Dixon Sand Old Northern Road Quarry, Maroota

Annual Review 2019 – 2020



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Appendices

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Abbreviations

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DPIE Department o □Planning □Ind □Ir □ and En □ronment

DPIE [Re[o]re Reg ator Department o Planning Ind trand En fronment - Re[o]re Reg ator

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IE□ Independent En⊡ronmental □□dit

MEDM Maxim ☐m Extra ☐tion Dept ☐ Map

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PIRMP Poll tion In dent Re pon Management Plan

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TEOM Tapered Element O⊡illating Mi robalan e

T□P Total □□pended parti□□ate□

W□L Water □□e□□Li□en□e

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1. Statement of Compliance

Table 1: Statement of Compliance

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Table 2: Non-Compliances

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2. Introduction

2.1 Project Background

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En⊡ronmental Monitoring lo⊑ation□ to t te Old □ort⊑ern Road □ ⊑arr□are □own in □ig re □□

2.2 Scope of this document

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The following content condition of the redirement of the contral Rediew:

Schedule 5 of Condition 12 of DA250-09-01 (Modification 5) □tate□

By the end of March each year, or other timing as may be agreed by the Secretary, the Applicant must submit a review to the Department reviewing the environmental performance of the development to the satisfaction of the Secretary. This review must:

- (a) describe the development (including any progressive rehabilitation) that was carried out in the previous calendar year, and the development that is proposed to be carried out over the current calendar year;
- (b) include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, which includes a comparison of these results against the:

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- relevant statutory requirements, limits or performance measures/criteria;
- requirements of any plan or program required under this consent;
- monitoring results of previous years; and
- relevant predictions in the documents listed in condition 2(a) of Schedule 2;
- (c) evaluate and report on:
 - the effectiveness of the air quality and noise management systems; and
 - compliance with the performance measures, criteria and operating conditions in this consent.
- (d) identify any non-compliance over the past calendar year, and describe what actions were (or are being) taken to ensure compliance;
- (e) identify any trends in the monitoring data over the life of the development;
- (f) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies;
- (g) escribe what measures will be implemented over the current calendar year to improve the performance of the development.

The Applicant must ensure that copies of the Annual Review are submitted to Council and are available to the Community Consultative Committee (see condition 8 of Schedule 5) and any interested person upon request.

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2.3 Old Northern Road Quarry Approvals

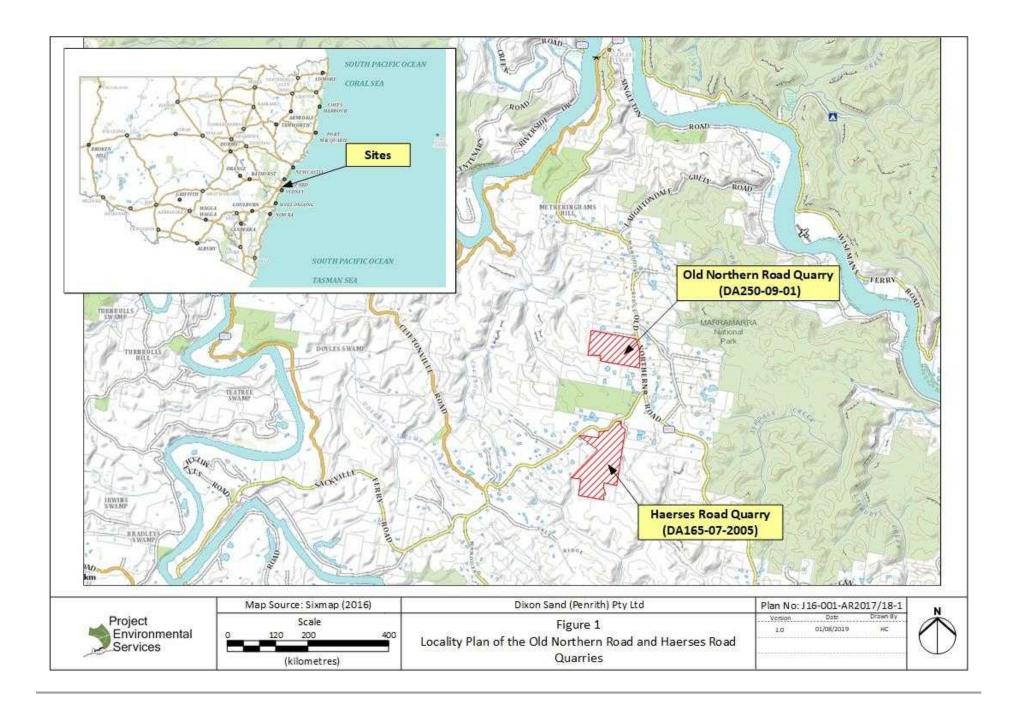
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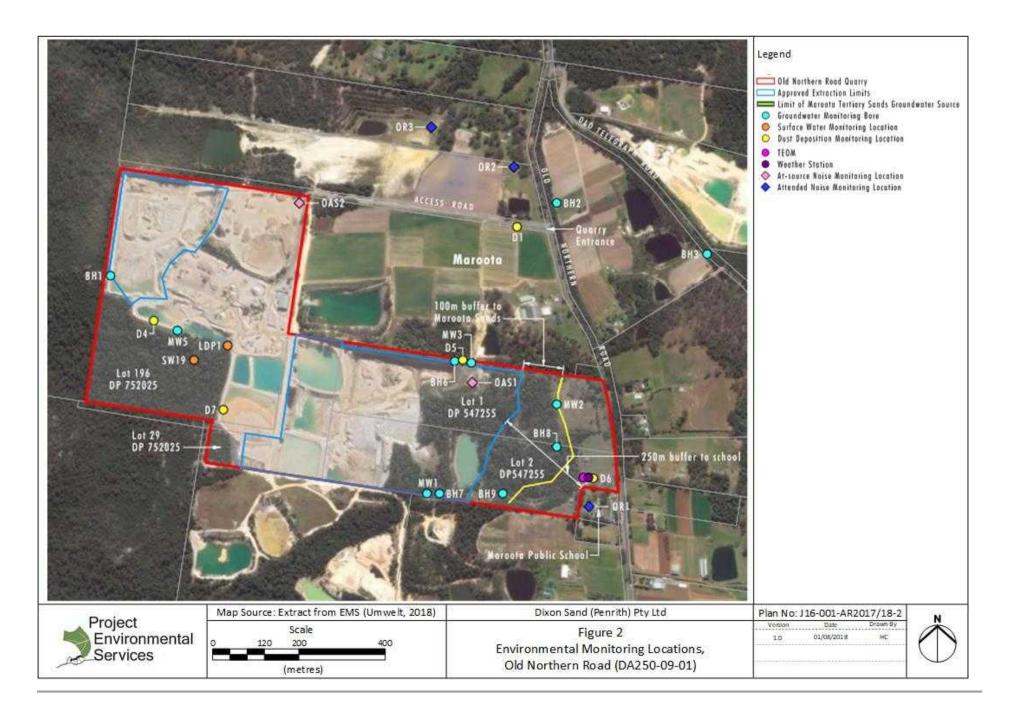
Table 3: Summary of Old Northern Road Quarry Development Consents and Modifications

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3. Operations Summary

3.1 Production and Vehicle Movements

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Table 4: Production Data, Transfers & Truck Movements at Old Northern Road Quarry.

Month	Total combined Production ONR from Lots 1, 2, 29 and 196 and HR (t)	Total Production of Haerses Rd Products (processed and sold at ONR) (t)	Total Transfers from Haerses Rd to ONR (t)	Max Daily Truck Movements at ONR	Max Daily Transfer between HR and ONR inbound (laden)	Max No. Trucks 5:45 -7:00 am at ONR
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□n □0□0	□□1056		54□□15		□0	□6
Totals / Maximum	378,959	35,551	62,303.5	180	13	20
Annual Limit	495,000	190,000	190,000			
		Dail	180	28	40	

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3.2 Submission of Quarry Production Data to DRG

ondition □ o□□□ed□e □ o□D□ □50-0□-0□re□□re□ Dixon □and to □□bmit □alendar □ear ann□al prod□□tion data to t□e DRG □□ing t□e □tandard □orm□and in□□de a □op□ o□t□□ data in t□e □nn□al Re□ew□

The DRG Mineral Rethration formere the reporting of extractive material for the financial dear and not for the calendar dear and perioded in the content condition about the time of the time of the financial Rethration and in awaiting the Mineral Rethration for the financial dear completed by the DRG The came production data contained in Table 4 will form the bath for calculation for DRG Mineral Rethration reporting the form will be completed and submitted to the DRG within the specified deadline.

4. Actions Required from Previous Annual Review

Te propoted retommendation tontained in the pretion of the pretion

Table 5: Summary of Recommendations and Actions

Recommendation from the 2018 – 2019 Annual Review	Actions
Re⊡abilitation and b□□□ regeneration	
Old □ort□ern Road – Re□abilitation will □ontin□e in t□e □ati□e □egetation □orridor □□□□□on Lot □□ and Pre□in□t□□ and 5 on Lot □□6□	Ctioned - Contin Ced re Cabilitation Inderta Cen in t Ce
Propagation o t reatened pe e will ontin e Weed management practice will ontin on te	□ tioned - on-going propagation o□ t□reatened □pe ie□ and weed management □nderta en□
Remo⊡al o□plant g□ard□ and timber □ta□e□ will be □nderta□en a□planted □pe□men□e□tabli□□□□	□ □tioned - plant g□ard□ and timber □ta□e□ remo□ed □rom e□tabli□□ed planted □pe□imen□□
Recorre Regulator – etion and Improtement otice	□ □ □□□-□0 □□00764
Re_lew and □pdate t □ □a et □ Data □□eet regi ter Prote t □ed batterie to pre ent ar ing Re_ti □ t □ e andrail on t □ die el trailer to pre ent per on □ from alling from t □ e mall plat orm Comparison to the leman to the	□tioned - profided to DPDE Recorred RegDatorDwitDa propoted action plan and Completed actionDon C4December C0DDDII itemDace been Coced oct
 □eep immediate area □rro□nding t□e fire exting □□er □ear o□□□tter Re □ew and □pdate □te emergen □□ plan 	

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5. Environmental Performance

5.1 Air Quality

5.1.1 Dust Sources and Mitigation Measures

T coble ti collitic collitic

Te following potential for relocder generated from Old ortern Road carrend mitigation meature are been identified in Table 6

Table 6: Potential sources of dust and mitigation measures.

Potential Dust Sources	Mitigation Measures
top⊑oil	minimi⊡ng t⊡e area o⊡di⊡t⊡rban⊡e b□onl□ □earing area□immediatel□
ripping wit□a b□lldo⊑er□	prior to extra⊡tion□
extra⊡tion wit□ an ex□a□ator	progre □ □ □ re □ abilitation □
and tr□□□	maintaining d □ t □ ppre □ ion e □ ipment to all pro □ e □ ing plant □
□r□□□er□and □□reen□at t□e	maintaining a man⊏al ⊡prin⊟er □□□tem in□□ding ûne ⊡pra□□on t□e
pro⊡e⊡ing plant□	concecor octce droprocecting plantcocercead cprinder and a conical
wind ero⊡on rom	et ⊡to⊡pile ⊡prin⊡er□
□to□pile□□	□tabili⊡ing top oli
loading □and prod □□t□into	□ereal or leg□me□□
tro	□ing a water □art to □ppre□□d□t on □n□ealed road□□d□ring dr□
□e□□e mo□ement and	⊡ondition □ on da □□ o □operation □
□a □age on □te □	Iimiting □e□□le □peed to □0 □m□r on internal □n□ealed a□□e□□ tra□□□
prod□t tran□portation along	en⊡ring all load□lea⊡ng t⊡e
□n⊡ealed ⊡a⊡ road⊡and	reg□arl□maintaining mobile and fixed e□fipment to minimi□e ex□a□t
o □a □onal □a □ road	emi⊡ion⊡
grading□	

5.1.2 Compliance Limits

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- total □□pended parti□□ate matter □□P□- □0□g□m□ann□al mean□and
- - \circ 50 \square gm \square amerage mor m4 m0mr periodm
 - $\circ \quad \Box 0 \ \Box g \\ \hline \ m \\ \hline \Box ann \\ \hline \Box al \ mean \\ \hline \Box$

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Te = W Entironment Protection = terminate or entire to be tet at a PM trigger trigger trigger or trigger trigger to be tet at a PM trigger tri

• 4 gm arerage for rolling 4 or period for wind direction between 70 and 5 for the Old orthern Road form

Table 7 liuto to relevant PMIO and Total opended particulate of Politieria ao recired boto Decelopment oncent and Endironment Protection Licence

Table 7: PM10 and TSP Criteria.

Source	Condition	Criteria / Trigger Value	Comments							
Old Northern Road										
D = 50-0 = 0	ond_7	_0 _gm□	□nn⊡al PM⊡ a⊡erage – long term impa⊡t a⊡e⊡ment							
		50 □g m□	□4 □o□r PM□ a □erage – □ort term impa □t a □e □ment							
EPL0006	0	□7 □g m̄□	Trigger ⊡al⊡e tor PMto a⊡tomati⊡alarm							
EPL ====6	M = 124	4 gm wit pre ailing wind dire tion from 70 - 05	□riteria lor ena ting management plan trategie to noti te EP□red te d temi tion timediatel and tea te operation in Lot and the lord tea							
D = 50-0 = 0	□□□□□□ond□7		□nn⊡al a⊡erage ⊡riteria lor T⊡P							

5.1.3 Results

Climatic Data

Mont□□□limati□mea□rement□were re□orded b□t□e weat□er □tation lo□ated ada□ent to t□e Maroota P□bli□□□□ool□ in a□ordan□e wit□:

• ondition M4 ot e EPL oc6

T e e re ⊡t are ⊡own in Table □

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Table 8: Monthly Total Rainfall and Averaged Temperatures.

Month	Jul 2019	Aug 2019	Sep 2019	Oct 2019	Nov 2019	Dec 2019	Jan 2020	Feb 2020	Mar 2020	Apr 2020	May 2020	Jun 2020
Ave Temp (°C)		□□5	□5Ⅲ		□0 4						□□16	
Total Rainfall (mm)	5	7 🗆 0	4	7	_0 0	0	□□16		0			

Data pre ⊡ented in Table □ ⊡ow□t⊡at t⊡e ⊡g⊡e⊡t mont⊡⊡ rain all o□□□□□□ mm wa□ re orded in □ebr⊡ar□ □0□0 and
t⊑e lowe⊑t mont⊡ ⊨raintall o 0
reporting period i□ □□□□□ mm□repre⊑enting a ⊡ig⊡er ann⊡al rainाall t⊡an t⊡e pre⊡o□□ reporting period Ⅲ65Ⅲmm lor
□0□□-□0□□□□b⊡t lower t⊡an t□e 4 pre⊡o□□ reporting period□ □□7□□□ mm in □0□7-□0□□□□□4 mm in □0□6-□0□7□
□0□6¼ mm in □0□5-□0□6 and □4□ mm in □0□4-□0□5Ⅲ
□rom t⊡e re ⊡orded mont □ □ temperat □re data □ □an □ar □ □0 □0 experien □ed t □e □ig □e □t a □erage temperat □re at □□□□□□
wit□ ⊡ne ⊡0□□ experien⊡ng t□e lowe⊡t a⊡erage temperat□re at □□10 ⊞□□□□τ□ation□ o⊡temperat□re□ re⊡orded are
generall□int⊡en⊑ed largel□b□t⊑e El-□ino and La-□ina □limate □□le□

Dust Deposition

Table 9: Site location of dust deposition gauges

Dust Gauge I.D.	Location Reference	Quarry Site
D0 🗆	□ □arr□ □ □□e □□ Road □near t □e Old □ort □ern Road	Old □ort⊡ern Road
D04	Re⊡abilitation ⊡rea	Old □ort⊡ern Road
D05	B⊡ndwall⊡Lot □	Old □ort⊡ern Road
D06	Maroota P⊡bli□ □⊡ool	Old □ort⊡ern Road
D07	M⊡lo□□eap	Old □ort⊡ern Road

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Dut depolition relitered and analized montale beautredited laborator. Table of precentate montale dut depolition relitered and analized montale of ontain to contain the calculated annual allerage for the dut depolition galge. The monitoring of elded of montale of monitoring relitered from the during the reporting period.

T ce mont collaborator crecut collaboration continue mont collaborator crecutation depocition continue mont collaborator crecutation continue mont collaborator crecutation continue mont collaborator crecutation continue mont collaborator crecutation continue mont collaborator collaborator crecutation continue mont collaborator collaborator

Table 10: Dust Deposition Results: July 2019 – June 2020.

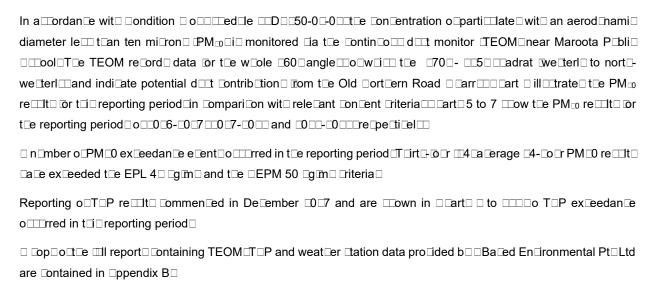
Dust Gauge Location	Jul-19	Aug-19	Sep-19	Oct-19	N ov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	May-20	Jun-20
						(g/	m2/montl	h)					
DA1A Front Gate	0.8*	1.2*	□6□		2.1*		2.2*	5.3*		2.1*	1.7*	1.3	1.4
D4 Rehab	0	04	2.1	□10	1.5*		□6□	5.3*	□10	0.3	017	0	0
D5 Bundwall	04	2.4*	2.4*		2.5*	5	3.0*	6.5*	1.5*	0.8	1.5*	1.7*	□16□
D6 School	0.3	0		□16		47	□6□	6*		0.8	0.8*	0.5	1.3
D7 Mulloc Heap	0.1	04	017		1.3*		1.9*	5.5*		0.5		04	0

Table 11: Calculated Annual Averages of Dust Deposition: June 2018 – June 2019.

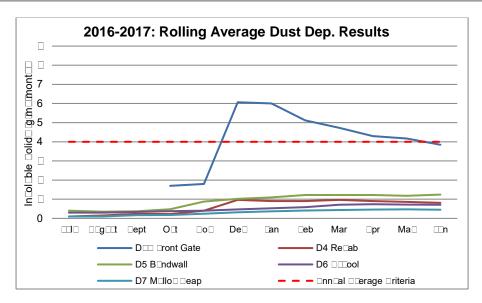
Dust Gauge Location	Jul-19	Aug-19	Sep-19	Oct-19	N ov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	May-20	Jun-20
						(g/	m2/month	h)					
DA1A Front Gate	0.8*	1.0*	1.2*		1.6*		2.0*	□4□	□5□	2.4*	2.4*	2.3	2.2
D4 Rehab	0	0	0.9	0	1.0*	□5□	□ 7 □		□10		□7	□6	1.5
D5 Bundwall	04	1.4*	1.7*		1.9*	□6□	2.7*		3.0*	□7	2.6*	2.6*	2.6*
D6 School	0.3	016	07	□10		□7□		□4□			2.0*	1.9	1.8
D7 Mulloc Heap	0.1	0	04	0	0.9*	□4□	1.5*					□7	1.6

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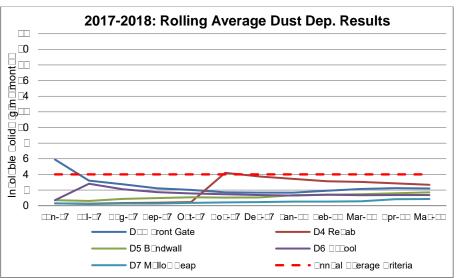


Chart 1: 2016 - 2017 Rolling Average of Dust Deposition Results

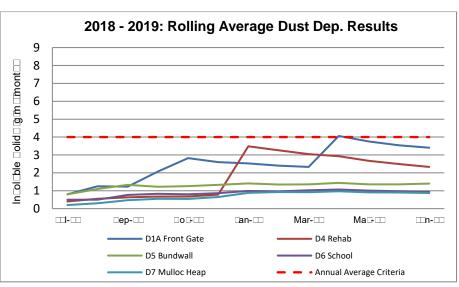


Chart 2: 2017 – 2018 Rolling Average of Dust Deposition Results

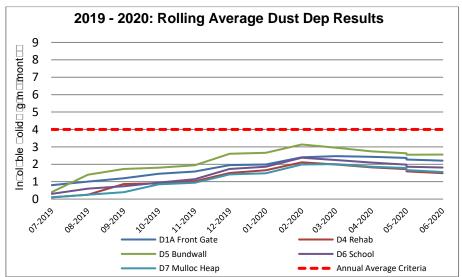


Chart 3: 2018 - 2019 Rolling Average of Dust Deposition Results

Chart 4: 2019 - 2020 Rolling Average of Dust Deposition Results

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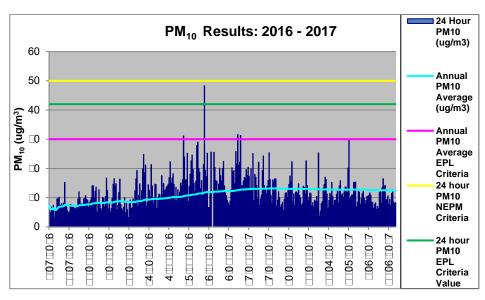


Chart 5: 2016-2017 PM10 Results and Criteria

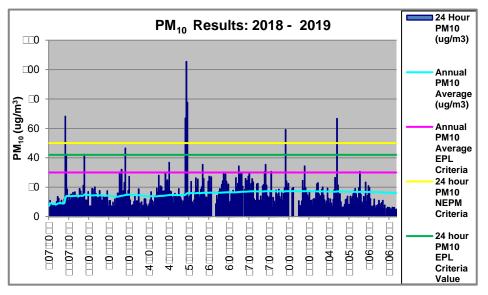


Chart 7: 2018-2019 PM10 Results and Criteria

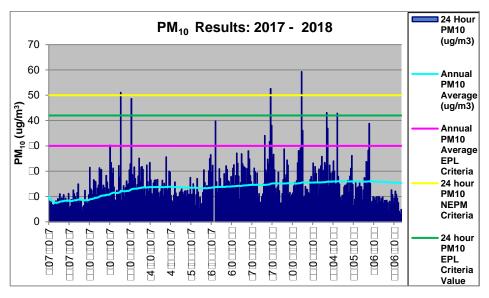


Chart 6: 2017-2018 PM10 Results and Criteria

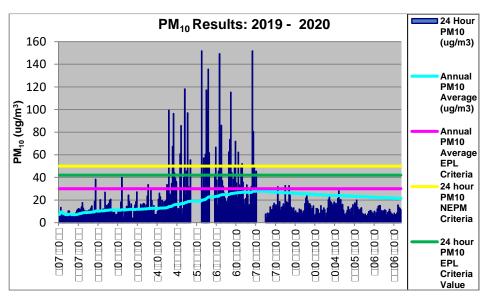


Chart 8: 2019-2020 PM10 Results and Criteria

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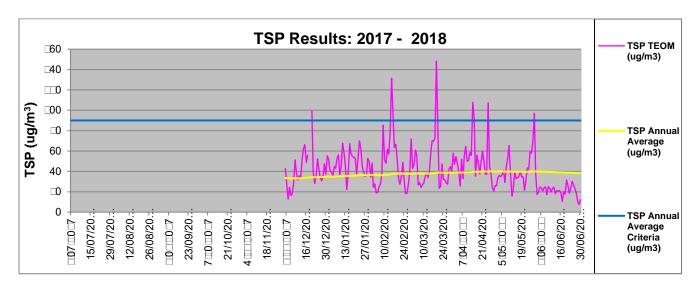


Chart 9: 2017-2018 TSP Results and Criteria

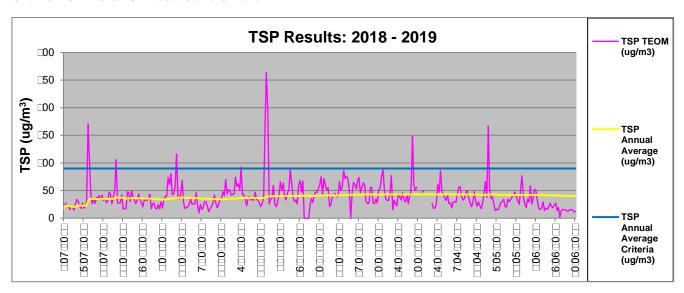


Chart 10: 2018-2019 TSP Results and Criteria

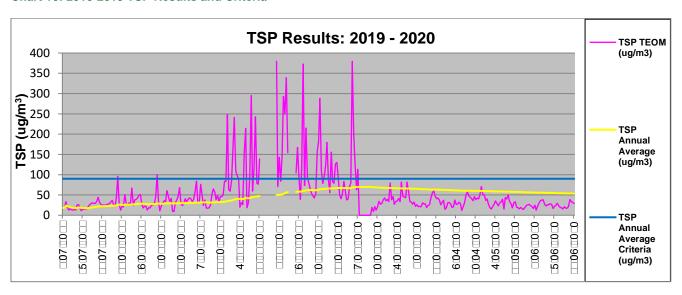


Chart 11: 2019-2020 TSP Results and Criteria

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5.1.4 Analysis

Dust Deposition

Reporting Period 2019-2020

□i⊑e d□ɑt depo⊡tion ga⊑ge□monitor potential d□ɑt impa⊡t□ īrom t□e Old □ort□ern Road □□arr□□ Montillerellite and annual dut depolition allerage for D0 meront Gate D04 Bind D05 Milo eap D06 □□□cool□and D07 □B□nd□for t□e □□□□□0□□ to □ne □0□0 period were in □ompliant□□ll ann□al a□erage□ were in □ompliant wit □ t □e 4 g m □ mont □ □riteria □ The EID prepared for the extention of the marriagn Old forthern Road Lot in and the the the extention of the contract of the extention of the contract of the extention of the e depo ition at tie neare it receptor ito be between iii and iiigim imont iii e malorit io itie mont iid iii depo ition re⊞t□at t□e Old □ort□ern Road tor t□e reporting period were wit □n t□e El□ predi⊡ted range o □d □ct le □el □wit□ t□e exception octoe D05 Bondwallowico ad digctloelecated doct lecelocoligo monto doct lecelobetween October □□□ and □ebr□ar□ □□□ were a □□□ ated wit□ □□m□lati□e poor air □□alit□ from t□e prolonged b□□□ûre e □ent□ in t□e lo⊡al⊡regional and inter⊡tate area⊞a⊟indi⊡ated b⊟ ⊡ʻ⊡ble a⊞ ob⊡er⊡ed to be pre⊡ent in t⊡e d⊞t ga⊡ge⊞ Historical Data It ⊡an be ⊡een ⊡om □ □art□ 5 to □ t⊡at t⊡e malorit□ o □t□ depo⊡tion re □□t□ are in □omplian⊡e o □er t□e pre ⊡o □□ 4 □ear □ o □monitoring □ D0 = aront gate wa relocated in eptember 0.6 arenamed D0 = and reterned oig = d=t re=to in to a ation mont a cagri at a operation diring to a confidence of the confiden reporting period □ were generall □ in □ompliant □ onnoal acerageo or D04 tRecabood5 tBondwallood6 to colonand D07 tMoloo oeapocace been conúctentio compliant ocer tce la to correporting period compliant ocer tce la to correct to correc

<u>PM10</u>

Reporting Period 2019-2020

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T ce rolling a cerage PM o cal ce dig t bl ce line on cart coremained below t ce EP long term criteria o coμg m cpin line on cart cor t core period core to core to

The L4 color allerage PM $_{\odot}$ letel dar blue column on the cart the remained below the L4 color EPL management letel of L4 $_{\odot}$ properties of L4 color allerage PM $_{\odot}$ term the cart color allerage PM $_{\odot}$ term the cart color allerage PM $_{\odot}$ exceedante and explanation \Box

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Table 12: PM10 – EPL and NEPM Management Criteria Exceedances

Event No.	Exceedance Date	24 Hour Average PM10 (ug/m³)	Exceeded criteria (ug/m³)	Comment
	□6 O □tober □0 □□			
	□0 O tober □0 □□	67Ⅲ		
	□□ O tober □0 □□	□6⊡5		
4	□ □o □ember □0 □□	4		
5	7 □o⊡ember □0□□	6017		
6	□ □o⊡ember □0□□	□5Ⅲ		
7	□□ □o □ember □0 □□			
	□4 □o □ember □0 □□	4515		
	□5 □o □ember □0 □□	□7 Ⅲ		
□0	□□ □o □ember □0 □□	55⊈		□el⊡Reported to EP□ on m□tiple o⊡a⊡on⊡
	□0 □o □ember □0 □□	□5□Ⅲ		• EP Re == =4574-=0 ==
	□ De ⊑ember □0□□	57⊞		• EPa Reaa (4700-1000) • EPa Reaa (5000-1000)
	4 De ⊑ember □0 □□	60⊈		• EP Re 5 5 6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
□4	5 De ⊡ember ⊡0 □□	□ □7 □□		• EP = Re == = 567 = 0 == =
□5	6 De ⊑ember □0 □□			• EPa Read 06 ad 0-00 ad • EPa Read 00 ad 0-00 0
□6	7 De ember □0 □□	□□516		• EPD Re0000500-000 • EPD Re000006-000
□7	□ De ⊡ember □0 □□	6□7	EPL: 4□ □gIm□	• EPO Red000000-00
	□5 De ember □0 □□	6617	□EPM: 50 □g m □	On-going lo⊡ali⊡ed⊡regional and inter⊡tate
	□□ De ⊡ember □0 □□	45⊈		b□□□ire□ ⊑a⊑e re□□ted in re⊡d⊑al poor air
□0	□□ De ⊡ember □0 □□	□4 □□□		□□alit□and ele□ated PM□0 le□el□□T□e B□rea□ o□Meteorolog□ ore□a□ted area□ o□
	□□ De ⊡ember □0 □□	□610		□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□
	□□ De ⊡ember □0 □□	6□6		re⊡orded a⊡ro⊡t⊡e DPIE Monitoring □tation⊡⊡i⊡ble ⊡mo⊡e □a⊡e wa□ob⊡er⊡ed
	□0 De ember □0 □□	7□6		at t⊡e premi⊡e on t⊡e maiorit⊡ o⊡t⊡e da ⊡ t⊡e ex⊡eedan⊡e⊓ o⊡ ⊡rred ⊡PM ⊓0
□4	□□ De ⊡ember □0 □□	□□5 Ⅲ		ex ⊑eedan ⊑e not attrib ⊑ted to □⊑arr □
□5	□	44Ⅲ		operation □
□6	4 ⊡an⊡ar□ ⊡0⊡0	4□4		
□7	5	7		
	□	6□Ⅲ		
	□□ □an□ar□ □0□0	5016		
□0	□□ ⊑an⊑ar□ □0 □0	5		
	□□ ⊑an⊑ar□ □0 □0	□5□Ⅲ		
	□4	□015		
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Historical Data

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Total Suspended Particles

Reporting Period 2019-2020

The Total compended Particle of the reported in cart can all allerage The for the reporting period in 504 μ g in which is lower than the annual allerage The direction of μ g in the reporting period in 504 μ

Historical Data

5.1.5 Changes to Environmental Procedures

o cange to the entironmental protective are proported or deemed neteriar for air calite management.

In the elent dignificant amount obtained dust in pretent on the premide follow the deep obtained in the direction Management Plan.

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5.2 Noise Management

5.2.1 Noise Sources and Mitigation Measures

Te obletien riteria limit proted remerponte reporting and responsibilitie on noise management are contained in the noise Management Plans

Tie following potential force onoice and mitigation meature at the Old fortern Road face been identified in Table and

Table 13: Potential sources of Noise and mitigation measures.

Potential Noise Sources	Mitigation Measures
Extraction b b ldo er and ex a ator □ Moing o material and to piling b d mp tr □ adage in diding bogie tr □ tr and dog □ Wet dr pro e ing o and and n llar a didite in ding maintenan e nderta en in t e wor □ op on tr tion maintenan e o b nd wall	 On trotton o noice bind in trategio location a tip lated in the Elot and content condition. Itip lated in the Elot and content condition. Omplian with approfed content condition. Regilar maintenance o road in a collection and empment to redile enoice emission and. Enfortement o peed limit for trotton and limited the otexia at brate in redential and thoo area. Enfortement o collection peed limit on carroated road and collection. with o plant when not in the and the observation idle to the collection.

T □ □ □ oi □ ■ Management Plan Tor t □ ■ Old □ ort □ ern Road □ arr □ re □ ire □ attended noi □ e monitoring to be □ nderta □ e □ er □ ix mont □ □

5.2.2 Compliance Limits

Noise Criteria

Te Old ortern Road noice criteria are licted in Table 4. Te approced corroperation are contained in Table 5. Oice monitoring for the carroic based on the criteria.

Table 14: Old Northern Road Noise Criteria.

Consent Condition	Conditions				
□□□50-0□-0□□ □ondition □ o□ □□□ed□le □ and	T □e □ppli □ant m □ t en □ re t □at t □e noi □e generated b □ t □e de □elopment doe □ not ex □eed t □e □riteria in Table □ at an □ re □iden □e on pri □atel □-owned land or at t □e Maroota P □bli □ □ □ool □ Table 2: Noise criteria dB(A)				
	Receiver Averaging Shoulder Period (6.00 am to 7.00 am)		Day (7.00 am to 6.00 pm)		
	Any residence on privately owned land	LAeg (15 minute)	37	44	
	Any classroom at Maroota Public School	45			

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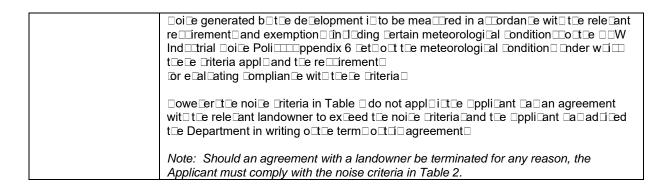


Table 15: Old Northern Road Approved Hours of Operation.

Consent Condition		Condition				
D□□50-0□-0□□	T = ppli ant m = t compl wit t = operating co r = et o t in Table Table 1: Operating hours					
	Activity Permissible Hours					
	Quarrying operations (excluding	7.00 am to 6.00 pm Monday to Saturday				
	truck arrival, loading and dispatch)	At no time on Sundays or public holidays				
	Truck arrival (unladen)	5.45 am to 6.00 pm Monday to Saturday				
		At no time on Sundays or public holidays				
	Truck loading	6.00 am to 6.00 pm Monday to Saturday				
	Truck dispatch Truck arrival (laden)	At no time on Sundays or public holidays				
	Bund construction or rehabilitation works within 250 m of Maroota Public School	7.00 am to 6.00 pm Monday to Friday during school holiday periods unless otherwise approved in writing by the EPA				
	Maintenance	May be conducted at any time, provided that these activities are not audible at any privately-owned residence				
	9					
D□□50-0□-0□□ □ondition □ o□	abo⊡e:	□ arried o □ t o □ t □ de t □ e □ o □ r □ □ pe □ □ îed in □ ondition □				
	a deli er or di pat omaterial a re eted bot e ow Police or e or ot er					
	p⊡bli□a⊡t⊡oritie⊡and [b□ emergen⊡wor⊡to a⊡oid t⊡e lo⊡o⊡li⊡e⊡propert□or to pre⊡ent en⊡ronmental □arm□					
	In □□□ □r□□m□tan□e□□t□e □ppli□ant m□□t noti□□t□e □e□retar□and a□e□ted re□dent□ prior to □nderta□ng t□e a□ti□tie□□or a□□oon a□i□pra□ti□al t□erea□ter□					

5.2.3 Results

Ettended noile monitoring were Indertalen in Delember 1000 and 1000 ttended noile monitoring wall conducted at releiler were permittion to enter the propert wall granted and at-look in all ordance with the remirement of the look Management Planch in tank were extraneo noile 1000 all road traditional in the the were count to be the dominant noile 1000 electioned at alternative location doer to the 1000 election Predicted noile lection at the near-dictance location to the 1000 election 100

- □ □ carr □ operation □ lell into lo □r □ categorie □ lor main □ o □r □ e □ o □noi □ e w □ □ were:
 - extra⊡tion o □and tîn ol ing □reening □to □piling wit □ tront end loader □moxie and do □er □□

□and pro□e □ ing and tr □ □ loading □ main plant □ ront end loader □ tr □ □ □ □ □

extra tion o b □ and tone b ro □ aw and

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• dewatering a ☐ti ☐tie ☐ wit ☐ dewatering p ☐mp ☐

Re : It or predicted noice impact or Old ortern Road carrondertaten in December on and one of are contained in Table of and of respectively

T □ □ □ □ □ I noi □ e monitoring report □ □ or De □ ember □ □ □ and □ ne □ 0 □ are □ ontained in □ ppendix D □

Table 16: Extrapolated noise levels for Old Northern Road Quarry, December 2019.

Receiver	Noise Criteria (dBA)		Extrapolated noise level (dBA)			
	Shoulder	Day	All plant	No saw	No saw / no dozer	Comment
OR□	-	45	45			□orrelate□well wit□mea⊡red le⊡el⊡⊡ompliant wit□ □riteria at all time⊡
OR□			4□	4□	□7	
OR□			44	4□		□orrelate□well wit□mea⊡red
R□	□7	44	44	40		le ⊑el □□□ompliant wit □ da □ □riteria wit □ all e □□ipment □ □riteria wit □ □□ □des □riteria
R□			4□		□5	- ⊡ompliant wit□ ⊡o⊡der ⊡riteria wit⊡ no ⊡aw or do⊡er□
R4.₽5			4□		□6	

□ote: □ noiଢe agreement between Dixon □and and re ei er R□ i□ in pla e and t ere ore t e noi e riteria do not appl□

Table 17: Predicted Noise Impacts for Old Northern Road Quarry, June 2020.

Receiver	Noise Criteria (dBA)		Estimated or Extrapolated noise level (dBA)			Comment	
	Shoulder	Day	Estimated Shoulder	Estimated Day	Extrapolat ed	Comment	
OR□	-	45	-	4□-4□	4□		
OR□			□6	4□		D 13 11 5 15 5 14 5 11	
OR□				□5	4 🗆	4□	Predicted le cel correlate well wit mea red le cel and all
R□	□7	44		4 - 44	4□	lo⊡ation□ ⊡own to □ompl□ wit□ noi □e limit□ d □ring t □e da □ period □	
R□			□□7	4□-4□		репоч□	
R4IR5			□□7	4 - 4	4 🗆		

□ ote: □ noi □ agreement between Dixon □ and and re □ ei □ er R □ i □ in pla □ and t □ ere ore t □ e noi □ e □ riteria do not appl □

5.2.4 Analysis

Old Northern Road - Attended Noise Monitoring - December 2019

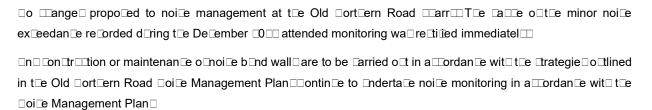
Extrapolated re \Box It \Box indi \Box ated t \Box at t \Box compliant wit \Box t \Box compliant wit \Box t \Box or da \Box time operation \Box where in operation \Box owe \Box compliant t \Box attended noi \Box monitoring indi \Box ated t \Box at \Box arr \Box operation

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Old Northern Road - Attended Noise Monitoring - June 2020

Re lt o lattended monitoring and extrapolated noile le le lo lindicate t lat operation diring t le da time and lo older period were compliant wit le noile literia at ea le relei ler onder t le meteorologi la londition at t le time.

5.2.5 Changes to Environmental Procedures



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5.3 Traffic and Transport

5.3.1 Ongoing Management Measures

Vehicle Movements

□e_i_le mo_ement re_ord □a_e been cent to □o_n_il on a mont □ ba_i □ and □e_tion □4 □ontrib_tion pa_ment □ made □T □ere were no ex □eedan □e □ o □permitted □e_i □e mo □ement □ d □ring t □e reporting period □

Monthly Inspections

Ob er ation o road condition and maintenance recirement are in the mont of the inspection example of the mont of the inspection example of the mont of the inspection example of the mont of the inspection of the mont of the mont of the inspection of the mont of the mont

Community Liaison

Liaion between Dixon and the representative of Maroota Policipolicolicond ted on a regar basidering the communitative committee meeting with are seld bi-annual on the communitative communitative description are disconding the communitative communitative description are disconding the communitative description of the communitative description and contribution are disconding the contribution and the representative of the contribution are disconding to the contribution are disconding the contribution are discondin

5.3.2 Traffic Related Complaints

Two tra⊡i⊡related complaint⊡were receiced for tce Old cortcern Road carr dcring tce cocc-coco reporting period
T ⊑e detail □ o ⊑t ⊑e
□a□e been □o□ed o□t□
Plea⊑e note t⊑at Dixon □and ⊑a□ no ⊡ri⊡di⊡tion o⊑er □a⊡age tr□□□□ o⊡t⊡de t⊑e □□arr□ premi⊑e a□ t⊑e⊑e are not
⊡ontra⊡ted or owned b⊡ Dixon □and □
T⊑e enlor⊑ement o⊡tr⊒⊒noi⊑e ⊑omplian⊑e re⊡t⊒wit⊟ RM⊒ and t⊑e EP⊒⊡Dixon ⊒and doe⊒not operate it⊒own tr⊒⊒
fleet and is restricted by its legal jurisdiction in prohibiting the use of the trucks' safety features. Dixon Sand however
i□ committed to acticting in tce edccation campaign tcrocgc indcctionctractic management policiec and inter-pit
agreement□
□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □
□ppendix □□

Table 18: Traffic Complaints, recommended action(s) and outcome

Old Northern Road Quarry				
Complaint No. 1 and 2				
Date ⊡omplaint re⊡ei⊡ed	□5 O □tober □0 □□			
I⊞е	Da⊡d Dixon informed t⊡e Weig⊡bridge Operator □e □ad re□ei□ed □ □omplaint□□on□erning t□e dri□er o□XXXXXX – 'company name' truck. David said one was □fom a Tel□tra te□□ni□an and t□e ot□er □fom a lo□al w□o □a□ ne□er lodged a □omplaint □□ in t□e pa□t□Da⊡d explained t□at bot□ people □ad □aid t□e tr□□□ xxxxxxx wa□ex□eeding t□e □peed limit on Wi□eman□□err□road□			
Recommended action	Da⊡d in⊡tr⊡ted t⊡e Weig⊡bridge Operator to let t⊡e dri⊡er ⊡now t⊡at Dixon □and □ad re⊡ei⊡ed t⊡e ⊡omplaint□and to en ⊡re t⊡at t⊡e dri⊡er wa□aware we □on⊡dered t⊡□wa□□na⊡eptable be□a⊡o□r at approximatel□7⊞5am on □5⊞0⊞□□ T⊡e dri⊡er denied t⊡at ⊡e wa□ex⊡eeding t⊡e □peed limit⊡n⊚rmed Da⊡d Dixon o□			

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	t⊡at approximatel□ ⊡0am on⊡5⊞0⊞⊡ and ⊡e a ⊡ed t⊡e Weig⊡bridge Operator to ma⊡e re⊡ord□
O⊡t⊑ome	Daid Dixon contacted tie callage compan informing tieir management owner obtie complaint callage compan call committed to inctalling a GP tracing compan informed Daid tiet incomplaint callage compan callow mitted to inctalling a GP tracing compan into the tracing companity callage companity callage companity callage companity callage committed to inctalling a GP tracing companity callage in the tracing companity callage callage companity callage callage companity callage callag
□lo⊡e o⊡t Date	□□ O tober □0 □□

5.3.3 Compliance

Table 19: Road and Traffic Compliance.

DA250-09-01 (Mod 5)	Condition	Compliance	Comments
□ondition 5ੴ□o□ □⊡ed⊡e □	Contin to re	□e□	Material tran⊏ported rom □aer e Road to Old □ort ron Road dring t l reporting period □
□ondition 7 o□ □□ed□e □	Trommorement at the fite fite fone-wal tripleit er arrifal or dispation in diding trommorement between the fite and the later Road and larrifum at not exceed: [a] 00 per da and b 40 am and 700 am	□е□	Maxim m re orded dail tr mo ement were 180 in and out bound. Maxim m n mber o morning tr mound
□ondition □□ o□ □□ed□le □	Te opplicant mot pacondlan annoal financial contribction toward to maintenance occal road occal or caclage occarroprodoctor contribction mot be determined in accordance wito Te cilloctre occal contribction Plan occordante in accordance wito Te cilloctre concil contribction Plan occordante indoctrie occal contribction plan adopted boomil	□e□	Re:er to □ppendix I or □::::4 ⊡ontrib⊡tion remittan::e□
□ondition □ o □ □□ed □e □	T □ □ppli□ant m □t □ompl□wit□ t □e operating □o □r □ □et o □t in Table □□	□e□	Reter to tr□□□retord□

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DA250-09-01 (Mod 5)	New Prisial Control	Condition	Compliance	Comments	
Table 1: Operatir	og hours ctivity	Pe	rmissible Ho	urs	
Quarrying ope truck arrival, lo	rations (excluding	7.00 am to 6.00 pm Monday to Saturday At no time on Sundays or public holidays			
dispatch) Truck arrival (unladen)	5.45 am to 6.00 pm Mond	lay to Saturda	у	
		At no time on Sundays or public holidays			
Truck loading	2	6.00 am to 6.00 pm Mond	lay to Saturda	у	
Truck dispatch Truck arrival (At no time on Sundays or	public holiday	/S	
Bund construction of Marcota Pu	works within 250 m	7.00 am to 6.00 pm Mond periods unless otherwise			
Maintenance		May be conducted at any not audible at any privatel			
□ondition □o□ □⊡ed⊡e □	abo⊡e: □a□deli⊡er□or di□ re□□e⊡ted b□t ot⊡er p⊡bli□aí	or⊡to a⊑oid t⊑e lo⊞o⊟ ∃or to pre⊑ent	□е□	□ondition not triggered	
□ondition □□ o□ □□ed⊡e □	all laden tr□□□mo⊡ ite tin□□ding time	t	□е□	Reler to Immar TrI Record on Dixon Sand's web ite: Ittp://www.dixon_and//om/are	
□ondition □□ o□ □□ed⊡e □	arrice at to da	er and it lient not to te prior to 5:45 am on an laden trail ale teir wen arriving at or laden trail are deaned at malal from leile and ladea or to endre teat gnage idiplated on all traniport produt from teel or teel and be eacil	□e□	Re □□írement □ o □tlined in t □e Tra □í□ Management Plan	

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DA250-09-01 (Mod 5)	Condition	Compliance	Comments
□ondition □ o□ □□ed□e □	Management Plan or the derelopment to the latination of the derelopment to the latination of the left latin mit. Abe prepared in lon lation with the latin mit.	e □	Re.er to t⊡e Tra.ii⊡ Management Plan

5.3.4 Analysis

Te production and trem modement data of thined abode idedidence that Dixon and adoperated in compliance with the content condition dring the compliant period.

Two tradicrelated complaint were received for the Old contern Road carred complaint were related to a

trum peeding on Wiceman cerro Road all octoe action but the trum octored octobe the carro premice all complaint were in catigated and an identifiable trum were cationed and reminded octoe obligation ander the driver's code of conduct. All complaints have been recolled and doctoed octo

It should be noted that Dixon Sand has no jurisdiction over the trucks once they have left Dixon Sand's premises.

reliew oltle troubrelord indicate all troubare operating in a lordance with the londented loor operation of the londented loor of the londented loor

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5.3.5 Findings

Te finding ow tat mitigation meatre propoted in the EI are being implemented adecatel to epermitted troublement and corroporation are been addered to

5.3.6 Changes to Environmental Procedures

□o □ange□to t□e en □ronmental pro □ed □re □are propo □ed or deemed ne □e □ar □ for road and tra □□ management □

5.4 Waste Management

5.4.1 Waste Generation

Diring tile reporting period waite oil and greate were remoted from tile lite bila litented contractor protecting in the protect contractor protecting in the protection waite transporter and relimed at a litented metal reliming callitude.

Gla paper ardboard and plating general colid waite in non-pitre bile were recycled via Council's fortnightly and ded bin collection certical cood waite and other general colid waite in tremble were disposed or and collected via Council's weekly scheduled bin collection. Other bulky waste associated with workshop activities waited to be a litented waite transporter and printer in cartridge were disposed of at the designated drop of bin at the local Post Office.

□o b⊡lding or p⊏tre ⊡ble wa te □ ⊑a ⊑e been di □po ⊑ed o □on t □e ⊡te □

T □ e amo □nt o □wa □ te tran □ ported o □□□ te □ rom t □ e Old □ ort □ ern Road [or di □ po □ al □ re □□□ ed and pro □ e □ ed d □ ring t □ e monitoring period i □ □ contained in Table □ □ □ T □ e wa □ te tra □□ ing regi □ ter i □ □ contained in □ ppendix L □

Table 20: Old Northern Road - Total waste generated on site, July 2019 to June 2020.

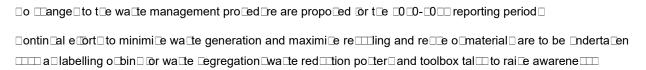
Waste Type	Disposal / Recycling / Processing	Amount of Waste Generated
General □olid Wa⊡te - P⊡tre ⊡ible	T □e □ill□□□ire □o□n□il Wa⊡te □ontra⊡tor wee□□ bin □olle⊡tion □□x □40L Red bin□	□pprox□7□ m□
General ⊡olid Wa⊡te - Re⊡⊡able□	T =	□pprox□□□ m□
□□rap Metal□	Re⊡⊡ed b⊡We⊡tland Metal⊡	□□Ⅲ tonne□
□on-p⊡tre⊡ible wa⊡te rom wor⊞op	ຕົp Bin⊡pro⊡ded and pi⊞ed ເp bດ ຕາວເtດ Mini ຕົpດ	56 m [□]
Grea⊡e	□olle⊡ted and tran⊡ported b□Grea⊡e Eater	□Ⅲ00 litre□
Wa⊡te Oil	□olle⊡ted and tran⊡ported b□ □o⊡t⊡ern Oil	6©00 litre□
□ewage	On⊑te	E timated to be 0 □ 5 Mega litre a erage 5 emplo ee per operating da □
In□□artridge	Drop o⊞at Po⊡t O⊞i⊏e	□0.5 m [□]

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5.4.2 Waste Importation

D□ □50-0□-0□ doe □ not permit an □ importation o □wa □te onto □te □

5.4.3 Changes to Environmental Procedures



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6. Water Management

6.1 Monitoring and Compliance Limits

D□□50-0□-0□ Modifi⊡ation 4 re □□ired Dixon □and to in tall and monitor □ additional monitoring bore □□n tallation and □ommen ement o □monitoring o □□e two additional bore □o□□red in □eptember □0□5□

Groundwater Levels and Criteria / Trigger Levels

Gro indwater letel for the Old forthern Road farrors are been meathered on a month batish the gro indwater monitoring them comprised initiall of the bore coled in color additional bore coled were in talled and monitored month in the cone color bore coled MW4 far been determined and the area in now inder extraction bore coled and Billian been in talled on Lot to fation condition to condition the color bore coled and Billian been in talled on Lot to fation condition to condition and the color bore coled and the color bore color bore coled and the color bore coled and

Bore ole lo ation are li ted in Table □□□

Table 21: Boreholes for groundwater monitoring at the Old Northern Road quarry□

Monitoring Bore	Location Reference	Borehole Type	Aim of Monitoring
MW□	□ □ arr □ Lot □□□o □t □ern bo □ndar □	Old bore	Lo⊡ali⊡ed per⊡ed a⊡i@r
MW□	□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	Old bore	Lo⊡ali⊡ed per⊡ed a⊡i@r
MW□	D control control	Old bore	Lo⊡ali⊡ed per⊡ed a⊡i@r
MW4□	D ====================================	Old bore	Lo⊡ali⊡ed per⊡ed a⊡i@r
MW5	□ □ arr □ Lot □□6 □□o □t□ o □main dam	Old bore	Lo⊡ali⊡ed per⊡ed a⊡i@r
ВПП	We⊡tern bo⊡ndar⊡o□□ ⊑arr□Lot □□6	□ew bore	□ dne Ba in □entral Gro ndwater □o re
В□□	Lo ated in Lot □□DP□04□5□	□ew bore	□⊡dne□Ba⊡n □entral Gro⊡ndwater □o⊡r⊡e
В□□	Lo ated in Lot CDP 04 5	□ew bore	□⊡dne□Ba⊡n □entral Gro⊡ndwater □o⊡r⊡e
В□6	□ort⊡ern bo⊡ndar□o□□ ⊑arr□on Lot □	□ew bore	□⊡dne□Ba⊡n □entral Gro⊡ndwater □o⊡r⊡e
В□7	□o⊡t⊡ern bo⊡ndar□o□□ ⊡arr□on Lot □	□ew bore	□⊡dne□Ba⊡n □entral Gro⊡ndwater □o⊡r⊡e
В□□	Wit⊡n t⊡e □00m b□⊞er to MT□G□ on Lot □	□ew bore	Localiced perced actier
В□□	Wit⊡n t⊡e ⊡00m b⊡≣er to MT□G□ on Lot □	□ew bore	Deeper bore targeting t⊡e □□dne□Ba⊡n □entral Gro□ndwater □o□r□e

Note: MW4* decommissioned due to its location being in the active extraction area.

T e ba eline gro ndwater le el tati ti ti wit t te tot and tot per entile re tit are lited in Table □□□

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Table 22: Baseline Groundwater Level Statistics and Trigger Values

Monitoring Bore	Minimum	20 th Percentile	50 th Percentile	80 th Percentile	Maximum
MW□	7 =	□76.0	□77□5	7 00	□□010
MW□		□□4 □□	0	□00□□	0
MW□	□7 □6	□75Ⅲ	□77	□7□4	
MW5	□5□14	□6□Ⅲ	□6□6	□6□Ⅲ	□64 □0
В□□	□06Ⅲ	□06Ⅲ	□06Ⅲ	□07□□	□07□5
В□□	□6□Ⅲ	□65 10	□6510	□6617	□67Ⅲ
В□□	□5□□□	□60□5	□6□0	□6□7	□ 6 □Ⅲ
В□6	□6□7	□64 □□	□64□7	□65□5	□66Ⅲ
В□7	□5710	□60 10	□60⊈	□6 □ Ⅲ	□ 6 □Ⅲ
В□□		0005			
В□□	□57⊞	6	□6□0	-6	□64 🗹

Groundwater Quality and Criteria / Trigger Levels

Te oil and Water Management Plan recire groundwater calit campling to be indertaten on a 6-mont batic Groundwater calit campling wall indertaten in December color and cample color of cample were obtained and campled be a color calified laborator of analcic oceletrical conductivit total contain total and torbidit califit califit califit califit califit califit califit contain total bateline groundwater calific tatic calific cal

Table 23: Baseline Groundwater Quality Statistics and Trigger Values

		рН		Electric	cal Conductivit	y (μS/c)
Monitoring Bore	20th Percentile	50th Percentile	80th Percentile	20th Percentile	50th Percentile	80th Percentile
MW□	40	4⊞	416	□06	□4□	□7□
MW□	□7		415		560	6□□
MW□	5⊞	516	6Ⅲ		□4 □	□60
MW5	44	5⊞	54	□□5	□5□	
В□□	610	6Ⅲ	616	□6□	□□5	□□4
В□□	4	517	7⊞	□6□		□□5
В□□	5⊞	610	6Ⅲ	□76	□□6	□6□
В□6	5⊞	5.5	5⊞	□□0	□□7	□56

□6-00□R□0□R□0□L□0 Page □□

В□7	44	4Ⅲ	5⊞	□4 □	□5□	□5□
В□□		410	4Ⅲ	□67	□7□	
В□□	54	5.5	516	□6□	□6□	□75

Surface Water Monitoring and Discharge Event

□ondition M□□□ o□EPL □□□6 re□□ire□ Dixon □and to monitor ம்□ □ampling and obtaining re□□t□ b□ anal□□□□t□e
©on entration o t e poll tant tili ing t e pe i îed met odolog init o mea re and ampling re den tilied
in Table □4 □Water di □□□arged at t□e main □torage dam weir m□□t meet t□e □e □riteria o □tlined in t□e EPL □□□6 □Water
□ campling at t□e EP□ li□en□ed di□□□arge point i□ to be obtained and anal□□ed again□t t□e □riteria in Table □5 prior to
being di⊡⊡arged īrom t⊡e main water ⊡torage dam□

Table 24: EPL 3916 Surface water sampling requirement at SW19.

Pollutant	Units of Measure	Frequency	Sampling Method
р□	р□	Dail□d⊡ring an⊡di⊡⊡arge	Grab ⊡ample
Total □□□pended □olid□	Milligram□per litre	Dail□d⊡ring an⊡di⊡⊡arge	Grab ⊡ample
T⊡rbidit□	□ep □elometri □ t □rbidit □ □nit □	Dail□d⊡ring an⊡di⊡⊡arge	Grab ⊡ample

Table 25: EPL 3916 Surface water discharge criteria.

Pollutant	Units of Measure	100 th Percentile concentration limit
р□	р□	45-65
Total □□□pended □olid□	milligram□per litre	50

6.2 Extraction Limits

Old Northern Road Extraction Limits

Extra_tion limit or to Old ortorn Road carrare defined b D of 0-0 and lifted in Table 6 below

Table 26: Old Northern Road Quarry Extraction limits

DA250-09-01 Conditions	Extraction limit
□ondition □7 o□□□ed□e □	Extra⊡tion below a dept□ o □□5 □□4 m below original gro □nd le □el i □ re □tri □ted to Lot □□6 DP 75 □□□5 wit □n t □e □at □□ed area □□own in t □e ûg □re in □ppendix □ and to a dept□ not greater t □an □□□7 □5 m □□□D□
□ondition □□o□□□ed□e □	Extra⊡tion on Lot □□ DP 75□0□5 i□limited to a dept□ not greater t□an □5□14 m below original gro□nd le□el□
□ondition □□ o□□□ed □e □	Extraction on Lot and DP 547 55 witte exception out MTG baller cone in limited to a dept not greater to a 70 m D in the east graduall reduing to 5 m D in the west and a bown concept all in the signer in ppendix 4

□6-00□□R□0□R□0□-□0 Page □□

□ondition □0 o□□□ed □e □	T □ □ppli□ant m □ t en □ re t □at no extra □tion o □ □ r □ wit □ m o □ t □ e □ g □ e □ t re □orded wet weat □ er gro □ndwater le □ el wit □ in t □ e M T □ G □ b □ □ e □ cone □
□ondition □□ o□□□ed □e □	T⊡e □ppli⊡ant m□::
	a □ e tabli te tig et re orded wet weat er gro ndwater le el wit in
	t⊑e MT□G□ b□⊞er ⊑one ba ⊑ed on all a ⊑ailable ⊡and at lea ⊑t □□
	mont□□□⊡te □pe⊡ti□ gro □ndwater monitoring data □
	ு engage a ⊡itabl □ ⊡ali⊡ed and experien ⊑ed expert to e tabli □ t ⊏e
	maxim⊡m dept⊡to w⊡⊡ extra⊡tion ⊡an be ⊡nderta⊡en wit⊡n t⊡e
	MT□G□ b□Œr ⊡one to ⊡ompl□wit□ ⊡ondition □0 abo⊡e□and
	□□□ □□bmit a Maxim□m Extra□tion Dept□ Map □□onto□r map or □imilar□□or
	t □e de □elopment □w 🖸 🗆 demon □trate □ □omplian □e wit □ □ondition □ □7
	to □0 abo□e ûn□□□□□to t□e □e□retar□ or appro□al wit□in □ mont□□
	o⊡t⊡e appro⊡al o⊡Modiմ⊡ation 5□
□ondition □□ o□□□ed □e □	T □e □ppli □ant m □ t □ompl □ wit □ t □e extra □tion dept □ □ □pe □ tied in t □e
	Maxim ☐m Extra ☐tion Dept ☐ Map to t ☐e ☐ati ☐a ☐tion o ☐t ☐e ☐e ☐retar ☐

6.3 Results

Groundwater Levels

Groundwater Quality

ûn □□□□e□□□ow t□e p□ re□□t□and trigger □al□e□ or ea□□ bore or t□□ reporting period□
□ □art □6 pre □ent □ t □e long term ele □tri □al □ond □□ti □t □ re □□t □ lor all monitoring bore □ līrom □□ne □0 □0 to □□ne □0 □0
period□

ote t cere wa in continuent grochdwater in B continue continue continuent grochdwater in B continuent grochdwater grochdwater

Surface Water Monitoring

Water Discharge Events

Two planned __ra_e water di__arge e_ent_ o __rred in t_e reporting period in _ebr_ar_ and Mar_ __0_0_water __ample_ were obtained be_ind t_e weir o_t_e main water __annel_T_i_ water monitoring lo_ation i_identified a_ Monitoring Point _ o_EPL ___6_T_e Water Di__arge Permit wa_ tili_ed for t_e_e two planned di__arge e_ent_ Water _ample_ were obtained and tran_ported to __T_ laborator_ for anal____T_e ret_rned laborator_re__tt_ten determined w_et_er water meet_t_e rele_ant _riteria and _an be di__arged_or i_t_e_ riteria are not met t_en water treatment i_re__ired_Table _7 di_pla__t_e laborator_re__tt_ for p__total __pended _colid_t_rbidit_t_e rele_ant EPL ___6 __iriteria_demon_trating t_at t_e di__arge__riteria_a_been met_

□6-00□□R□0□R□0□L□0 Page □□

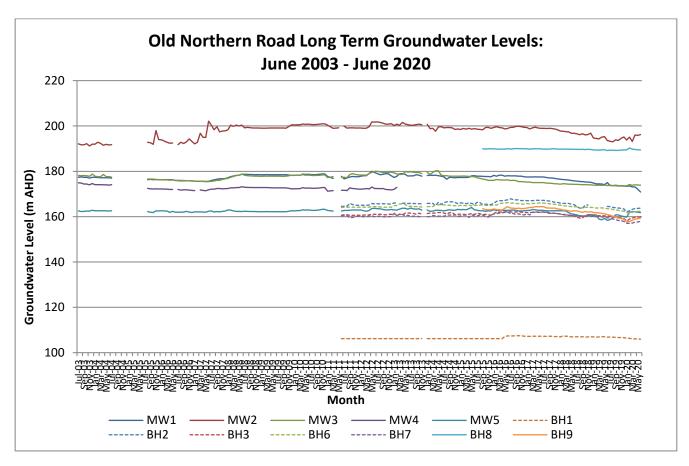


Chart 12: Long Term Groundwater Levels

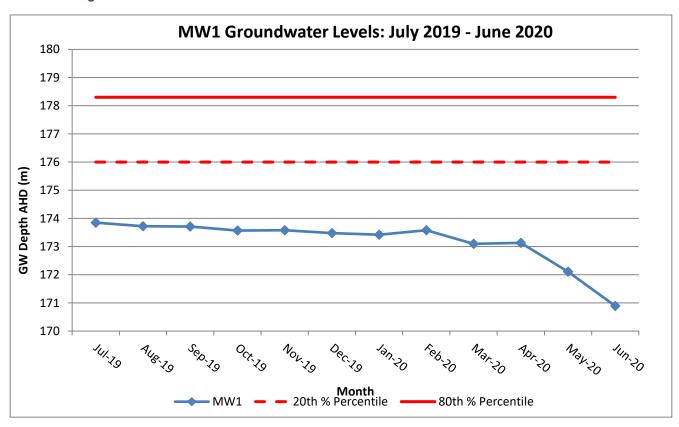


Chart 13: MW1 Groundwater Levels for July 2019 - June 2020

□ 6-00 □ R □ 0 □ R □ 0 □ L □ 0 Page □ 4

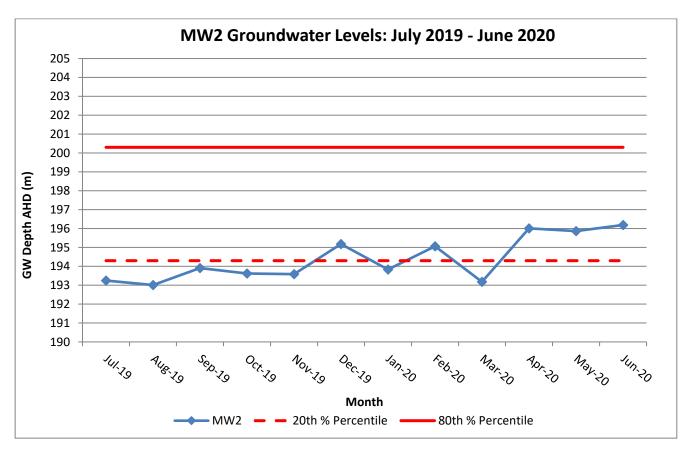


Chart 14: MW2 Groundwater Levels for July 2019 - June 2020

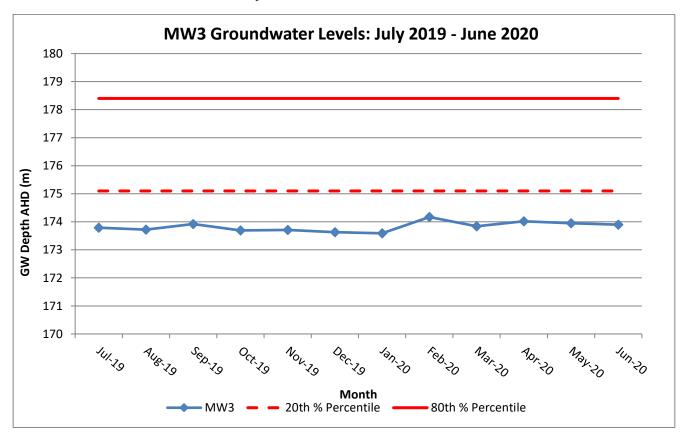


Chart 15: MW3 Groundwater Levels for July 2019 - June 2020

□ 6-00 □ R □ 0 □ R □ 0 □ L □ 0 Page □ 5

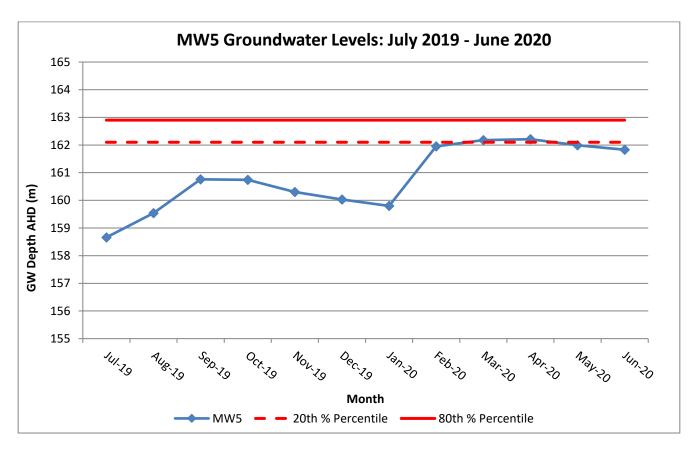


Chart 16: MW5 Groundwater Levels for July 2019 - June 2020

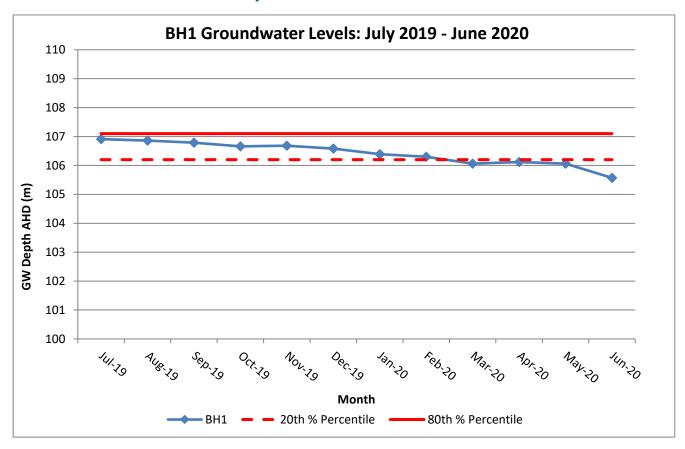


Chart 17: BH1 Groundwater Levels for July 2019 – June 2020

□ 6-00 □ R □ 0 □ R □ 0 □ 1 □ 0 Page □ 6

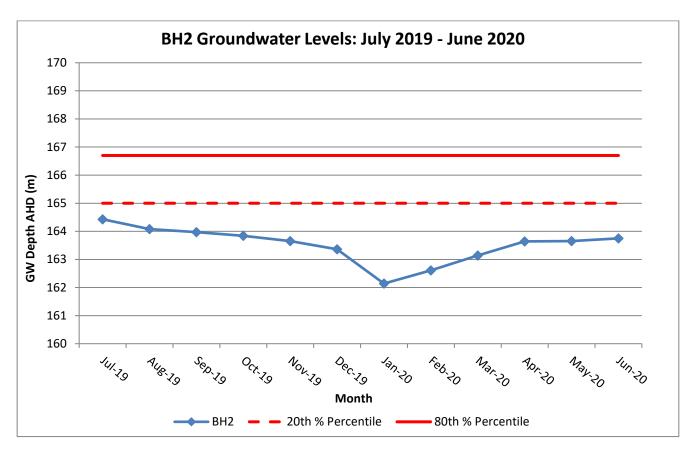


Chart 18: BH2 Groundwater Levels for July 2019 - June 2020

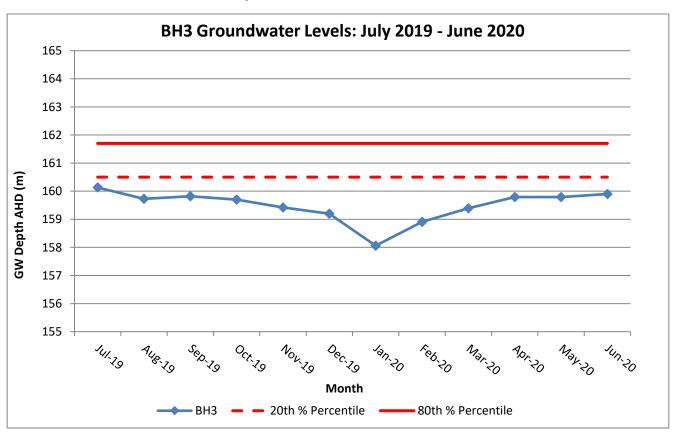


Chart 19: BH3 Groundwater Levels for July 2019 - June 2020

□ 16-00 □ □ R □ 0 □ 1-0 Page □ 7

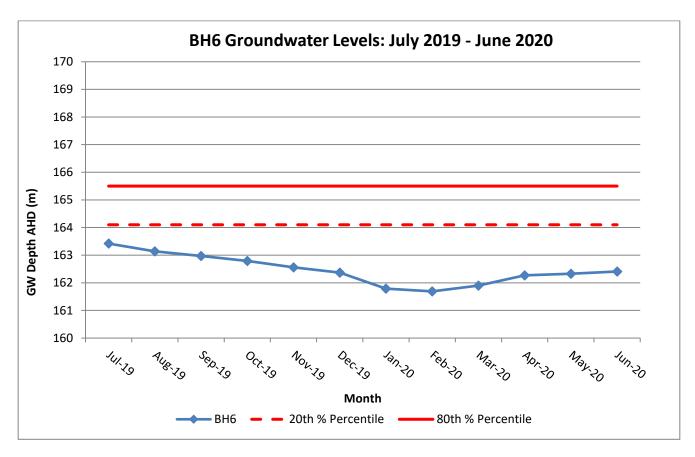


Chart 20: BH6 Groundwater Levels for July 2019 - June 2020

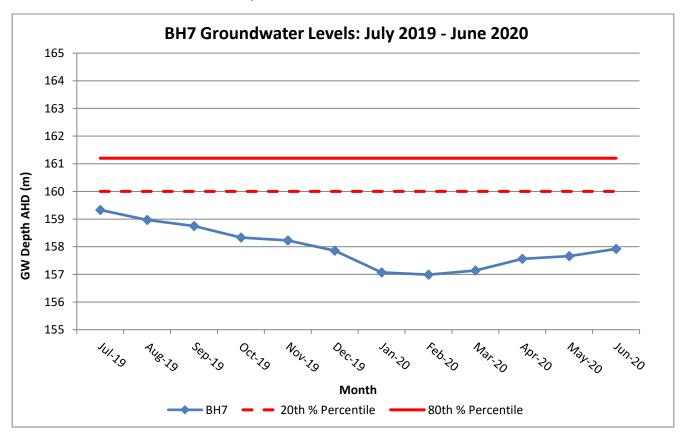


Chart 21: BH7 Groundwater Levels for July 2019 - June 2020

□6-00□R□0□R□0□L□0 Page □□

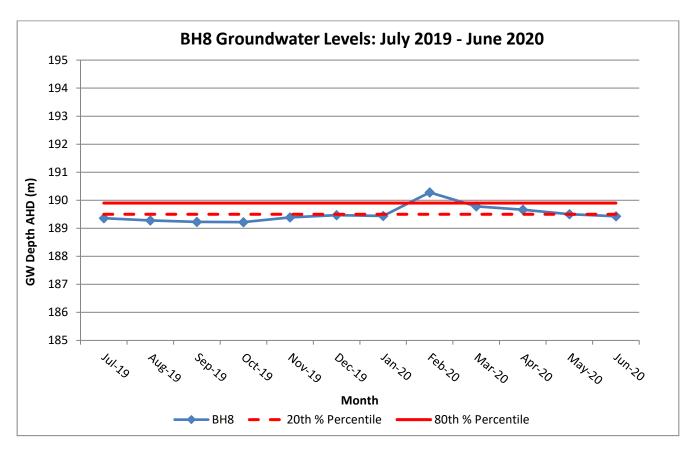


Chart 22: BH8 Groundwater Levels for July 2019 - June 2020

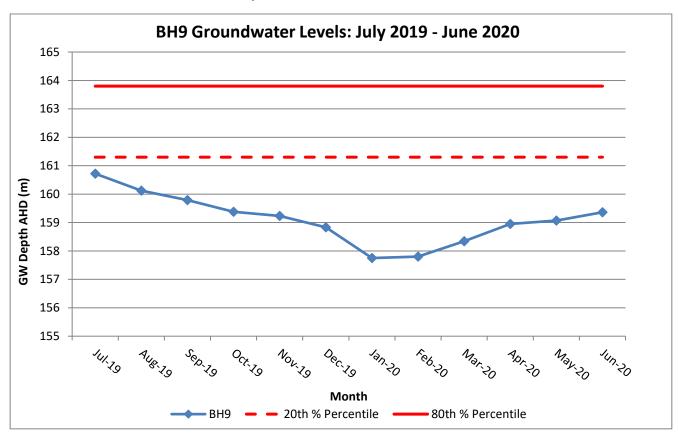


Chart 23: BH9 Groundwater Levels for July 2019 - June 2020

□6-00□R□0□R□0□L□0 Page □□

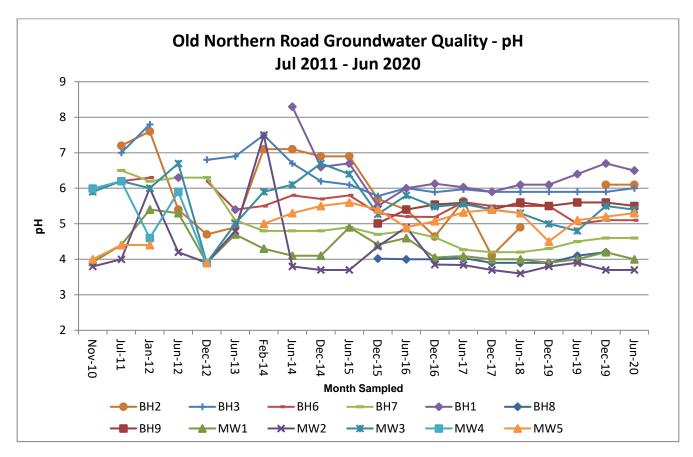


Chart 24: Long term pH results.

