

Appendix 5
NOISE AUDIT DECEMBER 2019
Atkins Acoustic

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16 December 2019

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Consulting Acoustical & Vibration Engineers

ENVIRONMENTAL NOISE AUDIT
GRANTS ROAD SAND QUARRY
SOMERSBY
NOVEMBER 2019

1.0 INTRODUCTION

Atkins Acoustics was retained by Grants Road Sand Pty Ltd to conduct an environmental noise audit of the Grants Road Sand Quarry operations. The audit was conducted by Graham Atkins. Grahams qualifications and membership include BE, MAAS, MIEAust and CPEng. Graham is employed by Atkins Acoustics and Associates Pty Ltd a Member Firm of the AAAC.

The quarry currently operates under approval from the Department of Planning and Environment (DoPE), Application number 08_0099. MOD 1, dated April 2018. Specific noise conditions (Schedule 3 - Conditions 5, 6, 7, 8 & 9) contained within the approval include a requirement for the preparation of a *NMP (Schedule 3 - Condition 9)* to the satisfaction of the Secretary.

The approval includes:

- extraction, processing and transportation of up to 250,000 tonnes per annum of various grades of washed sand, mortar sand, sandstone blocks and retaining wall rocks for a period of approximately thirty (30) years.
- total extraction of approximately nine point five (9.5) million tonnes (Mt) of extractable sand and sandstone.
- extension of quarry by approximately twenty (20) hectares.
- extraction to depth of thirty-five (35) metres, and
- extraction by dozer and excavator.

The quarry operates from 7.00am to 6.00pm Monday to Friday and 7.00am to 1.00pm Saturday.

2.0 APPROVAL CONDITIONS (Noise)

Project construction and quarry operational noise conditions imposed by the DoPE (*Application Number 08_0099, MOD 1*), dated April 2018 – Schedule 3 are presented below:

NOISE

Hours of Operation

5. The Proponent shall only conduct construction activities and quarrying operations on the site:
- (a) between 7.00 am and 6.00 pm, Monday to Friday;
 - (b) between 7.00 am and 1.00 pm, Saturday; and
 - (c) at no time on Sunday or public holidays.

Note: The Proponent may carry out other activities e.g. maintenance, on the site provided that these activities are conducted in a manner that is inaudible at all privately-owned residences.

6. The following activities may be carried out on the site outside the hours specified in condition 5:
- (a) delivery or dispatch of materials as requested by Police or other authorities; and
 - (b) emergency work to avoid the loss of lives, property and/or to prevent environmental harm.

In such circumstances the Proponent shall notify the Secretary and affected residents prior to undertaking the activities, or as soon as is practical thereafter.

Noise Impact Assessment Criteria

7. The Proponent shall ensure that the construction and operational noise generated by the project does not exceed the criteria in Table 1 at any residence on privately-owned land.

Table 1: Noise criteria

Receiver Location	$L_{Aeq, 15min}$ dB(A)
All privately-owned residences	40

Noise generated by the project is to be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the *NSW Industrial Noise Policy*. Appendix 2 sets out the meteorological conditions under which these criteria apply and the requirements for evaluating compliance with these criteria.

However, the noise criteria in Table 1 do not apply if the Proponent has an agreement with the relevant landowner to exceed the noise criteria, and the Proponent has advised the Department in writing of the terms of the agreement.

It is noted that no noise limits are provided in *Schedule 3 – Condition 7* for the National Park to the west of the quarry. Referenced to the EA Noise Assessment and the *NSW, INP* a target noise goal of $L_{Aeq, 15min}$ 50-55dB(A) is recommended for assessing noise at the National Park boundary.

4.0 OVERVIEW

The noise audit was undertaken between 7.10am and 11.45pm, Thursday 28 November 2019.

In accordance with the NMP noise measurements were conducted at three (3) reference residential locations and at the National Park site boundary.

<i>Location 1:</i>	'Ibels' - 380 Somersby Falls Road
<i>Location 2:</i>	'McGregor' - 239 Grants Road
<i>Location 3:</i>	'Sammut' - 210 Grants Road
<i>Location 4:</i>	'National Park' boundary,

4.1 Measurement Instrumentation

The measurement instrumentation comprised a Svan 949 Sound and Vibration Analyzer. The meter was programmed to calculate and record 15 minute statistical levels. The reference calibration level of the meter was checked prior to and after the measurements with a Bruel & Kjaer Sound Level Calibrator Type 4230 and remained within ± 0.5 dBA. The meter carried appropriate and current NATA calibration (*Attachment 2*).

Measurements were undertaken in accordance with procedures documented in Australian Standard AS1055-1997 'Acoustics - Description and Measurement of Environmental Noise' and the NSW Environmental Protection Authority, Noise Policy for Industry (*NPfI*) guidelines.

4.2 Weather Conditions

Weather observations and conditions reported at the Mangrove Mountain (ID 061375) weather station during the audit were calm to light east to north-east wind (0 - 2.5m/sec), air temperature 15-25°C, relative humidity 29-98% and clear sky.

4.3 Review of Noise Related Incidents

The Site Quarry Manager confirmed that no noise related incidents were reported during the period from 27 November 2018 to 28 November 2019.

5.0 MEASUREMENT RESULTS

5.1 Off-site Measurement Results

Attended measurements during the audit where appropriate were used to assess source noise contributions associated with Grants Road Sand Quarry operations. A summary of the measurement results and calculated contributions is presented in *Table 1*. Measurements at all reference assessment locations was dominated by cicada and insect noise

Table 1: Audit Measurement Results

dBA re: 20 x 10⁻⁶ Pa

Measured Ambient Sound Pressure Levels dBA				Estimated Grants Road Sand Contribution L _{Aeq, 15min}	Comments
L _{Aeq}	L _{A10}	L _{A90}	L _{A1}		
Location 1: Ibels Residence – 380 Somersby Falls Road					
48.1	47.5	32.7	58.1	<40	Bees, birds, distant road traffic, GRS mobile plant audible at times estimated L _{Amax} 34/6dBA.
40.3	43.5	33.2	49.2	<40	Aircraft, birds, GRS mobile plant audible at times estimated L _{Amax} 36/7dBA
Location 2: McGregor Residence – 239 Grants Road					
41.2	45.1	33.8	50.9	<40	Aircraft, birds, GRS onsite trucks L _{Amax} 34/5dBA, FEL audible at times.
41.6	42.4	32.9	52.4	<40	Aircraft, Distant road traffic, GRS onsite trucks L _{Amax} 34/5dBA, FEL loader audible at times.
Location 3: Sammut Residence – 210 Grants Road					
39.1	40.9	34.4	48.2	<40	Distant road traffic, Birds, GRS onsite trucks L _{Amax} 35/8dBA, FEL L _{Amax} 30/2dBA audible at times, Dozer track noise L _{Amax} 30/3dBA..
38.4	40.2	32.4	49.6	<40	Birds, GRS onsite trucks L _{Amax} 40/2dBA.
Location 4: National Park					
42.4	43.8	38.6	47.9	<50	GRS Hyundai excavator (L _{Aeq} 38dBA).
41.7	42.9	38.0	48.5	<50	GRS Hyundai excavator (L _{Aeq} 38dBA).

5.2 Site Audit Results

In addition to the offsite noise measurements *Table 2* presents a summary of sound power levels for the operating site plant and equipment.

Table 2: Quarry Plant and Equipment Sound Power Levels
dBA re: 10⁻¹² Watts

Plant Description	Sound Power Level dB 10-12 Watts									
	dBA	31.5	63	125	250	500	1k	2k	4k	8k
Cat Loader 980G	106	92	119	103	100	100	102	96	90	89
Cat Loader 980C	107	101	107	105	103	101	103	101	95	85
McClosky (Tricon) Screen	108	98	102	95	99	100	101	95	93	83
Komatsu Dozer PTD043	100	97	103	99	95	98	96	92	84	83
Cat Excavator 330F	97	97	99	102	100	94	92	89	44	81
Cat Loader 972G	102	93	101	104	105	100	96	92	88	85
Sand Wash Plant	101	115	113	101	94	97	95	92	91	90
Hyundai Excavator 290LC-9	96	92	108	101	94	92	88	88	87	86
Cat 222-4743 (Diesel Pump)	108	104	124	107	102	101	102	103	98	94

5.3 Compliance Status

The results in *Table 1* demonstrate that noise from Grants Road Sand Quarry activities complied with the DoPE (*Application Number 08_0099, MOD 1*), noise condition L_{Aeq, 15min} 40dBA and the NMP goal for the National Park L_{Aeq, 15min} 50-55. *Table 3* presents a summary of the noise compliance status for the Grants Road Sand Quarry operations.

Table 3 – Noise Compliance Status

Unique ID	Compliance Requirement	Development Phase	Monitoring methodology	Evidence and comments
7	The Proponent must ensure that the construction and operational noise generated by the project does not exceed L _{Aeq, 15min} 40dBA at all privately owned residences	At all times	Daily onsite inspection of plant and equipment. Annual Noise Audit Acoustic Consultant	Annual Compliance Report from Acoustic Consultant

5.4 Noise Trends

A review of the measurement results (*Table 1*) and previous reported levels has shown that noise contributions from Grant Road Sand Quarry have remained steady.

Table 1 – Environmental Performance Summary

Environmental Aspect	Approval Criteria: Requirements in the management plan.	Summary of Monitoring Results in the Previous Reporting Period	Summary of Monitoring Results in this Reporting Period	Improvement Measures to be implemented
Noise	Schedule 3 Conditional 7 of the Approval	Location 1: <40dBA Location 2: <40dBA Location 3: <40dBA	Location 1: <40dBA Location 2: <40dBA Location 3: <40dBA	Extension of earth mounding, routine maintenance program, replacement of faulty noisy plant/equipment

5.5 Noise Mitigation Planning

Noise mitigation options planned for the next calendar year, include the continuation of the earth mounding/bunding on the northern and western site boundaries.

Additionally and dependent on product demand, it is expected that the depth of the working platforms (Areas A and B) could increase by 3-4 metres.

6.0 CONCLUSION

Atkins Acoustics was retained by Grants Road Sand Pty Ltd to conduct an environmental noise audit for the Somersby Quarry.

The quarry currently operates under approval from the Department of Planning and Environment, Application number 08_0099. MOD 1, dated April 2018.

The noise audit was undertaken between 7.10am and 11.45pm, Thursday 28 November 2019.

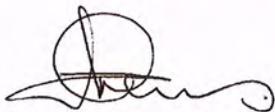
The findings of the measurement results show that noise from Grants Road Sand Quarry activities complied with the DoPE (*Application Number 08_0099, MOD 1*), noise condition $L_{Aeq, 15min}$ 40dBA and the NMP goal for the National Park $L_{Aeq, 15min}$ 50-55.

The Site Quarry Manager confirmed that no noise related incidents were reported to the site during the period from 27 November 2018 to 28 November 2019.

A review of the audit measurement results (*Table 1*) and previous reported audit measurements has shown that noise contributions from Grant Road Sand Quarry have remained steady.

Noise mitigation options planned for the next calendar year, include the continuation of the earth mounding/bunding on the site boundaries and dependent on product demand, the depth of working platforms in Areas A and B, could increase by 3-4 metres.

ATKINS ACOUSTICS & ASSOCIATES PTY LTD.



Graham Atkins

ATTACHMENT 1: ASSESSMENT MONITORING LOCATIONS

(Reference Source: Six Maps)



ATTACHMENT 2: Svan Certificate of Calibration.

CERTIFICATE OF CALIBRATION

CERTIFICATE No.: **SLM 21917 & FILT 4335**

Equipment Description: Sound & Vibration Analyzer

Manufacturer: Svantek

Model No: Svan-949 **Serial No:** 9713

Microphone Type: 7052E **Serial No:** 48484

Filter Type: 1/3 Octave **Serial No:** 9713

Comments: All tests passed for class 1.
(See over for details)

Owner: Atkins Acoustics
Suite 17, 1 Jordan Street
Gladesville, NSW 2111

Ambient Pressure: 1000 hPa \pm 1.5 hPa

Temperature: 25 °C \pm 2° C **Relative Humidity:** 45% \pm 5%

Date of Calibration: 08/01/2018 **Issue Date:** 08/01/2018

Acu-Vib Test Procedure: AVP10 (SLM) & AVP06 (Filters)

CHECKED BY: **AUTHORISED SIGNATURE:**
Jack Kild

Accredited for compliance with ISO/IEC 17025
The results of the tests, calibration and/or measurements included in this document are traceable to
Australian/national standards.





Accredited Lab. No. 9262
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Measurements

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AVCERT10 Rev. 1.2 03.02.15

Appendix 6
BASELINE AIR QUALITY MONITORING
Environmental Resources Management (ERM)



Compliance Monitoring Annual Report

2019 Grants Road Sand

11 February 2020

Project No.: 0476648

Document details	
Document title	Compliance Monitoring Annual Report
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Date	11 February 2020
Version	2.0
Author	Bryan Rondilla; Jane Barnett
Client Name	Grants Road Sand

Document history

Version	Revision	Author	Reviewed by	ERM approval to issue		Comments
				Name	Date	
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11 February 2019

Compliance Monitoring Annual Report

2019 Grants Road Sand



Jane Barnett
Partner

ERM Australia Pacific Pty Ltd

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1. EXECUTIVE SUMMARY

As part of the Conditions of Approval issued on 25 July 2014 for the Grants Road Sand Quarry Extension, the proponent is required to monitor meteorological and dust parameters and report annually on the results and findings. This report summarises the measured data for each of these parameters for the 2019 calendar year.

Monitoring data showed that there was a single exceedance of the maximum 24-hour average PM₁₀ criterion, and this was due to the extreme bushfire activity across the region in December 2019. There was no exceedance of the annual average air quality criterion. There were also no reported incidents or complaints received.

The information in this report provides a summary of the measurements of particulate matter (PM₁₀), deposited dust, respirable crystalline silica (RCS) and meteorological parameters measured at the site from 1 January to 31 December 2019.

2. INTRODUCTION

ERM Australia Pacific Pty Ltd (ERM) has been commissioned by Grants Road Sand to undertake the annual reporting for compliance monitoring at the Grants Road Sand Quarry, located on the NSW Central Coast at Somersby.

The results of the monitoring programs are provided on an annual basis. This report summarises the data collected during the January to December 2019 period.

All monitoring for air quality is conducted in accordance with the NSW Environmental Protection Agency (EPA)¹ “*Approved methods for the sampling and analysis of air pollutants in NSW*” (NSW DEC 2005).

Specifically, the approved methods relevant to this monitoring plan are:

- AM-1 – Guide for the siting of sampling equipment.
- AM-2 – Guide for measurement of horizontal wind for air quality applications.
- AM-4 – Meteorological monitoring guidance for regulatory modelling applications.
- AM-18 – Particulate matter – PM₁₀ – high volume sampler with size-selective inlet.
- AM-19 – Particulates – deposited matter – gravimetric method.

AM-1 refers to the Australian Standard (AS) 2922 – 1987, however this has been superseded by AS/NZS 3580.1.1:2007 Methods for sampling and analysis of ambient air – Guide to siting air monitoring equipment.

The siting of all instrumentation is undertaken in accordance with the requirements set out in both AS 2922 – 1987 and AS/NZS 3580.1.1:2007. Where conflicts arise, preference will be given to the more recent standard.

AM-2 refers to the Australian Standard AS 2923 – 1987 “Ambient Air – Guide for the Measurement of Horizontal Wind for Air Quality Applications”. As 2923 applies to the determination of wind speed and direction for the purpose of air quality applications and sets out requirements for apparatus, calibration and maintenance, siting and installation and data recording and processing (including appropriate methods for wind averaging). A monitoring site for the meteorological station (met station)

¹ The NSW EPA exists as a legal entity operated within the Office of Environment and Heritage (OEH) which came into existence in April 2011. OEH was previously part of the Department of Environment, Climate Change and Water (DECCW). The DECCW was also recently known as the Department of Environment and Climate Change (DECC), and prior to that the Department of Environment and Conservation (DEC). The terms NSW EPA, OEH, DECCW, DECC and DEC are interchangeable in this report.

was chosen in accordance with AS 2923 – 1987. The location is away from buildings or other obstructions that would otherwise impact on the prevailing with flow.

2.1 Project name and project application number

Project name: Grants Road Sand Quarry Extension

Application Number: 08_0099

2.2 Project address

270 Grants Road, Somersby NSW 2250. The site itself is shown in **Figure 1**.

2.3 Project phase

Operational Compliance Report.

2.4 Compliance reporting period

Annual reporting period includes 1 January 2019 to 31 December 2019.

2.5 Project activity summary

Measurements for Respirable Crystalline Silica (RCS), PM₁₀, deposited dust and meteorological parameters have been analysed and reported consistent with project requirements.

