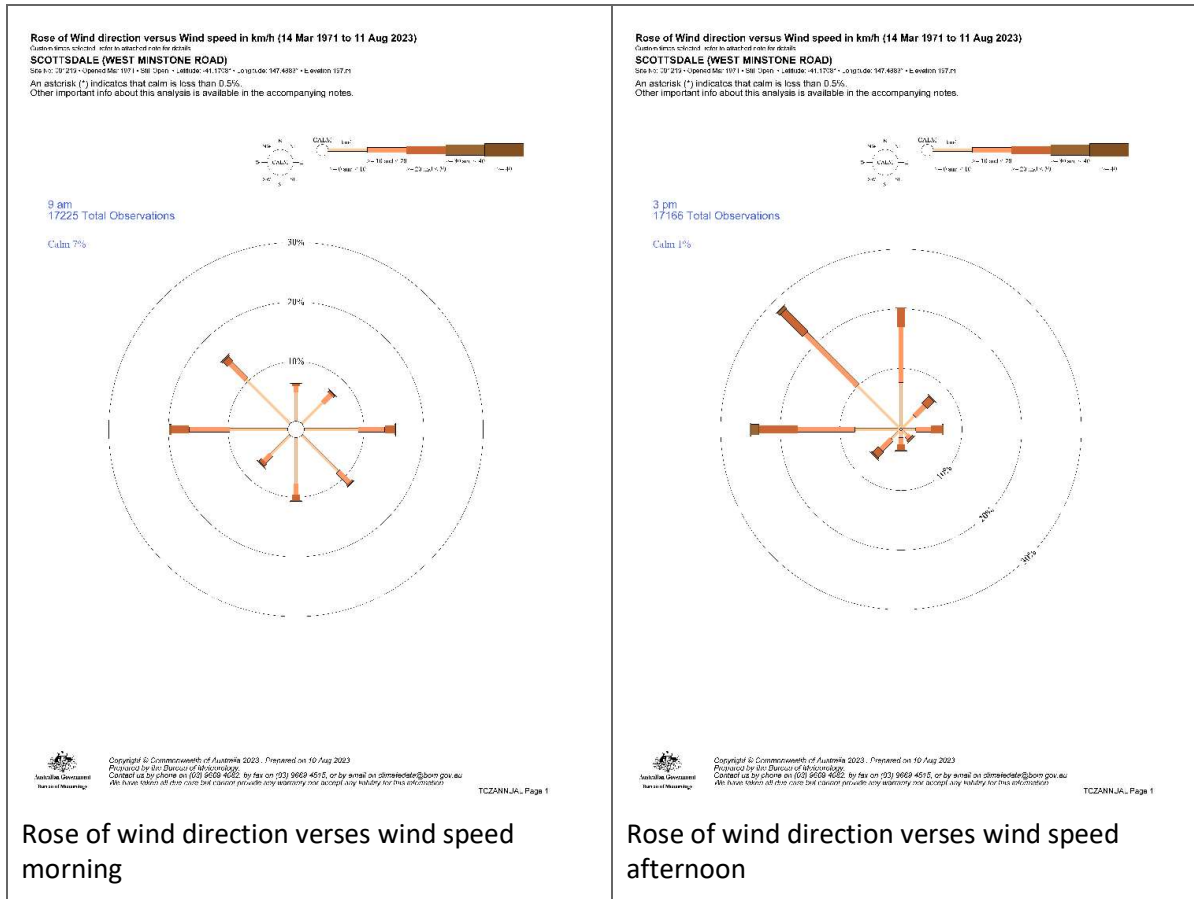
Property ID	3396565																																												
Certificate of Title	-																																												
Land tenure	Future Potential Production Forest																																												
Planning Scheme	Tasmanian Planning Scheme – Dorset																																												
Land zoning	Dorset Local Provisions Schedule – 20. Rural																																												
Land use planning permit	Pioneer Sand Quarry is currently permitted to operate as a Level 1 quarry under planning permit ‘DEV2011/19’. Dorset Council advised the proposal to increase annual production capacity will require a development application, see Dorset Council correspondence Appendix 1 in this document.																																												
Use Class	Extractive industry																																												
Permissibility	Extractive industry is permitted in the Rural Zone																																												
Mining lease	10M / 2008 has granted status due for renewal in 2026. A partial surrender application is currently under consideration for this lease.																																												
The Land	<p>This application applies to the area of the mining lease 10M / 2008 excluding those areas for which a surrender application is pending.</p> <p>The coordinate points below indicate the external land boundary starting at the Racecourse Road reserve and TP 1 through to TP 5. An area with of freehold land is excluded from the Land point TP 6 to TP 9 (see Figure 4: Location map (The Land) (extract Topographic The LIST)</p> <table><tr><td>Datum</td><td colspan="2">Australian Geocentric 1994 (GDA94)</td><td>Zone 55</td></tr><tr><td>Point number</td><td>Easting</td><td>Northing</td><td></td></tr><tr><td>TP1</td><td>578112</td><td>5451903</td><td></td></tr><tr><td>TP2</td><td>578111</td><td>5453183</td><td></td></tr><tr><td>TP3</td><td>578612</td><td>5453183</td><td></td></tr><tr><td>TP4</td><td>578611</td><td>5451818</td><td></td></tr><tr><td>TP5</td><td>578310</td><td>5451816</td><td></td></tr><tr><td>TP6</td><td>578301</td><td>5451885</td><td></td></tr><tr><td>TP7</td><td>578257</td><td>5451937</td><td></td></tr><tr><td>TP8</td><td>578338</td><td>5451970</td><td></td></tr><tr><td>TP9</td><td>578345</td><td>5451918</td><td></td></tr></table>	Datum	Australian Geocentric 1994 (GDA94)		Zone 55	Point number	Easting	Northing		TP1	578112	5451903		TP2	578111	5453183		TP3	578612	5453183		TP4	578611	5451818		TP5	578310	5451816		TP6	578301	5451885		TP7	578257	5451937		TP8	578338	5451970		TP9	578345	5451918	
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TP6	578301	5451885																																											
TP7	578257	5451937																																											
TP8	578338	5451970																																											
TP9	578345	5451918																																											

TABLE 5: DESCRIPTION OF SITE AND SURROUNDS

Land use	<p>Pioneer Sand Quarry is located on the outskirts of the township of Pioneer. The resource is sand stockpiles remaining as a by-product of an historic tin mining operation. The tin mine has been inundated and is now a recreational lake, Pioneer Lake. The land surrounding the mining lease is Crown Land allocated to Potential Future Production Forest. The land on the opposite side of Racecourse Road is unallocated Crown</p>
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	Land and the township of Pioneer is made up of private freehold parcels.					
Topography	<p>The mining lease is situated on the eastern shore of Pioneer Lake. Pioneer Lake is an artificial impoundment created by flooding the historic workings of the Pioneer Mine. The site has been modified by mining and the placement of washed sand tailings stockpiles. The ground surface has been trimmed to an elevation of approximately 80 metres (AHD¹) and the stockpiles rise to crests of around 94 metres.</p> <p>Racecourse Creek runs through the southern portion of the proposed development area and Bradshaws Creek runs around the north east boundary of the development area. Both watercourses are highly modified.</p>					
Climate	No weather stations offering a full range of data are located close to Pioneer. The closest that is likely to have similar climatic conditions is Scottsdale (West Minstone Road) 091219.					
Mean Maximum Temperature (°C)	February	23.0	July	12.0		
Mean Minimum Temperature (°C)	February	11.3	July	3.8		
Mean monthly rainfall (mm)	Minimum February	41.3	Maximum July	118.0	Annual	974.3
Wind Data						
Average wind direction verses speed plot 9.00 am		Average wind direction verses speed plot 3.00 pm				
<p>The average wind direction verses speed plot for this location in the morning period shows the predominant strong winds come from the west. Less frequent and lower strength winds come from the northwest.</p> <p>The stronger winds will tend to carry any dust away to the east.</p>		<p>The average wind direction verses speed plot for this location in the afternoon shows the predominant strong winds frequently from the northwest. Slightly less frequently lower strength winds come from the north and west.</p> <p>More frequent north west winds in the afternoon will tend to carry dust towards the southeast.</p>				

¹ AHD – Australian Height Datum



Geology	Geological mapping defines the substrate as Quaternary cover sequences described as older alluvium of river terraces. This is presumably underlying the sand stockpiles remaining as a by-product of the historic tin mining operation.
Soils	<p>The soil encountered in this operation will be a thin organic sand horizon built up by colonising vegetation. The soil is made up of inorganic sand mixed with dust blown in from surrounding land and leaf litter and other organics derived from the plants.</p> <p>Under the sand there may be another horizon of old soil on which the stockpiles were placed. There are areas now within Pioneer Lake and to the north of Gilham Creek which is mapped as having a Low (6-70%) probability of potential becoming acid sulphate soil if disturbed. The area mapped with this potential is inside the mining lease (The Land) but outside the area proposed for disturbance.</p>
Hydrology	<p>Two named watercourses cut across the site.</p> <p>In the north the watercourse is named Gilham Creek in the LIST's hydrographic lines data base or Bradshaws Creek in the Conservation of Freshwater</p>

	<p>Ecosystems (CFEV²) database. Taking the CFEV interpretation the river section is 347797 and is classified as having an Immediate Conservation Management Priority (ICMP) of moderate (M) and a RS Integrated Conservation Value (ICV) of Low. This watercourse is taken as being the north and east boundary of the sand extraction area.</p> <p>Cutting through the extraction area on the southern end is Racecourse Creek. The CFEV database records the section as 347794 and is classified as having an Immediate Conservation Management Priority (ICMP) of low (L) and a RS Integrated Conservation Value (ICV) of Low.</p>
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NATURAL VALUES EXTRACT FROM NATURAL VALUES ATLAS (NRE (TAS) B, 2023)

TABLE 6: THREATENED FLORA (500 METRES)

Species	Common Name	SS	NS	Bio	Observation Count	Last Recorded
<i>Eutaxia microphylla</i>	spiny bushpea	r		n	1	22-Oct-1973
<i>Pomaderris phyllicifolia</i>	narrow-leaf pomaderris	p		n	3	21-Nov-1973
<i>Spyridium parvifolium</i> var. <i>molle</i>	soft dustymiller	r		e	1	26-Sep-1973

TABLE 7: THREATENED FLORA (5000 METRES)

Species	Common Name	SS	NS	Bio	Observation Count	Last Recorded
<i>Baumea gunnii</i>	slender twigsedge	r		n	3	27-Oct-2011
<i>Eutaxia microphylla</i>	spiny bushpea	r		n	1	22-Oct-1973
<i>Orthoceras strictum</i>	horned orchid	r		n	2	12-Jan-1986
<i>Pimelea flava</i> subsp. <i>flava</i>	yellow riceflower	r		n	2	01-May-2001
<i>Pomaderris phyllicifolia</i>	narrow-leaf pomaderris	p		n	7	21-May-2015
<i>Pomaderris phyllicifolia</i> subsp. <i>ericoides</i>	revolute narrowleaf dogwood	r		n	178	09-Feb-2023
<i>Pomaderris phyllicifolia</i> subsp. <i>phyllicifolia</i>	narrowleaf dogwood	r		n	26	25-Jul-2012
<i>Pterostylis atricola</i>	snug greenhood	r		e	1	08-Mar-2002
<i>Spyridium parvifolium</i> var. <i>molle</i>	soft dustymiller	r		e	1	26-Sep-1973
<i>Utricularia australis</i>	yellow bladderwort	r		n	1	10-Jan-2012

TABLE 8: THREATENED FAUNA (500 METRES)

Species	Common Name	SS	NS	Bio	Observation Count	Last Recorded
<i>Sarcophilus harrisii</i>	tasmanian devil	e	EN	e	1	09-Mar-2017

TABLE 9: THREATENED FAUNA (5000 METRES)

Species	Common Name	SS	NS	Bio	Observation Count	Last Recorded
<i>Aquila audax</i> subsp. <i>fleayi</i>	tasmanian wedge-tailed eagle	e	EN	e	18	27-Oct-2021
<i>Astacopsis gouldi</i>	luteralipina or giant freshwater crayfish	v	VU	e	2	01-Jan-1991
<i>Beddomeia fromensis</i>	hydrobiid snail (frome river)	e		e	2	01-Feb-2003
<i>Botaurus poiciloptilus</i>	australasian bittern		EN	n	1	15-Jan-2023
<i>Dasyurus maculatus</i>	spotted-tail quoll	r	VU	n	1	05-Jul-2019

² CFEV - Conservation of Freshwater Ecosystem Values project is a comprehensive audit of freshwater ecosystems.