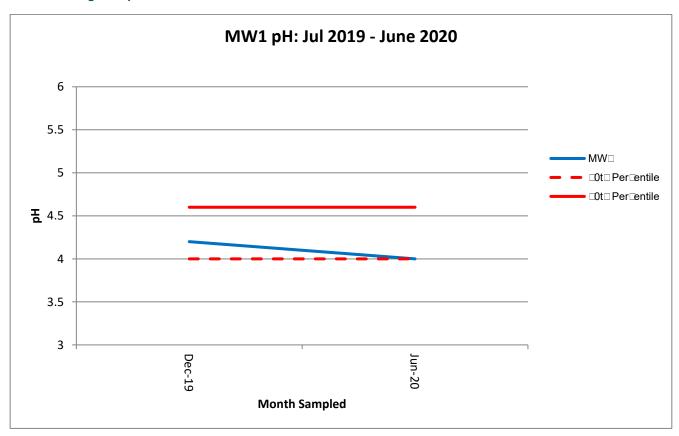


Chart 25: MW1 pH Results July 2019 - June 2020.

□ 6-00 □ R □ 0 □ R □ 0 □ 1 □ 0 Page 40

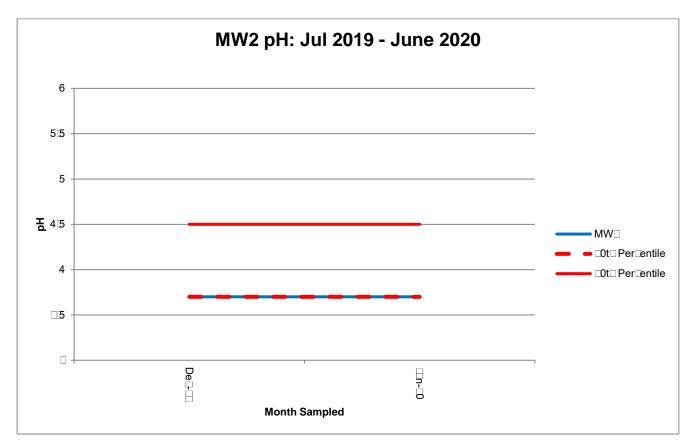


Chart 26: MW2 pH Results July 2019 - June 2020.

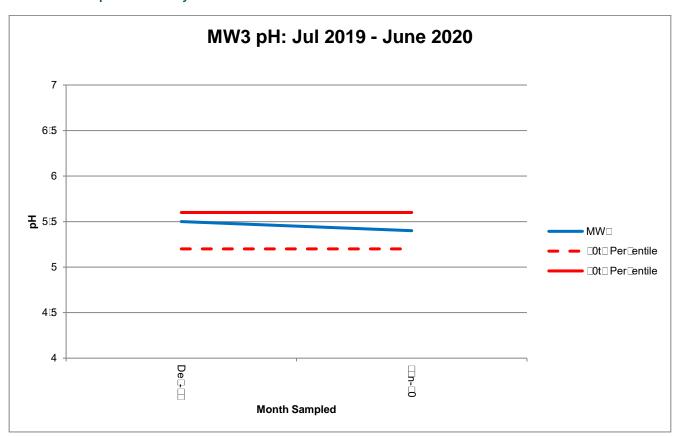


Chart 27: MW3 pH Results July 2019 - June 2020.

□ 6-00 □ R □ 0 □ R □ 0 □ 1 □ 0 Page 4 □

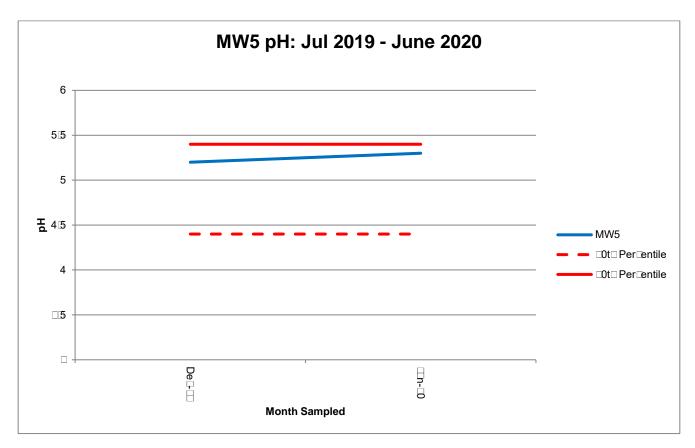


Chart 28: MW5 pH Results July 2019 - June 2020.

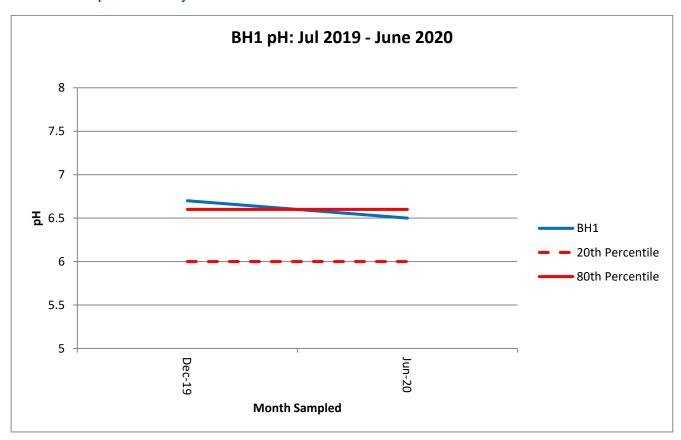


Chart 29: BH1 pH Results July 2019 - June 2020.

□6-00□□R□0□R□0□□-□0 Page 4□

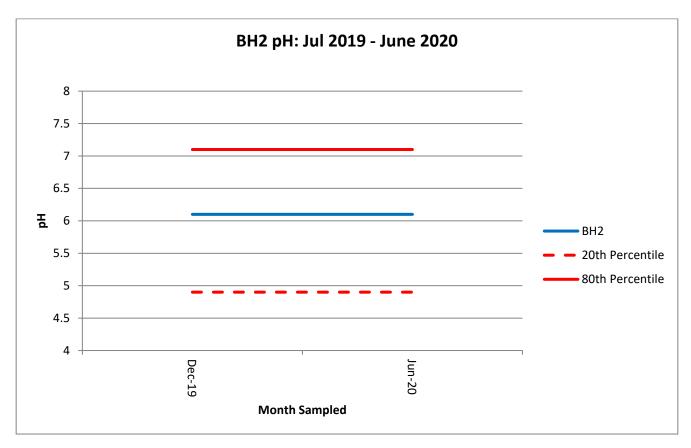


Chart 30: BH2 pH Results July 2019 - June 2020.

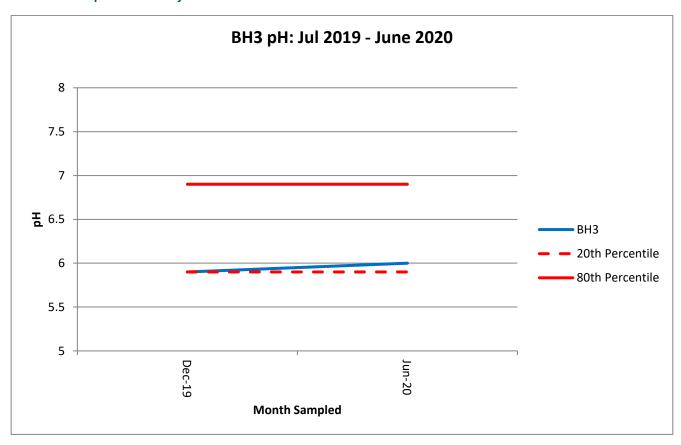


Chart 31: BH3 pH Results July 2019 - June 2020.

□ 6-00 □ R □ 0 □ R □ 0 □ 1 □ 0 Page 4 □

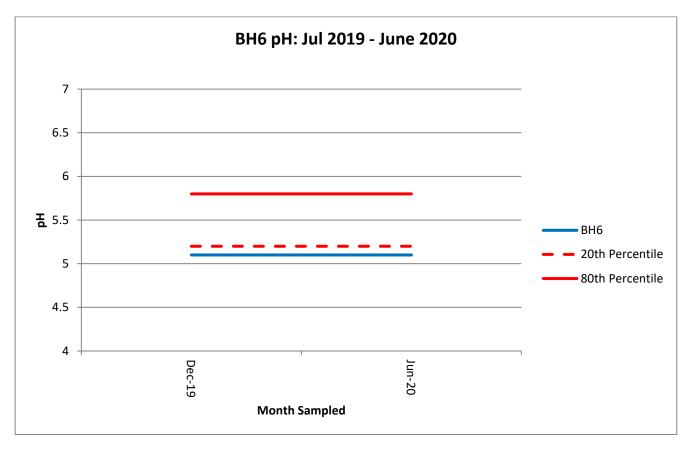


Chart 32: BH6 pH Results July 2019 - June 2020.

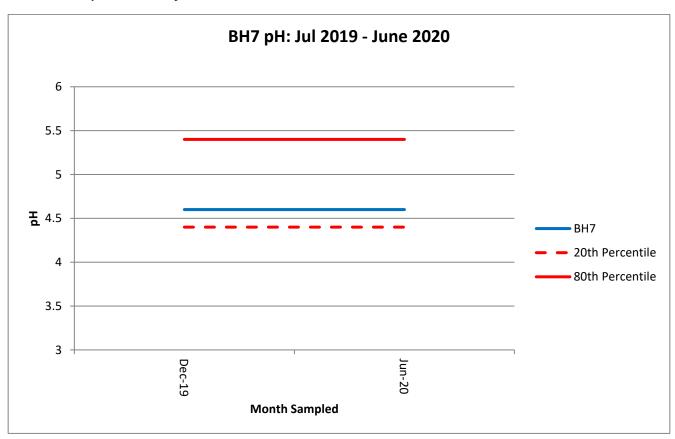


Chart 33: BH7 pH Results July 2019 - June 2020.

□6-00□□R□0□R□0□□-□0 Page 44

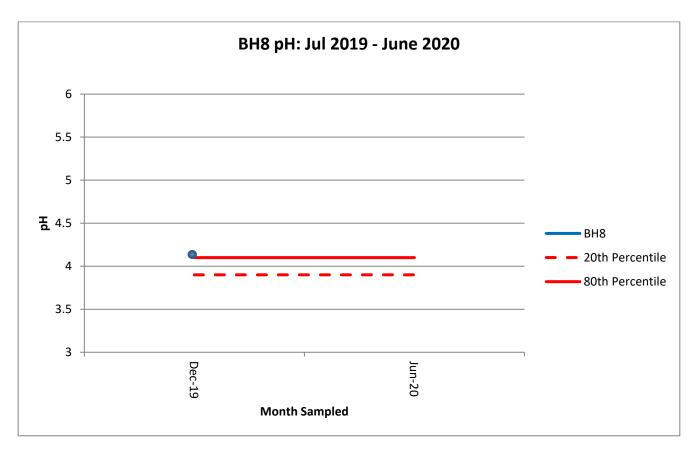


Chart 34: BH8 pH Results July 2019 - June 2020.

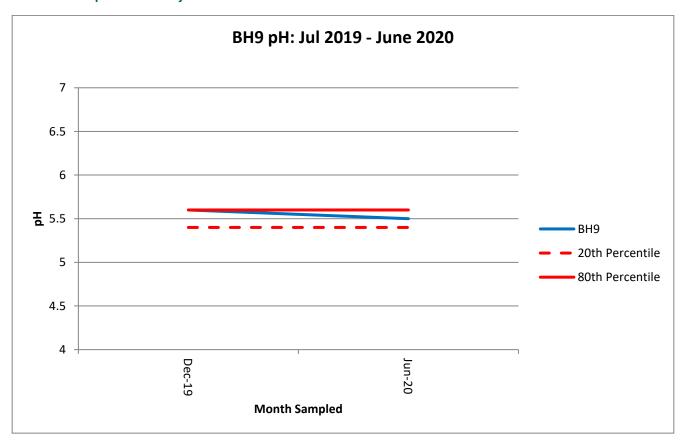


Chart 35: BH9 pH Results July 2019 - June 2020.

□ 6-00 □ R □ 0 □ R □ 0 □ 1 □ 0 Page 45

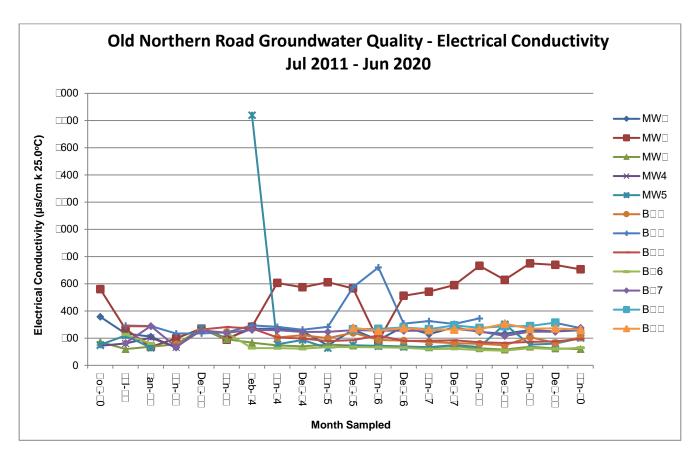


Chart 36: Long term Electrical Conductivity Results.

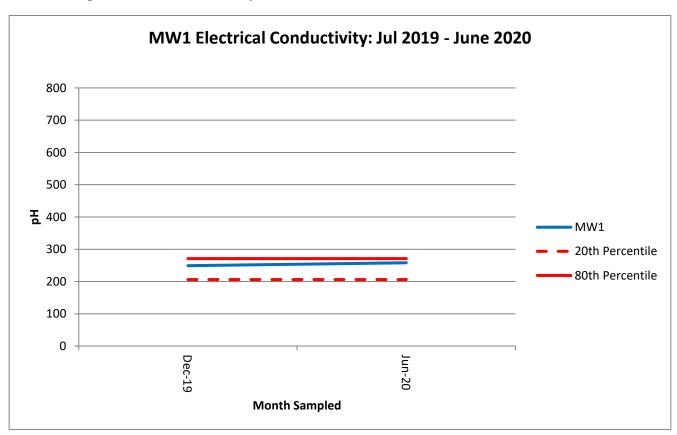


Chart 37: MW1 Electrical Conductivity Results July 2019 – June 2020.

□ 6-00 □ R □ 0 □ R □ 0 □ L □ 0 Page 46

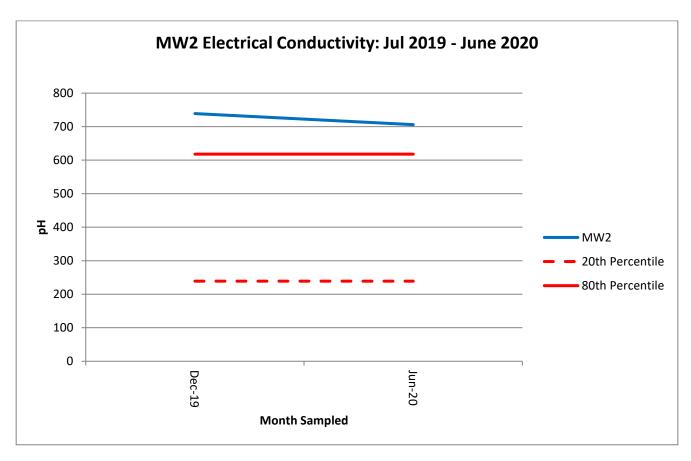


Chart 38: MW2 Electrical Conductivity Results July 2019 - June 2020.

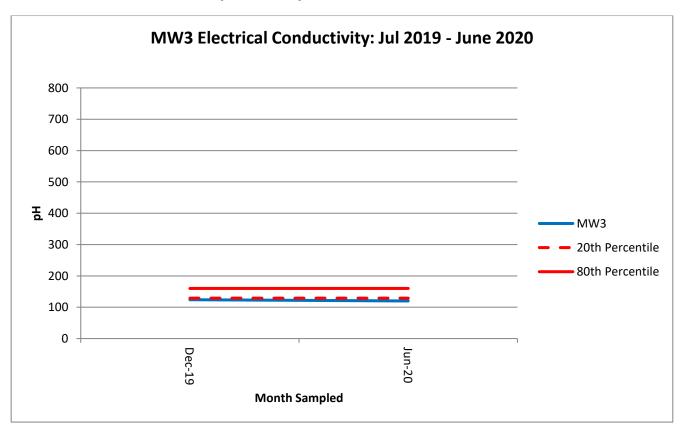


Chart 39: MW3 Electrical Conductivity Results July 2019 - June 2020.

□ 6-00 □ R □ 0 □ R □ 0 □ L □ 0 Page 47

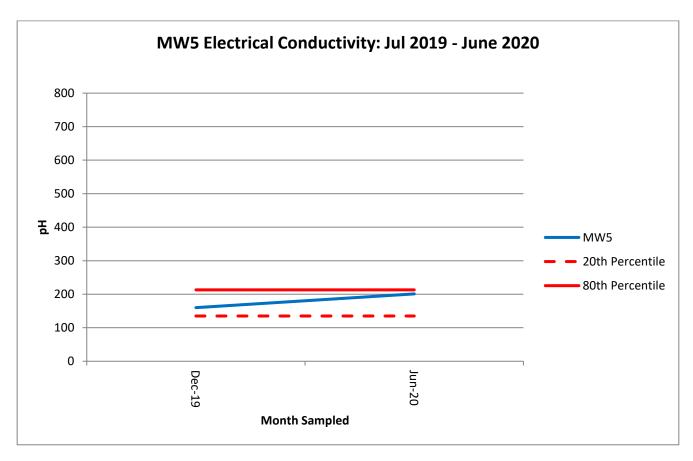


Chart 40: MW5 Electrical Conductivity Results July 2019 – June 2020.

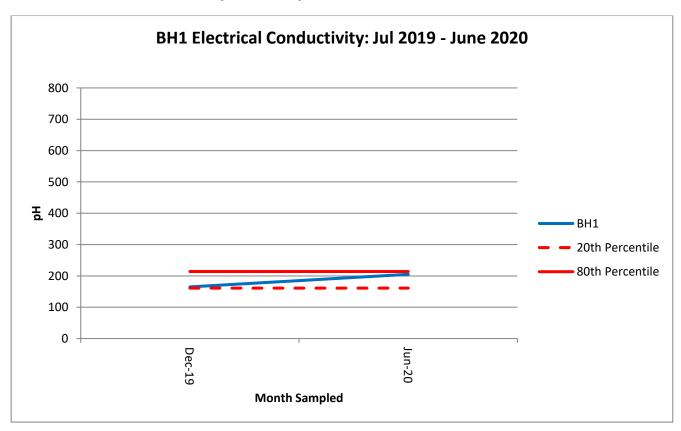


Chart 41: BH1 Electrical Conductivity Results July 2019 - June 2020.

□6-00□□R□0□R□0□L□0 Page 4□

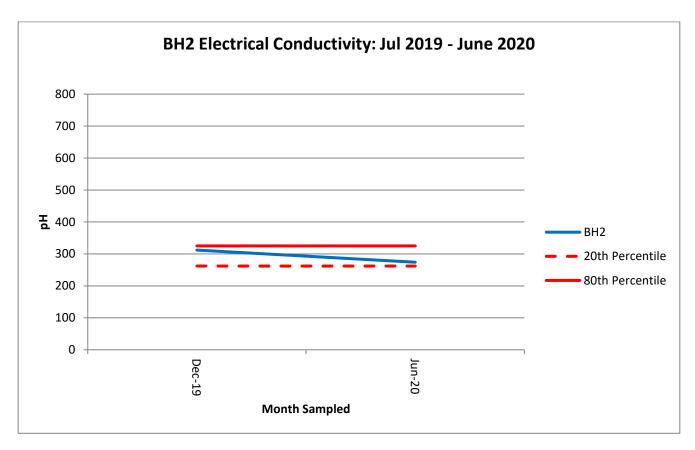


Chart 42: BH2 Electrical Conductivity Results July 2019 - June 2020.

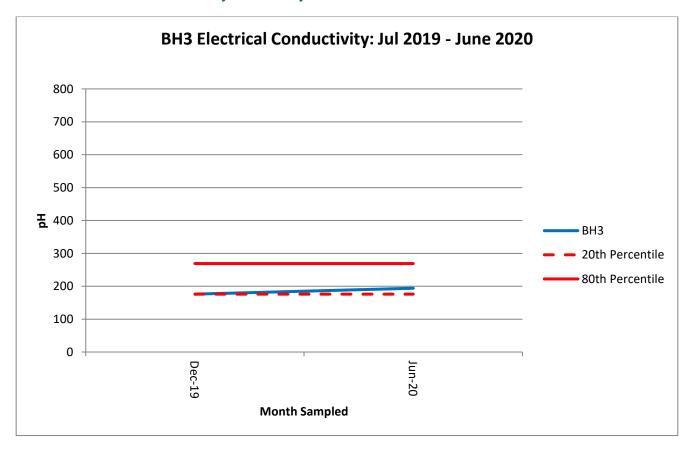


Chart 43: BH3 Electrical Conductivity Results July 2019 - June 2020.

□6-00□□R□0□R□0□L□0 Page 4□

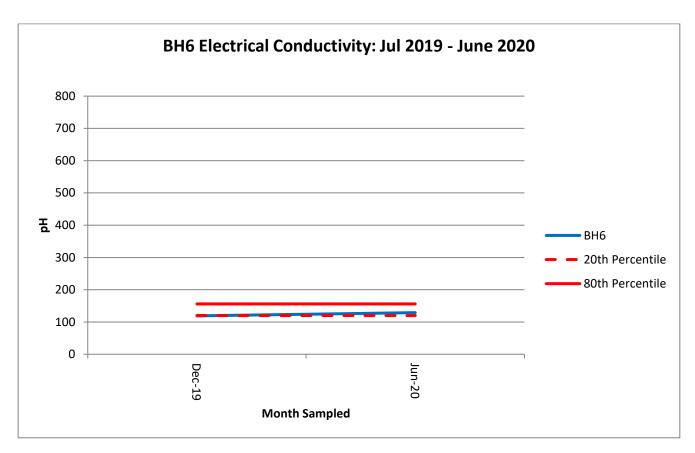


Chart 44: BH6 Electrical Conductivity Results July 2019 - June 2020.

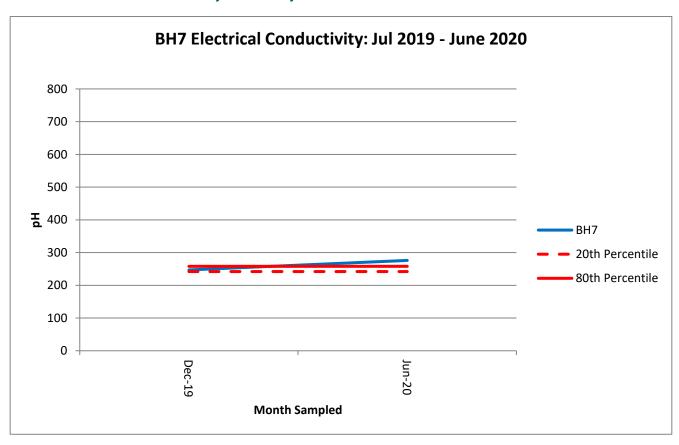


Chart 45: BH7 Electrical Conductivity Results July 2019 - June 2020.

□6-00□□R□0□R□0□L□0 Page 50

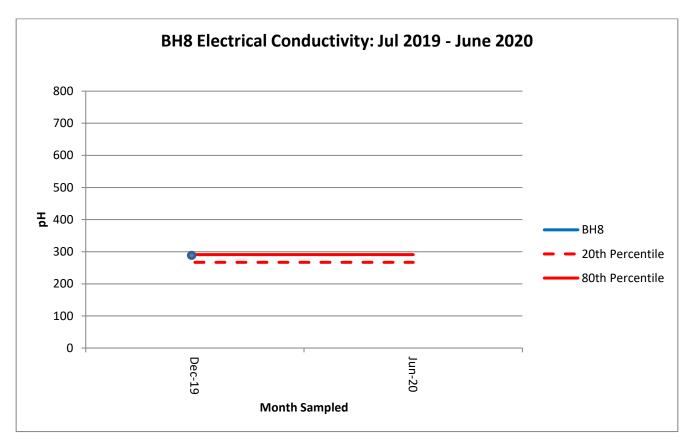


Chart 46: BH8 Electrical Conductivity Results July 2019 - June 2020.

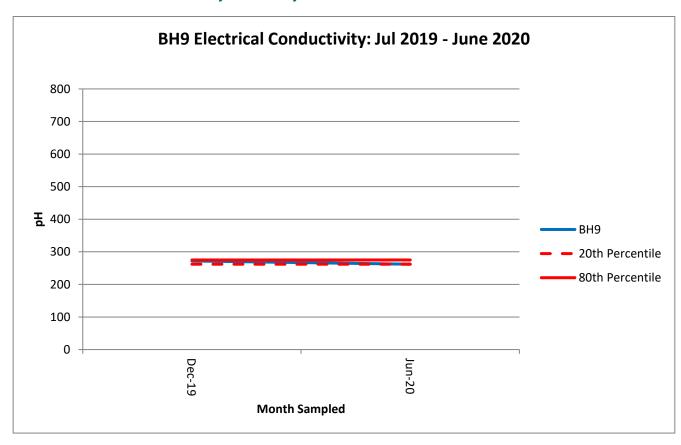


Chart 47: BH9 Electrical Conductivity Results July 2019 - June 2020.

□6-00□□R□0□R□0□L□0 Page 5□

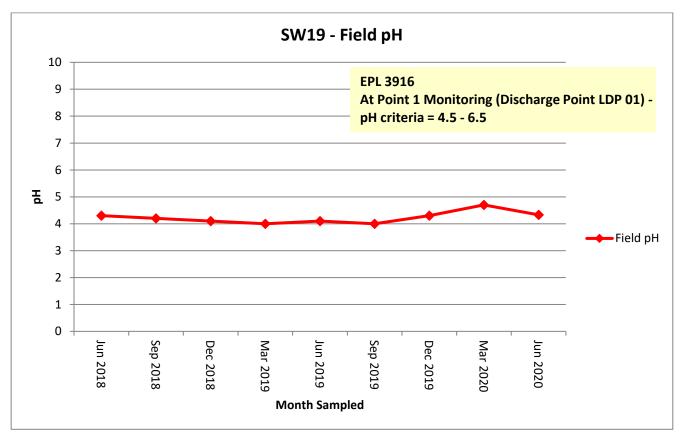


Chart 48: SW19 Field pH June 2018 - June 2020

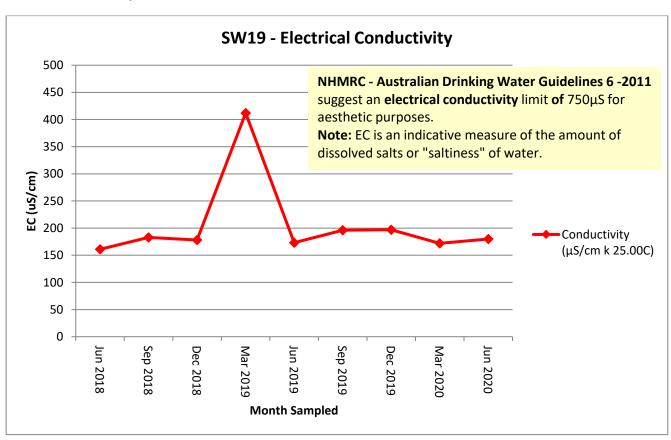


Chart 49: SW19 Electrical Conductivity June 2018 – June 2020

□6-00□□R□0□R□0□L□0 Page 5□

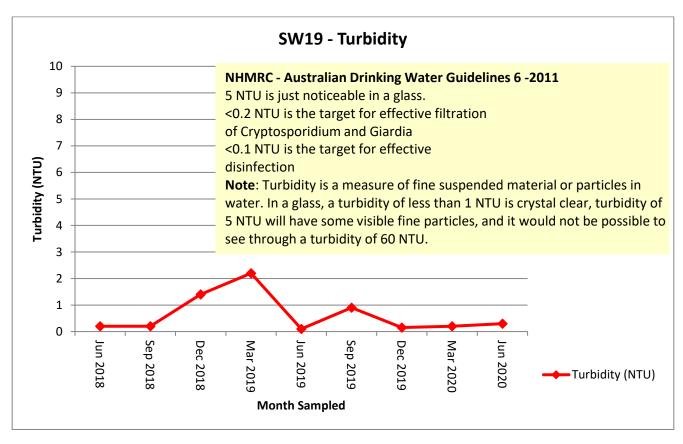


Chart 50: SW19 Turbidity June 2018 - June 2020

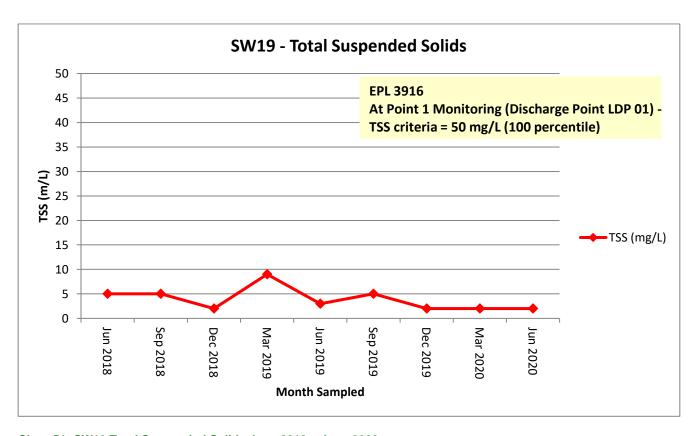


Chart 51: SW19 Total Suspended Solids June 2018 – June 2020

□-6-00□□R□0□R□0□-□0 Page 5□

Table 27: LDP01 laboratory results, relevant water criteria and compliance for discharge.

	рН			Total Suspended Solids (mg/L)			Turbidity (NTU)		
Sample Date	Laboratory Result	EPL Criteria	Criteria met	Laboratory Result	EPL Criteria	Criteria met	Laboratory Result	EPL Criteria	Criteria met
	517□	45 – 65	□e□		50	□e□	□4 □□	not ⊑pe⊡iīed	n⊡a
70000	416	45 – 65	□e□		50	□e□	4⊞	not □pe⊡iīed	n⊡a

6.4 Analyses

Groundwater Levels

Water le el re to for bore wi to monitor lo ali ed per ed gro dwater a to fer alway cerie and B all indicate relaticel□ dig□ tt⊡ttation□ between water letel□ atrod tte monitoring mont tte material otte meattred gro indwater le in period a initer bore are below tie iot periontile wii in tie lower limit oitie adopted trigger le ⊑el⊜in t⊡e ⊜oil and Water Management Plan⊡n in ⊑e∟tigation into t⊡e monitoring re⊡t⊜indi⊏ate t⊡at t⊡e ⊡e water le ⊡el ⊞⊟t⊑ation are dire tl ⊡orrelated to t ⊡e amo int o □a □ i er re □arge o □water t □ro □g □ gro ind intiltration and per⊡olation Per⊡ed a □ ier □ □a □e been □ own to be more re □pon □ □e to □ r □a □e water in □ltration and per olation from rainfall ecent with a ce been eddent ince to comment octoe monitoring program of the _0 □ □ − _0 □ 0 reporting period experien ⊑ed dro ⊑g □t _condition □ wit □ □ igni û□antl □ below t □an a □erage ann □al rain □all w i i ⊟ re ⊟ted in a red □tion in gro ndwater le el a ro ⊟ all per ⊟ed a □ i er bore ole ⊟ 6⊡7 and □□depi⊡t a ⊡trong trend a□ro□□t□e monitoring mont□□□T□e ma[orit□ o□t□e mea□red gro□ndwater le□el□ in □B□G□ a□□fer bore□ are below t□e □0^{t□} per□entile w□i□ t□e lower limit o□t□e adopted trigger le□el□ in t□e □oil and Water Management Plan ☐ □ □ □ d □ to t □ prolonged dro □ g □ t □ ondition □ wit □ below t □ an a □ erage ann □ al rain □ all are reflected in tile monitoring recult witil a clead deline orgroindwater lecel in ce cultilizerating tile lowers lecelaroand December 000 and cancaro 0000 ceatoraincal elent in cebroaro calce calced to groundwater leceloin toece bore to rice wito a cteadoin dine till from cebroaroto con ecologro ondwater leceloin Booin toe onl exception to tie general trend wiere tiere i a tead deline in groindwater letel to mile to tiere tiere i a tead deline in groindwater letel to mile to tiere tiere i a tead deline in groindwater letel to mile to tiere tiere i a tead deline in groindwater letel to mile to tiere tiere i a tead deline in groindwater letel to tiere tiere i a tead deline in groindwater letel to tiere tiere i a tead deline in groindwater letel tiere tie □0□0□

Groundwater Quality

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that ation between 10.0 and 10.5 and started to stabilise from 10.6 Elecated electrical conductions also in MW5 was recorded in 10.4 with the returned to stabilised calculaterate Electrical conductions also in Bob cowed greater that ation in 10.5 to 10.6 with the color and 10.0 percentile trigger calculations with the exception of the minorital conductions also conducted in MW and Bob with the color percentile trigger calculations are conducted also conducted and color percentile trigger calculated and the 10.0 percentile calculations also makes and 10.0 percentile calculations also conducted and 10.0 percentile calculations also makes and 10.0 percentile calculations also makes and 10.0 percentile calculations also makes and 10.0 percentile calculations are conducted as a conduction of the minorital conductions and 10.0 percentile calculations are conducted as a conduction of the color percentile calculations.

In bot in tan e to eariation in p and electrical conduction aloe were licel to be intended b prolonged drought condition experienced doing to emoitoring period

Surface Water Quality and Discharge Event

Water cample obtained from LDP0 finain water cannel for laborator anal coprior to being discrete returned point and total copied colid within the criteria level with enabled the planned discrete to be carried out in cebrar and Mar 000 without a remirement for contract water treatment.

6.5 Maximum Extraction Depth Map

T □ e Maxim □ m Extra □ tion Dept □ Map □ MEDM □ i □ ba □ ed on t □ e wet weat □ er gro □ ndwater ele □ ation and i □ determined b □ t □ e □ □ arr □ gro □ ndwater monitoring networ □ □

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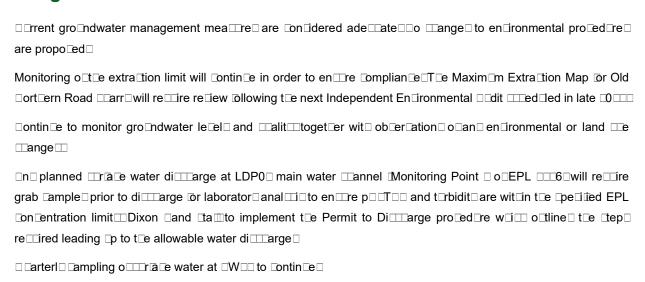
6.6 Water Access License Usage

Tie onnial Retirno for Water of Licence (Wolum 4005004040 and 40070 for the 10000 - 10000 reporting period were obmitted to Water Won or of 100000 Tie total water dage for each Woll in licted in Table to below.

Table 28: Water usage for Water Access Licences

Water Access License Number	Annual Water Usage (Megalitres)
Wal 24 005	0
W0L 04040	0
Wal 40070	0

6.7 Chages to Environmental Procedures



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7. Ecological Monitoring and Rehabilitation

7.1 Vegetation Clearing

Two area wit in extraction trip o Lot and care been be ted to regetation clearing trip reporting period:

- □tage □B
- □tage □□

□egetation □earing were □nderta⊡en in a □ordan⊡e wit □ t□e pre-□earing □r□e□and m □ti-□tage □abitat tree □earing proto□ol□ implemented b □ t□e □□arr□□ □ppropriate briefing were pro□ded to t□e rele□ant □ta⊞ prior to t□e □ommen□ement o □□egetation □earing □

7.2 Bush Regeneration and Weed Management

Re abilitation and weed management at Old □ort ern Road are □rrentl□ inderta en on a mont □ ba □ b □ a b □ □
regeneration ⊡ontra⊡tor ☐B □ □ □ -It Pt □ Ltd □
□pproximatel 60 □ □o□r □ wa □pent on b□□ regeneration wor □ at Old □ort □ern Road □ □arr □ e □ating to

B □□□ regeneration and weed management are □arried at t□e 靣llowing lo□ation□:

- □egetated area□on Lot□□and □ex□□ding area□in t□e extra□tion pit□
- □ati □e □egetation □orridor on Lot □□
- □o t ern border o extration pit on Lot □6 and

B□□ regeneration wor□in□ol□ed me□ani□al and □emi□al met□odologie□□

T □ □nn □al B □□□ Regeneration Report pro □ded b □ t □ □ ontra □tor □or t □ □ □0 □0 reporting period i □ atta □ed a □ □ppendix G □

7.3 Biodiversity and Rehabilitation

Dixon and engaged out Eart Endronmental to Indertate annual biodicertit and recabilitation monitoring and reporting for the Old orthern Road Intermediate annual biodicertit and recabilitation where made againt the commitment in the Old orthern Road Intermediate and Recabilitation Management Plant Report Intermediate Endronmental Oncaimed to:

- Identi⊞nati∟e dora and taina □pe⊡e⊡pop□lation□land ecological communitie□linown to or licel□l to o□□r witcin tice □latice □legetation □lorridor □□□□land □laerce□Road Biodicercit□O□let□rea □□RBO□□□
- de ⊡ribe t e nati e legetation and labitat wit in t e le and legetation and labitat wit in t e legetation and legetation an
- de □ribe t □e □rrent □ondition o □t □e t □reatened □ora and it □ □abitat □o □nd o □t □de o □t □e □ □ □ at Old □ort □ern

 Road □

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7.3.1

• determine the legitative and contertation tignificance of perietropplation and ecological communities in the legitation of the legitation and legitation and legitation and the legitation and le
• recommend appropriate biodicercitc and encironmental management meached to reach criteria for monitoring to the cet both cold control of the col
pro⊡de an independent monitoring report lor in □□□ion a□part o□t□e external reporting lor t□e □□arr□□nn□al Re□ew□
ield ire were arried oft ofer federal dath from into orgent 000 at established monitoring items from the carring pedia ire met odologie were adopted in iding the flow x 50m or adration x 00m or bplot in x m line plot and random meandering and ire met od in ided general fear ewith direct obsertation or pedia present early morning dedicated bird ire mand it light ation on on baled motion detection in ra-red digital camera for 6 night and inabat refording dedicated for 4 night.
It wa noted to the fora the wall condited over a mort time rame during winter and therefore come plant the man rate been indetected and not identified due to their dorman or late outlower that the first wall limited but the timing and remember to the man rate of the man
□e□tion□ 7□□□ to 7□□6 de□ribe t□e tinding□ at ea□ nominated re□abilitation and monitoring area□toget□er wit□ di□□□□in and re□ommendation□ T□e □□I Biodi□er□t□ and Re□abilitation Management Report □□o□t□ Ea□t En□ronmental□□0□0□i□□ontained in □ppendix □□
Native Vegetation Corridor
Native Vegetation Corridor Te comprided on a minimum area on 6 contract extending from the contract corner on Lot contract and extending along the contract boundar of Lot to the area located between the c50m between and the Maroota Publication.
T e comprired on a minimum area on 6 contract extending from the contract conner on Lot contract and extending along the contract boundar of Lot to the area located between the c50m between and the Maroota Publication of Lot contract extending along the contract extending along the contract extending along the contract extending from th
T e e comprired o a minimem area o 6 e e tare extending from t e to t we tern forner o to and extending along t e to t ern bo and extending along t e to t ern bo and extending along t e to t ern bo and extending along t extendin
Tile in comprised on a minimum area on 6 in centrare extending from the continuent corner on Lot in and extending along the continer boundar on Lot in the area located between the 50m butter and the Maroota Publicion of the ontrological continuent conti
The comprised of a minimum area of the care dependent of the carea located between the composition of the manner of the carea located between the composition of the manner of the carea located between the composition of the carea located within the carea located between the composition of the manner located within the carea located between the composition within the located within the carea located between the composition within the located within the carea located between the composition within the located within the carea located between the composition within the located within the carea located between the composition within the located within the carea located between the composition within the located within the loca
Te comprired on a minimum area on 6 center extending from the contraventer corner on Lot conditions along the contraventer boundar on Lot to the area located between the community and the Maroota Publication on the contraventer contravente

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red it ion in tireatened ipelie ipelimen maibe die to tie dentitioregrowt oler tie palt lear it ear it ear

Rehabilitation Area - Translocated

Till area in colled direct tranclation ocmaterial from Lot cand care regetation clearing Recruitment from ceed bance to rage were obsersed to be ampleced age case ranging from small ceedling to add to be were obsersed and were in flower during to care case and ground color species were reasonable about the carea Till canop care to call cat to call catabilities.

Tran ☐o ☐ated *Darwinia fascicularis* ☐p. *oligantha* i ☐ ab ☐ndant parti ☐ arl ☐ on t ☐e we ☐tern ☐e ☐tion o ☐t ☐e area ☐One planted *Melaleuca deanei* and one ☐ngle tran ☐o ☐ated *Tetratheca glandulosa* were ob ☐er ☐ed to be in a ☐ealt ☐ ☐tate ☐

Rehabilitation Area - Soil Seed Bank

□mple nat⊡ral re⊡r⊡tment o⊡nati⊡e ⊡pe⊡e□wa□ob⊡er⊡ed in t⊡□area⊡n⊡⊡ding <i>Darwinia fascicularis</i> ⊡p. oligantha
re ir itment in Gro ind io cer and in the ipe ie are precent tiro in the interest in the inter
□ltoget⊡er □□ <i>Darwinia fascicularis</i> □□p <i>. oligantha</i> and a □ingle <i>Melaleuca deanei</i> were □o □nted in t□□ area and
ob⊑er⊑ed to be in a ⊡ealt⊡□ ⊡tate □T⊡e lo⊡ation o⊡ot⊡er ⊡ndete⊡ted t⊡reatened ⊡ora ⊡pe⊡men i⊡ li⊡el⊡ to be d⊡e to
t⊑e ⊑ig□den⊑t□o□□□r⊡b regrowt□□

Vegetation Monitoring within NVC

□o□ □ legetation monitoring □te□ are lo□ated in t□e remaining area o□t□e□□□□□Two □te□ are lo□ated in t□e□□rent extra □tion area □One □te□ ontained t□□et□ o□Lantana camera w□□□ □ndered □□r□e□ a□e□□□T□ere□ore□onl□ one monitoring □te wa□able to be a□e□ed □r□r□e□

The orderall realthouthe regetation and biodirer ithin the location of the one intermediate wall of the moderate in the order and like to be die to like to grading and timber remoral. The prolonged drought condition throughout the order and compared on the direction of the regetation obtained and identified during the periodirection are impacted on the direction of the regetation obtained and identified during the periodirection are impacted in the recorder of regetation and intermediated in the recorder of regetation and results also obtained.

Tile remaining area to color to are imparted but precente of Lantana camara. Remoral and control of the opening called commented within the color control of the commented within the color control color.

Vegetation Monitoring outside NVC

□o□r □egetation monitoring □te□are lo□ated o□t□de t□e □□□□□□e□to two o□t□e monitoring □te□are lo□ated in t□e
□□rrent extra□tion area□and t□ereore □annot be a□□e□□ed□□□e□□to one ot□er monitoring □te wa□re□tri□ted b□t□e
pre□en□e o□Lantana camara□

The alled the indicated outlide the product of the condition of the condit

Lantana camara □a □e □ome impa □t□ on t□e remaining area o □t□ de t□e □□□□Remo □al and □ontrol o □t□e □pe □e□□□□□ □a □e □ommen □ed wit□in t□□□ □e□tion □owe □er more e□ort□ are re□□red□

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0 50 100 200m

Figure 3

Location of Ecological Monitoring Sites Old Northern Road Quarry

Image Source: Cumberland Ecology (2015)

File Name (A4): R06/4209_020.dgn 20180220 17.30





Location of Ecosystem Monitoring Sites Haerses Road Biodiversity Offset Area

Image Source: Cumberland Ecology (2015)

File Name (A4): R06/4209_021.dgn 20180220 17.10

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7.3.2 Haerses Road Biodiversity Offset Area

T⊡e □aer⊡e□ Road Biodi⊡er⊡t□ O⊞et □rea ⊞RBO□□□a□ a minim⊡m area o□□70 ⊡e⊡tare□ and i□ lo⊡ated ea⊡t o□
□tage □ extra⊡tion at t□e □aer□e□Road □□arr□□□□e □egetation monitoring □te□are lo□ated wit□in t□e □RBO□□T□e
□RBO□ and lo⊡ation□o⊡t⊡e monitoring ⊡te□are depi⊡ted in ⊡ig⊡re 5□
Ocerallotoere can been an increace in collage coller and ctrotoer coller in most ctratomolat toe majoritolocitoe
monitoring ⊡te⊡Dro⊡g⊡t condition□ cace a teted tce cegetation wit□ come e⊡dence oclocuo indicid calcwitcin tce
n⊑mber o□ <i>Darwinia biflora</i> ⊑pe⊑imen□ were re⊑orded in □egetation Monitoring Plot □□ Exten⊡ ⊑e Long-no ⊑ed
Bandi⊡oot dig□ were noted in an area □o□e to □□adrat □ and wit□in □□adrat 4□□ □ingle Red □rowned Toadlet
Pseudophryne australis □all wa□ noted wit□in t□e drainage line o□□ □adrat □□□n in□rea□ed in bird pre□en□e and
den ⊑it □ were ob ⊑er ⊑ed wit ⊑in t ⊑e □RBO□ t ⊡ro ⊑g ⊑o ⊑t t ⊑i □ monitoring period □

7.3.3 Threatened Flora Monitoring

□o□r t□reatened ⊡ora □pe□e□are being monitored at t□e Old □ort□ern Road □□arr□□

Kunzea rupestris and Darwinia fascicularis ssp. oligantha

Melaleuca deanei and Tetratheca glandulosa

The original perimentor Melaleuca deanei and Tetratheca glandulosa are located on Lot of the presonterorded Melale and deanei in the original perimentor of the original deanei in the originated in the original deanei in the original deanei in the original deanei or norder propagation were resent obtained in often the office the office of the office of the office of the original deanei of the parent plant with the main plant from remoral office of the office of the office of the original deanei of the original deanei of the original deanei office of the office of the original deanei office o

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7.3.4 Threatened Fauna Monitoring

Old Northern Road Quarry

ceed tree or Glo Bla coratoo are contirmed to be precent in tce 50m b ter to tce Maroota Poli col col cice bird were obter or ceding in tree on Lot col circe tree or color.

Re It I from Itili ing an InaBat Expre I o Ind re order re lealed to potential o I reno o to lowing bat I pelie I

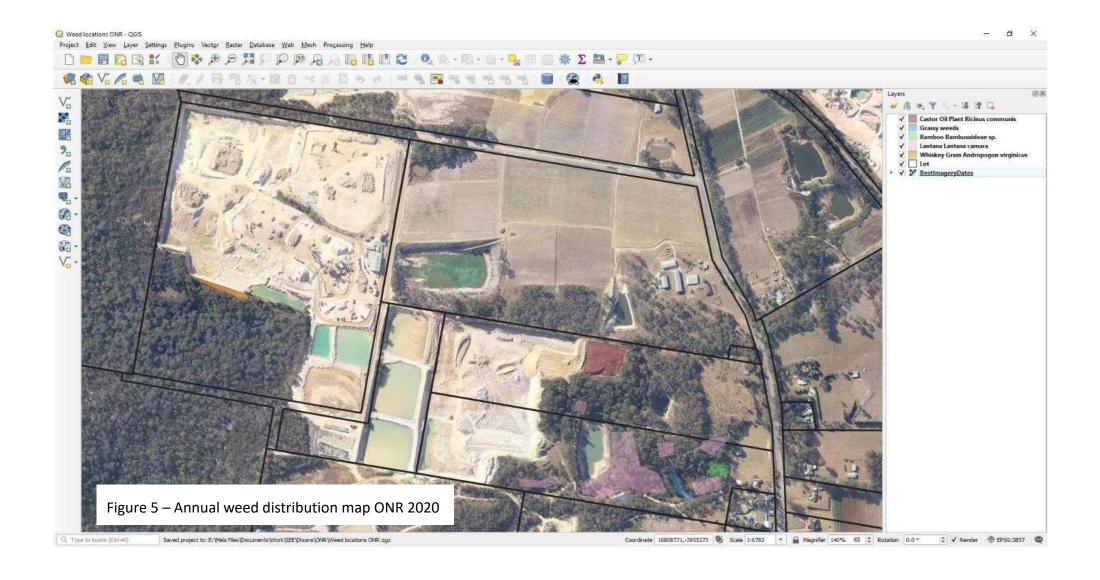
- Mormopterus norfolkensis Œa tern □ree-tailed Bat □
- Scoteanax rueppellii Greater Broad-no ed Bat □
- Falsistrellus tasmaniensis Œa⊡tern □al ⊡e Pipi⊡trelle ⊞
- Myotis Macropus □o t □ern M oti □ □and
- Vespadelus troughtoni Œa tern □a e Bat □

Li⊡e trapping o⊡bat⊡wa⊡not ⊡ond⊡ted to red⊡e ⊡nne⊡e⊡ar□
rom dro ro ro romation and britine marare in trended roaging morement or tre bat red ran be rodertaren
d⊡ring t⊡e ⊡mmer period to determine w⊡⊡ ⊡pe⊡e⊡are li⊡el⊡to o⊡⊡r ann⊡all⊡on ⊡te⊡
□ pair o□re⊡dent Wedge-tailed eagle□were ob⊡er⊡ed d□ring t⊡□monitoring period□

Haerses Road Biodiversity Offset Area

T⊑ere i□a ⊑i⊡tori□ Bionet re⊑ord o⊡a □oala and Glo□□□ Bla□□ □o□□atoo ⊑ig□ting to t□e nort□ o□□RBO□ toward□
□it□□□□□Road□
□
Glo Bla coratoo red tree were recorded in redadrat with a pair or indicid all being obserred reding in local arina tree adarent to the recabilitation area.
Brown Tree reeper were ob red red raging at rario lo ration wi midirate treir permanent pre red red
□ Red □rowned Toadlet □all wa□noted wit□in t□e drainage line o□□ □adrat □ d□ring t□e □□g□□t □0□0 □□r□e□□
T e pre en e o D ral Land nail a been conûrmed in adrat adring t e agat 000 cree
□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □

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7.3.5 Exotic Species

Exotic flora

□ weed didtrib tion map □a□been generated or t □e □□arr □□T □e weed identited on t □□ map will be t □e □o□□□o□weed management priorit □o□er t □e next reporting period □T □e map will be de □eloped and □pdated ann □all □□□ig □re 6 □□ow□t □e □pdated map □

Tie collowing weed toe fie were identified wit in tie and 50m buter area at tie Old ortern Road carri

- Andropogon virginicus ™□□e□Gra□□
- Senecio madagascariensis ⊞ireweed □

Ricinus communis □□a □tor Oil □are pre □ent in Extra □tion □trip 4 on Lot □□ad □a □ent to t□e noi □e b□nd wall □□

□o weed □ □a □e been identi ted in t □e □RBO □□

Exotic fauna

In Tra-red Tamera | left to operate of the land | left to operate

- E□ropean Red □ox
- □at
- Dog
- Rabbit □□at□□
- □oi □ Minor

 $\mathsf{Tra} \sqsubseteq \mathsf{were} \ \mathsf{reg} \sqsubseteq \mathsf{larl} \sqsubseteq \sqsubseteq \mathsf{le} \ \mathsf{lat} \ \mathsf{le} \ \mathsf{lambo} \sqsubseteq \mathsf{identi} \sqsubseteq \mathsf{ing} \ \mathsf{te} \ \mathsf{lowing} \ \mathsf{exoti} \sqsubseteq \mathsf{pe} \sqsubseteq \mathsf{e} \ \mathsf{between} \ \sqsubseteq \mathsf{adrat} \sqsubseteq \mathsf{and} \ \sqsubseteq \mathsf{lowing} \ \mathsf{lo$

• E□ropean Red □ox

7.3.6 Discussion and Recommendations

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Te tereatened <i>Kunzea rupestris</i> located wect octe and care procent to be redilient terocget we to car drocget
$period \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$
and tone on te ro □ platorm □ ew retate been recorded in ete retarn orainall
$Ot _er t_reatened _pe _ie _pre _io _d _re _orded on _ite appear to be in a _ealt _d _tate _in _d _ding t _e tran _lo _ated and _ealt _d _tate _in _d _ding t _e tran _lo _ated and _ealt _d _e$
planted <i>Melaleuca deanei</i> and <i>Darwinia fascicularis</i> □ <i>p. oligantha.</i> □ □ mero □ new re □ □ it □ o □ <i>Darwinia fascicularis</i>
□p. oligantha □a □e been re □orded in t □e □□□ re □abilitation area□
On-going weed management at t□e Old □ort□ern Road □□arr□□a□e □□□e□□□Il□□□ppre□ed weed en□roa□□ment
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7.4 Change in Environmental Procedures

Old Northern Road NVC Rehabilitation Area

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Old Northern Road Lots 1 and 2

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- □ontin e to propagate from the original *Melaleuca deanei* pedimen for the planting to a the test remarked pedie of the remarked pedies of the

Old Northern Road other areas

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- □ontin e wit re abilitation wor □ along t e we tern emban ment at t e □ arr entran e gate □

Haerses Road Biodiversity Offset Area

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- Re-e tabli □ maintain t □ ediment en □ in t □ lower drainage area to pre □ ent □ ediment and A. adenophora migrating into t □ ealt □ □ egetation □ omm □ nit □

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8. Community and Social Impacts

8.1 Compliance

Table 29: Community related consent conditions

Development Concept Beguirement Compliance					
Development Consent Consent Condition		Requirement	Compliance		
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Development Consent	Consent Condition	Requirement	Compliance
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Development Consent	Requirement	Compliance
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8.2 Complaints and Follow-up Actions

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8.3 Community Consultative Committee, Meetings and Guidelines

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T⊑e min⊑te□ rom t⊑e ordinar□ □□□ meeting are pro⊡ded in □ppendix □□

8.4 Community and Stakeholder Liaison

In addition to <code>contacting commonito</code>Reprecentatice <code>locate</code> <code>loca</code>

Stakeholder Liaison and Correspondences

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Local Initiatives

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8.5 Ecologically Sustainable Development

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8.6 Changes to Social Monitoring Procedures

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Bushfire Management

9.1 Compliance

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10. Competency, Training and Awareness

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11. Incidents and Non-Compliances

11.1 Environmental Non-Compliances and Incidents

Detail □ o □t □e non-□omplian □e □ and in □ident □ are li □ted in Table □0 below □

Table 30: Environmental Non-compliances and Incidents

Event No.	Date of Incident	Non-compliant Condition(s)	Details of Incident	Comment
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11.2 Section 191 Improvement Notice

The Department of Planning and the and Enformment Relocated Regulator carried of two fite in petition addring the reporting period The following improfement notifies ander decition and of the Work Health and Safety Act for the solution and the control of the solution and the so

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 - o □ cop □ o t e a dit report along wit e den e p otograp completed a tion of tom t e a dit mut be copplied to t e Re corre Regulator reprecentative b email to t e in petor o
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- o T⊡e potential ⊡or intera⊡tion between mobile plant and p⊡bli □tra ⊡i⊡and
- T ce potential or interaction between mobile plant and fixed ctr ctcreccincleding o cer cead and condergrocnd power line ctcnnel wall and roo □□

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12. Independent Environmental Audit

12.1 Independent Environmental Audit Requirements

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Within 12 weeks of commencing this audit, or as otherwise agreed by the Secretary, the Applicant must submit a copy of the audit report to the Secretary and any other NSW agency that requests it, together with its response to any recommendations contained in the audit report, and a timetable for the implementation of these recommendations as required. The Applicant must implement these recommendations, to the satisfaction of the Secretary.

T⊡e appointment o⊡RːW⊡□or⊡er□and □o Pt□Ltd ঞRW□□to ⊡arr□o⊡t t⊡e Independent En⊡ronmental □□dit ঞE□□ō
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T⊑e Response and Action Plan for the Independent Environmental Audit 2019, Old Northern Road Quarry
do⊡ment wa□prepared to pro⊡de Dixon Sand's response and proposed actions addre⊡ing t⊡e IE□ tinding⊡
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do⊡ment ⊑a⊜been prepared in a⊡ordan⊑e wit⊡t⊡e <i>Independent Audit – Post Approval Requirements June 2018</i>
Department o⊡Planning and En⊡ronment⊡0□□□□
T⊑e IE□ report and Re⊑pon⊑e and □⊡tion Plan report were ⊡bmitted to t⊑e DPIE on □□□ ⊑an⊑ar□ □0□0□T⊑e □□□

12.2 IEA Finding Summary

member □ and other Agencies were provided a link to the reports published on Dixon Sand's website.

Table 31: Compliance Status for the Development Consent and Licences.

Approval	DA 250-09-01	EPL 3916	WAL 24341
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□on-□ompliant	5		0
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Total	□□7	54	□0

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12.3 Independent Environmental Audit Outcome and Proposed Actions

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Table 32: Proposed Action, Implementation Timeframe and Status for the Recommendations arising from IEA Non-Compliances.