3. COMPLIANCE STATUS SUMMARY

Unique ID	Compliance Requirement	Development Phase	Monitoring methodology	Evidence and comments
Schedule 3, Condition 10	Ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the project do not exceed the criteria.	Operation	Dust deposition sampling and PM ₁₀ monitoring measurement as described in Section 2.	No exceedances in reporting period for PM ₁₀ or deposited dust.
Schedule 3, Condition 11, Part a	Implement best practice management to minimise the dust emissions of the project.	Operation	SMS alerts from on-site weather station when wind speeds are high. Operations are modified or ceased during these periods.	Remote access to the weather station to enable SMS alerts.
Schedule 3, Condition 11, Part b	Regularly assess air quality monitoring data and relocate, modify and/or stop operations on site to ensure compliance with the air quality criteria in this approval.	Operation	Dust deposition sampling, PM ₁₀ monitoring and meteorological measurement as described in Section 2.	Analysis of data throughout the year to ensure levels below short-term criteria and on track to remain below annual criteria.
Schedule 3, Condition 11, Part c	Minimise the air quality impacts of the project during adverse meteorological conditions and extraordinary events.	Operation	SMS alerts from the on-site weather station when winds are above certain speeds, as detailed in the Air Quality Management Plan.	Remote access to the weather station to enable SMS alerts.
Schedule 3, Condition 11, Part f	Carry out regular air quality monitoring to determine whether the project is complying with the relevant conditions of this approval.	Operation	Dust deposition sampling, PM ₁₀ monitoring and meteorological measurement as described in Section 2.	No exceedances in reporting period for PM ₁₀ or deposited dust.
Schedule 3, Condition 13	For the life of the project, the Proponent shall ensure that there is a suitable meteorological station operating in the vicinity of the site that complies with the requirements in the Approved Methods for Sampling of Air Pollutants in New South Wales guideline.	Operation	10 m meteorological mast installed at the site complying with all relevant methods listed in Section 2.	Data capture rate for all parameters for 2019 was ≥ 90%
Schedule 4, Condition 7	Immediately notify the Secretary and any other relevant agencies of any incident. Within 7 days of the date of the incident, provide the Secretary and any relevant agencies with a detailed report on the incident, and such further reports as may be requested	Operation	PM ₁₀ monitoring as described in Section 2.	No incidents recorded.

4. NON-COMPLIANCES

There is one instance of non-compliance recorded during the 2019 reporting period. This is the exceedance of the maximum 24-hour average PM₁₀ criterion. However, this is a regional exceedance and not due to the operation of the quarry. Summaries of the monitoring data through the year are shown in Appendix A.

5. PREVIOUS REPORT ACTIONS

No outstanding items from previous reporting period (2018) required action.

6. INCIDENTS

No incidents were notified from Grants Road Sand Quarry during the 2019 reporting period.

7. COMPLAINTS

No complaints arising from Grants Road Sand Quarry were received during the 2019 reporting period.

8. MONITORING DATA SUMMARIES

8.1 Meteorology

The valid data recovery rate for each meteorological parameter during the reporting period is 72%. There was storm damage to the wire connections to the data logger battery which caused some loss of data. The solar panel enabled the equipment to log during the day but was unable to charge the battery. There was significant data loss from September to November 2019 while this issue was being diagnosed and repaired.

8.1.1 Wind data

A wind rose for the annual period 2019 is presented in **Figure 2**. The wind rose indicates that winds from the west are dominant. The average wind speed for the period was 2.0 m/s and the percentage occurrence of calm wind conditions (less than or equal to 0.5 m/s) was 1.7%.

8.1.2 Temperature

A plot of the hourly average temperature, recorded at 2 m and 10 m, is shown in **Figure 3**. June was the coldest recorded month on average and January was the hottest month on average. The maximum daily average of 29°C was recorded on 31 December 2019. The monthly average temperature is shown in **Table 2**.

8.1.3 Rainfall

A plot of the daily average rainfall is shown in **Figure 4** and the monthly average rainfall is shown in **Figure 5**. January recorded the highest monthly total rainfall of 31 mm.

8.2 Air Quality

The NSW EPA specifies air quality assessment criteria relevant for assessing impacts from air pollution (**NSW DEC, 2005**). These criteria are health-based (i.e. they are set at levels to reduce the risk of adverse health effects). The EPA criteria are consistent with the National Environment Protection Measures for Ambient Air Quality (referred to as the Ambient Air-NEPM) (**NEPC, 1998**,

NEPC, 2003). In January 2017, the NSW EPA released their updated Approved Methods (EPA, 2016) to amend the annual average PM₁₀ criterion from 30 µg/m³ down to 25 µg/m³. The data for this report is referenced to the 25 µg/m³ criteria only.

Table 3 and **Table 4** summarise the air quality criteria for concentrations of particulate matter and deposited dust levels that are relevant to this study. That is, the criteria stated form the basis for the standards to be achieved at the quarry.

8.2.1 Particulate matter (PM₁₀)

The results for the available PM₁₀ data are presented in **Figure 6**. Of a possible 60 samples (over approximately 12 months), forty six (46) samples are reported, resulting in a data recovery rate of approximately 77%.

The average PM₁₀ concentration over the recorded 1-year period was 14.6 µg/m³, which is well below the annual EPA impact assessment criterion of 25 µg/m³. All reported results are below the EPA maximum 24-hour average criterion of 50 µg/m³ for PM₁₀, except for the maximum 24-hour average of 276 µg/m³ recorded on the 4th December 2019. This was attributed to the extreme bushfire activity experienced across the NSW region.

The dust sample collected by the HVAS monitor includes both dust generated by site activities (incremental dust impact) and dust from all other local sources (background dust levels). However as stated previously, even with the background levels accounted for, PM₁₀ levels are considerably below their respective 24-hour and annual criterion.

8.2.2 Dust deposition

Dust deposition is measured at two locations, R1 and R4, as shown in **Figure 1**. The results for the available dust deposition data are presented in **Figure 7**. Of a possible 12 samples, 12 samples are reported for both sites. The average monthly dust deposition level for the period of 2019 was 0.7 g/m²/month at R1 and 0.8 g/m²/month at R4. The results for R1 are all below the EPA cumulative annual average criterion of 4 g/m²/month. Only one value at R4 was above this criterion. The maximum values of 3.6 g/m²/month and 4.2 g/m²/month were both recorded in December, and both most likely attributed to the intense bushfire activity during December 2019. All other recorded levels were below 1.5 g/m²/month and the annual averages were well below the 4 g/m²/month criterion.

The dust sample collected by the deposition gauges includes both dust generated by site activities (incremental dust impact) and dust from all other local sources (background dust levels). Even with the background levels accounted for, the annual average deposition levels are considerably below both the incremental and cumulative annual criteria.

8.2.3 Respirable crystalline silica

A crystalline silica measurement was taken on December 3 2019, during a period of maximum throughput. The sample was measured over a period of 8 hours on a dozer operating at the site. The mass of sample collected on the filter was 15 µg. Based on a sample flow rate of 2.75 L/min, this equates to 11.4 µg/m³ over an 8 hour period. Average levels over a 24-hour period would be lower and lower again over a year (annual average).

A crystalline silica content of 17% of PM₁₀ was used for the air quality assessment in 2013 (PAEHolmes, 2013), and using the measured 2019 annual average PM₁₀ concentration of 14.6 µg/m³ would therefore equate to approximately 2.5 µg/m³. However, it is noted that only the respirable fraction of PM₁₀ is relevant for assessing respirable crystalline silica, that is, PM₄. If it is conservatively assumed that 50% of PM₁₀ is PM_{2.5}, then the inferred annual average respirable crystalline silica concentration might be approximately 1.25 µg/m³, significantly below the annual criterion of 3 µg/m³.

APPENDIX A FIGURES & TABLES

Table 1: Weather Station Parameters

Parameter	Unit	Frequency	Averaging Period	Sampling Method	
Rainfall	mm	Continuous	1 Hour	AM-4	
Temperature	°C		10 Minute		AM-4
Temperature @ 10m	°C				AM-2 and AM-4
Wind Speed @ 10m	m/s				AM-2 and AM-4
Wind Direction @ 10m	Degrees				AM-2 and AM-4
Sigma Theta	Degrees				AM-2 and AM-4
Relative Humidity	%				AM-4
Solar Radiation	W/m ²				AM-4

Monitoring Locations

The Grants Road Sand Quarry compliance monitoring locations are shown in **Figure 1**. Featured are the automatic weather station (AWS), the High Volume Air Sampler (HVAS) and two dust deposition gauges (R1 and R4).



Figure 1: Monitoring Locations at Grants Road Quarry

Wind Data

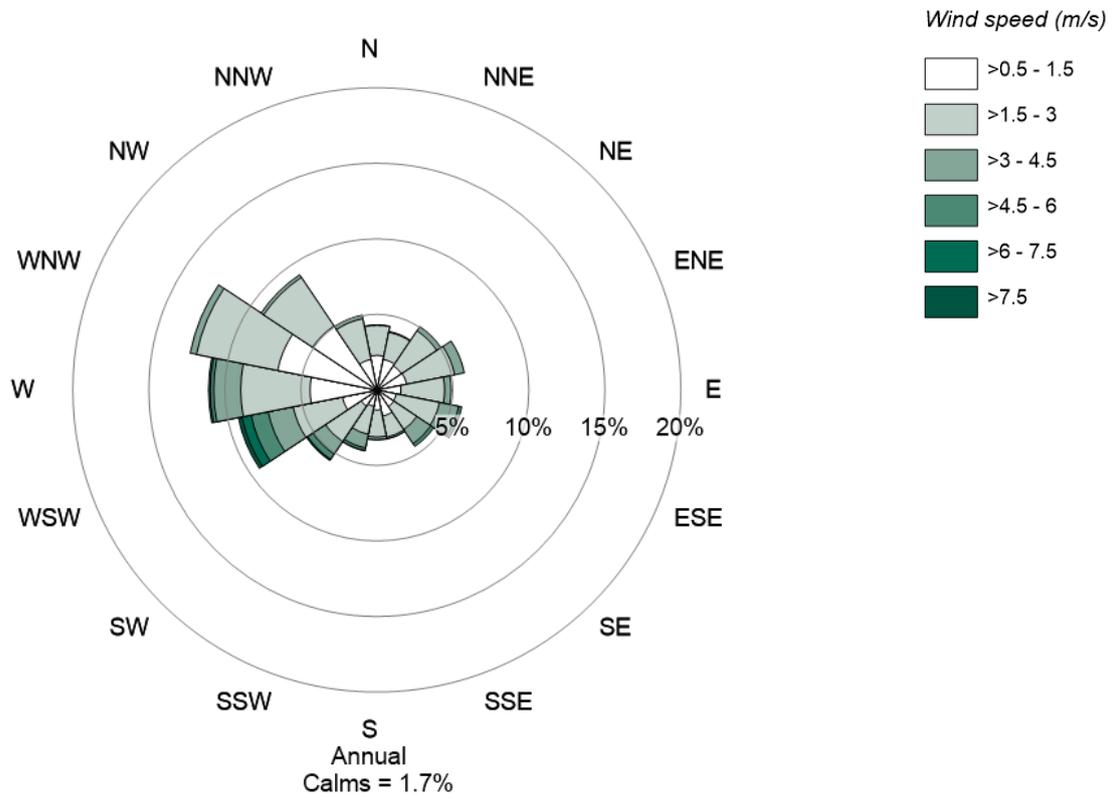


Figure 2: Grants Road Sand Wind Rose, 2019

Temperature

Table 2: Monthly Average Temperature, 2019

Month	Monthly Average Temperature at 2m (°C)	Monthly Average Temperature at 10m (°C)
January	23.7	23.5
February	21.3	21.2
March	20.3	20.3
April	17.9	18.0
May	15.0	15.2
June	11.8	12.2
July	12.0	12.3
August	12.2	12.5
September	-	-
October	-	-
November	-	-
December	21.0	20.9

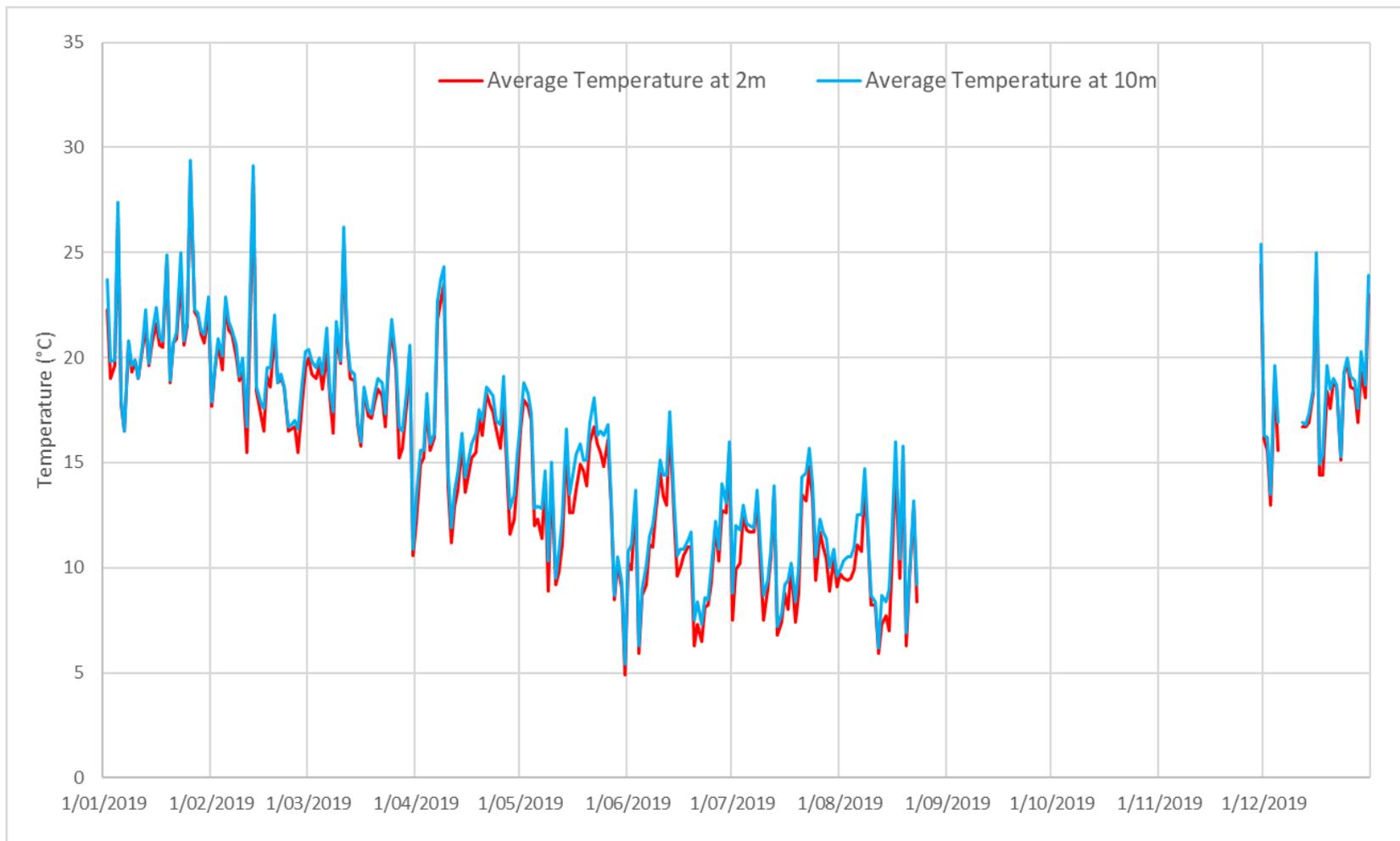


Figure 3: Average Daily Temperature, 2019

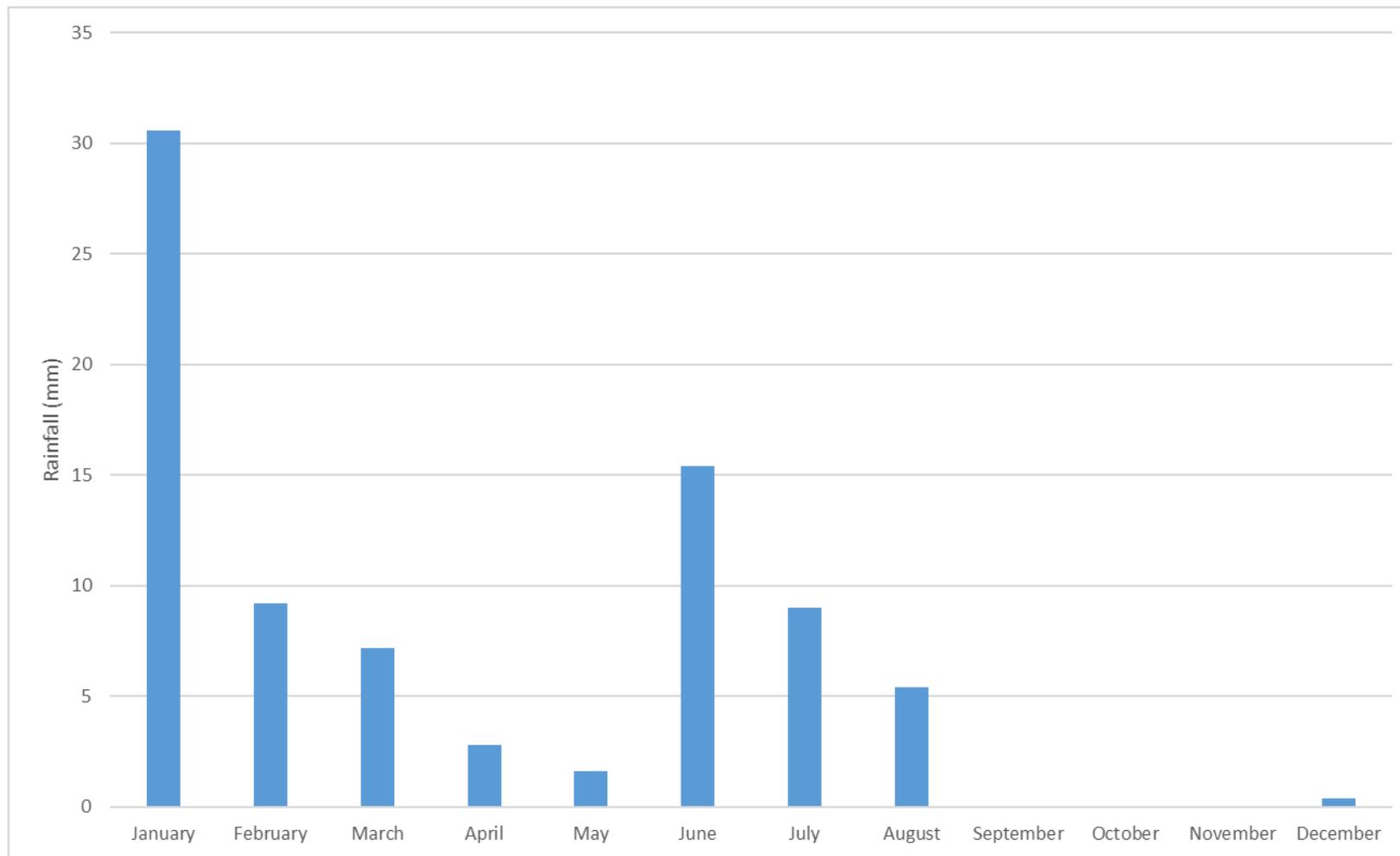


Figure 5: Monthly Rainfall Total, 2019

Air Quality

The NSW EPA specifies air quality assessment criteria relevant for assessing impacts from air pollution (**NSW DEC, 2005**). These criteria are health-based (i.e. they are set at levels to reduce the risk of adverse health effects). The EPA criteria are consistent with the National Environment Protection Measures for Ambient Air Quality (referred to as the Ambient Air-NEPM) (**NEPC, 1998, NEPC, 2003**). In January 2017, the NSW EPA released their updated Approved Methods (**EPA, 2016**) to amend the annual average PM₁₀ criterion from 30 µg/m³ down to 25 µg/m³. The data for this report is referenced to the 25 µg/m³ criteria only.