<i>Dasyurus maculatus</i> subsp. <i>maculatus</i>	spotted-tail quoll	r	VU	n	3	02-Aug-1996
<i>Dasyurus viverrinus</i>	eastern quoll		EN	n	8	12-Mar-2023
<i>Hirundapus caudacutus</i>	white-throated needletail		VU	n	1	21-Jan-1980
<i>Sarcophilus harrisii</i>	tasmanian devil	e	EN	e	18	19-Sep-2018

TABLE 10: RAPTOR NESTS (5000 METRES)

Nest ID	Species	Common Name	Obs Type	Observation Count	Last Recorded
1337	<i>Aquila audax</i> subsp. <i>fleayi</i>	tasmanian wedge-tailed eagle	Nest	5	11-Nov-2010
1338	<i>Aquila audax</i> subsp. <i>fleayi</i>	tasmanian wedge-tailed eagle	Nest	4	23-Sep-2010
1339	<i>Aquila audax</i> subsp. <i>fleayi</i>	tasmanian wedge-tailed eagle	Nest	6	27-Oct-2021
2450	<i>Aquila audax</i> subsp. <i>fleayi</i>	tasmanian wedge-tailed eagle	Nest	1	07-Jul-2017

TABLE 11: DECLARED WEEDS (500 M)

Species	Common Name	Observation Count	Last Recorded
<i>Cortaderia seloana</i>	silver pampasgrass	1	15-Dec-2016
<i>Cytisus scoparius</i>	english broom	1	11-Jan-2005
<i>Echium plantagineum</i>	patersons curse	36	15-Dec-2016
<i>Erica lusitanica</i>	spanish heath	5	01-Aug-2020
<i>Genista monspessulana</i>	montpellier broom or canary broom	2	11-Jan-2005
<i>Rubus anglocandicans</i>	blackberry	1	11-Jan-2005
<i>Rubus fruticosus</i>	blackberry	1	08-Jan-1995
<i>Salix matsudana</i>	sallow willow	1	11-Jan-2005

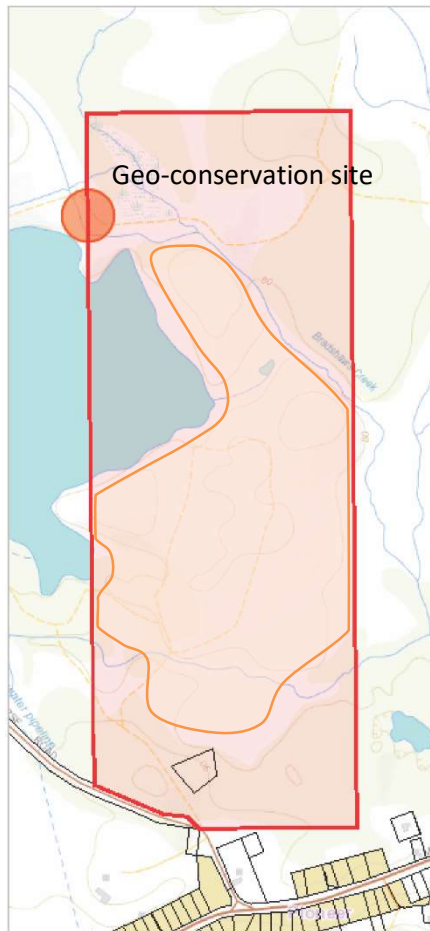
TABLE 12: DECLARED WEEDS (5000 M)

Species	Common Name	Observation Count	Last Recorded
<i>Cortaderia seloana</i>	silver pampasgrass	1	15-Dec-2016
<i>Cytisus scoparius</i>	english broom	1	11-Jan-2005
<i>Echium plantagineum</i>	patersons curse	36	15-Dec-2016
<i>Erica lusitanica</i>	spanish heath	17	01-Aug-2020
<i>Genista monspessulana</i>	montpellier broom or canary broom	3	11-Jan-2005
<i>Rubus anglocandicans</i>	blackberry	1	11-Jan-2005
<i>Rubus fruticosus</i>	blackberry	3	18-Feb-2015
<i>Salix matsudana</i>	sallow willow	1	11-Jan-2005
<i>Ulex europaeus</i>	gorse	7	05-Sep-2013

TABLE 13: GEOCONSERVATION SITES

Id	Name	Statement of Significance	Significance Level	Status
3173	Cenozoic Plant Macrofossils of Tasmania	Tasmania contains a rich assemblage of Cenozoic plant macrofossils, many in an excellent state of preservation. Collectively, the fossil sites allow reconstruction of the character, evolution and palaeoenvironmental context of the southern hemisphere temperate palaeoflora of Tasmania across ca. 60 million years. The fossil record is crucial to our understanding of Tasmania's distinctive modern flora, especially conifers.	Global	Listed
2326	Pioneer Oligocene-Miocene Plant Fossil Site	Outstanding example of type. The site is the only lowland equivalent of the Montpeelyata site. See Hill (1995) for full reference list.	State	Listed

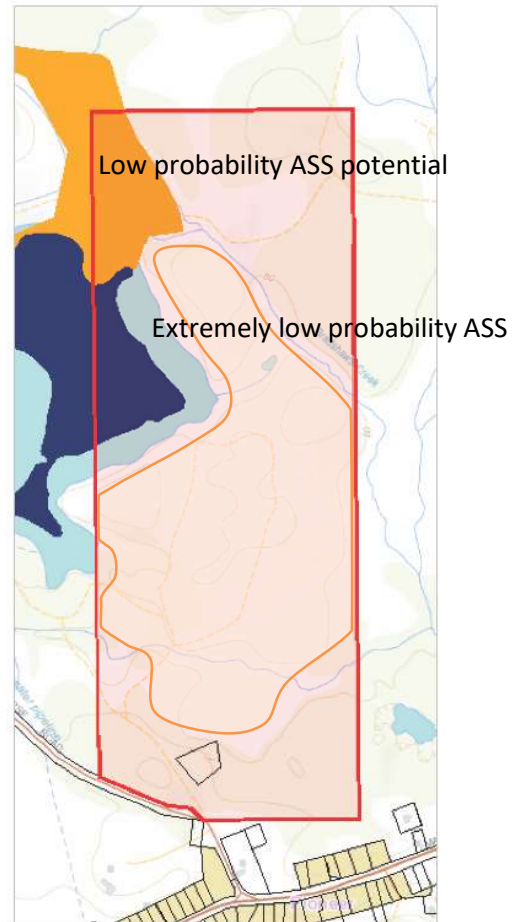
Geoconservation sites within 0 metres



Please note that some layers may not display at all requested map scales

FIGURE 1: GEO-CONSERVATION SITE (NVA)

Acid Sulfate Soils within 0 metres



Please note that some layers may not display at all requested map scales

FIGURE 2: ACID SULPHATE SOIL POTENTIAL (NVA)

TASVEG 4.0 Communities within 0 metres

578779, 5453391

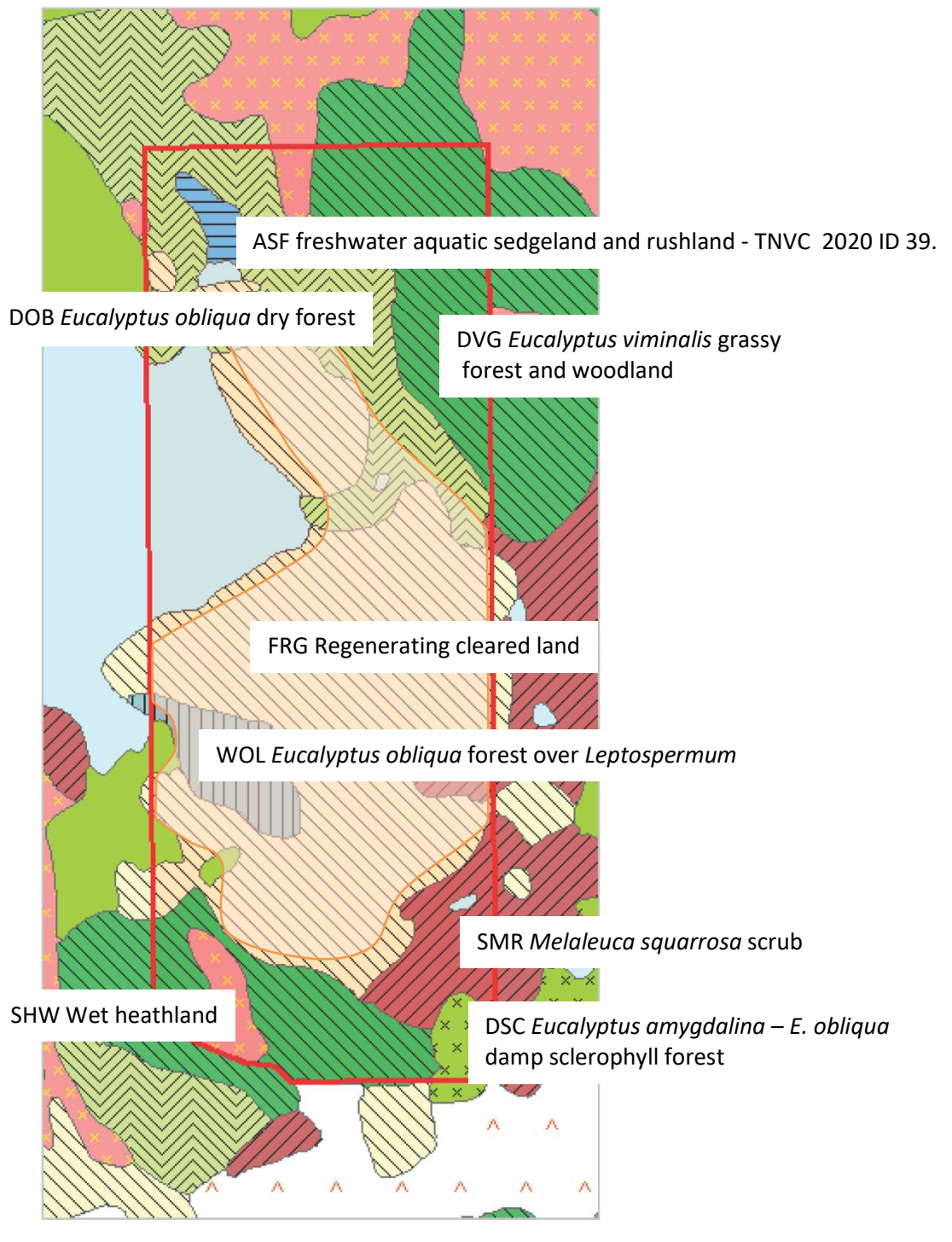


FIGURE 3: MAPPED VEGETATION COMMUNITIES (TAS VEG 4.0 NVA)