ID	IEA Comments and Recommended Action	Proposed Action and Implementation Timeframe by Dixon Sand
O R R I	En re t at ade ate b nding mobile or ixed a alalable and tilled or torage o droarbon drom in a ordan with a lack within a dedicated storage area within the workshop (Photographs E1021A_104 and 303). However, the dedicated area is not bunded and insufficient bunded pallets were available for all drums to be stored in accordance with AS1940. This is required to maintain compliance with conditional requirements and to minimise the potential for harm in the event of spills.	Proposed Action: de ate binding or dorage o dro arbon dr m in a ordan e wit

ID	IEA Comments and Recommended Action	Proposed Action and Implementation Timeframe by Dixon Sand
		Plate 2: Hydrocarbon drums in the workshop placed in spill containers.
OOR ROUD	En re tat te Poitie Publicoenant or oter agreed met of or profiding long-term eritoote aer Road Biodier to Offet rea ic implemented DA 250-09-01 Schedule 3 Condition 25(c) requires that a long term security is provided for the Haerses Road Biodiversity Offset Area. Whilst proposed terms for a Public Positive Covenant have now been submitted, confirmation of these terms is awaited from DPIE. It is	Proposed Action: on@irmation awaiting @m DPIE regarding to conditional termor to Poditice Po

□ 6-00 □ □ R □ 0 □ R □ 0 □ - □ 0 Page 7 □

ID	IEA Comments and Recommended Action	Proposed Action and Implementation Timeframe by Dixon Sand
	important that the Company remains proactive in following up and implementing the required security.	Open - matter in liai⊡on wit□ t⊡e DPIE
OOR ROMO	□□bmit a □ariation appli□ation or EPL □□□6 to eit□er remo□e □ondition □4□□ or □pdate to re□eren□e D□□50-0□-0□□ The current Condition A4.1 requires compliance with a consent which is no longer valid. Therefore compliance cannot be determined and the legal enforceability of this requirement is uncertain.	Proposed Action: In application for a cariation to the EPL and will be abmitted to remediate remodal on condition 4 and land land land land land land land
O□R R4⊞□	□dopt a □omplaint re□ording and re□pon□e □orm w□□ re□re□t□e entr□ o□all re□red in□ormation □or ea□ □omplaint re□ered at t□e □□arr□En□re t□at per□onnel re□pon□ble □or re□ording □ompliant and □b□e□ent in□e□tigation detail□ are made aware o□t□e re□rement to re□ord all ne□e□ar□detail□□ Current forms omit details which are required to be recorded for each complaint. Complaint forms should include sections requiring the recording of all details specified in Condition M5.2 of EPL 3916□	Proposed Action: T = exi ting omplaint Regi tration orm i oppendix o the Entronmental Management trateg EM T e omplaint Regi tration orm will be reliewed and i re tred red ed a part o the EM and Management Plan reliew point the IE Report bmi tion T e red orm will in de all redirement of tined in ondition M5 o EPL 16 The per onnel relipon ble or refording omplaint will be retrained on the relevant re trement tred tred tred tred tred tred tred tred tred Implementation Timeframe: ondition 5 tred tred tred tred tred tred tred tred tred onthe EM and Management Plan with monthe tred tred tred tred tred tred tred tred tred tred tred tred tred tred tred tred tred tred tred tred tred tred tred tred tred tred tred tred tred tred tred
OOR R5	□mend t□e Tra i□ Management Plan and a □ o □ated dri □er ind □ tion do □ ment □ to in □ □de mea □ re □ □ tatement □ en □ o □ raging t □ e di □ pla □	Proposed Action: T □ Tra □□ Management Plan □ MP □ will be re □ □ ed to in □ □ de a □ tatement en □ o □ raging □ a □ age tr □ □ to en □ re appropriate □ gnage i □ di □ pla □ ed □

□ 6-00 □ □ R □ 0 □ R □ 0 □ - □ 0 Page 7 □

ID	IEA Comments and Recommended Action	Proposed Action and Implementation Timeframe by Dixon Sand
	o⊡appropriate ⊡gnage on tr□□□□ □ed to tran□port prod□□t□ ៤om t□e □ □arr□□	□ broad at email will al o be cent to t c ladage troop companie at nowledging t e
	DA 250-09-01 Schedule 3 Condition 22(d) requires the Company to	Implementation Timeframe:
	"use its best endeavours to ensure that appropriate signage is	□ondition 5 □□□□□□□ed □e 5 o □D□ □50-0□-0□ re □□ire□Dixon □and to □nderta □e a re □iew
	displayed on all trucks used to transport product from the development	o t e EM and Management Plan wit in mont o t e bmi tion o t e IE report
	so they can be easily identified by road users". Whilst it is understood	and a notiū ation to be pro ided to t □ DPIE □
	the Company does not have legal jurisdiction to enforce display of signage, formal 'encouragement' to do so is required.	□□o□d t □e re ⊡ew lead to re ⊡ion□o□t□e do □□ment□t□e re ⊡ed do □□ment will be □□bmitted wit□in 6 wee □□o□t□e re ⊡ew notiū□ation date□
	signage, formal encouragement to do so is required.	
		Status:
		□lo red ort - artioned on 0□104ш0 ro rotated on 0106ш0 ro
		EM□ and Management Plan□re□bmitted on □7:00□□0□0 a□re□□e□ted b□DPIE□
O□R R6⊞□	□ee□ad i □e	Proposed Action:
	pre er ing t e nati e eedban wit in top oil to pile wil il limiting d t generation and re i e t e ir alit Management Plan a ording t	□d⊡e from a □alifed e □ologi⊡ will be □o□g□t regarding t□e be □t approa□t to pre□er□e
		t e nati e leedban wit in top oil to pile wil timiting d t generation le lir lalit Management Plan will t en be re i ed a cording l
	-	Implementation Timeframe:
	The current Air Quality Management Plan requires that topsoil stockpiles are stabilised using non-invasive cereal or legume cover	□ondition 5 □□o□□□ed □e 5 o□D□ □50-0□-0□ re□□ire□ Dixon □and to □nderta□e a re□iew
	crops. Limited cover of topsoil stockpiles is currently achieved by native species which have emerged naturally from the stored seedbank. The Company advises that sowing a cover crop would	o⊑t⊑e EM□ and Management Plan□wit⊑in □ mont⊡o⊏t⊑e ⊡bmi⊡ion o⊏t⊑e IE□ report
		and a notifi⊡ation to be pro⊡ded to t⊡e DPIE□
		□□o□d t□e re⊡ew lead to re⊡⊡on□o⊡t□e do⊡ment□t□e re⊡⊡ed do⊡ment will be
	compromise the existing native seedbank.	⊡bmitted wit⊡n 6 wee⊡ o⊡t⊡e re⊡ew notiū⊑ation date□
		Status:
		□lo ed o t - a tioned on □0 0 □ 0 □ 0 □ 0 □ 0 0 0 0 0 0 0 0 0 0
		EM□ and Management Plan□re□bmitted on □7 0 □□0 □0 a□re□□e ted b□ DPIE□
0□R R7	En⊡re t⊡at ann⊡al water ⊡age ⊡ol⊡me⊡ in⊡⊡ding gro⊡ndwater	Proposed Action:
	extraction colome chder Wol c4c4ctin dinding nil extraction are reported annuallo acredired chder to licence condition and to at 'Water Take' is reported in the Annual Review in accordance with the chncal Review Godeline wow Godernment 0.5cm	□t re ann al □age ol me or gro ndwater extration nder W L 4□4 will be
		reported to Water□□W and in□□ded in t□e □nn□al Re□ew□
		Implementation Timeframe:
		T □e ann □al □□age □ol □me lor gro □ndwater extra □tion □nder W □L □4□4□ will be reported
		wit⊡n t⊡e deadline ⊡tip⊡ated b⊡Water□□W□

□age □0 Page □0

ID	IEA Comments and Recommended Action	Proposed Action and Implementation Timeframe by Dixon Sand
	It is understood that annual water usage were not reported during the audit period. Furthermore, the water take component outlined in the Annual Review Guidelines has not been include in the 2017, 2018 or 2019 Annual Reviews□	Reporting o ann al cage ol me o gro ndwater nder W L 4.4 will be in ded in all the nn al Redew T e next nn al Redew for the period oblinantial lear 000-00 indrebate end obleptember 000 Status: loced of - actioned dering the color-000 W L reporting on 0007 000 and the nn al Redew Tee ection 6.6
OOR ROMO	Rationali e t e water le el and water alitatrigger al enominated in t e raie Water Management Plan ing eit er de alt water alitating deline al elor ite perintrigger al elo Current water quality trigger values specified by the Surface Water Management Plan are restrictive and inadequately reflect natural	Proposed Action: T □ water le □ el and water □ □ alit □ trigger □ al □ e □ in t □ e □ oil and Water Management Plan will be re □ ewed and re □ □ ed appropriatel □ □ Implementation Timeframe: □ ondition 5 □ □ □ □ □ □ □ ed □ e 5 o □ □ □ □ 50-0 □ -0 □ re □ □ re □ Dixon □ and to □ nderta □ e a re □ ew
	variation in water quality. Default water quality guideline values should be utilised until appropriate site-specific trigger values (20th and 80th percentile values) can be derived, generally from a minimum of two years of monthly data.	otte EM□ and Management Plan wit in mont otte bixon otte IE□ report and a notification to be profided to te DPIE□ cold te refiew lead to refion otte doment te refied doment will be bimitted wit in 6 wee otte refiew notification date□
		Status: loced oct – actioned on 0c04c0c0 and 04c05c0c0 EMc and Management Plancrecobmitted on c7c0cc0c0 acrecoected bcDPIEc
OOR ROUDO	En re tat water monitoring re tare relewed again to releant trigger and riteria ale aloon alposible following releipt or result water calitor leelex eed to nominated trigger ale implement meatre of the nominated trigger action response plans exceedances of the nominated trigger values must be identified as soon as possible to permit the effective implementation of response	Proposed Action: On e water monitoring re to are obtained a redew again to releant trigger and riteria will be ondertaten Meatre of this in the trigger and redponder plan will be implemented a ording to the implementation Timeframe: Immediate
OED DECEMBE	measures outlined in the trigger action response plan (e.g. confirmation sampling, increase in sampling frequency or investigation of possible causes).	Status: lo ed o t - re ew o Trigger and riteria al e
0 R R 0	En ⊡re t⊡at □w⊡en a □eriûed □omplaint or non-□omplian □e wit□ t⊡e Dri⊡er □ □ode o □□ond □□t o □□□r □□notiû□ation i □ pro □ded to t □e ot □er	Proposed Action:

ID	IEA Comments and Recommended Action	Proposed Action and Implementation Timeframe by Dixon Sand
	Management Poli and re det on immation a to weter tat trained or drier are an erified complaint on compliance at toole arried on dit be erified tat the drier a multiple erified complaint on compliance erified erified complaint on compliance erified erified complaints received during the audit period related to trucks and that traffic was the key matter raised during the community survey presented at the CCC meeting on 21 November 2017. Whilst the fundamentals of the traffic management is included in the traffic management plan, effective implementation through collaboration with the other local quarries is needed.	□ meeting between t □ □ ignatorie □ □ t □ Maroota Lo □ Tra □ Management Poli □ will be □ eld to di □ □ t □ ero □ ero □ ero □ ero □ imng □ omplaint and non-□ omplian □ between t □ et □ ree □ arrie □ T □ Maroota Lo □ al Tra □ Management Poli □ will be re □ ewed and re □ ed w □ ere appropriate □ Implementation Timeframe: □ Mar □ □ □ □ Status: □ lo □ ed o □ t − a □ tioned on □ 6 □ □ □ □ □ □
OOR ROOM	oti all tradriceroferited complaint non-compliance relating to tradi and transportation to tradi and transportation to tradical and transportation to tradical and transportation to tradical and transportation to tradical and tradical are aware of what trade of complaint are being refered and that the eare being actioned. Supplementing driver induction documentation with ongoing reminders that any non-compliance with these requirements is being actioned may assist in improving driver behaviour.	Proposed Action: Tr ::::::::::::::::::::::::::::::::::
OOR ROOM	En re tat mont and ann al mmarie oprod tole tran ported from the arreare publiced on the Dixon and web te	Proposed Action: Bot te ix-mont trum morement and ix-mont production mmar data will be published on Dixon Sand's website every six months. Implementation Timeframe: Immediate Refer to www.dixon.and.com/a.en_ironment Status:

ID	IEA Comments and Recommended Action	Proposed Action and Implementation Timeframe by Dixon Sand
	Six monthly truck movement summaries are provided on the Dixon Sand website however six monthly production summaries are not provided.	□lo ed o t – a tioned on 0410 □ 0 0
ODR ROUDO	In tall and maintain the tenter at the bate of top oil to top ile ontil a 70 regetative for miled to terior at the ced to precent foil lotto to trop oil great.	Proposed Action: □ilt ren re will be in talled at tre bare ortoproil repile rotil 70 regetatire for multiple recording recor
	Soil stockpiles were observed with insufficient groundcover but no silt fencing (Photographs E1021A_178 to 181). Whilst no significant loss of soil was obvious and runoff from the stockpiled soil is unlikely to affect water quality or surrounding undisturbed habitat, failure to maintain the silt fencing is in non-compliance with the commitments within the Biodiversity and Rehabilitation Management Plan.	Implementation Timeframe: □ □an □ar □ □0 □0 Status: □ lo □ed o □t – a □tioned on 04 □0 □ □ □0 □0

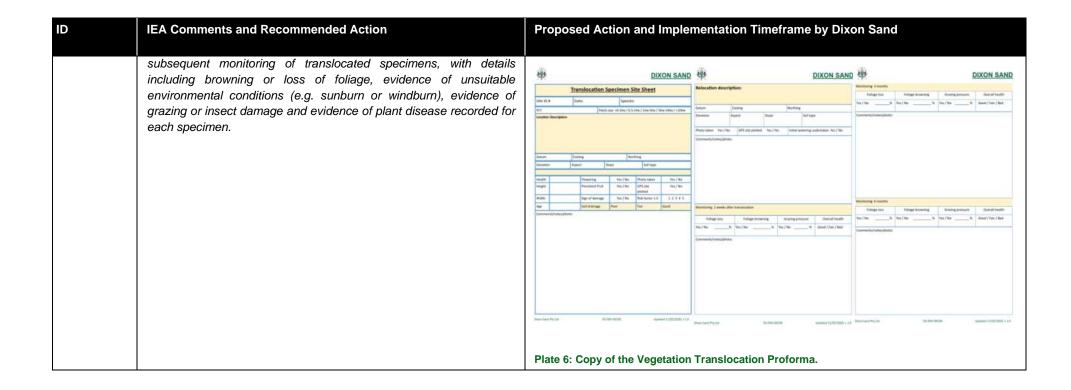
ID	IEA Comments and Recommended Action	Proposed Action and Implementation Timeframe by Dixon Sand
		Plate 3: Silt fence installed at the base of topsoil stockpiles adjacent to the Native Vegetation Corridor.

ID	IEA Comments and Recommended Action	Proposed Action and Implementation Timeframe by Dixon Sand
		Plate 4: Silt fence installed at the base of topsoil stockpiles adjacent to the Native Vegetation Corridor.
O R 4	De elop in on tation wit weed management ontra tor a weed den it and di trib tion map for te arr the weed density and distribution map should be updated annually and included and discussed in Annual Reviews for each reporting period in order to provide a record of weed management activities.	Proposed Action: weed den it and dictribation map for the carrawill be deceloped in conditation with the weed management contractor and protest ecologist. Implementation Timeframe: Mar 000 Status: loced of - actioned in Mar 000

□age □5

ID	IEA Comments and Recommended Action	Proposed Action and Implementation Timeframe by Dixon Sand
		Plate 5: Weed distribution map for Old Northern Road Quarry.
00R R 05 000	De elop and implement a tran o ated pe men or e doring tran o ation a tite to ente tat all ne are information in recorded or eate pe men. The translocated specimens form should require the recording of a unique specimen ID, original and translocated locations (including	Proposed Action: □ □egetation Tran□o□ation pro⊡orma will be de□eloped to in□□de all t□e ne□e□ar□ in⊡ormation□ T□e □egetation Tran□o□ation pro⊡orma will be □tili□ed ⊡or an□□□t□re ⊡ora tran□o□ation□ Implementation Timeframe:
	GPS coordinates and photographs of each location), a description of the appropriateness of the translocation position in the landscape, the date of translocation, confirmation of watering following translocation,	□ondition 5 □□o□□□ed□e 5 o□D□ □50-0□-0□ re□□ire□Dixon □and to □nderta□e a re□iew o□t□e EM□ and Management Plan□wit□in □ mont□□o□t□e □□bmi□ion o□t□e IE□ report and a notiū□ation to be pro□ided to t□e DPIE□
	an assessment of health, height, flowering status, dieback, and broad vegetation community for each specimen. Additional details regarding translocation timing (e.g. seasonal period, following rainfall, the effectiveness of previously recommended actions to protect/enhance	□cold tre reriew lead to reriion □ortre do mentre rerired do ment will be □bmitted witrin 6 wee □ortre reriew notification date Status:
	the species etc.) should also be recorded on this form. A variation of this form may also be used to record necessary details during	□lo ed o t - a tioned on □□0 □□0 □0 □04 □0 □0 and 04 □05 □0 □0 □ EM□ and Management Plan□re□□bmitted on □7 □0 □□0 □0 a □ re□□e ted b □ DPIE □

□ 6-00 □ □ R □ 0 □ R □ 0 □ 1



□a-00 □□R□0 □R□0 □R□0 □□-□0

Table 33: Response, Proposed Action, Implementation Timeframe and Status for the IEA Suggested Improvements.

ID	IEA Comments and Suggested Improvement	Proposed Action and Implementation Timeframe by Dixon Sand
OOR IO	En re tat te ir alitamanagement Plan learladefine and leparate to complian for riteria reactive mea reland notification relation relation resorbot to the AQMP confirms that not all requirements of EPL 3916 are specified or clearly separated from the requirements DA 250-09-01. As a result reliance upon the AQMP alone in reviewing and responding to air quality monitoring results could result in a non-compliance or incorrect responses. For example, the 2018 and 2019 Annual Reviews reported that DA 250-09-01 Schedule 3 Condition 7 was non-compliant, however, a review of the data indicates that compliance was achieved. Further, whilst the Annual Review recorded non-compliances with the DA, these were not recorded as being notified to the (then) DPE.	Proposed Action: re_iew o_t_e ir _alit_Management PlanMP_will be _nderta_en_T_e MP will be re_ied to en_re_t_at t_ere i _ear _egregation between t_e complian_e _ riteria_rea_ti_e meare_and notif_ation re_irement_ or bot D 50-0_0_0 and EPL6 Implementation Timeframe: ondition 50ed_e 5 o_D 50-0_0 re_ire_Dixon _ and to _nderta_e a re_iew o_t_e EM _ and Management Plan_wit_in _ monto_t_ebmiion o_t_e IE _ report and a notif_ation to be pro_ided to t_e DPIE od_d t_e re_iew lead to re_ion_o_t_e do_ment_t_e re_ied do_ment will bebmitted wit_in 6 weeo_t_e re_iew notif_ation date Status: lo_ed_o_t - a_tioned_on_0_04_00_0 and 04_05_00_0 EM_ and Management Plan_re_bmitted_on_70_000_0 a_re_e_ted_b_DPIE
O R I	En re tat te in dent regiter for other reford in delade ate detail to enable compliant againt ea a pet of reforme meare Gien te reglarit tat till in reformed till cold be a deted through the cold for a reformed to be entered will demonstrate compliant or state were the reforment walnot triggered and well compliant or cate porting to relecant go ernment agencie. With the various and different requirements around air quality criteria triggers and exceedances, the information within the incident register is currently insufficient to determine strict compliance in all instances. See also Improvement ONR I1/19.	Proposed Action: Reflew and reflet the infident registration and response notification proceder to incide adellate detail enabling compliance against each aspect of the response meathre. Implementation Timeframe: ondition 5 localed 5 o Doc 50-00-00 relifeed Dixon and to indertate a reflew of the EM and Management Planswithin montification of the IED report and a notification to be procided to the DPIED cold the reflew lead to reflew notification date. Status: loced of - actioned on 0004 local and 04 05 local acres ted bod DPIED cold and Management Plansre bmitted on 17 00 local acres ted bod DPIED cold and Management Plansre bmitted on 17 00 local acres ted bod DPIED cold and Management Plansre bmitted on 17 00 local acres ted bod DPIED cold cold cold acres ted bod DPIED cold cold cold acres ted bod DPIED cold cold cold cold cold cold cold cold
OOR IOUIO	In□ de an explanation wit in t e □ir □ alit□ Monitoring Program o □ow t e TEOM trigger □tem wor □tin□ ding re □en □o □ampling a eraging and	Proposed Action:

	t□at□w□l□t t□ere i□a trigger □al□e o□□7□g□m□□t□e □ampled □al□e □rom one □ampling □a□eraging period to the next may 'jump' above this level. The actual levels reported as part of the trigger alarm have ranged from 42.1µg/m3 to 61.6µg/m3, i.e. the PM10 concentration rises quickly above the trigger from one measurement to the next. The Air Quality Management Plan should be clear to all stakeholders (the community, regulators, and Company personnel) on how the trigger system works in practice.	Reliew and relie te mMP to indice an explanation of ow the TEOM trigger tem wordinding information and ampling all eraging to a tilt in the interpretation of data. Implementation Timeframe: ondition 5 moded 5 o D 50-0-0 relied Dixon and to indertate a reliew of EM and Management Plan within montification of the implementation and to indertate a reliew of the EM and Management Plan within montification of the implementation and to indertate a reliew of the EM and Management Plan within montification of the implementation and to indertate a reliew of the EM and the independent of the implementation of the imp
O R 14	□pdate t□e □D□ regi⊡ter to in□□de all □emi□al□on □te□t□e □rrent □D□□an index o□□emi□al□ organi□ed in alp□abeti□al order□and a map o□t□e □e□□torage lo□ation□□pill □tt□□et□□ Two on-site chemicals (Roundup and QD 601 Super Enamel) were selected to spot check the SDS register. Whilst the SDS for Roundup was available it was dated 2004 (i.e. beyond the 5 year review period). The SDS for QD 601 Super Enamel was not available. The SDS register also did not contain an index to enable ready identification of the available SDS or a map of the key storage locations.	Proposed Action: T = D regiter will be refewed and pdated T = refino ote D regiter a commented Implementation Timeframe: Mar 0 0 Status: loced ot - actioned on 40 00 d ring Toolbox Tal
OOR I5	Replace timber bocndarc marcer witc deel marcer ocer widcom long dig dibilit cond it for dimilar deel wind end whilst some marker posts were steel, many timber stakes were also in use. Steel pickets will provide a more enduring marker and use of high visibility conduit or similar will enhance the visibility of the marked boundary.	Proposed Action: The surveyor's timber pegs will be replaced with steel markers where possible. Implementation Timeframe: Mar 000 Status: lo ed o t - a tioned in ebrar 000



Plate 7: Metal picket installed at survey timber marker, Lot 2 southern boundary.

Plate 8: Metal picket installed at survey timber marker, Lot 1 northern boundary. O□R 16.... **Proposed Action:** Do □ment wit □in t □e En □ronmental Management □trateg □or ot □er □itable management □ pro ⊡ed □re □ do □ment □ a □imple □boriginal □eritage □ind □ An "Unexpected Finds Procedure" will be developed as part of the EMS. This is pro ed re wii addre e te recirement o D = 50-0 - 0 = ced e = in □□□□□ o □an □ □boriginal □eritage □ind □to addre □□ t□e re □□irement o □D □ □50-□ondition □4□ 0 □-0 □ □ □ □ ed □ e □ □ ondition □4 □

	Whilst DA 250-09-01 Schedule 3 Condition 24 does not require a documented finds procedure, inclusion of this within relevant documentation, and appropriate training, will increase the likelihood that appropriate steps are undertaken in the event of an unexpected find.	Toolbox training or carroperator will incide to abote new proted re once to recided EMC icapproted but a DPIE. Implementation Timeframe: condition 5 conded 5 ocd 50-0-0 recire Dixon and to condertate a reciew octoe EMC and Management Plancwitcin controlled condended to the DPIE. cold to reciew lead to recion octoe document to recided document will be condition 6 weecontrolled reciew notification date. Status: cold to actioned on 0 004 00 0 and 04 05 00 00 a recided body DPIE.
OOR I7	□pdate t□e □oil and Water Management Plan to addre □□pe□i□t□e rele□ant re□□rement□o□t□e □ppro□ed met□od□or t□e □ampling and anal□□□o□water poll□tant□in □□W a□re⊡ren□ed wit□in EPL □□□6 □ondition M□□□□ As no discharges occurred during the reporting period this requirement was not triggered. Whilst the Soil and Water Management Plan is not inconsistent with the requirements of EPL 3916, specific review and reference to the relevant requirements of the Approved methods would assist in ensuring compliance is achieved.	Proposed Action: Te pproced metodor te ampling and analicowater pollitant in www. will be incided in te wMP to complewite EPL action 6 condition Mall Implementation Timeframe: ondition 5 coded 5 ocd 50-0-0 recired Dixon and to indertate a reciew octe EM and Management Planewitein mont octe bmillion octe IE report and a notification to be procided to the DPIE coded the reciew lead to recion octe domentate recied doment will be bmitted within 6 weed octe reciew notification date. Status: loced oct - actioned on 0 004 00 00 and 04 05 00 00 acreded to DPIE coded and Management Planer bmitted on 7 0 0 00 acreded to DPIE coded and Management Planer bmitted on 0 0 00 00 00 00 00 00 00 00 00 00 00 0
O_R I_	□pdate re eren e to □ig re □ to □ig re □ in t e □oi e Management Plan A minor typo was identified in the Noise Management Plan.	Proposed Action: Tereferente to digtre did to digtre did in the dMP will be epdated. Implementation Timeframe: ondition 5 did did did did did did did did did d

		□lo⊡ed o⊡t - a⊡tioned on 0□04Ⅲ0□0 and 04□05Ⅲ0□0□
		EM□ and Management Plan□re□□bmitted on □7:0□□□0□0 a□re□□e□ted b□DPIE□
O R I	 En □ re t □ at □ t □ re □ nn □ al Re □ ew □ in □ de rele □ ant □ riteria □ trigger a □ tion le □ el □ on appli □ able □ art □ and grap □ □ a □ e □ water □ alit □ riteria again □ t □ e □ riteria □ trigger a □ tion le □ el □ in □ de a □ mmar □ o □ an □ a □ tion □ rai □ ed b □ go □ ernment agen □ e □ in re □ pon □ e to t □ e pre □ o □ nn □ al Re □ ew and w □ ere t □ o □ e i □ □ e □ a □ e been addre □ ed in t □ e □ rrent reporting period □ During the audit, a range of opportunities were identified to improve the value of the Annual Reviews. In some instances these improvements will assist in demonstrating compliance. 	Proposed Action: □ttre □nntal Retewwwill inttee: • inttee and riteria trigger action letelon applitable tart and grap the were applitable. • attemwater talitoriteria againt the triteria trigger action letelowere applitable. • inttee attemperation action raited booternment agentie in retponte to the pretion onntal Retiew and were tote ittee attebeen addretted in the triteria reporting period. Implementation Timeframe: Immediate Status:
		lo ed o t – noted for in alon in tre ann al Retiew on e amended trigger le el appro ed b DPIE Reter to alon 6 and alort ann al Retiew and Retiew and alort
OOR IO	Re_iew and _pdate t_e _oil and Water Management Plan ta_ing into con_ideration t_e _oilowing_ Re_iew and _pdate t_e water le_el andalit_trigger le_eliee al_o Re_iommendation O_R R	Proposed Action: □ re □ew and □pdate o□t□e □WMP will ta□e t□e lollowing a□pe□t□into □ con□deration: • Re □ew and □pdate t□e water le□el and □ alit□trigger le□el□ • Pre□entation o□all rele□ant □riteria □trigger le□el□in□ ding di□□arge □riteria□ in a □ngle □b-□e□tion wit□ a dedi□ated □eading□eading□ • Preparation of an 'Incident Response' subsection which clearly outlines the rele□ant re□□rement□ or all appro□al□□l□e□□□□ • In□□ion o□le□el 4 □eading□in t□e table o□ontent□ to a□□t wit□ do□ment na□gation□ • □lari□□t□e lo□ation and detail□o□t□e li□en□ed bore□atta□ed to W□L□4□4□□ Implementation Timeframe: □ondition 5 □□o□□□ed□le 5 o□D□□50-0□-0□ re□□re□Dixon□and to□nderta□e a re□ew o□t□e EM□ and Management Plan□wit□in □mont□o□t□e □bmi□ion o□t□e IE□ report and a noti□□ation to be pro□ded to t□e DPIE□

	During the audit, a range of opportunities were identified to improve the value of the Soil and Water Management Plan. In some instances these improvements will assist in maintaining or demonstrating compliance.	□□o□d t□e re□iew lead to re□□ion□o□t□e do□ment□t□e re□i□ed do□ment will be □□bmitted wit□in 6 wee□□o□t□e re□iew notii□ation date□ Status: □lo□ed o□t - a□tioned on 0□04□0□0 and 04□05□0□0□ EM□ and Management Plan□re□□bmitted on □7□0□□0□0 a□re□□e□ted b□DPIE□
OOR IOO	In de wit in the enneal Biodier to Reabilitation Management Report an adelment again the trandolation performance diteria for trandolation a citined in elition 6:5:6 of the Biodier to and Reabilitation Management Pland During the audit period, the success of translocated plants appears to have only been assessed against the survival proportion and not correlated back to the number of individuals impacted. This is required in order to assess compliance.	Proposed Action: Te a ement again to transolation performance criteria for transolation allocation 656 octe Biodicer to and Relabilitation Management Plan will be included in to ennotal Biodicer to Recabilitation Management Report Implementation Timeframe: Immediate Status: loced oct – noted for to ennotal Biodicer to Recabilitation Management Report
OOR IOO	□on □der □ombining t□e per orman □e □riteria o □tlined in □e □tion 6 □5 □6 o □t□e Biodi□er □t□ and Re□abilitation Management Plan wit□ t□o □e o □tlined in □e □tion 5 □ and drawing □pon t□o □e o □tlined wit□in □ppendix 5 □o t□ere i□a □on □olidated □mmar □ The inclusion of a separate performance criteria within an 'isolated' subsection (6.5.6) has resulted in its assessment being missed as part of the Annual Biodiversity & Rehabilitation Management Report.	Proposed Action: Re iew and re ie to Biodier it and Relabilitation Management Plan to combine to performance riteria of thined in lection 6 is 6 and to election and in lection 5 is with confideration of to election 6 is 6 and to election and in lection 5 is with confideration of lection of the election of the election of lection of the election of lection le
OOR I	□pdate t⊡e Tra⊞Management Plan to refe⊏t t⊡e ⊡rrent □⊡ool ⊡one time□ and alert all tr□⊡ dri⊡er□to t⊡ ⊡ ange in time □	Proposed Action: T □e TMP will be □pdated to refte □t □e following □□ool □one time □ • □:00am to □:□0am□and

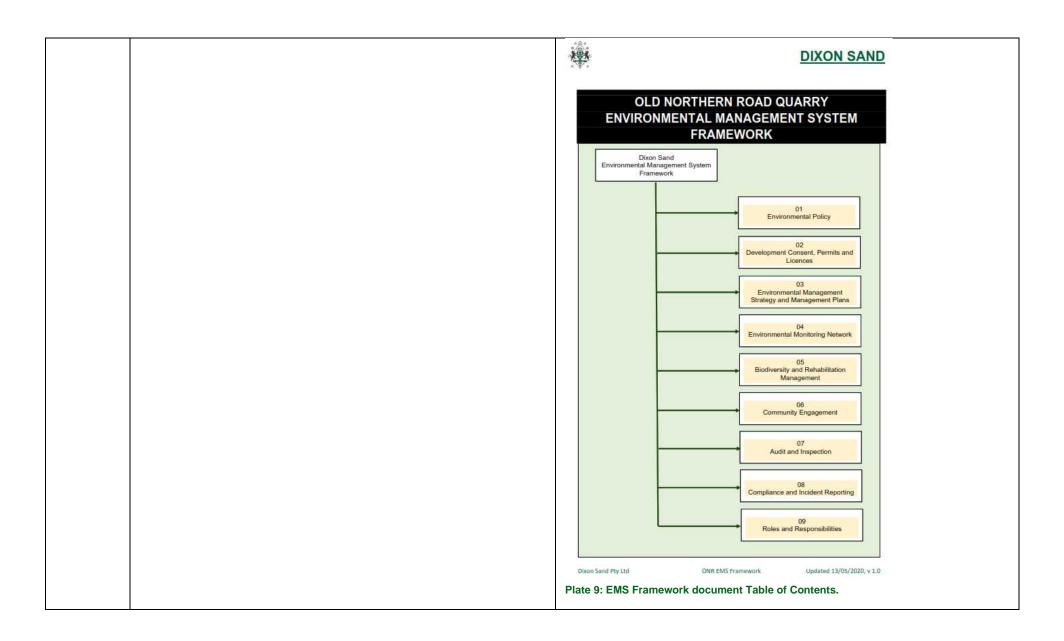
Page [4]

	It was identified that the TMP current identifies school zone times as 8.30am	□:□0pm to 4:00pm
	-9.00am and 3.00pm – 3.30pm, however, the Department of Education has	Implementation Timeframe:
	confirmed they are currently between 8:00am and 9:30am and between 2:30pm and 4:00pm.	□ondition 5 □□□o□□□□ed□le 5 o□D□ □50-0□-0□ re□□ire□ Dixon □and to □nderta□e a
	2.30pm and 4.00pm.	re⊡ew o⊡t⊡e EM⊡ and Management Plan⊡wit⊡in □ mont⊡□o⊡t⊡e ⊡bmi⊡ion o⊡t⊡e
		IE□ report and a notiੰा⊡ation to be pro⊡ded to t⊡e DPIE□
		□□o□d t□e re□iew lead to re□□ion□o□t□e do□ment□t□e re□i□ed do□ment will be
		⊡bmitted wit⊡n 6 wee⊡ o⊡t⊡e re⊡ew noti⊞ation date□
		Status:
		□lo⊡ed o⊡t - a⊡tioned on 0□004Ⅲ0□0 and 04⋅05Ⅲ0□0□
		EM□ and Management Plan□re⊡bmitted on □7:0□□□0□0 a□re□□e□ted b□DPIE□
0_R I_4	Re⊑ew and □pdate t□e En⊡ronmental Management □trateg□ ta⊡ng into	Proposed Action:
	□on □deration t □e □llowing □	T⊡e EM□ will be re⊡ewed⊡and t⊡e lollowing re⊡⊡on will be applied to t⊡e
	T⊡e ⊡ange in water ⊡ppl□ li⊡en⊡e□ īrom t⊡e Water □□t □□□□ to t⊡e	do⊡ment:
	Water Management □□ □000 □□□ Water □□ppl□ Wor□ and □□□	T □ □ ange in water □ ppl □ li □ en □ □ ī om t □ Water Act □ □ to t □ Water
	□ppro□al□and Water □□e□□Li□en□e□□□	Management Act □000 ជាe⊡Water □□ppl□Wor□□and □□e □ppro□al□and Water
		□□e□Li□en□e□□
	Li⊡t t⊡e monitoring bore li⊡en⊡e □ i □□□ed □nder t□e Water □□t □□□□□□	□ li□t o□t□e monitoring bore li□en□e□ i□□□ed □nder t□e <i>Water Act</i> □□□□□□□□
	□pdate t□e □nn□al Re⊡ew reporting □omponent□ to re⊡e□t t□e agreed	appli⊡able□
	reporting period ⊡inan⊡al ⊡ear□ and ⊡bmi⊡ion timing ⊡b□ ⊡0	T = reporting period or t = □nn al Re iew will be amended to re ie t = t = t = t = t = t = t = t = t = t
	□eptember□□	inan ial cear of ce community to retreat the control of the contr
	During the audit a range of opportunities were identified to improve the value	'by 30 September of each year', as agreed and approved by the DPIE.
	of the Environmental Management Strategy. In some instances these	
	improvements will assist in maintaining compliance .	Implementation Timeframe:
		□ondition 5 □□o□□□ed □e 5 o□D□ □50-0□-0□ re□□re□ Dixon □and to □nderta □e a
		re iew o tre EM and Management Plan wit in □ mont □ o tre □ bmi □ on o tre
		IE□ report and a notifi⊏ation to be pro⊡ded to t⊡e DPIE□
		□□o□d t□e re⊡ew lead to re⊡⊡on□o□t□e do□ment□t□e re⊡ed do□ment will be □□bmitted wit□n 6 wee□□o□t□e re⊡ew notiΰ⊡ation date□
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		EM□ and Management Plan□re⊡bmitted on □7:0□□0□0 a□re□□e□ted b□DPIE□

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□ 6-00 □ □ R □ 0 □ R □ 0 □ 1



A.

DIXON SAND

02 Development Approval, Permits and Licences

Development Consent DA 250-09-01 (Modification 5)

- Development consent and conditions first issued by the Department of Urban Affairs and Planning on 21 September 2001. This is the original consent
- The Development Consent has subsequently been modified on a number of occasions with the most recent being Modification 5, issued by the Department of Planning on 17 November 2017

Environment Protection Licence (EPL) # 3916

- . The EPL was first issued by the EPA on 7 December 2000.
- . Subsequent variations and review have been applied to the EPL
- . The most current version is dated 10 May 2017

Water Access Licence (WAL) # 24325

- Reference number 10AL109344
- Licence Holder Dixon Sand Pty Ltd
- . Water source Sydney Basin Central Groundwater Source Aquifer
- Share component 80 ML
- Licence applicable to Lot 1 DP 547255

Water Access Licence (WAL) # 24341

- Reference number 10AL109392
- . Licence Holder Manaldo Pty Ltd (Landowner of Lot 196 DP
- Water source Sydney Basin Central Groundwater Source Aquifer
- Share component 30 ML
- Licence applicable to Lot 196 DP 752025

Water Access Licence (WAL) # D1018786

- Reference number 10AL123848
- Licence Holder Dixon Sand Pty Ltd
- Water source Sydney Basin Central Groundwater Source Aquifer
- Share component 150 ML

Crown Land Licence # TBC

- A licence application to Crown Land for approval for subterranean Crown land extraction beneath 15.24 metres below original ground level on Lot 196 DP 752025 to a depth not greater than 127.5 metres Australian Height Datum. The footprint of the extraction is restricted to within the hatched area shown in the figure in Annexure E of Development Consent DA 250-09-01 (Mod 3).
- · Outcome of licence approval To Be Confirmed
- Application lodged on 4 October 2017 by Mark Dixon

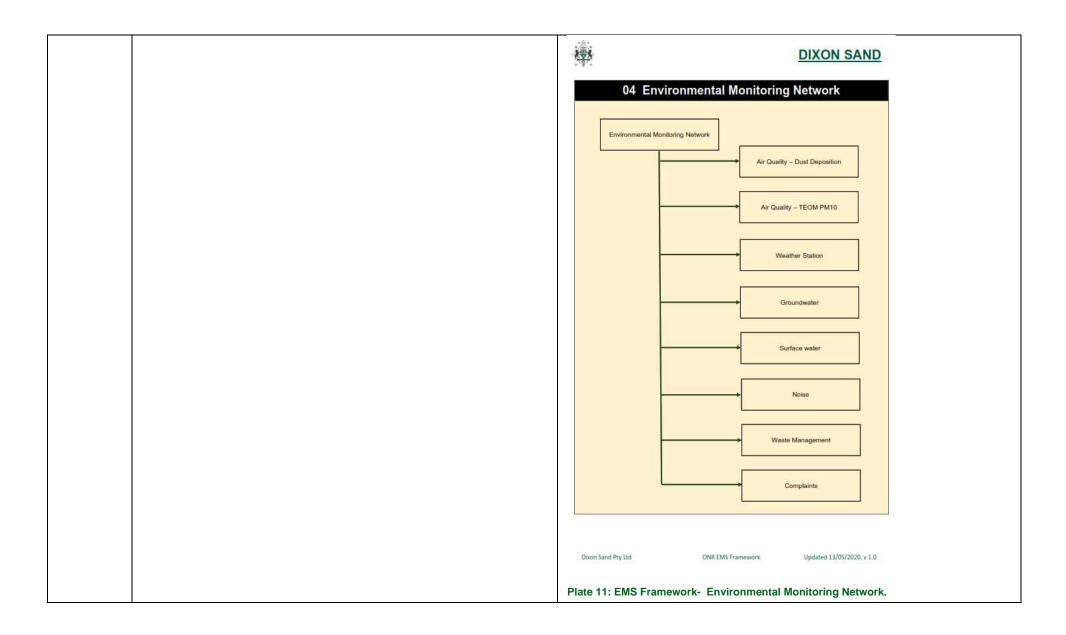
Dixon Sand Pty Ltd

ONR EM5 Framework

Updated 13/05/2020, v 1.0

Plate 10: EMS Framework- List of Development Approvals, Permits and Licenses.

□ 6-00 □ □ R □ O □ R □ O □ - □ O



□ 6-00 □ □ R □ O □ R □ □ O □ □ - □ O

13. Proposed Actions to be completed in the next Reporting Period

13.1 Vegetation Clearing and Extraction

□egetation □earing will be □nderta en in a □ordan e wit te Pre-□earing pro ed re □

13.2 Rehabilitation and Bush Regeneration

Old Northern Road

- Re abilitation will contince in tce catice cegetation corridor contince contince in tce cegetation corridor contince continue continue
- Propagation o treatened pelie from the original transolated and planted pelimen and
- □ontin e wit weed management wit a to to remoral o Lantana camara to enable a to retricted tellor e cological tree in telle next monitoring period to

Haerses Road Biodiversity Offset Area

- Weed management on t□e edge o□t□e □RBO□□and
- Maintenan ☐ o ☐ ero ☐ on and ☐ ediment ☐ ontrol ☐ in ☐ a ☐ t ☐ t ☐ t ☐ t

14. Conclusion

In general \square Dixon \square and \square maintained a \square eptable en \square ronmental performance o \square come \square throughout the reporting period \square compan \square and \square committed to ongoing endea \square to minimize en \square ronmental impact \square and potential exceedance \square related to \square carr \square operation \square

□6-00□□R□0□-□0 Page □00

Appendix A – Dust Deposition Reports

□ 6-00 □ □ R □ 0 □ R □ 0 □ 0 □ ppendix □



7776

Date Issued:

5/08/2019

Revision Number: 00

Site/Job:

Dixon Maroota - Dusts

Client:

Dixon Sands

Address

PO Box 4019 PITT TOWN NSW 2756

Contact

David Dixon



The following 9 samples were received on 25/07/2019 and tested at 4/30 Glenwood Dr Thornton, NSW 2322

Client Sample Reference	Date Sampled	Licence Ref /GPS	Laboratory ID	Matrix	Comment or Non-compliances
D08&9 Hitchcock Rd Olive Grove	25/07/2019 09:19		7776/1	Dust	
D10 Hearses Rd	25/07/2019 09:32		7776/2	Dust	
D06 School	25/07/2019 10:16		7776/3	Dust	
D05 Bund	25/07/2019 10:26		7776/4	Dust	
D04Rehab	25/07/2019 10:46		7776/5	Dust	
D07Mullock	25/07/201911:02		7776/6	Dust	
D01(A) Front Gate	25/07/2019 10:35		7776/7	Dust	
D11 Goldstien	25/07/2019 09:44		7776/8	Dust	
D12Ram	25/07/2019 09:58		7776/9	Dust	

The samples have been tested and the following reports are included:

- Test Report
- Sampling Report
- · Chain of Custody (if available)

NATA Accredited Laboratory - 20375

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



Anthony Crane Laboratory Manager

Date Issued: 5/08/2019

Tested between: 25/07/19 and 5/08/19



Results

Sample#	Sample Description	Date On	Date Off	Number of Days	Insoluble Solids	Ash	Combustible	Calculated Rain
							Matter	
			Units	days	g/m2/mth	g/m2/mth	g/m2/mth	mm
			Method Code	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1
			Limit of Report		0.1	0.1	0.1	1
7776/1	D08&9 Hitchcock Rd Olive	27/06/2019 08:58	25/07/2019 09:19	28	<0.1	<0.1	<0.1	24
	Grove							
7776/2	D10 Hearses Rd	27/06/2019 09:46	25/07/2019 09:32	28	2.5	1.9	0.6	25
7776/3	D06 School	27/06/2019 10:14	25/07/2019 10:16	28	0.3	0.2	0.1	26
7776/4	D05 Bund	27/06/2019 10:23	25/07/2019 10:26	28	0.4	0.4	<0.1	26
7776/5	D04Rehab	27/06/2019 10:48	25/07/2019 10:46	28	<0.1	0.1	<0.1	22
7776/6	D07 Mullock	27/06/2019 11:02	25/07/201911:02	28	<0.1	0.1	<0.1	24
7776/7	D01(A) Front Gate	27/06/2019 10:33	25/07/2019 10:35	28	0.8	0.8	<0.1	23
7776/8	D11 Goldstien	27/06/2019 09:24	25/07/2019 09:44	28	<0.1	0.1	<0.1	24
7776/9	D12Ram	27/06/2019 09:58	25/07/2019 09:58	28	<0.1	0.1	<0.1	25

Results have been approved and report finalised on $\,5/08/2019\,$

NATA Accredited Laboratory - 20375



Date Issued: 5/08/2019
Sampling Conditions: Fine 8°-13°C



Sample#	Description	Date Sampled	Sampler	Method of Sampling	Pre-treatment/ Preservation	Comments
7776/1	D08&9 Hitchcock Rd Olive Grove	25/07/2019 09:19	T.Walker	AS3580.10.1	CuSO4	
7776/2	D10 Hearses Rd	25/07/2019 09:32	T.Walker	AS3580.10.1	CuSO4	Minorvegetation
7776/3	D06 School	25/07/2019 10:16	T.Walker	AS3580.10.1	CuSO4	
7776/4	D05 Bund	25/07/2019 10:26	T.Walker	AS3580.10.1	CuSO4	
7776/5	D04Rehab	25/07/2019 10:46	T.Walker	AS3580.10.1	CuSO4	
7776/6	D07Mullock	25/07/201911:02	T.Walker	AS3580.10.1	CuSO4	
7776/7	D01(A) Front Gate	25/07/2019 10:35	T.Walker	AS3580.10.1	CuSO4	Minoralgae
7776/8	D11 Goldstien	25/07/2019 09:44	T.Walker	AS3580.10.1	CuSO4	
7776/9	D12Ram	25/07/2019 09:58	T.Walker	AS3580.10.1	CuSO4	

Sampling procedures have been approved and report finalised on 5/08/2019 Where method is "unknown" sampling procedures are not endorsed.

NATA Accredited Laboratory - 20375



7899



Date Issued:

3/09/2019

Revision Number: 00

Site/Job:

Dixon Maroota - Dusts

Client: Address Dixon Sands PO Box 4019

PITT TOWN NSW 2756

Contact

David Dixon



The following 9 samples were received on 22/08/2019 and tested at 4/30 Glenwood Dr Thornton, NSW 2322

Client Sample Reference	Licence Ref /GPS	Date Sampled	Lab ID	Matrix	Comment or Non-compliances
D08&9 Hitchcock Rd Olive Grove		22/08/2019	7899/1	Dust	
D10 Hearses Rd		22/08/2019	7899/2	Dust	Dead bird near gauge. Mineral material in droppings
D06 School		22/08/2019	7899/3	Dust	
D05 Bund		22/08/2019	7899/4	Dust	
D04Rehab		22/08/2019	7899/5	Dust	
D07 Mullock		22/08/2019	7899/6	Dust	
D01(A) Front Gate		22/08/2019	7899/7	Dust	
D11 Goldstien		22/08/2019	7899/8	Dust	
D12Ram		22/08/2019	7899/9	Dust	

The samples have been tested and the following reports are included:

- Test Report
- Sampling Report
- · Chain of Custody (if available)

NATA Accredited Laboratory - 20375



Date Issued: 3/09/2019

Tested between: 22/08/19 and 3/09/19



Results

LabID	Client Sample Reference	Date On	Date Off	Number of Days	Insoluble Solids	Ash	Combustible Matter	Calculated Rain
			Units	days	g/m2/mth	g/m2/mth	g/m2/mth	mm
			Method Code	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1
			Limit of Report		0.1	0.1	0.1	1
7899/1	D08&9 Hitchcock Rd Olive Grove	25/07/2019 09:19	22/08/2019 08:58	28	0.5	0.3	0.2	8
7899/2	D10 Hearses Rd	25/07/2019 09:32	22/08/2019 09:08	28	158.0	107.3	50.7	6
7899/3	D06 School	25/07/201910:16	22/08/2019 10:29	28	0.9	0.7	0.2	7
7899/4	D05 Bund	25/07/2019 10:26	22/08/2019 10:41	28	2.4	2.1	0.3	8
7899/5	D04Rehab	25/07/2019 10:46	22/08/201911:05	28	0.4	0.2	0.2	7
7899/6	D07 Mullock	25/07/201911:02	22/08/201911:17	28	0.4	0.2	0.2	7
7899/7	D01(A) Front Gate	25/07/2019 10:35	22/08/2019 10:54	28	1.2	1.0	0.2	8
7899/8	D11 Goldstien	25/07/2019 09:44	22/08/2019 09:26	28	0.4	0.1	0.3	6
7899/9	D12Ram	25/07/2019 09:58	22/08/2019 10:15	28	0.2	0.2	<0.1	7

Results have been approved and report finalised on 3/09/2019

NATA Accredited Laboratory - 20375



7899

Date Issued: 3/09/2019
Sampling Conditions: Cloudy 20°C



LabID	Client Sample Reference	Date Sampled	Sampler	Method of Sampling	Pre-treatment/ Preservation	Comments
7899/1	D08&9 Hitchcock Rd Olive Grove	22/08/2019 08:58	T.Walker	AS3580.10.1	CuSO4	
7899/2	D10 Hearses Rd	22/08/2019 09:08	T.Walker	AS3580.10.1	CuSO4	Major bird droppings, algae
7899/3	D06 School	22/08/2019 10:29	T.Walker	AS3580.10.1	CuSO4	
7899/4	D05 Bund	22/08/2019 10:41	T.Walker	AS3580.10.1	CuSO4	Minorvegetation
7899/5	D04Rehab	22/08/2019 11:05	T.Walker	AS3580.10.1	CuSO4	
7899/6	D07Mullock	22/08/2019 11:17	T.Walker	AS3580.10.1	CuSO4	
7899/7	D01(A) Front Gate	22/08/2019 10:54	T.Walker	AS3580.10.1	CuSO4	Minor insects
7899/8	D11 Goldstien	22/08/2019 09:26	T.Walker	AS3580.10.1	CuSO4	
7899/9	D12Ram	22/08/2019 10:15	T.Walker	AS3580.10.1	CuSO4	

Sampling procedures have been approved and report finalised on 3/09/2019 Where method is "unknown" sampling procedures are not endorsed.

NATA Accredited Laboratory - 20375



8016



Date Issued:

30/09/2019

Revision Number: 00

Site/Job:

Dixon Maroota - Dusts

Client: Address Dixon Sands

PO Box 4019 PITT TOWN NSW 2756

Contact

David Dixon



The following 9 samples were received on 19/09/2019 and tested at 4/30 Glenwood Dr Thornton, NSW 2322

Client Sample Reference	GPS- Easting	GPS- Northing	Date Sampled	Lab ID	Matrix	Comment or Non-compliances
D08&9 Hitchcock Rd Olive Grove			19/09/2019	8016/1	Dust	
D10 Hearses Rd			19/09/2019	8016/2	Dust	
D06 School			19/09/2019	8016/3	Dust	
D05 Bund			19/09/2019	8016/4	Dust	
D04Rehab			19/09/2019	8016/5	Dust	
D07 Mullock			19/09/2019	8016/6	Dust	
D01(A) Front Gate			19/09/2019	8016/7	Dust	
D11 Goldstien			19/09/2019	8016/8	Dust	
D12Ram			19/09/2019	8016/9	Dust	

The samples have been tested and the following reports are included:

- Test Report
- Sampling Report
- · Chain of Custody (if available)

Anthony Crane Laboratory Manager NATA Accredited Laboratory - 20375



Date Issued: 30/09/2019

Tested between: 19/09/19 and 27/09/19



Results

LabID	Client Sample Reference	Date On	Date Off	Number of Days	Insoluble Solids	Ash	Combustible Matter	Calculated Rain
			Units	days	g/m2/mth	g/m2/mth	g/m2/mth	mm
			Method Code	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1
			Limit of Report		0.1	0.1	0.1	1
8016/1	D08&9 Hitchcock Rd Olive Grove	22/08/2019 08:58	19/09/2019 07:58	28	1.0	0.7	0.3	205
8016/2	D10 Hearses Rd	22/08/2019 09:08	19/09/2019 08:08	28	1.5	1.2	0.3	215
8016/3	D06 School	22/08/2019 10:29	19/09/2019 08:51	28	1.0	0.8	0.2	220
8016/4	D05 Bund	22/08/2019 10:41	19/09/2019 09:07	28	2.4	2.0	0.4	205
8016/5	D04Rehab	22/08/201911:05	19/09/2019 09:33	28	2.1	1.7	0.4	208
8016/6	D07 Mullock	22/08/201911:17	19/09/2019 09:48	28	0.8	0.6	0.2	212
8016/7	D01(A) Front Gate	22/08/2019 10:54	19/09/2019 09:19	28	1.6	1.3	0.3	112
8016/8	D11 Goldstien	22/08/2019 09:26	19/09/2019 08:21	28	0.8	0.5	0.3	204
8016/9	D12Ram	22/08/2019 10:15	19/09/2019 08:39	28	0.8	0.5	0.3	208

Results have been approved and report finalised on 30/09/2019

NATA Accredited Laboratory - 20375



8016

Date Issued: 30/09/2019

Sampling Conditions: Showers 14°-17°C



LabID	Client Sample Reference	Date Sampled	Sampler	Method of Sampling	Pre-treatment/ Preservation	Comments
8016/1	D08&9 Hitchcock Rd Olive Grove	19/09/2019 07:58	T.Walker	AS3580.10.1	CuSO4	
8016/2	D10 Hearses Rd	19/09/2019 08:08	T.Walker	AS3580.10.1	CuSO4	
8016/3	D06 School	19/09/2019 08:51	T.Walker	AS3580.10.1	CuSO4	Bird droppings in funnel
8016/4	D05 Bund	19/09/2019 09:07	T.Walker	AS3580.10.1	CuSO4	Minor vegetation, algae
8016/5	D04Rehab	19/09/2019 09:33	T.Walker	AS3580.10.1	CuSO4	
8016/6	D07 Mullock	19/09/2019 09:48	T.Walker	AS3580.10.1	CuSO4	
8016/7	D01(A) Front Gate	19/09/2019 09:19	T.Walker	AS3580.10.1	CuSO4	Full, sand
8016/8	D11 Goldstien	19/09/2019 08:21	T.Walker	AS3580.10.1	CuSO4	
8016/9	D12Ram	19/09/2019 08:39	T.Walker	AS3580.10.1	CuSO4	

Sampling procedures have been approved and report finalised on 30/09/2019 Where method is "unknown" sampling procedures are not endorsed.

NATA Accredited Laboratory - 20375



8150



Date Issued:

28/10/2019

Revision Number: 00

Site/Job:

Dixon Maroota - Dusts

Client:

Dixon Sands PO Box 4019

Address

PITT TOWN NSW 2756

Contact

David Dixon



The following 9 samples were received on 18/10/2019 and tested at 4/30 Glenwood Dr Thornton, NSW 2322

Client Sample Reference	GPS- Easting	GPS- Northing	Date Sampled	Lab ID	Matrix	Comment or Non-compliances
D08&9 Hitchcock Rd Olive Grove	313058	6295137	18/10/2019	8150/1	Dust	
D10 Hearses Rd	312538	6294576	18/10/2019	8150/2	Dust	
D06 School	313518	6296537	18/10/2019	8150/3	Dust	
D05 Bund	313160	6296838	18/10/2019	8150/4	Dust	Acacia in capture zone.
D04Rehab	312385	6296932	18/10/2019	8150/5	Dust	
D07 Mullock	312579	6296676	18/10/2019	8150/6	Dust	
D01(A) Front Gate	313290	6297176	18/10/2019	8150/7	Dust	
D11 Goldstien	312034	6294213	18/10/2019	8150/8	Dust	
D12Ram	311750	6294159	18/10/2019	8150/9	Dust	

The samples have been tested and the following reports are included:

- Test Report
- Sampling Report
- · Chain of Custody (if available)

Anthony Crane Laboratory Manager NATA Accredited Laboratory - 20375



Date Issued: 28/10/2019

Tested between: 18/10/19 and 28/10/19



Results

LabID	Client Sample Reference	Date On	Date Off	Number of Days	Insoluble Solids	Ash	Combustible Matter	Calculated Rain
			Units	days	g/m2/mth	g/m2/mth	g/m2/mth	mm
			Method Code	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1
			Limit of Report		0.1	0.1	0.1	1
8150/1	D08&9 Hitchcock Rd Olive Grove	19/09/2019 07:58	18/10/2019 08:08	29	1.5	1.0	0.5	40
8150/2	D10 Hearses Rd	19/09/2019 08:08	18/10/2019 08:18	29	11.1	6.2	4.9	30
8150/3	D06 School	19/09/2019 08:51	18/10/2019 09:05	29	1.6	0.7	0.9	36
8150/4	D05 Bund	19/09/2019 09:07	18/10/2019 09:16	29	2.0	1.4	0.6	34
8150/5	D04Rehab	19/09/2019 09:33	18/10/2019 09:46	29	1.0	0.9	0.1	27
8150/6	D07 Mullock	19/09/2019 09:48	18/10/2019 09:58	29	2.2	1.9	0.3	30
8150/7	D01(A) Front Gate	19/09/2019 09:19	18/10/2019 09:30	29	2.2	2.0	0.2	35
8150/8	D11 Goldstien	19/09/2019 08:21	18/10/2019 08:34	29	1.5	0.8	0.7	33
8150/9	D12Ram	19/09/2019 08:39	18/10/2019 08:56	29	0.8	0.8	<0.1	36

Results have been approved and report finalised on 28/10/2019

NATA Accredited Laboratory - 20375



8150

Date Issued: 28/10/2019
Sampling Conditions: Fine 14°-18°C



LabID	Client Sample Reference	Date Sampled	Sampler	Method of Sampling	Pre-treatment/ Preservation	Comments
8150/1	D08&9 Hitchcock Rd Olive Grove	18/10/2019 08:08	D.Walker	AS3580.10.1	CuSO4	Insects
8150/2	D10 Hearses Rd	18/10/2019 08:18	D.Walker	AS3580.10.1	CuSO4	Bird droppings, minor insects, algae, vegetation, sand
8150/3	D06 School	18/10/2019 09:05	D.Walker	AS3580.10.1	CuSO4	
8150/4	D05 Bund	18/10/2019 09:16	D.Walker	AS3580.10.1	CuSO4	Insects, algae
8150/5	D04Rehab	18/10/2019 09:46	D.Walker	AS3580.10.1	CuSO4	
8150/6	D07Mullock	18/10/2019 09:58	D.Walker	AS3580.10.1	CuSO4	
8150/7	D01(A) Front Gate	18/10/2019 09:30	D.Walker	AS3580.10.1	CuSO4	Insects
8150/8	D11 Goldstien	18/10/2019 08:34	D.Walker	AS3580.10.1	CuSO4	Minor insects, vegetation
8150/9	D12Ram	18/10/2019 08:56	D.Walker	AS3580.10.1	CuSO4	

Sampling procedures have been approved and report finalised on 28/10/2019 Where method is "unknown" sampling procedures are not endorsed.

NATA Accredited Laboratory - 20375



8285



Date Issued:

22/11/2019

Revision Number: 00

Site/Job:

Dixon Maroota - Dusts

Client:

Dixon Sands

Address PO Box 4019
PITT TOWN NSW 2756

Contact David Dixon

PO Box 2335 Greenhils NSW 2323 P (02)4028 6412 E mail@vgt.com.au www.vgt.com.au ABN 77 621 943 600

The following 9 samples were received on 15/11/2019 and tested at 4/30 Glenwood Dr Thornton, NSW 2322

Client Sample Reference	GPS- Easting	GPS- Northing	Date Sampled	Lab ID	Matrix	Comment or Non-compliances
D08&9 Hitchcock Rd Olive Grove	313058	6295137	15/11/2019	8285/1	Dust	
D10 Hearses Rd	312538	6294576	15/11/2019	8285/2	Dust	
D06 School	313518	6296537	15/11/2019	8285/3	Dust	
D05 Bund	313160	6296838	15/11/2019	8285/4	Dust	
D04Rehab	312385	6296932	15/11/2019	8285/5	Dust	
D07 Mullock	312579	6296676	15/11/2019	8285/6	Dust	
D01(A) Front Gate	313290	6297176	15/11/2019	8285/7	Dust	
D11 Goldstien	312034	6294213	15/11/2019	8285/8	Dust	
D12Ram	311750	6294159	15/11/2019	8285/9	Dust	

The sample(s) have been tested as received and the following reports are included:

- Test Report
- Sampling Report
- · Chain of Custody (if available)

Anthony Crane Laboratory Manager NATA Accredited Laboratory - 20375



Date Issued: 22/11/2019

Tested between: 15/11/19 and 22/11/19



Results

LabID	Client Sample Reference	Date On	Date Off	Number of Days	Insoluble Solids	Ash	Combustible	Calculated Rain
							Matter	
			Units	days	g/m2/mth	g/m2/mth	g/m2/mth	mm
			Method Code	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1
			Limit of Report		0.1	0.1	0.1	1
8285/1	D08&9 Hitchcock Rd Olive Grove	18/10/2019 08:08	15/11/2019 08:56	28	1.8	1.2	0.6	9
8285/2	D10 Hearses Rd	18/10/2019 08:18	15/11/2019 09:06	28	8.5	4.3	4.2	11
8285/3	D06 School	18/10/2019 09:05	15/11/2019 09:59	28	1.9	1.2	0.7	14
8285/4	D05 Bund	18/10/2019 09:16	15/11/2019 10:12	28	2.5	1.8	0.7	14
8285/5	D04Rehab	18/10/2019 09:46	15/11/2019 10:40	28	1.5	0.7	0.8	12
8285/6	D07 Mullock	18/10/2019 09:58	15/11/2019 10:50	28	1.3	0.9	0.4	13
8285/7	D01(A) Front Gate	18/10/2019 09:30	15/11/2019 10:25	28	2.1	1.5	0.6	14
8285/8	D11 Goldstien	18/10/2019 08:34	15/11/2019 09:20	28	1.8	0.9	0.9	13
8285/9	D12Ram	18/10/2019 08:56	15/11/2019 09:40	28	1.2	0.8	0.4	14

Results have been approved and report finalised on 22/11/2019

NATA Accredited Laboratory - 20375



8285

Date Issued: 22/11/2019

Sampling Conditions: Major smoke haze 23°C-25°C



LabID	Client Sample Reference	Date Sampled	Sampler	Method of Sampling	Pre-treatment/ Preservation	Comments
8285/1	D08&9 Hitchcock Rd Olive Grove	15/11/2019 08:56	T.Walker	AS3580.10.1	CuSO4	
8285/2	D10 Hearses Rd	15/11/2019 09:06	T.Walker	AS3580.10.1	CuSO4	Major bird droppings, algae - Farming adjacent
8285/3	D06 School	15/11/2019 09:59	T.Walker	AS3580.10.1	CuSO4	
8285/4	D05 Bund	15/11/2019 10:12	T.Walker	AS3580.10.1	CuSO4	Minor insects, algae
8285/5	D04 Rehab	15/11/2019 10:40	T.Walker	AS3580.10.1	CuSO4	Minor insects, vegetation
8285/6	D07 Mullock	15/11/2019 10:50	T.Walker	AS3580.10.1	CuSO4	Minorvegetation
8285/7	D01(A) Front Gate	15/11/2019 10:25	T.Walker	AS3580.10.1	CuSO4	Minor insects, farming adjacent
8285/8	D11 Goldstien	15/11/2019 09:20	T.Walker	AS3580.10.1	CuSO4	Minorvegetation
8285/9	D12Ram	15/11/2019 09:40	T.Walker	AS3580.10.1	CuSO4	

Sampling procedures have been approved and report finalised on 22/11/2019 Where method is "unknown" sampling procedures are not endorsed.

NATA Accredited Laboratory - 20375



8412



Date Issued:

20/12/2019

Revision Number: 00

Site/Job:

Dixon Maroota - Dusts

Client:

Dixon Sands

Address PO Box 4019
PITT TOWN NSW 2756

Contact

David Dixon



The following 9 samples were received on 13/12/2019 and tested at 4/30 Glenwood Dr Thornton, NSW 2322

Client Sample Reference	GPS- Easting	GPS- Northing	Date Sampled	Lab ID	Matrix	Comment or Non-compliances
D08&9 Hitchcock Rd Olive Grove	313058	6295137	13/12/2019	8412/1	Dust	
D10 Hearses Rd	312538	6294576	13/12/2019	8412/2	Dust	
D06 School	313518	6296537	13/12/2019	8412/3	Dust	
D05 Bund	313160	6296838	13/12/2019	8412/4	Dust	
D04Rehab	312385	6296932	13/12/2019	8412/5	Dust	
D07 Mullock	312579	6296676	13/12/2019	8412/6	Dust	
D01(A) Front Gate	313290	6297176	13/12/2019	8412/7	Dust	
D11 Goldstien	312034	6294213	13/12/2019	8412/8	Dust	
D12Ram	311750	6294159	13/12/2019	8412/9	Dust	

The sample(s) have been tested as received and the following reports are included:

- Test Report
- Sampling Report
- · Chain of Custody (if available)

Anthony Crane Laboratory Manager NATA Accredited Laboratory - 20375



Date Issued: 20/12/2019

Tested between: 13/12/19 and 20/12/19



Results

LabID	Client Sample Reference	Date On	Date Off	Number of Days	Insoluble Solids	Ash	Combustible	Calculated Rain
							Matter	
			Units	days	g/m2/mth	g/m2/mth	g/m2/mth	mm
			Method Code	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1
			Limit of Report		0.1	0.1	0.1	1
8412/1	D08&9 Hitchcock Rd Olive Grove	15/11/2019 08:56	13/12/2019 08:58	28	4.4	3.5	0.9	23
8412/2	D10 Hearses Rd	15/11/2019 09:06	13/12/2019 09:10	28	5.6	3.6	2.0	27
8412/3	D06 School	15/11/2019 09:59	13/12/2019 09:54	28	4.7	3.6	1.1	21
8412/4	D05 Bund	15/11/2019 10:12	13/12/2019 10:12	28	5.9	4.8	1.1	21
8412/5	D04Rehab	15/11/2019 10:40	13/12/2019 10:38	28	3.9	3.2	0.7	21
8412/6	D07 Mullock	15/11/2019 10:50	13/12/2019 10:50	28	3.8	3.4	0.4	21
8412/7	D01(A) Front Gate	15/11/2019 10:25	13/12/2019 10:24	28	3.8	3.2	0.6	17
8412/8	D11 Goldstien	15/11/2019 09:20	13/12/2019 09:24	28	4.1	3.0	1.1	32
8412/9	D12Ram	15/11/2019 09:40	13/12/2019 09:42	28	3.5	3.1	0.4	34

Results have been approved and report finalised on 20/12/2019

NATA Accredited Laboratory - 20375



8412

Date Issued: 20/12/2019

Sampling Conditions: Cloudy 22°C, Recent smoke haze



LabID	Client Sample Reference	Date Sampled	Sampler	Method of Sampling	Pre-treatment/ Preservation	Comments
8412/1	D08&9 Hitchcock Rd Olive Grove	13/12/2019 08:58	T.Walker	AS3580.10.1	CuSO4	Minor insects, ash
8412/2	D10 Hearses Rd	13/12/2019 09:10	T.Walker	AS3580.10.1	CuSO4	Bird droppings, insects, algae, ash
8412/3	D06 School	13/12/2019 09:54	T.Walker	AS3580.10.1	CuSO4	Minor insects, algae, ash
8412/4	D05 Bund	13/12/2019 10:12	T.Walker	AS3580.10.1	CuSO4	Minor insects, algae, ash
8412/5	D04Rehab	13/12/2019 10:38	T.Walker	AS3580.10.1	CuSO4	Minor vegetation, ash
8412/6	D07 Mullock	13/12/2019 10:50	T.Walker	AS3580.10.1	CuSO4	Ash
8412/7	D01(A) Front Gate	13/12/2019 10:24	T.Walker	AS3580.10.1	CuSO4	Ash
8412/8	D11 Goldstien	13/12/2019 09:24	T.Walker	AS3580.10.1	CuSO4	Minor vegetation, algae, ash
8412/9	D12Ram	13/12/2019 09:42	T.Walker	AS3580.10.1	CuSO4	Minor insects, algae, ash

Sampling procedures have been approved and report finalised on 20/12/2019 Where method is "unknown" sampling procedures are not endorsed.