Table 3 and **Table 4** summarise the air quality criteria for concentrations of particulate matter and deposited dust levels that are relevant to this study. That is, the criteria stated form the basis for the standards to be achieved at the quarry.

Table 3: Air Quality Standards / Goals for Particulate Matter

Pollutant	Averaging Period	Standard / Goal	Agency
Particulate matter with an equivalent aerodynamic diameter less than 10 µm (PM ₁₀)	24-hour maximum	50 µg/m ³	EPA impact assessment criteria; NEPM reporting goal (allows five exceedances per year for bushfires)
	Annual mean	25 µg/m ³	EPA impact assessment criteria

Notes: µg/m³ – micrograms per cubic metre, µm – micrometre.

Table 4: Air Quality Standards / Goals for Deposited Dust

Pollutant	Averaging Period	Standard / Goal	Agency
Deposited dust (insoluble solids)	Annual mean	2 g/m ² /month (Incremental)	EPA impact assessment criteria
	Annual mean	4 g/m ² /month (Cumulative)	EPA impact assessment criteria

Notes: g/m²/month – grams per metre square per month

NSW has not set any impact assessment criteria for crystalline silica but references the Victorian EPA ambient assessment criterion for mining and extractive industries of 3 µg/m³ (annual average as PM_{2.5}) (**VEPA, 2007**).

Particulate Matter (PM₁₀)

Measured Results

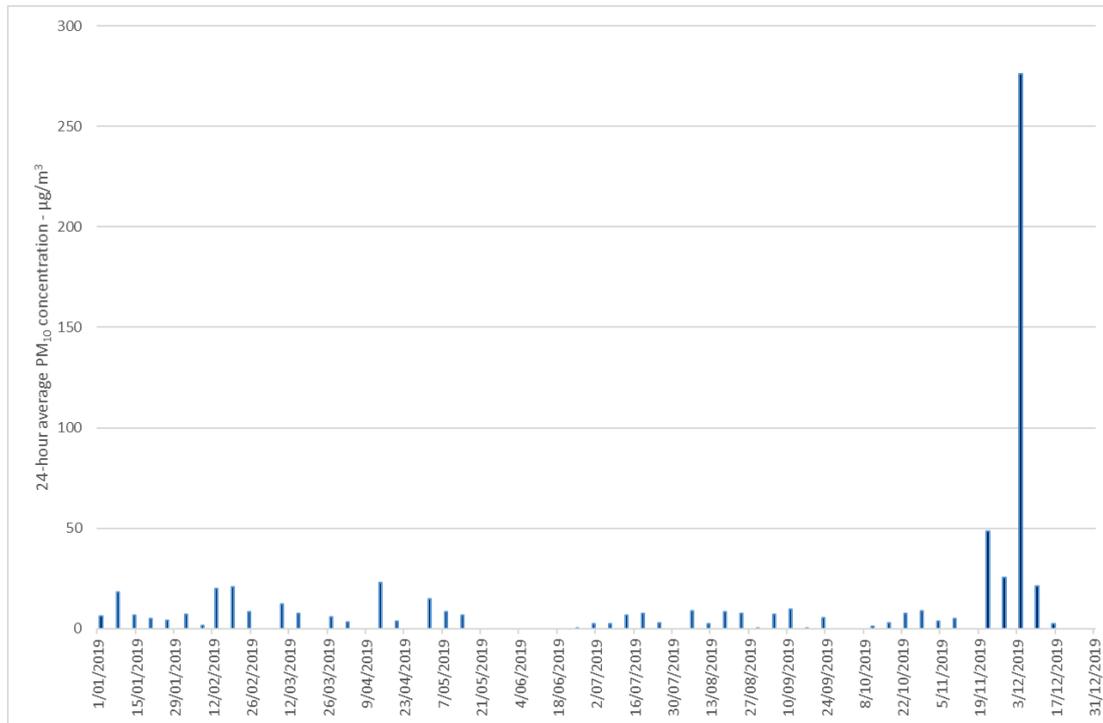


Figure 6: HVAS monitoring results for PM₁₀, 2019

Comparison to the environmental assessment predictions

The Air Quality Assessment (AQA) for the Grants Road Sand Quarry Extension was completed by PAEHolmes in 2013, Air Quality Impact Assessment – Extension of Grants Road Quarry (PAEHolmes, 2013). The cumulative results predicted in the assessment indicate that the 24 hour PM₁₀ ground level concentrations at the current location of the HVAS would be in the order of 70 µg/m³. In view of the elevated PM₁₀ concentration at nearby NSW DPIE's Wyong station on 4 December 2019 (PM₁₀ = 106.6 µg/m³) during which regional bushfire events were well documented, it is therefore considered that the exceedance shown in **Figure 6** above was attributable to bushfire activity. It is important to note that air quality across NSW was severely affected in December 2019 by extensive smoke from bushfires¹. Nevertheless the second highest measured cumulative 24-hour PM₁₀ concentration was 48.4 µg/m³ in 2019, a value considerably lower than the conservative predictions made in the air quality assessment.

The predicted annual average PM₁₀ concentration in the AQA was approximately 30 µg/m³ at the HVAS location, however an annual average concentration of 14.6 µg/m³ was measured in 2019. This is consistent with the 24-hour results, where the actual concentration has been established to constitute 50% or less than the predicted concentration at the same location. Given the results of the data during the monitoring period, currently no action is required to control environmental performance. Rather it is recommended that current mitigation processes are sustained.

¹ [https://worldview.earthdata.nasa.gov/?t=2019-12-04-T23%3A44%3A56Z&as=2019-02-09-T00%3A00%3A00Z&ae=2019-02-19-T00%3A00%3A00Z&l=MODIS_Aqua_Thermal_Anomalies_All,MODIS_Aqua_Thermal_Anomalies_Night,MODIS_Aqua_Thermal_Anomalies_Day,Reference_Labels\(hidden\),Reference_Features\(hidden\),Coastlines,VIIRS_SNPP_CorrectedReflectance_TrueColor\(hidden\),MODIS_Aqua_CorrectedReflectance_TrueColor\(hidden\),MODIS_Terra_CorrectedReflectance_TrueColor&ab=on](https://worldview.earthdata.nasa.gov/?t=2019-12-04-T23%3A44%3A56Z&as=2019-02-09-T00%3A00%3A00Z&ae=2019-02-19-T00%3A00%3A00Z&l=MODIS_Aqua_Thermal_Anomalies_All,MODIS_Aqua_Thermal_Anomalies_Night,MODIS_Aqua_Thermal_Anomalies_Day,Reference_Labels(hidden),Reference_Features(hidden),Coastlines,VIIRS_SNPP_CorrectedReflectance_TrueColor(hidden),MODIS_Aqua_CorrectedReflectance_TrueColor(hidden),MODIS_Terra_CorrectedReflectance_TrueColor&ab=on)

Dust Deposition

Measured Results

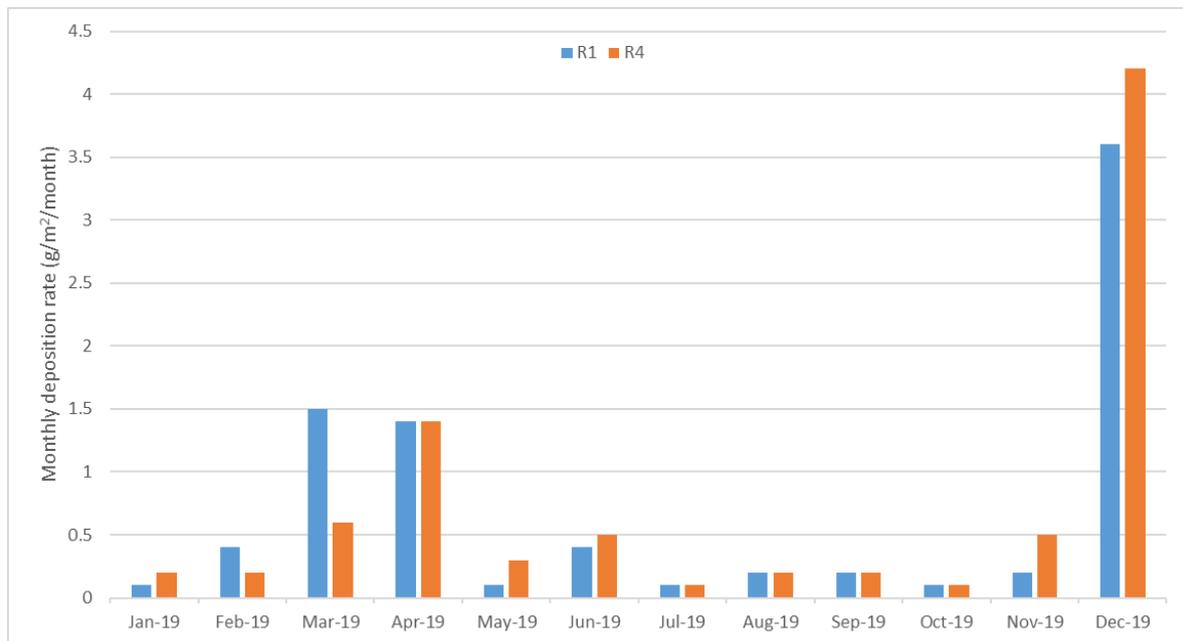


Figure 7: Dust deposition monitoring results for 2019

Comparison to environmental assessment predictions

The Air Quality Assessment (AQA) for the Grants Road Sand Quarry Extension was completed by PAEHolmes in 2013, Air Quality Impact Assessment – Extension of Grants Road Quarry (PAEHolmes, 2013). The cumulative results predicted in the assessment indicate that the annual dust deposition level at the locations of the deposition gauges would be in the order of 1.7 g/m²/month at R1 and 1.9 g/m²/month at R4.

Given the results of the data during the monitoring period, currently no action is required to control environmental performance. Rather, it is recommended that current mitigation processes are sustained.

APPENDIX B REFERENCES

Australian Standard / New Zealand Standard (2015). Methods for sampling and analysis of ambient air - Determination of suspended particulate matter - PM₁₀ high volume sampler with size-selective inlet - Gravimetric method. AS 3580.9.6:2015.

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NSW EPA (2016). "Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales". NSW Environment Protection Authority. December 2016.

PAEHolmes (2013). "Air Quality Impact Assessment – Extension of Grants Road Quarry".

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Appendix 7
GROUNDWATER DEPENDENT ECOSYSTEM
Conacher Consulting



**HIGH PRIORITY GROUNDWATER DEPENDANT ECOSYSTEM
2019 ANNUAL MONITORING REPORT**

**GRANTS ROAD
SAND QUARRY EXTENSION**

**MARCH 2020
REF: 20024V2**

PREFACE

This report has been prepared by *Conacher Consulting* to address the 2019 annual reporting requirements for High Priority Groundwater Dependant Ecosystems for the Grants Road Sand Quarry Extension Project at Somersby.

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SECTION 1 INTRODUCTION & METHODS

1.1 DOCUMENT INTENT

This report has been prepared by *Conacher Consulting* to address the 2019 annual monitoring requirements of Condition 21 “Groundwater Dependant Ecosystem Monitoring and Management Program” of the Schedule 3 Environmental Performance Conditions specified within the Project Approval for the Grants Road Sand Quarry Extension project (Project Approval No. 08_0099 Mod 1). An Environmental Performance Table and Compliance Status Table is provided in Appendix 1.

1.2 PROJECT SITE DETAILS

The site is located within Lots 1 & 2 DP 358717, Grants Road Somersby.

1.3 MONITORING METHODOLOGY

The monitoring program for High Priority Groundwater Dependant Ecosystems (GDEs) consists of a combination of aerial photograph assessment and mapping of GDEs within the predicted drawdown area, floristic plot surveys and field assessment for indicators and signs of potential project related impacts. Four monitoring plots were surveyed for the 2019 monitoring period at the selected locations shown in Figure 1.1. The monitoring survey was undertaken on 13 February 2020. The following monitoring variables were assessed:

i. **Native Plant Composition**

Plot surveys were completed comparing the results of the baseline plot monitoring results from the 2018 monitoring period with the current plot conditions. The native flora species present and projected foliage cover were assessed. Comments are provided for the species observed, including GDE species which are reliant on moist soil conditions.

ii. **Exotic Plant Composition**

All exotic flora species and total cover of exotic flora species was recorded for each plot.

iii. **GDE Extent and Distribution**

Mapping of GDE's was informed by aerial photograph analysis and interpretation using Nearmap imagery dated 18 December 2019.

iv. **Vegetation Photo Point Monitoring**

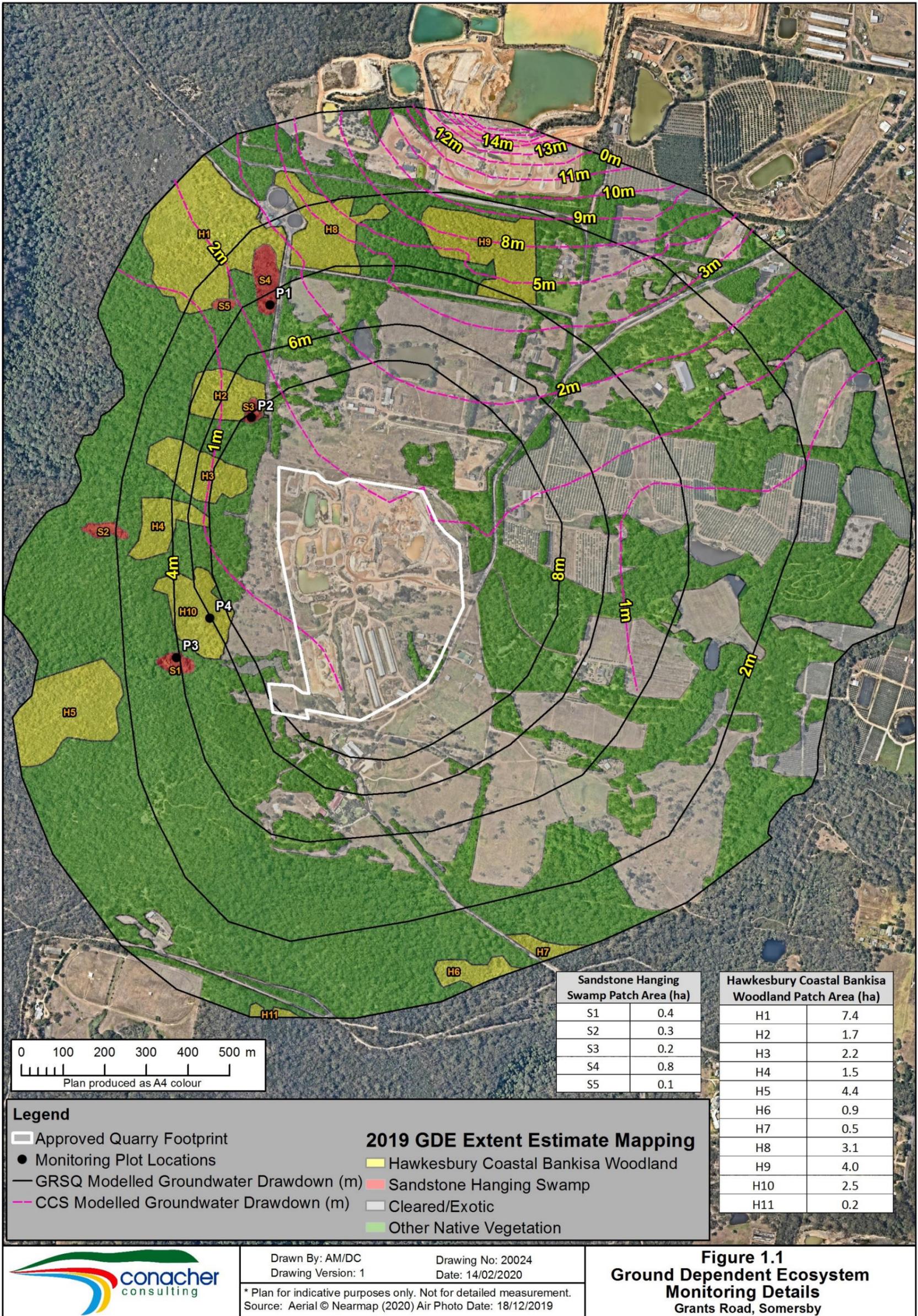
Photographs were taken for each monitoring quadrat from each cardinal point.

v. **Surface Erosion and Sedimentation Monitoring**

A visual inspection of the downstream and downslope GDE patches from the quarry site was undertaken to monitor for any surface erosion or sedimentation impacts from the quarry operations.

vi. **Comparison with Groundwater Monitoring Data**

The results for the groundwater monitoring for the current monitoring period identified close correlation with rain events and rise in water levels in shallow monitoring bores and a more subdued response to rainfall in the deeper monitoring bores. No potential impacts from current approved quarrying activities on the aquifer system were detected (Larry Cook Consulting Pty Ltd 2020).