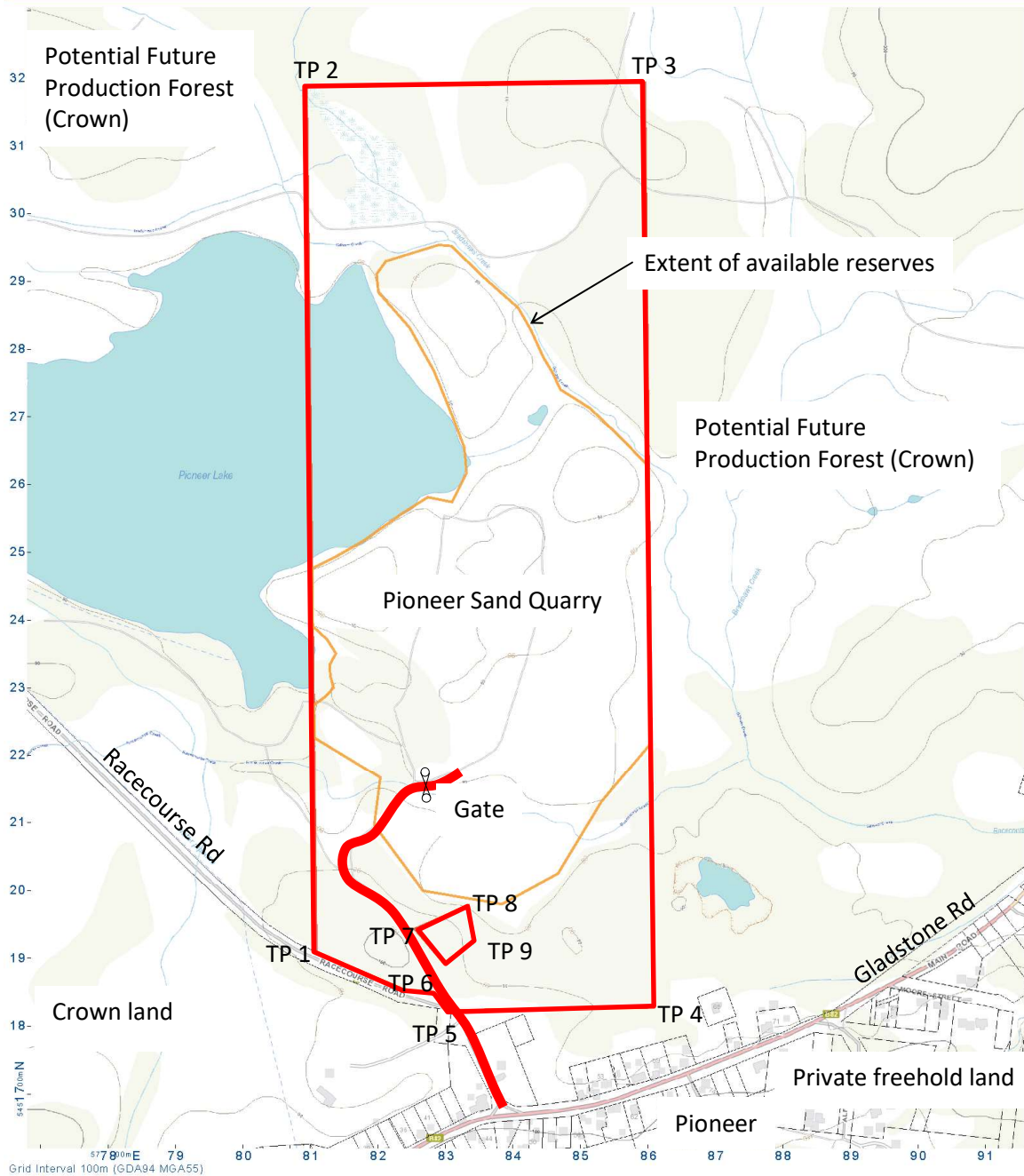


FIGURE 4: LOCATION MAP (THE LAND) (EXTRACT TOPOGRAPHIC THE LIST)

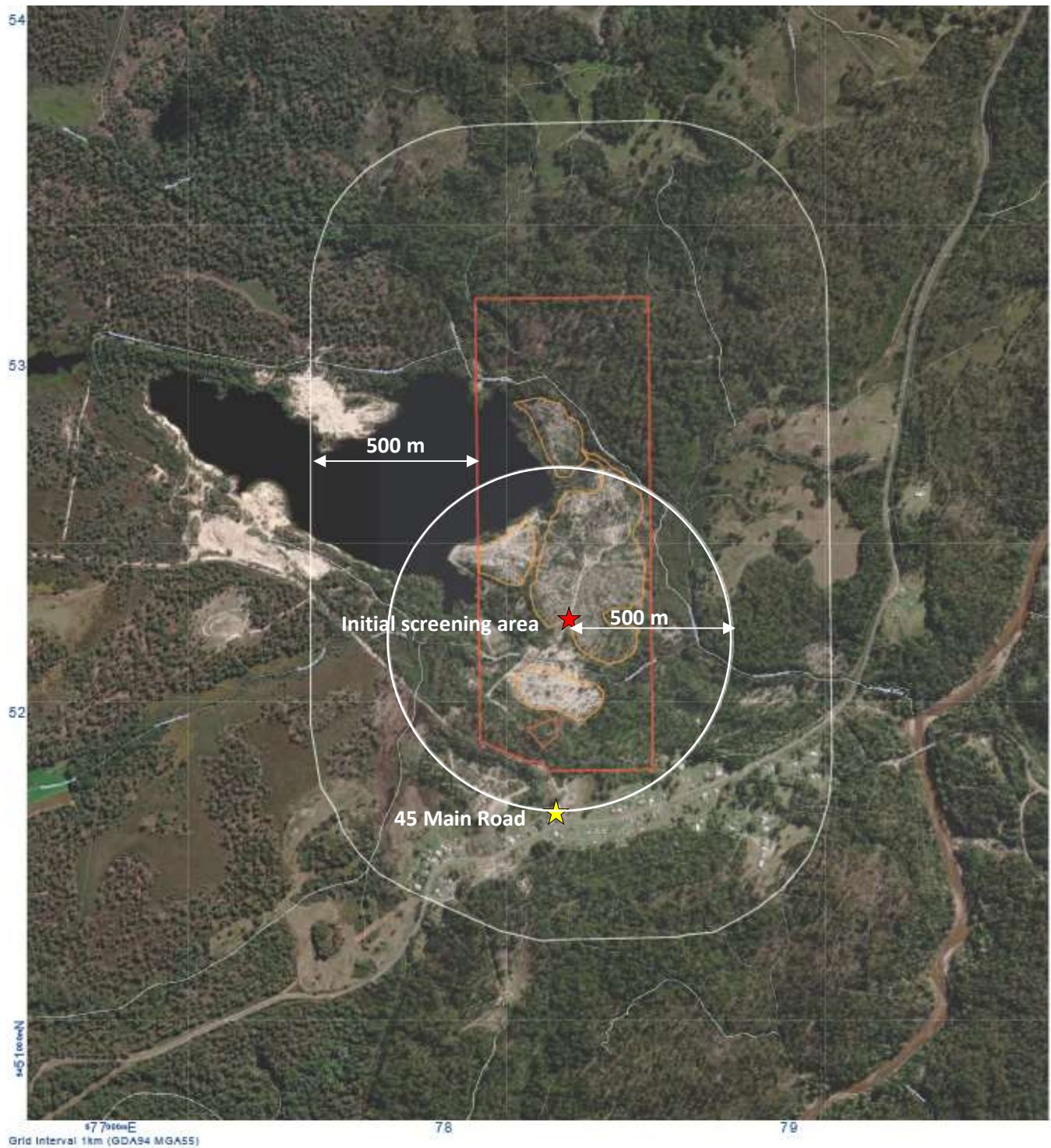


FIGURE 5: PIONEER SAND QUARRY WITH SURROUNDS

The populated portion of the township of Pioneer is located within the 500 metres buffer area when measured from the mining lease boundary. Reducing the buffer area to be measured from the boundary of the proposed extraction area captures less residents but still a significant number.

The closest properties that may be dwellings are tabulated below in Table 14 along with separation distances to the mining lease boundary and the initial operations area boundary.

TABLE 14: SENSITIVE RECEPTORS LOCATED WITHIN 500 METRES

Street address	Separation distance to residence (metres)	
	Mining Lease	Operations area
71 MAIN RD PIONEER TAS 7264	152	368
67 MAIN RD PIONEER TAS 7264	124	358
65 MAIN RD PIONEER TAS 7264	74	290
61 MAIN RD PIONEER TAS 7264	81	326
59 MAIN RD PIONEER TAS 7264	92	320
57 MAIN RD PIONEER TAS 7264	95	315
53 MAIN RD PIONEER TAS 7264	117	300
51 MAIN RD PIONEER TAS 7264	126	298
RACECOURSE RD PIONEER TAS 7264	93	248
45 MAIN RD PIONEER TAS 7264	125	285
43 MAIN RD PIONEER TAS 7264	144	306
37 MAIN RD PIONEER TAS 7264	183	353
31 MAIN RD PIONEER TAS 7264	220	380
29 MAIN RD PIONEER TAS 7264	235	386
78 MAIN RD PIONEER TAS 7264	160	396
74 MAIN RD PIONEER TAS 7264	130	374
64 MAIN RD PIONEER TAS 7264	130	355
62 MAIN RD PIONEER TAS 7264	138	345
60 MAIN RD PIONEER TAS 7264	145	340
58 MAIN RD PIONEER TAS 7264	164	340
54 MAIN RD PIONEER TAS 7264	176	340
'SUNNYBANK' - 52 MAIN RD PIONEER TAS 7264	176	337
50 MAIN RD PIONEER TAS 7264	172	329
46 MAIN RD PIONEER TAS 7264	167	322
42 MAIN RD PIONEER TAS 7264	182	340
32 MAIN RD PIONEER TAS 7264	238	405
28 MAIN RD PIONEER TAS 7264	284	438

The entire site is classified as an informal reserve which is 'available' under the *Mineral Resources Development Act 1995*. A small informal reserve on public land is located on Council owned land adjacent to Racecourse Road. The racecourse is situated on land that is classified as an informal reserve on public land also.