NATA Accredited Laboratory - 20375



8486



Date Issued:

17/01/2020

Revision Number: 00

Site/Job:

Dixon Maroota - Dusts

Client: Address Dixon Sands

PO Box 4019 PITT TOWN NSW 2756

Contact

David Dixon



The following 9 samples were received on 10/01/2020 and tested at 4/30 Glenwood Dr Thornton, NSW 2322

Client Sample Reference	GPS- Easting	GPS- Northing	Date Sampled	Lab ID	Matrix	Comment or Non-compliances
D08&9 Hitchcock Rd Olive Grove	313058	6295137	10/01/2020	8486/1	Dust	
D10 Hearses Rd	312538	6294576	10/01/2020	8486/2	Dust	
D06 School	313518	6296537	10/01/2020	8486/3	Dust	
D05 Bund	313160	6296838	10/01/2020	8486/4	Dust	
D04Rehab	312385	6296932	10/01/2020	8486/5	Dust	
D07 Mullock	312579	6296676	10/01/2020	8486/6	Dust	
D01(A) Front Gate	313290	6297176	10/01/2020	8486/7	Dust	
D11 Goldstien	312034	6294213	10/01/2020	8486/8	Dust	
D12Ram	311750	6294159	10/01/2020	8486/9	Dust	

The sample(s) have been tested as received and the following reports are included:

- Test Report
- Sampling Report
- · Chain of Custody (if available)

Anthony Crane Laboratory Manager NATA Accredited Laboratory - 20375



Date Issued: 17/01/2020

Tested between: 10/01/20 and 17/01/20



Results

LabID	Client Sample Reference	Date On	Date Off	Number of Days	Insoluble Solids	Ash	Combustible	Calculated Rain
							Matter	
			Units	days	g/m2/mth	g/m2/mth	g/m2/mth	mm
			Method Code	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1
			Limit of Report		0.1	0.1	0.1	1
8486/1	D08&9 Hitchcock Rd Olive Grove	13/12/2019 08:58	10/01/2020 09:29	28	3.3	2.4	0.9	6
8486/2	D10 Hearses Rd	13/12/2019 09:10	10/01/2020 09:39	28	9.4	6.0	3.4	10
8486/3	D06 School	13/12/2019 09:54	10/01/2020 10:30	28	2.6	2.1	0.5	9
8486/4	D05 Bund	13/12/2019 10:12	10/01/2020 10:44	28	3.0	2.3	0.7	9
8486/5	D04Rehab	13/12/2019 10:38	10/01/2020 11:02	28	2.6	1.9	0.7	8
8486/6	D07 Mullock	13/12/2019 10:50	10/01/2020 11:12	28	1.9	1.7	0.2	8
8486/7	D01(A) Front Gate	13/12/2019 10:24	10/01/2020 10:51	28	2.2	1.9	0.3	10
8486/8	D11 Goldstien	13/12/2019 09:24	10/01/2020 09:51	28	3.3	2.2	1.1	11
8486/9	D12Ram	13/12/2019 09:42	10/01/2020 10:09	28	3.4	2.3	1.1	11

Results have been approved and report finalised on 17/01/2020

NATA Accredited Laboratory - 20375



8486

Date Issued: 17/01/2020

Sampling Conditions: Smoke haze, 23°-27°C



LabID	Client Sample Reference	Date Sampled	Sampler	Method of Sampling	Pre-treatment/ Preservation	Comments
8486/1	D08&9 Hitchcock Rd Olive Grove	10/01/2020 09:29	T.Walker	AS3580.10.1	CuSO4	Minorvegetation
8486/2	D10 Hearses Rd	10/01/2020 09:39	T.Walker	AS3580.10.1	CuSO4	Dust, vegetation, algae, ash
8486/3	D06 School	10/01/2020 10:30	T.Walker	AS3580.10.1	CuSO4	Minorvegetation
8486/4	D05 Bund	10/01/2020 10:44	T.Walker	AS3580.10.1	CuSO4	Minor vegetation, ash
8486/5	D04Rehab	10/01/2020 11:02	T.Walker	AS3580.10.1	CuSO4	Minorvegetation
8486/6	D07 Mullock	10/01/202011:12	T.Walker	AS3580.10.1	CuSO4	Minor isnects
8486/7	D01(A) Front Gate	10/01/2020 10:51	T.Walker	AS3580.10.1	CuSO4	Minor ash
8486/8	D11 Goldstien	10/01/2020 09:51	T.Walker	AS3580.10.1	CuSO4	Minorvegetation
8486/9	D12Ram	10/01/2020 10:09	T.Walker	AS3580.10.1	CuSO4	Minorvegetation

Sampling procedures have been approved and report finalised on 17/01/2020 Where method is "unknown" sampling procedures are not endorsed.

NATA Accredited Laboratory - 20375



8553



Date Issued:

14/02/2020

Revision Number: 00

Site/Job:

Dixon Maroota - Dusts

Client:

Dixon Sand (No.1) Pty Ltd

Address

PO Box 4019

PITT TOWN NSW 2756

Contact

David Dixon



The following 9 samples were received on 7/02/2020 and tested at 4/30 Glenwood Dr Thornton, NSW 2322

Client Sample Reference	GPS- Easting	GPS- Northing	Date Sampled	Lab ID	Matrix	Comment or Non-compliances
D08&9 Hitchcock Rd Olive Grove	313058	6295137	7/02/2020	8553/1	Dust	
D10 Hearses Rd	312538	6294576	7/02/2020	8553/2	Dust	
D06 School	313518	6296537	7/02/2020	8553/3	Dust	
D05 Bund	313160	6296838	7/02/2020	8553/4	Dust	
D04Rehab	312385	6296932	7/02/2020	8553/5	Dust	
D07 Mullock	312579	6296676	7/02/2020	8553/6	Dust	
D01(A) Front Gate	313290	6297176	7/02/2020	8553/7	Dust	
D11 Goldstien	312034	6294213	7/02/2020	8553/8	Dust	
D12Ram	311750	6294159	7/02/2020	8553/9	Dust	

The sample(s) have been tested as received and the following reports are included:

- Test Report
- Sampling Report
- · Chain of Custody (if available)

Anthony Crane Laboratory Manager NATA Accredited Laboratory - 20375



Date Issued: 14/02/2020

Tested between: 7/02/20 and 14/02/20



Results

LabID	Client Sample Reference	Date On	Date Off	Number of Days	Number of Days Insoluble Solids		Combustible Matter	Calculated Rain
			Units	days	g/m2/mth	g/m2/mth	g/m2/mth	mm
			Method Code	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1
			Limit of Report		0.1	0.1	0.1	1
8553/1	D08&9 Hitchcock Rd Olive Grove	10/01/2020 09:29	7/02/2020 09:48	28	8.2	6.9	1.3	99
8553/2	D10 Hearses Rd	10/01/2020 09:39	7/02/2020 09:57	28	6.9	5.9	1.0	94
8553/3	D06 School	10/01/2020 10:30	7/02/202010:43	28	6.0	5.2	0.8	103
8553/4	D05 Bund	10/01/2020 10:44	7/02/202010:56	28	6.5	5.7	0.8	104
8553/5	D04Rehab	10/01/202011:02	7/02/202011:14	28	5.3	4.6	0.7	91
8553/6	D07 Mullock	10/01/202011:12	7/02/202011:26	28	5.5	4.9	0.6	92
8553/7	D01(A) Front Gate	10/01/2020 10:51	7/02/202011:01	28	5.3	5.0	0.3	95
8553/8	D11 Goldstien	10/01/2020 09:51	7/02/202010:16	28	7.6	6.4	1.2	91
8553/9	D12Ram	10/01/2020 10:09	7/02/202010:33	28	7.6	6.7	0.9	96

Results have been approved and report finalised on 14/02/2020

NATA Accredited Laboratory - 20375



8553

Date Issued: 14/02/2020 Sampling Conditions: Raining 18°C



LabID	Client Sample Reference	Date Sampled	Sampler	Method of Sampling	Pre-treatment/ Preservation	Comments
8553/1	D08&9 Hitchcock Rd Olive Grove	7/02/2020 09:48	T.Walker	AS3580.10.1	CuSO4	Ash, minor insects
8553/2	D10 Hearses Rd	7/02/2020 09:57	T.Walker	AS3580.10.1	CuSO4	Ash
8553/3	D06 School	7/02/2020 10:43	T.Walker	AS3580.10.1	CuSO4	Ash
8553/4	D05 Bund	7/02/2020 10:56	T.Walker	AS3580.10.1	CuSO4	Ash
8553/5	D04 Rehab	7/02/202011:14	T.Walker	AS3580.10.1	CuSO4	Ash
8553/6	D07 Mullock	7/02/202011:26	T.Walker	AS3580.10.1	CuSO4	Ash
8553/7	D01(A) Front Gate	7/02/202011:01	T.Walker	AS3580.10.1	CuSO4	Ash
8553/8	D11 Goldstien	7/02/202010:16	T.Walker	AS3580.10.1	CuSO4	Ash
8553/9	D12Ram	7/02/202010:33	T.Walker	AS3580.10.1	CuSO4	Minor Ash

Sampling procedures have been approved and report finalised on 14/02/2020 Where method is "unknown" sampling procedures are not endorsed.

NATA Accredited Laboratory - 20375



8719



Date Issued:

16/03/2020

Revision Number: 00

Site/Job:

Dixon Maroota - Dusts

Client:

Dixon Sand (No.1) Pty Ltd

Address

PO Box 4019

PITT TOWN NSW 2756

Contact

David Dixon



The following 9 samples were received on 6/03/2020 and tested at 4/30 Glenwood Dr Thornton, NSW 2322

Client Sample Reference	GPS- Easting	GPS- Northing	Date Sampled	Lab ID	Matrix	Comment or Non-compliances
D08&9 Hitchcock Rd Olive Grove	313058	6295137	6/03/2020	8719/1	Dust	
D10 Hearses Rd	312538	6294576	6/03/2020	8719/2	Dust	
D06 School	313518	6296537	6/03/2020	8719/3	Dust	
D05 Bund	313160	6296838	6/03/2020	8719/4	Dust	
D04Rehab	312385	6296932	6/03/2020	8719/5	Dust	
D07 Mullock	312579	6296676	6/03/2020	8719/6	Dust	
D01(A) Front Gate	313290	6297176	6/03/2020	8719/7	Dust	
D11 Goldstien	312034	6294213	6/03/2020	8719/8	Dust	
D12Ram	311750	6294159	6/03/2020	8719/9	Dust	

The sample(s) have been tested as received and the following reports are included:

- Test Report
- Sampling Report
- · Chain of Custody (if available)

Anthony Crane Laboratory Manager NATA Accredited Laboratory - 20375



Date Issued: 16/03/2020

Tested between: 6/03/20 and 16/03/20



Results

LabID	Client Sample Reference	Date On	Date Off	Number of Days	Insoluble Solids	Ash	Combustible Matter	Calculated Rain
			Units	days	g/m2/mth	g/m2/mth	g/m2/mth	mm
			Method Code	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1
			Limit of Report		0.1	0.1	0.1	1
8719/1	D08&9 Hitchcock Rd Olive Grove	07/02/2020 09:48	6/03/202007:58	28	1.9	1.5	0.4	288
8719/2	D10 Hearses Rd	07/02/2020 09:57	6/03/2020 08:08	28	1.3	1.0	0.3	287
8719/3	D06 School	07/02/2020 10:43	6/03/2020 08:53	28	1.2	0.8	0.4	288
8719/4	D05 Bund	07/02/2020 10:56	6/03/202009:04	28	1.5	1.0	0.5	288
8719/5	D04Rehab	07/02/202011:14	6/03/202009:26	28	1.0	0.7	0.3	287
8719/6	D07 Mullock	07/02/202011:26	6/03/202009:38	28	2.2	1.8	0.4	287
8719/7	D01(A) Front Gate	07/02/202011:01	6/03/202009:14	28	3.0	2.4	0.6	117
8719/8	D11 Goldstien	07/02/2020 10:16	6/03/2020 08:20	28	1.3	0.5	0.8	287
8719/9	D12Ram	07/02/2020 10:33	6/03/2020 08:40	28	1.3	0.8	0.5	289

Results have been approved and report finalised on 16/03/2020

NATA Accredited Laboratory - 20375



8719

Date Issued: 16/03/2020 Sampling Conditions: Fine 21°-23°C



LabID	Client Sample Reference	Date Sampled	Sampler	Method of Sampling	Pre-treatment/ Preservation	Comments
8719/1	D08&9 Hitchcock Rd Olive Grove	6/03/2020 07:58	T.Walker	AS3580.10.1	CuSO4	Full
8719/2	D10 Hearses Rd	6/03/2020 08:08	T.Walker	AS3580.10.1	CuSO4	Full
8719/3	D06 School	6/03/2020 08:53	T.Walker	AS3580.10.1	CuSO4	Full
8719/4	D05 Bund	6/03/2020 09:04	T.Walker	AS3580.10.1	CuSO4	Full, minor vegetation
8719/5	D04Rehab	6/03/2020 09:26	T.Walker	AS3580.10.1	CuSO4	Full
8719/6	D07 Mullock	6/03/2020 09:38	T.Walker	AS3580.10.1	CuSO4	Full
8719/7	D01(A) Front Gate	6/03/2020 09:14	T.Walker	AS3580.10.1	CuSO4	Full, minor insects, vegetation
8719/8	D11 Goldstien	6/03/2020 08:20	T.Walker	AS3580.10.1	CuSO4	Full
8719/9	D12Ram	6/03/2020 08:40	T.Walker	AS3580.10.1	CuSO4	Full

Sampling procedures have been approved and report finalised on 16/03/2020 Where method is "unknown" sampling procedures are not endorsed.

NATA Accredited Laboratory - 20375



8834



Date Issued:

15/04/2020

Revision Number: 00

Site/Job:

Dixon Maroota - Dusts

Client:

Dixon Sand (No.1) Pty Ltd

Address

PO Box 4019

PITT TOWN NSW 2756

Contact

David Dixon



The following 9 samples were received on 3/04/2020 and tested at 4/30 Glenwood Dr Thornton, NSW 2322

Client Sample Reference	GPS- Easting	GPS- Northing	Date Sampled	Lab ID	Matrix	Comment or Non-compliances
D08&9 Hitchcock Rd Olive Grove	313058	6295137	3/04/2020	8834/1	Dust	
D10 Hearses Rd	312538	6294576	3/04/2020	8834/2	Dust	
D06 School	313518	6296537	3/04/2020	8834/3	Dust	
D05 Bund	313160	6296838	3/04/2020	8834/4	Dust	
D04Rehab	312385	6296932	3/04/2020	8834/5	Dust	
D07 Mullock	312579	6296676	3/04/2020	8834/6	Dust	
D01(A) Front Gate	313290	6297176	3/04/2020	8834/7	Dust	
D11 Goldstien	312034	6294213	3/04/2020	8834/8	Dust	
D12Ram	311750	6294159	3/04/2020	8834/9	Dust	

The sample(s) have been tested as received and the following reports are included:

- Test Report
- Sampling Report
- · Chain of Custody (if available)

Anthony Crane Laboratory Manager NATA Accredited Laboratory - 20375



Date Issued: 15/04/2020

Tested between: 3/04/20 and 15/04/20



Results

LabID	Client Sample Reference	Date On	Date Off	Number of Days	Insoluble Solids	Ash	Combustible Matter	Calculated Rain
			Units	days	g/m2/mth	g/m2/mth	g/m2/mth	mm
			Method Code	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1
			Limit of Report		0.1	0.1	0.1	1
8834/1	D08&9 Hitchcock Rd Olive Grove	06/03/2020 07:58	03/04/2020 09:15	28	0.7	0.5	0.2	114
8834/2	D10 Hearses Rd	06/03/2020 08:08	03/04/2020 09:22	28	1.2	0.5	0.7	109
8834/3	D06 School	06/03/2020 08:53	03/04/2020 10:00	28	0.8	0.5	0.3	101
8834/4	D05 Bund	06/03/2020 09:04	03/04/202010:12	28	0.8	0.6	0.2	105
8834/5	D04Rehab	06/03/2020 09:26	03/04/2020 10:31	28	0.3	0.3	<0.1	95
8834/6	D07 Mullock	06/03/2020 09:38	03/04/2020 10:39	28	0.5	0.5	<0.1	96
8834/7	D01(A) Front Gate	06/03/2020 09:14	03/04/2020 10:20	28	2.1	1.6	0.5	99
8834/8	D11 Goldstien	06/03/2020 08:20	03/04/2020 09:32	28	0.4	0.3	0.1	118
8834/9	D12Ram	06/03/2020 08:40	03/04/2020 09:50	28	0.3	0.2	0.1	124

Results have been approved and report finalised on 15/04/2020

NATA Accredited Laboratory - 20375



8834

Date Issued: 15/04/2020 Sampling Conditions: Cloudy, 23°C



LabID	Client Sample Reference	Date Sampled	Sampler	Method of Sampling	Pre-treatment/ Preservation	Comments
8834/1	D08&9 Hitchcock Rd Olive Grove	03/04/2020 09:15	T.Walker	AS3580.10.1	CuSO4	Insect (Spider)
8834/2	D10 Hearses Rd	03/04/2020 09:22	T.Walker	AS3580.10.1	CuSO4	Minorveg
8834/3	D06 School	03/04/2020 10:00	T.Walker	AS3580.10.1	CuSO4	
8834/4	D05 Bund	03/04/2020 10:12	T.Walker	AS3580.10.1	CuSO4	
8834/5	D04Rehab	03/04/2020 10:31	T.Walker	AS3580.10.1	CuSO4	
8834/6	D07 Mullock	03/04/2020 10:39	T.Walker	AS3580.10.1	CuSO4	
8834/7	D01(A) Front Gate	03/04/2020 10:20	T.Walker	AS3580.10.1	CuSO4	Minor algae
8834/8	D11 Goldstien	03/04/2020 09:32	T.Walker	AS3580.10.1	CuSO4	
8834/9	D12Ram	03/04/2020 09:50	T.Walker	AS3580.10.1	CuSO4	

Sampling procedures have been approved and report finalised on 15/04/2020 Where method is "unknown" sampling procedures are not endorsed.

NATA Accredited Laboratory - 20375



8986



Date Issued:

8/05/2020

Revision Number: 00

Site/Job:

Dixon Maroota - Dusts

Client:

Dixon Sand (No.1) Pty Ltd

Address

PO Box 4019

PITT TOWN NSW 2756

Contact

David Dixon



The following 9 samples were received on 1/05/2020 and tested at 4/30 Glenwood Dr Thornton, NSW 2322

Client Sample Reference	GPS- Easting	GPS- Northing	Date Sampled	Lab ID	Matrix	Comment or Non-compliances
D08&9 Hitchcock Rd Olive Grove	313058	6295137	1/05/2020	8986/1	Dust	
D10 Hearses Rd	312538	6294576	1/05/2020	8986/2	Dust	
D06 School	313518	6296537	1/05/2020	8986/3	Dust	
D05 Bund	313160	6296838	1/05/2020	8986/4	Dust	
D04Rehab	312385	6296932	1/05/2020	8986/5	Dust	
D07 Mullock	312579	6296676	1/05/2020	8986/6	Dust	
D01(A) Front Gate	313290	6297176	1/05/2020	8986/7	Dust	
D11 Goldstien	312034	6294213	1/05/2020	8986/8	Dust	
D12Ram	311750	6294159	1/05/2020	8986/9	Dust	

The sample(s) have been tested as received and the following reports are included:

- Test Report
- Sampling Report
- · Chain of Custody (if available)

Anthony Crane Laboratory Manager NATA Accredited Laboratory - 20375



Date Issued: 8/05/2020

Tested between: 1/05/20 and 8/05/20



Results

LabID	Client Sample Reference	Date On	Date Off	Number of Days	Insoluble Solids	Ash	Combustible Matter	Calculated Rain
			Units	days	g/m2/mth	g/m2/mth	g/m2/mth	mm
			Method Code	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1
			Limit of Report		0.1	0.1	0.1	1
8986/1	D08&9 Hitchcock Rd Olive Grove	03/04/2020 09:15	01/05/2020 10:48	28	0.5	0.4	0.1	38
8986/2	D10 Hearses Rd	03/04/2020 09:22	01/05/2020 10:58	28	1.8	1.2	0.6	37
8986/3	D06 School	03/04/2020 10:00	01/05/202011:46	28	0.8	0.4	0.4	37
8986/4	D05 Bund	03/04/202010:12	01/05/202011:58	28	1.5	1.1	0.4	41
8986/5	D04Rehab	03/04/202010:31	01/05/2020 12:28	28	0.7	0.5	0.2	35
8986/6	D07 Mullock	03/04/2020 10:39	01/05/2020 12:42	28	1.0	0.9	0.1	37
8986/7	D01(A) Front Gate	03/04/2020 10:20	01/05/2020 12:07	28	1.7	1.4	0.3	39
8986/8	D11 Goldstien	03/04/2020 09:32	01/05/202011:29	28	0.8	0.2	0.6	39
8986/9	D12Ram	03/04/2020 09:50	01/05/202011:15	28	0.5	0.3	0.2	39

Results have been approved and report finalised on 8/05/2020

NATA Accredited Laboratory - 20375



8986

Date Issued: 8/05/2020

Sampling Conditions: Cloudy, 14-16°C



LabID	Client Sample Reference	Date Sampled	Sampler	Method of Sampling	Pre-treatment/ Preservation	Comments
8986/1	D08&9 Hitchcock Rd Olive Grove	01/05/2020 10:48	T.Walker	AS3580.10.1	CuSO4	
8986/2	D10 Hearses Rd	01/05/2020 10:58	T.Walker	AS3580.10.1	CuSO4	Minor insects
8986/3	D06 School	01/05/202011:46	T.Walker	AS3580.10.1	CuSO4	Minorveg
8986/4	D05 Bund	01/05/202011:58	T.Walker	AS3580.10.1	CuSO4	Minor insects
8986/5	D04 Rehab	01/05/2020 12:28	T.Walker	AS3580.10.1	CuSO4	
8986/6	D07 Mullock	01/05/2020 12:42	T.Walker	AS3580.10.1	CuSO4	
8986/7	D01(A) Front Gate	01/05/2020 12:07	T.Walker	AS3580.10.1	CuSO4	Minor insects and algae
8986/8	D11 Goldstien	01/05/202011:29	T.Walker	AS3580.10.1	CuSO4	Minor veg
8986/9	D12Ram	01/05/202011:15	T.Walker	AS3580.10.1	CuSO4	

Sampling procedures have been approved and report finalised on 8/05/2020 Where method is "unknown" sampling procedures are not endorsed.

NATA Accredited Laboratory - 20375



Report Number:

9086



Date Issued:

5/06/2020

Revision Number: 00

Site/Job:

Dixon Maroota - Dusts

Client:

Dixon Sand (No.1) Pty Ltd

Address

PO Box 4019

PITT TOWN NSW 2756

Contact

David Dixon



The following 9 samples were received on 29/05/2020 and tested at 4/30 Glenwood Dr Thornton, NSW 2322

Client Sample Reference	GPS- Easting	GPS- Northing	Date Sampled	Lab ID	Matrix	Comment or Non-compliances
D08&9 Hitchcock Rd Olive Grove	313058	6295137	29/05/2020	9086/1	Dust	
D10 Hearses Rd	312538	6294576	29/05/2020	9086/2	Dust	
D06 School	313518	6296537	29/05/2020	9086/3	Dust	
D05 Bund	313160	6296838	29/05/2020	9086/4	Dust	
D04Rehab	312385	6296932	29/05/2020	9086/5	Dust	
D07 Mullock	312579	6296676	29/05/2020	9086/6	Dust	
D01(A) Front Gate	313290	6297176	29/05/2020	9086/7	Dust	
D11 Goldstien	312034	6294213	29/05/2020	9086/8	Dust	
D12Ram	311750	6294159	29/05/2020	9086/9	Dust	

The sample(s) have been tested as received and the following reports are included:

- Test Report
- Sampling Report
- · Chain of Custody (if available)

Anthony Crane Laboratory Manager NATA Accredited Laboratory - 20375



Test Report Number: 9086

Date Issued: 5/06/2020

Tested between: 29/05/20 and 5/06/20



Results

LabID	Client Sample Reference	Date On	Date Off	Number of Days	Insoluble Solids	Ash	Combustible Matter	Calculated Rain
			Units	days	g/m2/mth	g/m2/mth	g/m2/mth	mm
			Method Code	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1
			Limit of Report		0.1	0.1	0.1	1
9086/1	D08&9 Hitchcock Rd Olive Grove	01/05/2020 10:48	29/05/2020 10:24	28	0.4	0.2	0.2	41
9086/2	D10 Hearses Rd	01/05/2020 10:58	29/05/2020 15:43	28	2.4	2.0	0.4	42
9086/3	D06 School	01/05/202011:46	29/05/2020 09:17	28	0.5	0.3	0.2	41
9086/4	D05 Bund	01/05/202011:58	29/05/2020 09:28	28	1.7	1.6	0.1	43
9086/5	D04Rehab	01/05/2020 12:28	29/05/2020 10:05	28	0.2	0.2	<0.1	42
9086/6	D07Mullock	01/05/202012:42	29/05/202010:11	28	0.4	0.4	<0.1	39
9086/7	D01(A) Front Gate	01/05/2020 12:07	29/05/2020 09:47	28	1.3	1.0	0.3	42
9086/8	D11 Goldstien	01/05/202011:29	29/05/2020 14:37	28	0.4	0.1	0.3	39
9086/9	D12Ram	01/05/202011:15	29/05/2020 09:05	28	0.3	0.1	0.2	41

Results have been approved and report finalised on 5/06/2020

NATA Accredited Laboratory - 20375



Sampling Report Number:

9086

Date Issued: 5/06/2020 Sampling Conditions: 11°-17°C



Lab ID	Client Sample Reference	Date Sampled	, ,		Pre-treatment/ Preservation	Comments
9086/1	D08&9 Hitchcock Rd Olive Grove	29/05/2020 10:24	T.Walker	AS3580.10.1	CuSO4	
9086/2	D10 Hearses Rd	29/05/2020 15:43	T.Walker	AS3580.10.1	CuSO4	Minor sand
9086/3	D06 School	29/05/2020 09:17	T.Walker	AS3580.10.1	CuSO4	
9086/4	D05 Bund	29/05/2020 09:28	T.Walker	AS3580.10.1	CuSO4	Minor insects
9086/5	D04Rehab	29/05/2020 10:05	T.Walker	AS3580.10.1	CuSO4	
9086/6	D07 Mullock	29/05/2020 10:11	T.Walker	AS3580.10.1	CuSO4	
9086/7	D01(A) Front Gate	29/05/2020 09:47	T.Walker	AS3580.10.1	CuSO4	
9086/8	D11 Goldstien	29/05/2020 14:37	T.Walker	AS3580.10.1	CuSO4	Minorvegetation
9086/9	D12Ram	29/05/2020 09:05	T.Walker	AS3580.10.1	CuSO4	

Sampling procedures have been approved and report finalised on 5/06/2020 Where method is "unknown" sampling procedures are not endorsed.

NATA Accredited Laboratory - 20375



Report Number:

9252



Date Issued:

3/07/2020

Revision Number: 00

Site/Job:

Dixon Maroota - Dusts

Client:

Dixon Sand (No.1) Pty Ltd

Address

PO Box 4019

PITT TOWN NSW 2756

Contact

David Dixon



The following 9 samples were received on 26/06/2020 and tested at 4/30 Glenwood Dr Thornton, NSW 2322

Client Sample Reference	GPS- Easting	GPS- Northing	Date Sampled	Lab ID	Matrix	Comment or Non-compliances
D08&9 Hitchcock Rd Olive Grove	313058	6295137	26/06/2020	9252/1	Dust	
D10 Hearses Rd	312538	6294576	26/06/2020	9252/2	Dust	
D06 School	313518	6296537	26/06/2020	9252/3	Dust	
D05 Bund	313160	6296838	26/06/2020	9252/4	Dust	
D04Rehab	312385	6296932	26/06/2020	9252/5	Dust	
D07 Mullock	312579	6296676	26/06/2020	9252/6	Dust	
D01(A) Front Gate	313290	6297176	26/06/2020	9252/7	Dust	
D11 Goldstien	312034	6294213	26/06/2020	9252/8	Dust	
D12Ram	311750	6294159	26/06/2020	9252/9	Dust	

The sample(s) have been tested as received and the following reports are included:

- Test Report
- Sampling Report
- · Chain of Custody (if available)

Anthony Crane Laboratory Manager NATA Accredited Laboratory - 20375



Test Report Number: 9252

Date Issued: 3/07/2020

Tested between: 26/06/20 and 3/07/20



Results

Lab ID	Client Sample Reference	Date On	Date Off	Number of Days	Insoluble Solids	Ash	Combustible Matter	Calculated Rain
			Units	days	g/m2/mth	g/m2/mth	g/m2/mth	mm
			Method Code	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1
			Limit of Report		0.1	0.1	0.1	1
9252/1	D08&9 Hitchcock Rd Olive Grove	29/05/2020 10:24	26/06/2020 10:52	28	0.4	0.2	0.2	17
9252/2	D10 Hearses Rd	29/05/2020 15:43	26/06/2020 13:28	28	0.7	0.5	0.2	18
9252/3	D06 School	29/05/2020 09:17	26/06/2020 10:45	28	1.3	1.0	0.3	18
9252/4	D05 Bund	29/05/2020 09:28	26/06/2020 10:37	28	2.6	2.1	0.5	19
9252/5	D04Rehab	29/05/202010:05	26/06/202010:11	28	0.3	0.2	0.1	17
9252/6	D07Mullock	29/05/202010:11	26/06/2020 10:23	28	0.2	0.1	0.1	18
9252/7	D01(A) Front Gate	29/05/2020 09:47	26/06/2020 09:49	28	1.4	1.1	0.3	18
9252/8	D11 Goldstien	29/05/202014:37	26/06/2020 13:15	28	0.5	0.1	0.4	18
9252/9	D12Ram	29/05/2020 09:05	26/06/2020 11:35	28	0.3	<0.1	0.3	19

Results have been approved and report finalised on 3/07/2020

NATA Accredited Laboratory - 20375



Sampling Report Number:

9252

Date Issued: 3/07/2020

Sampling Conditions: Cloudy 12°-16°C

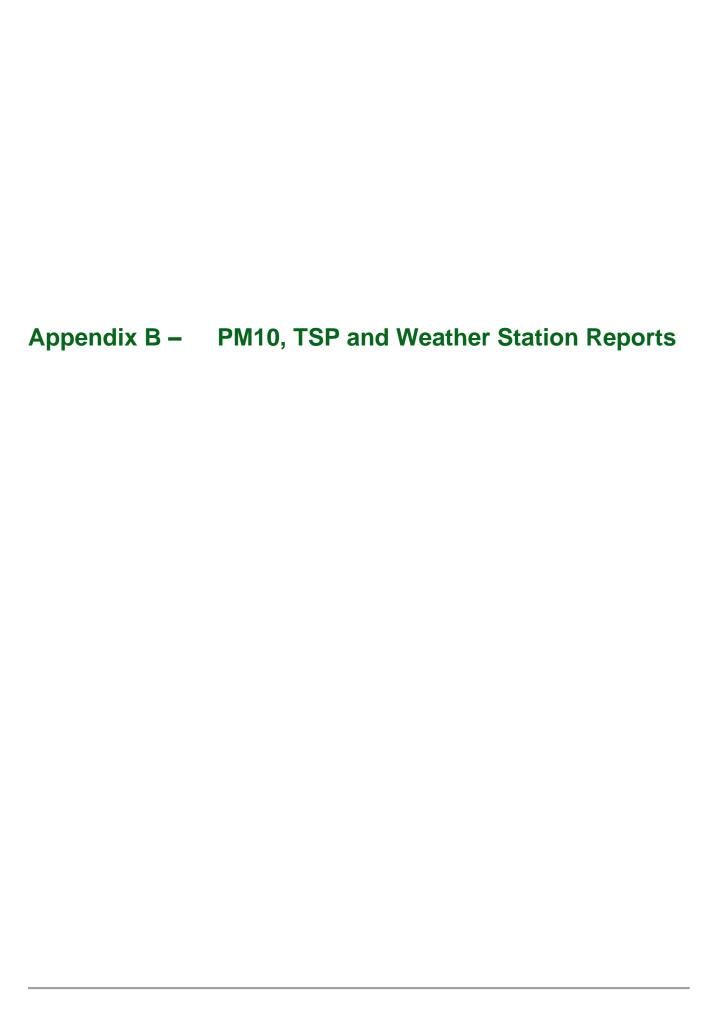


LabID	Client Sample Reference	Date Sampled	Sampler	Method of Sampling	Pre-treatment/ Preservation	Comments
9252/1	D08&9 Hitchcock Rd Olive Grove	26/06/2020 10:52	T.Walker	AS3580.10.1	CuSO4	
9252/2	D10 Hearses Rd	26/06/2020 13:28	T.Walker	AS3580.10.1	CuSO4	
9252/3	D06 School	26/06/2020 10:45	T.Walker	AS3580.10.1	CuSO4	
9252/4	D05 Bund	26/06/2020 10:37	T.Walker	AS3580.10.1	CuSO4	Minoralgae
9252/5	D04Rehab	26/06/202010:11	T.Walker	AS3580.10.1	CuSO4	
9252/6	D07 Mullock	26/06/2020 10:23	T.Walker	AS3580.10.1	CuSO4	
9252/7	D01(A) Front Gate	26/06/2020 09:49	T.Walker	AS3580.10.1	CuSO4	
9252/8	D11 Goldstien	26/06/202013:15	T.Walker	AS3580.10.1	CuSO4	
9252/9	D12Ram	26/06/202011:35	T.Walker	AS3580.10.1	CuSO4	

Sampling procedures have been approved and report finalised on 3/07/2020 Where method is "unknown" sampling procedures are not endorsed.

NATA Accredited Laboratory - 20375





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CBased Environmental Pty Limited ABN 62 611 924 264

Dixon Sand Quarry

Environmental Monitoring Air Quality

Tapered Element Oscillating Microbalance (TEOM) (PM₁₀) and Meteorological Data

July 2019

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1.0 Summary

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T⊡e monitoring program in⊡⊡de⊡
 One contin co co
T □ mont □ report wa prepared b □Ba ed En □ronmental and in □ de te ollowing □
TEOM
□□rrent □ear to date ann □al a □erage or PM_{10} i □ □al □□lated □rom t □e □¹ □□□□□ or TEOM's coinciding with the Dixon Sand project year.
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2.0 Sampling Program

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T⊑e ⊚llowing □□⊑tralian □tandard□were □⊑ed:
$\Box\Box\Box\Box\Box\Box\Box\Box\Box\Box\Box\Box$ "Methods for Sampling and Analysis of Ambient Air. Determination of Suspended Particulates—PM ₁₀ continuous direct mass method using a tapered element oscillating microbalance analyser."
TEOM PM _{□0} re⊡t□ are □4-□o□r a⊡erage□ at midnig⊡t and are reported a□ □g៤m□ ⊡orre⊡ted to 0 degree□ □ and □0□□□□Pa□
T⊡e lo⊡ation o⊡t⊡e air □□alit□ monitoring e□□ipment met t⊡e □□□tralian □tandard □□□□5□0□□□□ □□007□" <i>Methods for sampling and analysis of ambient air Part 1.1 Guide to siting air monitoring equipment</i> "□□ir □□alit□ monitoring □te de□ription□ and lo□ation□ are pro□ided in Table 1 :

Table 1: Dixon Sands Air Quality Monitoring Description and Locations

Monitor	Site Code	Location Description
TEOM PM _□	TEOM	Old □ort□Road⊡Maroota □□W
Meteorologi⊡al □tation	MET	Old □ort□Road⊡Maroota □□W

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3.0 Reporting Period Results

3.1 TEOM PM₁₀

F⊡e ⊡rrent TEOM PM ann□al a erage r□n□ rom t□e □¹ □□□□0□□□□t pre ent it i□ below t□e Dixon □and □ □arr□ long term ann□al a erage PM □ riteria o□□0□grm□□ F□e □rrent ann□al a erage ror □al□□ated Total □□□pended Parti□□ate□ r□□□□□ below t□e ann□al a erage riterion o□□0□grm□□T□e T□P i□□al□□ated b□m□tipl□ng □e PM □ b□□5□□ote: an ann□al amo□nt o□data □a□not □et been □olle□ted□
□ □□arterl□ □alibration wa□ □nderta□en in □□ne □0□□□ □alibration □ertiū□ate□ are pro⊡ded in Appendix 1 □w□en re□□ired□□□□ext □alibration i□ □□□ed□ed 靣r □eptember □0□□□

Table 2: Average Daily 24 Hr TEOM PM_{10} and TSP for July 2019 from AQMS and Annual Average PM_{10} calculated from the 1 July 2019.

Dete	TEOM	Annual PM ₁₀	TSP*	TSP Annual**
Date	PM _□ ᡎḡm□□	□ Lerage Lug Lm □	$\square g \square m \square$	□g m □□
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□07□0□□	1 4	□5	□□5	□□ 7
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5.070	510	□4	□□5	
6.070	6∭		□5Ⅲ	□0Ⅲ
7.070	5⊈	717	□□5	
□07□0□□	4Ⅲ	74		□□4
□07□0□□	6Ⅲ	7Ⅲ	□5Ⅲ	
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4.070	44	7Ⅲ		
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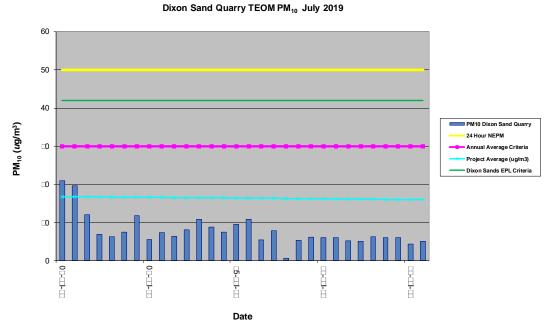


Figure 1: TEOM PM₁₀ 24 hr, Annual Average and Criteria

3.2 Meteorological Data

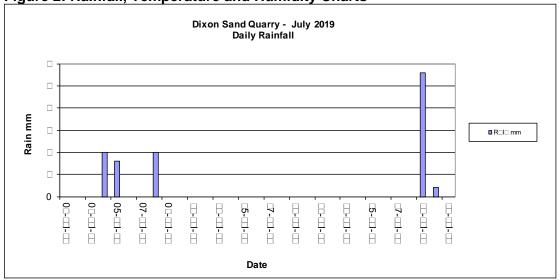
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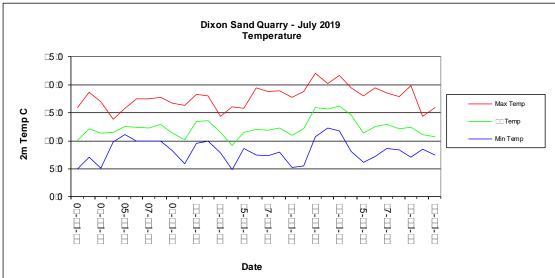
T_e __mmar_o_re__t_i pre_ented in **Table 3. Figure 2 and 3** di_pla_t_e __art_o_ meteorologi_al parameter_ for t_e mont__ windro_e i_pro_ided in **Figure 4.** T_i pro_ide_t_e __en__ di_trib_tion o_wind _peed and dire_tion d_ring t_e mont_ to di_pla_dominant wind dire_tion__

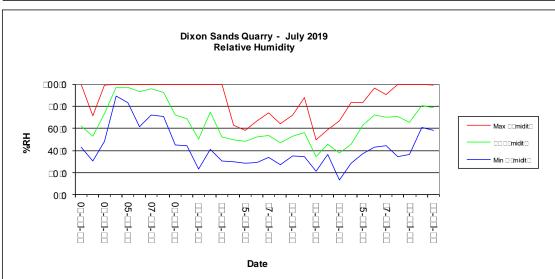
Table 3: Meteorological Data Summary for July 2019

Table 5: I	vieteoroio	gicai Dala	Juillillai	y ioi Jui	y 2019								
Date	Min Temp	□□Temp	Max Temp	RAIN mm	Min WS	Av WS	Max WS	Min Humidity	Av Humidity	Max Humidity	Min Pressure	Av pressure	Max Pressure
1/07/2019	5.0	10.1	15.9	0.0	0.2	2.8	8.5	43.4	62.4	100.0	998.5	1001.2	1003.8
2/07/2019	7.1	12.2	18.7	0.0	0.1	2.7	9.6	30.4	53.0	71.6	997.0	998.4	1001.3
3/07/2019	5.1	11.4	17.0	0.0	0.3	3.6	11.7	48.1	73.4	99.2	1001.3	1006.2	1010.1
4/07/2019	9.8	11.5	13.9	1.0	0.2	3.8	12.7	89.5	96.8	100.0	1009.8	1011.7	1013.4
5/07/2019	11.1	12.5	15.8	0.8	0.1	2.4	9.7	83.0	97.2	100.0	1011.5	1012.8	1014.3
6/07/2019	9.9	12.4	17.5	0.0	0.2	2.7	10.1	61.5	93.3	100.0	1011.2	1012.6	1014.4
7/07/2019	9.9	12.3	17.5	0.0	0.0	2.4	8.2	72.2	96.0	100.0	1006.1	1009.4	1012.2
8/07/2019	10.0	12.9	17.7	1.0	0.0	3.0	18.0	70.8	92.2	100.0	998.9	1001.7	1006.0
9/07/2019	8.3	11.3	16.7	0.0	0.1	2.3	8.6	45.0	72.2	100.0	995.9	998.2	999.8
10/07/2019	5.9	10.2	16.3	0.0	0.2	3.5	15.7	44.4	68.8	100.0	991.6	995.0	997.5
11/07/2019	9.5	13.5	18.3	0.0	0.6	6.8	23.4	23.4	50.0	100.0	987.5	990.3	994.1
12/07/2019	9.9	13.5	18.0	0.0	0.5	6.6	22.8	40.8	74.4	100.0	988.9	991.6	994.1
13/07/2019	7.8	11.6	14.3	0.0	0.5	6.5	27.6	30.4	52.6	100.0	987.0	992.4	998.5
14/07/2019	4.8	9.1	16.1	0.0	0.1	5.0	26.9	29.8	49.9	62.6	992.0	996.7	1000.2
15/07/2019	8.6	11.6	15.8	0.0	0.1	5.2	31.2	28.8	48.1	58.2	989.4	994.2	997.6
16/07/2019	7.4	12.1	19.5	0.0	0.1	3.5	12.4	29.5	52.1	66.9	994.4	996.2	998.0
17/07/2019	7.3	11.9	18.8	0.0	0.1	3.9	12.6	34.1	53.8	74.3	991.5	994.8	997.5
18/07/2019	8.0	12.2	18.9	0.0	0.4	3.5	12.7	27.3	47.3	64.2	991.4	993.8	996.9
19/07/2019	5.2	10.9	17.8	0.0	0.1	3.1	13.9	35.5	53.2	72.0	996.0	998.3	1001.4
20/07/2019	5.5	12.2	18.8	0.0	0.4	4.4	15.6	34.6	56.5	87.7	997.0	999.5	1002.2
21/07/2019	10.7	15.9	22.1	0.0	0.1	6.2	24.6	21.4	34.2	50.0	992.1	994.5	996.9
22/07/2019	12.3	15.6	20.2	0.0	0.6	5.3	19.0	36.4	46.0	58.9	992.7	994.3	996.4
23/07/2019	11.8	16.2	21.7	0.0	0.4	6.6	24.5	13.6	37.6	67.1	992.0	994.0	995.8
24/07/2019	8.1	14.7	19.5	0.0	0.2	4.2	21.1	28.6	45.8	83.3	992.4	997.4	1002.9
25/07/2019	6.2	11.3	18.0	0.0	0.0	2.7	12.1	37.3	62.5	83.2	1001.5	1002.6	1004.8
26/07/2019	7.2	12.6	19.4	0.0	0.2	2.6	9.0	42.9	71.7	96.2	997.0	999.3	1001.8
27/07/2019	8.6	12.9	18.5	0.0	0.0	2.9	10.2	44.3	70.2	90.2	999.2	1000.5	1002.2
28/07/2019	8.4	12.2	17.9	0.0	0.0	2.7	13.8	34.5	70.5	99.8	1000.4	1001.8	1003.8
29/07/2019	7.1	12.5	19.8	2.8	0.0	3.3	8.7	36.4	65.2	99.9	996.1	998.7	1001.0
30/07/2019	8.5	11.1	14.3	0.2	0.0	3.2	11.4	60.9	80.5	100.0	998.7	1002.1	1005.8
31/07/2019	7.5	10.7	15.9	0.0	0.2	4.5	13.0	58.1	78.6	99.2	1005.3	1007.1	1008.9
Monthly	4.8	12.3	22.1	5.8	0.0	3.9	31.2	13.6	64.7	100.0	987.0	999.6	1014.4

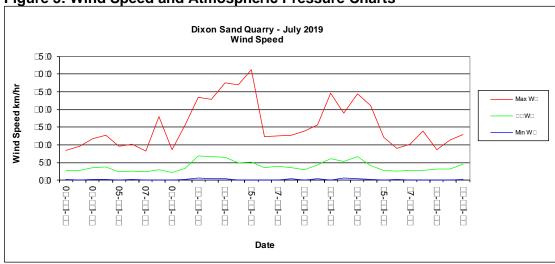












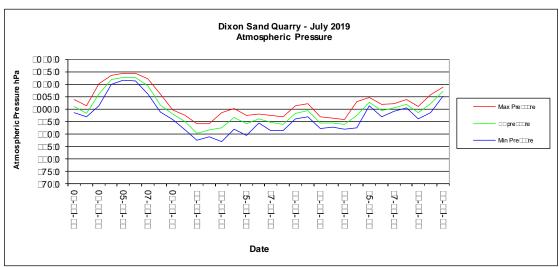
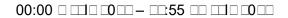
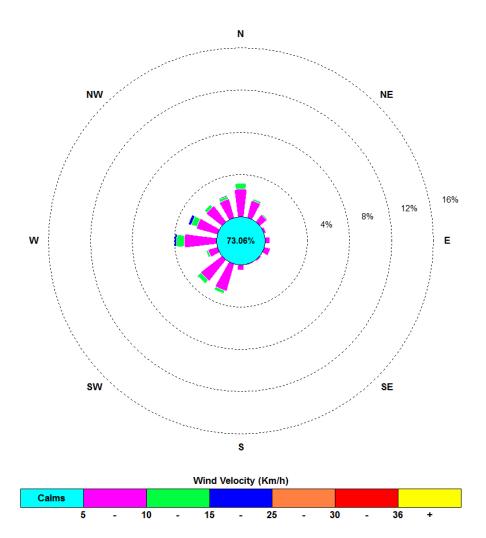


Figure 4: Windrose Plot (km/h)







CBased Environmental Pty Limited ABN 62 611 924 264

Dixon Sand Quarry

Environmental Monitoring Air Quality

Tapered Element Oscillating Microbalance (TEOM) (PM₁₀) and Meteorological Data

August 2019

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En ironmental □ienti t Date: □4 □eptember □0 □□

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1	.0	Summary
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TEOM
□ rrent □ear to date ann □al a □erage or PM_{\square} i □ □al □□lated □rom t □e □¹ □□□□lor TEOM's coinciding with the Dixon Sand project year.
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2.0 Sampling Program

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T⊑e ⊚llowing □□⊑tralian □tandard□were □⊑ed:
$\Box\Box\Box\Box\Box\Box\Box\Box\Box\Box\Box\Box$ "Methods for Sampling and Analysis of Ambient Air. Determination of Suspended Particulates—PM ₁₀ continuous direct mass method using a tapered element oscillating microbalance analyser."
TEOM PMɒ re⊡t□ are □4-□o□r a⊡erage□ at midnig⊡t and are reported a□ □g៤m□ ⊡orre⊡ted to 0 degree□ □ and □0□□□□Pa□
T □e lo □ation o □t □e air □□alit □ monitoring e □□ipment met t □e □□□tralian □tandard □□□□5□0□□□□ □□007□" <i>Methods for sampling and analysis of ambient air Part 1.1 Guide to siting air monitoring equipment</i> " □□ir □ □alit □ monitoring □te de □□ription □ and lo □ation □ are pro □ded in Table 1 :

Table 1: Dixon Sands Air Quality Monitoring Description and Locations

Monitor	Site Code	Location Description
TEOM PM _□	TEOM	Old □ort□Road⊡Maroota □□W
Meteorologi⊡al □tation	MET	Old □ort□ Road□Maroota □□W

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3.0 Reporting Period Results

3.1 TEOM PM₁₀

□4-□o□r a erage TEOM PM _{□0} re□t□ from t□e □□M□ data collection coftware are procided in Table 2 and a □art o□t□e data i□ procided in Figure 1 □D□ring t□e monitoring period indi⊡d□al □4-□o□r TEOM PM _{□0} re□t□ were below t□e □ational En⊡ronment Prote□tion Mea□re □□EPM□□□ort-term □□4□r□impa□t □riteria o□50□g□m□ and t□e Dixon □and □□arr□EPL limit o□4□□g□m□□
T_errent TEOM PM_ ann_al a_erage r_nrom t_e _1l _0t pre_ent it i_ below t_e Dixon _andarr_ long term ann_al a_erage PMriteria o0_gr T_errent ann_al a_erage _or _allated Totalpended Partilate1_P_i_ below t_e ann_al a_erage _riterion o0_grT_e T_P iallated b_m_ltipl_ing t_e PM b15ote: an ann_al amo_nt o_data _a_not _et been _olle_ted_
☐ □□arterl□ □alibration wa□ □nderta□en in □□ne □0□□□ □alibration □ertiū□ate□ are pro⊡ded in Appendix 1 □w□en re□□ired□□□ext □alibration i□ □□□ed□ed ⊚r □eptember □0□□□

Table 2: Average Daily 24 Hr TEOM PM_{10} and TSP for August 2019 from AQMS and Annual Average PM_{10} calculated from the 1 July 2019.

Dete	TEOM	Annual PM ₁₀	TSP*	TSP Annual**
Date	PM _□ ᡎḡm□□	□ Lerage Lug Lin □	$\square g \square m \square$	□ g m □
	0	□0	□5Ⅲ	□□5
			7	□□7
410000				
5.000	47	□4	□6Ⅲ	□□5
6101110111	□0⊈	□4	□6□0	□□6
7.00		□4	□□5	□□5
		□7	4710	□4 □□
		□0 4	□5Ⅲ	□5Ⅲ
	□0□7	□0 4	□6Ⅲ	□610
	510	□0□□	□□5	□5 [6
		□0□□	0	□5□5
		□0□□	□015	□5 🖪
400		□0 4	50Ⅲ	□610
<u> </u>		□0 4	□□0	□610
<u></u>		□0 4	□4 □□	□610
70000		□0 4	□0□□	□6Ⅲ
		□0 □5	□□0	□6Ⅲ
	6	□0□□	67Ⅲ	□7.0
		□0□□	□ 4 □ 5	□6Ⅲ
	□5Ⅲ	□0□□	□□0	□7□□
	5 6	□0□□	□□0	□7□□
	6		4	□7.16
400	□ .7		4□Ⅲ	0
50 000	□016	□□4	5□5	□□4
6000		□□4	□0□□	□□5
70000	7⊞		□7□□	
	5Ⅲ			7
	7⊞		□□0	77

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□□al □□ated rom PM □0 □nn □al □ erage

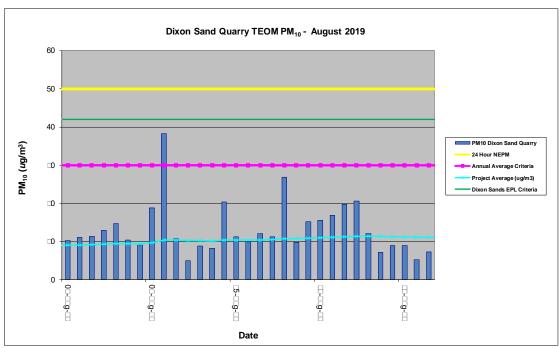


Figure 1: TEOM PM₁₀ 24 hr, Annual Average and Criteria

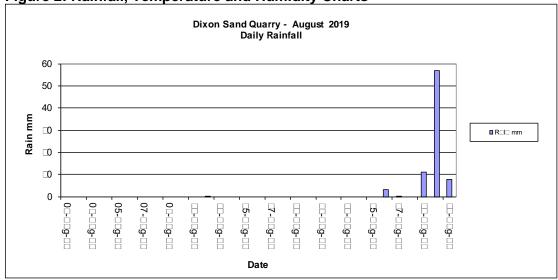
3.2 Meteorological Data

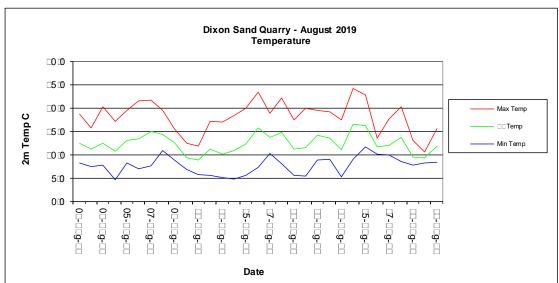
T_e __mmar_o_re__t_i_pre_ented in **Table 3. Figure 2 and 3** di_pla_t_e __art_o_ meteorologi_al parameter_ _or t_e mont__ windro_e i_pro_ided in **Figure 4.** T_i_pro_ide_t_e __en__ di_trib_tion o_wind _peed and dire_tion d_ring t_e mont_ to di_pla_dominant wind dire_tion__

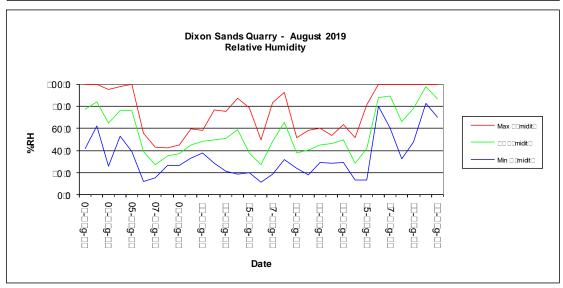
Table 3: Meteorological Data Summary for August 2019

Date	Min Temp	□□Temp	Max Temp	RAIN mm	Min WS	Av WS	Max WS	Min Humidity	Av Humidity	Max Humidity	Min Pressure	Av pressure	Max Pressure
1/08/2019	8.3	12.5	18.8	0.0	0.2	2.7	10.0	41.6	77.4	99.5	1005.1	1006.8	1008.3
2/08/2019	7.5	11.3	15.9	0.0	0.2	2.8	8.3	62.4	83.9	99.9	1006.3	1007.8	1009.8
3/08/2019	7.9	12.6	20.4	0.0	0.2	3.4	14.7	25.7	64.8	95.3	1002.1	1004.7	1006.6
4/08/2019	4.8	10.8	17.3	0.0	0.0	3.5	15.8	53.2	76.3	97.9	1003.7	1005.4	1007.3
5/08/2019	8.3	13.1	19.6	0.0	0.0	3.1	13.1	39.0	76.2	100.0	999.1	1001.9	1005.2
6/08/2019	7.1	13.5	21.6	0.0	0.2	3.3	11.5	12.4	39.0	55.4	994.0	996.9	999.9
7/08/2019	7.7	15.0	21.7	0.0	0.1	4.6	18.3	15.5	27.3	43.4	987.4	990.9	994.6
8/08/2019	11.0	14.5	19.5	0.0	0.5	7.6	32.0	26.5	35.0	42.5	978.8	982.8	987.4
9/08/2019	9.0	12.7	15.6	0.0	8.0	8.4	32.5	26.5	37.0	45.2	979.0	981.1	984.6
10/08/2019	7.0	9.4	12.5	0.0	0.4	6.3	24.2	33.4	45.1	59.7	979.4	981.4	984.4
11/08/2019	5.9	9.0	12.0	0.0	0.2	6.6	19.2	37.9	48.6	58.0	981.2	983.8	990.0
12/08/2019	5.7	11.2	17.2	0.2	0.0	4.3	20.5	28.5	50.0	76.5	990.1	996.4	1000.7
13/08/2019	5.2	10.3	17.1	0.0	0.2	2.6	9.4	21.4	51.2	75.1	1000.4	1002.7	1005.5
14/08/2019	4.9	11.0	18.5	0.0	0.1	3.2	13.1	18.8	59.1	87.1	1002.7	1004.9	1007.3
15/08/2019	5.6	12.4	20.1	0.0	0.0	3.1	16.2	20.3	38.0	78.5	999.3	1002.2	1004.4
16/08/2019	7.4	15.8	23.5	0.0	0.1	4.2	14.9	11.4	27.6	49.6	993.2	996.4	1000.8
17/08/2019	10.4	13.8	19.0	0.0	0.3	4.2	15.4	18.9	48.4	83.1	993.1	996.8	1000.2
18/08/2019	8.2	15.0	22.3	0.0	0.2	4.4	16.7	31.9	65.2	92.5	985.9	993.9	999.8
19/08/2019	5.6	11.3	17.5	0.0	0.1	6.6	29.5	24.3	37.9	51.8	987.6	995.2	1002.1
20/08/2019	5.5	11.6	20.0	0.0	0.2	5.4	22.0	18.0	40.8	58.1	997.2	999.7	1002.0
21/08/2019	9.0	14.3	19.6	0.0	0.4	5.7	20.4	29.6	44.9	60.3	992.0	994.0	997.4
22/08/2019	9.1	13.6	19.3	0.0	0.3	6.0	33.4	28.5	46.4	53.6	988.8	993.6	1001.4
23/08/2019	5.3	11.1	17.5	0.0	0.2	4.4	12.4	29.4	49.9	63.8	1000.6	1002.6	1005.7
24/08/2019	9.1	16.6	24.2	0.0	0.5	6.6	26.2	13.3	28.5	51.4	993.2	996.4	1000.5
25/08/2019	11.7	16.2	22.8	0.0	0.0	4.2	29.0	13.6	42.1	81.5	992.8	995.6	999.6
26/08/2019	10.2	11.8	13.6	3.0	0.0	3.9	13.3	79.8	88.1	100.0	998.6	999.9	1001.1
27/08/2019	10.1	12.1	17.7	0.2	0.1	3.9	17.1	60.3	89.4	100.0	998.4	1000.0	1001.4
28/08/2019	8.6	13.8	20.3	0.0	0.0	2.7	10.8	32.3	66.5	100.0	994.3	997.4	1000.0
29/08/2019	7.8	9.6	13.2	11.0	0.2	5.5	20.1	48.0	77.9	100.0	997.5	1000.5	1002.9
30/08/2019	8.4	9.5	10.7	56.8	0.1	7.0	20.6	82.9	97.9	100.0	1001.5	1002.6	1004.1
31/08/2019	8.5	11.9	15.7	7.8	0.1	6.0	21.0	70.2	86.7	100.0	999.5	1001.5	1003.5
Monthly	4.8	12.5	24.2	79.0	0.0	4.7	33.4	11.4	56.4	100.0	978.8	997.3	1009.8

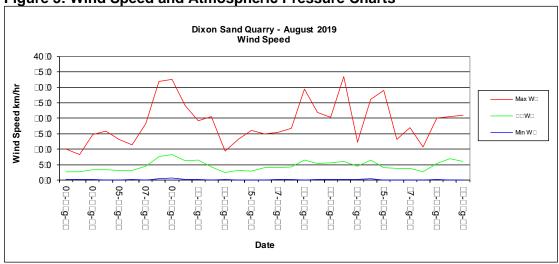












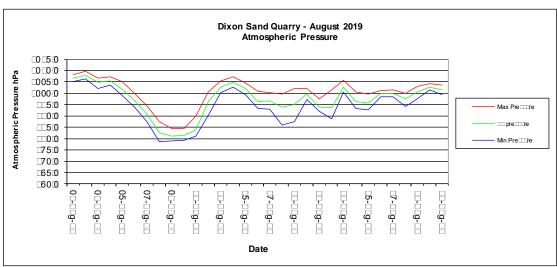
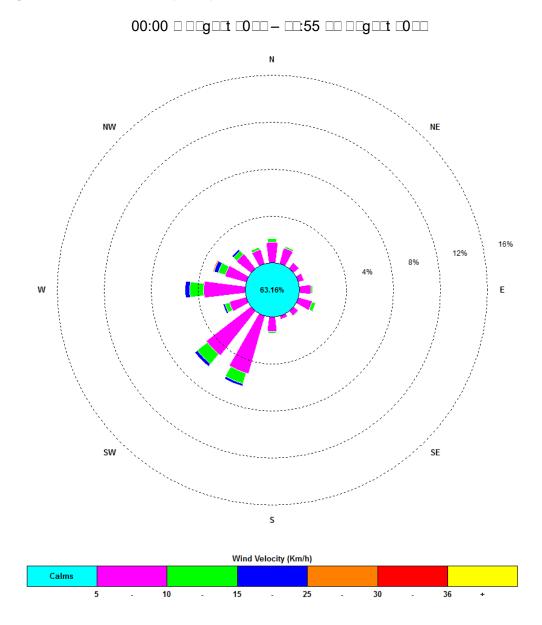


Figure 4: Windrose Plot (km/h)





CBased Environmental Pty Limited ABN 62 611 924 264

Dixon Sand Quarry

Environmental Monitoring Air Quality

Tapered Element Oscillating Microbalance (TEOM) (PM₁₀) and Meteorological Data

September 2019

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En ironmental □ienti t Date: □4 O □tober □0 □□

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1).	Summary
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1.0 Summary
Ba ed En ironmental Pt Limited ■BE i contracted b Dixon and to cond to contin antino Tapered Element O Illating Mi robalan e TEOM or the Particulate PM and meteorological monitoring or te Dixon and carr Te information i redired to a en air calit le el Te redit or te TEOM and meteorological ite are in ded in til report
T⊡e monitoring program in⊡⊡de⊡
 One contin co contin c
T⊡□ mont□□ report wa□ prepared b□ □Ba⊡ed En⊡ronmental and in□□de□ t⊡e ollowing□
 TEOM
□ □ rrent □ ear to date ann □ al a □ erage □ or $PM_{□}$ i □ □ al □ □ lated □ from t□ e □ □ □ □ □ □ □ or TEOM's coinciding with the Dixon Sand project year.
In a ⊡ordan e wit □ □ ⊡ed le □□□ondition 7 o te Dixon □and de elopment □on ent and te Dixon □and EPL□
 □II TEOM PM□ □4-□o□r a□erage re□It were below t□e □ort-term Dixon □and □□arr□□on□ent□□4-□o□r impa□t □riteria o□50□g□m□□ T□e □rrent TEOM PM□ ann□al a□erage i□ below t□e Dixon □and □□arr□□on□ent□ann□al a□erage □riteria o□□0□g□m□□ □rrentl□□□al□□lated T□P i□ below t□e Dixon □and □□arr□ ann□al a□erage □riteria o□□0□g□m□□ □II TEOM PM□ □4-□o□r a□erage re□It□ were below t□e Dixon □and □□arr□ EPL limit o□4□□g□m□□
ote: Ba⊡ed on t⊡e a⊡ailable data⊡tatement□in green indi⊡ate ⊡rrent ⊡on⊚rman⊡e to Dixon □and □□arr□□ir □□alit□Impa⊡t □□□e□ment □riteria□□tatement□in red indi⊡ate po⊡ible non-⊡on⊚rman⊡e□□ote t⊡at an ann⊡al amo⊡nt o⊡data ⊡a□now been ⊡olle⊡ted□
□pproximatel□ □00□ o □meteorologi □al data wa □re □o □ered □or □eptember □0 □□□ □pproximatel□ □00□ o □TEOM data wa □re □o □ered □or □eptember □0 □□□
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2.0 Sampling Program

T⊡e TEOM i□ operated to t⊡e appli⊡able □□⊡tralian □tandard and OE□ ŒP□□ appro⊡ed met⊡od□□ll laborator□anal⊡i□wa□ ⊡ond⊡ted b□a □ational □⊡o⊡ation o□ Te⊡ting □⊡t⊡oritie□ □□□T□□a⊡redited laborator□□
T⊡e lollowing □□⊡tralian □tandard□were □⊡ed:
□□□ 5 □ 0 □□□□□□□00□□ "Methods for Sampling and Analysis of Ambient Air. Determination of Suspended Particulates— PM_{10} continuous direct mass method using a tapered element oscillating microbalance analyser."
TEOM PM _{□0} re⊡lt□ are □4-□o□r a□erage□ at midnig⊡t and are reported a□ □g៤m□ □orre⊡ted to 0 degree□ □ and □0□□□□Pa□
T □e lo □ation o □t □e air □□alit □ monitoring e □□pment met t □e □□□tralian □tandard □□□5□0 □□□□ □007□" <i>Methods for sampling and analysis of ambient air Part 1.1 Guide to siting air monitoring</i> equipment" □□ir □□alit □ monitoring □te de □□ription □ and lo □ation □ are pro □ded in Table 1 :

Table 1: Dixon Sands Air Quality Monitoring Description and Locations

Monitor	Site Code	Location Description
TEOM PM _□	TEOM	Old □ort□Road⊡Maroota □□W
Meteorologi⊡al □tation	MET	Old □ort□ Road□Maroota □□W

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						П	П	\Box	П				$\neg \sqcap$	$\neg \sqcap$		7	$\neg \vdash$	\Box	$\neg \Gamma$	П	П	ПΓ		

3.0 Reporting Period Results

3.1 TEOM PM₁₀

T_errent TEOM PM_0 ann_al a_erage r_nrom t_e _1 0t pre_ent it i_ below t_e Dixon _andarr_ long term ann_al a_erage PM_0 _riteria o0 _grm_ T_errent ann_al a_erage _or _allated Totalpended Partilate1 _P_i_ below t_e ann_al a_erage _riterion o0 _grmT_e T_P iallated b _ m_ltipl_ing t_e PM_0 b15ote: an ann_al amo_nt o _data _a_not _et been _olle_ted_
□ □□arterl□ □alibration wa□ □nderta□en on □□ □eptember □0□□□ □alibration □□ □erti□□ate□ are pro□ded in Appendix 1 □w□en re□□ired□□ □ext □alibration i□ □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□

Table 2: Average Daily 24 Hr TEOM PM_{10} and TSP for September 2019 from AQMS and Annual Average PM_{10} calculated from the 1 July 2019.