Legend

- Approved Quarry Footprint
- Monitoring Plot Locations
- GRSQ Modelled Groundwater Drawdown (m)
- CCS Modelled Groundwater Drawdown (m)
- Hawkesbury Coastal Bankisa Woodland
- Sandstone Hanging Swamp
- Cleared/Exotic
- Other Native Vegetation

2019 GDE Extent Estimate Mapping



Drawn By: AM/DC
 Drawing Version: 1
 Drawing No: 20024
 Date: 14/02/2020
 * Plan for indicative purposes only. Not for detailed measurement.
 Source: Aerial © Nearmap (2020) Air Photo Date: 18/12/2019

Figure 1.1
Ground Dependent Ecosystem
Monitoring Details
 Grants Road, Somersby

SECTION 2 MONITORING RESULTS

2.1 GROUNDWATER DEPENDANT ECOSYSTEMS WITHIN 1KM

High Priority Groundwater Dependiant Ecosystems (GDEs) are defined in the Water Sharing Plan for the Kulnura Mangrove Mountain Groundwater Source (Dept. of Infrastructure, Planning and Natural Resources 2006). The following High Priority GDEs have been identified within 1km of the site:

- Sandstone Hanging Swamp; and
- Hawkesbury Coastal Banksia Woodland.

These map units relate to mapping prepared by House (2003) which has been superseded by Council's current vegetation mapping prepared by Bell (2013). Further updated mapping for the modelled drawdown area has been prepared by *Conacher Consulting* and is provided in Figure 1.1. This mapping provides an estimate of the current extent of High Priority GDEs within the modelled groundwater drawdown area.

No detected decrease in the extent of this GDE has occurred due to project related impacts since the previous monitoring period.

Sandstone Hanging Swamp

The floristic composition of this vegetation type indicates that it is likely to have high dependence on groundwater and can be considered a high-dependence facultative GDE.

No decrease in the previously mapped extent of this GDE has been detected since the previous monitoring period.

The current estimated extent of Sandstone Hanging Swamp within the modelled drawdown area is 1.8 hectares. The sizes of individual patches are mapped and listed in Figure 1.1.

Hawkesbury Coastal Banksia Woodland

The floristic composition of this vegetation type indicates that it is likely to be either a low-dependence facultative GDE or not a GDE.

The current estimated extent of Hawkesbury Banksia Scrub Woodland within the modelled drawdown area is 28.6 hectares. The sizes of individual patches mapped and listed in Figure 1.1.

2.2 FLORISTIC MONITORING RESULTS

Full floristic plots were sampled for the current monitoring period, a total of four plots were surveyed. A summary of the floristic plot survey results is provided in Table 2.1 and full floristic plot results are provided in Table 2.2.

Indicator species were determined from the floristic plot results, these species occur in moist or swamp environments such as coastal upland swamps. There are several other species characteristic of Hawkesbury Coastal Banksia Woodland and Sandstone Hanging Swamp within the plots sampled, however these are considered to be not indicative of moist or swampy environments and can often be found in adjoining areas which do not contain high priority groundwater dependant ecosystems.

The sandstone hanging swamp plots recorded a decline in the indicator species cover by approximately 6 to 7 % for plots 1 and 3. This was due to browning of *Gleichenia microphylla* which is likely due to some self-shading and also drought conditions during the 2019 monitoring period. New growth on *Gleichenia microphylla* was observed and no complete dieback of plants within the plots was recorded.

TABLE 2.1 FLORISTIC PLOT RESULT SUMMARY				
Variables	Plot 1 Sandstone Hanging Swamp	Plot 2 Sandstone Hanging Swamp	Plot 3 Sandstone Hanging Swamp	Plot 4 Hawkesbury Coastal Banksia Woodland
Indicator Species Richness				
2018 Monitoring Period	9	11	13	4
2019 Monitoring Period	9	11	13	4
Indicator Species Cover				
2018 Monitoring Period	84.1	63	74.15	0.75
2019 Monitoring Period	79.1	63	69.15	0.75
Total Species Richness				
2018 Monitoring Period	39	40	50	35
2019 Monitoring Period	39	40	50	35
Total Species Cover				
2018 Monitoring Period	140.3	112.55	163.45	137.65
2019 Monitoring Period	140.3	112.55	163.45	137.65

**TABLE 2.2
2019 MONITORING PERIOD FLORISTIC PLOT RESULTS**

Family	Scientific Name	Common Name	Plot 1	Plot 2	Plot 3	Plot 4	Browning / Dieback Observations
TREES							
Casuarinaceae	<i>Allocasuarina littoralis</i>	Black She-Oak		0.25		1	
Myrtaceae	<i>Angophora costata</i>	Sydney Red Gum	0.25		2		
Myrtaceae	<i>Angophora hispida</i>	Dwarf Apple				0.5	
Myrtaceae	<i>Corymbia gummifera</i>	Red Bloodwood			4		
Myrtaceae	<i>Eucalyptus haemastoma</i>	Broad-leaved Scribbly Gum			10		Large branch fall observed likely due to recent storm conditions in first week of February 2020.
Myrtaceae	<i>Eucalyptus piperita</i>	Sydney Peppermint			15		
Myrtaceae	<i>Eucalyptus resinifera</i> subsp. <i>resinifera</i>	Red Mahogany	10			5	
Myrtaceae	<i>Eucalyptus scias</i>	Large-fruited Red Mahogany	15				
Myrtaceae	<i>Eucalyptus sieberi</i>	Silvertop Ash	0.3	10			
SHRUBS							
Apiaceae	<i>Platysace linearifolia</i>			0.5	5		
Araliaceae	<i>Polyscias sambucifolia</i> subsp. <i>Long Leaflets</i>	Elderberry Panax	0.2	0.25	0.5		
Cunoniaceae	<i>Bauera rubioides</i>	River Rose	1	2	2		
Cunoniaceae	<i>Callicoma serratifolia</i>	Black Wattle			0.25		
Dilleniaceae	<i>Hibbertia procumbens</i>	Spreading Guinea Flower				0.1	
Ericaceae	<i>Epacris obtusifolia</i>	Blunt-leaf Heath	0.25	0.1	0.1		
Ericaceae	<i>Epacris pulchella</i>	Wallum Heath				0.2	
Euphorbiaceae	<i>Amperea xiphoclada</i>				0.25		
Euphorbiaceae	<i>Pseudanthus orientalis</i>			0.1			

**TABLE 2.2
2019 MONITORING PERIOD FLORISTIC PLOT RESULTS**

Family	Scientific Name	Common Name	Plot 1	Plot 2	Plot 3	Plot 4	Browning / Dieback Observations
Fabaceae (Faboideae)	<i>Almaleea paludosa</i>		0.1				
Fabaceae (Faboideae)	<i>Bossiaea scolopendria</i>					0.1	
Fabaceae (Faboideae)	<i>Dillwynia floribunda</i>				1	0.2	
Fabaceae (Faboideae)	<i>Pultenaea rosmarinifolia</i>		2	0.1			
Fabaceae (Faboideae)	<i>Viminaria juncea</i>	Native Broom	0.5	0.25	0.25		
Fabaceae (Mimosoideae)	<i>Acacia linifolia</i>	White Wattle			0.1		
Fabaceae (Mimosoideae)	<i>Acacia longifolia</i> subsp. <i>longifolia</i>	Sydney Golden Wattle	0.5	0.5			
Fabaceae (Mimosoideae)	<i>Acacia oxycedrus</i>	Spike Wattle	15		1	0.1	
Fabaceae (Mimosoideae)	<i>Acacia parvipinnula</i>	Silver-stemmed Wattle	0.5				
Fabaceae (Mimosoideae)	<i>Acacia suaveolens</i>	Sweet Wattle	0.5			0.2	
Fabaceae (Mimosoideae)	<i>Acacia terminalis</i> subsp. <i>Long inflorescences</i>	Sunshine Wattle	0.2		0.25		
Myrtaceae	<i>Callistemon citrinus</i>	Crimson Bottlebrush	0.1	0.25			
Myrtaceae	<i>Leptospermum polygalifolium</i> subsp. <i>cismontanum</i>	Tantoon			20	10	
Myrtaceae	<i>Leptospermum polygalifolium</i> subsp. <i>polygalifolium</i>	Tantoon	1	2			
Pittosporaceae	<i>Pittosporum revolutum</i>	Rough Fruit Pittosporum				0.1	
Pittosporaceae	<i>Pittosporum undulatum</i>	Sweet Pittosporum				0.2	
Proteaceae	<i>Banksia ericifolia</i>	Heath-leaved Banksia	5	10	0.5	70	Dieback evident in plots 1 & 2 from previous hazard reduction burn
Proteaceae	<i>Banksia robur</i>	Swamp Banksia			0.5		
Proteaceae	<i>Grevillea sericea</i> subsp. <i>sericea</i>	Pink Spider Flower			0.25		
Proteaceae	<i>Grevillea speciosa</i>	Red Spider Flower	0.3				
Proteaceae	<i>Hakea teretifolia</i>	Needlebush	0.2	0.25			

**TABLE 2.2
2019 MONITORING PERIOD FLORISTIC PLOT RESULTS**

Family	Scientific Name	Common Name	Plot 1	Plot 2	Plot 3	Plot 4	Browning / Dieback Observations
Proteaceae	<i>Lambertia formosa</i>	Mountain Devil			0.25		
Proteaceae	<i>Persoonia isophylla</i>		0.25				
Proteaceae	<i>Persoonia lanceolata</i>	Lance Leaf Geebung	0.3				
Proteaceae	<i>Persoonia levis</i>	Broad-leaved Geebung			0.25		
Proteaceae	<i>Petrophile pulchella</i>	Conesticks				0.25	
Groundcovers (Forbs)							
Thymelaeaceae	<i>Pimelea linifolia</i>	Slender Rice Flower		0.1	0.1		
Anthericaceae	<i>Thysanotus juncifolius</i>				0.1		
Apiaceae	<i>Actinotus minor</i>	Lesser Flannel Flower		0.5		0.25	
Apiaceae	<i>Hydrocotyle laxiflora</i>	Stinking Pennywort		0.1			
Apiaceae	<i>Xanthosia pilosa</i>	Woolly Xanthosia	0.1	0.1			
Apiaceae	<i>Xanthosia tridentata</i>	Rock Xanthosia		0.1	0.5	0.1	
Droseraceae	<i>Drosera peltata</i>	A Sundew		0.1			
Euphorbiaceae	<i>Monotaxis linifolia</i>			0.25	0.1		
Goodeniaceae	<i>Dampiera stricta</i>			0.2			
Goodeniaceae	<i>Goodenia paniculata</i>			0.1			
Haemodoraceae	<i>Haemodorum corymbosum</i>		0.1				
Haloragaceae	<i>Gonocarpus micranthus</i>			0.1			
Haloragaceae	<i>Gonocarpus tetragynus</i>	Poverty Raspwort			0.25		
Haloragaceae	<i>Gonocarpus teucrioides</i>	Germander Raspwort	0.1		0.5		
Orchidaceae	<i>Cryptostylis subulata</i>	Large Tongue Orchid				0.1	
Phormiaceae	<i>Dianella caerulea var. producta</i>	Blue Flax-lily	0.1	0.1		0.25	
Phormiaceae	<i>Dianella prunina</i>	Blue Flax-lily				0.25	
Groundcovers (Ferns)							

**TABLE 2.2
2019 MONITORING PERIOD FLORISTIC PLOT RESULTS**

Family	Scientific Name	Common Name	Plot 1	Plot 2	Plot 3	Plot 4	Browning / Dieback Observations
Dennstaedtiaceae	<i>Histiopteris incisa</i>	Bat's Wing Fern		1	0.5	0.2	
Dennstaedtiaceae	<i>Pteridium esculentum</i>	Bracken		20	5		
Gleicheniaceae	<i>Gleichenia microphylla</i>	Scrambling Coral Fern	75	60	65	0.1	Some browning in response to self-shading. Browning has continued likely in response to drought conditions.
Lindsaeaceae	<i>Lindsaea linearis</i>	Screw Fern			0.1	0.25	
Selaginellaceae	<i>Selaginella uliginosa</i>	Swamp Selaginella		0.1	0.1		
Groundcovers (Monocots)							
Cyperaceae	<i>Cyathochaeta diandra</i>					10	Some browning observed due to drought conditions
Cyperaceae	<i>Gahnia clarkei</i>	Tall Saw-sedge	1	0.5	0.25		
Cyperaceae	<i>Gahnia sieberiana</i>	Red-fruit Saw-sedge	2		1		
Cyperaceae	<i>Gymnoschoenus sphaerocephalus</i>	Button Grass	0.5	0.5			
Cyperaceae	<i>Lepidosperma laterale</i>					5	
Cyperaceae	<i>Ptilothrix deusta</i>					20	Some browning observed due to drought conditions
Cyperaceae	<i>Schoenus apogon</i>	Fluke Bogrush	0.1				
Cyperaceae	<i>Schoenus brevifolius</i>	Zig-zag Bog-rush	0.2		0.25		
Cyperaceae	<i>Schoenus melanostachys</i>				0.5		
Lomandraceae	<i>Lomandra gracilis</i>					10	
Lomandraceae	<i>Lomandra longifolia</i>	Spiny-headed Mat-rush			1		
Lomandraceae	<i>Lomandra multiflora subsp. multiflora</i>	Many-flowered Mat-rush				0.1	

**TABLE 2.2
2019 MONITORING PERIOD FLORISTIC PLOT RESULTS**

Family	Scientific Name	Common Name	Plot 1	Plot 2	Plot 3	Plot 4	Browning / Dieback Observations
Lomandraceae	<i>Lomandra obliqua</i>					0.1	
Poaceae	<i>Entolasia marginata</i>	Bordered Panic			0.25	1	
Poaceae	<i>Entolasia stricta</i>	Wiry Panic	1	0.5	5		
Poaceae	<i>Eragrostis brownii</i>	Brown's Lovegrass		0.1			
Poaceae	<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Grass				1	
Poaceae	<i>Oplismenus aemulus</i>	Basket Grass				0.1	
Poaceae	<i>Plinthanthesis paradoxa</i>				0.25		
Restionaceae	<i>Empodisma minus</i>		1	0.5	2	0.1	
Restionaceae	<i>Eurychorda complanata</i>			0.25	0.5		
Xyridaceae	<i>Xyris gracilis</i>		0.1				
Groundcovers (Other)							
Apocynaceae	<i>Parsonsia straminea</i>	Common Silkpod	0.1		0.1	0.2	
Dicksoniaceae	<i>Calochlaena dubia</i>	Rainbow Fern			10		
Dilleniaceae	<i>Hibbertia scandens</i>	Climbing Guinea Flower		0.25			
Doryanthaceae	<i>Doryanthes excelsa</i>	Gynea Lily			1		
Fabaceae (Faboideae)	<i>Hardenbergia violacea</i>	False Sarsaparilla				0.1	
Lauraceae	<i>Cassytha glabella</i>		0.1	0.1			
Lauraceae	<i>Cassytha pubescens</i>	Downy Dodder-laurel			0.1		
Orchidaceae	<i>Cymbidium suave</i>	Snake Orchid			0.1		
Pittosporaceae	<i>Billardiera scandens</i>	Hairy Apple Berry	0.1	0.1	0.1		
Rubiaceae	<i>Gynochthodes jasminoides</i>	Sweet Morinda		0.1	0.1	0.5	
Vitaceae	<i>Cissus hypoglauca</i>	Giant Water Vine			0.25		
Xanthorrhoeaceae	<i>Xanthorrhoea arborea</i>		0.25	0.25			
Exotics							

**TABLE 2.2
2019 MONITORING PERIOD FLORISTIC PLOT RESULTS**

Family	Scientific Name	Common Name	Plot 1	Plot 2	Plot 3	Plot 4	Browning / Dieback Observations
Verbenaceae	<i>Lantana camara</i>	Lantana	0.1				
	<i>Ageratina adenophora</i>	Crofton Weed			x		Observed adjacent to Plot 3 / was evident in baseline surveys

2.3 QUALITATIVE MONITORING RESULTS

i. GDE Surface Erosion and Sedimentation

No surface erosion attributable to the quarry operations was observed within any of the GDE areas shown in Figure 1.1 during the monitoring surveys. High rainfall was experienced in the week prior to monitoring and rainfall was observed during monitoring works. Sediment movement was observed in the watercourse which intersects GDE patch S1, however no sedimentation of the GDE vegetation was observed.

ii. Assessment of Groundwater Monitoring Data

The Water Monitoring Report for the 2019 period was not available for at the time of completing this Report.

iii. GDE Photo Point Results

The results of the photo point surveys are provided in Figure 2.1 to 2.4.