2 MAPS AND SITE PLAN

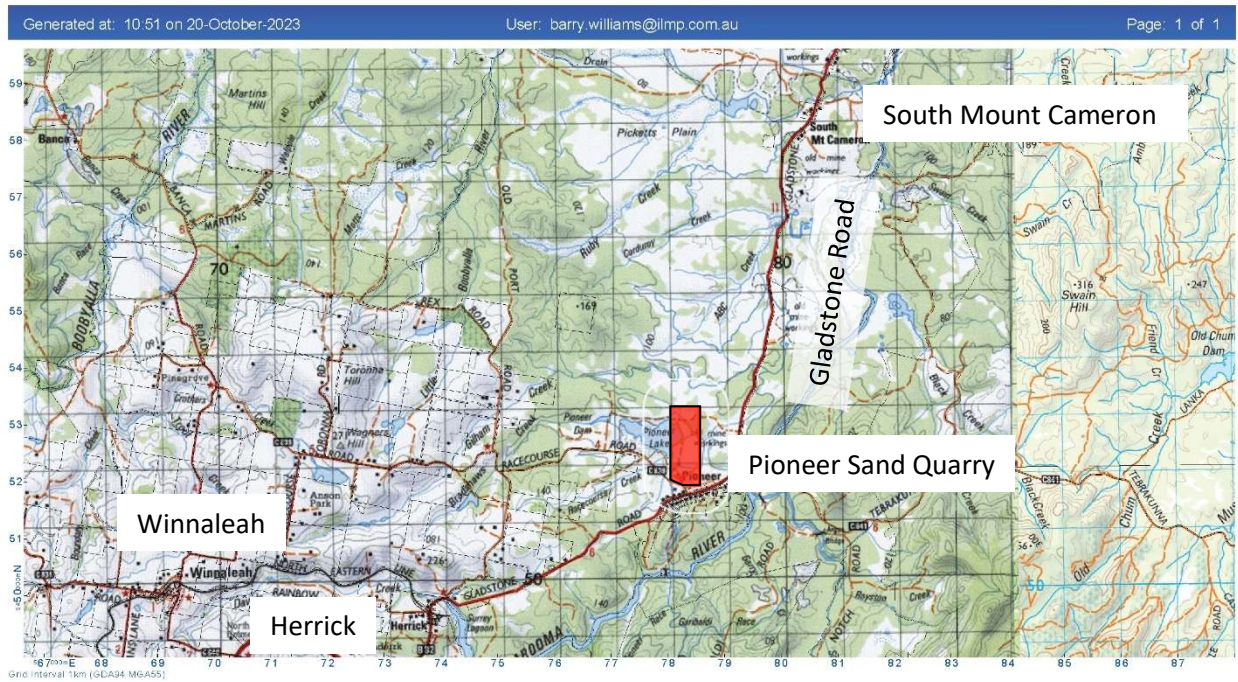
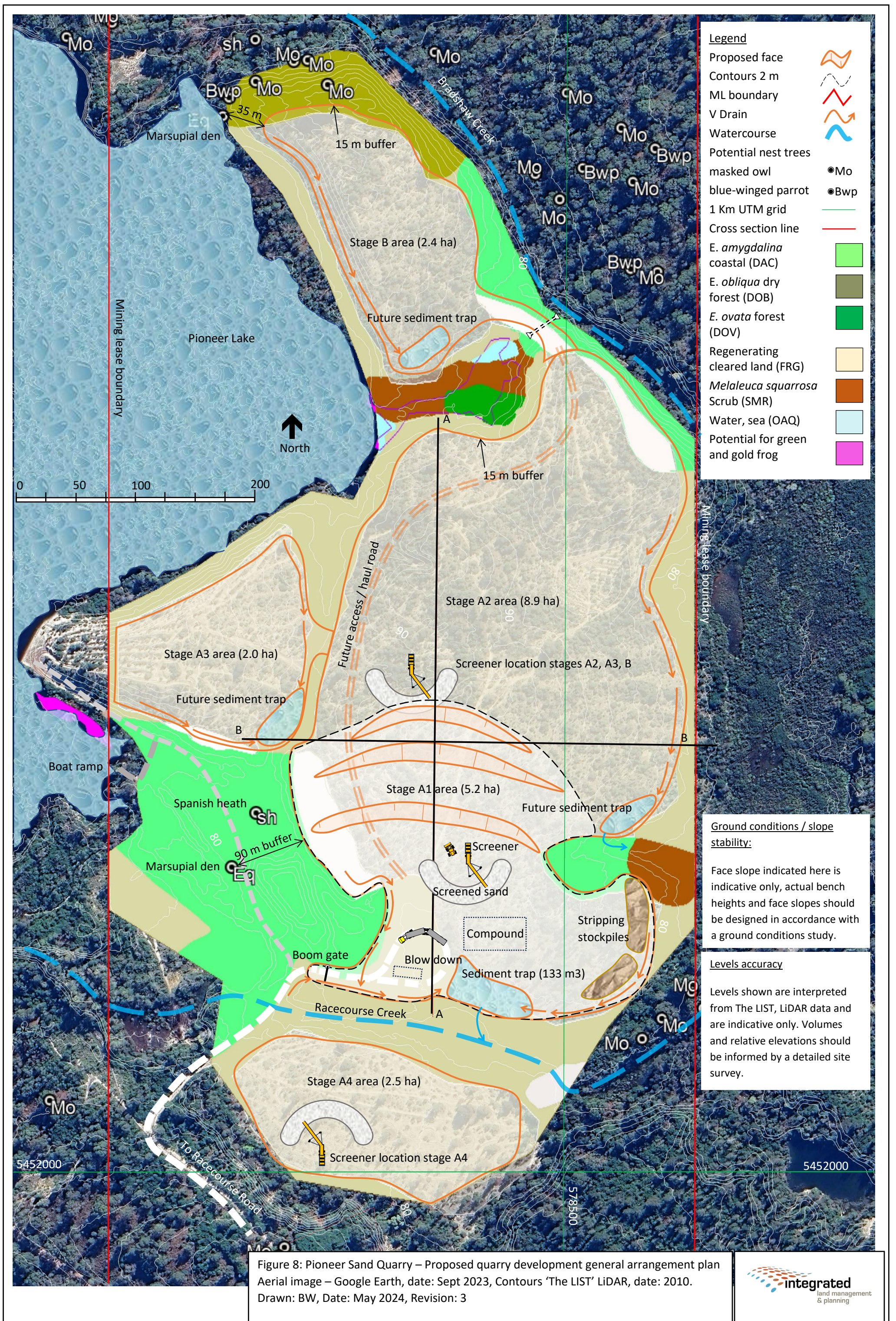
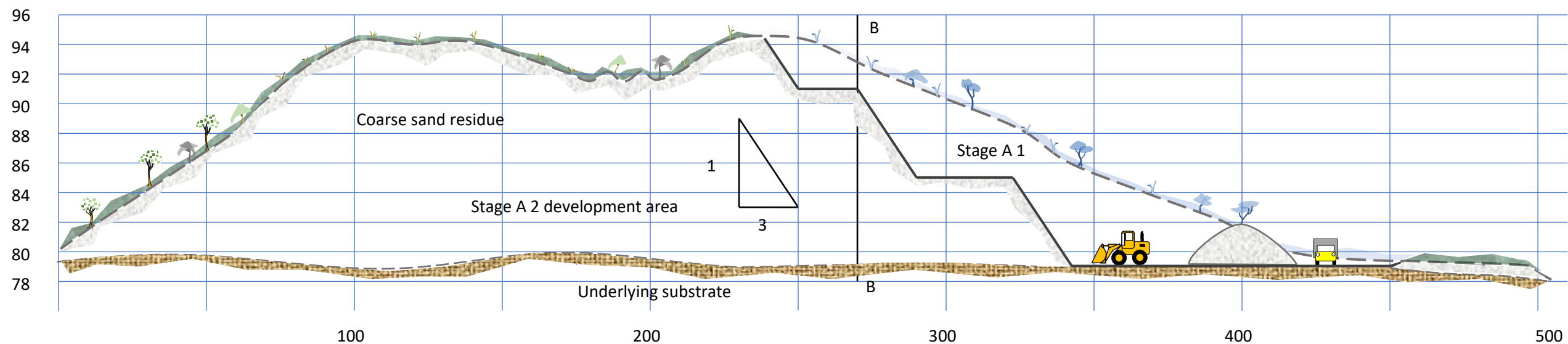


FIGURE 6: GENERAL LOCATION MAP (EXTRACT FROM TASM)

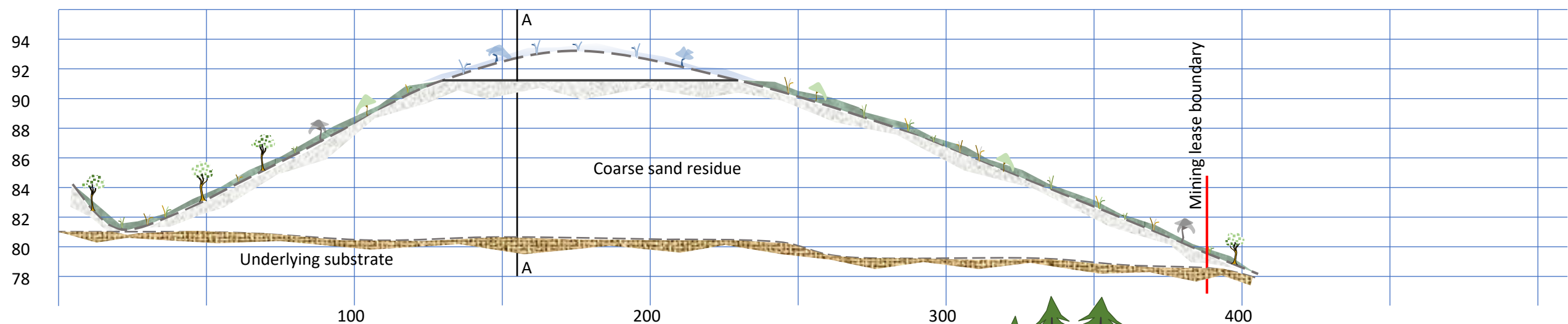


FIGURE 7: PIONEER PROPERTIES CLOSEST TO QUARRY





Representative section at A – A (vertical scale exaggerated)



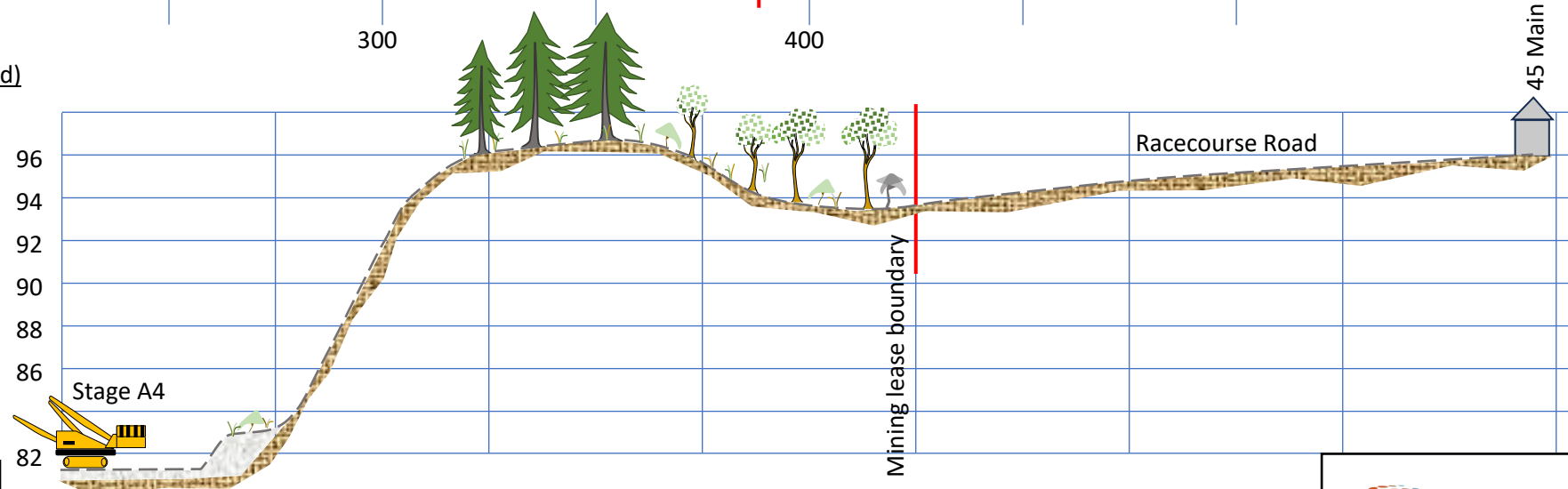
Representative section at B – B (vertical scale exaggerated)

Ground conditions / slope stability:

Face slope indicated here is indicative only, actual bench heights and face slopes should be designed in accordance with a ground conditions study.

Levels accuracy

Levels shown are interpreted from The LIST, LiDAR data and are indicative only. Volumes and relative elevations should be informed by a detailed site survey.



Land profile at C – C (vertical scale exaggerated)

Figure 9: Pioneer Sand Quarry – Proposed quarry development – Cross Sections
Aerial image – Google Earth, date: Sept 2023, Contours 'The LIST' LiDAR, date: 2010.
Drawn: BW, Date: May 2024, Revision: 3

3 PROJECT RATIONALE AND ALTERNATIVES

3.1 PROJECT RATIONALE

The Pioneer Tin Mine ceased operations in the 1930s leaving a substantial void where the source material was extracted, which had been partly filled with the fines from the sluicing operation and substantial stockpiles of sand by-product. The void and fines were inundated to form Pioneer Lake. The stockpiles of sand have partly been furrowed to form crests and hollows to encourage recruitment revegetation.

The sand in these stockpiles was identified as a potential construction material source and the Proponent undertook sampling and analysis. The results of the resource definition work in 1995 found that the estimated quantity of resource 3,400,000 tonnes of silica sand with ideal particle size distribution for use in a variety of applications.

Supply of natural sand for construction is in short supply internationally. Reserves in coastal areas that traditionally supply the product are being depleted. Environmental values and population pressures in coastal areas make it unlikely large scale future resource development will proceed.

The sand stockpiles consist of coarse to medium grade sand which can be segregated using the screener into two products:

- Medium particle size sand will be ideal for construction and can be blended with the finer sand from the company's Llanherne operation.
- Coarse sand and gravel is valuable for use as a decorative product used in landscaping.

Pioneer Sand Quarry offers a mine waste reuse opportunity which will bolster the supply of construction sand in Tasmania. The stockpiles can be recovered and the product screened and carted west and south to supply markets.

As areas are worked out the natural landform will be revealed and this can be rehabilitated with natural vegetation like that surrounding the site.

3.2 ALTERNATIVES

Two alternatives to upgrading Pioneer Sand Quarry have been considered:

1. Continue to operate uneconomically with a restrictive annual extractive limit.

As stated previously the Pioneer Sand Quarry has a Level 1 permit and a mining lease to extract up to 5,000 cubic metres per annum. 5,000 cubic metres is not sufficient annual production to sustain the operation in the current and projected economic climate or any significant market.

2. Decommission and close Pioneer Sand Quarry.

The mining lease area on the south eastern flank of Pioneer Lake could be abandoned. Currently the site is utilised by recreational vehicle users and a network of tracks have been created across the site. Constant disturbance through quad bike use will cause the stabilising recruitment vegetation to be patchy at best. The constant churn of tyres over the steepest sections of the stockpiles will continue to cause the sand to move, encroaching on watercourses and Pioneer Lake.

PART C – ENVIRONMENTAL IMPACTS AND MANAGEMENT

1 AIR QUALITY

Dust at any quarry is managed to protect the workforce from any discomfort associated with encountering fine particles. In addition to improving the workplace for employees, quarry operators consider any impact of dust on neighbours either directly from the quarry operation or more remotely from vehicular traffic.

1.1 AIR QUALITY STANDARDS

Environment Protection Policy (Air Quality) 2004

Part 3 - ENVIRONMENTAL VALUES AND STANDARDS

Environmental values

6. (1) *Environmental values are the values or uses of the environment that are to be protected.*

(2) *The environmental values to be protected under this Policy are –*

- (a) the life, health and well-being of humans at present and in the future;*
- (b) the life, health and well-being of other forms of life, including the present and future health, wellbeing and integrity of ecosystems and ecological processes;*
- (c) visual amenity; and*
- (d) the useful life and aesthetic appearance of buildings, structures, property and materials.*

1.2 DUST EMISSION SOURCES

The Pioneer Sand Quarry is targeting the stockpiles of sand and gravel remaining from a closed tin mine at Pioneer. The operation involves stripping vegetation from the stockpiles, screening to remove deleterious material and loading screened sand into on-road trucks for cartage.