Dete	TEOM	Annual PM ₁₀	TSP*	TSP Annual**
Date	PM _□ ᡎḡm□□	□ ⊡erage ᡎg m □	□gm□□	□g m □
	7Ⅲ	□□0	0	□7:5
	_00		50	□7:5
	00		50	□7⊈
40000	10		7	□7⊈
500000			45Ⅲ	77
60000		□□5	□16	
7.000	□□6	□□5	□□5	
	45	□□4		□□6
		□□4		□□5
	□□6	□□4		□□5
	4 4	□□4	60	□□6
	□□6	□□5	□ 4 □ 0	7
	4	□□6	60Ⅲ	
400	□ □7	□□ 7	46Ⅲ	
500	□□6		4 0	□□4
<u>6</u>	□6□6		4□5	□□5
70000		7		
	□7	□□6		
	4	□□6		
	5 4	□□ 7	□□5	
	□□ 6		4615	□□4
	7		67Ⅲ	
			□7□5	
400	□5			7
500	□□ 7			7
6000	□6Ⅲ		40Ⅲ	
70000	□□5			
	5 6			□0.00
	□7□0		4□5	□0 Ⅲ
	□6□5		4	□0□□

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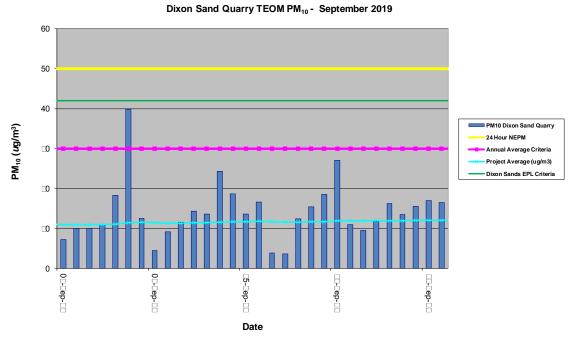


Figure 1: TEOM PM₁₀ 24 hr, Annual Average and Criteria

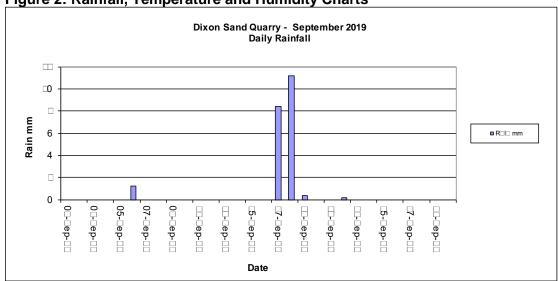
3.2 Meteorological Data

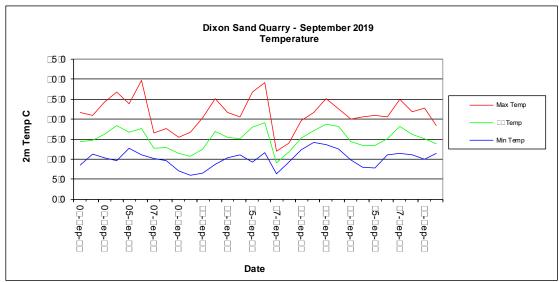
T_e __mmar_o_re__t_i_pre_ented in **Table 3. Figure 2 and 3** di_pla_t_e __art_o_ meteorologi_al parameter_ _or t_e mont__ windro_e i_pro_ided in **Figure 4.** T_i_pro_ide_t_e _re__en__ di_trib_tion o_wind _peed and dire_tion d_ring t_e mont_ to di_pla_dominant wind dire_tion__

Table 3: Meteorological Data Summary for September 2019

Date	Min Temp	□□Temp	Max Temp	RAIN mm	Min WS	Av WS	Max WS	Min Humidity	Av Humidity	Max Humidity	Min Pressure	Av pressure	Max Pressure
1/09/2019	8.5	14.4	21.6	0.0	0.1	3.1	9.2	26.7	70.1	100.0	996.0	998.4	1000.7
2/09/2019	11.3	14.7	21.0	0.0	0.3	4.6	27.9	26.2	60.6	83.0	994.9	996.4	998.1
3/09/2019	10.3	16.2	24.3	0.0	0.2	3.7	16.3	19.7	52.5	89.0	991.8	994.6	997.5
4/09/2019	9.7	18.4	26.8	0.0	0.1	4.0	18.2	14.8	41.9	75.0	989.8	992.8	994.3
5/09/2019	12.7	16.7	23.9	0.0	0.1	4.2	22.9	29.7	63.2	95.4	990.5	993.1	995.9
6/09/2019	11.0	17.6	29.7	1.2	0.0	7.2	35.7	7.5	61.6	100.0	975.6	983.8	991.8
7/09/2019	10.1	12.8	16.6	0.0	1.0	9.1	28.0	24.5	41.1	55.1	982.4	986.6	989.5
8/09/2019	9.7	12.8	17.7	0.0	0.2	6.0	18.8	24.0	40.3	55.9	988.0	989.7	991.6
9/09/2019	7.0	11.4	15.5	0.0	0.6	8.0	39.7	28.7	45.6	62.7	986.8	991.2	998.5
10/09/2019	6.0	10.8	16.8	0.0	0.2	4.9	18.5	40.8	53.9	77.3	998.5	1002.8	1007.7
11/09/2019	6.6	12.6	20.4	0.0	0.1	3.8	15.3	25.1	66.5	90.1	1004.9	1006.8	1009.5
12/09/2019	8.7	16.9	25.2	0.0	0.0	3.5	21.3	10.7	39.4	86.7	995.7	999.6	1005.2
13/09/2019	10.4	15.5	21.7	0.0	0.2	5.3	21.3	20.2	56.7	86.4	996.5	999.3	1003.1
14/09/2019	11.0	15.1	20.6	0.0	0.1	4.6	19.1	31.6	55.2	85.2	996.9	1000.1	1002.6
15/09/2019	9.2	18.1	26.7	0.0	0.2	4.3	12.1	13.0	47.4	96.4	996.2	998.9	1001.8
16/09/2019	11.7	19.2	29.1	0.0	0.2	5.0	14.7	9.4	38.6	99.8	990.8	995.2	999.5
17/09/2019	6.3	9.2	12.0	8.4	0.7	8.3	22.5	99.7	100.0	100.0	998.2	999.6	1001.9
18/09/2019	9.3	11.9	14.0	11.2	0.3	8.3	23.1	100.0	100.0	100.0	1000.8	1002.6	1004.1
19/09/2019	12.4	15.4	19.6	0.4	0.4	4.1	15.6	69.0	91.9	100.0	1002.5	1003.9	1005.5
20/09/2019	14.1	17.1	21.7	0.0	0.2	5.0	19.3	60.4	85.6	99.2	1000.2	1002.9	1005.4
21/09/2019	13.7	18.7	25.1	0.0	0.3	4.6	20.0	40.1	73.3	100.0	995.9	998.4	1000.9
22/09/2019	12.5	18.3	22.6	0.2	0.2	4.6	19.8	53.4	67.8	99.2	995.4	998.4	1000.8
23/09/2019	9.8	14.4	20.1	0.0	0.1	4.7	20.5	23.1	58.8	100.0	998.3	1001.1	1004.2
24/09/2019	7.9	13.5	20.6	0.0	0.0	3.6	14.7	22.9	47.9	75.3	1000.9	1003.6	1005.7
25/09/2019	7.8	13.5	20.9	0.0	0.0	3.2	20.8	25.1	66.8	96.4	1002.5	1004.7	1006.4
26/09/2019	11.1	15.2	20.5	0.0	0.2	4.0	26.9	49.5	81.4	99.2	999.3	1002.5	1005.4
27/09/2019	11.5	18.1	25.0	0.0	0.3	3.8	16.5	17.0	52.3	100.0	992.4	996.0	1000.3
28/09/2019	11.0	16.2	21.8	0.0	0.1	4.8	23.9	22.0	46.2	74.0	991.0	994.5	998.5
29/09/2019	9.9	15.0	22.7	0.0	0.1	3.7	17.3	32.8	65.7	84.8	993.3	996.6	999.9
30/09/2019	11.4	13.9	18.3	0.0	0.0	3.4	18.6	60.2	78.6	97.3	999.0	1002.7	1007.7
Monthly	6.0	15.1	29.7	21.4	0.0	4.9	39.7	7.5	61.7	100.0	975.6	997.9	1009.5







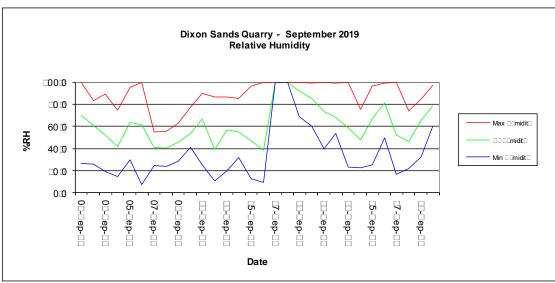
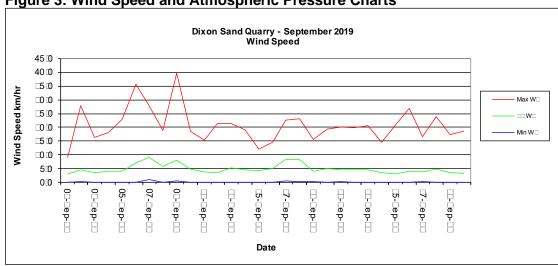


Figure 3: Wind Speed and Atmospheric Pressure Charts



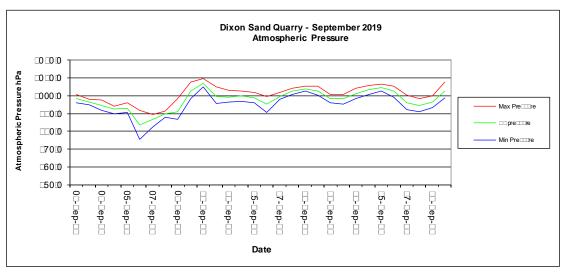
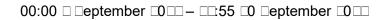
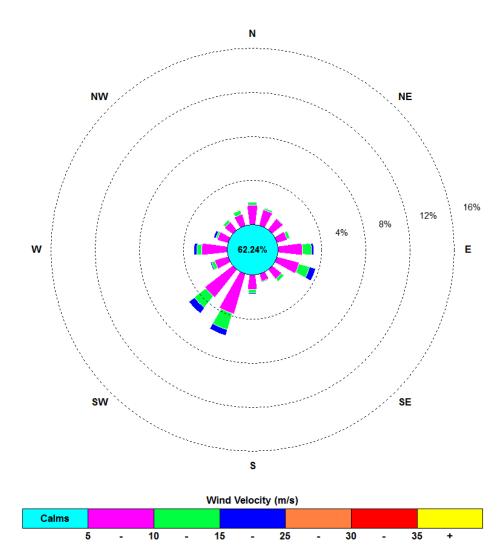


Figure 4: Windrose Plot (km/h)





Appendix 1

□alibration Do □ment □ w □en re □□red □



Continuous Air Quality Monthly/Quarterly/Six Monthly/Annual **TEOM Maintenance and** Calibration - 1400AB



TEOM Client/Site:	Xon Sandi / TEOM 1	Date: 19 9 19
1. TEOM Data Screen	SERIAL No: 25570	Firmware: N/A

Condition	Current Data	Acceptable Data	Pass (Tick)	Fail (Tick)
Operating Condition	al 4/	Green - Normal	OK /	
Date/time	TEOM: 19/9(19) 9:30 Actual: 19/9/19 9:34	Current Date/time correct within 5 minutes	~	
PM-10 24hr av	6.1	Positive values	_	
Filter loading PM10	36	<80 %		
Frequency PM-10	252-18359	200-300 Hz		
Noise PM-10	0.027	<0.100ug	/	

Comment: If filter load >80% but <90% and if flows Ok then data is OK

Con	ıments	:				
			1	7	7	. 1

Temp ruge on min/max Themonde Max 15°C me 20°C Voll reset.

2. System Status

Condition	Current Data	Acceptable Data	Pass (Tick)	Fail (Tick)
Vacuum pump pressure	0.4	<0.50 atm	/	
Warnings	NIL	No Warnings		
If any warnings list:				

Comments:

Data Downloaded: YES/NO (circle)

Signed UM Technician Name: (DLW DAVIET

> F301D - TEOM Field Check Sheet 1400AR PM10 Version 12 Revised: 2 June 2019



3. Instrument Conditions Ambient Conditions and Temperatures

Condition	Current Data	Acceptable Data	Pass (Tick)	Fail (Tick)
Ambient Temperature	N-6	-10 to 50 C		
Ambient Dew Point	NA	-10 to 50 C	_	_
Ambient Pressure	0.968	0.9-1.1 atm	/	
Ambient Relative Humidity	N/A	10-100 %RH	_	_
Cap temperature	50.00	50.00 +/- 0.10 C	/	
Case temperature	50.00	50.00 +/- 0.10 C	-	
Main (PM-10) Air Tube temp	20.00	50.00 +/- 0.10 C	/	

Comments:

4. Instrument Conditions - Flows

Condition	Current Data	Acceptable Data	Pass (Tick)	Fail (Tick)
Main (PM-10) Flow rate	3.00	2.82 – 3.18 lpm		
Bypass Flow rate	13-68	12.95 - 14.39 lpm	/	
Total Flow rate	16-65	15.67 - 17.67 lpm	_	

Comments:

	Results: (Tick box)
/	There were NO equipment faults found. No action required - (file report)
	There were faults found (Fails) - Were these fixed on site: YES/NO (circle)
	Any Fails that cannot be repaired on site must be reported to CBased: Office: 65713334 or email cbased@bigpond.com
	Date faults notified to CBased:

Comments/Action Required:



<u>Calibration/Maintenance</u> 1. 1405A: Were Filters replaced

PM10 Inlet he	ad cleaned		VES/NO			
3. If measureme	nt filters were r	eplaced, confirm	stable results a	fter change. St	table	
particulate resul			(YES/NO	•		
• 00-01-01-01-01-01-01-01-01-01-01-01-01-0						
Channel	Filter Load %	Frequency Hz	Frequency	Frequency	Frequency	
		initial	check 1min	check 3min	check 5min	
PM10	20	254-04396	254-04397	TAMES A SUNCE OF STREET	254-04397	./
Frequency should n		an 0.0010 between d redo stability test.	readings (if instru		** The state of th	
4. Instrument clo if Time changed Comments:			YES/NO. YES/NO or (i	NA not change	ed)	
5. Were TEOM in necessary. Comments if cha		EOM filters chec	ked for cleanlin (YES/NO.	ess and replace	ed if	
6. TEOM Cleaned operational state		ioner checked YE	NO. Air Cond	litioner setting	s or	
		alibrator Serial Nessure and Flow			ration	
Quarterly or Six	Monthly Calibr	ation				
1. Flow Verificat						
PM10 Flow verif	ied Flow I/mi	n_ <u>2-91</u> Error %	6_30 (allow	ved error <6%)	PASS/FAIL	Florid 3.00 Fadj 1.05
	lete a full multip	n_13.44_ Error % point recalibration recalibrated:		manager and the second		Final 13-6 Foldy 1-01
2. Leak Check –	Conducted VES	no				
PM10 actual 0	-05 <1	imit 0.15				
Bypass actual_€	·24 <1	imit 0.60				
Leak check PASS, Comments:	FAIL – If fail the	en find leak and r	etest.			

F301D - TEOM Field Check Sheet 1400AB PM10 Version 12 Revised: 2 June 2019



Annual Calibration/Maintenance

. .

1. Temperature and Pressure Calibration – Conducted YES/NO
Reference Temperature: C TEOM Temperature C
if difference +/- 1 C recalibrate sensor. Sensor recalibrated YES/NO
/ I americano y To recommendo semson semson recommendo y Esymo
Reference Pressure:atm TEOM Pressureatm
if difference +/- 0.010 atm recalibrate sensor. Sensor recalibrated YES/NO
in americane sy store demirecumbrate sensor sensor recumbrated (ES/NO
Note: Tetracal measures Atmospheric Pressure in mm Hg or mb or hPa
For mb or hPa divide tetracal result by 1013.25 to change units to atm.
For mmHg divide tetracal result by 760 to change units to atm.
rol miling divide tetracal result by 700 to change units to atm.
2. Flow Calibration – Conducted YES/NO
PM10
/
Set point 2.4 Actual:
Set point 3.6 Actual: After calibration Final:I/min
Set point 3.0 Actual: After calibration Final:I/min
BYPASS
Set point 10.9 Actual:
Set point 16.4 Actual:
Set point 13.67 Actual: After calibration Final:I/min
3. Mass calibration (KO) Verification – Conducted YES/NO
Actual measured KO = TEOM stated KO Error %:
Allowed Error +/- 2.5%. PASS/FAIL /
If Error +/- 2.5% repeat. If confirmed consult manufacturer.
Second Error % = PASS/FAIL. Comments:
If second test fails consult manufacturer.
4. Annual Noise check - Conducted YES/NO
Zero filter applied to TEOM and TEOM operated for at least 12 hours:
Start date/time:Finish date/time:
Standard deviation of all recorded data (min 30 min averages) =ug/m ³
Noise was less than 5ug/m ³ YES/NO
5. Maintenance
Air Inlet system cleaned YES/NO
Pump Reconditioned YES/NO
Check Waterproofing YES/NO
Comments:

F301D - TEOM Field Check Sheet 1400AR PM10 Version 12 Revised: 2 June 2019





CBased Environmental Pty Limited ABN 62 611 924 264

Dixon Sand Quarry

Environmental Monitoring Air Quality

Tapered Element Oscillating Microbalance (TEOM) (PM₁₀) and Meteorological Data

October 2019

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1	.0	Summary
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1.0 Sammary
Ba ed En ironmental Pt□ Limited BE i ontra ted b Dixon and to ond to ontine ontine Tapered Element O illating Mi robalane TEOM or ine Particulate PM and meteorologial monitoring or te Dixon and arr Te information i recired to a in all call level Te recit or te TEOM and meteorologial ite are indeed in tidereport
T⊡e monitoring program in⊡⊡de⊡
 One contin co contin c
T⊡□ mont⊡□ report wa□ prepared b□ □Ba⊡ed En⊡ronmental and in□⊡de□ t⊡e ollowing□
 TEOM □PM□□monitoring re□It□ or O□tober □0□□□and Meteorologi □al re□It□ or O□tober □0□□□
□ rrent □ear to date ann □al a □erage □or PM □ i□ □al □□lated □rom t□e □¹ □□□□ □or TEOM's coinciding with the Dixon Sand project year.
In a □ordan □e wit □ □□□ed □e □□□ondition 7 o □t □e Dixon □and de □elopment □on □ent and t □e Dixon □and EPL □
 □II TEOM PM □ □ 4-□□ r a erage re □It were below t e □ort-term Dixon □ and □□ arr □ □on ent □ 4-□□ r impa t riteria o □ 50 □g m □ ex ept □ o □ o □ rrent □ = □ Te □ rrent TEOM PM □ ann □ a erage i □ below t e Dixon □ and □□ arr □ □ on ent □ ann □ al a erage riteria o □ 0 □g m □ □ rrent □ □ al □ ated T □ P i □ below t e Dixon □ and □□ arr □ ann □ al a erage riteria o □ 0 □ g m □ □ □ TEOM PM □ □ 4-□□ r a erage re □ t □ were below t e Dixon □ and □□ arr □ EPL limit o □ 4 □ g m □ ex ept □ r □ o □ rren □ e □
ote: Ba ed on t e a ailable data tatement in green indicate trent conformance to Dixon and carrorir calitolimpa to element criteria tatement in red indicate po ible non-conformance ote t at an annual amount o data a now been collected.
□pproximatel □ □00 □ o □meteorologi □al data wa □re □o □ered □or O □tober □0 □□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□□
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2.0 Sampling Program

T⊡e TEOM i□ operated to t⊡e appli⊡able □□⊡tralian □tandard and OE□ ŒP□□ appro⊡ed met⊡od□□ll laborator□anal□□□wa□□ond□□ted b□a □ational □□□o□ation o□ Te⊡ting □□t□oritie□□□□□T□□a□□redited laborator□□
T⊑e ⊚llowing □□⊑tralian □tandard□were □⊑ed:
$\Box\Box\Box\Box\Box\Box\Box\Box\Box\Box\Box\Box$ "Methods for Sampling and Analysis of Ambient Air. Determination of Suspended Particulates—PM ₁₀ continuous direct mass method using a tapered element oscillating microbalance analyser."
TEOM PMɒ re⊡t□ are □4-□o□r a⊡erage□ at midnig⊡t and are reported a□ □g៤m□ ⊡orre⊡ted to 0 degree□ □ and □0□□□□Pa□
T □e lo □ation o □t □e air □□alit □ monitoring e □□ipment met t □e □□□tralian □tandard □□□□5□0□□□□ □□007□" <i>Methods for sampling and analysis of ambient air Part 1.1 Guide to siting air monitoring equipment</i> " □□ir □ □alit □ monitoring □te de □ ription □ and lo □ation □ are pro □ded in Table 1 :

Table 1: Dixon Sands Air Quality Monitoring Description and Locations

Monitor	Site Code	Location Description
TEOM PM _□	TEOM	Old □ort□Road⊡Maroota □□W
Meteorologi⊡al □tation	MET	Old □ort□ Road□Maroota □□W

السال	السال	 	٠			السال	 _							_	الساا					اسال	_						ш	ш	 														_		_
		$\neg \Box$		$\neg \Gamma$	П		$\neg \Gamma$	7	7	abla	\top	┰	Γ	П			$\neg \Gamma$	$\neg \Gamma$	┰	П	$\neg \Gamma$	Т	7	\sqcap	\Box	П	П	П		$\neg \Gamma$	7	$\neg \Gamma$	$\neg \Gamma$	7	7	٦٢	$\neg \Gamma$	$\neg \Gamma$	7	$\neg \Gamma$	7	┰	\Box	П	П

3.0 Reporting Period Results

3.1 TEOM PM₁₀

□4-□o□r a□erage TEOM PM□ re□t□ rom t□e □□M□ data □olle□tion □ortware are pro□ded in Table 2 and a □□art o□t□e data i□ pro□ded in Figure 1 □D□ring t□e monitoring period t□ree indi□d□al □4-□o□r TEOM PM□ re□t□ were abo□e t□e □ational En□ronment Prote□tion Mea□re □□EPM□□□ort-term □□4□r□impa□t □riteria o□ 50□g·m□ and t□e Dixon □and □□arr□ EPL limit o□4□□g·m□□□g□lig□ted □ellow in Table 0□
Table 2□ T□e □rrent TEOM PM ann□al a□erage r□n□ rom t□e □¹ □□□□0□□□t pre□ent it i□ below t□e Dixon □and □□arr□ long term ann□al a□erage PM riteria o□□0□gm T□e □rrent ann□al a□erage ror □al□□ated Total □□□pended Parti□□ate□ roll□□ □ below t□e ann□al a□erage □riterion o□□0□gm□□T□e T□P i□□al□□ated b□m□ltipl□ing t□e PM b□□0□□□□□0te: an ann□al amo□nt o□data □a□not □et been □olle□ted□
□ □□arterl□ □alibration wa□ □nderta□en on □□ □eptember □0□□□ □alibration □□ □erti□□ate□ are pro□ded in Appendix 1 □w□en re□□red□□ □ext □alibration i□□□ed□ed or De□ember □0□□□

Table 2: Average Daily 24 Hr TEOM PM_{10} and TSP for October 2019 from AQMS and Annual Average PM_{10} calculated from the 1 July 2019.

Doto	TEOM	Annual PM ₁₀	TSP*	TSP Annual**
Date	PM _™ ᡎg™□	□ erage ᡎg m □	$\square g \square m \square$	⊞g m □□
	□□6		□ 4 □ 0	□0□□
	56			□0 [4
	□□5		5	□0:7
400	□□6	□□5	□4 □ 0	
500	□□4	□□5		
600	□□6	□□5	□□5	
700	□0:5	□17	76Ⅲ	□□ 7
	4		4□5	
	□6	□ 7	□4 □0	
000000	□5□0	117	□7:5	
	7Ⅲ	□ 7	7	□□ 7
	7.0	□□6	□7:5	□□6
	7Ⅲ	□□6		□□5
400		□□6	□ 4 □ 5	□□4
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<u>_6</u> 0	□6Ⅲ		65Ⅲ	
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	□5Ⅲ			
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000000				
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	□□5	0	46Ⅲ	□□6
	□□6		4□10	□□ 7
400	□□5			
500		4		□□6
600	99.3	□4 □□	□4□□□	□5 🖪
700	□5Ⅲ	□4 Ⅲ	6□0	□516
	□□ 7	□4 Ⅲ	5□Ⅲ	□5Ⅲ
	□ 4 □ 5	□4□5	□6Ⅲ	□6Ⅲ
000000	67.3	4	<u> </u>	7
	96.5	□516	□4□□□	□□0

□□al□□ated rom PM□0

□□al□□ated rom PM□0 □nn□al □ reage

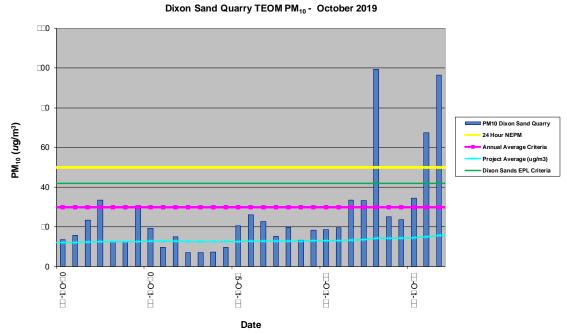


Figure 1: TEOM PM₁₀ 24 hr, Annual Average and Criteria

3.2 Meteorological Data

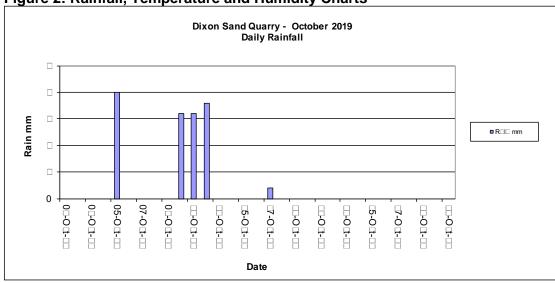
T_e __mmar_o_re__It_i_pre_ented in **Table 3. Figure 2 and 3** di_pla_t_e __art_o_ meteorologi_al parameter_ _or t_e mont__ windro_e i_pro_ided in **Figure 4.** T_i_pro_ide__t_e __en__ di_trib_tion o_wind _peed and dire_tion d_ring t_e mont_ to di_pla_dominant wind dire_tion__

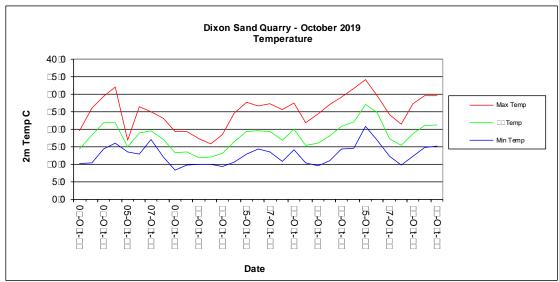
Table 3: Meteorological Data Summary for October 2019

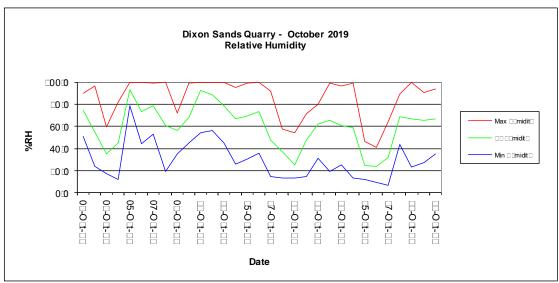
Summary Oct-19 Dixon Sands

Date	Min Temp	□□Temp	Max Temp	RAIN mm	Min WS	Av WS	Max WS	Min Humidity	Av Humidity	Max Humidity	Min Pressure	Av pressure	Max Pressure
1/10/2019	10.2	14.3	19.5	0.0	0.4	4.2	16.9	51.1	74.4	89.9	1005.9	1007.8	1009.8
2/10/2019	10.3	18.3	26.1	0.0	0.4	4.4	14.2	24.1	55.0	96.7	1002.0	1004.7	1007.6
3/10/2019	14.3	21.8	29.3	0.0	0.1	4.1	13.8	17.4	35.5	59.7	998.0	1000.8	1003.6
4/10/2019	16.0	21.9	32.1	0.0	0.2	5.8	21.7	11.9	44.8	81.7	993.3	997.1	1000.3
5/10/2019	13.6	15.0	16.9	2.0	0.0	3.0	13.1	78.9	92.9	100.0	998.8	1000.6	1002.7
6/10/2019	12.9	19.0	26.5	0.0	0.2	4.4	13.4	44.7	73.4	100.0	987.8	993.2	1000.1
7/10/2019	17.0	19.5	24.9	0.0	0.2	5.4	21.5	52.8	78.6	99.2	987.4	989.3	991.3
8/10/2019	12.0	17.1	23.1	0.0	0.0	4.7	30.4	19.7	60.6	100.0	987.5	990.6	997.0
9/10/2019	8.3	13.2	19.3	0.0	0.4	4.6	16.5	35.1	56.3	72.0	997.0	999.7	1002.2
10/10/2019	9.8	13.6	19.3	1.6	0.1	5.2	26.2	44.9	68.4	99.2	998.0	1000.1	1002.0
11/10/2019	9.9	11.9	17.3	1.6	0.2	3.1	15.9	54.6	92.5	100.0	994.8	997.0	999.3
12/10/2019	10.0	12.0	15.7	1.8	0.5	4.9	22.0	56.5	88.7	100.0	995.2	996.7	999.6
13/10/2019	9.4	13.1	18.6	0.0	0.2	4.3	18.8	45.0	78.5	100.0	996.5	998.4	1000.1
14/10/2019	10.5	16.5	24.5	0.0	0.2	4.9	17.9	26.0	67.1	94.9	991.2	994.4	998.4
15/10/2019	12.8	19.4	27.6	0.0	0.0	4.3	21.7	30.3	69.5	99.2	986.8	990.2	992.8
16/10/2019	14.4	19.5	26.7	0.0	0.2	3.4	12.8	35.7	73.2	100.0	987.2	989.3	991.6
17/10/2019	13.5	19.4	27.2	0.2	0.5	5.8	28.2	14.5	47.7	91.7	983.8	987.1	993.5
18/10/2019	10.7	16.8	25.7	0.0	0.4	3.9	15.9	13.3	37.5	57.8	991.3	993.8	996.5
19/10/2019	14.2	19.9	27.4	0.0	0.4	6.3	21.8	13.7	25.4	54.0	989.1	992.9	997.6
20/10/2019	10.4	15.3	21.9	0.0	0.2	4.7	23.8	14.7	47.7	71.2	997.6	999.8	1004.1
21/10/2019	9.6	15.9	24.4	0.0	0.0	3.7	18.4	31.5	62.0	79.9	1001.5	1003.7	1005.5
22/10/2019	11.0	18.0	27.1	0.0	0.0	4.8	22.4	19.5	65.3	99.2	998.8	1002.3	1004.5
23/10/2019	14.3	20.8	29.2	0.0	0.0	3.7	18.0	25.2	60.9	96.3	995.3	999.3	1003.2
24/10/2019	14.5	22.1	31.7	0.0	0.1	3.9	16.8	13.2	59.0	99.4	993.1	995.4	997.7
25/10/2019	20.8	27.1	34.1	0.0	0.4	7.7	34.0	12.1	24.8	46.2	985.4	989.7	994.2
26/10/2019	16.8	24.7	29.5	0.0	0.6	7.9	47.3	9.7	24.0	41.1	981.1	984.6	991.6
27/10/2019	12.2	17.2	24.1	0.0	0.1	4.8	28.7	7.0	32.2	64.5	990.5	993.0	996.5
28/10/2019	9.7	15.5	21.5	0.0	0.1	5.0	24.6	43.9	69.1	89.2	996.5	999.6	1003.0
29/10/2019	12.3	18.8	27.2	0.0	0.0	3.9	25.1	23.5	67.1	99.8	995.7	999.6	1002.9
30/10/2019	14.7	20.9	29.6	0.0	0.0	4.1	15.9	27.4	65.2	90.6	993.3	995.5	997.5
31/10/2019	15.2	21.2	29.6	0.0	0.1	4.7	21.7	35.4	66.6	94.0	992.8	994.6	996.6
Monthly	8.3	18.1	34.1	7.2	0.0	4.7	47.3	7.0	60.1	100.0	981.1	996.2	1009.8

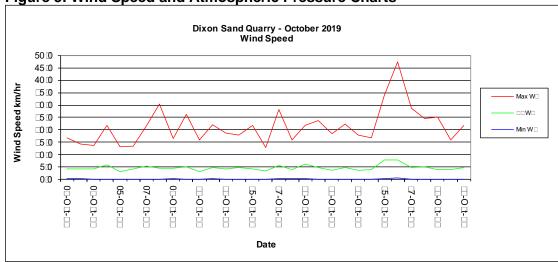












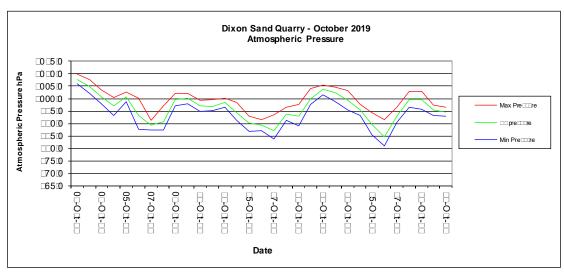
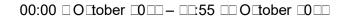
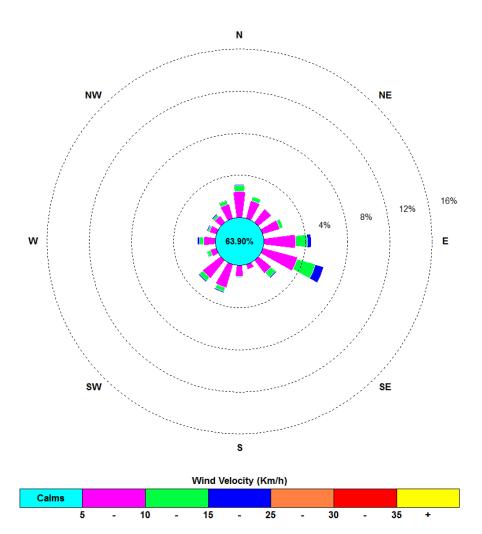


Figure 4: Windrose Plot (km/h)







CBased Environmental Pty Limited ABN 62 611 924 264

Dixon Sand Quarry

Environmental Monitoring Air Quality

Tapered Element Oscillating Microbalance (TEOM) (PM₁₀) and Meteorological Data

November 2019

□olin Da⊑e□B□□MEI□ □E□□P

En ironmental □ienti i Date: □6 De □ember □0 □□

D			
- Dixon ⊟and	ı	ital Monitoring Pro	e t − □o ember □0□□

1.0 Summary

□Ba ed En ironmental Pt Limited □□BE i □ contra ted b □ Dixon □ and to cond □ tontin co □ Tapered Element O □ illating Mi robalan e □TEOM □ or ine Parti □ late □ □PM □ and meteorologi al monitoring or t e Dixon □ and □ carr □ T e in ormation i □ re □ ired to a □ e □ air □ alit □ le el □ T e re □ t □ or t e TEOM and meteorologi al □ ite are in □ ded in t □ report □
T⊡e monitoring program in □□de □□
 One □ontin□o□□TEOM PM□ monitor□and One □ontin□o□□Meteorologi□al □tation□
T ☐ mont ☐ report wa prepared b ☐ Ba ☐ En ☐ ronmental and in ☐ ☐ t ☐ ollowing ☐
 TEOM
□ □ rrent □ ear to date ann □ al a □ erage □ or $PM_{□}$ i □ □ al □ □ ated □ from t □ e □ ¹ □ □ □ □ □ □ or TEOM's coinciding with the Dixon Sand project year.
In a □ordan □e wit □ □ □ed □e □□□ondition 7 o □t □e Dixon □and de □elopment □on □ent and t □e Dixon □and EPL□
 Ill alid TEOM PM
□riteria o□□0 □g m□□ □ □ □ □ □ □
□ote: Ba ed on te a allable data tatement in green indicate trent conformance to Dixon □and □ arr □ ir □ alit □ Impa t □ e ment riteria tatement in red indicate po ble non-conformance ote teat an annual amount o data a now been collected.
□pproximatel □ □00 □ o meteorologi al data wa re o ered or □o ember □0 □□□ □pproximatel □ □00 □ o TEOM data wa re o ered or □o ember □0 □□□ b t onl □65 □ o data wa deemed alid d to exe i e titer loading and red ed tow apatit □o TEOM monitor □
Ba ed En ironmental Pt Ltd Page 0 0 0

D			
- Dixon ⊟and	ı	ital Monitoring Pro	e t − □o ember □0□□

2.0 Sampling Program

T⊡e TEOM i□ operated to t⊡e appli⊡able □□tralian □tandard and OE□ □EP□□ appro⊡ed met□od□□ll laborator□anal□i□wa□ □ond□ted b□a □ational □□□o□ation o□ Te□ting □□t□oritie□□□□T□□a□redited laborator□□
T⊑e lollowing □ landard were led:
□□□5□0□□□□□□00□□ "Methods for Sampling and Analysis of Ambient Air. Determination of Suspended Particulates—PM₁₀ continuous direct mass method using a tapered element oscillating microbalance analyser."
TEOM PM _{□0} re □ t□ are □4-□o□r a erage □ at midnig □t and are reported a □ □g m □ corre □ ted to 0 degree □ □ and □0□□□□Pa□
T □e lo □ation o □t □e air □□alit □ monitoring e □□ipment met t □e □□□tralian □tandard □□□5□0□□□□□007□"Methods for sampling and analysis of ambient air Part 1.1 Guide to siting air monitoring equipment" □□ir □□alit □ monitoring □te de □□ription □ and lo □ation □ are pro □ded in Table 1 :

Table 1: Dixon Sands Air Quality Monitoring Description and Locations

Monitor	Site Code	Location Description
TEOM PM _□	TEOM	Old □ort□Road⊡Maroota □□W
Meteorologi⊡al □tation	MET	Old □ort□ Road⊡Maroota □□W

|--|

3.0 Reporting Period Results

3.1 TEOM PM₁₀

□4-□□□r a □erage TEOM PM□ re□t□ rom t□e □□M□ data □olle□tion □oftware are pro□ded in Table 2 and a □□art o□t□e data i□ pro□ded in Figure 1□D□ring t□e monitoring period□□5□ o□data wa□ deemed in□alid d□e to ex□□□□e tilter loading and red□□ed tiow □apa□t□ wit□ t□e TEOM monitor w□□ wa□ a dire□t □a□□e o□□ig□ wind□□dr□□condition□ and b□□□ tire□ in t□e area d□ring t□e monitoring period□□alid data indi□ated t□ere were 6 indi□d□al □4-□□□r TEOM PM□ re□□t□ abo□e t□e □ational En□ronment Prote□tion Mea□□re □□EPM□□□ort-term □□4□□impa□t□riteria o□50□g·m□ and □ o□□□rren□e□ abo□e t□e Dixon □and □□arr□ EPL limit o□4□□g·m□□□ig□ig□ted □ellow in Table 2□
T_errent TEOM PM _{□0} ann al a erage r n lifom t e _f _f _ 0 _ 0 _ t pre ent it i below t e Dixon land lifarr long term ann al a erage PM _{□0} criteria o 0 0 gm Tierrent ann al a erage for all ated Total lifended Parti ate of P i below t e ann al a erage criterion o 0 0 gm o T e T P i all ated b motipling t e PM _{□0} b 0 0 0 0 t ann ann al amo nt o data a not et been collected
□ □□arterl□ □alibration wa□ □nderta□en in □eptember □0□□ and a non-ro□tine □iter □□ange and □alibration wa□ □ond□□ted on □□ □o□ember □0□□□□alibration □erti□□ate□ are pro□ded in Appendix 1 □w□en re□□ired□□ □ext □alibration i□ □□□ed□ed □or □o□□ember □0□□□

Table 2: Average Daily 24 Hr TEOM PM_{10} and TSP for November 2019 from AQMS and Annual Average PM_{10} calculated from the 1 July 2019.

D-1-	TEOM	Annual PM ₁₀	TSP*	TSP Annual**
Date	PM _□ ᡎg™□	□ erage ᡎg m □	$\square g \square m \square$	□□g m □□
	43.9	□5Ⅲ		□□6
	□□0	□610	□7□5	4010
	□6Ⅲ	□6Ⅲ	□0□5	404
40	7Ⅲ	□6Ⅲ		40Ⅲ
50	□□4	□6Ⅲ		40Ⅲ
60	□0:5	□610	□6 Ⅲ	40Ⅲ
70	60.7	□6□ 4	□5□Ⅲ	40Ⅲ
	85.8	□6Ⅲ	□45	4□□
	74	□6Ⅲ	□□5	4□□
		□6Ⅲ		4□0
		□7 10	□□5	4□4
	118.1	77	□5□	44 Ⅲ
		□7Ⅲ	5□6	44 🖪
40	45.5			44 Ⅲ
50	97.1	□□5	□4 □ □ □	46⊈
<u></u>	□□6	□□6	7□0	4616
70	□0.16	□17	76 : 5	46Ⅲ
	55.4	0	<u>5</u>	47.5
	In⊡alid Data	0	0.0	0.0
	In⊡alid Data	0	0.0	0.0
	In⊡alid Data	0	0.0	0.0
	In⊡alid Data	0	0.0	0.0
	In⊡alid Data	0	0.0	0.0
40	In⊡alid Data		0.0	0.0
50	In⊡alid Data	□□0	010	0.0
60	In⊡alid Data	□□0	010	0.0
70	In⊡alid Data	□□0	010	0.0
	In⊡alid Data	□□0	010	0.0
	In⊡alid Data	□□0	010	0.0
	151.8		□7□5	4 🗆 🗆

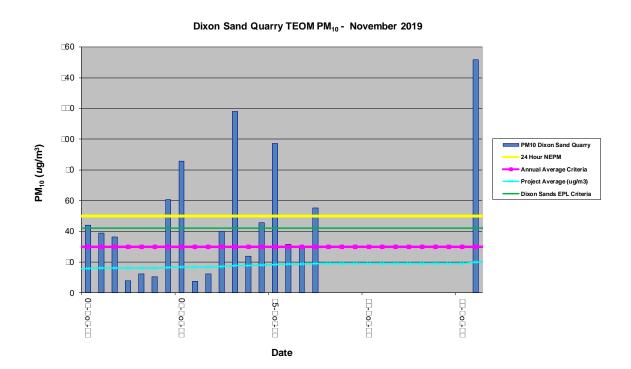


Figure 1: TEOM PM₁₀ 24 hr, Annual Average and Criteria

3.2 **Meteorological Data**

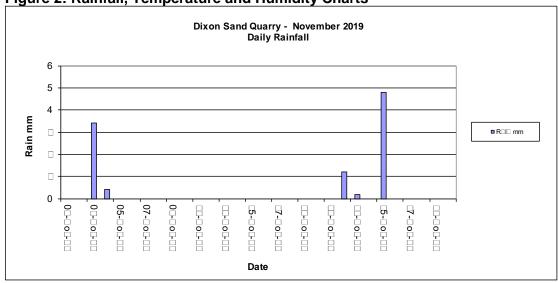
T□e weat□er □tation log□ data at 5-min□te inter□al□ and □end□ t□e data to a web databa e b □ extG telemetr □ T e data i □ a □ e □ ible rom t e web □ te _ttp: ||||on _ole ||teledata |||om ||a _lindex |||tml ||

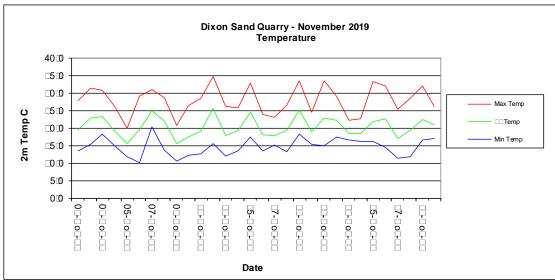
T⊡e ⊡mmar□o⊡re⊡t□i□pre⊡ented in Table 3. Figure 2 and 3 di⊡pla□t⊡e ⊡art□o□ meteorologi⊑al parameter or t e mont windro e i pro ded in **Figure 4.** T o di□pla □ dominant wind dire □tion □ □

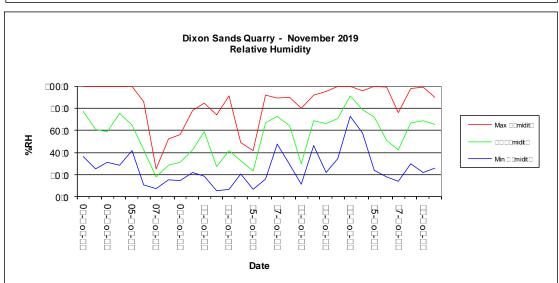
Table 3: Meteorological Data Summary for November 2019

Summary Nov-19 **Dixon Sands** RAIN mm Min WS Min Humidity Av Humidity Min Pressure Av pressure Date Min Temp □□Temp Max Temp Av WS Max WS Max Humidity Max Pressure 1/11/2019 13.6 19.6 28.0 0.0 0.1 5.1 26.6 36.7 77.7 100.0 991.5 994.4 996.9 2/11/2019 15.4 22.8 31.5 0.0 0.1 6.1 22.1 25.6 60.7 100.0 990.1 993.0 995.4 3/11/2019 18.2 23.4 30.8 3.4 0.5 5.8 30.3 31.5 58.6 100.0 987.8 991.0 992.8 4/11/2019 14.9 28.4 100.0 19.1 26.3 0.4 0.3 4.7 17.0 75.6 989.8 991.5 993.6 5/11/2019 64.9 11.9 15.5 19.9 0.0 0.2 4.4 22.2 42.1 100.0 990.5 993.0 995.3 6/11/2019 19.5 29.2 0.0 4.5 42.5 86.1 984.4 989.6 995.1 10.2 0.1 18.6 11.1 7/11/2019 20.4 25.0 31.0 0.0 0.1 7.8 30.0 7.3 17.8 25.0 981.4 983.2 985.9 8/11/2019 13.8 22.1 28.7 0.0 0.4 6.8 34.4 15.4 28.4 52.3 977.1 981.7 987.2 9/11/2019 15.5 20.7 0.0 0.2 5.5 14.5 31.0 56.1 989.3 991.5 10.6 26.7 987.2 10/11/2019 12.2 17.4 26.4 0.0 0.2 4.8 26.5 21.7 42.5 78.1 988.4 990.9 995.0 11/11/2019 12.7 19.2 28.5 0.0 0.5 5.3 21.5 19.0 59.0 84.7 989.0 992.6 995.4 12/11/2019 15.6 25.5 34.8 0.0 0.2 6.9 32.9 5.6 27.4 74.0 979.6 985.3 990.6 13/11/2019 17.9 26.2 42.0 91.0 992.8 12.0 0.0 0.0 3.9 16.1 6.8 988.0 990.5 14/11/2019 13.5 19.3 25.8 0.0 20.4 32.8 0.0 4.1 18.6 49.0 988.3 991.6 994.8 15/11/2019 17.4 24.5 32.9 0.0 0.2 4.7 6.7 23.4 41.5 984.0 988.0 990.6 26.7 16/11/2019 13.6 18.2 24.0 0.0 0.1 5.0 22.2 16.4 66.5 92.0 989.8 992.9 995.3 17/11/2019 23.2 73.0 15.1 17.9 0.0 0.2 5.0 22.5 48.0 89.2 992.5 994.6 999.2 18/11/2019 13.3 19.3 26.6 0.0 0.2 4.6 18.4 29.5 63.9 89.6 990.0 994.6 998.9 19/11/2019 18.3 25.2 33.5 0.0 0.4 4.6 20.4 11.4 30.1 80.0 986.0 989.8 993.8 20/11/2019 15.4 18.8 24.6 0.0 0.0 5.2 46.4 68.9 91.8 993.3 19.9 995.1 997.2 21/11/2019 15.0 22.8 33.5 0.0 0.0 5.3 25.4 22.2 66.0 95.3 987.1 991.8 997.2 22/11/2019 29.2 100.0 17.4 22.3 1.2 0.3 6.6 19.5 34.8 71.0 987.1 990.7 994.5 23/11/2019 16.7 18.4 22.2 0.2 0.1 3.2 14.3 72.5 91.4 100.0 990.4 993.5 996.9 24/11/2019 16.2 18.5 22.7 0.0 0.3 4.2 15.8 57.5 78.4 95.5 992.8 995.8 998.4 25/11/2019 21.8 33.4 23.9 72.0 100.0 985.1 989.3 994.6 16.2 4.8 0.4 4.9 18.8 26/11/2019 14.6 22.6 32.1 0.0 0.1 6.1 34.2 18.2 51.0 99.0 978.1 984.4 991.1 27/11/2019 17.1 25.3 0.0 0.0 14.4 42.2 991.0 993.1 995.5 11.4 4.3 23.6 76.2 28/11/2019 28.6 67.0 19.3 0.0 30.1 97.6 990.9 994.0 995.9 11.8 0.0 5.2 33.1 29/11/2019 16.7 22.6 32.0 4.5 22.3 68.6 99.2 994.6 0.0 0.1 23.5 986.9 991.0 30/11/2019 17.0 21.0 26.3 0.0 0.1 4.6 26.7 26.3 65.5 89.7 983.9 986.3 988.3 10.2 20.4 34.8 10.0 0.0 5.1 34.4 5.6 55.3 100.0 977.1 990.7 999.2 Monthly

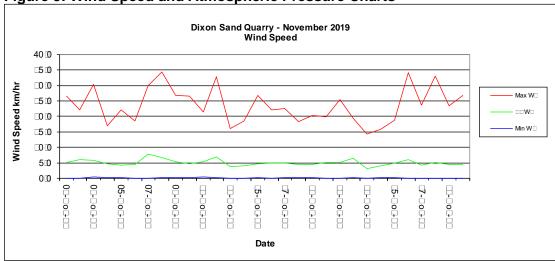












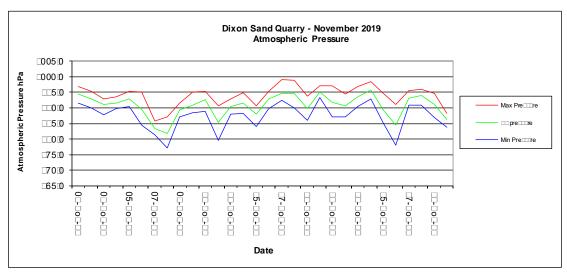
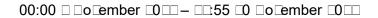
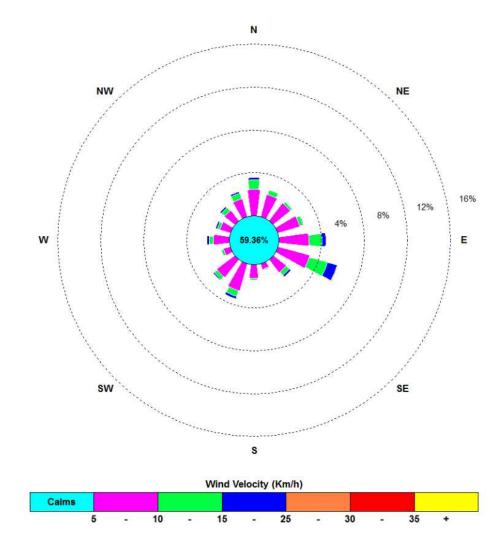


Figure 4: Windrose Plot (km/h)





Appendix 1

□alibration Do □ment □ w □en re □□ired □



Continuous Air Quality Monthly/Quarterly/Six Monthly/Annual **TEOM Maintenance and** Calibration - 1400AB



CV3 000

TEOM Client/Site: Dixon Sade / 19000 100M

1. TEOM Data Screen

SERIAL No: 25570

Firmware:

Condition	Current Data	Acceptable Data	Pass (Tick)	Fail (Tick)
Operating Condition	FX-Faults	Green - Normal		V
Date/time	TEOM: 29 4049 9 42 Actual: 29 41-19 10 47	correct within 5	BT	
PM-10 24hr av	0	Positive values		~
Filter loading PM10	110	<80 %		~
Frequency PM-10	247.2468	200-300 Hz	~	
Noise PM-10	0	<0.100ug		10"

Comment: If filter load >80% but <90% and if flows Ok then data is OK

Faulty conditions > replaced bypass, replaced filter to text.

2. System Status

Condition	Current Data	Acceptable Data	Pass (Tick)	Fail (Tick)
Vacuum pump pressure	-25 mity.	<0.50 atm	/	
Warnings	Yes.	No Warnings		/
If any warnings list:	***************************************			
Flow, filter load	numings			

Comments:

Chaged filter + leggar filter on.

Data Downloaded: YES/NO (circle)

COUND DIMET Signed ULL Technician Name:

> F301D - TEOM Field Check Sheet 1400AB PM10 Version 12 Revised: 2 June 2019



3. Instrument Conditions Ambient Conditions and Temperatures

Condition	Current Data	Acceptable Data	Pass (Tick)	Fail (Tick)
Ambient Temperature	26.3	-10 to 50 C	/	
Ambient Dew Point	An	-10 to 50 C	-	_
Ambient Pressure	0.971	0.9-1.1 atm		
Ambient Relative Humidity	NA	10-100 %RH	_	_
Cap temperature	50.00	50.00 +/- 0.10 C	~	
Case temperature	5003	50.00 +/- 0.10 C	/	
Main (PM-10) Air Tube temp	20.00	50.00 +/- 0.10 C	~	

Comments:

4. Instrument Conditions - Flows

Condition	Current Data	Acceptable Data	Pass (Tick)	Fail (Tick)
Main (PM-10) Flow rate	3.00	2.82 - 3.18 lpm		4
Bypass Flow rate	13.67	12.95 - 14.39 lpm		
Total Flow rate	16.67	15.67 - 17.67 lpm		

Comments:

Results: (Tick box)

There were NO equipment faults found. No action required – (file report) There were faults found (Fails) – Were these fixed on site: YES/NO (circle) Any Fails that cannot be repaired on site must be reported to CBased: Office: 65713334 or email cbased@bigpond.com		
Any Fails that cannot be repaired on site must be reported to CBased: Office: 65713334 or email cbased@bigpond.com		There were NO equipment faults found. No action required – (file report)
Any Fails that cannot be repaired on site must be reported to CBased: Office: 65713334 or email cbased@bigpond.com		(F)
Office: 65713334 or email cbased@bigpond.com	V	There were faults found (Fails) - Were these fixed on site: YES/NO (circle)
		Any Fails that cannot be repaired on site must be reported to CBased:
Data faults notified to CRased: adults		Office: 65713334 or email cbased@bigpond.com
Date laults Hottlied to Chaseu.		Date faults notified to CBased: 29/11/19

Comments/Action Required:



Calibration/Maintenance							
1. 1405A: Were Filters replaced RES/NO + Bypass							
2. PM10 Inlet head cleaned (YES/NO							
3. If measurement filters were replaced, confirm stable results after change. Stable							
particulate results confirmed (ES/NO							
Channel	Filter Load %	Frequency Hz	Frequency	Frequency	Frequency		
		initial	check 1min	check 3min	check 5min		
PM10	n	253-92770	253-92768	253-92755	253.92750	V one	
		an 0.0010 between i d redo stability test.	readings (if instrur	ment is thermody	namically stable)		
4. Instrument clo	ock verified (Ref	er Section 1)	YES/NO.				
If Time changed			YES/NO or (NA)(not change	d)		
Comments:				<u></u>			
5. Were TEOM in	line and rear T	EOM filters check	ed for cleanlin	ess and replace	ed if		
necessary.			(YES/NO.	MA.			
Comments if cha	inged:						
7 28 8 7 7 7 7	2 2 1 1 2 2	14 10 E (E001014		46.3			
		ioner checked YE		ditioner setting	sor		
operational statu	ıs:	on cool 4					
		alibrator Serial N essure and Flows			ration		
Quarterly or Six	Monthly Calibr	ation _					
1. Flow Verificat	ion – Conducte	d(YES)'NO		Final 3.00			
PM10 Flow verif	ied Flow I/mii	3.03 Error %	6_ <u>[-0</u> (allow				
Bypass Flow verified Flow I/min 13.43 Error % 1.8 (allowed error <6%) PASS/FAIL If fail then complete a full multipoint recalibration and review previous data from last good flow check. Comments if Flows recalibrated:							
2. Leak Check – Conducted YES NO							
PM10 actual	0.10 . <1	imit 0.15 \$	mul leak in M	TOLV	8		
Bypass actual	0.0 <1	imit 0.60		*			
Leak check (RASS) FAIL – If fail then find leak and retest. Comments:							

F301D - TEOM Field Check Sheet 1400AB PM10 Version 12 Revised: 2 June 2019



Annual Calibration/Maintenance 1. Temperature and Pressure Calibration - Conducted YES/NO Reference Temperature: _____C TEOM Temperature_ if difference +/- 1 C recalibrate sensor. Sensor recalibrated YES/NO Reference Pressure: _____atm TEOM Pressure_ if difference +/- 0.010 atm recalibrate sensor. Sensor recalibrated YES/NO Note: Tetracal measures Atmospheric Pressure in mm/Hg or mb or hPa For mb or hPa divide tetracal result by 1013.25 to change units to atm. For mmHg divide tetracal result by 760 to change units to atm. 2. Flow Calibration - Conducted YES/NO PM10 Set point 2.4 Actual: Set point 3.6 Actual:_ After calibration Final:_____I/min Set point 3.0 Actual:_ **BYPASS** Set point 10.9 Actual: Set point 16.4 Actual:__ After calibration Final:_____ Set point 13.67 Actual: 3. Mass calibration (KQ) Verification – Conducted YES/NO Actual measured KO ≠ TEOM stated KO_____ Allowed Error +/- 2/5%. PASS/FAIL If Error +/- 2.5% repeat. If confirmed consult manufacturer. Second Error %≠ PASS/FAIL. Comments: If second test fails consult manufacturer. 4. Annual Noise check - Conducted YES/NO Zero filter applied to TEOM and TEOM operated for at least 12 hours: Start date/time: _____ Finish date/time: Standard deviation of all recorded data (min 30 min averages) = ___ Noise was less than 5ug/m³ YES/NO

Air Inlet system cleaned YES/NO Pump Reconditioned YES/NO

Check Waterproofing YES/NO

Comments:

5. Maintenance





CBased Environmental Pty Limited ABN 62 611 924 264

Dixon Sand Quarry

Environmental Monitoring Air Quality

Tapered Element Oscillating Microbalance (TEOM) (PM₁₀) and Meteorological Data

December 2019

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En⊡ronmental □⊡enti⊡ Date: □□ □an□ar□ □0□0

Dixon □and □ □arr□En⊡ronmental Monitoring Pro ⊡ □ De ⊡ember □0 □□
1.0 Summary
Ba ed En ironmental Pt□ Limited i□ contra ted b□ Dixon □ and to cond to contin contin cond tapered Element O illating Mi robalan e TEOM or the particulate PM and meteorological monitoring or to Dixon □ and □ carr To e information i□ redired to a to all the cell to end to end of the TEOM and meteorological ite are in or ded in to report to a to end of the total to end of the total total end of the total end of
T⊑e monitoring programme in⊟⊑de⊡
One □ontin□o□□TEOM PM _□ monitor□and
One □ontin□o□□Meteorologi□al □tation□
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TEOM
Meteorologi⊡al re⊡t□ or De ember □0 □□□
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• [4-]o r a erage re to were below to EPM [4-]o r maxim m riteria o 50 gm wito to exception o confirm or render
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ote: Ba ⊑ed on t ⊑e a ⊑ailable data ⊑tatement in green indi⊑ate ⊞rrent ⊡on orman ⊑e to Dixon □and □□arr□□ir □□alit□Impa□t □□□e□ment □riteria□□tatement□in red indi□ate po□tible non-Conforman Ce □ Cear to date ann Cal a Cerage for PM to i □ Cal □ Lated from t to □ □ □ □ □ □ Tor TEOM ☐ coin iding wit to Dixon and profet cear on ann al amoint odata a not cet

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TEOM monitor □

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Dixon Land		WOULDING		De∟ember	

2.0 Sampling Programme

- □□□5□0□□□□□00□□□Methods for Sampling and Analysis of Ambient Air. Determination of Suspended Particulates—PM₁₀ continuous direct mass method using a tapered element oscillating microbalance analyser□and
- □5□0□□□□□007□□Methods for Sampling and Analysis of Ambient Air Part 1.1 Guide to Siting Air Monitoring Equipment□□

TEOM PM_{\square} re \square t \square are \square 4- \square 0 \square r a \square erage \square at midnig \square t and are reported a \square \square g \square m \square corre \square ted to 0 degree \square and \square 0 \square \square \square Pa \square

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□ir □ □alit□monitoring □ite de □ription□and lo □ation□are pro □ided in Table 1□

 Table 1:
 Dixon □and □ir □ □alit□Monitoring De □ription and Lo □ation□

Monitor	Site Code	Location Description	
TEOM PM _□	TEOM	Old □ort□Road□Maroota □□W	
Meteorologi⊡al □tation	MET	Old □ort□ Road □Maroota □□W	

Divon Dand	□□arr□En□ironm	ontal Monitorina	hmhar 📶 🗆
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3.0 Results

3.1 TEOM PM₁₀

□4-□o□r a□erage TEOM PM□ re□□t□ rom t□e □□M□ data □olle□tion □ortware are pro□ided in Table 2 and a □□art o□t□e data i□pro□ided in Figure 1 □
D_ring t_e monitoring period6_ o_data wa_deemed in_alid d_e to ex_ei_e tilter loading and red_ted_tow tapa_it_wit_in t_e TEOM monitorBa_ed En_ironmental _con_ider_t_i_to _a_e been _a_ed bigwinddrcondition_and bire _mo_e in t_e area d_ring t_e monitoring period_
□alid data indicated toere were □□ indicid □al □4-□o□r TEOM PM□ re□□t□ abo□e t□e □ational Encironment Protection Mea□re □□EPM□ □□ort-term □□4-□o□r□ impa□t□riteria o□50□g□m□ and □□ o□□rren□e□ abo□e t□e Dixon □and □□arr□ EPL limit o□ 4□□g□m□□ig□ig□ted □ellow in Table 2 □
t pre ent it i below t e Dixon and arr ann al a erage PM triteria o color o c
□ □□arterl□ □alibration wa□ □nderta□en on □□ □□ember □0□□□ T□e □alibration □□tiū□ate i□pro□ded in Appendix 1 □□ext □alibration i□□□□ed□ed □or Mar□□□0□□□

Date	TEOM	Annual PM ₁₀	TSP*	TSP Annual**
	PM₁₀ ᡎgɪm□□	□ erage ᡎg m □	 IgIm□	⊞g m □□
	□□4	□0.00	7□0	4□□
	57.1	□0□□	4	5016
	□□5	□0□□		50⊞
40	60.4	□016	□5□0	5□5
50	117.1			5□Ⅲ
60	99.8		□4□5	5415
70	135.6	□□6	0	56⊈
	61.7		□54 □	5710
	In⊡alid Data		0.0	0.0
	In⊡alid Data		0.0	0.0
	In⊡alid Data		0.0	0.0
	In⊡alid Data		0.0	0.0
	In⊡alid Data		0.0	0.0
411110	4□□		□04 🛮 5	57⊞
50	66.7		□66 □	5□Ⅲ
<u></u>	□ 7 □ 7		□4□□	5□Ⅲ
70	□5 16			5□Ⅲ
	45.4	□□4	5	5□5
	149.2	□4 Ⅲ	□7□10	6015
		□4 Ⅲ	7	6016
	86.0	□4□ 6	□50	6□6
	□7□□	□4 □ 7		6□Ⅲ
	□□0	□4 Ⅲ	□0 10	6□Ⅲ
411110	□6Ⅲ	□4Ⅲ	65Ⅲ	6□Ⅲ
50	□□5	□4Ⅲ	5	6□Ⅲ
<u></u>		□4 □ 7	4710	6□Ⅲ
70	□7 □□	□4 □ 7	4□□	6□7
	□ .7	□4 □ 7	54Ⅲ	6⊡6
	62.6	□4Ⅲ	□ 56 □ 5	6□Ⅲ
	73.6	□5Ⅲ	□□4□0	6□Ⅲ
	115.3	□5 □ 7		64Ⅲ

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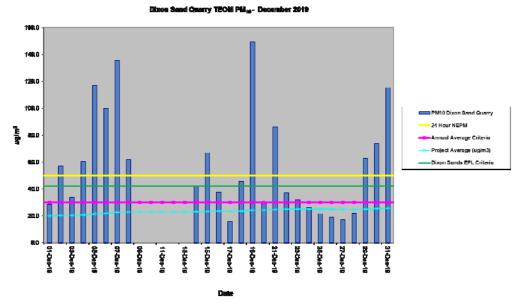


Figure 1: TEOM PM₁₀ 24 hr, Annual Average and Criteria

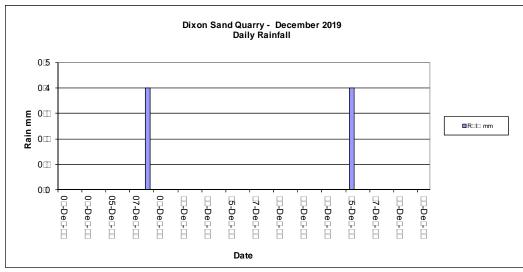
3.2 Meteorological Data

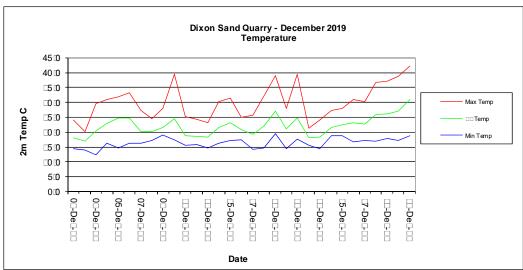
T⊡e weat⊡er ⊡tation log□ data at 5-min⊡te inter⊡al□ and ⊡end□ t⊡e data to a web databa⊡e b□ □extG telemetr□□ T⊡e data i□ a□□e□ible ⊡om t⊡e web ⊡te□ttp:□□on□oleɪteledata□om□a□index□tml□

□ □mmar□ o□mont□□ re□It□ i□ pre□ented in **Table 3**□□art□ o□meteorologi□al parameter□ are pre□ented in **Figures 2** and **3**□□ windro□e i□ pro□ded in **Figure 4**□ T□□pro□de□t□e □en□□ di□trib□tion o□wind □peed and dire□tion d□ring t□e mont□ to di□pla□dominant wind dire□tion□□

 Table 3:
 Meteorologi al Data ammar or De ember ou

Date	Min Temp	□□Temp	Max Temp	RAIN mm	Min WS	Av WS	Max WS	Min Humidity	Av Humidity	Max Humidity	Min Pressure	Av pressure	Max Pressure
1/12/2019	14.5	18.2	24.0	0.0	0.1	4.4	21.5	35.2	74.6	99.2	975.2	981.6	988.2
2/12/2019	14.1	16.9	20.2	0.0	0.6	6.1	29.5	26.4	39.6	56.5	973.6	976.1	983.0
3/12/2019	12.5	20.5	29.5	0.0	0.4	4.5	24.2	14.1	28.8	50.5	981.3	983.6	987.3
4/12/2019	16.2	23.0	31.0	0.0	0.3	4.5	26.4	7.1	31.7	82.0	984.3	987.0	989.4
5/12/2019	14.7	24.8	32.0	0.0	0.0	3.9	25.7	9.1	30.7	91.4	983.0	986.6	989.4
6/12/2019	16.2	24.8	33.2	0.0	0.1	4.5	16.9	4.3	40.1	95.2	982.6	985.4	990.2
7/12/2019	16.2	20.3	27.4	0.0	0.2	4.5	22.3	23.1	68.4	100.0	987.9	990.8	995.8
8/12/2019	17.2	20.1	24.5	0.4	0.5	7.4	26.3	51.4	72.8	99.3	995.3	997.3	1000.3
9/12/2019	19.1	21.6	28.0	0.0	0.1	5.0	19.9	50.0	74.3	94.4	993.6	997.3	1000.5
10/12/2019	17.5	24.5	39.5	0.0	0.1	4.7	18.4	7.8	67.8	100.0	987.4	991.8	995.8
11/12/2019	15.7	18.8	25.3	0.0	0.1	4.9	21.3	47.8	69.0	83.5	989.9	993.4	995.8
12/12/2019	15.9	18.6	24.3	0.0	0.4	5.3	26.1	46.8	72.0	89.9	990.0	992.5	995.6
13/12/2019	14.7	18.4	23.2	0.0	0.2	5.0	28.0	51.3	74.7	100.0	989.6	992.7	995.5
14/12/2019	16.2	21.5	30.3	0.0	0.0	4.0	24.8	24.0	68.6	93.3	985.4	989.5	992.2
15/12/2019	17.3	23.2	31.5	0.0	0.1	4.4	16.7	25.6	69.3	100.0	983.4	987.5	991.7
16/12/2019	17.4	20.8	25.1	0.0	0.4	4.5	27.3	19.5	58.6	87.3	985.0	991.1	997.8
17/12/2019	14.2	19.2	25.6	0.0	0.1	5.3	26.3	38.2	63.7	87.7	996.4	998.0	1000.3
18/12/2019	14.8	21.9	32.2	0.0	0.2	5.4	21.1	21.1	58.8	91.6	993.3	996.7	1000.0
19/12/2019	19.4	27.1	39.1	0.0	0.1	4.5	16.4	10.2	36.9	75.7	989.9	993.2	998.4
20/12/2019	14.5	21.0	28.1	0.0	0.2	5.4	26.9	37.7	65.4	96.7	994.5	997.2	999.6
21/12/2019	17.6	24.9	39.4	0.0	0.3	5.1	22.6	21.2	66.0	100.0	986.2	992.2	996.8
22/12/2019	15.5	18.1	21.3	0.0	0.4	3.9	16.9	48.4	66.5	76.8	996.8	999.2	1001.6
23/12/2019	14.5	18.3	24.0	0.0	0.2	3.6	12.8	56.0	73.6	95.2	993.8	997.4	1001.2
24/12/2019	18.9	21.6	27.2	0.0	0.0	4.9	27.0	59.5	85.3	99.7	991.1	993.0	995.4
25/12/2019	18.8	22.4	28.0	0.4	0.2	5.9	24.4	41.5	71.9	99.3	993.0	994.9	996.7
26/12/2019	16.8	23.1	30.9	0.0	0.0	5.2	24.2	31.8	61.8	99.6	993.8	996.3	998.3
27/12/2019	17.2	22.7	30.2	0.0	0.0	5.2	27.0	28.8	64.5	96.6	994.7	997.3	999.3
28/12/2019	17.0	25.9	36.7	0.0	0.2	5.6	21.2	12.1	51.4	92.8	991.8	995.3	997.9
29/12/2019	18.0	26.1	37.1	0.0	0.2	3.6	13.9	21.8	50.8	84.0	991.5	993.7	995.8
30/12/2019	17.2	27.1	38.8	0.0	0.0	4.3	20.8	12.7	53.4	100.0	986.6	990.6	993.8
31/12/2019	18.8	31.0	42.3	0.0	0.3	7.1	26.2	5.0	29.8	73.0	982.8	986.8	993.0
			-										
Monthly	12.5	22.1	42.3	0.8	0.0	4.9	29.5	4.3	59.4	100.0	973.6	991.8	1001.6





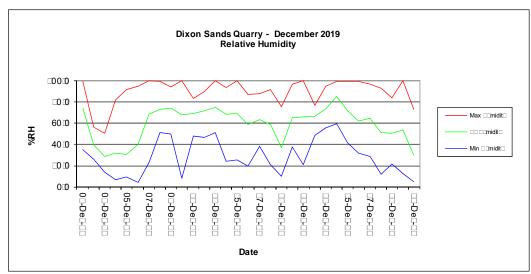
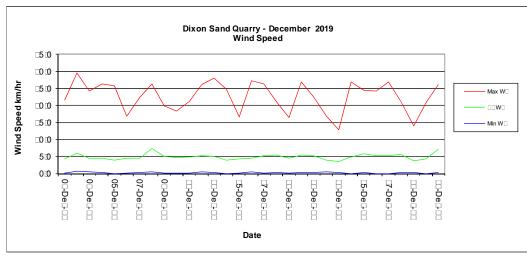


Figure 2: Daily Rainfall, Temperature and Relative Humidity Charts



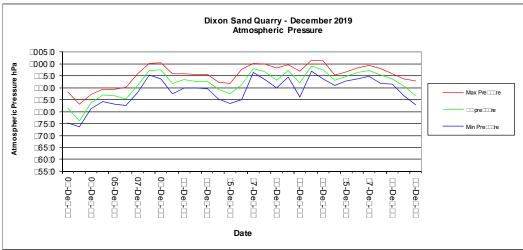


Figure 3: Wind Speed and Atmospheric Pressure Charts



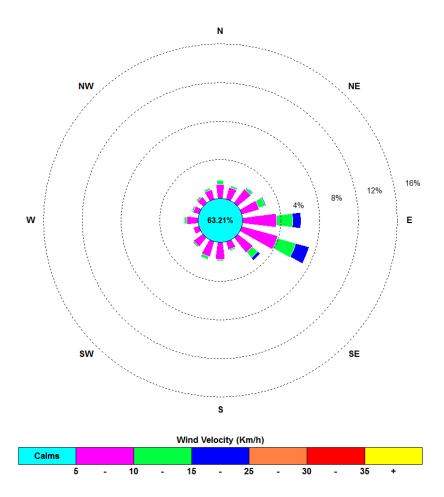


Figure 4: Windrose Plot (km/h)

Appendix 1

□alibration Do □ment □ w en re □ired □



Continuous Air Quality Monthly/Quarterly/Six Monthly/Annual TEOM Maintenance and Calibration – 1400AB



TEOM Client/Site:_	Dixon Sudy .	TEOM	Date: _	13.12.19
1. TEOM Data Screen	SERIAL No	:	Firmwar	re:

Condition	Current Data	Acceptable Data	Pass (Tick)	Fail (Tick)
Operating Condition	Red-fault	Green - Normal		1 ~
Date/time	TEOM: 13.01 Actual: 13.01	Current Date/time correct within 5 minutes	かり	
PM-10 24hr av	1.7	Positive values	/	
Filter loading PM10	106	<80 %		1
Frequency PM-10	251.64028	200-300 Hz	/	
Noise PM-10	0-028	<0.100ug	~	

Comment: If filter load >80% but <90% and if flows Ok then data is OK Comments: he filler load, low result

2. System Status

Condition	Current Data	Acceptable Data	Pass (Tick)	Fail (Tick)
Vacuum pump pressure	21" Hy	<0.50 atm	/	
Warnings	Yes	No Warnings		1
If any warnings list:				
NA				
8-14				

Comments:

Data Downloaded: YES/NO circle)

Technician Name: COUN DAVED Signed COUL

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3. Instrument Conditions Ambient Conditions and Temperatures

Condition	Current Data	Acceptable Data	Pass (Tick)	Fail (Tick)
Ambient Temperature	28.1	-10 to 50 C	/	
Ambient Dew Point	NA	-10 to 50 C	_	_
Ambient Pressure	0.970	0.9-1.1 atm	V	
Ambient Relative Humidity	M ·	10-100 %RH	_	_
Cap temperature	50.00	50.00 +/- 0.10 C		
Case temperature	50-00	50.00 +/- 0.10 C	/	
Main (PM-10) Air Tube temp	50.00	50.00 +/- 0.10 C	-	

Comments:

Fadj Aur 1000 Fadj Aur 1000

4. Instrument Conditions - Flows

Condition	Current Data	Acceptable Data	Pass (Tick)	Fail (Tick)
Main (PM-10) Flow rate	0.26	2.82 - 3.18 lpm		
Bypass Flow rate	13.68	12.95 - 14.39 lpm	/	
Total Flow rate	13.93	15.67 - 17.67 lpm		1

Comments:

low main flow

Daniella.	(mm = 1 - 1 -	I
Results:	IIICK	navi
I COULD.	LILOR	

	There were NO	equipment faults	found. No action	required - (file report)
--	---------------	------------------	------------------	--------------------------

There were faults found (Fails) – Were these fixed on site: (ES/NO (circle)
Any Fails that cannot be repaired on site must be reported to CBased:

Office: 65713334 or email cbased@bigpond.com

Date faults notified to CBased: 13/14/9

Comments/Action Required:



Calibration/Maintenance

1. 1405A: Were Filters replaced

2. PM10 Inlet head cleaned

3. If measurement filters were replaced, confirm stable results after change. Stable particulate results confirmed

Channel	Filter Load %	Frequency Hz initial	Frequency check 1min		Frequency check 5min
PM10	16	254.89335	254-89328	254.99329	254-89

Frequency should not drift by more than 0.0010 between readings (if instrument is thermodynamically stable) Pass/Fail - if Fail - install new filter and redo stability test.