Figure 2.1a – Plot 1 Photo-monitoring point north aspect



Figure 2.1b - Plot 1 Photo-monitoring point east aspect



Figure 2.1c - Plot 1 Photo-monitoring point south aspect



Figure 2.1d - Plot 1 Photo-monitoring point west aspect



Figure 2.2a – Plot 2 Photo-monitoring point north aspect



Figure 2.2b - Plot 2 Photo-monitoring point east aspect



Figure 2.2c - Plot 2 Photo-monitoring point south aspect



Figure 2.2d - Plot 2 Photo-monitoring point west aspect



Figure 2.3a – Plot 3 Photo-monitoring point north aspect



Figure 2.3b - Plot 3 Photo-monitoring point east aspect



Figure 2.3c - Plot 3 Photo-monitoring point south aspect



Figure 2.3d - Plot 3 Photo-monitoring point west aspect

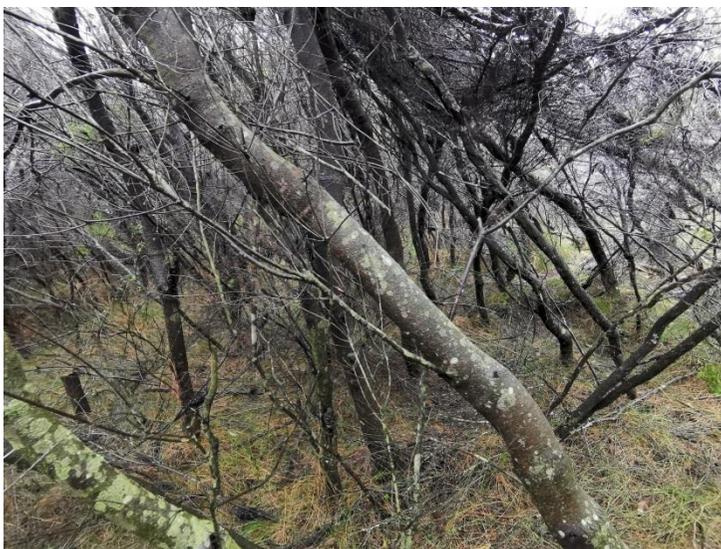


Figure 2.4a – Plot 4 Photo-monitoring point north aspect



Figure 2.4b - Plot 4 Photo-monitoring point east aspect



Figure 2.4c - Plot 4 Photo-monitoring point south aspect



Figure 2.4d - Plot 4 Photo-monitoring point west aspect

SECTION 3 COMPLIANCE WITH PERFORMANCE MEASURES

3.1 EROSION

The performance target requires negligible erosion of the surface within the GDEs as a result of adverse impacts attributable to the quarry operations authorised under the project approval. The trigger level for management intervention is observable erosion of the surface within the GDEs, directly attributable to the quarry operations authorised under the project approval.

No surface erosion within GDE areas attributable to the quarry operations was observed and no management intervention is required.

3.2 SEDIMENTATION

The performance target for sedimentation is that negligible sedimentation within the GDEs occurs as a result of adverse impact attributable to the quarry operations authorised under the project approval.

The trigger level for management intervention is observable sedimentation within the GDEs, attributable to the quarry operations authorised under the project approval.

No sedimentation within high priority GDE vegetation, attributable to the quarry operations was observed.

3.3 HIGH PRIORITY GROUND WATER DEPENDANT ECOSYSTEM EXTENT

The performance target for High Priority GDE size is for only minor changes in the sizes of the GDEs as a result of adverse impact attributable to the quarry operations authorised under the project approval.

The high priority GDEs within 1km of the site are likely to form a continuum across the landscape in response to fire and soil moisture availability (Bell 2013).

The trigger level for management intervention is adverse change in size of the GDEs of greater than 20% mappable extent, directly attributable to the quarry operations authorised under the project approval.

In order to determine that a reduction in the extent of a High Priority GDE was attributable to the quarry operations a correlation with reduced GDE patch size or dieback and groundwater levels would be required. No reduction in GDE patch size has been determined for the current monitoring period.

3.4 GROUND WATER DEPENDANT ECOSYSTEM SPECIES COMPOSITION & DISTRIBUTION

The performance target for species composition and distribution is for no significant change to the composition or distribution of species within the GDEs as a result of adverse impact attributable to the quarry operations authorised under the project approval. The trigger level for management intervention is adverse change in composition or distribution of the dominant species, directly attributable to the quarry operations authorised under the project approval.

The GDE areas were burnt prior to site inspections undertaken in 2015 and are currently regenerating. Further changes between monitoring events are expected within monitoring plots 1 & 2 as these areas continue to regenerate, these changes should not be related to the quarry operations at the subject site.

For the current monitoring period there was significant adverse species composition or distribution changes within the GDEs as a result of the project. Some browning of vegetation, particularly *Gleichenia microphylla*, however this is considered to be related to hot and dry weather experienced during spring and early summer directly prior to monitoring.

3.5 MITIGATION AND RESPONSE MEASURES

Monitoring has identified that all performance targets have been met for GDEs and requirement for mitigation or response measures has not been triggered in relation to 2019 site operations.

SECTION 4 CONCLUSIONS & RECOMMENDATIONS

4.1 CONCLUSIONS

The quarry operations for the 2019 monitoring period have not exceeded the compliance and performance measures for High Priority Groundwater Dependant Ecosystems.

4.2 RECOMMENDATIONS

The implementation of mitigation and response measures in relation to the 2019 quarry operations is considered not necessary.

5. REFERENCES

- Bell (2007) *Review of Flora and Fauna Information for Grants Road Sands*, Gosford LGA.
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- Larry Cook Consulting P/L (2020) *Water Monitoring Period 1.1.19-31.12.19 Grants Road Sand Quarry*. Unpublished Report prepared for Grants Road Sand.
- NSW Scientific Committee 2012, *Coastal Upland Swamp in the Sydney Basin Bioregion – endangered ecological community listing*, NSW Scientific Committee Final Determination. Available Online:
<http://www.environment.nsw.gov.au/determinations/coastaluplandswampfd.htm>
- Water Sharing Plan for the Kulnura Mangrove Mountain Groundwater Sources 2003. New South Wales Government.

APPENDIX 1
ENVIRONMENTAL PERFORMANCE & COMPLIANCE STATUS SUMMARY

Details on the Environmental Performance and Compliance Status in relation to High Priority GDEs have been requested for the Annual Reporting. This information is provided in Tables A1.1 and A1.2.

TABLE A1.1 ENVIRONMENTAL PERFORMANCE TABLE				
Environmental Aspect	Approval Criteria	Summary of Monitoring Results in the Previous Monitoring Period	Summary of Monitoring Results in this Monitoring Period	Improvement Measures to be Implemented
High Priority Groundwater Dependant Ecosystems within 1km	<p>The proponent must ensure that the project does not cause exceedances of the following performance measures:</p> <ul style="list-style-type: none"> • Negligible erosion of the surface of GDEs • Negligible sedimentation within the GDEs • Minor changes in the size of the GDEs • No Significant change to the composition or distribution of species within the GDEs 	No exceedances	No exceedances	Ensure appropriate erosion and sediment controls are maintained.

A compliance status table is provided in Table A1.2.

TABLE A1.2 COMPLIANCE STATUS TABLE				
Unique ID	Compliance Requirement	Development Phase	Monitoring Methodology	Evidence & Comments
Condition 19.	Negligible erosion of the surface of GDEs	Operations	Visual monitoring	Annual Monitoring Reports
	Negligible sedimentation within the GDEs	Operations	Visual monitoring	Annual Monitoring Reports
	Minor changes in the size of the GDEs	Operations	Aerial photograph and ground assessment	Annual Monitoring Reports
	No Significant change to the composition or distribution of species within the GDEs	Operations	Plot surveys	Annual Monitoring Reports

Appendix 8
SOMERSBY MINTBUSH
Conacher Consulting



**SOMERSBY MINTBUSH
2019 ANNUAL MONITORING REPORT**

**GRANTS ROAD
SAND QUARRY EXTENSION**

**FEBRUARY 2020
REF: 20025**

PREFACE

This report has been prepared by *Conacher Consulting* to address the 2019 annual monitoring and reporting requirements for Somersby Mintbush for the Grants Road Sand Quarry Extension Project at Somersby.

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SECTION 1

INTRODUCTION

1.1 DOCUMENT INTENT

This report has been prepared by *Conacher Consulting* to address the monitoring requirements of Condition 22 “Somersby Mintbush Monitoring and Management Program” of the Schedule 3 Environmental Performance Conditions specified within the Project Approval for the Grants Road Sand Quarry Extension project (Project Approval No. 08_0099 Mod 1). An Environmental Performance Table and Compliance Status Table is provided in Appendix 1.

1.2 PROJECT SITE DETAILS

The site is located within Lots 1 & 2 DP 358717, Grants Road Somersby.

1.3 PREVIOUS MONITORING RESULTS

2015 Monitoring Surveys

These surveys included a baseline assessment of the Somersby Mintbush (*Prostanthera junonis*) locations previously identified adjacent to the site and described as Population 7 Reservoir Road Brisbane Water National Park. They were undertaken on 23 October 2015 and 7 November 2015.

No specimens of *P. junonis* were observed during the baseline surveys as the locations where this species was previously identified had been subject to a controlled burn undertaken by NPWS.

During the baseline surveys, the previous location of *P. junonis* identified along the Great North Walk track showed noticeable signs of erosion caused by poor track maintenance and design.

2016 Monitoring Surveys

Regrowth of *P. junonis* was observed at subpopulations 3 and 4. Two flowering plants were detected at sub-population 3 where none were detected in recent years, the presence of several juvenile non-flowering plants were also noted.

No flowering plants and several juvenile non-flowering plants were observed at the location of sub-population 4.

The low numbers of flowering plants detected and evidence of regrowth plants was considered to be a result of the NPWS hazard reduction burn undertaken during October 2015.

2017 Monitoring Surveys

Regrowth of *P. junonis* was observed at subpopulations 3 and 4. Flowering plants were detected at sub-population 4 which were not detected in recent years.

The increasing numbers of flowering plants detected and evidence of several regrowth non-flowering plants was considered to be a result of regeneration following the NPWS hazard reduction burn undertaken during October 2015 and the reduced shade from tall shrub cover.

2018 Monitoring Surveys

P. junonis was observed at subpopulations 3 and 4. Large numbers of plants were detected at sub-population 4 which were not detected in previous years.

The ongoing trend of increasing numbers of flowering plants detected is considered to be a result of regeneration following the NPWS hazard reduction burn undertaken during October 2015 and the reduced shade levels from tall shrub cover.

SECTION 2

2018 MONITORING RESULTS

2.1 SOMERSBY MINTBUSH 2018 COUNT RESULTS

Counts of flowering *P. junonis* plants were undertaken on 22 November 2019 and 27 December 2019 at the Somersby Mintbush subpopulation locations adjacent to the quarry allotment identified by NSW NPWS (2000).

Flowering plants were identified and counted. Plants were defined as any flowering *P. junonis* plants in a patch with a separation distance of ≥ 30 cm from the nearest *P. junonis* plant. The results of the counts are provided in Table 2.1 and the locations of the subpopulations are shown in Figure 2.1. An Environmental Performance Table is provided in Appendix 1.

TABLE 2.1 SOMERSBY MINT BUSH ANNUAL MONITORING COUNT RESULTS					
Sub-Population Number	Count Results				
	2015	2016	2017	2018	2019
3	0	2 flowering plants (several non-flowering juvenile regrowth plants observed)	18 flowering plants	42 flowering plants	29 flowering plants
4	0	No flowering plants several non-flowering juvenile plants observed	34 flowering plants	394 flowering plants	484 flowering plants

2.2 QUALITATIVE MONITORING RESULTS

Photographs of the habitats at subpopulations 3 and 4 for the current monitoring period are provided in Figures 2.2 and 2.3.

2.2.1 Signs of Surface Erosion

No signs of surface erosion attributable to the project were observed.

Ongoing erosion of the track through subpopulation 4 was observed, as was in previous years. This is attributable to poor track maintenance and natural surface flows not attributable to the project. No noticeable NPWS maintenance of this track within the Brisbane Water National Park has occurred since the commencement of monitoring.

2.2.2 Signs of Sedimentation

No signs of sedimentation attributable to the project were observed.

2.2.3 Density of Surrounding Vegetation

The density of the surrounding vegetation has been increasing since the NPWS hazard reduction burn completed in October 2015.

Dieback and decomposition of the *Banksia ericifolia* was evident particularly for Sub-population 4. Vigorous regrowth of a dense healthy shrub cover was observed at sub-population 3. The following estimates of the vegetation density for both sub-populations are provided:

Sub-population 3

Tree Cover: Approximately 5% to 10m tall
Shrub Cover: Open with approximately 60% cover to 2m tall with vigorously regenerating heath.
Groundlayer: Approximately 50% cover to 1m.

Sub-population 4

Tree Cover: Approximately 20% to 8m tall
Shrub Cover: Approximately 40% cover to 4m tall.
Groundlayer: Approximately 40% cover to 1.5m.

It is considered that the current reduced density of shrub cover has provided ongoing favourable conditions for Somersby Mintbush growth of both sub-populations, however the shrub cover is rapidly regenerating and increasing in both density and height at Sub-population 3.

2.2.4 Fire Disturbance

No signs of fire disturbance attributable to the project were observed. No fire disturbance within the current monitoring period was observed.

2.2.5 Herbivory

No signs of herbivory were observed.

2.2.6 Other Disturbances

The vegetation adjoining the eastern edge of Subpopulation 3 had been disturbed within approximately 3 to 4m of the site boundary fence when checked on 14 February 2020.

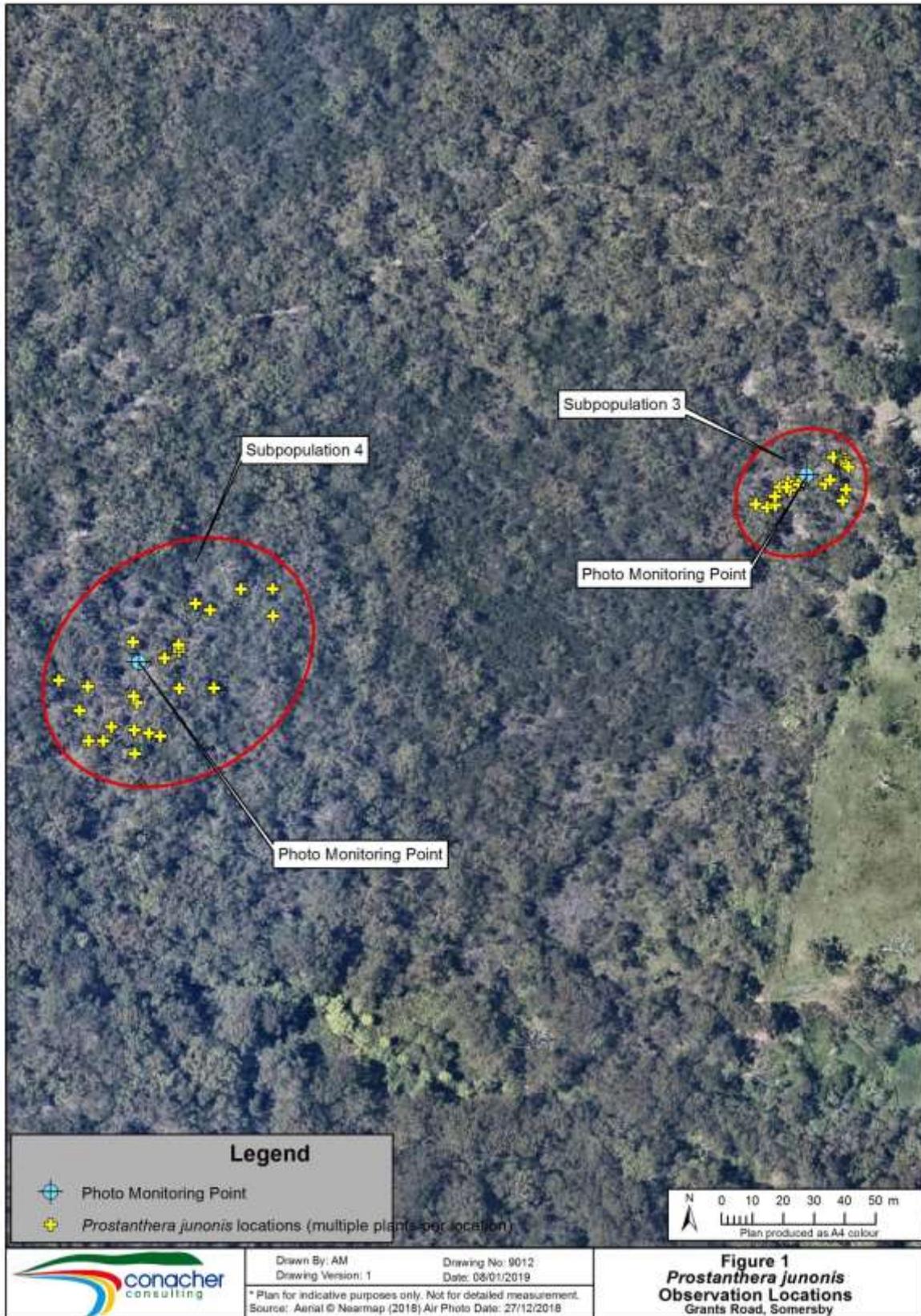




Figure 2.2a – Sub-population 3 photo monitoring point north aspect



Figure 2.2b – Sub-population 3 photo monitoring point east aspect



Figure 2.2c – Sub-population 3 photo monitoring point south aspect



Figure 2.2d – Sub-population 3 photo monitoring point west aspect



Figure 2.3a – Sub-population 4 photo monitoring point north aspect



Figure 2.3b – Sub-population 4 photo monitoring point east aspect



Figure 2.3c – Sub-population 4 photo monitoring point south aspect



Figure 2.3d – Sub-population 4 photo monitoring point west aspect

2.3 DETAILS OF NON-COMPLIANCE MATTERS

An assessment of the project performance indicators and responses required is provided in Table 2.2. Physical disturbance of vegetation likely by a machine was observed on the eastern extent of Somersby Mintbush Sub-population 3, between the Mintbush outer limits and the quarry site fence. There are no quarry works occurring within the vicinity of the observed disturbance. The disturbance area was detected after the flowering season surveys had concluded on 13 February 2020. It is not known whether any plants have been impacted or the source of the disturbance.