Pioneer Sand Quarry can potentially generate dust through the following activities:

- Wheel loader excavating sand, loading the screener, screening building stockpiles.
- Loading truck trays from stockpiles.
- Traffic traversing unsealed worked areas and road surfaces.
- Exposed gravel surfaces and stockpiles during high wind conditions.

Vehicular traffic generated by the Pioneer Sand Quarry will travel on the public Racecourse Road, and the private access road both of which have unsealed gravel surfaces and in dry conditions is likely to generate dust emissions.

Dust generated from dirty surfaces and roads has the capacity to result in chronic and persistent dust nuisance.

1.3 POTENTIAL FOR ENVIRONMENTAL NUISANCE

The most serious adverse impact because of excessive dust emissions will be to residences located close by. The township of Pioneer is near the resource and 27 residences are located within 500 metres of the sand recovery area. There are fewer residences within 500 metres (7 residences) of the initial location of the recovery and loading activities.

A single residence (45 Main Road) is located on Racecourse Road adjacent to the gravel surfaced section. This residence may be affected by dust from sand trucks along with other traffic on Racecourse Road when wind is coming from the north east.

1.4 MITIGATING FACTORS

Intervening between the extraction and loading activities and the residential properties is a significant artificial escarpment around 10 metres high which has retained forest on the top level. TasVeg 4.0 maps the forest communities as *Eucalyptus amygdalina* – *E. obliqua* damp sclerophyll forest and *E. viminalis* grassy forest.

The tin mining operation that resulted in the production of the sand stockpiles used a sluicing activity to separate the tin from the rest of the alluvial deposit. The sluicing process used water to separate the fine particles including the metal from the larger particles. The stockpiles are constructed of the material considered oversized for that operation. The typical particle size distribution chart below shows that the fine component (less than 75 microns) has been almost completely removed.

The potential for dust emissions being generated by the loading operation is mitigated through the lack of fine particles in the source product. The previous removal of the fine component of the natural sand mitigates the risk of workers at the site being exposed to respirable crystalline silica (RCS) as these ultra fine particles are not present in the source sand.

In its natural state the sand has a moderate moisture content which will be maintained through screening and stockpile building.

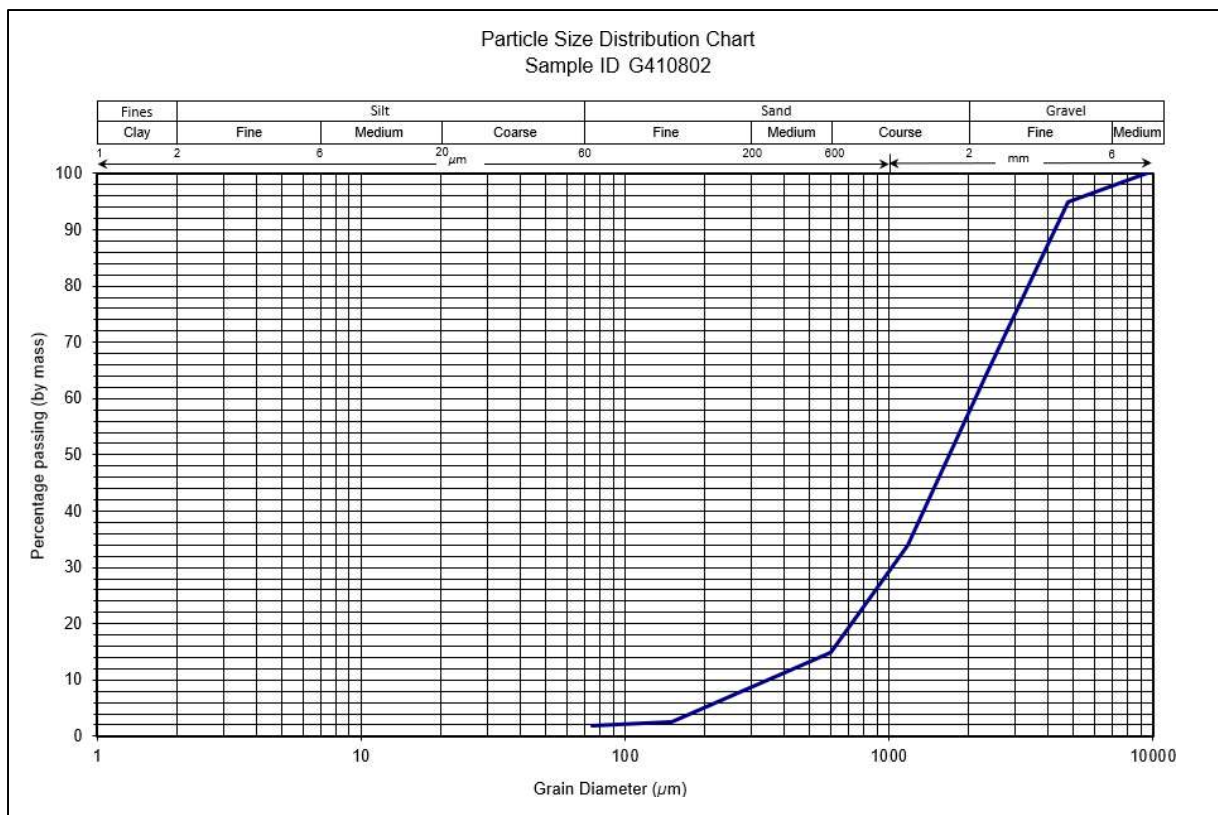


FIGURE 10: PARTICLE SIZE DISTRIBUTION CHART (BOTTRILL, APRIL 2023)

The climate data shows that the region is subjected to a relatively high annual rainfall with mean monthly rainfall between 52 mm per month up to 109 mm (B.O.M. (b), 2023). It is apparent that periods of persistent dry and windy weather will be rare. If the climate conditions change in the future, dust suppression measures will be deployed to prevent visible dust emissions generated by sand processing from crossing the mining lease boundary.

1.5 MITIGATION MEASURES

The following measures will be employed to help further mitigate the risk of adverse fugitive dust emissions:

- Trafficked surfaces on the quarry floor, benches and haul roads will be maintained in good condition and clean.
- Drop distances between buckets, screener deck and truck trays will be kept to a minimum.
- Trucks carrying product off site will have covers fitted.
- A site wide speed restriction of 30 km/hr will be imposed.

1.6 RESULTANT IMPACTS

The sand operation will include stripping and loading and screening activities. Experience with the current operation demonstrates that the sand product is normally moist in situ and the normal moisture content is preserved during screening and loading. The coarse nature of the sand makes it unlikely that stockpiled sand will be a source of dust even when dry.

Pioneer Sand Quarry is separated from the township of Pioneer by a mature stand of pine trees which provides a substantial barrier and filter if any dust emission should occur.

The greatest risk is from vehicles traversing unmade surfaces which will be minimised by a site wide speed limit of 30 km/hr and a speed restriction on Racecourse Road of 40 km/hr.

The *Tasmanian Environment Protection Policy (Air Quality) 2004* (EPP) seeks to further the objectives of the *Environmental Management and Pollution Control Act 1994* set out in Schedule 1 of that Act. In relation to air quality the Act promotes the sustainable development of natural resources in a manner which avoids, remedying or mitigating any adverse effects on the environment.

If the operation is managed in the manner described above it is unlikely that the receiving environment will suffer adverse effects through dust emissions.

MANAGEMENT MEASURE 1: DUST MANAGEMENT

Item	Proposed measure	Timeframe
1.	Trucks carting sand off site will have covers fitted	At all times
2.	A site wide speed limit of 30 km/hr and a speed restriction for quarry trucks on Racecourse Road of 40 km/hr will be imposed.	At all times
3.	If the climate conditions change in the future, dust suppression measures will be deployed to prevent visible dust emissions generated by sand processing from crossing the mining lease boundary.	As required

Surface water and groundwater quality

1.7 WATER QUALITY STANDARDS

State Policy on Water Management 1997

PART 2 - OBJECTIVES

5. Purpose of the Policy

5.1 To achieve the sustainable management of Tasmania's surface water and groundwater resources by protecting or enhancing their qualities while allowing for sustainable development in accordance with the objectives of Tasmania's Resource Management and Planning System. (Schedule 1 of the State Policies and Projects Act 1993)

1.8 WATER AND OVERLAND FLOW

The entire site is within Lower Ringarooma flood plain wetlands (sub-catchment ID 46010). The southern portion is drained by Racecourse Creek (river section ID 347794) and the northern portion is drained by Bradshaws Creek (river section ID 247799). These two watercourses combine before discharging into the Ringarooma River close to the township of Pioneer.

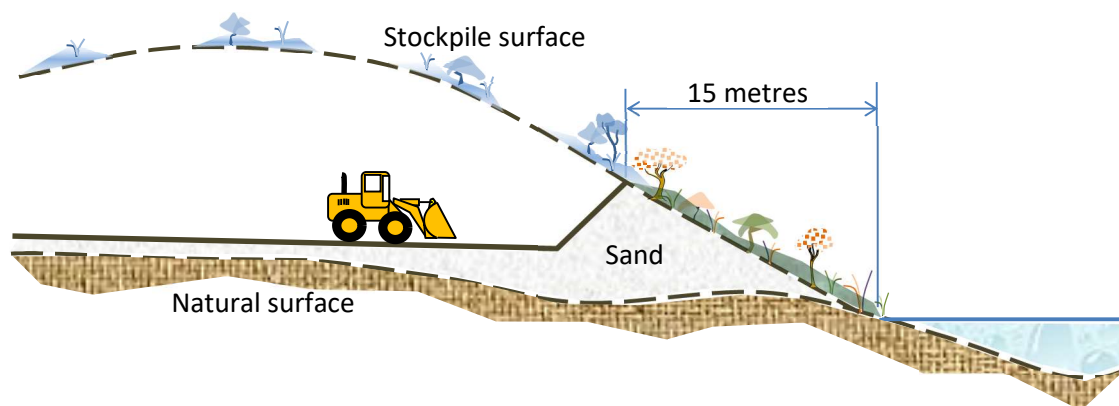
The largest portion of the southern sand stockpiles are located north of Racecourse Creek. The land either side of Racecourse Creek has 3 to 4 metres of sand overlying. A 30 metre wide buffer to extractive operations will be provided from the alignment of Racecourse Creek and extractive operations will remove the resource from above the natural surface that existed prior to the stockpiles being constructed.



PLATE 1: ALIGNMENT OF RACECOURSE CREEK (DRY)

The northern stockpiles have been constructed on the western side of Bradshaws Creek. Similarly, a 30 metre buffer will be provided but in this case no excavation will occur on the eastern side. Extractive operations will commence on the western side 15 metres from Bradshaws Creek alignment and will continue until the natural surface is exposed.

Pioneer Lake forms the northern and western boundary to the extractive areas. The mining lease cuts through a portion of the sand stockpile referred to here as stage A3. Extractive operations will be offset 10 metres from the boundary in this location. A 15 metre buffer to extractive operations will be provided from the shore line of Pioneer Lake. The stockpiled sand is resting at its angle of repose up to the edge of these features. By providing a buffer any water run-off from a disturbed surface that does occur will flow into the workings and not into the aquatic environment.



Both the sand stockpile surface and the natural surface are exposed on the site. At the time of inspection rainfall runoff was ponding on trafficked areas of the exposed natural surface but not on trafficked areas of exposed sand. It is anticipated that the free draining nature of the stockpiled sand will result in negligible rainfall run off until the excavation has exposed the natural ground.

Preliminary works will include sediment control infrastructure for each stage of quarry development. The facilities will be designed to accommodate the final development area and will remain in place and be developed into wetlands on decommissioning.

1.9 SEDIMENT CONTROL INFRASTRUCTURE (STAGE A1)

Extractive operations will commence on the southern extent of the eastern stockpile in stage A1. The access road to the Racecourse Creek crossing is shared with access to the Pioneer Lake boat ramp.

A sediment trap will be constructed outside the 15 metre buffer line to Racecourse Creek to service Area A. This sediment trap will be designed to accommodate the potential runoff from the entire extractive portion of stage A1 area. A 'V' drain will be installed, designed to intercept run off from the extractive areas and discharging to the sediment trap.