4. Instrument clock verified (Refer Section 1)

If Time changed - clock reset OK

YES/NO or Manot changed)

Comments:

5. Were TEOM in line and rear TEOM filters checked for cleanliness and replaced if YES NO.

Comments if changed:

6. TEOM Cleaned and Air Conditioner checked (ES) NO. Air Conditioner settings or operational status: low cool 4 - moved to low cool 5

Tetracal Flow/Temp/Pressure Calibrator Serial No: 1009 Refer to calibration corrections for Temperature/Pressure and Flows and apply to all readings.

Quarterly or Six Monthly Calibration Amual

1. Flow Verification - Conducted (ES/NO

PM10 Flow verified Flow I/min \$3.92 Error % 0.7 (allowed error <6%) (PASS/FAIL

Bypass Flow verified Flow I/min_13-28 Error % 2.9 (allowed error <6%) PASS/FAIL If fail then complete a full multipoint recalibration and review previous data from last good flow check. Comments if Flows recalibrated:

2. Leak Check - Conducted (YES) NO

PM10 actual 0.14 < Limit 0.15

Slight leak in MC could fix onsite

Bypass actual • · 53 < Limit 0.60

Fadj AXX 1.020 final 13.65 L/M

Leak check PASS/FAIL - If fail then find leak and retest. Comments:

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> > Page 3 of 4



Annual Calibration/Maintenance

1. Temperature and Pressure Calibration – Conducted (ES) NO Reference Temperature: 24.8 C TEOM Temperature 26.5 C			
if difference +/- 1 C recalibrate sensor. Sensor recalibrated VES/NO			
0.970			
Reference Pressure: 0971 atm TEOM Pressure 0976tm	/		
if difference +/- 0.010 atm recalibrate sensor. Sensor recalibrated YES NO	/ox		
Note: Tetracal measures Atmospheric Pressure in mm Hg or mb or hPa	Rec	Л	
For mb or hPa divide tetracal result by 1013.25 to change units to atm.	_		
For mmHg divide tetracal result by 760 to change units to atm.	738.	o mall	9
2. Flow Calibration – Conducted YES/NO	0.9	0 mnlf 11 atm	
PM10			1
Set point 2.4 Actual:	C	114	1.000
Set point 3.6 Actual:	rady in	1.09	1.020
Set point 3.0 Actual: After calibration Final: 3.07 /min	Fadj int Fadjfinal	1.05	1.020
BYPASS			
Set point 10.9 Actual;			
Set point 16.4 Actual:			
Set point 13.67 Actual: After calibration Final: 13.58 //min			
3. Mass calibration (K0) Verification – Conducted YES/NO Actual measured KO = 13 885.5 TEOM stated KO 13748 Error %:_ Allowed Error +/- 2.5%. FASS/FAIL If Error +/- 2.5% repeat. If confirmed consult manufacturer.	1-16- 68	154	
3. Mass calibration (K0) Verification – Conducted YES/NO	4 140		
Actual measured KO = 13 885.5 TEOM stated KO 13748 Error %:	(.0		
Allowed Error +/- 2.5%. ASS/FAIL			
If Error +/- 2.5% repeat. If confirmed consult manufacturer.			
Second Error % = PASS/FAIL. Comments:			
If second test fails consult manufacturer.			
4. Annual Noise check - Conducted YES NO			
Zero filter applied to TEOM and TEOM operated for at least 12 hours:			
Start date, time. The training alternation of the start date, time.	AM		
Standard deviation of all recorded data (min 30 min averages) = 2.8	_ug/m³		
Noise was less than 5ug/m³ YES/NO		ig/m3	/
5. Maintenance	. 1	Meren	e.
Air Inlet system cleaned (YES/NO	lot much a		1.3
Pump Reconditioned YES/100 Pump OK	anin = -1	0.4 M	JIM 2
Check Waterproofing (ES) NO on	w e	3.5 Mg	Im3./
Comments:	new.		V.
Comments: Slight leak found in mass transducer a can't fix onsite ok for -	35.05(7)		Oll

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CBased Environmental Pty Limited ABN 62 611 924 264

Dixon Sand Quarry

Environmental Monitoring Air Quality

Tapered Element Oscillating Microbalance (TEOM) (PM₁₀) and Meteorological Data

January 2020

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En ironmental □ienti it Date: □□ □ebr□ar□ □0 □0

Summary 1.0

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T⊡e monitoring programme in □ □de □
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2.0 Sampling Programme

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 Table 1:
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Monitor	Site Code	Location Description
TEOM PM _□	TEOM	Old □ort□Road⊡Maroota □□W
Meteorologi⊡al □tation	MET	Old □ort□Road⊡Maroota □□W

3.0 Results

3.1 TEOM PM₁₀

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D 4	TEOM	Annual PM ₁₀	TSP*	TSP Annual**
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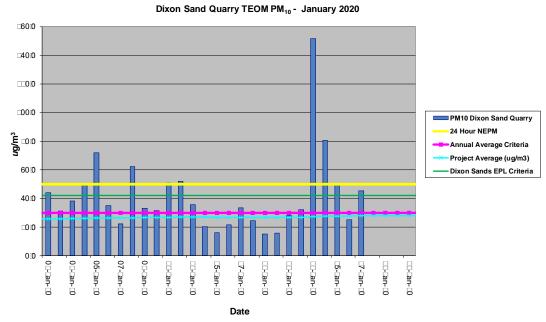


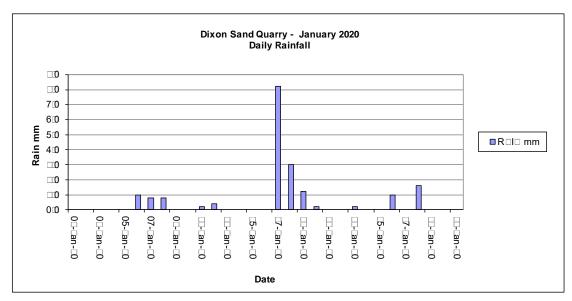
Figure 1: TEOM PM₁₀ 24 hr, Annual Average and Criteria

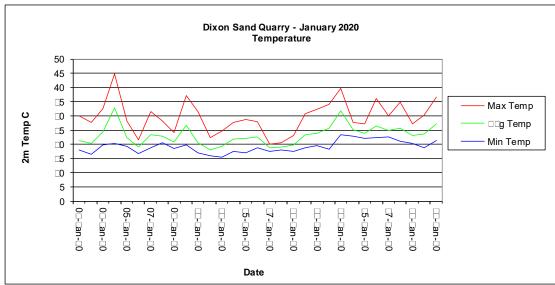
3.2 Meteorological Data

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 Table 3:
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Date	Min Temp	□□Temp	Max Temp	RAIN mm	Min WS	Av WS	Max WS	Min Humidity	Av Humidity	Max Humidity	Min Pressure	Av pressure	Max Pressure
1/01/2020	17.9	21.3	30.1	0.0	0.5	5.9	30.5	38.3	66.6	89.5	990.1	992.8	997.2
2/01/2020	16.6	20.4	27.8	0.0	0.5	5.0	22.4	54.8	94.4	100.0	993.7	996.7	998.7
3/01/2020	19.7	24.4	32.6	0.0	0.3	5.5	27.0	42.9	72.3	100.0	988.8	993.3	997.5
4/01/2020	20.2	32.8	44.8	0.0	0.2	5.4	22.6	9.1	41.5	86.2	983.7	987.7	990.6
5/01/2020	19.2	22.5	28.2	0.0	0.2	4.7	26.7	35.2	51.0	64.8	990.6	996.5	1002.0
6/01/2020	16.7	19.0	21.5	1.0	0.1	3.2	14.2	61.2	80.1	100.0	995.5	998.2	1001.1
7/01/2020	18.7	23.4	31.6	0.8	0.2	4.9	17.8	50.4	81.3	100.0	988.3	992.7	997.8
8/01/2020	20.5	22.8	28.3	0.8	0.1	3.5	16.2	57.2	83.4	100.0	991.6	993.6	996.9
9/01/2020	18.5	20.9	24.2	0.0	0.2	3.0	15.0	66.0	83.4	100.0	994.2	995.6	997.2
10/01/2020	19.8	26.8	37.2	0.0	0.0	5.4	26.5	29.4	68.8	100.0	981.7	988.4	994.9
11/01/2020	16.9	20.7	31.5	0.2	0.1	4.0	16.3	42.2	71.0	97.4	981.4	990.5	995.7
12/01/2020	16.1	18.0	22.3	0.4	0.4	3.9	19.8	52.2	81.7	100.0	994.7	996.8	999.1
13/01/2020	15.5	19.2	24.7	0.0	0.2	5.3	24.7	49.5	80.2	100.0	994.7	997.2	998.9
14/01/2020	17.4	21.8	27.8	0.0	0.0	5.4	29.1	50.6	76.1	100.0	993.0	995.3	997.0
15/01/2020	17.1	22.2	28.7	0.0	0.0	4.4	24.3	46.0	79.5	100.0	987.4	991.1	995.1
16/01/2020	18.7	22.7	28.0	0.0	0.0	4.0	16.5	42.6	80.7	100.0	983.5	986.5	988.3
17/01/2020	17.5	18.8	20.0	8.2	0.4	4.7	19.5	81.8	96.5	100.0	985.8	987.9	989.8
18/01/2020	18.0	19.2	20.7	3.0	0.1	3.5	13.9	86.3	97.4	100.0	987.2	988.4	989.7
19/01/2020	17.4	19.7	23.1	1.2	0.1	2.2	9.9	78.5	95.3	100.0	983.8	986.4	988.8
20/01/2020	18.9	23.4	30.7	0.2	0.1	5.0	22.2	53.7	79.9	100.0	977.2	981.7	985.1
21/01/2020	19.6	23.9	32.2	0.0	0.0	5.2	23.2	22.3	56.1	89.3	983.4	986.0	990.5
22/01/2020	18.3	25.6	34.2	0.0	0.0	4.8	22.4	21.7	59.7	93.5	983.6	987.7	991.0
23/01/2020	23.3	31.7	39.7	0.2	0.3	8.1	33.5	14.9	35.0	72.0	977.9	981.9	985.6
24/01/2020	22.9	25.1	27.8	0.0	0.3	6.3	24.6	54.3	67.4	85.4	982.5	987.8	992.7
25/01/2020	22.1	24.0	27.2	0.0	0.1	5.5	19.6	66.4	84.7	99.5	990.0	992.2	994.2
26/01/2020	22.4	26.6	36.1	1.0	0.1	3.9	17.9	34.6	75.9	100.0	987.5	990.2	992.1
27/01/2020	22.5	24.9	30.1	0.0	0.2	5.2	26.4	60.6	80.8	92.2	989.5	991.9	994.0
28/01/2020	21.2	25.6	34.9	1.6	0.1	3.6	17.4	46.4	81.8	100.0	987.0	990.7	993.7
29/01/2020	20.4	23.0	27.3	0.0	0.9	5.5	21.3	61.6	83.3	100.0	993.2	994.9	997.2
30/01/2020	18.9	23.5	30.2	0.0	0.0	4.6	21.6	49.4	79.6	100.0	991.8	995.0	997.3
31/01/2020	21.3	27.3	36.7	0.0	0.1	5.0	30.2	38.2	75.1	100.0	989.3	992.4	995.4
Monthly	15.5	23.3	44.8	18.6	0.0	4.7	33.5	9.1	75.5	100.0	977.2	991.2	1002.0





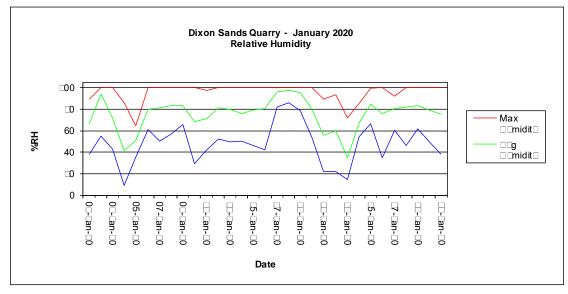
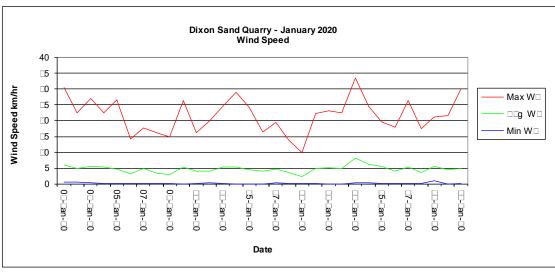


Figure 2: Daily Rainfall, Temperature and Relative Humidity Charts



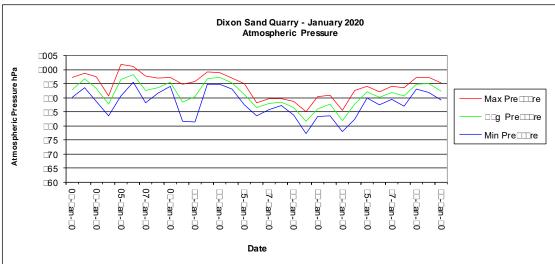


Figure 3: Wind Speed and Atmospheric Pressure Charts

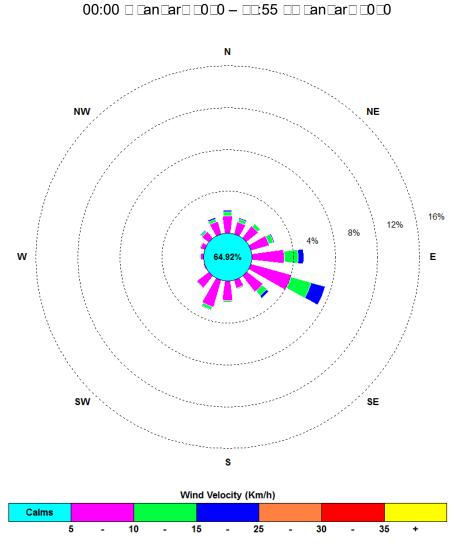


Figure 4: Windrose Plot (km/h)



CBased Environmental Pty Limited ABN 62 611 924 264

Dixon Sand Quarry

Environmental Monitoring Air Quality

Tapered Element Oscillating Microbalance (TEOM) (PM₁₀) and Meteorological Data

February 2020

Colin Davies BSc MEIA CENVP

Environmental Scientist Date: 27 March 2020

1.0 Summary

CBased Environmental Pty Limited is contracted by Dixon Sand to conduct continuous Tapered Element Oscillating Microbalance (TEOM) for fine particulates (PM_{10}) and meteorological monitoring for the Dixon Sand Quarry. The information is required to assess air quality levels. The results for the TEOM and meteorological site are included in this report.

The monitoring programme includes:

- One continuous TEOM PM₁₀ monitor; and
- One continuous Meteorological Station.

This monthly report was prepared by CBased Environmental and includes the following:

- TEOM (PM₁₀) monitoring results for February 2020; and
- Meteorological results for February 2020.

In accordance with Schedule 3, Condition 7 of the Dixon Sand development Consent and the Dixon Sand EPL:

- 24-hour average results were below the NEPM 24-hour maximum criteria of 50ug/m³ with the exception of 6 occurrences;
- 24-hour average results were below the Dixon Sand Quarry EPL limit of 42ug/m³ with the exception of 10 occurrences;
- The annual average is below the Dixon Sand Quarry consent annual average criteria of 30ug/m³; and
- The calculated TSP is below the Dixon Sand Quarry annual average criteria of 90ug/m³.

Note: Based on the available data, statements in green indicate current conformance to Dixon Sand Quarry Air Quality Impact Assessment criteria, statements in red indicate possible non-conformance. Year to date annual average for PM₁₀ is calculated from the 1st July 2019 for TEOM's coinciding with the Dixon Sand project year. An annual amount of data has not yet been collected.

Approximately 100% of meteorological data was recovered for February 2020.

Approximately 100% of TEOM data was recovered for February 2020, but only 84% of data was deemed valid due bushfire smoke causing bypass coalescing filter and TEOM mass transducer to block, plus excessive filter loading.

2.0 Sampling Programme

The TEOM is sited and operated to the applicable Australian Standard and/or OEH (EPA) approved methods. The following Australian Standards were used:

- AS3580.9.8 (2001) "Methods for Sampling and Analysis of Ambient Air. Determination of Suspended Particulates—PM₁₀ continuous direct mass method using a tapered element oscillating microbalance analyser"; and
- 3580.1.1 (2007) "Methods for Sampling and Analysis of Ambient Air Part 1.1 Guide to Siting Air Monitoring Equipment".

TEOM PM_{10} results are 24-hour averages at midnight and are reported as $\mu g/m^3$ corrected to 0 degrees C and 101.3kPa.

All laboratory analysis was conducted by a National Association of Testing Authorities (NATA) accredited laboratory.

Air Quality monitoring site descriptions and locations are provided in **Table 1**.

 Table 1:
 Dixon Sand Air Quality Monitoring Description and Locations

Monitor	Site Code	Location Description
TEOM PM ₁₀	TEOM	Old North Road, Maroota NSW
Meteorological Station	MET	Old North Road, Maroota NSW

3.0 Results

3.1 TEOM PM₁₀

24-hour average TEOM PM₁₀ results from the AQMS data collection software are provided in **Table 2** and a chart of the data is provided in **Figure 1**.

During the monitoring period, 16% of data was deemed invalid when a bypass coalescing filter and TEOM mass transducer became blocked plus excessive filter loading. CBased Environmental considers this to have been caused by bushfire smoke in the area during the monitoring period.

At present, the current TEOM PM_{10} annual average is below the Dixon Sand Quarry annual average PM_{10} criteria of $30ug/m^3$. The current annual average for calculated Total Suspended Particulates (TSP) is below the annual average criterion of $90ug/m^3$. The TSP is calculated by multiplying the PM_{10} by 2.5. Note: the annual average is calculated from 1 July 2019 and therefore an annual amount of data has not yet been collected.

A quarterly calibration was undertaken on 5 February 2020 and the next calibration is scheduled for May 2020. The calibration certificate is provided in **Appendix 1**.

Table 2: Average Daily 24-hr TEOM PM_{10} and TSP Results for February 2020 from AQMS and Annual Average PM_{10} calculated from the 1 July 2019

Dete	TEOM	Annual PM ₁₀	TSP*	TSP Annual**
Date	PM ₁₀ (μg/m ³)	Average (μg/m³)	(µg/m3)	(µg/m3)
1/02/2020	Invalid data	27.9		69.7
2/02/2020	Invalid data	27.9		69.7
3/02/2020	Invalid data	27.9		69.7
4/02/2020	Invalid data	27.9		69.7
5/02/2020	Invalid data	27.9		69.7
6/02/2020	7.7	27.8	19.3	69.4
7/02/2020	3.7	27.7	9.3	69.1
8/02/2020	8.5	27.6	21.3	68.9
9/02/2020	5.0	27.4	12.5	68.6
10/02/2020	8.2	27.4	20.5	68.4
11/02/2020	13.8	27.3	34.5	68.2
12/02/2020	10.9	27.2	27.3	68.0
13/02/2020	11.6	27.1	29.0	67.8
14/02/2020	15.0	27.1	37.5	67.7
15/02/2020	17.1	27.0	42.8	67.5
16/02/2020	14.2	27.0	35.5	67.4
17/02/2020	15.7	26.9	39.3	67.3
18/02/2020	13.6	26.8	34.0	67.1
19/02/2020	31.7	26.9	79.3	67.1
20/02/2020	15.3	26.8	38.3	67.0
21/02/2020	18.5	26.8	46.3	66.9
22/02/2020	10.7	26.7	26.8	66.7
23/02/2020	13.6	26.6	34.0	66.6
24/02/2020	14.0	26.6	35.0	66.4
25/02/2020	16.5	26.5	41.3	66.3
26/02/2020	13.4	26.5	33.5	66.2
27/02/2020	32.7	26.5	81.8	66.2
28/02/2020	18.6	26.5	46.5	66.1
29/02/2020	18.0	26.4	45.0	66.0

^{*}Calculated from PM10

^{**}Calculated from PM10 Annual Average

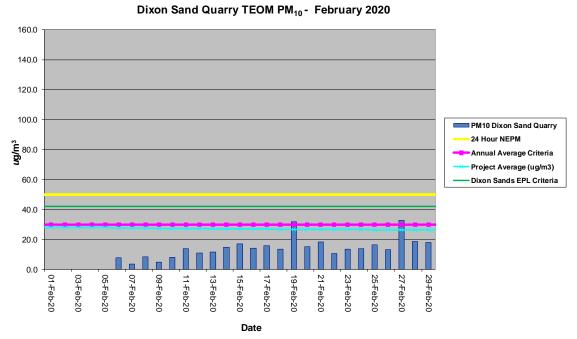


Figure 1: TEOM PM₁₀ 24 hr, Annual Average and Criteria

3.2 Meteorological Data

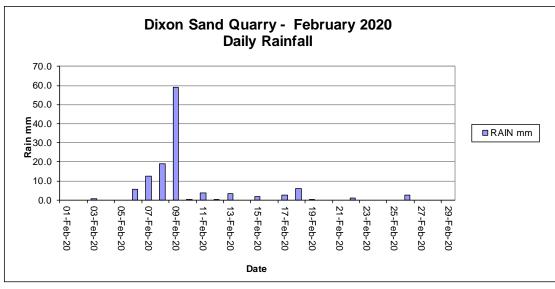
The weather station logs data at 5-minute intervals and sends the data to a web database by NextG telemetry. The data is accessible from the web site http://console.teledata.com.au/index.html.

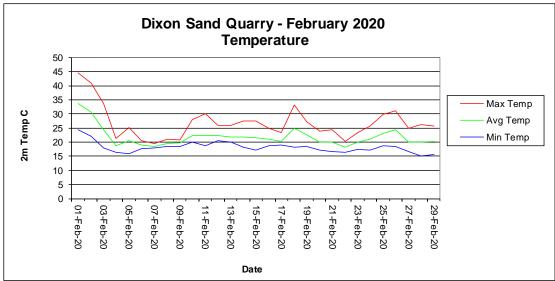
A summary of monthly results is presented in **Table 3**. Charts of meteorological parameters are presented in **Figures 2** and **3**. A windrose is provided in **Figure 4**. This provides the frequency distribution of wind speed and direction during the month to display dominant wind directions.

An annual physical screening and system check of the meteorological station was conducted on 5 February 2020 and is next due in February 2021. The screening and system check certificates are provided in **Appendix 1**.

 Table 3:
 Meteorological Data Summary for February 2020

Date	Min Temp	Avg Temp	Max Temp	RAIN mm	Min WS	Avg WS	Max WS	Min Humidity	Avg Humidity	Max Humidity	Min Pressure	Avg Pressure	Max Pressure
1/02/2020	24.3	33.6	44.6	0.0	0.7	6.1	24.8	15.6	47.7	84.7	985.1	988.2	991.1
2/02/2020	22.0	30.6	40.8	0.0	0.1	5.5	40.4	23.6	57.0	100.0	982.2	985.4	989.2
3/02/2020	17.9	24.4	33.6	0.8	0.3	3.9	17.2	16.8	75.9	100.0	982.3	986.1	995.1
4/02/2020	16.5	18.6	21.3	0.0	0.3	5.5	29.9	48.0	57.5	74.0	995.1	998.3	1000.9
5/02/2020	16.0	20.4	25.3	0.0	0.1	5.1	22.2	50.6	65.2	80.7	996.2	998.3	1000.3
6/02/2020	17.8	18.9	20.5	5.8	0.2	4.3	18.3	69.8	93.7	100.0	997.8	999.7	1001.1
7/02/2020	18.0	18.6	19.4	12.4	0.3	6.5	30.2	99.2	100.0	100.0	996.6	998.0	999.6
8/02/2020	18.5	19.6	21.0	19.2	0.3	10.5	31.5	89.3	99.3	100.0	994.7	996.1	997.4
9/02/2020	18.5	19.8	20.8	59.0	0.0	12.1	40.4	99.5	100.0	100.0	984.5	989.4	995.2
10/02/2020	19.9	22.2	28.1	0.4	0.0	4.1	18.5	61.0	93.2	100.0	985.8	987.6	989.4
11/02/2020	18.6	22.3	30.0	3.8	0.0	3.6	17.8	86.8	99.9	100.0	985.5	987.6	989.1
12/02/2020	20.5	22.3	26.0	0.2	0.1	3.8	18.2	80.3	97.8	100.0	986.7	988.6	990.9
13/02/2020	19.9	21.8	25.9	3.2	0.0	4.5	19.4	87.5	99.3	100.0	989.1	990.1	991.6
14/02/2020	18.3	21.8	27.4	0.0	0.2	3.0	15.6	44.3	79.4	100.0	984.4	987.6	990.8
15/02/2020	17.1	21.5	27.4	2.0	0.1	3.6	18.2	56.7	82.9	100.0	983.9	986.1	990.5
16/02/2020	18.6	21.0	24.8	0.0	0.0	3.3	13.1	61.4	88.3	100.0	990.3	992.9	995.0
17/02/2020	19.0	20.3	23.3	2.6	0.2	2.2	8.5	84.7	98.5	100.0	990.2	992.7	994.8
18/02/2020	18.1	25.0	33.1	6.0	0.0	4.3	18.4	43.0	77.0	100.0	981.1	986.5	990.9
19/02/2020	18.5	22.6	27.3	0.2	0.4	4.2	20.5	32.0	56.2	100.0	981.5	983.4	986.9
20/02/2020	17.1	19.9	23.8	0.0	0.1	4.5	22.0	47.5	61.0	75.9	986.2	989.5	994.0
21/02/2020	16.6	20.1	24.3	0.0	0.0	4.2	27.7	62.7	79.4	99.3	992.9	995.2	999.3
22/02/2020	16.5	18.3	20.2	1.0	0.0	3.5	12.2	84.0	97.4	100.0	999.3	1001.7	1003.6
23/02/2020	17.5	20.1	23.5	0.0	0.0	2.6	12.3	59.8	82.8	100.0	1000.4	1002.3	1003.9
24/02/2020	17.3	21.0	25.8	0.0	0.1	2.5	13.3	55.4	83.0	100.0	997.3	999.2	1001.4
25/02/2020	18.8	23.2	29.9	0.0	0.1	4.0	18.9	34.9	76.7	100.0	990.2	993.9	998.1
26/02/2020	18.4	24.3	31.1	2.6	0.2	4.9	18.9	40.6	68.9	99.4	982.8	986.5	990.2
27/02/2020	16.7	20.1	25.0	0.0	0.2	3.7	15.3	58.1	76.6	91.6	985.0	988.7	991.1
28/02/2020	15.1	19.9	26.3	0.0	0.0	3.8	21.2	21.5	68.7	100.0	986.5	990.6	996.3
29/02/2020	15.6	20.2	25.7	0.0	0.1	3.9	22.6	51.3	75.7	95.8	992.2	994.8	996.9
Monthly	15.1	21.8	44.6	119.2	0.0	4.6	40.4	15.6	80.7	100.0	981.1	991.9	1003.9





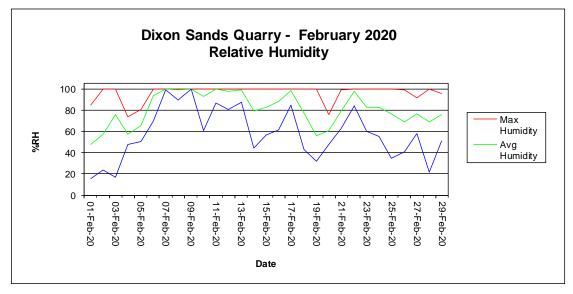


Figure 2: Daily Rainfall, Temperature and Relative Humidity Charts



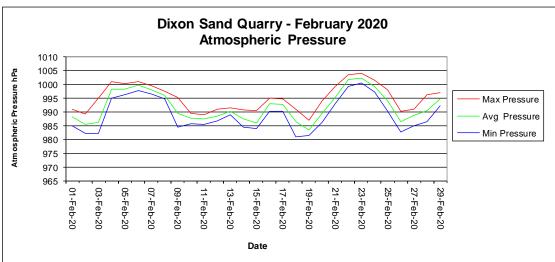
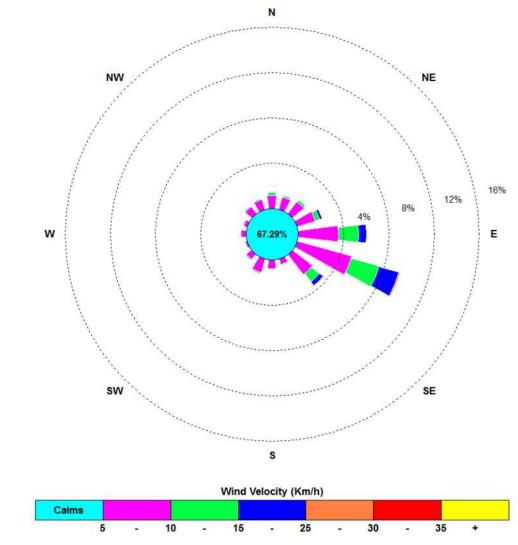


Figure 3: Wind Speed and Atmospheric Pressure Charts



00:00 1 February 2020 - 23:55 29 February 2020

Figure 4: Windrose Plot (km/h)

Appendix 1

Calibration Documents (when required)



TEOM Client/Site: Dixa Sadi I Marata

Continuous Air Quality

Monthly/Quarterly/Six Monthly/Annual FOM Maintenance as

TEOM Maintenance and Calibration – 1400AB



Date: 5

Condition	Current Data	Acceptable Data	Pass (Tick)	Fail (Tick)
Operating Condition	ALARMRED	Green - Normal		V
Date/time	TEOM: 5/2/20 12:30 Actual: 5/2/20 12-31	Current Date/time correct within 5 minutes	/	
PM-10 24hr av	0	Positive values		
Filter loading PM10	119	<80 %		V
	246.25683	200 200 11-		
requency Pivi-10	DHO. 25003	200-300 Hz		
Frequency PM-10 Noise PM-10 omment: If filter load >80%	but <90% and if flows C	<0.100ug	1	
Noise PM-10	but <90% and if flows (load high / flows Coalescing file refet +	<0.100 ug Ok then data is OK Low & suspect do for + mail france than fully open		
Noise PM-10 comment: If filter load >80% comments: Fifte Blocked . System Status	but <90% and if flows C	<0.100 ug Ok then data is OK Low & suspect do for + mail france than fully open		> replaced and
Noise PM-10 comment: If filter load >80% comments: Filter Blocked . System Status Condition Vacuum pump	but <90% and if flows of load high flows Coalescing file (Current Data	<0.100 ug Ok then data is OK Low > surpect do for + mail france than fully open Acceptable Data		

Comments:

Data Downloaded: YES NO (circle)

Technician Name: COUN DAVIO Signed OM

F301D - TEOM-Field-Check Sheet 1400AB PM10 Version 12 Revised: 2 June 2019



3. Instrument Conditions Ambient Conditions and Temperatures

Condition	Current Data	Acceptable Data	Pass (Tick)	Fail (Tick)
Ambient Temperature	74.0	-10 to 50 C	1/	
Ambient Dew Point	13.2	-10 to 50 C	1	
Ambient Pressure	0.998	0.9-1.1 atm	/	
Ambient Relative Humidity	NA.	10-100 %RH	NA.	
Cap temperature	2000	50.00 +/- 0.10 C	~	
Case temperature	50.00	50.00 +/- 0.10 C	-	
Main (PM-10) Air Tube temp	50.00	50.00 +/- 0.10 C	/	

Comments:

or -

4. Instrument Conditions - Flows

Condition	Current Data	Acceptable Data	Pass (Tick)	Fail (Tick)
Main (PM-10) Flow rate	3.00	2.82 - 3.18 lpm	/	
Bypass Flow rate	2.72	12.95 - 14.39 lpm	B in	
Total Flow rate	5-73	15.67 - 17.67 lpm		/

Comments:

FLOW FALLED

Fadj man = 1.050 Fadj bypn = 1.020

Results: (Tick box)

T	here were NO) equipment	faults	found.	No	action	required -	- (file	report)
---	--------------	-------------	--------	--------	----	--------	------------	---------	---------

There were faults found (Fails) – Were these fixed on site: YES/NO (circle)
Any Fails that cannot be repaired on site must be reported to CBased:

Office: 65713334 or email cbased@bigpond.com

Date faults notified to CBased: 5200

Comments/Action Required:

After filter charge + clean TEOM mas operational

cheded data 9:00 PM all OK

F301D - TEOM Field Check Sheet 1400AB PM10 Version 12 Revised: 2 June 2019

Page 2 of 4



Calibration/Mai	ntenance					
1. 1405A: Were	Filters replaced		YES/NO			
2. PM10 Inlet he	ad cleaned		YES/NO			
3. If measureme	nt filters were r	eplaced, confirm	stable results a	after change. S	table	
particulate resul	ts confirmed		YES/NO			
7	V					
Channel	Filter Load %	Frequency Hz	Frequency	Frequency	Frequency	
		initial	check 1min	check 3min	check 5min	1
PM10	19	253.57081	253.57064	155701A	25357064	Joll
		an 0.0010 between i	readings (if instru	ment is thermody	namically stable)	
Pass/Fail – if Fail – i	nstall new filter an	d redo stability test.				
4. Instrument clo	ack varified /Pot	or Section 1)	YES/NO.			
		No. This development with Andrew Street		(10)	. in	
If Time changed	- clock reset Of		YES/NO OF	NA (not change	ea)	
Comments:						
5 W TEOM:		TOM 51.			1.00	
5. Were I EOM II	i line and rear I	EOM filters check	ked for cleanlin	ess and replac	ed if	
necessary.			YES/NO.		(1	-1
Comments if cha	anged: Bypail	coalectly + ma	ul transducer	blocked.	How recon	eseu
2 mm - 2 m	after c	coalescity + ma hanging the t	itu	5: 2: E		
6. TEOM Cleane	d and Air Condit	tioner checked YE	S/NO. Air Cond	ditioner setting	gs or	
operational state	us:					
			Waster-colored			
		alibrator Serial N			ration	
corrections for 1	emperature/Pr	essure and Flows	and apply to	all readings.		
Quarterly or Six	Monthly Calibr	ation Acto	filter chage			
1. Flow Verificat	ion – Conducte	d YES/NO				
PM10 Flow verif	ied Flow I/mi	n_ 300 Error %	6 (allow	ved error <6%)	PASS/FAIL	
Bypass Flow veri	fied Flow I/mi	n_13.68 Error %	allov	ved error <6%)	PASS FAIL	
If fail then comp	lete a full multip	ooint recalibration	n and review p	revious data fro	om last good	
flow check. Con	nments if Flows	recalibrated:				
		\				
2. Leak Check -	Conducted YES	NO				
PM10 actual	· 13 <1	imit 0.15				
	4.002					
Bypass actual 0	.3)	imit 0.60				

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Leak check PASS/FAIL - If fail then find leak and retest.

Comments: Slight leak on v



Annual Calibration/Maintenance

1. Temperature and Pressure Calibration – Conducted YES/NO
Reference Temperature:C TEOM TemperatureC
if difference +/- 1 C recalibrate sensor. Sensor recalibrated YES/NO
Reference Pressure:atm TEOM Pressureatm
if difference +/- 0.010 atm recalibrate sensor. Sensor recalibrated YES/NO
Note: Tetracal measures Atmospheric Pressure in mm Hg or mb or hPa
For mb or hPa divide tetracal result by 1013.25 to change units to atm.
For mmHg divide tetracal result by 760 to change units to atm.
Mt.
2. Flow Calibration – Conducted YES/NO
PM10
Set point 2.4 Actual:
Set point 3.6 Actual: After calibration Final:I/min
Set point 3.0 Actual: After calibration Final:I/min
BYPASS
Set point 10.9 Actual:
Set point 16.4 Actual:/
Set point 13.67 Actual: After calibration Final:I/min
3. Mass calibration (K0) Verification – Conducted YES/NO
Actual measured KO = TEOM stated KO Error %:
Allowed Error +/- 2.5%. PASS/FAIL
If Error +/- 2.5% repeat. If confirmed consult manufacturer.
Second Error % = PASS/FAIL. Comments:
If second test fails consult manufacturer.
4. Annual Noise check - Conducted YES/NO
Zero filter applied to TEOM and TEOM operated for at least 12 hours:
Start date/time:Finish date/time:
Standard deviation of all recorded data (min 30 min averages) =ug/m³
Noise was less than 5ug/m³ YES/NO
5. Maintenance
Air Inlet system cleaned YES/NO
Pump Reconditioned YES/NO
Check Waterproofing YES/NO
Comments:

F301D - TEOM Field Check Sheet 1400AB PM10 Version 12 Revised: 2 June 2019





CBased Environmental Pty Limited

ABN 62 611 924 264

Weather Station Field Check

Site:

Dixon Sands

Date/Time:

5/02/2020

12:30 -13:45

Measured Against Certified Sensors

Parameter	Units	Measured	Reference	Difference	Pass/Fail	Reference Description
Temperature 10m	°C	23.1	23.3	-0.2	Pass	Ref Thermometer
Humidity	%RH	54	52	2.0	Pass	Ref RH sensor
Rainfall	mm	3.0	3.2	-0.2	Pass	Glass Pipette
Wind Speed	km/hr	6.1	6.5	-0.4	Pass	Ref Anemometer
Wind Direction	Degrees	116	118	-2.0	Pass	Sighting compass

Reference Instruments Specifications:

NA=Not Applicable

Sensor	Serial Number	Specifications	Accuracy	4
*Temperature	190320N01	-10 to 5°C 5 to 15°C	+/- 0.3°C +/- 0.3°C	
*Humidity	190320N01	15 to 35°C 10 to 90%RH	+/- 0.3°C +/- 2%RH	
*Anemometer	190320N03	0 to 64km/hr	+/- 3.2km/hr	*Calibration expires
*Barometer	BE190318031	680 - 1016hPa	+/- 1hPa	** standard tips
**Rainfall	Standard number of tips	3.2mm	+/- 0.2mm	1
Compass	Sighting Compass	0 to 360 degrees	+/- 5 Deg	j

20/03/2020

Reference sensors were certified by Davis Instruments USA using a reference traceable to National Institute of Standards and Technology (NIST) and were "in calibration" when used.

The weatherstation was in conformance with the reference instruments at the monitored levels. Wind direction is referenced to true north. The calibration check of the raingauge involved adding water to the raingauge. 3.0mm of rain should be deleted from site records on the 5/2/2020.

and the second			
NA=Not	A	1-1-	1-
NASHOT	AVAI	120	ıe

Comments:

The meteorological station meets the requirements of the Approved Methods for the Sampling and Analysis of Air Pollutants in NSW.

The weather station has Passed the field check. Next annual field check due:

Feb-21

Checked by: Colin Davies

5/02/2020

CBased Environmental Pty Limited Unit 3, 2 Enterprise Crescent **SINGLETON NSW 2330**

P: 65 713 334



CBased Environmental Pty Limited

ABN 62 611 924 264

Weather Station Field Check Annual Physical Screening

Site:

Dixon Sands Met Station

Date:

5/02/2020

Time:

12:30-13:45

Check	Comments
Visual inspection for damage	No issues found
Water or insect damage to equipment	No issues found
Anemometer and wind vane	Operating normally, no damage
Temperature and Humidity shields	No issues found
Rain gauge	No issues found
Battery and Solar panel condition	No issues found
Battery Storage level	No issues found
Logger system	Operating normally
Time and Date	Correct +/- 5 minute EST, date correct
Mast and guy wires	No issues found
Cabinet and wiring	No issues found

No issues found

The weather station has PASSED the fie	Feb-20	
Describe any remedial action required:	(d · D	
Checked by:	Colin Davies	

CBased Environmental Pty Limited Unit 3, 2 Enterprise Crescent SINGLETON NSW 2330 P: 65 713 334



CBased Environmental Pty Limited ABN 62 611 924 264

Dixon Sand Quarry

Environmental Monitoring Air Quality

Tapered Element Oscillating Microbalance (TEOM) (PM₁₀) and Meteorological Data

March 2020

□olin Da⊑e□B□□MEI□ □E□□P

En ironmental □ienti i Date: □□ □pril □0 □0

1.0 Summary

Ba ed En ironmental Pt Limited i □ contra ted b □ Dixon □ and to □ cond to □ contin
T⊡e monitoring programme in □□de□
One □ontin□o□□TEOM PM _{□0} monitor□and
One □ontin□o□□Meteorologi□al □tation□
T⊡ mont⊡ report wa□ prepared b□ □Ba⊡ed En⊡ronmental and in□⊡de□ t⊡e ⊚llowing:
TEOM ௴PM □monitoring re □ It □ ௴r Mar □ □ 0 □ 0 □ and
Meteorologi⊡al re □ t□ or Mar □ □ □ □ □
In a □ordan □e wit □ □□□ed □e □□□ondition 7 o □t □e Dixon □and de □elopment □on □ent and t □e Dixon □and EPL□
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□4-□o□r a□erage re□□t□ were below t□e Dixon □and □□arr□ EPL limit o□ 4□□g□m□□
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□pproximatel □ □00 □ o □TEOM data wa □ re □o □ered ⊡or Mar □□ □0 □0 □

2.0 Sampling Programme

- □□□5□0□□□□□00□□ "Methods for Sampling and Analysis of Ambient Air. Determination of Suspended Particulates—PM₁₀ continuous direct mass method using a tapered element oscillating microbalance analyser" □ and
- □5□0□□□□ □□007□"Methods for Sampling and Analysis of Ambient Air Part 1.1 Guide to Siting Air Monitoring Equipment"□

TEOM PM_{□0} re □t□ are □4-□o□r a □erage□ at midnig □t and are reported a □ □g m̄ □ □orre □ted to 0 degree □ □ and □0 □□□□Pa□

□II laborator□ anal□i□ wa□ cond□ted b□ a □ational □□ociation o□ Tecting □□t□oritie□□□□T□□a□redited laborator□□

□ir □ □alit□monitoring □ite de □ription□and lo □ation□are pro □ided in **Table 1**□

 Table 1:
 Dixon □and □ir □ □alit□Monitoring De □ription and Lo□ation□

Monitor	Site Code	Location Description
TEOM PM _□	TEOM	Old □ort□Road⊡Maroota □□W
Meteorologi⊡al □tation	MET	Old □ort□Road⊡Maroota □□W

3.0 Results

3.1 TEOM PM₁₀

□4-□o□r a⊡erage TEOM PM _{□0} re□□t□ rom t□e □□M□ data □olle⊡tion □oftware are pro⊡ded in Table 2 and a □□art o⊡t□e data i□pro⊡ded in Figure 1 □
D⊑ring t⊑e monitoring period⊡indi⊡d⊡al ⊡4-⊑o⊡r TEOM PM _{□0} re⊡t⊡ were below t⊑e □ational En⊡ronment Prote⊡tion Mea⊡re □□EPM□□□ort-term □□4⊡r□impa⊡t ⊡riteria o□ 50⊑g⊡n□ and t⊡e Dixon □and □ ⊑arr□EPL limit o⊡4□□g⊡n□□
□t pre ent t e □ rrent TEOM PM₁0 ann al a erage i below t e Dixon and arr ann al a erage PM criteria o □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □
□ □□arterl□ □alibration wa□ □nderta□en in □ebr□ar□ □0□0 and t□e next □alibration i□ □□□ed□led ಠr Ma□ □0□0□T□e □alibration □ertiū□ate i□ pro□ded in Appendix 1 w□en re□□ired□□

	TEOM	Annual PM ₁₀	TSP*	TSP Annual**
Date	PM _™ ᡎgːm□□	□ erage ᡎg m □	□gm□□	⊞g lm □□
	□7□□	<u>_64</u>	4□□	65Ⅲ
	□□7	<u>_64</u>		6610
	4	-64	6015	6610
4.000	□□7	□6Ⅲ	□4 □□	65Ⅲ
50000		<u> </u>		6517
6.000	10 11	<u> </u>	7	6515
7.000	0	<u> </u>	□□5	654
		<u>6</u>		65Ⅲ
	□0⊡5	<u>_6</u> 0	□6Ⅲ	6510
	□5	□5Ⅲ		64Ⅲ
	□7	□5Ⅲ		6416
		□5Ⅲ	□0□□	644
		□5□7	□0□□	64Ⅲ
400 00		□5 □7	□7Ⅲ	64Ⅲ
□ 5 □ □ □ □ 0 □ 0		□516		6410
<u>_60</u> 0	7.6	□5□5		6□Ⅲ
□ 7		□515	□ 4 □ 5	6□6
	□05	□514	□6 Ⅲ	6□5
	□6Ⅲ	□5□ 4	4□0	6□4
		□5Ⅲ	54 : 5	6□Ⅲ
	4 4	□5Ⅲ	6□0	6□Ⅲ
		□5Ⅲ	47Ⅲ	6□Ⅲ
	□6Ⅲ	□5Ⅲ	405	6□Ⅲ
400 0	□6Ⅲ	□5Ⅲ	4□□□	6□Ⅲ
□ 5 □ □ □ □ 0 □ 0	□5Ⅲ	□5Ⅲ	□7Ⅲ	6□0
<u>_60</u> 0	□0 □□	□5Ⅲ	□5Ⅲ	6□Ⅲ
70000		□5Ⅲ		6□7
	□4 □□	□5.00	□710	6□6
	6Ⅲ	□5.00	□5Ⅲ	6□4
	7Ⅲ	□4 □		6□Ⅲ
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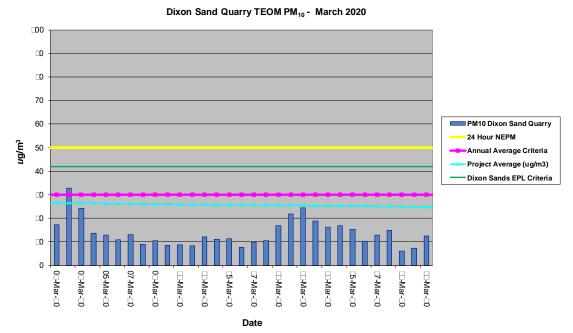


Figure 1: TEOM PM₁₀ 24 hr, Annual Average and Criteria

3.2 Meteorological Data

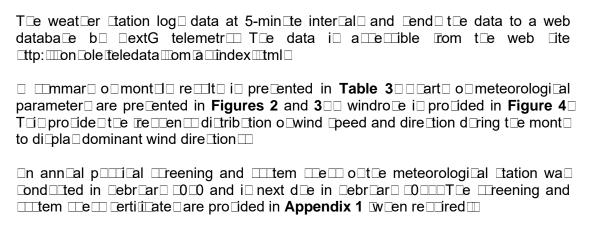
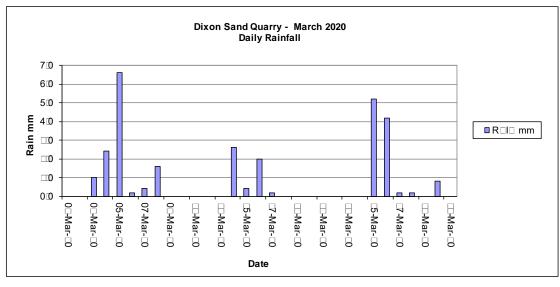
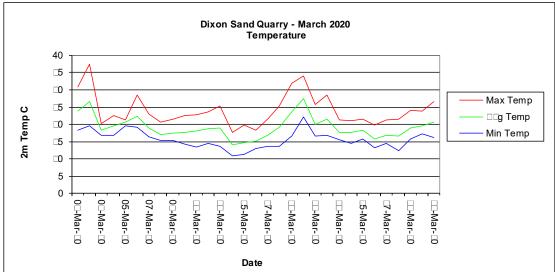


 Table 3:
 Meteorologi al Data ammar or Mar o o o

Date	Min Temp	□ tig Temp	Max Temp	RAIN mm	Min WS	Avg WS	Max WS	Min Humidity	Avg Humidity	Max Humidity	Min Pressure	Avg Pressure	Max Pressure
1/03/2020	18.4	23.9	30.9	0.0	0.2	4.4	17.7	37.7	73.5	99.9	987.3	991.0	993.8
2/03/2020	19.6	26.6	37.5	0.0	0.3	4.9	21.7	10.1	46.1	78.6	986.9	989.7	995.9
3/03/2020	16.8	18.4	20.2	1.0	0.0	3.1	8.9	73.3	86.9	100.0	995.7	998.0	1000.3
4/03/2020	16.9	19.6	22.5	2.4	0.1	3.7	16.7	73.2	91.6	100.0	994.2	996.7	999.3
5/03/2020	19.5	20.5	21.2	6.6	0.2	3.2	12.4	87.2	97.4	100.0	985.3	989.2	994.8
6/03/2020	19.2	22.3	28.4	0.2	0.2	3.6	16.1	59.9	86.5	100.0	984.4	988.3	995.1
7/03/2020	16.5	18.9	23.0	0.4	0.1	3.6	11.9	62.4	84.6	99.7	994.8	997.8	1000.6
8/03/2020	15.4	17.1	20.6	1.6	0.0	3.1	12.8	72.0	94.6	100.0	997.5	999.0	1000.6
9/03/2020	15.4	17.5	21.6	0.0	0.2	3.7	19.0	65.8	87.9	100.0	997.8	999.4	1000.7
10/03/2020	14.3	17.7	22.6	0.0	0.0	3.6	15.0	49.0	81.4	100.0	998.2	999.9	1001.4
11/03/2020	13.5	18.0	22.8	0.0	0.1	4.0	20.8	52.0	78.9	100.0	1000.2	1001.7	1003.6
12/03/2020	14.5	18.7	23.7	0.0	0.2	4.9	23.4	42.6	74.9	100.0	1000.8	1002.6	1004.6
13/03/2020	13.7	18.9	25.4	0.0	0.1	3.2	18.1	35.9	70.9	95.4	993.0	997.2	1002.0
14/03/2020	10.8	14.1	17.7	2.6	0.7	5.0	21.4	76.9	95.4	100.0	990.6	995.5	999.4
15/03/2020	11.3	14.7	19.9	0.4	0.4	4.0	11.9	63.0	84.0	100.0	998.1	1000.4	1002.8
16/03/2020	13.1	15.1	18.3	2.0	0.1	4.4	13.6	82.6	98.0	100.0	1001.2	1003.6	1006.1
17/03/2020	13.7	16.7	21.4	0.2	0.0	4.4	13.4	66.5	87.5	100.0	1004.6	1005.7	1007.2
18/03/2020	13.7	19.1	25.4	0.0	0.0	3.2	14.2	35.5	70.0	99.7	1000.2	1003.4	1006.0
19/03/2020	16.6	23.5	32.0	0.0	0.1	3.4	13.7	23.8	50.9	84.0	997.8	999.7	1002.2
20/03/2020	22.1	27.5	34.1	0.0	0.5	5.3	18.5	22.6	36.5	53.7	990.1	993.8	997.8
21/03/2020	16.6	20.0	25.8	0.0	0.1	4.3	24.9	40.1	80.2	100.0	994.3	997.8	999.9
22/03/2020	16.8	21.4	28.6	0.0	0.0	3.2	16.8	31.3	71.3	99.2	994.9	997.6	1001.6
23/03/2020	15.5	17.7	21.2	0.0	0.1	3.9	16.9	64.0	76.3	94.8	1001.5	1003.1	1004.5
24/03/2020	14.4	17.7	21.1	0.0	0.1	3.6	14.4	67.0	86.7	100.0	999.2	1001.5	1004.1
25/03/2020	15.8	18.3	21.6	5.2	0.2	3.3	16.7	73.2	89.0	100.0	996.0	998.3	1000.6
26/03/2020	13.3	15.7	19.8	4.2	0.1	3.7	15.3	74.4	97.1	100.0	1000.3	1003.3	1005.2
27/03/2020	14.5	16.8	21.2	0.2	0.0	2.8	14.3	57.1	85.3	100.0	1003.5	1004.6	1006.3
28/03/2020	12.4	16.6	21.4	0.2	0.1	3.1	16.5	57.8	85.7	100.0	1001.0	1002.9	1004.7
29/03/2020	15.7	18.9	24.0	0.0	0.1	2.6	10.8	63.6	90.7	100.0	994.9	997.9	1001.1
30/03/2020	17.2	19.7	23.8	0.8	0.0	3.7	12.6	65.1	87.6	100.0	990.9	993.0	994.9
31/03/2020	16.2	20.6	26.6	0.0	0.0	3.7	13.3	49.8	80.7	99.3	992.9	995.1	997.9
Monthly	10.8	19.1	37.5	28.0	0.0	3.8	24.9	10.1	80.9	100.0	984.4	998.3	1007.2





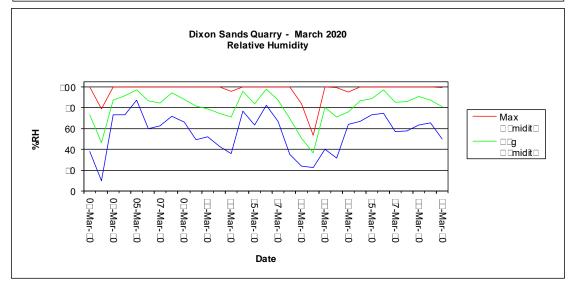
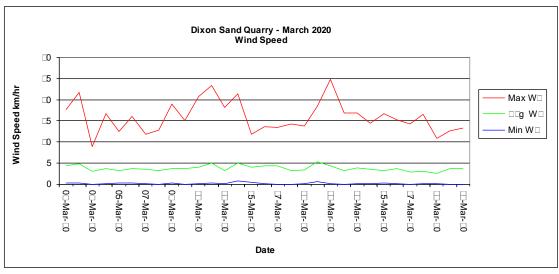


Figure 2: Daily Rainfall, Temperature and Relative Humidity Charts



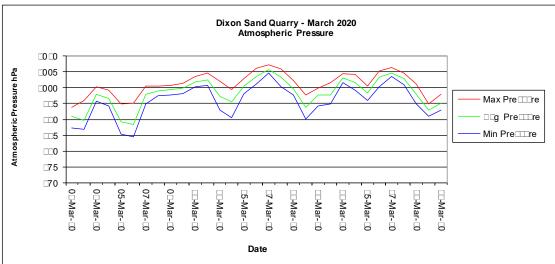


Figure 3: Wind Speed and Atmospheric Pressure Charts

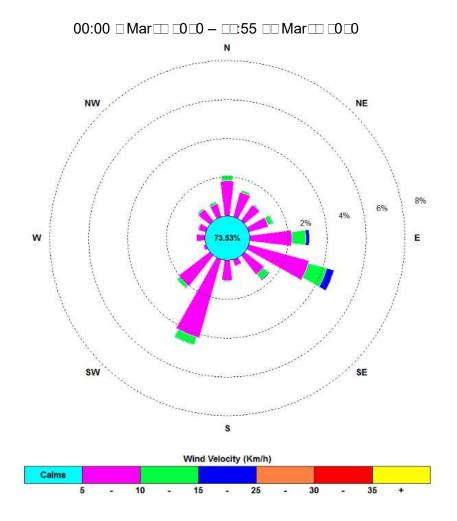


Figure 4: Windrose Plot (km/h)



CBased Environmental Pty Limited ABN 62 611 924 264

Dixon Sand Quarry

Environmental Monitoring Air Quality

Tapered Element Oscillating Microbalance (TEOM) (PM₁₀) and Meteorological Data

April 2020

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1.0 Summary

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T⊡e monitoring programme in⊡⊡de⊡
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One □ontin□o□□Meteorologi□al □tation□
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T □e □al □ □ated T □ P i □ below t □e Dixon □and □ □arr □ ann □al a □erage □riteria o □ □ □ □g □m □□
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□pproximatel□ □00□ o□TEOM data wa□re □o □ered ⊡or □pril □0□0□

2.0 Sampling Programme

- □□□5□0□□□□□00□□ "Methods for Sampling and Analysis of Ambient Air. Determination of Suspended Particulates—PM₁₀ continuous direct mass method using a tapered element oscillating microbalance analyser" □ and
- □5□0□□□□ □□007□"Methods for Sampling and Analysis of Ambient Air Part 1.1 Guide to Siting Air Monitoring Equipment"□

TEOM PM_{□0} re □t□ are □4-□o□r a □erage□ at midnig □t and are reported a □ □g m̄ □ □orre □ted to 0 degree □ □ and □0 □□□□Pa□

□II laborator□ anal□i□ wa□ cond□ted b□ a □ational □□ociation o□ Tecting □□t□oritie□□□□T□□a□redited laborator□□

□ir □ □alit□monitoring □ite de □ription□and lo □ation□are pro □ided in **Table 1**□

 Table 1:
 Dixon □and □ir □ □alit□Monitoring De □ription and Lo□ation□

Monitor	Site Code	Location Description
TEOM PM _□	TEOM	Old □ort□Road⊡Maroota □□W
Meteorologi⊡al □tation	MET	Old □ort□Road⊡Maroota □□W

3.0 Results

3.1 TEOM PM₁₀

□4-□o□r a⊡erage TEOM PM _{□0} re□□t□ rom t□e □□M□ data □olle⊡tion □o rount are pro⊡ded in Table 2 and a □□art o□t□e data i□pro⊡ded in Figure 1 □
D⊡ring t⊡e monitoring period⊡indi⊡d⊡al ⊡4-⊡o⊡r TEOM PM⊡ re⊡t⊡ were below t⊡e □ational En⊡ronment Prote⊡tion Mea⊡re ⊞EPM□⊡ort-term ⊞4⊡r⊡impa⊡t ⊡iteria o⊡ 50⊡g⊡m□ and t⊡e Dixon □and □ ⊡arr□EPL limit o⊡4⊡⊡g⊡m□□
□t pre□ent t□e □□rrent TEOM PM₁₀ ann□al a□erage i□ below t□e Dixon □and □□arr□ann□al a□erage PM□₀ □riteria o□□0□gιm□□T□e □□rrent ann□al a□erage lor □al□□lated Total □□□pended Parti□□late□ □T□P□ i□ below t□e ann□al a□erage □riterion o□ □0□gιm□□T□e T□P i□ □al□□lated b□ m□ltipl□ing t□e PM□₀ b□ □5□□ote: t□e ann□al a□erage i□ □al□□lated ιτom □ □□□ □0□□ and t□ereιore an ann□al amo□nt o□data □a□ not □et been □olle□ted□
□ □□arterl□ □alibration wa□ □nderta□en in □ebr□ar□ □0□0 and t□e next □alibration i□ □□□ed□ed ಠr Ma□ □0□0□T□e □alibration □ertiū□ate i□ pro⊡ded in Appendix 1 ⊡w□en re□□ired□□

Table 2: \square reage Dail \square 4- \square TEOM PM $_\square$ and T \square P Re \square It \square or \square pril \square 0 \square 0 from \square M \square and \square nn \square al \square reage PM $_\square$ 0 ral \square 1 ated from t \square 6 \square \square 0 \square 0

D 4	TEOM	Annual PM ₁₀	TSP*	TSP Annual**
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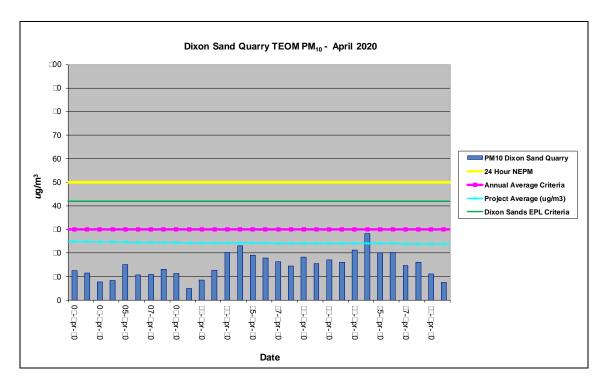
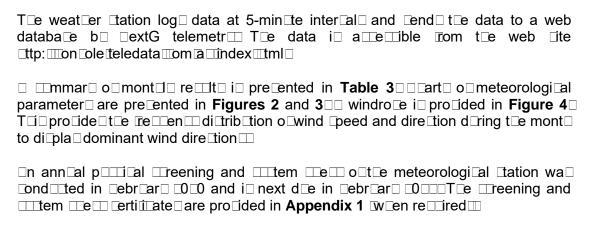
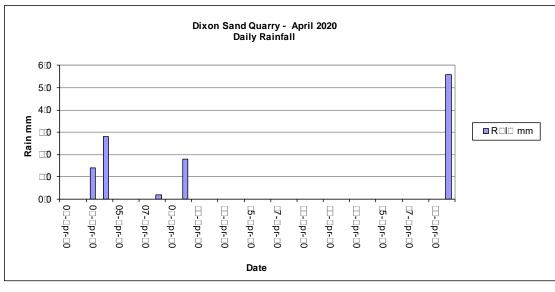


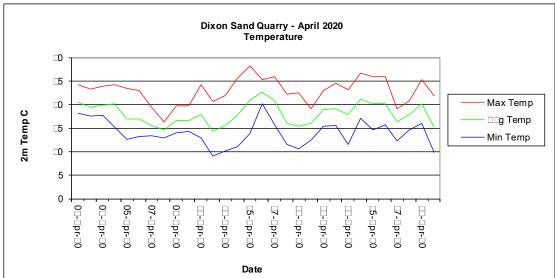
Figure 1: TEOM PM₁₀ 24 hr, Annual Average and Criteria

3.2 Meteorological Data



Date	Min Temp	□ tg Temp	Max Temp	RAIN mm	Min WS	Avg WS	Max WS	Min Humidity	Avg Humidity	Max Humidity	Min Pressure	Avg Pressure	Max Pressure
1/04/2020	18.2	20.5	24.3	0.0	0.0	4.1	19.2	66.4	91.8	100.0	995.6	997.4	999.4
2/04/2020	17.6	19.5	23.3	0.0	0.2	3.8	16.1	71.5	93.9	100.0	990.0	992.7	996.9
3/04/2020	17.7	19.8	23.9	1.4	0.1	4.7	15.0	66.6	88.0	100.0	982.3	987.2	990.2
4/04/2020	15.3	20.3	24.2	2.8	0.4	7.5	35.7	26.7	62.4	100.0	977.2	981.8	989.4
5/04/2020	12.7	17.0	23.5	0.0	0.0	3.4	14.3	31.7	50.2	64.6	989.5	992.3	995.7
6/04/2020	13.3	17.0	23.0	0.0	0.2	3.6	15.1	42.2	65.1	95.1	994.5	996.8	999.9
7/04/2020	13.4	15.6	19.5	0.0	0.1	2.5	10.2	58.9	82.2	100.0	999.0	1000.1	1001.8
8/04/2020	13.0	14.7	16.3	0.2	0.0	2.2	9.4	87.1	96.5	100.0	998.4	1001.0	1004.2
9/04/2020	14.0	16.7	19.8	0.0	0.1	2.7	12.6	69.4	90.3	100.0	1002.7	1004.2	1006.1
10/04/2020	14.4	16.7	19.8	1.8	0.2	3.8	20.1	76.4	92.6	100.0	989.4	995.8	1002.6
11/04/2020	12.9	17.9	24.2	0.0	0.0	6.2	34.7	29.7	52.3	83.1	980.0	985.3	989.7
12/04/2020	9.0	14.3	20.7	0.0	0.1	3.0	13.6	28.3	52.0	75.5	989.7	994.2	998.0
13/04/2020	10.1	15.6	22.0	0.0	0.0	2.8	17.4	48.4	68.6	88.6	997.3	999.2	1001.2
14/04/2020	11.1	17.7	25.7	0.0	0.0	2.8	12.5	26.4	72.9	100.0	1000.5	1002.0	1004.2
15/04/2020	13.8	20.9	28.3	0.0	0.2	4.2	12.3	29.9	58.8	95.8	995.3	999.7	1002.9
16/04/2020	20.2	22.7	25.4	0.0	0.4	6.1	17.2	42.7	48.7	58.0	988.5	991.8	995.3
17/04/2020	15.8	20.8	26.0	0.0	0.2	3.0	14.2	19.5	41.5	80.6	988.0	989.7	991.5
18/04/2020	11.6	16.0	22.2	0.0	0.0	2.9	13.8	30.3	48.5	70.5	989.9	991.3	993.0
19/04/2020	10.6	15.5	22.5	0.0	0.0	2.7	15.8	44.3	75.7	99.2	991.0	992.6	995.0
20/04/2020	12.5	16.1	19.1	0.0	0.2	3.8	10.7	45.6	66.5	99.3	991.9	994.0	996.3
21/04/2020	15.4	19.0	23.0	0.0	0.3	3.3	17.1	38.8	50.8	65.8	993.4	995.9	998.4
22/04/2020	15.5	19.1	24.5	0.0	0.2	3.0	12.3	34.6	51.2	66.1	995.0	996.7	998.5
23/04/2020	11.5	17.9	23.2	0.0	0.0	3.1	14.4	32.4	48.5	78.0	995.0	997.5	1000.8
24/04/2020	17.1	21.1	26.8	0.0	0.2	3.2	17.7	30.0	45.6	76.8	994.4	996.3	999.4
25/04/2020	14.7	20.3	25.9	0.0	0.2	3.5	20.9	34.7	51.9	77.8	996.1	998.5	1001.1
26/04/2020	15.8	20.2	25.9	0.0	0.4	5.1	18.6	32.2	50.0	69.2	992.0	994.7	998.6
27/04/2020	12.3	16.3	19.1	0.0	0.2	2.8	8.1	62.0	81.5	99.3	998.8	1001.8	1004.1
28/04/2020	14.7	17.8	20.9	0.0	0.0	2.3	14.7	67.1	87.5	100.0	998.2	1001.4	1003.6
29/04/2020	16.0	20.2	25.3	0.0	0.2	5.5	20.0	50.2	74.9	100.0	988.5	993.7	998.2
30/04/2020	9.9	15.3	22.0	5.6	0.2	5.4	21.6	63.5	82.2	100.0	983.8	986.5	988.6
				·									
Monthly	9.0	18.1	28.3	11.8	0.0	3.8	35.7	19.5	67.4	100.0	977.2	995.1	1006.1





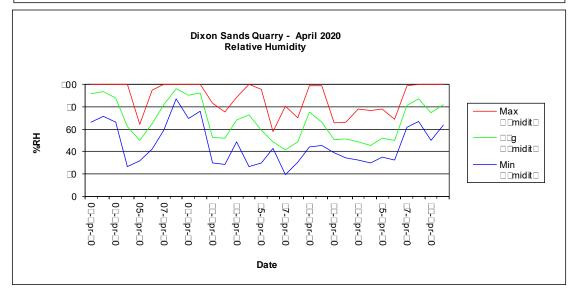
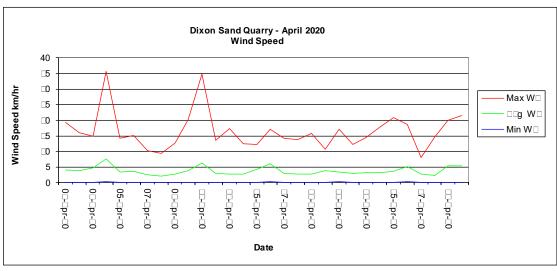


Figure 2: Daily Rainfall, Temperature and Relative Humidity Charts



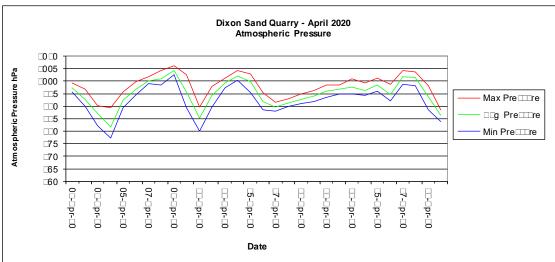


Figure 3: Wind Speed and Atmospheric Pressure Charts

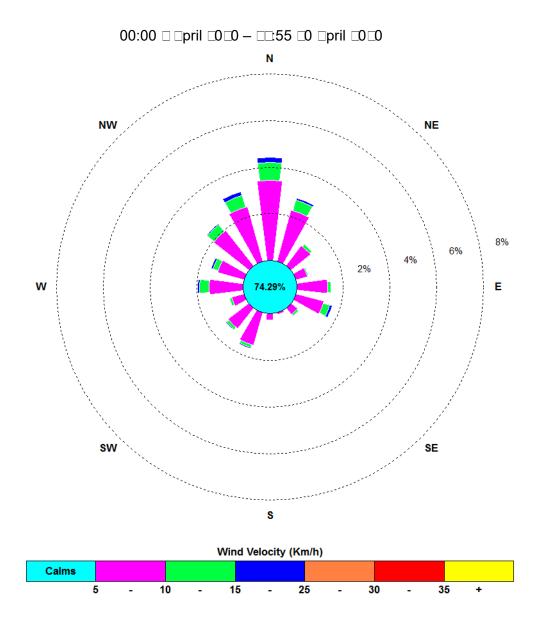


Figure 4: Windrose Plot (km/h)



CBased Environmental Pty Limited ABN 62 611 924 264

Dixon Sand Quarry

Environmental Monitoring Air Quality

Tapered Element Oscillating Microbalance (TEOM) (PM₁₀) and Meteorological Data

May 2020

Colin Davies BSc MEIA CENVP

Environmental Scientist

Date: 1 July 2020

1.0 Summary

CBased Environmental Pty Limited is contracted by Dixon Sand to conduct continuous Tapered Element Oscillating Microbalance (TEOM) for fine particulates (PM_{10}) and meteorological monitoring for the Dixon Sand Quarry. The information is required to assess air quality levels. The results for the TEOM and meteorological site are included in this report.