TABLE 2.2 SOMERSBY MINTBUSH COMPLIANCE ASSESSMENT FOR 2019 MONITORING PERIOD										
Trigger Levels	1 - Erosion and Sedimentation		2 - Fire Impacts		3 - Stock Herbivory		4 - Other Disturbances		5 - Population Decline	
	Trigger	Response	Trigger	Response	Trigger	Response	Trigger	Response	Trigger	Response
Low Impact	Sediment / erosion event offsite within 5m of Somersby Mintbush Population	-Report to GRSQ -Include in Annual Report -Immediately correct /improve erosion and sediment control - Consult with OEH to rehabilitate area	Fire outbreak on quarry site within vicinity of Somersby Mintbush Population	-Report to GRSQ -Include in Annual Report -Extinguish fire and improve controls to prevent reoccurrence.	One-off herbivory event from stock on site resulting in minor grazing on Somersby Mintbush Habitat	-Report to GRSQ -Include in Annual Report -Immediately repair / improve fences - Remove any manure	NA	NA	Somersby Mintbush dieback in excess of 10%	-Report to GRSQ -Include in Annual Report - Assess whether natural shading has reduced population - Identify whether attributable to the project -Provide offsets if attributable to the project and recovery does not occur
Moderate	Sediment / erosion event which directly impacts on Somersby Mintbush Population but does not result in population dieback	-Immediately Report to GRSQ - Immediately Report to DPE -Include in Annual Report -Immediately correct /improve erosion and sediment controls - Consult with OEH to rehabilitate area	Fire outbreak from quarry site which impacts habitats of Somersby Mintbush Population but does not result in Somersby Mintbush dieback	-Immediately Report to GRSQ & DPE -Include in Annual Report -Extinguish fire and improve controls to prevent reoccurrence. - Monitor and provide offsets if recovery does not occur	Repeat herbivory events from stock on site resulting in grazing on Somersby Mintbush Habitat	-Report to GRSQ -Include in Annual Report -Immediately repair / improve fences -Remove any manure - Report to DPE	NA	NA	Somersby Mintbush dieback in excess of 25%	-Report to GRSQ -Include in Annual Report - Assess whether natural shading has reduced population - Identify whether attributable to the project -Consult with DPE/OEH -Provide offsets if attributable to the project and recovery does not occur
High Impact	Sediment / erosion event which directly impacts on Somersby Mintbush Population resulting in population dieback	-Immediately Report to GRSQ - Immediately Report to DPE -Include in Annual Report -Immediately correct /improve erosion and sediment control - Consult with OEH to rehabilitate area	Fire outbreak from quarry site which impacts habitats of Somersby Mintbush Population & results in Somersby Mintbush dieback	-Immediately Report to GRSQ & DPE -Include in Annual Report -Extinguish fire and improve controls to prevent reoccurrence. - Monitor and provide offsets if recovery does not occur	Repeat herbivory events from stock on site resulting in grazing on Somersby Mintbush Habitat and noticeable physical habitat damage	-Report to GRSQ -Include in Annual Report -Immediately repair / improve fences - Remove any manure - Report to DPE	Disturbance event from quarry operations associated with machinery or soil movements	-Report to GRSQ - Report to DPIE -Include in Annual Report -Improve operational procedures - Provide offsets if attributable to the project and recovery does not occur	Somersby Mintbush dieback in excess of 50%	-Report to GRSQ -Include in Annual Report - Identify whether attributable to the project -Consult with DPIE - Assess whether natural shading has reduced population -Provide offsets if attributable to the project and recovery does not occur

**TABLE 2.2
SOMERSBY MINTBUSH COMPLIANCE ASSESSMENT FOR 2019 MONITORING PERIOD**

Trigger Levels	1 - Erosion and Sedimentation		2 - Fire Impacts		3 - Stock Herbivory		4 - Other Disturbances		5 - Population Decline	
	Trigger	Response	Trigger	Response	Trigger	Response	Trigger	Response	Trigger	Response
2019 Monitoring Period Results	No impact observed	No response required	No impact observed	No response required	No impact observed	No response required	Disturbance event observed, source not known.	Report to GRSQ Report to DPIE Include in Annual Report Determine if attributable to the project and implement improved operational procedures and offsets if necessary.	Population increase observed at SP4 during flowering period Decrease in flowering plants detected at SP3 of 31% during flowering period	Reduced counts during flowering period do not appear to be attributable to the project Natural shading is increasing due to regenerating shrub cover Very dry weather conditions also experienced during 2019. Report to DPIE

2.4 MONITORING TRENDS

A decrease in the total number of plants was recorded at subpopulation 3 compared to the 2018 monitoring period counts (29 vs 42 flowering plants). This may be attributable to the timing of annual flowering for this monitoring period or increasing shrub density. The population trend should continue to be monitored over subsequent years as the number of plants recorded is still greater than the 2017 and 2016 monitoring period counts.

Continuing regrowth of *P. junonis* was observed at subpopulation 4. The increased numbers of flowering plants detected at sub-population 4 compared to previous surveys is considered to be a result of the reduced shrub cover present and ongoing growth of *P. junonis* following the NPWS hazard reduction burn undertaken during October 2015.

2.5 PROJECT IMPACT DISCREPANCIES

Physical disturbance of vegetation, likely by a machine, was observed on the eastern extent of Somersby Mintbush Sub-population 3. It is not known whether any plants have been impacted or the source of the disturbance.

No other discrepancies between the predicted and actual impacts of the project were observed with regard to Somersby Mintbush.

2.6 MEASURES TO IMPROVE PROJECT PERFORMANCE

It is recommended that signposting of Somersby Mintbush Sub-population 3 be undertaken.

SECTION 3

CONCLUDING COMMENTS

3.1 CONCLUDING COMMENTS

The following concluding comments are provided:

- i. An increase in the sub-population 4 of Somersby Mintbush was recorded compared to the previous monitoring period.
- ii. The Somersby Mintbush population increase recorded is likely a result of reduced shading and regeneration following the 2015 hazard reduction burning operations of the NPWS.
- iii. A decrease in the sub-population 3 of Somersby Mintbush was recorded compared to the previous monitoring period. The number of plants observed flowering is still greater than the 2017 and 2016 monitoring periods.
- iv. Physical disturbance of vegetation, likely by a machine, was observed on the eastern extent of Somersby Mintbush Sub-population 3. It is not known whether any plants have been impacted or the source of the disturbance.
- v. The responses identified in Table 2.2 should be implemented.
- vi. Suitable environmental controls should continue to be maintained for the Project and signposting of Smoersby Mintbush sub-population 3 should be undertaken.

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Conacher Consulting (2016) Somersby Mintbush 2015 Monitoring Report, Grants Road Sand Quarry Extension Lot 1 DP 358717 270 Grants Road Somersby.

Conacher Consulting (2017) Somersby Mintbush 2016 Monitoring Report, Grants Road Sand Quarry Extension Lot 1 DP 358717 270 Grants Road Somersby.

Conacher Consulting (2018) Somersby Mintbush 2017 Monitoring Report, Grants Road Sand Quarry Extension Lot 1 DP 358717 270 Grants Road Somersby.

Conacher Consulting (2019) Somersby Mintbush 2018 Annual Monitoring Report, Grants Road Sand Quarry Extension.

NSW National Parks and Wildlife Service (2000) Somersby Mintbush *Prostanthera junonis* Recovery Plan. NSW NPWS. Hurstville NSW.

APPENDIX 1
ENVIRONMENTAL PERFORMANCE & COMPLIANCE STATUS SUMMARY

Details on the Environmental Performance and Compliance Status in relation to Somersby Mintbush have been requested for the Annual Reporting. This information is provided in Tables A1.1 and A1.2.

TABLE A1.1 ENVIRONMENTAL PERFORMANCE TABLE				
Environmental Aspect	Approval Criteria	Summary of Monitoring Results in the Previous Monitoring Period	Summary of Monitoring Results in this Monitoring Period	Improvement Measures to be Implemented
Somersby Mintbush	Negligible Environmental Consequences	<p>Sub Pop 3. 42 plants</p> <p>Sub Pop 4 394 plants</p> <p>No erosion, sedimentation or reduction in area attributable to the project observed.</p>	<p>Sub Pop 3. 29 plants</p> <p>Sub Pop 4 484 plants</p> <p>No erosion, sedimentation observed.</p> <p>Disturbance to vegetation adjoining sub population 3 observed, source unknown. Further monitoring required when flowering again.</p>	Implement signage where the site fence adjoins Sub-population 3.

A compliance status table is provided in Table A1.2.

TABLE A1.2 COMPLIANCE STATUS TABLE				
Unique ID	Compliance Requirement	Development Phase	Monitoring Methodology	Evidence & Comments
Condition 19.	Negligible environmental consequences	Operations	Direct population counts and qualitative observation of impacts	Annual Monitoring Reports

Appendix 9
LANDSCAPE & REHABILITATION MONITORING
Conacher Consulting



**LANDSCAPE REHABILITATION
&
BIODIVERSITY OFFSET AREA
2019 ANNUAL MONITORING REPORT
GRANTS ROAD
SAND QUARRY EXTENSION**

**FEBRUARY 2020
REF: 20022**

PREFACE

This Report has been prepared by *Conacher Consulting* to address the 2019 annual monitoring and reporting requirements under the Landscape & Rehabilitation Management Plan and Biodiversity Offset Management & Habitat Rehabilitation Plan for the Grants Road Sand Quarry Extension Project at Somersby.

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SECTION 1

INTRODUCTION & BACKGROUND

1.1 INTRODUCTION

This Landscape Rehabilitation & Biodiversity Offset Area 2019 Annual Monitoring Report has been prepared by *Conacher Consulting* for the Grants Road Sand Quarry Extension (Application No. 08-0099 / Mod 1).

This Report provides details on the compliance with the Landscape & Rehabilitation Management and Biodiversity Offset Management requirements for the Grants Road Sand Quarry Extension Project at Somersby.

The current Biodiversity Offset Areas, as approved by Modification No.1, are shown in Figure 1.

1.2 DETAILS ON CURRENT MANAGEMENT PLANS

The Landscape and Rehabilitation Areas and the Biodiversity Offset Areas and Landscape Buffer Areas for the project have been revised through an approved Modification Application (No.1).

A revised Landscape and Rehabilitation Management Plan (LRMP) (Conacher Consulting Version 2 - 2019) and a new Biodiversity Offset Management & Habitat Rehabilitation Plan (Conacher Consulting November 2019) have been prepared to meet the current project approval and commitment requirements. These new documents have been forwarded to the Department of Planning, Industry and Environment and have been approved by the Department.

This Report provides details on the works and performance of the Project in relation to these documents and the following Project Approval Conditions and Commitments:

i. **Schedule 2 Environmental Performance Conditions**

- Condition 23 Biodiversity Offset Strategy
- Condition 24 Long Term Security of Offset
- Condition 25 Landscape Rehabilitation Objectives
- Condition 26 Progressive Rehabilitation
- Condition 27 Landscape & Rehabilitation Management Plan
- Condition 28 Conservation & Rehabilitation Bond

ii. **Statement of Commitments**

- No. 6 Soils and Land Capability
- No. 9 Biodiversity & Environmental Management

SECTION 2

BIODIVERSITY OFFSET STRATEGY ANNUAL REPORTING

2.1 BACKGROUND

The revised Biodiversity Offset Areas are shown in Figure 1 in Appendix 1. Details on the implementation of the current approved Biodiversity Offset Strategy is outlined within the Biodiversity Offset Management & Habitat Rehabilitation Plan (BOMHRP) (Conacher Consulting November 2019). The annual monitoring and compliance requirements and results are addressed in Table 2.1 of this annual report.

2.2 BIODIVERSITY OFFSET AREA WORKS UNDERTAKEN

The following works have been completed in accordance with the Biodiversity Offset Strategy requirements for the Project:

i. Management of Fauna Nest Boxes

The nest box locations are shown in Figure 1 (Appendix 1). The results of the nest box monitoring are provided in Appendix 2. All boxes within the site are to continue to be maintained. Some new nest boxes may be relocated to the current Biodiversity Offset Areas of the site if the existing boxes require extensive repair work.

During the current monitoring period Seven nest boxes were identified as requiring maintenance or relocation. This is to be undertaken during the 2020 operational period. During the current reporting period three nestboxes (10, 20 and 25) were replaced with new boxes.

ii. Fencing of Biodiversity Offset Areas

The Biodiversity Offset Areas A & B are required to be protected with deer and livestock proof fencing. This fencing was completed in 2018 and fencing has been maintained during the reporting period.

2.3 LONG TERM SECURITY OF OFFSET (CONDITION 24)

This condition is currently being addressed by Stephen Thorne and Associates Surveyors. The Department of Planning, Industry and Environment have been provided with the following documents:

- Plan of Positive Covenants and Restrictions on the use of Land within Lots 1 and 2 DP 358717
- Draft Section 88B Covenant
- Draft Deposited Plan Administration Sheet
- Revised Landscape and Rehabilitation Management Plan (November 2019)
- Biodiversity Offset Area and Habitat Rehabilitation Plan (November 2019) to reflect the modified Biodiversity Offset Strategy.

**TABLE 2.1
BIODIVERSITY OFFSET STRATEGY MONITORING COMPLIANCE DETAILS**

Unique ID	Compliance Requirement		Development Phase	Monitoring Methodology	Evidence Required	Monitoring Results	Improvement Measures Required (2020)
	Task	Description					
Condition 27 (f) Commitment 9 BOMHRP-1	Soil Management	Install erosion and sediment controls to protect offset areas and prevent soil loss during weed control and rehabilitation activities	Operation 1-3 years	Project ecologist inspection Works records	Annual Monitoring Report -Photographs	Not required during 2019 monitoring period due to Management Plan Revisions and Offset Area modification. To be implemented during the 2020-2021 period.	Revised sediment erosion control procedures.
Condition 27 (f) Commitment 9 BOMHRP-2	Soil Management	Undertake soil and landform remediation and stabilisation works for heavily disturbed areas	Operation 1-3 years	Project ecologist inspection works records	Annual Monitoring Report -Photographs -Mapping	As above.	Implement ongoing revegetation of batters and track side areas.
Condition 27 (f) Commitment 9 BOMHRP-3	Weed Management	Undertake Primary Weed Control Works	Operation 1-3 years	Project ecologist inspection Works records	Annual Monitoring Report -Monitoring Plot Data -Mapping	As above.	Prepare Weed Management Procedures Plan (2020).
Condition 27 (f) Commitment 9 BOMHRP-4	Weed Management	Undertake Secondary Weed Control Works	Operation 4-10 years	Project ecologist inspection Works records	Annual Monitoring Report -Monitoring Plot Data -Mapping	As above.	Incorporate into Weed Management Plan.

**TABLE 2.1
BIODIVERSITY OFFSET STRATEGY MONITORING COMPLIANCE DETAILS**

Unique ID	Compliance Requirement		Development Phase	Monitoring Methodology	Evidence Required	Monitoring Results	Improvement Measures Required (2020)
	Task	Description					
Condition 27 (f) Commitment 9 BOMHRP-5	Revegetation	Obtain planting material (seeds / plant stock)	Operation 1-6 years	Tax invoice records	Annual Monitoring Report -Tax Invoices	As above.	Prepare preliminary revegetation plan.
Condition 27 (f) Commitment 9 BOMHRP-6	Revegetation	Undertake seeding and planting works	Operation 1-6 years	Project ecologist inspection Works records	Annual Monitoring Report -Plot data -Photos -Mapping	As above.	Prepare preliminary revegetation plan.
Condition 27 (f) Commitment 9 BOMHRP-7	Revegetation	Maintain plantings	Operation 1-6 years	Project ecologist inspection Works records	Plot data -Photos -Mapping	As above.	Implement initial revegetation in identified areas.
Condition 27 (f) Commitment 9 BOMHRP-8	Access Control	Install fencing to exclude livestock and deer from Offset Areas A & B	Operation 1-3 years	Project ecologist inspection	Annual Monitoring Report -Fence mapping -Photos	Completed during 2018 period. See Figure 2.1.	None required.
Condition 27 (f) Commitment 9 BOMHRP-9	Access Control	Maintain fencing to exclude livestock from Offset Area C	Operation 1-26 years	Project ecologist inspection	Annual Monitoring Report	Completed during 2018 period. See Figure 2.1.	None required.
Condition 27 (f) Commitment 9 BOMHRP-10	Access Control	Maintain all exclusion fencing in working condition	Operation 1-26 years	Project ecologist inspection	Annual Monitoring Report	Compliance achieved for 2018 period. See Figure 2.1.	None required.

**TABLE 2.1
BIODIVERSITY OFFSET STRATEGY MONITORING COMPLIANCE DETAILS**

Unique ID	Compliance Requirement		Development Phase	Monitoring Methodology	Evidence Required	Monitoring Results	Improvement Measures Required (2020)
	Task	Description					
Condition 27 (f) Commitment 9 BOMHRP-11	Habitat Enhancement	Install nest boxes and hollow logs to meet hollow tree offset requirement as clearing occurs	Operation 1-6 years	Project ecologist inspection	Annual Monitoring Report Nest boxes installed (31)	Some maintenance works required. Further nest box installation required only when hollow trees within footprint are cleared	Complete maintenance works for existing nest boxes during 2020 period.
Condition 27 (f) Commitment 9 BOMHRP-12	Habitat Enhancement	Salvage environmental/habitat resources where available from quarry footprint and transfer to Offset Areas A & B	Operation 1-10 years	Project ecologist inspection Works records	Annual Monitoring Report -Photos	Not required during 2018. Undertake progressively as footprint clearing is undertaken.	None required.
Condition 27 (f) Commitment 9 BOMHRP-13	Bushfire Management	Protect non-established plantings from bushfire	Operation 1-6 years	Project ecologist inspection	Annual Monitoring Report	No applicable during 2019 period.	None required.
Condition 27 (f) Commitment 9 BOMHRP-14	Bushfire Management	Allow natural bushfire disturbance and revegetation for areas containing established vegetation	Operation 1-26 years	Project ecologist inspection	Annual Monitoring Report -Monitoring Plot data -Photographs	No fire events detected during 2019	None required.
Condition 27 (f) Commitment 9 BOMHRP-15	Bushfire Management	Protect nest boxes from fire and/or replace if burnt out	Operation 1-10 years	Project ecologist inspection	Annual Monitoring Report	No fire events detected during 2019	None required.