1.10 SEDIMENT CONTROL INFRASTRUCTURE (STAGE B)

Extractive operations will commence on the southern extent of the stockpile in stage B. The access to stage B is through a connection with stage A2 and across a vegetated gully. It will be necessary to

construct this crossing during dry weather to minimise disruption to the Pioneer Lake outfall. A culvert pipe will be installed before constructing the access / haul road.

A sediment trap will be constructed outside the 15 metre buffer line to Pioneer Lake to service stage B area. This sediment trap will be designed to accommodate the potential runoff from the entire extractive portion of stage B. A 'V' drain will be installed at the toe of the batter forming the edge of the 15 metre buffer to Lake Pioneer designed to intercept run off from the extractive areas and discharging to the sediment trap.

1.11 POTENTIAL FOR ENVIRONMENTAL NUISANCE

There is a low potential for environmental nuisance resulting from rainfall runoff discharge while sand excavation continues using the sand stockpiles as a base. The free sand surface allows rainfall to infiltrate readily and does not pond on the surface or form channels even on steep slopes (30 degrees).

When the original natural surface is exposed however the likelihood that rainfall will collect in ponds and form channels will increase. This is the scenario that is treated in the stormwater infrastructure design for each of the development areas.

1.12 LIKELIHOOD FOR ENVIRONMENTAL NUISANCE

The Pioneer region has a moderately high annual rainfall of around 1 metre with the highest mean monthly totals (above 100 mm) occurring in the winter months. Once extraction has exposed the original natural surface there is a moderate likelihood that a high rainfall event may cause an emission of turbid water from the site without controls in place.

2.1.1 MITIGATING FACTORS

The main mitigating factor is the extremely high rate of infiltration offered by the stockpiled sand. The operator will manage the total area of unrehabilitated land to control the volume of run-off water to be considered at any one time. Progressive rehabilitation will be applied to manage the area of unrehabilitated land.

1.13 POTENTIAL IMPACT AND MITIGATION

1.13.1 POTENTIAL IMPACT

Pioneer Lake outfall and all the neighbouring watercourses converge and discharge to the Ringarooma River at Pioneer. The Ringarooma River flows through the Cameron Regional Reserve. The Environmental Management Goals for Tasmanian Surface Waters (DPIWE, Nov 2005) for this land tenure set the Protected Environmental Values (PEVs) for the Ringarooma River as:

A: Protection of Aquatic Ecosystems

(ii) Protection of modified (not pristine) ecosystems from which edible fish can be harvested

B: Recreational Water Quality Aesthetics

(i) Primary contact water quality

(ii) Secondary contact water quality

(iii) Aesthetic water quality

C: Raw Water for Drinking Supply (Gladstone)

(ii) Subject to coarse screening plus disinfection

(DPIWE, Nov 2005)

In addition to the PEVs described above the report identifies special ecosystem values for the Ringarooma catchment. These include:

- *Astacopsis gouldii* (giant freshwater crayfish)
- *Galaxiella pusilla* (dwarf galaxiid)
- *Prototroctes maraena* (Grayling)
- Rearing and spawning habitat for *G. maculatus* and *G. truttaceus*, spawning for grayling, as well as for lampreys, blackfish, trout, estuarine perch, sandies.
- Macrophytes - these are of botanical importance as well as habitat for macroinvertebrates.
- Ringarooma River is affected by the sediment wave from the mine tailings (dilution issue).

The last point suggests that the river bed of the Ringarooma River is affected by tailings from past mining activities. The tailings still present are referred to as a sediment wave which is smothering the natural bed of the river and causing the flow to be divided into a braided stream. Turbid water entering the river under these circumstances is likely to resist mixing and remain concentrated in a small channel flow for longer affecting all water quality values.

1.13.2 MITIGATION MEASURES

The largest single stockpile is stage A1-2 which has a footprint area of 13 hectares. This area will be developed to ensure that no more than 8 hectares of the original natural surface is exposed without rehabilitation at any time. Likewise, stages A3, A4 and B will also be managed to ensure the total area of unrehabilitated land remains less than 8 hectares.

Each extraction area will be serviced by a run-off flow collection and treatment system. V drains will be installed on the perimeter of the area to intercept and direct flows into a purpose-built sediment trap which will contain and treat the run-off water to ensure the discharge criteria for surface waters are met.

1.14 DESIGN FOR V DRAINS AND SEDIMENT TRAPS

The design for the drains and sediment traps will consider the worst case scenario which is a 1 in 20 year design event with the maximum area of unrehabilitated land exposed.

A 1 in 20 year return interval is roughly equivalent to Annual Exceedance Probability of 5%

1.14.1 SEDIMENT CONTROL CALCULATIONS

Design stormwater infrastructure 1 in 20 year storm

description	units	result
Storm (AEP 5%)	mm	122
Catchment	hectares	5.200
Coefficient of runoff		0.350
Design flow	m ³ /s	0.617
Channel flow		
triangular channel width	m	2.000

flow depth	m	1.000
average slope	m/m	0.010
Volumetric flow rate (Omni calculator)	m ³ /s	0.633
Type D sediment trap		
Water temperature	degrees (C)	15
Critical particle characteristics (d)	default	2.6
Sediment settlement coefficient (Ks)	Table B22	3270
Effective length to width ratio		3:1
Hydraulic efficiency		1.0
1 in 1 year ARI 120 hour storm (I)	mm/hr	0.79
Discharging to sensitive receiving waters Y%		85.0
K1		23.2
K2		12.6
R		31.0
Volumetric runoff coefficient (assume sandy loam)	Table B31	0.042
Minimum volume of upper settling zone	m ³	67.70
Minimum storage zone + settling zone	m ³	102
From Table B25		
Settling zone depth	m	0.65
Storage zone depth	m	0.85
Surface area (minimum)	m ²	104
Width	m	7
Length	m	15
Sediment surface area	m ²	105
Total sediment trap volume (Actual)	m ³	133

The design above uses the approach recommended for a Type D sediment basins in Appendix B of the International Erosion Control Association Australasia (IECA) Best Practice guidelines (IECA, June 2018). The natural ground is assumed to not behave as the stockpiled sand and hence rainfall will run off. The preparation for stage A1 operations will include the development of the sediment trap with a minimum mid settling zone volume of 68 cubic metres. The side slopes will be 2 to 1 vertical, the sediment trap surface area will be 105 square metres. A desirable ratio of 3 to 1 length to width is achieved with a pond of 15 metres long and 7 metres wide. This sediment trap will have a total volume of 133 cubic metres.

1.15 NET ENVIRONMENTAL IMPACT

The Operator is required to control emissions at the point runoff water from the site enters a waterway. The design presented in Figure 8: Pioneer Sand Quarry - Quarry Development Plan shows that where extract activities approach a watercourse or waterbody, a 15 metres buffer will be provided. If the buffer area is vegetated the vegetation will remain intact.

Racecourse Creek traverses the southern portion of the site and separates extraction stages A1 and A4. The bed and banks of Racecourse Creek are badly eroded through persistent recreational vehicle access, see Plate 1: Alignment of Racecourse Creek (dry).

Pioneer Lake forms the west and north boundary for extraction stages A2 and A3. The extraction method will ensure that a 15 metres buffer is maintained to the shoreline thus ensuring that any erosion that occurs will be directed into the extraction area and away from the lake.

Bradshaws Creek forms the north and east boundary to stage B area. Similarly, the 15 metre buffer will protect this watercourse from sediment entrained runoff entering from the extraction activities.

MANAGEMENT MEASURE 2: SEDIMENT CONTROL MANAGEMENT

Item	Proposed measure	Timeframe
4.	A 15 metre wide minimum buffer will be provided to existing watercourses and water bodies.	As extraction approaches these features
5.	Stormwater control infrastructure including drains and sediment traps will be installed to cater for a 1 in 20 rainfall event.	For each stage of development

1.16 GROUNDWATER

1.16.1 SITUATION

Groundwater levels and flows commonly appear as a subdued representation of the surface topography. No constructed water bores have been installed near the Pioneer Sand Quarry site.

The Water Section of the Department of Natural Resources and Environment Tasmania (NRE Tas) offer a public portal to the groundwater bore database titled Groundwater Information Access Portal. This database lists the identification number and basic information on all registered water bores drilled in Tasmania. The information below is derived from this source.

The results of the search show that the two closest water bores are 15631 and 15693. The included image shows the proximity of these bores to Pioneer Lake and hence the development site.

The geology through which these bores were drilled is identified as Tertiary sediments which is like the underlying geology of the development site. The shallowest groundwater level recorded at these bore holes (15693) was 6.1 metres below the surface. The other (15631) being 13.4 metres below the surface.

It is likely however that seepage from Pioneer Lake will be cause the water table to increase in level in the substrate surrounding the lake. Infiltration through the sand stockpiles may have also resulted in an artificially high (perched) water table directly under the stockpiles.

1.16.2 MITIGATION MEASURES

The target resource is only the stockpiled sand remaining on the old natural surface as a by-product of the historic mining operation. Field observations and site auger sampling show that there is no water table within the stockpiles and there will be no disturbance to the underlying Tertiary sediments, sand and gravel. Disturbance to the groundwater in this location is unlikely.



(NRETas, 2023)

Feature id	Feature type	Easting	Northing	Datum	Coordinate accuracy (m)	Drilled date	Drilling company	Depth	Initial yield	SWL list	Last SWL date	Final TDS	Main aquifer geology	Last operating status	Last operating status date
15631	Bore	575214	5451983	GDA94	500	11/10/1972	Mines Department (=Tasmania Department of Mines)	62.50	1.51	13.4	11/10/1972	130	Tertiary Sediments	abandoned	11/10/1972
15693	Bore	577714	5451283	GDA94	2000	07/08/1985	Gerald Spaulding Drillers Pty Ltd	18.30	1.26	6.1	07/08/1985		Tertiary Sediments	functioning	07/08/1985

2 NOISE EMISSIONS

Pioneer Sand Quarry currently uses a wheel loader and mechanical screener to extract and process the stockpiled sand. Operational campaigns have been sporadic and annual product volumes are small but this proposal seeks to intensify the operation to extract and process up to 50,000 cubic metres of sand per year.

Noise generating activities on the Pioneer Sand Quarry will be confined to the operation of mobile equipment used for the extraction and screening the sand and trucks entering, being loaded and leaving the site as part of the cartage task.

2.1 NOISE GENERATING EQUIPMENT

The actual equipment used will vary according to the contractor used and what equipment the contractor has available at the time.

Table 15: Assumed sound power level is a list of equipment used by contractors on these types of operation. The sound power levels tabulated have been derived from previous studies on other sites.

TABLE 15: ASSUMED SOUND POWER LEVEL

Operation	Equipment	Power (kW)	Sound power dB
Stripping / excavating	Excavator	120	108
Loading / stockpiling	Wheel loader CAT 950K	157	103
Screening	Screener: Terex-Finlay 883	72	109
Cartage	On-road truck	320	104

2.2 NOISE SENSITIVE ADDRESSES

Figure 5: Pioneer Sand quarry with surrounds shows the Pioneer Sand Quarry mining lease boundary and the initial location of the screener with the perimeter of 500 metres from the boundary and another 500 metre circle centred on the screener. The 500 metre boundary from the mining lease captures most of the township of Pioneer. This report will focus on the potential for noise impact on the residents of Pioneer.

Table 14: sensitive receptors located within 500 metres tabulates 27 residences believed to be occupied located within 500 metres of the mining lease boundary.

2.3 POTENTIAL NOISE IMPACT AND MITIGATION

Pioneer Sand Quarry is an existing operation and this proposal will not add any new noise generating activities. If the application is successful the additional production will be achieved by establishing operational campaigns more frequently. The operation will proceed during the same hours but on more days per year.

There is potential for even a familiar activity to disturb neighbours when the activity occurs more frequently. The excavator will be introduced only when a new area is to be stripped of vegetation which likely to occur 2 or 3 times per year. At full production the loader and screener will be

operating between 60 and 90 days per year to produce the product stockpiles. The loader and trucks will cart product throughout the year to maintain supply to the various anticipated markets.

A substantial embankment over 10 metres high is located between the residences in Pioneer and the Pioneer Sand Quarry. The effect of this topographic attenuation is enhanced by further visual screening provided by dense forest on the intervening land. The profile of the land between the nearest residence (45 Main Road) and the screen when working on stage A4 is represented by land profile C – C on Figure 9: Pioneer Sand Quarry - Quarry development plan.