The monitoring programme includes:

- One continuous TEOM PM₁₀ monitor; and
- One continuous Meteorological Station.

This monthly report was prepared by CBased Environmental and includes the following:

- TEOM (PM₁₀) monitoring results for May 2020; and
- Meteorological results for May 2020.

In accordance with Schedule 3, Condition 7 of the Dixon Sand development Consent and the Dixon Sand EPL;

- 24-hour average results were below the NEPM 24-hour maximum criteria of 50ug/m³;
- 24-hour average results were below the Dixon Sand Quarry EPL limit of 42ug/m³;
- The annual average is below the Dixon Sand Quarry consent annual average criteria of 30ug/m³; and
- The calculated TSP is below the Dixon Sand Quarry annual average criteria of 90ug/m³.

Note: Based on the available data, statements in green indicate current conformance to Dixon Sand Quarry Air Quality Impact Assessment criteria, statements in red indicate possible non-conformance. Year to date annual average for PM₁₀ is calculated from the 1st July 2019 for TEOM's coinciding with the Dixon Sand project year. An annual amount of data has not yet been collected.

Approximately 100% of meteorological data was recovered for May 2020.

Approximately 100% of TEOM data was recovered for May 2020.

2.0 Sampling Programme

The TEOM is sited and operated to the applicable Australian Standard and/or OEH (EPA) approved methods. The following Australian Standards were used:

- AS3580.9.8 (2001) "Methods for Sampling and Analysis of Ambient Air. Determination of Suspended Particulates—PM₁₀ continuous direct mass method using a tapered element oscillating microbalance analyser"; and
- 3580.1.1 (2007) "Methods for Sampling and Analysis of Ambient Air Part 1.1 Guide to Siting Air Monitoring Equipment".

TEOM PM_{10} results are 24-hour averages at midnight and are reported as $\mu g/m^3$ corrected to 0 degrees C and 101.3kPa.

All laboratory analysis was conducted by a National Association of Testing Authorities (NATA) accredited laboratory.

Air Quality monitoring site descriptions and locations are provided in **Table 1**.

 Table 1:
 Dixon Sand Air Quality Monitoring Description and Locations

Monitor	Site Code	Location Description
TEOM PM ₁₀	TEOM	Old North Road, Maroota NSW
Meteorological Station	MET	Old North Road, Maroota NSW

3.0 Results

3.1 TEOM PM₁₀

24-hour average TEOM PM₁₀ results from the AQMS data collection software are provided in **Table 2** and a chart of the data is provided in **Figure 1**.

During the monitoring period, individual 24-hour TEOM PM₁₀ results were below the National Environment Protection Measure (NEPM) short-term (24hr) impact criteria of 50ug/m³ and the Dixon Sand Quarry EPL limit of 42ug/m³.

At present the current TEOM PM_{10} annual average is below the Dixon Sand Quarry annual average PM_{10} criteria of $30ug/m^3$. The current annual average for calculated Total Suspended Particulates (TSP) is below the annual average criterion of $90ug/m^3$. The TSP is calculated by multiplying the PM_{10} by 2.5. Note: the annual average is calculated from 1 July 2019 and therefore an annual amount of data has not yet been collected.

A quarterly calibration was undertaken in 28 May 2020 and the next calibration is scheduled for August 2020. The calibration certificate is provided in **Appendix 1** (when required).

Table 2: Average Daily 24-hr TEOM PM_{10} and TSP Results for May 2020 from AQMS and Annual Average PM_{10} calculated from the 1 July 2019

Dete	TEOM	Annual PM ₁₀	TSP*	TSP Annual**
Date	PM ₁₀ (μg/m ³)	Average (μg/m³)	(µg/m3)	(µg/m3)
1/05/2020	6.1	23.7	15.3	59.3
2/05/2020	8.5	23.6	21.3	59.1
3/05/2020	10.8	23.6	27.0	59.0
4/05/2020	14.0	23.6	35.0	58.9
5/05/2020	11.5	23.5	28.8	58.8
6/05/2020	9.3	23.5	23.3	58.7
7/05/2020	12.2	23.4	30.5	58.6
8/05/2020	13.1	23.4	32.8	58.5
9/05/2020	15.8	23.4	39.5	58.4
10/05/2020	6.1	23.3	15.3	58.3
11/05/2020	17.4	23.3	43.5	58.2
12/05/2020	16.0	23.3	40.0	58.2
13/05/2020	20.0	23.3	50.0	58.1
14/05/2020	13.5	23.2	33.8	58.1
15/05/2020	11.5	23.2	28.8	58.0
16/05/2020	7.3	23.1	18.3	57.8
17/05/2020	12.1	23.1	30.3	57.7
18/05/2020	13.2	23.1	33.0	57.7
19/05/2020	8.0	23.0	20.0	57.5
20/05/2020	7.4	23.0	18.5	57.4
21/05/2020	6.4	22.9	16.0	57.3
22/05/2020	7.7	22.9	19.3	57.1
23/05/2020	6.3	22.8	15.8	57.0
24/05/2020	5.7	22.7	14.3	56.9
25/05/2020	7.7	22.7	19.3	56.7
26/05/2020	9.7	22.7	24.3	56.6
27/05/2020	10.3	22.6	25.8	56.5
28/05/2020	10.8	22.6	27.0	56.4
29/05/2020	9.5	22.5	23.8	56.3
30/05/2020	8.5	22.5	21.3	56.2
31/05/2020	6.6	22.4	16.5	56.1

^{*}Calculated from PM10

^{**}Calculated from PM10 Annual Average

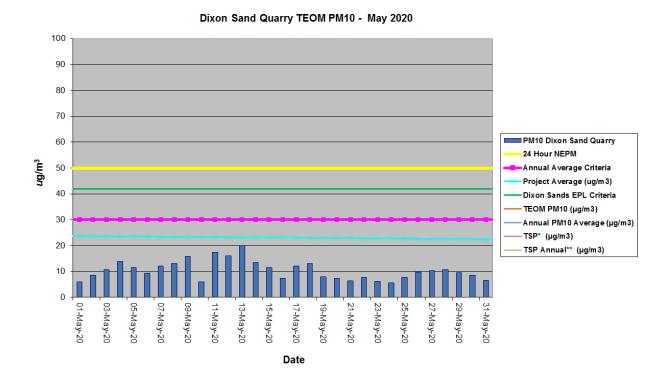


Figure 1: TEOM PM₁₀ 24 hr, Annual Average and Criteria

3.2 Meteorological Data

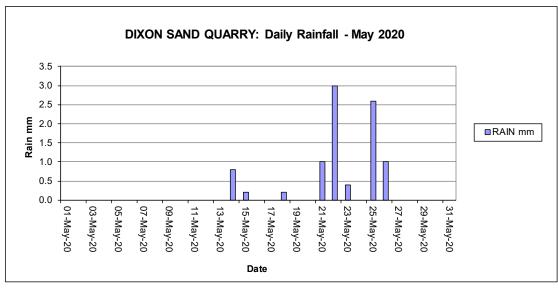
The weather station logs data at 5-minute intervals and sends the data to a web database by NextG telemetry. The data is accessible from the web site http://console.teledata.com.au/index.html.

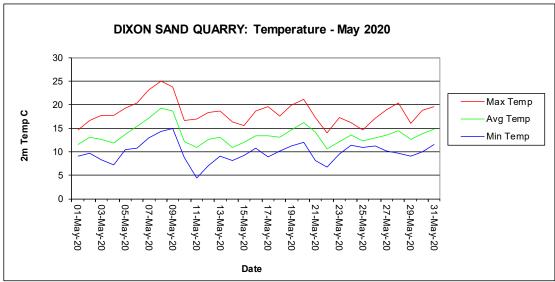
A summary of monthly results is presented in **Table 3**. Charts of meteorological parameters are presented in **Figures 2** and **3**. A windrose is provided in **Figure 4**. This provides the frequency distribution of wind speed and direction during the month to display dominant wind directions.

An annual physical screening and system check of the meteorological station was conducted in February 2020 and is next due in February 2021. The screening and system check certificates are provided in **Appendix 1** (when required).

 Table 3:
 Meteorological Data Summary for May 2020

Date	Min Temp	Avg Temp	Max Temp	RAIN mm	Min WS	Avg WS	Max WS	Min Humidity	Avg Humidity	Max Humidity	Min Pressure	Avg Pressure	Max Pressure
1/05/2020	9.0	11.6	14.6	0.0	0.6	6.7	33.0	36.7	54.5	70.7	984.5	987.0	988.8
2/05/2020	9.7	13.1	16.6	0.0	0.6	7.6	44.2	33.8	49.3	64.9	983.4	985.3	989.5
3/05/2020	8.3	12.7	17.7	0.0	0.2	3.3	17.4	38.4	53.0	70.9	989.3	996.0	1002.0
4/05/2020	7.2	11.9	17.8	0.0	0.1	2.4	11.9	41.9	67.8	84.6	1001.4	1003.9	1007.0
5/05/2020	10.4	13.8	19.3	0.0	0.2	3.9	11.4	53.5	79.7	97.1	1006.7	1008.0	1009.6
6/05/2020	10.8	15.4	20.4	0.0	0.4	3.8	18.4	48.6	72.8	98.8	1002.8	1006.0	1008.8
7/05/2020	13.0	17.1	23.1	0.0	0.2	5.3	21.3	45.7	60.5	73.9	998.0	1000.0	1002.7
8/05/2020	14.3	19.3	25.0	0.0	0.6	6.3	16.4	34.8	53.7	74.0	994.5	996.6	998.6
9/05/2020	14.9	18.6	23.8	0.0	0.3	6.5	37.9	39.8	54.0	71.2	989.1	992.0	994.6
10/05/2020	8.7	12.2	16.6	0.0	0.0	3.5	13.6	20.8	43.1	59.7	994.4	998.9	1003.6
11/05/2020	4.4	11.0	16.9	0.0	0.0	2.6	11.3	34.2	55.2	75.3	1003.0	1004.9	1006.5
12/05/2020	7.1	12.7	18.4	0.0	0.0	2.8	11.4	42.3	63.1	82.1	1001.6	1004.0	1006.2
13/05/2020	9.1	13.0	18.6	0.0	0.1	2.4	9.3	39.6	65.2	99.2	1000.1	1001.5	1003.2
14/05/2020	8.2	11.0	16.3	0.8	0.2	3.7	21.3	65.7	84.2	99.2	1002.7	1005.2	1007.6
15/05/2020	9.2	12.1	15.6	0.2	0.5	4.6	13.7	62.4	81.6	100.0	1006.2	1007.6	1009.1
16/05/2020	10.8	13.4	18.7	0.0	0.2	2.5	10.5	55.5	84.8	100.0	1007.7	1008.9	1010.4
17/05/2020	8.9	13.4	19.6	0.0	0.2	2.3	9.9	52.8	83.1	100.0	1008.0	1009.2	1010.7
18/05/2020	10.2	13.2	17.6	0.2	0.0	1.7	7.1	71.0	95.2	100.0	1009.2	1010.3	1012.2
19/05/2020	11.2	14.7	19.9	0.0	0.0	2.4	10.8	57.2	88.4	100.0	1001.6	1006.2	1009.5
20/05/2020	12.0	16.2	21.1	0.0	0.3	5.2	17.0	56.8	75.8	99.3	994.8	997.5	1001.7
21/05/2020	8.2	14.2	17.2	1.0	0.2	4.8	23.2	69.0	84.1	99.6	987.9	991.4	994.9
22/05/2020	6.7	10.6	14.0	3.0	0.5	4.5	20.2	60.2	80.2	100.0	988.0	989.2	990.6
23/05/2020	9.6	12.2	17.2	0.4	0.5	3.4	16.7	54.9	85.3	100.0	986.0	987.2	988.6
24/05/2020	11.4	13.5	16.2	0.0	1.1	7.9	23.0	51.0	64.9	92.1	988.2	991.2	994.9
25/05/2020	11.0	12.3	14.7	2.6	1.5	8.7	22.9	61.4	79.5	100.0	994.0	996.3	999.5
26/05/2020	11.2	13.0	17.1	1.0	0.4	5.8	20.6	67.4	93.8	100.0	999.3	1000.7	1002.4
27/05/2020	10.2	13.5	19.0	0.0	0.3	3.1	9.7	54.1	89.5	100.0	998.3	1000.3	1002.0
28/05/2020	9.7	14.5	20.3	0.0	0.0	2.3	8.2	50.7	82.3	100.0	998.3	999.9	1002.6
29/05/2020	9.1	12.7	16.1	0.0	0.1	2.9	11.5	79.1	91.5	100.0	1002.3	1005.1	1007.1
30/05/2020	10.0	13.8	18.8	0.0	0.1	2.7	12.4	60.4	88.5	100.0	1000.0	1004.1	1006.9
31/05/2020	11.6	14.9	19.6	0.0	0.1	4.7	19.0	49.4	79.2	100.0	993.1	996.8	999.8
Monthly	4.4	13.6	25.0	9.2	0.0	4.2	44.2	20.8	73.7	100.0	983.4	999.7	1012.2





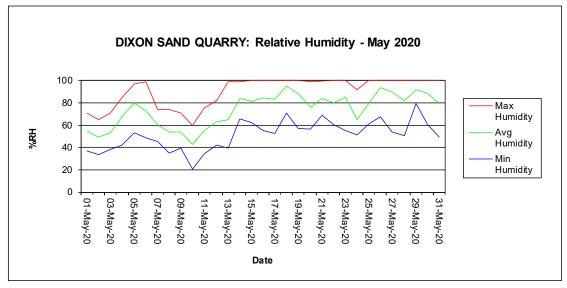
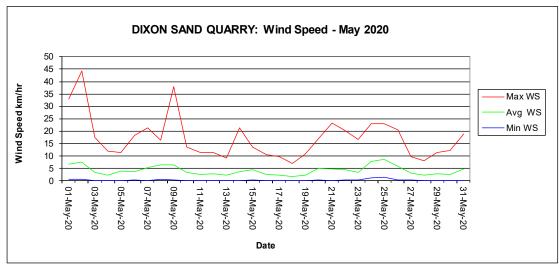


Figure 2: Daily Rainfall, Temperature and Relative Humidity Charts



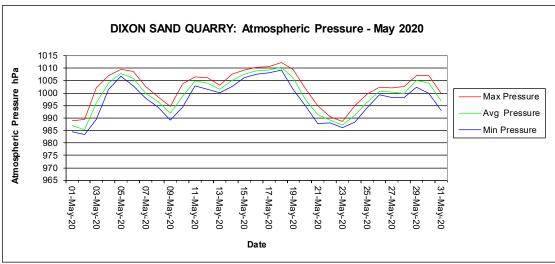


Figure 3: Wind Speed and Atmospheric Pressure Charts

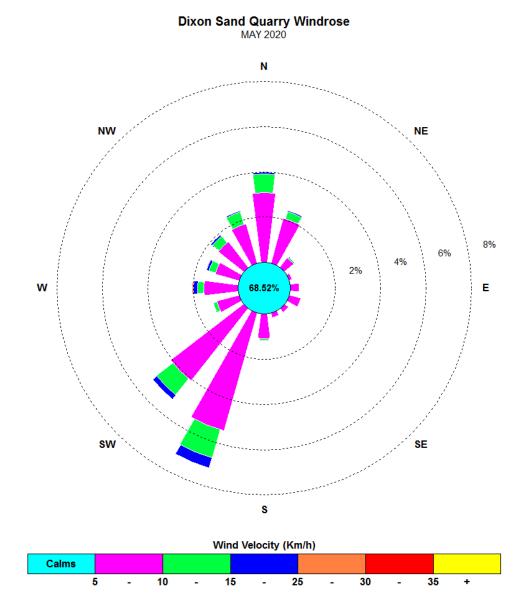


Figure 4: Windrose Plot (km/h)

Appendix 1

Calibration Documents (when required)



Continuous Air Quality Monthly/Quarterly/Six Monthly/Annual TEOM Maintenance and Calibration – 1400AB



TEOM Client/Site:	Pixon Sundel	TEOM !	Date:28	15/20
1. TEOM Data Screen	SERIAL No:	25570	Firmware:	N/A.

Condition	Current Data	Acceptable Data	Pass (Tick)	Fail (Tick)
Operating Condition	Frily of (4)	Green - Normal	レ	
Date/time	TEOM: 28/5/20 11-46 Actual: 38/5/20 11-50	Current Date/time correct within 5 minutes	~	
PM-10 24hr av	12.9	Positive values	/	
Filter loading PM10	61	<80 %	/	
Frequency PM-10	250.96885	200-300 Hz	~	
Noise PM-10	0.065	<0.100ug	V	

Comment: If filter load >80% but <90% and if flows Ok then data is OK **Comments:**

2. System Status

Condition	Current Data	Acceptable Data	Pass (Tick)	Fail (Tick)
Vacuum pump pressure	N/A.	<0.50 atm		_
Warnings	NIC	No Warnings		
If any warnings list:				

Comments:

Data Downloaded: YES/NO circle)

Technician Name: COUN DAND Signed CUM

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3. Instrument Conditions Ambient Conditions and Temperatures

Condition	Current Data	Acceptable Data	Pass (Tick)	Fail (Tick)
Ambient Temperature	24-7	-10 to 50 C	1	
Ambient Dew Point	NA	-10 to 50 C	~	_
Ambient Pressure	0.977	0.9-1.1 atm	/	
Ambient Relative Humidity	NA	10-100 %RH	-	_
Cap temperature	50.00	50.00 +/- 0.10 C		
Case temperature	50.00	50.00 +/- 0.10 C	/	
Main (PM-10) Air Tube temp	50.00	50.00 +/- 0.10 C		

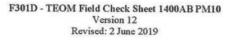
Comments:

4. Instrument Conditions - Flows

Condition	Current Data	Acceptable Data	Pass (Tick)	Fail (Tick)
Main (PM-10) Flow rate	3.00	2.82 - 3.18 lpm		
Bypass Flow rate	13.68	12.95 - 14.39 lpm		
Total Flow rate	NA	15.67 - 17.67 lpm	NA	

Comments:

	Results: (Tick box)
V	There were NO equipment faults found. No action required - (file report)
	There were faults found (Fails) - Were these fixed on site: YES/NO (circle)
	Any Fails that cannot be repaired on site must be reported to CBased:
	Office: 65713334 or email cbased@bigpond.com
	Date faults notified to CBased:
	•
	Comments/Action Required:





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<u>Calibration/Maintenance</u> 1. 1405A: Were Filters replaced

2. PM10 Inlet			(YES/NO				
	nent filters were r sults confirmed	eplaced, confirm	stable results a	after change. S	table		
particulate res	suits committed		(TES/NO				
Channel	Filter Load %	Frequency Hz	Frequency	Frequency	Frequency	1	
		initial	check 1min	check 3min	check 5min	,	
PM10	16	254.75499	254-13508		254-51514	VOL	
	d not drift by more th – install new filter an			ment is thermody	namically stable)		
	clock verified (Ref ed – clock reset OI		YES/NO.	NA (not change	.d\		
Comments:	d – clock reset Of		153/100 01	NA (HOL Change	ea)		
5. Were TEOM	I in line and rear T	EOM filters chec	ked for cleanlin	ess and replac	ed if		
necessary.			(YES/NO.				
Comments if c	hanged:						
6. TEOM Clean	ned and Air Condit	ioner checked Y	FR/NO. Air Cond	litioner setting	's or		
	atus: AÁ			artioner setting	3 01		
	Temp/Pressure C				ration		
corrections to	r Temperature/Pr	essure and Flow	s and apply to	all readings.			
Quarterly or S	ix Monthly Calibr	ation				- 1	
						Int	FIL
1. Flow Verific	ation – Conducte	YES/NO				Fadj	Fa
PM10 Flow ver	rified Flow I/mi	n_ 2-96 Error 9	6_1-3_ (allow	ved error <6%)	PASS/FAIL	1-05	1-0
If fail then com	erified Flow I/min oplete a full multip comments if Flows	ooint recalibratio	6 <u>l - 6</u> (allov on and review po	ved error <6%) revious data fro	PASS/FAIL om last good	1.02	(-0
2. Leak Check	- Conducted YES	NO					
PM10 actual_	0.12 <1	imit 0.15					
Bypass actual_	<u>0.45</u> <1	imit 0.60					
Leak check RAS	SS/FAIL – If fail the	n find leak and r	etest.		, ,		
(ell si	ighet leak ->	in mad france	dies OK +	or now all	m_	

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Annual Calibration/Maintenance

1. Temperature and Pressure Calibration – Conducted YES/NO
Reference Temperature:C TEOM TemperatureC
if difference +/- 1 C recalibrate sensor. Sensor recalibrated YES/NO
Reference Pressure:atm TEOM Pressureatm
if difference +/- 0.010 atm recalibrate sensor. Sensor recalibrated YES/NO
Note: Tetracal measures Atmospheric Pressure in mm Hg or mb or hPa
For mb or hPa divide tetracal result by 1013.25 to change units to atm.
For mmHg divide tetracal result by 760 to change units to atm.
NH
2. Flow Calibration – Conducted YES/NO
PM10
Set point 2.4 Actual:
Set point 3.6 Actual:
Set point 3.0 Actual: After calibration Final:I/min
BYPASS
Set point 10.9 Actual:
Set point 16.4 Actual:
Set point 13.67 Actual: After calibration Final: I/min
3. Mass calibration (K0) Verification – Conducted YES/NO
Actual measured KO = TEOM stated KO Error %:
Allowed Error +/- 2.5%. PASS/FAIL
If Error +/- 2.5% repeat. If confirmed consult manufacturer.
Second Error % =/PASS/FAIL. Comments:
If second test fails consult manufacturer.
4. Annual Noise check - Conducted YES/NO
Zero filter applied to TEOM and TEOM operated for at least 12 hours:
Start date/time: Finish date/time:
standard deviation of all recorded data (min 30 min averages) =ug/m ³
Noise was less than 5ug/m³ YES/NO
5. Maintenange
Air Inlet system cleaned YES/NO
Pump Reconditioned YES/NO
Check Waterproofing YES/NO
Comments:



CBased Environmental Pty Limited ABN 62 611 924 264

Dixon Sand Quarry

Environmental Monitoring Air Quality

Tapered Element Oscillating Microbalance (TEOM) (PM₁₀) and Meteorological Data

June 2020

Colin Davies BSc MEIA CENVP

Environmental Scientist

Date: 31 July 2020

1.0 Summary

CBased Environmental Pty Limited is contracted by Dixon Sand to conduct continuous Tapered Element Oscillating Microbalance (TEOM) for fine particulates (PM_{10}) and meteorological monitoring for the Dixon Sand Quarry. The information is required to assess air quality levels. The results for the TEOM and meteorological site are included in this report.

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- One continuous TEOM PM₁₀ monitor; and
- One continuous Meteorological Station.

This monthly report for June 2020 was prepared by CBased Environmental and includes the following:

- TEOM (PM₁₀) monitoring results; and
- Meteorological results.

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- 24-hour average results were below the NEPM 24-hour maximum criteria of 50ug/m³;
- 24-hour average results were below the Dixon Sand Quarry EPL limit of 42ug/m³;
- The annual average is below the Dixon Sand Quarry consent annual average criteria of 30ug/m³; and
- The calculated TSP is below the Dixon Sand Quarry annual average criteria of 90ug/m³.

Note: Based on the available data, statements in green indicate current conformance to Dixon Sand Quarry Air Quality Impact Assessment criteria, statements in red indicate possible non-conformance. Year to date annual average for PM₁₀ is calculated from the 1st July 2019 for TEOM's coinciding with the Dixon Sand project year. An annual amount of data has now been collected.

Approximately 100% of meteorological data was recovered for June 2020.

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2.0 Sampling Programme

The TEOM is sited and operated to the applicable Australian Standard and/or OEH (EPA) approved methods. The following Australian Standards were used:

- AS3580.9.8 (2001) "Methods for Sampling and Analysis of Ambient Air. Determination of Suspended Particulates—PM₁₀ continuous direct mass method using a tapered element oscillating microbalance analyser"; and
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Meteorological Station	MET	Old North Road, Maroota NSW

3.0 Results

3.1 TEOM PM₁₀

24-hour average TEOM PM₁₀ results from the AQMS data collection software are provided in **Table 2** and a chart of the data is provided in **Figure 1**.

During the monitoring period, individual 24-hour TEOM PM₁₀ results were below the National Environment Protection Measure (NEPM) short-term (24hr) impact criteria of 50ug/m³ and the Dixon Sand Quarry EPL limit of 42ug/m³.

At present the current TEOM PM_{10} annual average is below the Dixon Sand Quarry annual average PM_{10} criteria of $30ug/m^3$. The current annual average for calculated Total Suspended Particulates (TSP) is below the annual average criterion of $90ug/m^3$. The TSP is calculated by multiplying the PM_{10} by 2.5. Note: the annual average is calculated from 1 July 2019 and therefore an annual amount of data has now been collected.

A quarterly calibration was undertaken in May 2020 and the next calibration is scheduled for August 2020. The calibration certificate is provided in **Appendix 1** (when required).

Table 2: Average Daily 24-hr TEOM PM_{10} and TSP Results for June 2020 from AQMS and Annual Average PM_{10} calculated from the 1 July 2019

Date	PM ₁₀ 24-hr Average (μg/m³)	PM ₁₀ Annual Average (μg/m³)	24-hr Average TSP* (μg/m³)	Annual Average TSP** (µg/m³)
1/06/2020	10.0	22.4	25.0	56.0
2/06/2020	5.0	22.3	12.5	55.8
3/06/2020	8.8	22.3	22.0	55.7
4/06/2020	12.0	22.3	30.0	55.7
5/06/2020	14.3	22.2	35.8	55.6
6/06/2020	15.0	22.2	37.5	55.5
7/06/2020	15.1	22.2	37.8	55.5
8/06/2020	10.8	22.2	27.0	55.4
9/06/2020	9.1	22.1	22.8	55.3
10/06/2020	10.5	22.1	26.3	55.2
11/06/2020	10.3	22.0	25.8	55.1
12/06/2020	11.3	22.0	28.3	55.0
13/06/2020	10.6	22.0	26.5	54.9
14/06/2020	6.7	21.9	16.8	54.8
15/06/2020	8.9	21.9	22.3	54.7
16/06/2020	9.6	21.9	24.0	54.6
17/06/2020	11.8	21.8	29.5	54.5
18/06/2020	9.3	21.8	23.3	54.5
19/06/2020	7.8	21.7	19.5	54.3
20/06/2020	7.5	21.7	18.8	54.2
21/06/2020	6.2	21.6	15.5	54.1
22/06/2020	8.4	21.6	21.0	54.0
23/06/2020	7.0	21.6	17.5	53.9
24/06/2020	7.0	21.5	17.5	53.8
25/06/2020	8.5	21.5	21.3	53.7
26/06/2020	15.5	21.5	38.8	53.7
27/06/2020	13.5	21.4	33.8	53.6
28/06/2020	12.7	21.4	31.8	53.5
29/06/2020	11.6	21.4	29.0	53.5
30/06/2020	8.2	21.3	20.5	53.4

^{*}Calculated from PM10

^{**}Calculated from PM10 Annual Average

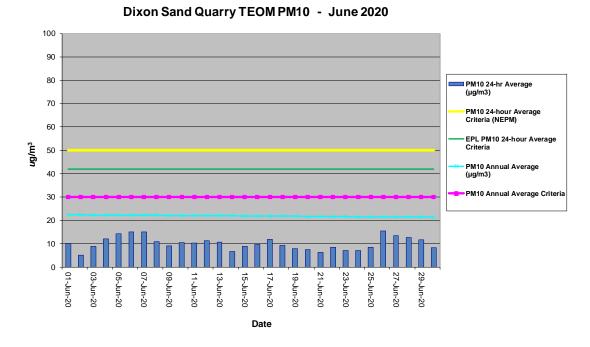


Figure 1: TEOM PM₁₀ 24 hr, Annual Average and Criteria

3.2 Meteorological Data

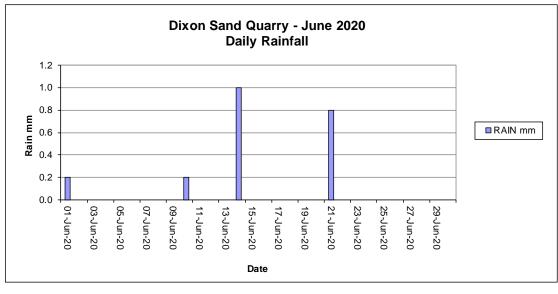
The weather station logs data at 5-minute intervals and sends the data to a web database by NextG telemetry. The data is accessible from the web site http://console.teledata.com.au/index.html.

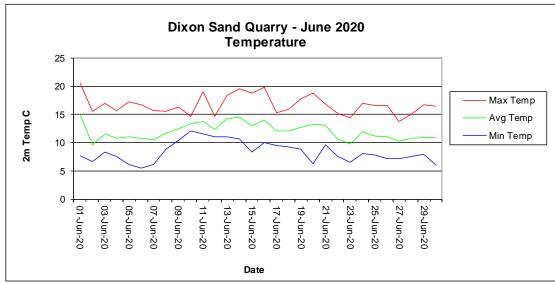
A summary of monthly results is presented in **Table 3**. Charts of meteorological parameters are presented in **Figures 2** and **3**. A windrose is provided in **Figure 4**. This provides the frequency distribution of wind speed and direction during the month to display dominant wind directions.

An annual physical screening and system check of the meteorological station was conducted in February 2020 and is next due in February 2021. The screening and system check certificates are provided in **Appendix 1** (when required).

Table 3:Meteorological Data Summary for June 2020

Date	Min Temp	Avg Temp	Max Temp	RAIN mm	Min WS	Avg WS	Max WS	Min Humidity	Avg Humidity	Max Humidity	Min Pressure	Avg Pressure	Max Pressure
1/06/2020	7.7	15.1	20.6	0.2	0.6	6.9	21.7	34.1	54.6	76.2	985.0	989.4	993.1
2/06/2020	6.6	9.7	15.5	0.0	0.1	3.7	16.5	42.6	59.2	70.0	990.5	993.8	997.1
3/06/2020	8.3	11.6	17.0	0.0	0.1	3.6	19.1	36.3	58.1	75.1	996.4	1001.6	1008.2
4/06/2020	7.6	10.7	15.7	0.0	0.2	4.4	13.1	50.9	67.0	82.9	1008.0	1009.6	1011.5
5/06/2020	6.2	11.0	17.3	0.0	0.1	2.1	7.3	47.4	75.9	99.3	1003.7	1006.5	1009.4
6/06/2020	5.5	10.8	16.7	0.0	0.2	2.6	8.0	54.5	81.3	100.0	1000.7	1002.7	1004.8
7/06/2020	6.2	10.6	15.7	0.0	0.1	2.5	11.4	66.3	90.9	100.0	1000.0	1001.6	1003.9
8/06/2020	8.8	11.7	15.6	0.0	0.3	5.6	23.2	57.8	82.9	100.0	1003.8	1006.6	1009.9
9/06/2020	10.4	12.4	16.3	0.0	0.2	3.3	12.0	83.6	97.7	100.0	1009.4	1010.3	1012.1
10/06/2020	12.1	13.3	14.7	0.2	0.0	2.2	9.5	100.0	100.0	100.0	1003.5	1006.4	1009.8
11/06/2020	11.5	13.7	19.0	0.0	0.3	3.1	9.9	63.5	95.1	100.0	1000.9	1002.4	1003.9
12/06/2020	11.0	12.3	14.6	0.0	0.1	4.1	14.9	86.4	97.6	100.0	1002.5	1003.6	1005.3
13/06/2020	11.0	14.3	18.4	0.0	0.0	2.7	11.7	76.8	93.8	100.0	995.1	999.6	1002.6
14/06/2020	10.6	14.6	19.6	1.0	0.3	4.6	14.1	54.9	99.3	100.0	991.7	994.8	999.4
15/06/2020	8.3	12.9	18.8	0.0	0.2	3.7	13.1	65.9	99.5	100.0	999.3	1001.3	1002.9
16/06/2020	10.0	14.1	19.8	0.0	0.0	3.3	14.5	100.0	100.0	100.0	1000.5	1002.6	1004.7
17/06/2020	9.5	12.1	15.3	0.0	0.1	3.5	11.3	93.2	100.0	100.0	1004.7	1010.3	1015.0
18/06/2020	9.2	12.0	16.0	0.0	0.0	2.7	9.4	57.7	83.8	100.0	1012.1	1014.3	1016.8
19/06/2020	8.9	12.7	17.8	0.0	0.1	2.3	11.9	63.3	86.1	99.3	1005.5	1008.5	1012.1
20/06/2020	6.3	13.2	18.8	0.0	0.1	4.3	13.3	50.7	78.9	100.0	996.2	1000.9	1005.5
21/06/2020	9.6	13.1	16.9	0.8	0.2	4.2	15.8	59.9	76.8	100.0	987.6	991.2	996.1
22/06/2020	7.5	10.7	15.2	0.0	0.2	3.7	12.7	47.4	65.5	85.2	987.4	989.0	990.8
23/06/2020	6.5	9.7	14.4	0.0	0.2	3.0	13.2	45.3	64.4	76.7	989.7	991.1	993.0
24/06/2020	8.1	11.9	17.0	0.0	0.4	4.5	19.9	48.3	63.2	83.8	991.4	993.7	996.8
25/06/2020	7.8	11.2	16.6	0.0	0.0	2.1	8.1	53.8	77.0	99.2	996.5	998.0	1000.1
26/06/2020	7.2	11.0	16.6	0.0	0.0	2.5	11.2	50.9	69.4	100.0	999.6	1001.9	1004.5
27/06/2020	7.2	10.3	13.7	0.0	0.0	2.6	13.9	75.0	95.9	100.0	1004.0	1005.5	1006.7
28/06/2020	7.5	10.7	15.0	0.0	0.0	2.5	9.4	64.0	84.0	100.0	1004.6	1005.9	1007.1
29/06/2020	8.0	11.0	16.7	0.0	0.0	2.7	10.6	58.5	89.3	100.0	1004.0	1005.6	1007.3
30/06/2020	6.0	10.9	16.4	0.0	0.2	3.0	13.5	66.5	95.8	100.0	1000.5	1003.0	1005.7
Monthly	5.5	12.0	20.6	2.2	0.0	3.4	23.2	34.1	82.8	100.0	985.0	1001.7	1016.8





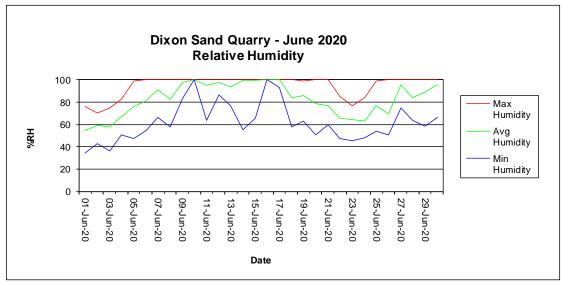
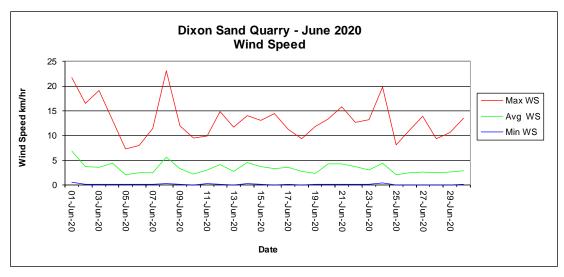


Figure 2: Daily Rainfall, Temperature and Relative Humidity Charts



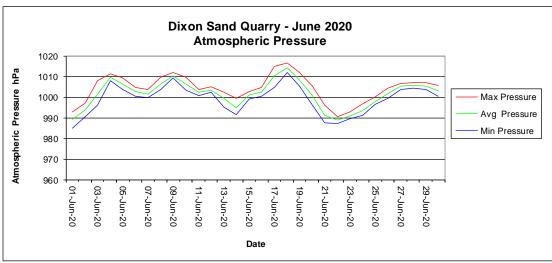


Figure 3: Wind Speed and Atmospheric Pressure Charts

2020_06 DIXON SAND QUARRY - WIND ROSE 00:00 1 June 2020 - 23:50 30 June 2020

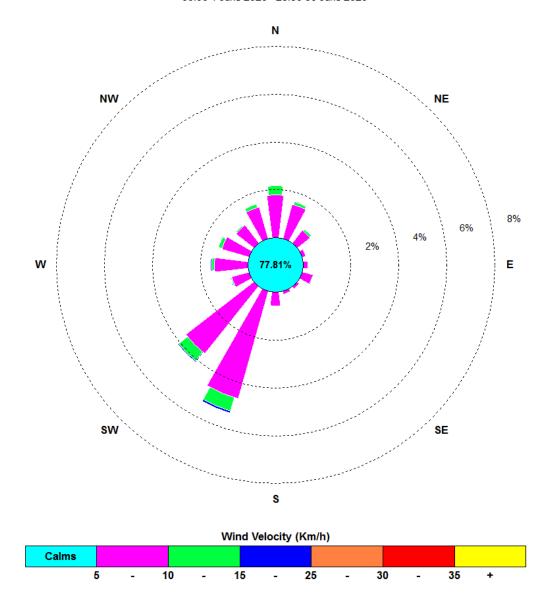


Figure 4: Windrose Plot (km/h)

Appendix 1

Calibration Documents (when required)

Appendix C – Groundwater and Surface Water Monitoring Results

□ 6-00 □ □ R □ 0 □ R □ 0 □ 0 □ ppendix □

Groundwater Quality

□ 6-00 □ R □ 0 □ R □ 0 □ - □ 0 □ ppendix □

Report Number:

8352



Date Issued:

10/12/2019

Revision Number: 00

Site/Job:

Old Northern Rd 6 Mnth Ground Water

Client:

Dixon Sand Pty Ltd

Address

PO Box 4019

Pitt Town NSW 2756

Contact

David Dixon

The following 11 samples were received on 2/12/2019

Client Sample Reference	Licence Reference	Date Sampled	Lab ID	Matrix	General Comments
BH1		2/12/2019	8352/1	Water	
BH2		2/12/2019	8352/2	Water	
BH3		2/12/2019	8352/3	Water	
BH6		2/12/2019	8352/4	Water	
BH7		2/12/2019	8352/5	Water	
BH8		2/12/2019	8352/6	Water	
ВН9		2/12/2019	8352/7	Water	
MW1		2/12/2019	8352/8	Water	
MW2		2/12/2019	8352/9	Water	
MW3		2/12/2019	8352/10	Water	
MW5		2/12/2019	8352/11	Water	

The sample(s) have been tested as received and the following reports are included:

- Test Report
- Sampling Report
- · Chain of Custody (if available)

Anthony Crane Laboratory Manager NATA Accredited Laboratory - 20375

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



Test Report Number:

8352

Date Issued: 10/12/2019 Revision No: 00



Results

Water Sampling and Field Tests	Units	Method		8352/1	8352/2	8352/3	8352/4	8352/5
			Limit (LOR)	BH1 2/12/2019	BH2 2/12/2019	BH3 2/12/2019	BH6 2/12/2019	BH7 2/12/2019
Depth to Water	m(bTOC)	AS5667.11	0.01	59.42	38.30	34.17	32.80	23.23
Temperature	∞	Temp	0.1	18.6	19.0	19.0	18.3	18.9
рН	pH Units	APHA 4500-H B	0.1	6.7	6.1	5.9	5.1	4.6
Electrical Conductivity	μS/cm	APHA 2510 B	50	165	312	176	119	247

Water Sampling and Field Tests	Units	Method		8352/6	8352/7	8352/8	8352/9	8352/10
			Limit (LOR)	BH8 2/12/2019	BH9 2/12/2019	MW1 2/12/2019	MW2 2/12/2019	MW3 2/12/2019
Depth to Water	m(bTOC)	AS5667.11	0.01	26.42	37.20	9.50	20.82	22.72
Temperature	∞	Temp	0.1	17.5	18.6	19.0	17.3	18.4
рН	pH Units	APHA 4500-H B	0.1	4.2	5.6	4.2	3.7	5.5
Electrical Conductivity	μS/cm	APHA 2510 B	50	314	272	249	739	124

Water Sampling and Field Tests	Units	Method		8352/11
			Limit (LOR)	MW5 2/12/2019
Depth to Water	m(bTOC)	AS5667.11	0.01	7.17
Temperature	℃	Temp	0.1	18.6
рH	pH Units	APHA 4500-H B	0.1	5.2
Electrical Conductivity	μS/cm	APHA 2510 B	50	160

Total Dissolved Solids	Units	Method		8352/1	8352/2	8352/3	8352/4	8352/5
			Limit (LOR)	BH1 2/12/2019	BH2 2/12/2019	BH3 2/12/2019	BH6 2/12/2019	BH7 2/12/2019
Total Dissolved Solids	mg/L @105°C	AS3550.4	20	160	194	110	99	165

Total Dissolved Solids	Units	Method		8352/6	8352/7	8352/8	8352/9	8352/10
			Limit (LOR)	BH8 2/12/2019	BH9 2/12/2019	MW1 2/12/2019	MW2 2/12/2019	MW3 2/12/2019
Total Dissolved Solids	mg/L @105°C	AS3550.4	20	244	140	145	463	86

Total Dissolved Solids	Units	Method		8352/11
			Limit (LOR)	MW5 2/12/2019
Total Dissolved Solids	mg/L @105°C	AS3550.4	20	102

Report Comments:

Note: # Where present, indicates NATA accreditation does not cover the performance of this service.

Location Analysed : Field and 4/30 Glenwood Dr Thornton NSW 2322 $\,$

NATA Accredited Laboratory - 20375

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



Results have been approved and report finalised on 10/12/2019

Sampling Report Number:

8352

Date Issued: 10/12/2019 Revision No: 00

Sampling Conditions: Cloudy 16°-20°C



Lab ID	Client Sample Reference	Date Sampled	Sampler	Method of Sampling	Pre- treatment / Preservation	Comments
8352/1	BH1	2/12/2019 9:20 AM	T.Walker	AS5667.11, Bail	AS5667.1	No veicle access for pump
8352/2	BH2	2/12/2019 10:29 AM	T.Walker	AS5667.11, Pump	AS5667.1	
8352/3	ВН3	2/12/2019 11:08 AM	T.Walker	AS5667.11, Pump	AS5667.1	
8352/4	ВН6	2/12/2019 9:50 AM	T.Walker	AS5667.11, Pump	AS5667.1	
8352/5	ВН7	2/12/2019 1:52 PM	T.Walker	AS5667.11, Pump	AS5667.1	
8352/6	ВН8	2/12/2019 2:08 PM	T.Walker	AS5667.11, Bail	AS5667.1	Roots @27.53
8352/7	ВН9	2/12/2019 1:15 PM	T.Walker	AS5667.11, Pump	AS5667.1	
8352/8	MW1	2/12/2019 1:38 PM	T.Walker	AS5667.11, Pump	AS5667.1	Turbid
8352/9	MW2	2/12/2019 2:52 PM	T.Walker	AS5667.11, Bail	AS5667.1	Insufficient to pump
8352/10	MW3	2/12/2019 10:08 AM	T.Walker	AS5667.11, Pump	AS5667.1	
8352/11	MW5	2/12/2019 8:40 AM	T.Walker	AS5667.11, Pump	AS5667.1	

Sampling procedures have been approved and report finalised on 10/12/2019 Where method is "unknown" sampling procedures are not endorsed

NATA Accredited Laboratory - 20375

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



Well Parameters:

Client: Dixon Sand Pty Ltd

Site/Job: Old Northern Rd 6 Mnth Ground Water



Well ID	GPS location (Easting)	GPS location (Northing)	Survey Date	Surveyed AHD (m)	Depth to Screen (m)
BH1	312290	6297039			
BH2	313429	6297202			
BH3	313808	6297093			
BH6	313153	6296833			
BH7	313097	6296495			
BH8	313435	6296617			
ВН9	313294	6296504			
MVV1	313092	6296499			
MW2	313417	6296733			
MW3	313161	6296838			
MW5	312460	6296903			

Well ID	Date Well Measured	Case Height (m)	Depth to bottom m(bTOC)	Recharge Rate	Approx Volume (L)
BH1	2/12/2019	0.68	>60	Slow	unkown
BH2	2/12/2019	0.57	>60	slow	unkown
BH3	2/12/2019	0.56	>60	Slow	Unkown
BH6	2/12/2019	0.52	>60	Slow	Unkown
BH7	2/12/2019	0.53	>60	Slow	Unknown
BH8	2/12/2019	0.73	27.53	Slow	2
ВН9	2/12/2019	0.64	>60	Medium	Unkown
MW1	2/12/2019	0.28	15.53	Medium	12
MW2	2/12/2019	0.45	24.53	Slow	7.5
MW3	2/12/2019	0.88	34.57	Slow	2.5
MW5	2/12/2019	0.70	21.19	Slow	28

Note: NATA accreditation does not cover information provided in this section.

^{*} Where indicated AHD from ground level (m) estimated based on handheld GPS.

Report Number:

9247



Date Issued:

1/07/2020

Revision Number: 00

Site/Job:

Old Northern Rd 6 Mnth Ground Water

Client:

Dixon Sand Pty Ltd

Address

PO Box 4019

Pitt Town NSW 2756

Contact

David Dixon

The following 11 samples were received on 24/06/2020

Client Sample Reference	Licence Reference	Date Sampled	Lab ID	Matrix	General Comments
BH1		24/06/2020	9247/1	Water	
BH2		24/06/2020	9247/2	Water	
BH3		24/06/2020	9247/3	Water	
BH6		24/06/2020	9247/4	Water	
BH7		24/06/2020	9247/5	Water	
BH8		24/06/2020	9247/6	Water	
BH9		24/06/2020	9247/7	Water	
MW1		24/06/2020	9247/8	Water	
MW2		24/06/2020	9247/9	Water	
MW3		24/06/2020	9247/10	Water	
MW5		24/06/2020	9247/11	Water	

The sample(s) have been tested as received and the following reports are included:

- Test Report
- Sampling Report
- · Chain of Custody (if available)

Anthony Crane Laboratory Manager NATA Accredited Laboratory - 20375

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



Test Report Number:

9247

Date Issued: 1/07/2020 Revision No: 00



Results

Field Tests	Units	Method		9247/1	9247/2	9247/3	9247/4	9247/5
			Limit	BH1	BH2	ВН3	BH6	BH7
			(LOR)	24/06/2020	24/06/2020	24/06/2020	24/06/2020	24/06/2020
Depth to Water	m(bTOC)	AS5667.11	0.01	>59.44	38.13	33.59	32.89	23.40
Temperature	℃	Temp	0.1	19.9	20.7	20.8	20.1	20.7
pH	pH Units	APHA 4500-H B	0.1	6.5	6.1	6.0	5.1	4.6
Electrical Conductivity	μS/cm	APHA 2510 B	50	205	274	194	129	276

Field Tests	Units	Method		9247/6	9247/7	9247/8	9247/9	9247/10
			Limit	BH8 24/06/2020	BH9 24/06/2020	MW1 24/06/2020	MW2 24/06/2020	MW3 24/06/2020
			(LOR)	24/06/2020	24/06/2020	24/06/2020	24/06/2020	24/06/2020
Depth to Water	m(bTOC)	AS5667.11	0.01	26.52	36.81	12.29	21.17	22.52
Temperature	∞	Temp	0.1	[NT]	20.7	20.5	19.2	19.9
рН	pH Units	APHA 4500-H B	0.1	[NT]	5.5	4.0	3.7	5.4
Electrical Conductivity	μS/cm	APHA 2510 B	50	[NT]	262	258	706	120

Field Tests	Units	Method		9247/11
			Limit (LOR)	MW5 24/06/2020
Depth to Water	m(bTOC)	AS5667.11	0.01	5.62
Temperature	℃	Temp	0.1	19.8
рН	pH Units	APHA 4500-H B	0.1	5.3
Electrical Conductivity	μS/cm	APHA 2510 B	50	201

Total Dissolved Solids	Units	Method		9247/1	9247/2	9247/3	9247/4	9247/5
			Limit (LOR)	BH1 24/06/2020	BH2 24/06/2020	BH3 24/06/2020	BH6 24/06/2020	BH7 24/06/2020
Total Dissolved Solids	mg/L @105°C	AS3550.4	20	156	197	126	96	142

Total Dissolved Solids	Units	Method		9247/7	9247/8	9247/9	9247/10	9247/11
			Limit (LOR)	BH9 24/06/2020	MW1 24/06/2020	MW2 24/06/2020	MW3 24/06/2020	MW5 24/06/2020
Total Dissolved Solids	mg/L @105°C	AS3550.4	20	165	137	410	144	164

Report Comments:

Note: # Where present, indicates NATA accreditation does not cover the performance of this service.

Location Analysed: Field and 4/30 Glenwood Dr Thornton NSW 2322

Please note: Results **bold** indicate an exceedance of the relevant guideline. NEPM SCHEDULE B1 - Groundwater Investigation Limits (GILs) for Freshwater. When considering the pass or fail of tests against guidelines, the measurement of uncertainty of each parameter must be considered.

NATA Accredited Laboratory - 20375

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



Results have been approved and report finalised on 1/07/2020

Sampling Report Number:

9247

Date Issued: 1/07/2020 Revision No: 00

Sampling Conditions: Cloudy 12°-18°C



Lab ID	Client Sample Reference	Date Sampled	Sampler	Method of Sampling	Pre- treatment / Preservation	Comments
9247/1	BH1	24/06/2020 9:58 AM	T.Walker	AS5667.11, Bail	AS5667.1	Limit of depth meter
9247/2	BH2	24/06/2020 11:50 AM	T.Walker	AS5667.11, Bail	AS5667.1	
9247/3	ВН3	24/06/2020 12:10 PM	T.Walker	AS5667.11, Bail	AS5667.1	
9247/4	ВН6	24/06/2020 10:59 AM	T.Walker	AS5667.11, Bail	AS5667.1	
9247/5	ВН7	24/06/2020 2:15 PM	T.Walker	AS5667.11, Bail	AS5667.1	
9247/6	ВН8	24/06/2020 2:53 PM	T.Walker	AS5667.11, Bail	AS5667.1	No water
9247/7	ВН9	24/06/2020 1:54 PM	T.Walker	AS5667.11, Bail	AS5667.1	
9247/8	MVV1	24/06/2020 2:32 PM	T.Walker	AS5667.11, Bail	AS5667.1	
9247/9	MW2	24/06/2020 3:14 PM	T.Walker	AS5667.11, Bail	AS5667.1	
9247/10	MW3	24/06/2020 11:25 AM	T.Walker	AS5667.11, Bail	AS5667.1	
9247/11	MW5	24/06/2020 10:29 AM	T.Walker	AS5667.11, Bail	AS5667.1	

Sampling procedures have been approved and report finalised on 1/07/2020 Where method is "unknown" sampling procedures are not endorsed

NATA Accredited Laboratory - 20375

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



Well Parameters:

Client: Dixon Sand Pty Ltd

Site/Job: Old Northern Rd 6 Mnth Ground Water



Well ID	GPS location (Easting)	GPS location (Northing)	Survey Date	Surveyed AHD (m)	Depth to Screen (m)
BH1	312290	6297039			
BH2	313429	6297202			
ВН3	313808	6297093			
ВН6	313153	6296833			
BH7	313097	6296495			
BH8	313435	6296617			
ВН9	313294	6296504			
MVV1	313092	6296499			
MW2	313417	6296733			
MVV3	313161	6296838			
MVV5	312460	6296903			

Well ID	Date Well Measured	Case Height (m)	Depth to bottom m(bTOC)	Recharge Rate	Approx Volume (L)
BH1	2/12/2019	0.68	>60	Slow	unkown
BH2	2/12/2019	0.57	>60	slow	unkown
ВН3	2/12/2019	0.56	>60	Slow	Unkown
BH6	2/12/2019	0.52	>60	Slow	Unkown
BH7	2/12/2019	0.53	>60	Slow	Unknown
BH8	2/12/2019	0.73	27.53	Slow	2
ВН9	2/12/2019	0.64	>60	Medium	Unkown
MVV1	2/12/2019	0.28	15.53	Medium	12
MW2	2/12/2019	0.45	24.53	Slow	7.5
MVV3	2/12/2019	0.88	34.57	Slow	2.5
MW5	2/12/2019	0.70	21.19	Slow	28

Note: NATA accreditation does not cover information provided in this section.

^{*} Where indicated AHD from ground level (m) estimated based on handheld GPS.

Surface Water Quality

□ 6-00 □ R □ 0 □ R □ 0 □ - □ 0 □ ppendix □



CERTIFICATE OF ANALYSIS

Work Order : ES1931441

Client : DIXON SAND (PENRITH) PTY LTD

Contact : HUNNY CHURCHER

Address

Telephone : 02 4566 8348

Project : Old Northern Road Quarry

Order number

C-O-C number

Sampler : HUNNY CHURCHER

Site

Quote number : EN/333

No. of samples received : 1 No. of samples analysed : 1 Page : 1 of 2

> Laboratory : Environmental Division Sydney

Contact : Customer Services ES

Address : 277-289 Woodpark Road Smithfield NSW Australia 2164

Telephone : +61-2-8784 8555

Date Samples Received : 26-Sep-2019 16:30

Date Analysis Commenced : 28-Sep-2019

Issue Date · 02-Oct-2019 11:20



Accreditation No. 825 Accredited for compliance with

ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with **Quality Review and Sample Receipt Notification.**

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories Position Accreditation Category

Ankit Joshi Inorganic Chemist Sydney Inorganics, Smithfield, NSW Page : 2 of 2 Work Order : ES1931441

Client : DIXON SAND (PENRITH) PTY LTD

Project Old Northern Road Quarry

ALS

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key: CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

- ^ = This result is computed from individual analyte detections at or above the level of reporting
- ø = ALS is not NATA accredited for these tests.
- ~ = Indicates an estimated value.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)	Client sample ID		SW19	 	 	
Client sampling date / time		26-Sep-2019 10:08	 	 		
Compound	CAS Number	LOR	Unit	ES1931441-001	 	
				Result	 	
EA010P: Conductivity by PC Titrator						
Electrical Conductivity @ 25°C		1	μS/cm	196	 	
EA025: Total Suspended Solids dried at	104 ± 2°C					
Suspended Solids (SS)		5	mg/L	<5	 	
EA045: Turbidity						
Turbidity		0.1	NTU	0.9	 	

WATER SAMPLING FIELD SHEET



Sampler Name	Hunny Churcher	Project No.	116-001		Project Name	Dixon Sand	ONR QUATRY
Date of Survey	26/09/2019	Weather	overcast	/ warm			

	Water Body	later Body		Field Para	ameters & Ob	Comments **	
Sample ID Type *	Type *	Time	Flow	pH	EC	Turbidity	Comments
5W19	37	10.08am	Medium	4.0@18.60			Clear. No odour.
				-			
	-		TO TO SERVICE AND ADDRESS OF THE PERSON NAMED IN COLUMN TO SERVICE AND ADDRESS OF THE	-			

Borehole = BH, Stream = ST, Lake = LA, Sediment Basin = SB, Dam = DA Comments: Odour, Colour, Surface film, Obvious Contamination Notes: *

Laboratory Details				
Laboratory Name	ALS	Contact Name	Contact No.	
Sample Sent Date	26/09/2019	Delivery Method	Result Due	Standard reportin
Analysis Suites	· EC · TSS · Turbidity			

Report Number:

8351



Date Issued:

5/12/2019

Revision Number: 00

Site/Job:

Old Northern Rd - Surface Water

Client:

Dixon Sand Pty Ltd

Address

PO Box 4019

Pitt Town NSW 2756

Contact

David Dixon

The following 1 sample(s) were received on 3/12/2019

Client Sample Reference	Licence Ref /GPS	Date Sampled	Lab ID	Matrix	General Comments
SW19		3/12/2019 9:00 AM	8351/1	Water	

The sample(s) have been tested as received and the following reports are included:

- Test Report: Results relate to sample(s) as received
- · Chain of Custody (if available)

Anthony Crane Laboratory Manager NATA Accredited Laboratory - 20375

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



Test Report Number:

8351

Date Issued: 5/12/2019 Revision No: 00



Results

pH/EC/TSS/Turb	Units	Method	Limit (LOR)	8351/1 SW19 3/12/2019
Temperature	°C	Temp	0.1	19.6
Electrical Conductivity	μS/cm	APHA 2510 B	50	197
Turbidity	NTU	APHA 2130 B	0.1	0.15
Total Suspended Solids	mg/L	AS3550.4	2	2

Report Comments:

Note: # Where present, indicates NATA accreditation does not cover the performance of this service.

Location Analysed: Field and 4/30 Glenwood Dr Thornton NSW 2322

NATA Accredited Laboratory - 20375

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Results have been approved and report finalised on 5/12/2019

WATER SAMPLING FIELD SHEET



Sampler Name	Melissa mass	Project No.	314-001	Project Name	Dixon Sand ONR Quarry
	3/12/2019	Weather	clear / warm	(a	

Data Collection				Field Pa	rameters & Ob	servations	Comments **
Sample ID Water Body	Type *	Time	Flow	рН	EC	Turbidity	
SW19	ST	9am	medium	4.3 pH			Clear. No odour.
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					·		
	-						
						1	
			WILL				
					NITTO COLUMN TO MITTO COLUMN TO COLU		

Notes:	*	Borehole = BH, Stream = ST, Lake = LA, Sediment Basin = SB, Dam = DA Comments: Odour, Colour, Surface film, Obvious Contamination
	R.A.	Comments: Odour, Colour, Surface film, Obvious Comments.

Laboratory Details			Contact No.	
Laboratory Name	ALS	Contact Name		
Sample Sent Date 3/12/2019		Delivery Method	Result Due	Standard reporting
Analysis Suites	-EC -TSS -Turbidity			

Report Number:

8804



Date Issued: 22/09/2020 Revision Number: 01

Site/Job: ONR surface water sample

Client: Dixon Sand Pty Ltd Address PO Box 4019

Pitt Town NSW 2756

Contact David Dixon

The following 1 sample(s) were received on 17/03/2020

Client Sample Reference	Licence Ref /GPS	Date Sampled	Lab ID	Matrix	General Comments
SW1		16/03/2020 9:15 AM	8804/1	Water	Sampled by Melissa Mass

The sample(s) have been tested as received and the following reports are included:

- Test Report: Results relate to sample(s) as received
- · Chain of Custody (if available)

NATA Accredited Laboratory - 20375

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



Test Report Number:

8804

Date Issued: 22/09/2020 Revision No: 01



Results

Physical Components	Units	Method	PQL	8804/1
				SW1 16/03/2020
Electrical Conductivity	μS/cm	APHA 2510 B	50	172
Turbidity	NTU	APHA 2130 B	0.1	0.20
Total Suspended Solids	mg/L	AS3550.4	2	V

Report Comments:

Note: # Where present, indicates NATA accreditation does not cover the performance of this service.

Location Analysed: 4/30 Glenwood Dr Thornton NSW 2322.