**TABLE 2.1
BIODIVERSITY OFFSET STRATEGY MONITORING COMPLIANCE DETAILS**

Unique ID	Compliance Requirement		Development Phase	Monitoring Methodology	Evidence Required	Monitoring Results	Improvement Measures Required (2020)
	Task	Description					
Condition 27 (f) Commitment 9 BOMHRP-16	Monitoring Evaluation & Reporting	Undertake Annual Monitoring as per the Monitoring Strategy	Operation 1-26 years	Project ecologist inspection	Annual Monitoring Report	This report has been prepared to address this requirement.	None required.
Condition 27 (f) Commitment 9 BOMHRP-17	Monitoring Evaluation & Reporting	Re-assess risks to implementation of actions	Operation 1-10 years	NA	Annual Monitoring Report	No risks identified	None required.
Condition 27 (f) Commitment 9 BOMHRP-18	Monitoring Evaluation & Reporting	Implement adaptive response strategies	Operation 1-10 years	NA	Annual Monitoring Report	None applicable	None required.
Condition 27 (f) Commitment 9 BOMHRP-19	Monitoring Evaluation & Reporting	Prepare annual monitoring reports	Operation 1-26 years	Project ecologist reporting	Annual Monitoring Report	This report has been prepared to address this requirement.	None required.

SECTION 3

LANDSCAPE & REHABILITATION MANAGEMENT PLAN ANNUAL REPORTING

The details of the results of annual monitoring for the Landscape & Rehabilitation Management Plan (LRMP) are provided in Table 3.1. Details on the compliance with specific approval conditions are documented as follows.

3.1 LANDSCAPE REHABILITATION OBJECTIVES (CONDITION 25)

A requirement for rehabilitation works has not been triggered during the 2019 monitoring period.

3.2 PROGRESSIVE REHABILITATION (CONDITION 26)

A requirement for rehabilitation works has not been triggered during the 2019 monitoring period.

3.3 LANDSCAPE & REHABILITATION MANAGEMENT PLAN (CONDITION 27)

A Revised Landscape and Rehabilitation Management Plan has been prepared to address this condition of the current project approval under Modification 1. The implementation of the Biodiversity Offset Strategy Component is addressed in Section 2.1. The requirement for physical Landscape Rehabilitation works was not triggered during the 2019 monitoring period.

3.4 CONSERVATION & REHABILITATION BOND (CONDITION 28)

The Conservation and Rehabilitation Bond Calculation Report (Conacher Consulting December 2016 Ref: 4143/6) was prepared to address Condition No. 28 of Schedule 3 of the approval. This Report calculated that the Conservation and Rehabilitation Bond be set at \$306,000.00. This figure has been accepted by the Department of Planning and Environment. The financial arrangements for the rehabilitation bond were finalised in 2018.

**TABLE 3.1
LANDSCAPE REHABILITATION MANAGEMENT PLAN COMPLIANCE DETAILS**

Unique ID	Compliance Requirement		Development Phase	Monitoring Methodology	Evidence Required	Monitoring Results	Improvement Measures Required
	Task	Description					
LRMP (v2 - 2019) Landscape Buffer Area Management Actions No.1-4	Earth Mound & Bund Construction & Management	1.Progressively construct bund and earth mound around quarry pit	Operational / progressive as quarrying occurs	Visual site inspection and aerial photograph inspection	Annual mapping of bund and earth mound locations	Initial mound construction has occurred (Figure 3.1)	None required.
		2.Vegetate bund and mound areas with Kikuyu Grass or other suitable species	Operational / progressive as bunds and mounds are constructed	Visual inspection by Project Environmental Consultant	Documentation in monitoring reports	Revegetation commenced & ongoing (Figure 3.1)	Control weeds on mounds to assist further revegetation
		3.Construct and maintain sandstone block bund around Aboriginal archaeological site RE1	Prior to operation	Subject to monitoring by the project Archaeologist.	Refer to Environmental Plan of Management & Aboriginal Cultural Heritage Management Plan	Not applicable to this monitoring	Not applicable to this monitoring
		4.Implement downslope sediment controls for bunds and mounds until they are vegetated	Operational / progressive as bunds and mounds are constructed	Visual inspection	Annual monitoring reporting	None required as existing mound is upslope and adjoining quarry pit	None required
LRMP (v2 - 2019) Landscape Buffer Area Management Action No. 5-6	Tree Protection	5.Survey trees to be retained within the Landscape Buffer Area in close proximity to earth mounds	Operational / Years 4-6	Initial survey and further visual inspection	Initial mapping of tree locations and monitoring reporting	Tree locations identified on plan	None required.

**TABLE 3.1
LANDSCAPE REHABILITATION MANAGEMENT PLAN COMPLIANCE DETAILS**

Unique ID	Compliance Requirement		Development Phase	Monitoring Methodology	Evidence Required	Monitoring Results	Improvement Measures Required
	Task	Description					
		6. Provide protection for trees to be retained in the landscape buffer during bund construction	Operational / for life of the quarry	Visual inspection by Project Environmental Consultant	Annual Reporting	New requirement added to Revised LRMP. To be reported for 2019 period	None required.
LRMP (v2 - 2019) Landscape Buffer Area Management Actions No. 7-9	Aboriginal Archaeological Site Management	7. Maintain fencing and sandstone bund around Aboriginal archaeological site RE1	Operational / for the life of the quarry	Subject to monitoring by the project Archaeologist.	Refer to Environmental Plan of Management & Aboriginal Cultural Heritage Management Plan	NA	NA
		8. Maintain vehicle access diversion around Aboriginal archaeological site RE2	Operational / for the life of the quarry	As above.	As above.	NA	NA
		9. Implement Aboriginal Cultural Heritage Program	Operational / for the life of the quarry	As above.	As above.	NA	NA

**TABLE 3.1
LANDSCAPE REHABILITATION MANAGEMENT PLAN COMPLIANCE DETAILS**

Unique ID	Compliance Requirement		Development Phase	Monitoring Methodology	Evidence Required	Monitoring Results	Improvement Measures Required
	Task	Description					
LRMP (v2 - 2019) Landscape Buffer Area Management Action No. 10	Access Management	10.Ensure that common boundary fencing adjoining the Biodiversity Offset Areas and Aboriginal archaeological heritage sites is maintained	Operational for the life of the quarry	Project Ecologist inspection and annual monitoring reporting	Annual reporting	Compliant for Biodiversity Offset Areas. Refer to separate monitoring by Project Archaeologist for protection of Aboriginal Heritage Sites	None required
LRMP (v2 - 2019) Landscape Buffer Area Management Action No. 11	Bushfire Hazard Reduction & Weed Management	11. Undertake bushfire hazard reduction and weed management through grazing and slashing of the landscape buffer.	Operational for the life of the quarry	Project Ecologist inspection and annual monitoring reporting	Annual reporting	Generally compliant / further ongoing management required	Continue ongoing grazing and slashing
LRMP (v2 - 2019) Landscape Buffer Area Management Action No. 12	Rubbish Management	12.Monitor for rubbish accumulations and remove as necessary	Operational for the life of the quarry	Visual inspection by Project Environmental Consultant	Annual reporting	Compliant	None required
LRMP (v2 - 2019) Quarry Area Biodiversity Management Plan Actions.	Habitat Clearing Management	Implement pre-clearing, clearing and reporting requirements	Operational prior to and during clearing works	Project Ecologist Reporting	Annual reporting	Compliant / no habitat tree clearing undertaken within Quarry Footprint	None required

**TABLE 3.1
LANDSCAPE REHABILITATION MANAGEMENT PLAN COMPLIANCE DETAILS**

Unique ID	Compliance Requirement		Development Phase	Monitoring Methodology	Evidence Required	Monitoring Results	Improvement Measures Required
	Task	Description					
Quarry Area Rehabilitation Plan Actions 1-4	Site	-Safe, stable and non-polluting -Minimise the visual impact of the final landforms as far as is reasonable and feasible	Operation / progressive and post operation	-Land survey -Observation by suitably qualified Environmental Consultant	Record within quarry operation procedures and annual monitoring reports	Rehabilitation not required during current monitoring period	None required.
	Surface Infrastructure	To be decommissioned and removed unless the Secretary agrees otherwise	Post operation	-Observation by suitably qualified Environmental Consultant	As above	As above	None required.
	Quarry Benches	Suitably landscaped and revegetated using native species	Operation / progressive and post operation	-Observation by suitably qualified Environmental Consultant	As above	As above	None required.
	Quarry Pit Floor	Establish land with a level floor of at least Class 4 agricultural suitability over 80% of the quarry floor	Operation / progressive and post operation	-Observation by suitably qualified Environmental Consultant	As above	As above	None required.

SECTION 4

CONCLUSIONS & RECOMMENDATIONS

4.1 CONCLUDING COMMENTS

The Project is compliant with the requirements of the current Landscape and Rehabilitation Management Plan and Biodiversity Offset Management & Habitat Rehabilitation Plan prepared in compliance with the Conditions for Mod 1 of the Project Approval.

The progressive implementation of these plans is being undertaken as required.

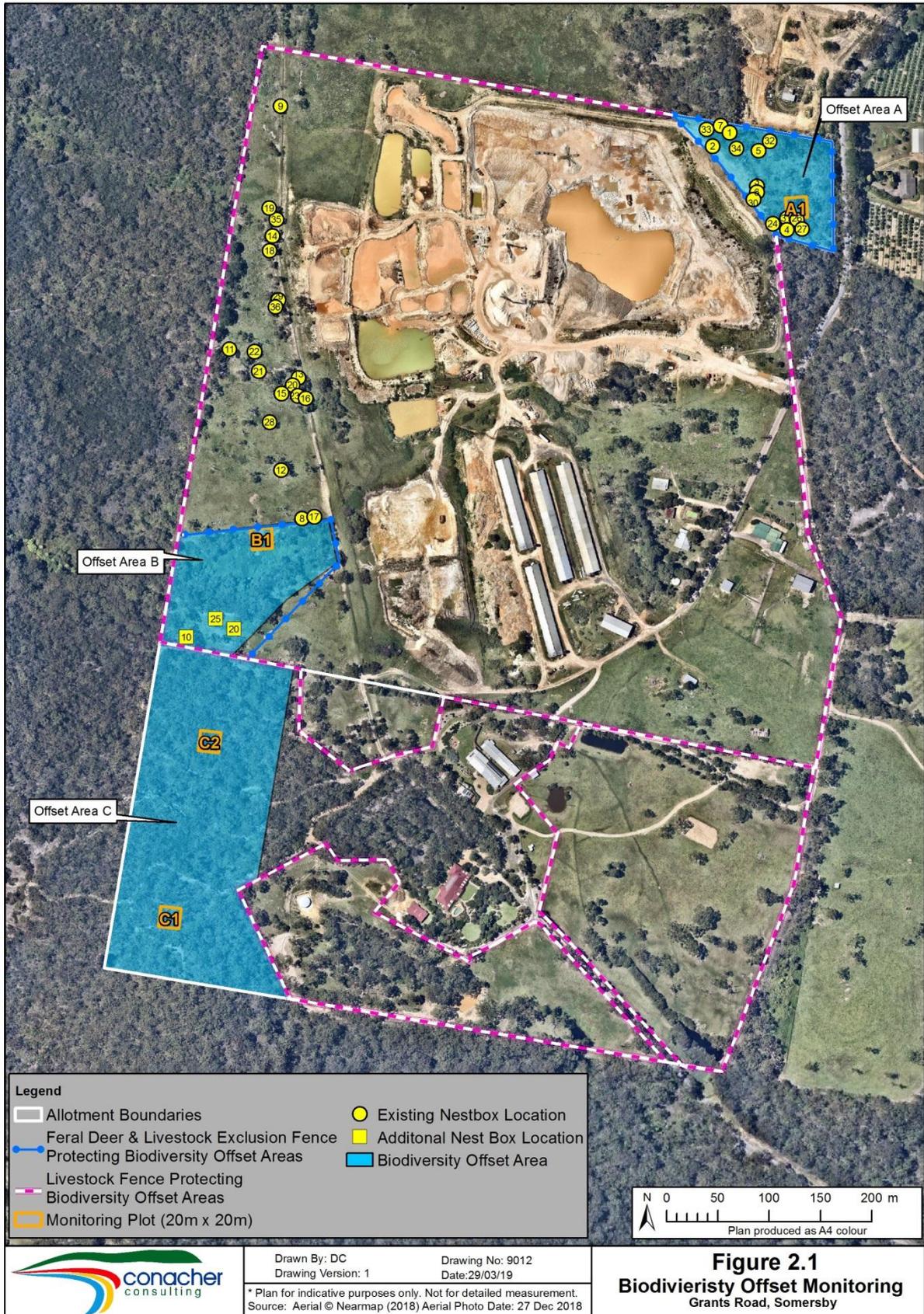
The current Landscape and Rehabilitation Management Plan and Biodiversity Offset Management & Habitat Rehabilitation Plan documents have been revised in 2019 and no revisions are recommended this stage. Any revisions required as a result of the Department of Planning, Industry and Environment's initial review of these documents can be completed separately to the annual review process.

REFERENCES

Conacher Consulting (2019) Biodiversity Offset Management & Habitat Rehabilitation Plan, Grants Road Sand Quarry Extension. Unpublished Report (November 2019).

Conacher Consulting (2019) Landscape and Rehabilitation Management Plan Version 2 Grants Road Sand Quarry Extension. Unpublished Report (November 2019).

APPENDIX 1 FIGURES



APPENDIX 2
NEST BOX ANNUAL MONITORING RESULTS

Fauna nest box monitoring data is provided in Table A2.1.

TABLE A2.1 NEST BOX MONITORING RESULTS					
Nest Box Number	Type	Monitoring Observation	Actions Required Prior to 2020 Monitoring Period	Easting	Northing
1	Side Entry Very Small Bird / Mammal	Intact	None	338720	6304269
2	Side Entry Very Small Bird / Mammal	Intact	None	338704	6304256
3	Side Entry Small Bird / Mammal (narrow box)	Intact / minor timber shrinkage detected	Monitor and fill gaps if further separation detected	338747	6304216
4	Side Entry Small Bird / Mammal	Intact / minor timber shrinkage detected	Monitor and fill gaps if further separation detected	338780	6304176
5	Front Entry Small Bird / Mammal (short box)	Intact / minor crack in front panel	Monitor and fill gaps if further separation detected	338746	6304252
6	Front Entry Small Bird / Mammal (short box)	Intact / minor cracking	Monitor and fill gaps if further separation detected	338747	6304211
7	Front Entry Small Bird / Mammal (short box)	Intact / timber shrinkage detected	Monitor and fill gaps if further separation detected	338711	6304276
8	Front Entry Small Bird / Mammal (short box)	Intact / small split above front entry	Monitor and fill gaps if further separation detected	338303	6303890
9	Front Entry Small Bird / Mammal	Intact	None	338282	6304295
10	Front Entry Small Bird / Mammal	Intact	None (replaced 2019)	TBD	TBD
11	Front Entry Small Bird / Mammal	Intact	None	338232	6304056
12	Front Entry Small Bird / Mammal	Slipped of support	Re-secure	338283	6303937
13	Front Entry Small Bird / Mammal	Tree Fallen	Re-install box	338300	6304028

**TABLE A2.1
NEST BOX MONITORING RESULTS**

Nest Box Number	Type	Monitoring Observation	Actions Required Prior to 2020 Monitoring Period	Easting	Northing
14	Front Entry Small Bird / Mammal	Intact / timber shrinkage detected	Monitor and fill gaps if further separation detected	338274	6304168
15	Front Entry Small Bird / Mammal	Intact	None	338294	6304021
16	Front Entry Small Bird / Mammal	Intact	None	338307	6304008
17	Front Entry Small Bird / Mammal	Support wire failure	Replace/Repair	338303	6303890
18	Side Entry Small Bird / Mammal	Intact / timber shrinkage detected	Monitor and fill gaps if further separation detected	338272	6304153
19	Side Entry Small Bird / Mammal	Intact	None	338278	6304184
20	Side Entry Small Bird / Mammal	Intact	None (replaced 2019)	338294	6304021
21	Side Entry Small Bird / Mammal	Intact / timber shrinkage detected	None	338261	6304035
22	Side Entry Small Bird / Mammal	Support wire failure	Replace/Repair	338257	6304054
23	Side Entry Small Bird / Mammal	Support wire failure	Replace/Repair	338299	6304011
24	Side Entry Very Small Bird / Mammal	Intact / timber shrinkage detected	Monitor and fill gaps if further separation detected	338769	6304184
25	Side Entry Very Small Bird / Mammal	Intact	None (replaced 2019)	TBD	TBD
26	Side Entry Very Small Bird / Mammal	Intact / timber shrinkage detected	Monitor and fill gaps if further separation detected	338786	6304184
27	Front Entry Small Bird / Mammal	Intact	None	338786	6304184

**TABLE A2.1
NEST BOX MONITORING RESULTS**

Nest Box Number	Type	Monitoring Observation	Actions Required Prior to 2020 Monitoring Period	Easting	Northing
28	Side Entry Small Bird / Mammal	Intact / timber shrinkage detected	Monitor and fill gaps if further separation detected	338272	6303985
29	Side Entry Small Bird / Mammal	Intact / timber shrinkage detected	Monitor and fill gaps if further separation detected	338280	6304105
30	Front Entry Small Bird / Mammal	Intact / timber shrinkage detected	Monitor and fill gaps if further separation detected	338743	6304203
31	Side Entry Very Small Bird / Mammal (Horizontal mount)	Intact	None	338776	6304185
32	Side Entry Very Small Bird / Mammal (Horizontal mount)	Intact	None	338759	6304261
33	Side Entry Very Small Bird / Mammal (Horizontal mount)	Intact	None	338697	6304272
34	Side Entry Very Small Bird / Mammal (Horizontal mount)	Tree fallen over	Re-install box on other tree	338727	6304253
35	Natural Log Rear Entry Bat box	Intact	None	338278	6304184
36	Natural Log Rear Entry Bat box	Intact	None	338277	6304098

Appendix 10 **HERITAGE INSPECTION REPORT**

Grant Sands Annual Review – Heritage

Conditions of Consent Compliance

The Cultural Heritage Management Plan – submitted and approved by the Department of Planning in October 2015.