2.4 BLASTING

Extracting the stockpiled sand will not require rock drilling, blasting or rock breaking activities.

2.5 NOISE NUISANCE POTENTIAL

Operations only occur during normal hours of operation, 7.00 am to 7.00 pm weekdays and occasionally between 8.00 am and 4.00 pm on Saturdays.

Trucks leaving the site travel on a short section on Racecourse Road (unsealed) and then turn onto Gladstone Road (sealed) and mainly turn west to travel towards Derby or Weldborough. Trucks will travel past the following residences using this route.

TABLE 16: RESIDENCES POTENTIALLY AFFECTED BY TRUCK NOISE

RACECOURSE RD PIONEER TAS 7264	50 MAIN RD PIONEER TAS 7264
45 MAIN RD PIONEER TAS 7264	46 MAIN RD PIONEER TAS 7264
43 MAIN RD PIONEER TAS 7264	42 MAIN RD PIONEER TAS 7264
37 MAIN RD PIONEER TAS 7264	32 MAIN RD PIONEER TAS 7264
31 MAIN RD PIONEER TAS 7264	28 MAIN RD PIONEER TAS 7264
29 MAIN RD PIONEER TAS 7264	16 MAIN RD PIONEER TAS 7264
21 MAIN RD PIONEER TAS 7264	12 MAIN RD PIONEER TAS 7264
19 MAIN RD PIONEER TAS 7264	10 MAIN RD PIONEER TAS 7264
17 MAIN RD PIONEER TAS 7264	4 MAIN RD PIONEER TAS 7264
13 MAIN RD PIONEER TAS 7264	
11 MAIN RD PIONEER TAS 7264	
7 MAIN RD PIONEER TAS 7264	

The site is in relatively close proximity to noise sensitive premises. The area is rural however and surrounding land uses include agriculture and forestry operations, both of which are likely to generate noise. It is likely that ambient noise levels during daytime hours will include forest noises.

2.6 NOISE ATTENUATION MEASURES

Equipment will be well maintained and late model machines with proprietary exhaust silencers fitted to ensure noise emissions are as low as possible.

Quarry operations currently occur during normal daytime hours of 7.00 am to 7.00 pm. The hours of operation for this proposal will remain unchanged.

The mechanical screener will be set up on or close to the original land surface. Stockpile building and hopper and truck loading will take place at this level which is an elevation between 78 and 80 metres

AHD. Between these operations and the township of Pioneer a steep embankment will provide noise attenuation.

The transport route includes a very short section of Racecourse Road. Trucks will navigate the junction with the quarry access road and then travel 160 metres to the intersection between Racecourse Road and Gladstone Road. Over this short distance trucks will not exceed 40 kilometres per hour. Trucks will refrain from using engine brakes within the Pioneer township.

2.7 ENVIRONMENT PROTECTION POLICY (NOISE) 2009

The Environment Protection Policy (Noise) 2009 (EPP (Noise)) seeks to protect environmental values of the acoustic environment to ensure the;

- wellbeing of the community including social and economic amenity,
- wellbeing of individuals, including the individual's,
 - health, and
 - opportunity to work, study, sleep, relax and have conversation without unreasonable interference from noise.

The policy assumed the values are protected for most of the population if acoustic indicator levels are not exceeded and no individual sources of noise are dominant or intrusive.

2.8 NET ENVIRONMENTAL IMPACT

The Pioneer Sand Quarry will not use drilling and blasting equipment or require rock crushers or rock breakers to produce the product. Activities will include operating heavy machinery and a mechanical screener. The topographic screening combined with physical separation distance and restricted hours of operation will make it unlikely that the noise of the operation will be intrusive.

MANAGEMENT MEASURE 3: NOISE MANAGEMENT

Item	Proposed measure	Timeframe
6.	Truck loading operations will be confined to the lowest level of the site providing the best noise attenuation to the township of Pioneer.	At all times
7.	Trucks travelling to and from the operation will be restricted to 50 kilometres per hour on Gladstone Road in Pioneer township and 40 kilometres per hour on Racecourse Road.	During carting operations
8.	Trucks travelling to and from the operation will refrain from using engine brakes within the township of Pioneer.	During carting operations

3 NATURAL VALUES

The Proponent engaged North Barker Ecosystem Services to undertake flora and fauna surveys and fauna habitat assessment of the entire proposed development site. The resulting report (North Barker Ecosystem Services, Jan 2024) is included in this document as Appendix 2 and is summarised below:

3.1 VEGETATION COMMUNITIES

The site is highly disturbed due in part to historic mining activities. Most of the site is correctly mapped as regenerating cleared land TasVeg - FRG (Department of Primary Industries, Parks, Water and Environment, July 2020). On the perimeter of the site five native vegetation communities occupy less disturbed areas, four of these are communities frequently occur locally and one (*Eucalyptus ovata* forest and woodland - TasVeg DOV) is listed as threatened under the *Nature Conservation Act 2002*.

3.1.1 IMPACT MITIGATION

The development area footprint will exclude the area mapped as DOV. The perimeter of each stage of the development footprint will be delineated by flagging prior to clearing activities occurring to ensure disturbance related to equipment and vehicles is confined to within the development footprint.

In response to the findings of the natural values assessment clearing activities will be confined to the vegetation community mapped as FRG apart from a small area (less than 0.8 hectares) of the DAC community on the perimeter and through the connection between stages A and B.

3.2 THREATENED FLORA

No flora species listed under the *Threatened Species Protection Act 1995* or the *Environment Protection and Biodiversity Conservation Act 1999* were detected during the field work or are considered likely to be impacted by the proposed works.

3.2.1 IMPACT MITIGATION

No impact is anticipated, no management action is recommended.

3.3 THREATENED FAUNA

Potential habitat for several threatened fauna species is present:

3.3.1 BLUE-WINGED PARROT

Five trees of sufficient size to potentially support nesting hollows for blue-winged parrot were detected close to the project area footprint.

3.3.2 TASMANIAN MASKED OWL

The survey included the development area plus a buffer area of 150 metres outside the development area. Four trees with a diameter at breast height (DBH) of 100 cm or more were recorded within the development area. A further 22 trees were recorded within the extended buffer area. No direct evidence of habituation such as whitewash or pellets were noted in the vicinity of the trees.

3.3.2.1 IMPACT MITIGATION AVIAN SPECIES

The trees recorded as potential habitat trees for Tasmanian masked owl and blue-winged parrot are located within remnant native forest on the perimeter of the proposed development area. The development area has been adjusted to avoid these areas of native forest, woodland and scrub.

No disturbance to these potential habitat trees will occur because of this proposal hence no further investigations into potential habituation by Tasmanian masked owl or blue-winged parrot are considered necessary.

3.3.3 TASMANIAN DEVIL, SPOTTED-TAILED QUOLL, EASTERN QUOLL

Scats and a potential active den of eastern quoll were observed during the survey, it is possible that both Tasmanian devil and spotted-tailed quoll include the site in their territory range.

3.3.3.1 IMPACT MITIGATION

A potentially active den for eastern quoll was recorded in an area of remnant woodland within the proposed development area. The development area has been altered to avoid this patch of native vegetation, thus preserving the den and the surrounding remnant vegetation.

Although the proposal includes up to 32 hectares of clearing over the life of the project only 5 to 8 hectares will be cleared at any one time and the Proponent intends to immediately revegetate worked out areas. Over time the areas of revegetation will balance the areas of clearance until the entire site is fully revegetated at project closure.

The ecological assessment found evidence of denning activities in the remnant native forest community adjacent to the stage A1 development area. This site will be protected with a 90 metre buffer to clearing activities. The site identified in the northern portion will also be avoided with a 45 metre buffer to clearing activities associated with stage B. It was concluded that it is possible the development area supports occasional dens and hence a pre-clearance survey is recommended.

The ecological assessment found it unlikely that operation of the proposed quarry will impact on marsupial carnivores due to road kill. Traffic within the quarry site will be dead slow due to the unmade roads and short travel distances. Traffic to and from the quarry will travel over a 160 metre long section of Racecourse Road between the site entrance and the junction with Gladstone Road. Traffic will have a speed limit of 40 km/hr applied over this section. The increase in traffic attributed to the quarry will not constitute an increase of more than 10% during night time on Gladstone Road.

3.3.4 GREEN AND GOLD FROG, STRIPED MARSH FROG

No evidence of either species was observed. Small wetlands within the development area support characteristic habitat suited to these species.

3.3.4.1 IMPACT MITIGATION

Potential habitat for green and gold frog and striped marsh frog is considered low quality and no mitigation measures are recommended.

3.4 AQUATIC VALUES

The receiving aquatic environment is compromised by historic mining activities and is unlikely to provide significant habitat for aquatic fauna species.

3.4.1 IMPACT MITIGATION

Measures described in Section 2.1 Surface water and ground water quality describes significant infrastructure is proposed to control stormwater contamination and discharge from the site. These measures will protect the receiving aquatic environment from adverse impacts associated with the proposed Pioneer Sand Quarry operation.

4 WEEDS PESTS AND PATHOGENS

4.1 WEEDS

The ecological study and assessment (North Barker Ecosystem Services, Jan 2024) included a survey for weeds and disease that may be present on the site. Two declared weed species and several environmental weeds were observed within the then project area.

The Proponent used the information gained through the ecological assessment to refine the development area to avoid more intact vegetation stands which also avoided the areas where declared weeds were observed.

A Weed and Disease Hygiene Management Plan (WDHMP) was commissioned to provide a management strategy to allow extractive operations to proceed with minimal risk of spreading weeds through the transport of vehicles and machinery on and off the site. The resultant plan (North Barker Ecosystem Services, May 2024) is included in this document as Appendix 3.

The WDHMP refers to the weeds observed during the ecological survey and observations of weeds recorded on the Natural Values Atlas, these results are tabulated below:

TABLE 17: WEED SPECIES OBSERVED ON SITE

Species	WoNS	Biosecurity Act 2019 (Tas)	Extent
montpellier broom <i>Genista monspessulana</i>	Yes	Class B	Within the mining lease adjacent to the main access road.
spanish heath <i>Erica lusitanica</i>	No	Class A	Within the southwest portion of the mining lease in bushland and north west portion. Both areas now excluded from operations areas.
cumbungi <i>Typha latifolia</i>	No	-	Between stage A2 and B and on Pioneer Lake foreshore.
radiata pine <i>Pinus radiata</i>	No	-	Scattered throughout the project area over and around the stockpiles.

TABLE 18: WEED SPECIES RECORDED NEARBY IN NATURAL VALUES ATLAS

Species	WoNS	Biosecurity Act 2019 (Tas)	Extent
blackberry <i>Rubus anglocandicans</i> and <i>fruticosus</i>	Yes	Class B	Main Road and 25 Main Road Pioneer
english broom <i>Cytisus scoparius</i>	Yes	Class B	Recorded at 25 Main Road, Pioneer
montpellier broom <i>Genista monspessulana</i>	Yes	Class B	Recorded at 25 Main Road, Pioneer.

paterson's curse <i>Echium plantagineum</i>	No	Class A	Recorded at 25, 27, 32 & 35 Main Road, Pioneer.
sallow willow <i>Salix matsudana</i>	Yes	Class B	Recorded at 25 Main Road, Pioneer.
silver pampas grass <i>Cortaderia selloana</i>	No	Class A	Recorded at 32 Main Road, Pioneer.
spanish heath <i>Erica lusitanica</i>	No	Class A	Recorded along Main Road and 25 Main Road Pioneer

4.1.1 MITIGATION

Spanish heath typically harbours a significant seed bank which makes eradication only possible through persistent control over several years. The area where Spanish heath is present will be excluded from the development footprint leaving a minimum of a 35 metre buffer to ground disturbing works. The observed spanish heath infestations and the montpellier broom will be the target of ongoing herbicide control as described in the WDHMP until eradication is successful.

The WDHMP makes the following specific recommendations for weed species observed onsite, the full detail of these recommendations is included Appendix 3:

TABLE 19: WEED MANAGEMENT RECOMMENDATIONS

Species	Treatment	Timing	Further advice
montpellier broom <i>Genista monspessulana</i>	Cut and paint or foliar spray plants	Spring to early summer or autumn after rain.	When plants are actively growing. Avoid mechanical disturbance.
spanish heath <i>Erica lusitanica</i>	Cut and paint or foliar spray plants	Autumn to early winter prior to setting seed.	Do not disturb area (no machinery within 50 metres)
cumbungi <i>Typha latifolia</i>	Mechanical removal when area is dry or glyphosate 360	Summer to autumn	Use water safe wetter and surfactants only.
radiata pine <i>Pinus radiata</i>	Seedlings hand pulled removing main root. Cut mature trees.	anytime	Follow up control necessary seedlings will sprout from seed bank.

All works are to comply with best-practice guidelines:

- *Keeping it clean – A Tasmanian field hygiene manual to prevent the spread of freshwater pests and pathogens* (Gartenstein, 2010);
- *Weed and Disease Planning and Hygiene Guidelines – Preventing the spread of weeds and diseases in Tasmania* (Department of Primary Industries Parks, Water and Environment, 2015);

- *Tasmanian Washdown Guidelines for Weed and Disease Control. Machinery, Vehicles & Equipment* (Department of Primary Industries Parks Water and Environment, 2004);
- *Wetlands and Waterways Works Manual* (Department of Primary Industries, Parks, Water and Environment, 2003).

To comply with the guidelines above a machinery and vehicle acceptance protocol will be developed to ensure that all equipment brought onto the site has been thoroughly cleaned and checked. A site will be established suitable to use compressed air to blown-down road trucks which have not been cleaned prior to coming to site.

The areas known to be harbouring declared weeds have been excised from the operations areas and the Operator will ensure that no equipment or personnel enter these areas unless to perform weed control activities.

4.2 PHYTOPHTHORA CINNAMOMI (Pc)

There is a record of observation of Pc located at the boat ramp just outside the mining lease west boundary. This is a public area and the quarry operation will not require any interaction or disturbance here.

The survey found no evidence that Pc was present at the site, but did find susceptible species. The presence of susceptible species warrants mitigation measures.

4.2.1 MITIGATION

Soil disturbance should be restricted to the extent of the development footprint and implementation of the WHDMP will prevent the introduction of Pc to the site.

4.3 CHYTRID FUNGUS

No frogs were recorded at the site during field work, but habitat is present and hence the development presents a risk of introducing the pathogen. Hygiene protocols required by the WHMP will be effective in preventing the introduction of Chytrid fungus to the site.

MANAGEMENT MEASURE 4: WEED AND DISEASE MANAGEMENT

Item	Proposed measure	Timeframe
9.	Implement recommendations within the Weed and Disease Hygiene Management Plan developed specific to this site.	Upon issue of a permit
10	A blown-down site will be established to clean road truck which have not be cleaned and inspected prior to coming to site.	Upon issue of a permit
11	A pre-clearance survey and den management protocol in accordance with <i>Survey Guidelines and Management Advice for Development Proposals that may impact on the Tasmanian devil</i> will be implemented.	Prior to significant clearing

5 WASTE

5.1 WASTE FROM EXTRACTION

Pioneer Sand Quarry will not produce waste products from extraction. Stripping will consist of current vegetation cover which will be broken up and stockpiled along with any sandy loam forming topsoil in low windrows alongside extraction areas. These materials will be replaced over the ground surface once extraction is complete and an area is considered 'worked out'.

The resource will be segregated in to medium particle size to be used for construction materials including concrete, asphalt, bedding etc and a coarse particle size that will be used for landscaping work. There will be no unsuitable product. There is a remote possibility that rubbish and relics may have been covered by the stockpiles.

5.2 SPARES AND LITTER

Machinery will be taken off site to the Operator's workshops for servicing and maintenance. Spares or waste generated through breakdowns or routine lubrication will be retained in workers utilities and taken off-site at the end of each working day.

Litter emanating from lunches and other amenities will be retained in enclosed containers and periodically disposed of to an approved disposal site.

6 ENVIRONMENTALLY HAZARDOUS SUBSTANCES

6.1 HYDROCARBONS

Mobile equipment will be refuelled using a utility mounted refuelling facility. Lubricants, engine oil and hydraulic fluid for daily maintenance will not be stored on site. Lubricants for daily servicing will be kept in the operator's utility vehicles.

6.2 LEAK AND SPILLS

The Operator will provide a hydrocarbon spill kit ready for immediate deployment if a hydrocarbon leak or spill occurs. A hydrocarbon boom will be available for deployment across the surface of the sediment trap should a hydrocarbon spill or leak enter the sediment control infrastructure.

6.3 OTHER HAZARDOUS SUBSTANCES

Any herbicides that may be used by contractors in controlling weeds at the site will not be stored at the site and will remain in the contractors vehicles during the course of the contract works.

MANAGEMENT MEASURE 5: HAZARDOUS SUBSTANCE MANAGEMENT

Item	Proposed measure	Timeframe
12	A hydrocarbon spill kit and a hydrocarbon boom will be available and ready for immediate deployment in the event of a hydrocarbon leak or spill.	During operational campaigns

7 SITE CONTAMINATION

The resource at Pioneer is sand tailings from historic tin mining activities. The ground surface under the tailings was most likely altered because of the mining activities and the tailings placed on worked out ground. If any contamination occurred it would have been during mining activities and would be present in the underlying ground. This proposal seeks to remove the sand from above ground without disturbing the underlying surface. It is therefore unlikely that any contaminated material will be disturbed.

8 ENVIRONMENTAL IMPACTS OF TRAFFIC

Stripping new areas for extraction, extraction activities will coincide with cartage activities. Cartage will occur consistently throughout the year:

TABLE 20: TRUCK MOVEMENTS

Description	Units	Quantity
Annual production (m3) max.	m3	50000
average bulk density	t/m3	1.54
Annual production (t) max.	t	77000
Conservative pay load	t	39
Loads to cart production		1974
Weeks worked per year		48
Days worked per week		6
Days worked per year		288
Adjust for public holidays		280
Loads per day		7.1
Movements per day (in/out)		14.1

Traffic from Pioneer Sand Quarry will travel along the access road (unsealed) through a junction onto Racecourse Road (unsealed) and then to Gladstone Road (sealed). The nature of the road surface, geometry and short distances will force the trucks to travel at a low speed.

Once on Gladstone Road traffic from the quarry will only be allowed to speed up once vehicles have cleared the restricted speed zone in the township of Pioneer. Quarry traffic will have then been integrated with other traffic from other operations that use Gladstone Road and the environmental impact related to the quarry is difficult to isolate.

9 OTHER OFF-SITE IMPACTS

The Pioneer Sand Quarry will be self-sufficient for energy and the natural water content of the insitu sand makes it unlikely that additional water will be required for dust suppression.

10 MONITORING

10.1 MONITORING

Pioneer Sand Quarry will conduct regular and routine monitoring to ensure compliance with environmental conditions.

10.2 SEDIMENT CONTROL INFRASTRUCTURE

The Operator will observe the level of accumulated sediment in the sediment traps and drainage channels. Once the level of accumulated sediment in the traps or drains has risen to half the full water level the sump and drains will be cleaned out. The spoil gathered from clearing the sediment traps and drains will be stored with rehabilitation materials for use in future rehabilitation activities.

10.3 DUST IMPACTS

The quarry operator will observe dust conditions in dry and windy weather. If dust is observed crossing the operations area boundary loading operations will be paused until conditions improve. It is noted that the operations area boundary is 150 metres within the mining lease boundary in the direction of the township of Pioneer.

10.4 WEEDS

During normal operations the operator, employees and contractors will observe the quarry stockpiles and surrounding areas for emergent weeds and if present, initiate controls as required.

11 DECOMMISSIONING AND REHABILITATION

11.1 PROGRESSIVE REHABILITATION

Once the stockpiled sand has been removed the Pioneer Sand Quarry site will be an attractive site for recreational activities. Pioneer Lake is an attractive body of water which is stocked by Inland Fisheries for recreational fishing and offer numerous other recreational opportunities.

To prepare the site for future recreation the most positive interim rehabilitation goal will be to re-establish native vegetation like that surrounding. Progressive rehabilitation will be carried out so that when decommissioning occur the site appears as a mosaic of different aged native vegetation communities.

11.2 DECOMMISSIONING

Once all remaining marketable materials have been recovered the Proponent will carry out decommissioning and rehabilitation:

- All machinery, sheds and equipment will be removed from the site.
- Faces will be reduced to maximum height of 5 metres.
- The access track quarry floor and remaining benches will be ripped to enhance infiltration.
- Overburden stockpiles will be spread over the ripped surfaces and placed against the toe of remaining faces to further reduce the height.
- Topsoil stockpiles will be spread on the finished surface and any remaining stripping pulled back over this.

- Smaller sediment traps will be filled with spoil and covered with soil. The larger eastern sediment trap will be retained until a self-sustaining vegetation cover is achieved and then allowed to gradually fill and become a wetland.
- The gate securing the site will be retained and remain locked until full rehabilitation is complete.

11.3 MONITORING DURING REHABILITATION

Until such time as the site is considered rehabilitated the Operator will continue to monitor the following aspects of the rehabilitation:

Inspection	Action
Emerging weeds	Weed control using herbicide spray or cut and paint
Eastern sediment trap will be inspected for capacity	Clean out if accumulated sediment has reduced trap effectiveness.
Planting and natural recruitment revegetation	Broadcast native seed mix if revegetation is unsuccessful.

12 GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

Natural sand is becoming a scarce commodity, particularly in southern Tasmania. Alternatives to natural sand include manufactured sand and recycled glass, both of which require significant energy inputs to crush, screen, wash and dry the product before it is ready for use. The Pioneer Sand Quarry operation will replace natural sand with a recycled by-product from an historic mining operation. No crushing and only minor screening will be required.

The transport task to cart sand from Pioneer to the market is a greenhouse gas contributor which will be partly offset by the ease of processing at the destination or may be fully offset if the product is backloaded.

The stormwater management infrastructure included in this proposal will protect the surrounding environment from adverse impact due to more severe storm events associated with climate change.

PART D SUMMARY OF PROPOSED MANAGEMENT MEASURES

Item	Proposed measure	Timeframe
1.	Truck carting sand off site will have covers fitted	At all times
2.	A site wide speed limit of 30 km/hr and a speed restriction for quarry trucks on Racecourse Road of 40 km/hr will be imposed.	At all times
3.	A 15 metre wide minimum buffer will be provided to existing watercourses and water bodies.	As extraction approaches these features
4.	If the climate conditions change in the future, dust suppression measures will be deployed to prevent visible dust emissions generated by sand processing from crossing the mining lease boundary	As required
5.	Stormwater control infrastructure including drains and sediment traps will be installed to cater for a 1 in 20 rainfall event.	For each stage of development
6.	Truck loading operations will be confined to the lowest level of the site providing the best noise attenuation to the township of Pioneer.	At all times
7.	Trucks travelling to and from the operation will be restricted to 50 kilometres per hour on Gladstone Road in Pioneer township and 40 kilometres per hour on Racecourse Road.	During carting operations
8.	Trucks travelling to and from the operation will refrain from using engine brakes within the township of Pioneer.	During carting operations
9.	A Weed and Hygiene Management Plan specific to this site and operation and as a minimum complying with the <i>Weed and Disease Planning and Hygiene Guidelines</i> will be implemented.	Upon issue of a permit
10.	A blown-down site will be established to clean road truck which have not be cleaned and inspected prior to coming to site.	Upon issue of a permit
11.	A pre-clearance survey and den management protocol in accordance with <i>Survey Guidelines and Management Advice for Development Proposals that may impact on the Tasmanian devil</i> will be implemented.	Prior to significant clearing
12.	A hydrocarbon spill kit and a hydrocarbon boom will be available and ready for immediate deployment in the event of a hydrocarbon leak or spill.	During operational campaigns

PART E PUBLIC AND STAKEHOLDER CONSULTATION

This proposal seeks to increase the current level of production at Pioneer Sand Quarry from less than 5,000 cubic metres extracted to 50,000 cubic metres. The proposal has been deemed by Dorset Council as requiring a Development Application. A quarry extracting material at a rate greater than 5,000 cubic metres per year is classified under Schedule 2 of the *Environmental Management and Pollution Control Act 1995* (EMPC Act) as Level 2.

Stakeholders that have been consulted through this process include the following:

- Dorset Council has been consulted regarding the status of the existing quarry and consideration of the requirement for a Development Application.
- The Board of the Environment Protection Authority (EPA) through a Notice of Intent and this Environment Effects Report.
- Mineral Resources Tasmania has been engaged to consider the proposal and change the boundaries of the mining lease as per an application to surrender portions.

A development application will be submitted to the Dorset Council for a discretionary activity which will require advertising to the public through print media, private notice to property owners that share a boundary with the site as well as a physical notice posted on the land. During the consultation period Council will accept representations from interested parties and both Council and the EPA will consider the representation in their assessment of the proposal.

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