Cultural Heritage Monitoring

2.13.2 Cultural Heritage Monitoring Reporting

The monitoring of the sites will be undertaken upon completion of the protective fencing and signage of the site Grants Road RE1 or one year after approval (25th July 2015) which ever arises first.

As per the inspection, post approval, undertaken by Insite Heritage Pty Ltd, in 2015, the sandstone block wall, 8m perimeter fencing and signage have remained in-situ throughout 2019. These mitigation measures were undertaken as per the CHMP and Statement of Commitments.

Plate 1 – a recent photograph shows the fencing, sandstone block wall, inner barrier and signage in place and is providing the required protection.



Plate 1 The inner perimeter fence 2019



Plate 2 Outer perimeter steel dropper fence 2019

The monitoring of Howes Reserve in conjunction with the Grants Sand site was undertaken as per the CHMP requirement. A visual inspection was undertaken in three main areas – the main area of engravings to the south east, the exposed for sheet to the south west including the vertical engraving on the rock shelf face, and the rock shelf to the north side of Howes Reserve.



Figure 1 Grant Sands relative to Howes Reserve - Photographic points across Howes Reserve in blue



Figure 2 Howes Reserve photographic locations in table below



Plate 3 Engraving on vertical face



Plate 4 View south east across rock platform above previous plate



Plate 5 View north east over rockshelf 2



Plate 6 a Mondo (circular engraving) Rockshel 2



Plate 7 Eel engraving (one of 3 eels side by side) view south east Rockshelf 3



Plate 8 View south over rockshelf 3 east. fainter engraving in foreground

The inspection of Howes Reserve did not find any evidence, such as rockshelf cracking, displacement or scouring due to dust deposition. At the time of inspection it had rained, and it is evident that natural sheet erosion of the sandstone rock shelves and wash from the access road through the reserve, have produced some sand that washes over the lower lying sites.

Biodiversity offsets

There has been no activity (ie. ground disturbance works) in the biodiversity offset area that has required a cultural heritage inspection in 2019. This is due to the purchase of an off-site biodiversity offset.

Complaints

There have been no complaints regarding cultural heritage in this period.

Table 1 – Environmental Performance Heritage.

Environmental Aspect	Approval Criteria: Requirements in the management plan; Relevant predictions in the EA	Summary of Results in the Previous Reporting Period	Summary of Results in this reporting period	Improvement Measures to be implemented
Heritage	Item 2.8 as per the approved CMP Stakeholder access to heritage sites.	No requests for site visits received.	No requests for site visits received	Facilitate site visits by direct invitation in 2020.
	Item Requirements in the management plan			
	Relevant prediction in the EA	Protection of cultural sites from harm.	Sites remain protected from harm.	Monitoring program to be carried out in 2019

Table 2 – Compliance Status table – Cultural heritage management plan

Unique ID	Compliance Requirement	Development Phase	Monitoring methodology	Evidence and comments
2.11	OEH to be notified of the discovery of an unknown object or cultural site.	At all times	Identification and notification of finds. No finds this reporting period.	Incident protocol Incident notification tracking report Compliance Report
2.12	Discovery of human remains – notification of OEH and NSW Police.	At all times	Track and compare incident times to Planning Secretary notification times No incidents this reporting period.	Incident protocol Incident notification tracking report Compliance Report
2.13.1	Biodiversity Offset Area to be inspected prior to revegetation works.	At all times.	Notification for inspection required prior to revegetation works in the BDO.	No works notified in this period.
2.13.2	Monitoring of the conserved sites RE1 and RE 2 along with the Howes Aboriginal Reserve every five years.	At all times	Monitored as per requirements	Monitoring report to be prepared and lodged with OEH and Grant Sands. Any issues identified to be managed as per recommendations, in consultation with OEH and stakeholders.

Appendix 11
COMMUNITY CONSULTATION
The Department of Planning and Environment



**COMMUNITY CONSULTATIVE COMMITTEE
MINUTES OF THE MEETING HELD THURSDAY 28TH MARCH 2019
AT SOMERSBY GARDENS ESTATE**

	NAME	ORGANISATION
PRESENT	Lisa Andrews (LA)	Independent Chairperson
	Charles Sammut (CS)	Community Representative
	Steven Jones (SJ)	Grants Rd Sand
	Leanne Jones (LJ)	Grants Rd Sand
	Brett Eddy (BE)	Central Coast Council (Guest)
APOLOGIES	Jeffrey Gay	Community Representative
	David Medcalf	Central Coast Council delegate
	Scott Stapleton (SS)	Central Coast Council (Guest)
	Karen Brace (KB)	Community Representative

The CCC Meeting was opened at 2.00pm

WELCOME & INTRODUCTIONS	The chair welcomed all present and thanked them for their attendance. LA introduced Brett Eddy, Team Leader Design, Major Design & Transport with Central Coast Council (south office).	
APOLOGIES	As above. LA advised that KB has resigned from the CCC, as she has sold her property and moved out of the area.	LA moved this item to General Business for discussion on recruiting another community representative.
DECLARATION OF INTEREST	LA declared that she is an approved Independent Chairperson with the Department of Planning and Environment, appointed by the Secretary to chair this CCC and engaged by Grants Rd Sand.	
BUSINESS ARISING	<p>1. Write to Central Coast Council regarding maintenance levy and road speed limit signage. (LA wrote to CCC on 24/20/19 & followed up on 15/3/19.) LA read out the content of the correspondence to the committee.</p> <p>BE provided an update, tabling correspondence from SS:</p> <ul style="list-style-type: none"> • Sign posting & line marking improvements were approved by the Traffic Committee in mid-2018 & installed shortly after, which included CAMS, Stop Signs, Curve Warnings, etc. • RMS undertook a review of the speed limit on Grants Rd & Reservoir Rd. • Existing speed limit was 100km (default - rural limit). 	<p>Following discussion by the CCC, it was agreed that no further action be taken in terms of the speed limit. Motorists should drive to the road conditions.</p> <p>BE sought further information on specific road drainage & road shoulder locations that required further works.</p> <p>BE recommended that residents contact Council if they have any</p>

	<ul style="list-style-type: none"> • Council advised RMS that its preference was for 60km/h. • Majority of residents seem to prefer 50km/h. • The review by RMS recommended 80km/h, accordingly signs were installed. • Council has received objections that 80km/h is too high. These objections have been forwarded to RMS. • Tree trimming has occurred. • In terms of the levy paid by Grants Rd Sand to Council, this money is placed in general revenue. He further advised that Grants Road & Reservoir Road were being considered for treatment in the 2021 rehabilitation program. • CS suggested Council investigate the regrading of the road table drain to direct stormwater flows to a nearby stormwater pipe under Grants Rd (adjacent to No. 91). • CS advised that there had been a letter box drop in the area, by an unidentified person, asserting that the road speed limit should be reduced to 50km/h. • SJ advised that the quarry hasn't received any complaints since the speed signs were installed. 	<p>concerns. Council operates on a 3 monthly road maintenance schedule.</p> <p>BE to inspect this area.</p>
<p>CORRESPONDENCE</p>	<p>As per correspondence report sent out with the meeting notice on 9/3/19, with 3 additional items:</p> <ul style="list-style-type: none"> • 23/10/18 - Email / letter to Central Coast Council regarding the road maintenance levy and road speed limit signage. • 26/10/18 - Email to members with the draft minutes for review • 3/11/18 - Email to members with the finalised minutes. • 9/3/19 – Email to Central Coast Council chasing up a response to previous correspondence. • 9/3/19 – Email to members with the meeting notice, agenda & correspondence report for this meeting. • 15/3/19 – Email from David Medcalf advising that he will be an apology, however, sending 2 representatives in his place. • 25/3/19 – Email from Jeff Gay with an apology for this meeting. • 25/3/19 – Email from Karen Brace resigning from the CCC as she has sold her property & moved out of the area. 	<p>Accepted.</p>

REPORT/PROJECT UPDATE	<ul style="list-style-type: none"> • SJ advised that the quarry continues to operate in accordance with its conditions of development consent (granted by Gosford City Council in 2000 with the sand mine expansion approval granted by DP&E in late 2014). • Production is not up to the approved licence (250k/t), currently 150k/t to 200k/t. • The annual report has been undertaken and will be forwarded to DP&E at the end of April 2019. • Monitoring continues to be carried out on a regular basis for environmental, air, noise and water management. • No complaints have been received, either via the website or personally to the quarry. 	<p>LA advised that she would provide a letter for the annual report, stating that the CCC has been established in accordance with the consent and the guidelines.</p>
GENERAL BUSINESS	<ul style="list-style-type: none"> • LA discussed the recruitment process for a replacement community representative (or 2) and sought input from the CCC: <ul style="list-style-type: none"> ○ Was anyone aware of interest from members of the community in joining the CCC? ○ When the CCC was formed last year, a letter box drop was undertaken of all properties in Grants Rd, with limited success. ○ Potential local publications for advertising – Mangrove Mountain District Community News was suggested. ○ Whether there were any stakeholder groups in the area. LJ mentioned there was a CWA. 	<p>CS advised that he would ask his new neighbour (that had purchased KB's property).</p> <p>LJ advised that she would place an advertisement on the Somersby Shop noticeboard.</p> <p>LA to write to the Country Women's Association (CWA)</p>
NEXT MEETING	<p>The next meeting will be held on <u>Thursday 5th September 2019</u> commencing at 2pm (same venue - Somersby Gardens Estate).</p>	

Meeting closed at 2.25pm with LA thanking all for their attendance.

ACTION ITEMS

ITEM	ISSUE	RESPONSIBILITY
1	Recruit for new community representative/s	LA
2	Inspect road shoulder/table drain adjacent to No. 91 Grants Rd Somersby	BE
3	Annual Report of CCC activities to be provided to DP&E	LA



**COMMUNITY CONSULTATIVE COMMITTEE
MINUTES OF THE MEETING HELD THURSDAY 5TH SEPTEMBER 2019
AT SOMERSBY GARDENS ESTATE**

	NAME	ORGANISATION
PRESENT	Lisa Andrews (LA)	Independent Chairperson
	Charles Sammut (CS)	Community Representative
	Steven Jones (SJ)	Grants Rd Quarry
	Leanne Jones (LJ)	Grants Rd Quarry
	Brett Eddy (BE)	Central Coast Council representative
APOLOGIES	Jeffrey Gay	Community Representative
	David Medcalf	Central Coast Council

The CCC Meeting was opened at 2.12pm

WELCOME & INTRODUCTIONS	The chair welcomed all present and thanked them for their attendance.										
APOLOGIES	As above.										
DECLARATION OF INTEREST	LA declared that she is an approved Independent Chairperson with the Department of Planning, appointed by the Secretary to chair this CCC and engaged by Grants Rd Sand.	No changes to members' previous declarations.									
BUSINESS ARISING	<p>There were 2 actions items from the previous meeting:</p> <table border="1"> <thead> <tr> <th>ITEM</th> <th>ISSUE</th> <th>RESPONSIBILITY</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Recruit for new community representative/s. Complete – 30/3/19. LA wrote to CWA. Ad placed in the Mangrove Mountain & District Community newspaper and letters distributed to local residents, as well as an ad placed on the noticeboard at the Somersby Shop. One nomination was received and a report will be prepared for the Department's consideration.</td> <td>LA</td> </tr> <tr> <td>2</td> <td>Inspect road shoulder/table drain adjacent to No. 91 Grants Rd Somersby. (Complete - request sent through to Mangrove Mountain Depot by BE, and drainage mitigation works were carried out at the end of April.)</td> <td>BE</td> </tr> </tbody> </table>	ITEM	ISSUE	RESPONSIBILITY	1	Recruit for new community representative/s. Complete – 30/3/19. LA wrote to CWA. Ad placed in the Mangrove Mountain & District Community newspaper and letters distributed to local residents, as well as an ad placed on the noticeboard at the Somersby Shop. One nomination was received and a report will be prepared for the Department's consideration.	LA	2	Inspect road shoulder/table drain adjacent to No. 91 Grants Rd Somersby. (Complete - request sent through to Mangrove Mountain Depot by BE, and drainage mitigation works were carried out at the end of April.)	BE	
ITEM	ISSUE	RESPONSIBILITY									
1	Recruit for new community representative/s. Complete – 30/3/19. LA wrote to CWA. Ad placed in the Mangrove Mountain & District Community newspaper and letters distributed to local residents, as well as an ad placed on the noticeboard at the Somersby Shop. One nomination was received and a report will be prepared for the Department's consideration.	LA									
2	Inspect road shoulder/table drain adjacent to No. 91 Grants Rd Somersby. (Complete - request sent through to Mangrove Mountain Depot by BE, and drainage mitigation works were carried out at the end of April.)	BE									

	3	Annual Report of CCC activities to be provided to DP&E (Complete - sent 20/5/19)	LA	
CORRESPONDENCE	<p>As per correspondence report sent out with the meeting notice on 24/8/19:</p> <ul style="list-style-type: none"> • 29/3/19 – Email to LJ with documentation for recruitment of new member/s. • 30/3/19 - Email to CWA – Somersby Branch inviting to nominate on delegate on this CCC. • 2/4/19 – Email to Grants Rd Quarry with the Annual CCC Report for DP&E • 3/4/19 – Email from Brett Eddy from CC Council to advise that road shoulder maintenance will be carried out at the end of April. • 3/4/19 - Email to members with the draft minutes for review. • 15/4/19 – Email from CWA advising that following consideration, there was no interest in providing a delegate on this CCC. • 15/4/19 - Email to members with the finalised minutes. • 20/5/19 – Email to DP&E with the CCC Annual Report for uploading to the department’s website. • 14/6/19 – Email of nomination onto this CCC. (Further information required to assess application.) • 24/8/19 – Email to members with the meeting notice, agenda & correspondence report for this meeting. 			Accepted.
REPORT/PROJECT UPDATE	<ul style="list-style-type: none"> • SJ advised that the quarry continues to operate in accordance with its approval. • Production has eased a bit with small down turn, accordingly, not as much production. • It has been very dry on site, up until last weekend when rain fell. All the dams are topped up now. • Central Coast Council’s contractor (Fulton Hogan) carried out some road works (heavy patching) in front of the Hanson Quarry on Reservoir Rd and on Grants Rd, near the quarry. Council did a letter box drop of the immediate area (200m vicinity of the works). A complaint was received to Grants Rd Quarry from a neighbour alleging that its quarry was operating on the weekend and the truck movements were causing a nuisance. LJ explained to the complainant that the quarry was not operating and that the trucks and noise were as a result of Council organised roadworks. • There has not been any feedback from the Department as a result of the lodgement of the project’s annual report at the end of April 2019. • Monitoring continues to be carried out on a regular basis for environmental, air, noise and water management with no exceedances. With the dry weather, water carts continue to be used for dust suppression. 			

	<ul style="list-style-type: none"> • Employment remains at the same number, however, less overtime is being offered. • No complaints have been received, except for the issue mentioned above, regarding Council's contractor undertaking roadworks on Sunday. 	
GENERAL BUSINESS	<ul style="list-style-type: none"> • LA advised that the Department of Planning has changed its name to Department of Planning, Industry and Environment (DPIE). • BE advised that Council has allocated and is currently reviewing funding in its current capital year for rehabilitation works on Grants Road (~\$1M). CS asked who would be responsible for these works with BE advising it would be Casey De Pereira – Section Manager Asset Management – email address: casey.depereira@centralcoast.nsw.gov.au • CS stated that the road is not wide enough to accommodate vehicles passing and Council should consider extending the width. Commenting that it would be better to widen the road and build a shorter length, then reseal the existing "legacy" road. The road was never built to meet the truck/traffic movements of two quarries. • BE reminded members that if they have any issues (pot holes, drainage, etc) to lodge a service request with Council at: ask@centralcoast.nsw.gov.au • BE advised that with DM on extended leave, he would continue to be Council's representative on this CCC. 	LA to include BE in distribution list.
NEXT MEETING	<p>It was agreed to hold CCC meetings' bi-annually. LA suggested the same schedule in 2020 as 2019:</p> <p>Thursday 26th March and 3rd September, 2020, commencing at 2pm (same venue - Somersby Gardens Estate).</p>	

Meeting closed at 2.31pm with LA thanking all for their attendance.

ACTION ITEM

ITEM	ISSUE	RESPONSIBILITY
1	Report to DPIE for its consideration of new community representative nomination.	LA