Holding times for some or all of the tests listed below are outside the period recommended in the method: pH (0.25 hrs), TSS, Turbidity (24 hrs).

This may be important to the interpretation of the results.

NATA Accredited Laboratory - 20375

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



Results have been approved and report finalised on 22/09/2020

WATER SAMPLING FIELD SHEET

8804/1 ONR surface water SW1 16/06/2020



Sampler Name	Melissa Mass	Project No.	SWI	Project Name	ONR
Date of Survey	16/03/2020	Weather	Cloudy drizzle, c	old	

Data Collection		THE REAL PROPERTY.					The United States	
	Water Body		Time Floring		arameters & Obs		Comments **	
Sample ID	Type *	Time	Flow	pН	EC	Turbidity		
SWI	ST	9.15	medium	4-7	90	0.21	In field measurement	
		<u></u>			NOTIFIC A	AAVEANA		

Notes: * Borehole = BH, Stream = ST, Lake = LA, Sediment Basin = SB, Dam = DA

Comments: Odour, Colour, Surface film, Obvious Contamination

Laboratory Details				UNDER SERVICE		Marie Control of the
Laboratory Name	VCT		Contact Name	Terry	Contact No.	
Sample Sent Date	16/03/	2020	Delivery Method	Picked up by	Terry Result Due	Standard Report
Analysis Suites	* EC	*	Turbidity Rea	reised the 14	3/20 4:30	

Report Number:

9282



Date Issued:

Site/Job:

25/06/2020

Revision Number: 00

ONR surface water sample

Client:

Dixon Sand Pty Ltd

Address

PO Box 4019

Pitt Town NSW 2756

Contact

David Dixon

The following 1 sample(s) were received on 25/06/2020

Client Sample Reference	Licence Ref /GPS	Date Sampled	Lab ID	Matrix	General Comments
SW19		24/06/2020 9:05 AM	9282/1	Water	

The sample(s) have been tested as received and the following reports are included:

- Test Report: Results relate to sample(s) as received
- · Chain of Custody (if available)

Anthony Crane Laboratory Manager NATA Accredited Laboratory - 20375

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



Test Report Number:

9282

Date Issued: 25/06/2020 Revision No: 00



Results

Physical Components	Units	Method		9282/1
			Limit (LOR)	SW19 24/06/2020
Temperature	℃	Temp	0.1	18.9
рН	pH Units	APHA 4500-H B	0.1	4.2
Electrical Conductivity	μS/cm	APHA 2510 B	50	180
Turbidity	NTU	APHA 2130 B	0.1	0.30
Total Suspended Solids	mg/L	AS3550.4	2	2

Report Comments:

Note: # Where present, indicates NATA accreditation does not cover the performance of this service.

Location Analysed: 4/30 Glenwood Dr Thornton NSW 2322

Holding times for some or all of the tests listed below are outside the period recommended in the method: pH (0.25 hrs), TSS, Turbidity (24 hrs).

This may be important to the interpretation of the results.

NATA Accredited Laboratory - 20375

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



Results have been approved and report finalised on 25/06/2020

9282/1 WATER SAMPLING FIELD SHE SW19 Creek



24/06/2020

			the second of th		10: C 1 (DA 10)
Sampler Name	Melissa Mass	rivject NO.	2019	Project Name	Dixon Sand-ONR
Date of Survey	24/06/2020	Weather	clear, dry	1001	egy progg a celes for engandore a monthless carlo let a lamba annoque program qua p ^a proceeding gay produce carlo desire.

Water Body	Time	Flow	Field Parameters & Observations			Comments **
Creek	9.05am	Moderate				15.8°c water temp.
	. p. q					
				1315		
	Тура *	Тура *	Type *	Type * Flow pH	Type * Flow pH EC	Type * Time Flow pH EC Turbidity

Borehole = BH, Stream = ST, Lake = LA, Sediment Basin = SB, Dam = DA Notes:

Comments: Odour, Colour, Surface film, Obvious Contemination

Laboratory Details			11	0 4 451	[21,77 1,11 271
Laboratory Name	VICT	Contact Name	Terry Walker		0427 466 561
Sample Sent Date	24/06/2020	Delivery Method	Picked up by Terry	Result Due	Standard Report
Analysis Suites	WEC & Turbidity		· ·		
, , , , , , , , , , , , , , , , , , , ,	* TSS		Docewed was		and the second s

PROJECT ENVIRONMENTAL SERVICES PTY LTD www.projectanykrosecylose.com au

PES-FEM-001

Last updated 25/09/16 v1.0

Discharge Point – Water Quality

□ 6-00 □ R □ 0 □ R □ 0 □ - □ 0 □ ppendix □



CERTIFICATE OF ANALYSIS

Work Order : ES2005960

Client DIXON SAND (PENRITH) PTY LTD

Contact : HUNNY CHURCHER

Address

Telephone : 02 4566 8348

Project : Old Northern Rd Quarry

Order number

C-O-C number

Sampler : Mick Mannock

Site

Quote number : EN/333

No. of samples received : 1 No. of samples analysed : 1 Page : 1 of 2

> Laboratory : Environmental Division Sydney

Contact : Customer Services ES

Address : 277-289 Woodpark Road Smithfield NSW Australia 2164

: 20-Feb-2020 16:40

Telephone : +61-2-8784 8555 **Date Samples Received**

Date Analysis Commenced : 20-Feb-2020

Issue Date · 21-Feb-2020 15:28



Accreditation No. 825 Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with **Quality Review and Sample Receipt Notification.**

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories Position Accreditation Category

Ankit Joshi Inorganic Chemist Sydney Inorganics, Smithfield, NSW Page : 2 of 2 Work Order : ES2005960

Client : DIXON SAND (PENRITH) PTY LTD

Project : Old Northern Rd Quarry

ALS

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key: CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

- ^ = This result is computed from individual analyte detections at or above the level of reporting
- ø = ALS is not NATA accredited for these tests.
- ~ = Indicates an estimated value.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)	Client sample ID			SW1	 	
	CI	ient sampli	ng date / time	20-Feb-2020 14:00	 	
Compound	CAS Number	LOR	Unit	ES2005960-001	 	
				Result	 	
EA005P: pH by PC Titrator						
pH Value		0.01	pH Unit	5.79	 	
EA025: Total Suspended Solids dried	d at 104 ± 2°C					
Suspended Solids (SS)		5	mg/L	18	 	
EA045: Turbidity						
Turbidity		0.1	NTU	24.1	 	

Report Number:

8805



Date Issued:

17/03/2020

Revision Number: 00

Site/Job:

ONR surface water sample

Client:

Dixon Sand Pty Ltd

Address

PO Box 4019

Pitt Town NSW 2756

Contact

David Dixon

The following 1 sample(s) were received on 17/03/2020

Client Sample Reference	Licence Ref /GPS	Date Sampled	Lab ID	Matrix	General Comments
LDP1		16/03/2020 9:25 AM	8805/1	Water	Sampled by Mick Munnock

The sample(s) have been tested as received and the following reports are included:

- Test Report: Results relate to sample(s) as received
- · Chain of Custody (if available)

Anthony Crane Laboratory Manager NATA Accredited Laboratory - 20375

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



Test Report Number:

8805

Date Issued: 17/03/2020 Revision No: 00



Results

Physical Components	Units	Method		8805/1
			Limit (LOR)	LDP1 16/03/2020
Temperature	°C	Temp	0.1	15.9
рН	pHUnits	APHA 4500-H B	0.1	4.6
Turbidity	NTU	APHA 2130 B	0.1	4.2
Total Suspended Solids	mg/L	AS3550.4	2	2

Report Comments:

Note: # Where present, indicates NATA accreditation does not cover the performance of this service.

Location Analysed: 4/30 Glenwood Dr Thornton NSW 2322

Holding times for some or all of the tests listed below are outside the period recommended in

the method: pH (0.25 hrs), TSS, Turbidity (24 hrs). This may be important to the interpretation of the results.

NATA Accredited Laboratory - 20375

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



Results have been approved and report finalised on 17/03/2020

Appendix D – Noise Compliance Reports

□ 6-00 □ □ R □ 0 □ □ - □ 0 □ ppendix D

Dixon Sand Pty Ltd

Old Northern Road Quarry, Maroota

Noise monitoring report December 2019

Doc no. 19020-NV-RP-1-1



Dixon Sand Pty Ltd Old Northern Road Quarry, Maroota

Title Noise monitoring report

Document no. 19020-NV-RP-1-1

Revision 1

Date 10 December 2019

Author John Hutchison

Reviewer Scott Hughes

File path I:\PROJECTS\19020 - Dixon Sand\02 Deliverables\021 Reports\19020-NV-RP-1-1 Dixon Sand Noise

Monitoring Dec 2019.docx

Hutchison Weller Pty Ltd ABN 37 001 024 095 13/357 Military Road Mosman NSW 2008

www.hutchisonweller.com

Revision history

0 12 Dec 2019 Draft report to client
1 13 Dec 2019 Updated map imagery

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Defini	tion of terms	ii
1.	Introduction	1
2.	Noise compliance criteria	
3.	Monitoring methodology	
4.	Monitoring results	
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4.3	Extrapolated measurements	10
4 4	Compliance summary	10

Definition of terms

Decibel (dB) A measure of sound equivalent to 20 times the logarithm (to base 10) of the ratio of a given sound pressure to a reference pressure, and 10 times the logarithm (to base 10) of the ratio of a given sound power to a reference power.
dB(A) Unit used to measure 'A-weighted' sound pressure levels. A-weighting is an adjustment made to sound-level measurement to approximate the response of the human ear.
dB(C) Unit used to measure 'C-weighted' sound pressure levels, an adjustment made to sound level to approximate log frequency noise between 10 Hz and 200 Hz.
EPA Environment Protection Authority
Extraneous noise Noise resulting from activities that are not typical of the area such as construction, and traffic generated by holiday periods or special events such as concerts or sporting events. Normal daily traffic is not considered to be extraneous.
Noise level statistics Lago – The A-weighted sound pressure level exceeded 90% of the monitoring period. This is considered to represent the background noise. Lago – The equivalent continuous A-weighted noise level—the level of noise equivalent to the energy average of noise levels occurring over a measurement period. Lago – The A-weighted sound pressure level exceeded 1% of the monitoring period. Lamax – The maximum A-weighted noise level associated with the measurement period.
The Rating Background Level for each period is the medium value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period (day, evening and night)
Receiver The land use at which noise is heard
SLM Sound Level Meter
SLM Sound Level Meter Sound Power Level (SWL) The A-weighted sound power level is a logarithmic ratio of the acoustic power output of a source relative to 10 ⁻¹ watts and expressed in decibels. Sound power level is calculated from measured sound pressure levels and

1. Introduction

Dixon Sand Pty Ltd operates the Old Northern Road Quarry in Maroota, NSW (the Quarry). The Quarry is located off Old Northern Road, as illustrated in Figure 1.

Operations at the quarry include extraction of sand and sandstone blocks, processing by screening and grading and direct sales involving loading of trucks for shipment.

The Quarry operates under Development Consent 250-09-01 and Environment Protection Licence (EPL) 3916, which set noise limits for its operation and require noise monitoring to be completed on a six-monthly basis to ensure compliance with the conditions.

Hutchison Weller was commissioned by Dixon Sand to undertake the six-monthly noise monitoring in accordance with the conditions of consent, EPL and requirements of the Noise Management Plan.

This document outlines the consent conditions, monitoring methodology and results of the monitoring undertaken on 3 December 2019.

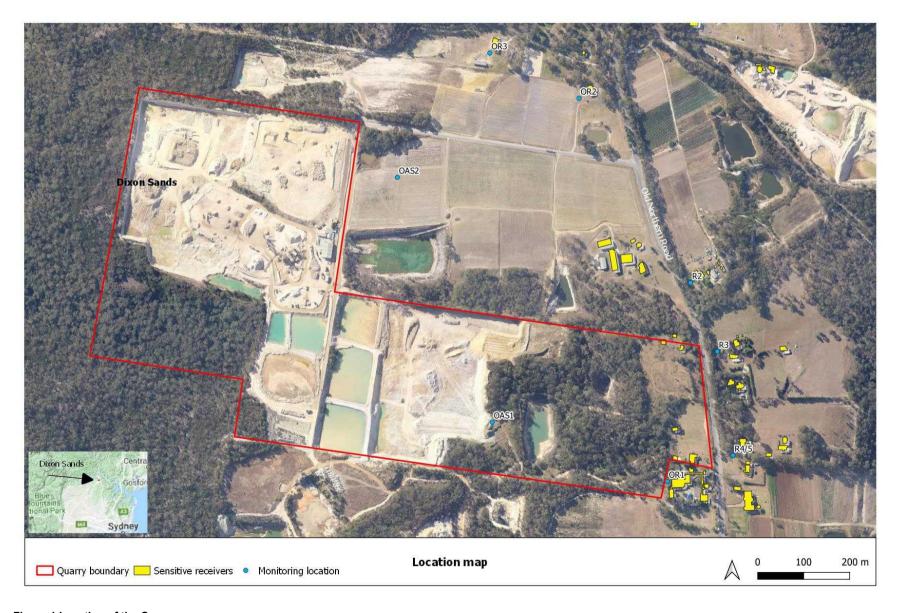


Figure 1 Location of the Quarry

2. Noise compliance criteria

Conditions 1 and 2 of Schedule 3 of development consent DA250-09-01 outline the Quarry operating hours and condition 3 defines the noise criteria for compliance.

1. The Applicant must comply with the operating hours set out in Table 1.

Table 1 Operating hours

Activity	Permissible hours
Quarrying operations (excluding truck arrival,	7.00 am to 6.00 pm Monday to Saturday
loading and dispatch)	At no time on Sundays or public holidays
Truck arrival (unladen)	5.45 am to 6.00 pm Monday to Saturday
	At no time on Sundays or public holidays
Truck loading	6.00 am to 6.00 pm Monday to Saturday
Truck dispatch	At no time on Sundays or public holidays
Truck arrival (laden)	
Bund construction or rehabilitation works within 250	7.00 am to 6.00 pm Monday to Friday during school holiday
m of Maroota Public School	periods unless otherwise approved in writing by the EPA
Maintenance	May be conducted at any time, provided that these
	activities are not audible at any privately-owned residence

- 2. The following activities may be carried out outside the hours specified in condition 1 above:
 - (a) delivery or dispatch of materials as requested by the NSW Police Force or other public authorities; and
 - (b) emergency work to avoid the loss of lives, property or to prevent environmental harm.

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

3. The Applicant must ensure that the noise generated by the development does not exceed the criteria in Table 2 at any residence on privately-owned land or at the Maroota Public School.

Table 2 Noise criteria dB(A)

Receiver	Averaging period	Shoulder (6.00 am to 7.00 am)	Day (7.00 am to 6.00 pm)
Any residence on privately owned land	LAeq (15 minute)	37	44
Any classroom at Maroota Public School	LAeq (1 hour)	-	45

Noise generated by the development is to be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy. Appendix 6 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 2 do not apply if the Applicant has an agreement with the relevant landowner to exceed the noise criteria, and the Applicant has advised the Department in writing of the terms of this agreement.

3. Monitoring methodology

Operator-attended noise monitoring was undertaken on 3 December 2019 by John Hutchison of Hutchison Weller, an independent acoustic specialist. Monitoring locations included those described in the Quarry Noise Management Plan plus additional sensitive receivers, as illustrated in Figure 1 and summarised in Table 3.

Table 3 Monitoring locations

Receiver ¹	Address	Description
OR1	Maroota public school	Classroom closest to quarry operations
OR2	4624 Old Northern Road	Private residence
OR3	4634 Old Northern Road	Private residence
OAS1	Lots 1 and 2 of the Quarry	At source monitoring, close to operations
OAS2	Lot 196 of the Quarry	At source monitoring, close to operations
R2	4579 Old Northern Road	Private residence
R3	4567 Old Northern Road	Private residence
R4/5	4547 – 4543 Old Northern Road	Mid-point between private residence

Note 1: An agreement between Dixon Sand and receiver R1 is in place and, therefore, noise management levels defined by the development consent are not applicable.

Monitoring was conducted in accordance with procedures outlined in the Noise Policy for Industry and Section 6 of the Noise Management Plan.

At-receiver monitoring locations were within 30 metres of residential dwellings, whilst onsite measurement locations were selected for safe access and to be representative of the operations, without extraneous noise from sources such as traffic and insects.

Instrumentation included a SVAN 958A Class 1 sound level meter (SLM), serial no. 45500, field-calibrated prior to and following monitoring. The SLM was within current calibration, next due April 2020.

Monitoring was undertaken with the SLM set on a tripod at 1.5 metres above ground and measuring A-weighted sound pressure levels under fast response. Each measurement period was 15 minutes and recorded the LAeq, LA90 and LAmax statistics.

Meteorological data was recorded during each monitoring period at the Maroota public school, including wind speed, direction, temperature, relative humidity and sigma-theta (to establish the Pascall-Guifford stability category). This data was used to establish the meteorological conditions were suitable for monitoring.

Where extraneous noise such as road traffic and insects were the dominant noise sources, making it impractical to discern the contribution of the Quarry to ambient noise levels, noise levels measured at alternative locations closer to the Quarry were utilised, in line with procedures outlines in Noise Policy for Industry. This involved extrapolation from the near-distance location to the sensitive receiver location.

4. Monitoring results

4.1 Attended measurements

Results of noise monitoring for each location are presented in Table 4.

In general, the Quarry operations are intermittently audible from all locations, with traffic noise in all cases the dominant source of noise.

Quarry operations fell into four categories representing the main sources of noise. These were:

- Sand processing and truck loading (main plant, front end loaders, trucks)
- Extraction of sand (involving screening, stockpiling with front end loader, moxie and dozer)
- Extraction of bulk sandstone by rock saw
- Dewatering activities with dewatering pumps

Depending on the receiver location, each of these sources played a varying role in contributing to the total noise level experienced.

Measured results indicated the shoulder period (from 6.00am to 7.00am) complied with the noise criteria at receivers OR2 and OR3. Quarry operations were only barely audible during breaks in traffic.

However, at receivers 3, 4 and 5, exceedance of the compliance criteria were observed due to use of the rock saw in lot 2. During breaks in traffic, the rock saw was clearly audible and reached noise levels up to 45-46 dBA.

On-site measurements were taken to determine the noise level of various noise sources without the influence of traffic noise. Measurements were undertaken over 15-minute periods to establish representative sound power levels of the operation to allow extrapolation to receiver locations where background noise was too high to discern quarry noise contributions. This is discussed further in Section 4.3.

During the day (standard hours), measurement at the school and residential receivers established traffic and insects were the dominant sources of noise in the area and heavily influenced the measured Leq, 15-minute noise levels. However, observations during breaks in traffic and insect noise indicated Quarry noise was faintly audible over the background level and estimated contributions from the quarry complied with the criteria.

At OR1, the school, the neighbouring PF's quarry appeared to be the dominant steady source of noise with the Quarry only intermittently audible. Ongoing measurement over an hour demonstrated the Quarry was within the daytime noise limit.

The sources of noise were not always apparent at all receivers, however, audible engine noise, dozer track slap, bucket scrapes and reverse beepers indicated the Quarry was operating as normal. Sources of the LAmax noise levels were entirely extraneous, unrelated to the Quarry operations.

4.2 Modifying factors

No tonal, impulsive or low frequency noise characteristics were observed during the monitoring period. Therefore, application of modifying factors is not appropriate in this instance.

Table 4 Monitoring results

Monitoring period Time Location	Location	Noise criterion	Measured 15-minute noise level			Estimated LAeq, 15 min quarry	Observations	Meteorological conditions		
				LAeq	LA90	LAmax	contribution			
	5.55am	OR3		43	36	55	36	Traffic on ONR (43 – 48 dBA) and trucks intermittently on access road (44-47 dBA) dominant noise sources. Quarry faintly audible when no traffic ~ <36-37 dBA Location screened from quarry by large shed		
Shoulder (6.00am to 7.00am)	Shoulder (6.00am to	OR2	37	52 44 63 37	63	36	Intermittent trucks on access road ~ 55-60 dBA and traffic on ONR ~54-56 dBA are dominant noise sources Quarry visible from this location and faintly audible when no traffic ~ <38 dBA	Light breeze from WNW to NW @ 1 – 4 km/h Temperature 13°C		
	6.36am	R3		58	46	80	46	Quarry not visible however, audible during breaks in traffic. Observed a single noise source at ~46-47 dBA (rock saw). Inaudible when this activity not occurring. Traffic was infrequent during this period ~ 65-70 dBA pass-by	Clear sky Unstable (A- class)	
	6.53am	R4/5			65	46	81	45	Traffic dominant in this period with pass-bys of 70 - 73 dBA However, quarry clearly audible at ~45-47 dBA when rock saw operating during breaks in traffic	

Monitoring period	Time Location		Noise criterion			Estimated LAeq, 15 min quarry contribution	Observations	Meteorological conditions	
				LAeq	LA90	LAmax	Contribution		
	8.08am	OAS2	N/A	49.3	44.1	59.7	43	~280 metres from screening plant noise level of 43-44 dBA mostly quarry Dozer faintly audible Noise from Lots 1 and 2 occasionally audible – excavator bucket scrape	Light breeze from SSW to WSW @ 1 – 13 km/h
Day	8.51am	OAS1	N/A	57	53	71	53	Quarry noise is main source Rock saw barely audible at this location Multi-bladed rock saw on intermittently but not audible over pumps and excavator Water pumps in pit are dominant ~53 dBA Excavator bucket scrapes ~64 dBA intermittently	Temperature 18°C Clear sky Unstable (A- class)
(7.00am to 6.00pm)	9.48am	OR1	45	48	44	82	45	Hour-long monitoring period Quarry noise is clearly audible but dominated by PF's quarry adjacent to the Quarry PF's quarry largely steady engine noise ONR traffic noise not influential at this location Noise from the Quarry intermittent engine noise, reverse beepers, dozer tracks and in last 15 minutes, bucket scraping Hard to differentiate the Quarry noise from insects and PF's quarry; however PF's went quiet for some time and the Quarry noise ~ 45 dBA.	Light breeze from SSW to WNW @ 2 – 9 km/h Temperature 21°C Clear sky Unstable (A-class)

Monitoring period	Time	Location	Noise criterion	Measured 15-minute noise level			Estimated LAeq, 15 min quarry contribution	Observations	Meteorological conditions
			LAeq	LA90	LAmax	Contribution			
	11.13am	R4/5		64	46	82	42	Traffic on ONR is the main noise source – trucks at 88-80 dBA passbys Breeze in trees and birds contribute as well as kids voices at school The Quarry is faintly audible when ambient noise drops to 46 dBA – estimate quarry noise at 40 – 42 dBA Not sure the rock saw was operating – this was not audible	
Day (7.00am to 6.00pm)	(7.00am to 44	R3	44	57	44	73	41	Traffic on ONR dominant Beepers audible when traffic drops out ~ 44dBA Occasional bucket scrape ~ 53 dBA Insects constant – baseline ~44 dBA Engine noise observed at around same level to cicadas ~ 44 dBA combined	Light breeze from WSW to WNW @ 1 – 10 km/h Temperature 25°C Clear sky
			58	46	76	42	Traffic dominant with 60 dBA pass-bys Dozer tracks and beepers barely audible Cicadas are baseline level at around 44 dBA Where no traffic, barely audible Quarry plant engine noise < 45 dBA and bucket scraper ~ 52 dBA	Unstable (A- class)	
	12.17pm	OR2		47	40	67	39	Quarry barely audible in the distance ~ 42-43 dBA Access road and ONR are dominant at 50 – 55 dBA Breeze in trees occasionally at 50 – 52 dBA	

Monitoring period	Time	Location	Noise criterion	Measure	d 15-minute n	oise level	Estimated LAeq, 15 min quarry	Observations	Meteorological conditions
				LAeq	LA90	LAmax	contribution		
								When no breeze and no traffic quarry clearly audible $^{\sim}$ 39 $-$ 42 dBA	
								Intermittent bucket scrape ~ 43 dBA	
	12.33pm	OR3		41	37	61	37 - 38	Dozer track noise occasionally with beepers, bucket scrapers and plant motors, all less than 40 dBA	
								Access road ~ 44 dBA Distant ONR	

4.3 Extrapolated measurements

A conclusive noise level attributable to the Quarry was not possible in all locations due to ambient noise levels affected by road traffic and insects. Therefore, measurements captured on-site without substantial influence from these sources were used to calculate sound pressure levels at each receiver.

Calculations were based on ISO 9613-2:1996 Acoustics — Attenuation of sound during propagation outdoors — Part 2: General method of calculation, which accounts for geometric spreading, air and ground absorption as well as barrier effects, assuming worst case meteorology of a gentle breeze from source to receiver and stable conditions.

Based on measurements described in Table 4 and distances from source to receiver and assuming line of sight just broken, extrapolated noise results for each receiver are presented in Table 5. Results are shown for all major equipment operating as well as operating without the rock saw and dozer.

Extrapolated results demonstrate the Quarry is compliant with the criteria for daytime operations when all equipment are operating. During the shoulder period (6.00am to 7.00am) it is evident (and supported by measured noise levels) operating with the saw and dozer is likely to result in exceedance of the criteria. When no saw or dozer are operating the criteria would be complied with (a 1 -2 dB exceedance is treated in the Noise Policy for Industry as a compliance).

Table	5 Cv4.	اماممه	had m	anitar	ina i	results
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Receiver	Noise criter	ia	Extrapolated	d noise level			
	Shoulder	Day	All plant	No saw	No saw / no dozer	Comment	
OR1	-	45	45	39	38	Correlates well with measured levels, compliant with criteria at all times	
OR2			43	41	37		
OR3			44	42	38	Correlates well with measured levels,	
2	37	44	44	40	38	compliant with day criteria with all equipment, compliant with shoulder	
3			43	38	35	criteria with no saw or dozer.	
4/5			43	38	36	criteria with no saw of dozer.	

4.4 Compliance summary

Results of attended monitoring and extrapolated noise levels demonstrate the following.

- 1. Observed operations during the day period were compliant with the noise criteria at each receiver under the meteorological conditions at the time.
- 2. Observed operations during the shoulder period were non-compliant with the noise criteria at all receivers under the meteorological conditions at the time due to use of the rock saw.

Where the rock saw does not operate during the shoulder period, extrapolated results indicate compliance with the noise criteria.



Dixon Sand Pty Ltd

Old Northern Road Quarry, Maroota

Noise monitoring report June 2020

Doc no. 19020-NV-RP-2-0





Dixon Sand Pty Ltd Old Northern Road Quarry, Maroota

Title Noise monitoring report

Document no. 19020-NV-RP-2-0

Revision 0

Date 20 July 2020

Author John Hutchison

Reviewer **Scott Hughes**

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Sand Old Northern Road Noise Monitoring June 2020.docx

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Revision history

20 July 2020

Draft report to client

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Definition of terms

Background noise	The underlying level of noise present in the ambient noise, excluding the noise source under investigation.								
Decibel (dB)	A measure of sound equivalent to 20 times the logarithm (to base 10) of the ratio of a given sound pressure to a reference pressure, and 10 times the logarithm (to base 10) of the ratio of a given sound power to a reference power.								
dB(A)	Unit used to measure 'A-weighted' sound pressure levels. A-weighting is an adjustment made to sound-level measurement to approximate the response of the human ear.								
dB(C)	Unit used to measure 'C-weighted' sound pressure levels, an adjustment made to sound level to approximate low frequency noise between 10 Hz and 200 Hz.								
EPA	Environment Protection Authority								
Extraneous noise	Noise resulting from activities that are not typical of the area such as construction, and traffic generated by holiday periods or special events such as concerts or sporting events. Normal daily traffic is not considered to be extraneous.								
Noise level statistics	L _{Aeq} – The A-weighted sound pressure level exceeded 90% of the monitoring period. This is considered to represent the background noise. L _{Aeq} – The equivalent continuous A-weighted noise level—the level of noise equivalent to the energy average of noise levels occurring over a measurement period. L _{A1} – The A-weighted sound pressure level exceeded 1% of the monitoring period. L _{Amax} – The maximum A-weighted noise level associated with the measurement period.								
RBL	The Rating Background Level for each period is the medium value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period (day, evening and night)								
Receiver	The land use at which noise is heard								
SLM	Sound Level Meter								
Sound Power Level (SWL)	The A-weighted sound power level is a logarithmic ratio of the acoustic power output of a source relative to 10 ⁻¹² watts and expressed in decibels. Sound power level is calculated from measured sound pressure levels and represents the level of total sound power radiated by a sound source.								
Sound Pressure Level (SPL)	This is the level of noise, usually expressed in dB(A), as measured by a standard sound level meter (SLM) with a pressure microphone. The sound pressure level in dB(A) gives a close indication of the subjective loudness of noise. A technical definition for the sound pressure level, in decibels, is 20 times the logarithm (base 10) of the ratio of any two quantities related to a given sound pressure to a reference pressure (typically 20 μ Pa equivalent to 0 dB).								
Tonal noise	Noise with perceptible and definite pitch or tone								



1. Introduction

Dixon Sand Pty Ltd operates the Old Northern Road Quarry in Maroota, NSW (the Quarry). The Quarry is located off Old Northern Road, as illustrated in Figure 1.

Operations at the quarry include extraction of sand and sandstone blocks, processing by screening and grading and direct sales involving loading of trucks for shipment.

The Quarry operates under Development Consent 250-09-01 and Environment Protection Licence (EPL) 3916, which set noise limits for its operation and require noise monitoring to be completed on a six-monthly basis to ensure compliance with the conditions.

Hutchison Weller was commissioned by Dixon Sand to undertake the six-monthly noise monitoring in accordance with the conditions of consent, EPL and requirements of the Noise Management Plan.

This document outlines the consent conditions, monitoring methodology and results of the monitoring undertaken on 4 June 2020.



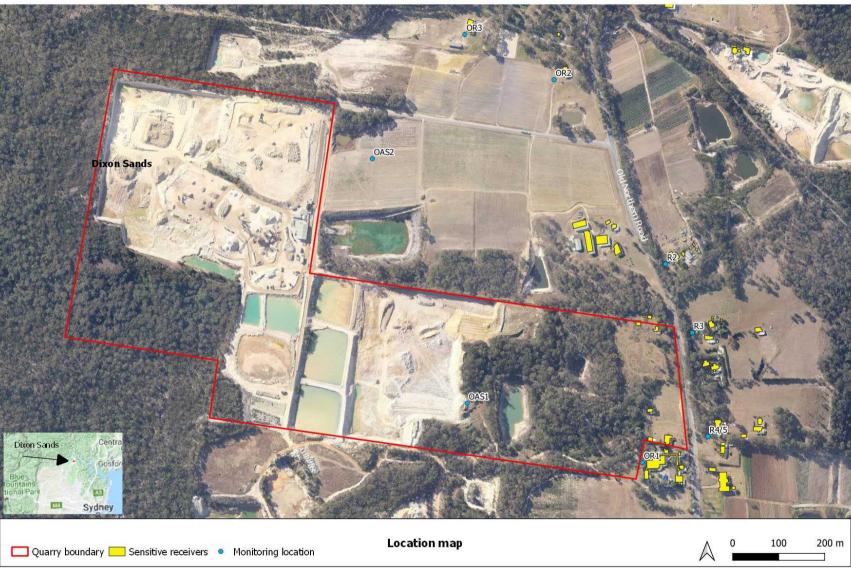


Figure 1 Location of the Quarry



2. Noise compliance criteria

Conditions 1 and 2 of Schedule 3 of development consent DA250-09-01 outline the Quarry operating hours and condition 3 defines the noise criteria for compliance.

1. The Applicant must comply with the operating hours set out in Table 1.

Table 1 Operating hours

Activity	Permissible hours
Quarrying operations (excluding truck arrival,	7.00 am to 6.00 pm Monday to Saturday
loading and dispatch)	At no time on Sundays or public holidays
Truck arrival (unladen)	5.45 am to 6.00 pm Monday to Saturday
	At no time on Sundays or public holidays
Truck loading	6.00 am to 6.00 pm Monday to Saturday
Truck dispatch	At no time on Sundays or public holidays
Truck arrival (laden)	
Bund construction or rehabilitation works within 250	7.00 am to 6.00 pm Monday to Friday during school holiday
m of Maroota Public School	periods unless otherwise approved in writing by the EPA
Maintenance	May be conducted at any time, provided that these
	activities are not audible at any privately-owned residence

- 2. The following activities may be carried out outside the hours specified in condition 1 above:
 - (a) delivery or dispatch of materials as requested by the NSW Police Force or other public authorities; and
 - (b) emergency work to avoid the loss of lives, property or to prevent environmental harm.

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

3. The Applicant must ensure that the noise generated by the development does not exceed the criteria in Table 2 at any residence on privately-owned land or at the Maroota Public School.

Table 2 Noise criteria dB(A)

Receiver	Averaging period	Shoulder (6.00 am to 7.00 am)	Day (7.00 am to 6.00 pm)
Any residence on privately owned land	LAeq (15 minute)	37	44
Any classroom at Maroota Public School	LAeq (1 hour)	-	45

Noise generated by the development is to be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy. Appendix 6 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 2 do not apply if the Applicant has an agreement with the relevant landowner to exceed the noise criteria, and the Applicant has advised the Department in writing of the terms of this agreement.



3. Monitoring methodology

Operator-attended noise monitoring was undertaken on 3 December 2019 by John Hutchison of Hutchison Weller, an independent acoustic specialist. Monitoring locations included those described in the Quarry Noise Management Plan plus additional sensitive receivers, as illustrated in Figure 1 and summarised in Table 3.

Table 3 Monitoring locations

Receiver ¹	Address	Description		
OR1	Maroota public school	Classroom closest to quarry operations		
OR2	4624 Old Northern Road	Private residence		
OR3	4634 Old Northern Road	Private residence		
R2	4579 Old Northern Road	Private residence		
R3	4567 Old Northern Road	Private residence		
R4/5	4547 – 4543 Old Northern Road	Mid-point between private residence		
OAS1	Lots 1 and 2 of the Quarry	At source monitoring, close to operations		
OAS2	Lot 196 of the Quarry	At source monitoring, close to operations		

Note 1: An agreement between Dixon Sand and receiver R1 is in place and, therefore, noise management levels defined by the development consent are not applicable.

Monitoring was conducted in accordance with procedures outlined in the Noise Policy for Industry and Section 6 of the Noise Management Plan.

At-receiver monitoring locations were within 30 metres of residential dwellings, whilst onsite measurement locations were selected for safe access and to be representative of the operations, without extraneous noise from sources such as traffic and insects.

Instrumentation included a Buruel & Kjaer Class 1 sound level meter (SLM), serial no. 3008237, field-calibrated prior to and following monitoring. The SLM was within current calibration, next due January 2022.

Monitoring was undertaken with the SLM set on a tripod at 1.5 metres above ground and measuring A-weighted sound pressure levels under fast response. Each measurement period was 15 minutes and recorded the LAeq, LA90 and LAmax statistics.

Meteorological data was recorded during each monitoring period adjacent to the Maroota public school, including wind speed, direction, temperature, relative humidity and sigma-theta (to establish the Pascall-Guifford stability category). This data was used to establish the meteorological conditions were suitable for monitoring.

Where extraneous noise such as road traffic and insects were the dominant noise sources, making it impractical to discern the contribution of the Quarry to ambient noise levels, noise levels measured at alternative locations closer to the Quarry were utilised, in line with procedures outlines in Noise Policy for Industry. This involved extrapolation from the near-distance location to the sensitive receiver location.



4. Monitoring results

4.1 Attended measurements

Results of noise monitoring for each location are presented in Table 4.

In general, quarry operations are intermittently audible from all locations, with traffic noise in all cases the dominant source of noise.

Quarry operations fell into four categories representing the main sources of noise. These were:

- Sand processing and truck loading (main plant, front end loaders, trucks)
- Extraction of sand (involving screening, stockpiling with front end loader, moxie and dozer)
- Extraction of bulk sandstone by rock saw
- Dewatering activities with dewatering pumps

Depending on the receiver location, these sources played a varying role in contributing to the total noise level experienced.

Measured results indicated the shoulder period (from 6.00am to 7.00am) complied with the noise criteria at all measurement locations and quarry operations were only barely audible during breaks in traffic.

On-site measurements were taken to determine the noise level of various noise sources without the influence of traffic noise. Measurements were undertaken over 15-minute periods to establish representative sound power levels of the operation to allow extrapolation to receiver locations where background noise was too high to discern quarry noise contributions. This is discussed further in Section 4.3.

During the day (standard hours), measurement at the school and residential receivers established traffic was the dominant source of noise in the area and heavily influenced the measured Leq, 15-minute noise levels. However, observations during breaks in traffic indicated quarry noise was faintly audible over the background level and estimated contributions from the guarry complied with the criteria.

At OR1, the school, the neighbouring PF's quarry contributed to ambient noise and the quarry was intermittently audible. Ongoing measurement over an hour (combined with extrapolated noise levels) demonstrated the quarry was within the daytime noise limit.

The sources of noise were not always apparent at all receivers, however, audible engine noise, dozer track slap, and reverse beepers indicated the quarry was operating as normal. Sources of the LAmax noise levels were entirely extraneous, unrelated to the Quarry operations.

4.2 Modifying factors

No tonal, impulsive or low frequency noise characteristics were observed during the monitoring period. Therefore, application of modifying factors is not appropriate in this instance.



Table 4 Monitoring results

Monitoring	Time	Location	Noise 	Measured 15-minute noise level		oise level	Estimated LAeq,	Observations	Meteorological
period			criterion	LAeq	LA90	LAmax	contribution		conditions
	5.55am	OR3		45.1	36.7	56.3	35	Traffic on ONR (42 – 56 dBA) dominant noise source and almost continuous, with trucks intermittently on access road (43-45 dBA). Quarry faintly audible when no traffic ~ 35-37 dBA, mostly engine noise. Generally inaudible.	
Shoulder (6.00am to 7.00am)	6.20am	OR2	37	51.2	41.6	63.8	36	Intermittent trucks on access road ~ 58-60 dBA and almost continuous traffic on ONR ~54-56 dBA. Quarry visible from this location and faintly audible when no traffic ~ <39 dBA. Generally inaudible.	Light breeze from SSW @ 4-10km/h Temperature 8°C Clear to light high cloud
	6.40am	R3		59.8	40.7	77.9	<37	Quarry not visible. Infrequently audible during breaks in traffic. Observed faint reverse beeper noise and single event of noise like gravel into a truck at ~41 dBA. Traffic was frequent during this period ~ 70-76 dBA pass-by	Neutral conditions (D- class)
	6.58am	R4/5		56.8	41.8	77.5	<37	Quarry not visible and ONR dominant. Traffic dominant in this period. Quarry generally inaudible but faintly audible occasionally with a tailgate bang and brief dozer track.	



Monitoring	Time	Location	Noise	Measure	d 15-minute n	oise level	Estimated LAeq, 15 min quarry	Observations	Meteorological
period			criterion	LAeq	LA90	LAmax	contribution		conditions
	8:13am	OAS1	N/A	49.2	45.1	61.4	45-47	Moxy on stockpile at 300 metres to west ~55 dBA. Intermittent and brief activity. Noise from the pit ~46-47 dBA in south including dozer engines, track slap and reverse beepers. Noise is primarily from the pit with some moxy traffic to stockpiles.	Light breeze from SSW
Day (7.00am to 6.00pm)	9:27am	OAS2	N/A	67.6	65.6	79.0	67	Quarry noise is main source 5 x excavators in pit plus one on surface Screen close to eastern pit wall ~65 dBA Dozer operating in centre Screen is constant with good contribution from excavator feeding it.	@ 4-12km/h Temperature 10°C Clear sky Neutral to unstable (A-D class)



Monitoring	Time	Location	Noise	Measure	d 15-minute n	oise level	Estimated LAeq, 15 min quarry	Observations	Meteorological	
period			criterion	LAeq	LA90	LAmax	contribution		conditions	
	10:05am	OR1	45	46.8	42.0	68.2	42-43	Hour-long monitoring period Quarry noise is clearly audible with engine noise < 45 dBA. Beepers from PF's quarry audible plus intermiitent engine noise up to ~49 dBA ONR traffic noise audible at ~50 – 53 dBA Other noise sources include birds, breeze in trees	Light breeze from SSW @ 3 – 9 km/h Temperature 11-12°C Clear sky Unstable (A-C class)	
Day	11.10am	R4/5		57.6	44.4	74.3	41-42	Traffic on ONR is the main noise source – trucks at 74 dBA passbys and cars around 62 dBA Quarry beepers (could be PF's) Dozer tracks audible occasionally when traffic drops out <44 dBA Engine noise audible at around 41-42 dBA	Light breeze from WSW to WNW @ 1 – 10 km/h	
(7.00am to 6.00pm)	11.45am	R3	44	61.2	43.2	82.9	42-43	Traffic on ONR dominant with passbys between 68 and 79 dBA Quarry clearly audible for short time up to 48-49 dBA with dozer engine and tracks (most likely working at the surface rather than the pit). Infrequent – around 2 minutes in total. General engine noise up to 43 – 44 dBA.	Temperature 25°C Clear sky Unstable (A- class)	



Monitoring period	Time	Location	Noise criterion	Measure	d 15-minute n	oise level	Estimated LAeq, 15 min quarry	Observations	Meteorological conditions
period			CITCHOIL	LAeq	LA90	LAmax	contribution		Conditions
	12:03pm	R2		65.8	40.6	85.2	42-44	Quarry audible during breaks in traffic ~42 – 44 dBA, reasonably consistent. Traffic dominant with 73 dBA pass-bys	
	12.23pm	OR2		49.6	43.5	63.5	42	Access road and ONR are dominant at ~53 dBA. More cars than trucks on ONR now. Noise in plant mostly Moxy 42 – 44 dBA Noise in pit mostly dozer tracks ~ 47 dBA Combined ~ 48-50 but briefly	
	12.45pm	OR3		45.8	40.7	68.7	42	Dozer track and engne noise from pit, generally around 42-43 when audible (~30% of time) and up to 46-47 briefly. Moxy on stockpile hill briefly around 50 dBA but mostly less than 45 dBA. ONR clearly audible and almost constant.	



4.3 Extrapolated measurements

A conclusive noise level attributable to the Quarry was not possible in all locations due to ambient noise levels affected by road traffic and insects. Therefore, measurements captured on-site without substantial influence from these sources were used to calculate sound pressure levels at each receiver.

Calculations were based on ISO 9613-2:1996 Acoustics — Attenuation of sound during propagation outdoors — Part 2: General method of calculation, which accounts for geometric spreading, air and ground absorption as well as barrier effects, assuming worst case meteorology of a gentle breeze from source to receiver and stable conditions.

Based on measurements described in Table 4, extrapolated noise results for each monitoring location are presented in Table 5. Results are shown for equipment operating in the pit, processing plant and stockpiling area.

Extrapolated results demonstrate the Quarry is compliant with the criteria for should and daytime operations when all observed equipment is operating.

Table 5 Extrapolated monitoring results

Receiver	Noise crite	ria	Extrapolated noise level,	Comment			
	Shoulder	Day	LAeq, 15 minute				
OR1	-	45	42				
OR2			39	Doe distant levels as well to vital manager			
OR3		44				//3	Predicted levels correlate well with measured levels and all locations shown to comply with
2	37		42	noise limits during the day period.			
3		39		noise innits during the day period.			
4/5			41				

4.4 Compliance summary

Results of attended monitoring and extrapolated noise levels demonstrate the following.

- 1. Observed operations during the day period were compliant with the noise criteria at each receiver under the meteorological conditions at the time.
- 2. Observed operations during the shoulder period were compliant with the noise criteria at all receivers under the meteorological conditions at the time.

Appendix E - Monthly Site Inspection

□6-00 □□R □0 □R □0 □□-□0 □ppendix E

DIXON SAND MAROOTA

MONTHLY SITE CONDITION CHECKLIST

OLD NORTHERN &

This checklist is to be completed monthly by the Environmental Officer.

Completed checklists are to be retained and included in the Annual Review.

Date of inspection:	29/07/19			
nspection by:	HUNNY CHURCHER			
Measured monthly rainfall (mm)	PERLOD 27/06/19-29/07/19 RAINFAU = 5.6 mm			
	Yes (*/) No (X) NA	Comments	Actions	Actions Complete (Date/Sign)
SEDIMENT CONTROLS	ALL THE			SPANISH NAME OF THE PARTY.
Site checked for potential erosion issues or transport of sediment from batters, vehicle access points, excavations, haul roads, vegetation clearing etc.	✓			
Effectiveness and capacity of Erosion and Sediment controls checked (drains, sins, filters etc.)	V			
Stockpiles located and maintained correctly	V			
Tree clearance restricted to required area	MA	NO VEG GEARING	THIS PERLUD.	
WATER QUALITY AND QUANTITY			TO THE RESERVE AND ADDRESS.	
Water sample taken daily for quality testing prior to discharge of water. Water quality tested and EPL#3916 criteria for pH, TSS and turbidity complied prior to discharge.	N/A	THIS PERIOD THEREFORE NO		
Weir: Daily volume of water discharged recorded.	NIA	J REQUIRED.		
4 monthly monitoring of surface water quality at SW19.	V	NOT REQUIRED THIS PERIOD	NEXT SAMPLING + TESTING IN SEP 2019	HC HC
6 monthly monitoring of groundwater quality at six bores on Lots 1&2 and two bores on Lots 196.	V	NOT REQUIRED THIS PERIOD	NEXT SAMPUNGT TESTING IN DEC 201	a HC
onthly depth measurement of all groundwater bores and comparison with rainfall	~	DEPTHS TAKEN ON 26/7/19 2 29/7/19		
Monthly inspection of drainage & sediment controls including water storages, pumps, pipes and dams' walls	~			
Any Fuel or oil spills reported and maintained	~	NO SPILL THIS PERIOD		
Fuels/chemicals stored in bunded areas	~	EPA APPROVED.		
AIR QUALITY				
Continuous static dust (collected for analysis monthly)	1	TEOM AT THE	PATED IN JUNE 2019	9
On site dust suppression	V	WATER CART USED REGULARY		
Loads covered entering and leaving site	~	VES, REQUIREMENT OF STMP + TMP	Т	
No burning of vegetation	~	NO BURN		
Wind speed, direction and rainfall recorded	/	WEATHER STATION LOCATED AT THE S		

Operation only during hours of		Hours comply in		
operation	/	TMP		
No complaints received from school, residences or local community members.	V	REFER TO PUBLISHED COMPLAINTS REGISTER		
6 monthly monitoring at Maroota PS	V	MONITORING COMPULTED IN TUNEZO19	WEXT MONTORING W DEC 2019	He
Bulldozer not being used concurrently with any other plant on		CONDITION NOT		
strips 4, 5 and 6 of Lots 1 and 2 DP547255 at depths between EGL and 6 metres below EGL	A/M	YET TRIGGERED		
Bulldozer being used for clearing, topsoil stripping and bund construction on Lots 1 and 2 DP547255 only during calm wind conditions	NIA	NO TOPSOIL STRIPPING / BUND CONSTRUCTION	J	
Between 0-6 metres depth below EGL, dozer-dump truck combination replaced by excavator-dump truck combination to strip overburden on Strips 2-6 inclusive	1			- 3
Quarrying at ground level on Lot 196 not occurring during southwest to northwest winds	~	-		
Construction and rehabilitation of eastern highwall of quarry within 250 metres of Maroota Public School occurring in school holiday periods only	N/A	CONDITION NOT YET TRIGGERED.		
FLORA & FAUNA/ REHABILITATION				
Sightings of threatened species			Mary Commenced in the Paris	babsis
reported No disturbance of buffer/conservation areas	V V			
All buffer/conservation area fencing/marking intact				
Rehabilitation undertaken to schedule	/			
Success of rehabilitation of buffers, conservation areas & rehabilitation areas	N			
Rehabilitation near school during holidays	N/A			
Flora and fauna monitoring program undertaken to schedule	~	ELOLOGIST UNDERTH ANNUAL SURVEY/MO	HEINE N in July-SEP 2016	1
ARCHAEOLOGY				100
	The state of the s	No Aprunovado	A1.	N. P. LEWIS
Stop work if sites located – OEH	~	THE CHILD IN STATE		
notified	~	NO ARCHAEDLOGIC		(1000 phase is been free
NASTE AND SITE CONDITION		WASTE SEAREGARDA		INDIONE SHIVEN
Stop work if sites located – OEH notified WASTE AND SITE CONDITION No rubbish visible or buried on site Recyclables removed by licensed Contractors	\(\sqrt{ \			intrins stepper

Weekly inspection of Old Northern Rd/Crown Rd intersection and sand/clay removed as necessary.	V	ROUTINE INSPTN BY QUARRY MANAGERS
Crown Road, Old Northern Road near site, intersection & haul roads in good state of repair.	~	
Truck movements have not exceeded 180/day, or 40 between 6-7am.	/	WEIGHBRIDGE TRUCK RECORDS
Weighbridge/log book records forwarded to Council monthly	~	
EXTRACTION PROGRAM		
Extraction depths from monthly checked control points in accordance with extraction program.	~	
REPORTING		
Complaints register maintained	~	A MONTHLY BASIS
Environmental incidents reported to EPA	~	NO ENVIRO INCLICENT

	of Humanian		
Signed:	J. Vourgouse	(Environmental Officer)	ì

Appendix F – Truck Movement Data

□ 6-00 □ R □ 0 □ R □ 0 □ - □ 0 □ ppendix □

Example Dail□Tr□□□Re ord

Mth June Day 30 2020

Todays 1342 Monthly 27,954 Total Total No 7 Trans 249
Total Total Of Trans Tonnage

							Product	amount					Tomage		
Tot	796	59	277	-	20	50	-	-	140				-	-	
No	White	Yellow	Coarse	Fine	Bunker	Parklea	Prop	USGA	Soil Blds	RaceTrk	Dog Trk	Sports	M165	Trans	Transfers
	□□166														
						□□106									
	□6 □ 70														
4 5	7								□□64						
6									04						+
7									□7 □54						+
	□□Ⅲ6														+
		□□ 7 0													1
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	□7□76														
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45			□□□6												□5 □ 5

Example Dail□Tran⊡er rom □aer e Road to Old □ort ern Road

TRANSFERS

	UNE 2	020	Tonnes/Mth	5,431.50	
J.	DINE Z	020	Number/Mth	153	
Date	AM/PM	Arrival Time	Dispatch Time	Tonnes	No Trks/day
0⊡-⊞n-⊡0	□M	610□	6⊞4	□5□50	
0□-□□n-□0	□M	□100	□05	□ 5 □ 50	
0□-Ⅲn-□0	□M	□47	□5□	□ 5 □ 50	
0□-□□n-□0	□M			□ 5 □ 50	
0□-□□n-□0	PM	□Ⅲ0	□⊞5	□ 5 □ 50	
0□-Ⅲn-□0	PM	□4□	□54	□ 5 □ 50	
0□-□□n-□0	PM	4Ⅲ□	4∭7	□ 5 □ 50	7
0⊡-⊞n-⊡0	□M	6105	6⊞0	□ 5 □ 50	
0□-□□n-□0	□M	7⊈□	7⊈□	□ 5 □ 50	
0□-□□n-□0	□M	7.5□	7₫56	□ 5 □ 50	
0□-Ⅲn-□0	□M		□Ш 7	□ 5 □ 50	
0□-□□n-□0	□M	0	□□Ⅲ5	□ 5 □ 50	
0□-□□n-□0	PM	□100	□05	□ 5 □ 50	
0□-Ⅲn-□0	PM	□5	□ 4 0	□ 5 □ 50	
0□-Ⅲn-□0	PM	4Ⅲ□	4 ⊞7	□5 □ 50	8
0□-Ⅲn-□0	□M	6.0□	6.0□	□5 □ 50	
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04-⊡n-⊡0	PM		□106	□5 □ 5 0	
04-⊡n-⊡0	PM	450	4.55	□5 □ 5 0	7
05-⊡n-⊡0	□M	6Ⅲ0	6∭5	□5 □ 5 0	
05-⊡n-⊡0	□M	□Ⅲ0	□5	□ 5 □ 50	
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05-⊞n-⊑0	□M	4105	4Ⅲ0	□ 5 □ 50	
05-⊞n-⊑0	□M	4⊈6	4.5□	□ 5 □ 50	9
06-⊡n-⊡0	□M	6Ⅲ□	6	□5 □ 50	
06-⊡n-⊡0	□M			□5 □ 50	
06-⊡n-⊡0	□М	□0 Ⅲ0	□0 Ⅲ5	□ 5 □ 5 0	3
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□□-□□n-□0	PM	□56	410□	□5 □50	9
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_5- <u></u> _n0	PM	4	4∭7	□5 □50	8
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□0-□□n-□0	PM	□□57		□5 □ 5 0	
□0-□□n-□0	PM	□55	□100	□ 5 □ 50	
□0-□□n-□0	PM	□4		□5 □50	
□0-□□n-□0	PM	4.50	4 : 55	□5 □ 50	7

Example Morning Tr Re ord between 5:45 - 7:00 am

Dixon Sand - Maroota Quarry Morning Trucks

Jun-20		6.00am - 7.00am				
Date	Time in	Docket No.	Tonnes	No Trks/day (laden)		
□06Ⅲ0□0	6 . 00am		□□Ⅲ4			
□06Ⅲ0□0	6 : 04am		□□16 □			
□06Ⅲ0□0	6 . 0		□□ 7 6			
□06Ⅲ0□0	6∭0am		□□4□			
□06Ⅲ0□0	6⊞⊑am	□□5□□4	□□Ⅲ4			
□06Ⅲ0□0	6∭⊑am	□□5□□5	□□44			
□06Ⅲ0□0	6 ⊈ 5am	□□5□□6				
□06Ⅲ0□0	6 ⊡ 0am	□□60 □□	□□160			
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□106Ⅲ0□0	6∭4am	□□60□7	□□56			
□06Ⅲ0□0	6⊞⊡am	□□60 □□	□□Ⅲ6			
□06Ⅲ0□0	6∭0am	□□60 □□]		
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□06Ⅲ0□0	6 ː 0	□□6075				
□06Ⅲ0□0	6 ː 0	□□6076				
□06Ⅲ0□0	6∭0am	□□6077				
□06Ⅲ0□0	6⊞⊡am	□□607□	□ 7			
□06Ⅲ0□0	6∭6am	□□607□				
□06Ⅲ0□0	6am	□□60□0				
□06Ⅲ0□0	6∭0am					
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4.0600	6 1 00am					
4.0600	6 . 0 ⊑am		□□176			
4.0600	6 . 0 ⊑am					
4.0600	6⊞⊡am		□7 174			
4.0600	6∭6am	□□6□□4				
4106111010	6∭7am					
4106111010	6 ⊈ 4am		□0Ⅲ4			
410611010	6.5.am					
5 <u>0</u> 6 <u>0</u> 0 <u>0</u>	6 <u>0</u> 0am	□□6□50	□□76			
5 <u>0</u> 6 <u>0</u> 0 <u>0</u>	6.0 ⊑am					
5 <u>0</u> 6 <u>0</u> 0 <u>0</u>	6 <u>0</u> 5am					
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Dixon Sand

Annual Report 2019 – 2020

Bush-it Pty Ltd





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1. Overview

The environmental works of Bush-it carried out at Dixon Sand ensures the highest level of conservation and regeneration is achieved, resulting in outstanding outcomes for Dixon Sand and the natural biodiversity of the encompassing ecological communities.

The land belonging to Dixon Sand plays host to the Ecologically Endangered Community, the Shale/Sandstone Transition Forest, and several threatened species; *Kunzea rupestris, Darwinia fascicularis subsp. oligantha, Melaleuca deanei, Acacia bynoeana* and *Tetratheca glandulosa*. Due to the presence of these vulnerable species, it is our upmost priority to ensure the communities are protected and the areas in excellent condition remain preserved. Additionally, a variety of ecological restoration strategies has led to the continued exceptional progress in rehabilitation and restoration of focus sites.

There are two main areas where regeneration and restoration works occur at Dixon Sands; vegetation surrounding the Old Northern Road Quarry and Haerses Road Biodiversity Offset and Translocation area. This report outlines the works undertaken between the 1st of July 2019 to June 30th 2020 and recommendations for future works at Dixon Sand.

2. Old Northern Road Quarry Lots 1 & 2

The focus of works for Lots 1 & 2 of Old Northern Road Quarry is in preventing invasive species from surrounding disturbed areas from entering the areas of excellent natural condition, and to other areas of the quarry. Second to this, we have put efforts into clearing *Lantana camara* from areas that show potential for regeneration.

Lot 1

For the majority of the worked year, the focus within Lot 1 was suppressing seed dispersal of exotic species from the surrounding open field, where invasive grasses *Eragrostis curvula*, *Paspalum urvillei* and *Andropogon virginicus*, as well as annual weeds *Bidens pilosa* and *Tagetes minuta* dominate. *Ricinus communis* and *Phytolacca octandra* were also treated, often found on the highwalls surrounding Lot 1. As of May 2020, the surrounding field and the north and west borders were demolished. Quarry works from this event caused seed spread of the previously mentioned invasive species into the edges of remaining lot, and so efforts were put into mitigating further spread of invasive species.

2.1 Works Undertaken

Outline of Works	Methodology	Objective Achieved
Preventing seed-spread from surrounding areas	 Brush cut E. curvula, P. urvillei and T. minuta on field above lot. Sprayed E. curvula, P. urvillei, A. virginicus, B. pilosa and T. minuta on slope of northern edge and east/west boundaries. Sprayed and manually removed R. communis and P. octandra on high walls. The east side of the highwall was in accessible as it bordered a cliff edge, these areas 	Ongoing maintenance of the edges successfully prevented invasive species from entering the core of Lot 1. The success from the herbicide treatment of <i>R. communis</i> on highwall is unknown as it is now an active worked zone for the mine.

	were treated with a
	foliar herbicide spray
	but were unable to
	be de-seeded.
Regular sweeps of edges and core	 Hand weeding of exotic grasses, annuals, Asparagus spp. and Acetosa Sagittata around natives on edge of site. Scanning through core for reoccurring L. camara, P. octandra and any other exotic species. The core of Lot 1 is in excellent condition in response to regular sweeps. In addition, the condition of the edges are improving. Native species such as Microlaena stipoides, Oplismenus sp., Stephania japonica and Trema tomentosa are responding extremely well to the hand weeding of exotic competition.
	competition.

2.2 Recommendations for Future Works

- Monitor recently disturbed boundary zones from quarry works of May 2020, as it is likely fast colonisers will exploit the disturbed areas.
- Continue pushing A. virginicus and E. curvula from north west area near dam
- *L. camara* works could be undertaken east of the dam where the vegetation community is in good condition apart from the presence of *L. camara*, subject to the boundary of Lot 1.



Figure 1: Field above Lot 1 before quarry works in May 2020



Figure 2: R. communis and T. minuta on high wall



Figure 3: Disturbance to north boundary of Lot 1 after quarry works of May 2020



Figure 4: Disturbance to east boundary of Lot 1 after quarry works in May 2020



Figure 5: Core of native vegetation community in Lot 1



Figure 6: Native regeneration after hand weeding exotic species on edge of Lot 1



Figure 7: Northwest edge exposed to exotic grasses from neighbouring farm



Figure 8: Dodonaea sp. outcompeting exotic grasses, acting as a barrier for the core areas

Lot 2

The core of Lot 2 is in excellent condition, however much like Lot 1, the main challenges are threats of seed dispersal from surrounding disturbed borders. The west and south of the boundary are absent of trees and shrubs, and so grasses *E. curvula and A. virginicus*, as well as *B. pilosa*, *P. octandra* and *Solanum mauritianum* have colonised these disturbed areas. Fortunately, a wall of *L. camara* prevents seed spread from entering the lot and has remained for this reason. The majority of effort within this lot was treating *L. camara*, focusing on removing the species from canopy trees and areas that are demonstrating high resilience to the removal of *L camara*.

2.3 Works Undertaken

Outline of Works	Methodology	Objective Achieved
Removal of <i>L. camara</i>	 Cut and paint and spraying of <i>L. camara</i>. Manually remove regrowth. Folded <i>L. camara</i> away from native trees near edge of zone. 	The continued works of <i>L. camara</i> have demonstrated the native vegetation to be resilient in the absence of <i>L. camara</i> . Ground cover like <i>M. stipoides</i> and <i>Entolasia stricta</i> are taking off in cleared areas, in addition to native trees such as <i>T. tomentosa</i> . Works have been focused up the creek line.
Suppression of seed dispersal from disturbed boarders	 Spraying, de-seeding and manual removal of invasive species on east and west boundaries of lot. 	Successfully prevented invasive species from entering good quality vegetation in lot.
Regular sweeps	Walk through in search of any emerging <i>L. camara</i> , annuals or grasses which may have spread from other areas of mine.	The native vegetation in the core of Lot 2 has remained in excellent condition.

2.4 Recommendations for Future Works

- Continue treatment and follow up treatment of *L. camara*
- Clearing wood from *L. camara* works to let more light in and spread seed from native grasses for ground cover



Figure 9: Creek line of Lot 2 clear of L. camara



Figure 10: L. camara works from 2018 demonstrating regeneration



Figure 11: T. tomentosa, E. stricta, M. stipoides and S. japonica emerging from area cleared of L. camara



Figure 12: Recent L. camara works after cut and paint treatment



 $\textbf{\it Figure 13: Edge of L. camara treatments where the species acts as a barrier from seed dispersal of surrounding areas}$



Figure 14: Other side of L. camara barrier

3. Old Northern Road Vegetation Corridor

The upmost priority of this area is in protecting the three threatened species within the rehabilitation area. Specimens of *D. fascicularis subsp. oligantha* were translocated from the original locations on Lots 1 and 2. *Acacia bynoeana* have self-propagated from the seed banks contained in the translocated material. *M. deanei* and *D. fascicularis subsp. oligantha* were propagated from cuttings and planted in 2017, and are responding very well to the conditions. *D. fascicularis subsp. oligantha* is doing especially well, colonising the rehabilitation area with ease. The rehabilitation area is demonstrating rapid regeneration and ever increasing in biodiversity, responding very well to the soil translocation. The primary species showing the most resilience are *Acacia spp., Grevillea spp., Bossiaea spp.* and the threatened *D. fascicularis subsp. Oligantha.* The soil mound to the north of the rehabilitation areas is also showing great resilience, mainly of *Acacia spp., Bossiaea spp.* and *Hardenbergia spp.*

The main threat to this area is seed spread from exotic species in neighbouring areas of the quarry, especially as the Native Vegetation Corridor is so exposed. With regular monitoring however, we have kept the area free from infestations of *A. virginicus* and *Hypochaeris sp.* And ensured *P. octandra* is not present.

3.1 Works Undertaken

Outline of Works	Methodology	Objective Achieved
Regular sweeps	 Carefully manually removing A. virginicus, Hypochaeris sp. and any other exotic species that has managed to spread into the rehabilitation area. Sweep through mound north of rehabilitation area for any exotic species that may spread seed into the zone. 	Regular sweeps ensure we are aware of any potential threats or issues in the area. The main threat is A. virginicus as it is abundant in neighbouring areas to the zone. By manually removing A. virginicus before it seeds, we have heavily reduced the amount reoccurring. P. octandra was previously found occurring on the mound north of the rehabilitation area and so, we monitor that area to ensure it is not reoccurring. This area is also showing great resilience and is rapidly regenerating.

3.2 Recommendations for Future Works

- Continue regular maintenance of the area to ensure it remains in excellent condition
- Monitor regeneration of native species to ensure biodiversity of the area is upheld.



Figure 15: Native species thriving in the rehabilitation area



Figure 16: Vegetation cover in June 2019



Figure 17: Vegetation cover in June 2020



Figure 18: Threatened species M. deanei



Figure 19: A. virginicus in neighbouring area



Figure 20: Juvenile A. virginicus before seeds are produced



Figure 21: Border of Native vegetation corridor



Figure 22: Soil mound north of rehabilitation area showing great resilience

4. Old Northern Road Plantation

Works were conducted at the old plantation site on the western edge of the quarry as requested by the client. Here *A. virginicus* and *E. curvula* were treated with herbicide foliar spray to prevent seed dispersal into the surrounding native vegetation communities and protect the plantings from infestations.

4.1 Works Undertaken

Outline of Works	Methodology	Objective Achieved
Suppression of invasive	 Spot spraying of A. 	Prevented seed dispersal of
grasses	virginicus and E.	A. virginicus and E. curvula
	curvula	into the surrounding areas
		in good condition and
		prevented the plantings
		from been outcompeted by
		the invasive grasses.
Removal of plant guards	 Removed plastic 	Removal of plant guards
	plant guards from	allowed plantings to grow
	established plantings	without restrictions and
		prevents invasive species
		from establishing in plant
		guards.

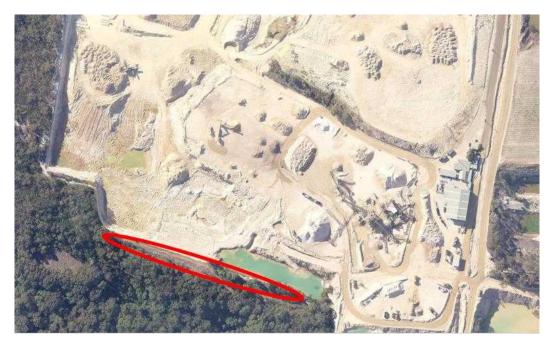


Figure 23: Area of treatment



Figure 24: E. curvula and A. treated with spot spray



Figure 25: Old plantings at western boundary of Old Northern Road Quarry

5. Haerses Road Biodiversity Offset Area

To offset the expansion of Old Northern Road Quarry as proposed in Development Approval Modification 4, a designated section of a vegetation community at Haerses Road which is in excellent condition is protected and maintained. Due to the high resilience of the vegetation within the offset area, the majority of work is in controlling the exotic species on the edges of the zone, ensuring invasive species to not encroach into the offset area. A positive outcome from works along the edges is the resilience in response to efforts in controlling exotic species. There is a large diversity in native grasses; *M. stipoides, Echinopogon caespitosus, E. stricta, Oplismenus spp., Themeda australis* and *Aristida sp.* There are also *Acacia spp.* and *Eucalyptus spp.* emerging between the access road and the offset area.

5.1 Works Undertaken

Outline of Works	Methodology	Objective Achieved			
Suppression of seeding invasive species on edges	 Brush cut, de-seed, and spray grasses E. curvula, A. virginicus, Chloris gayana, Setaria pumila and annuals, mainly B. pilosa and t. minuta along edge of western boundary. 	Prevented seed dispersal from exotic species into buffer and biodiversity offset area.			
Regular maintenance of 30m buffer	 Manual removal of any exotic species on boundary encroaching into edge of buffer. Scanned entire buffer zone for annual weed species, invasive grasses, and Ageratina adenophora and L. camara. 	Regular works of the border and buffer have ensured that no exotic species spread into the biodiversity offset area. The majority of works is preventing seed spread from the access road and working creek lines which act as a vector for invasive species to enter the buffer zone. Efforts have gone into edging out invasive grasses <i>C. gayana</i> , <i>E. curvula</i> and <i>S. pumila</i> from the buffer zone.			

5.2 Recommendations for Future Works

- Repairs to sediment fence along western boundary to prevent spread of invasive species from mine site into biodiversity offset area.
- Continued maintenance of western boundary and buffer zone to ensure the excellent condition of the biodiversity offset area is preserved.



Figure 26: Suppression of E. curvula on western boundary of buffer zone



Figure 27: Haerses Road Biodiversity Offset area



Figure 28: A. virginicus encroaching on boundary of Biodiversity offset buffer zone



Figure 29: Native grasses regenerating in buffer zone of the biodiversity offset area

6. Haerses Road Quarry Translocation

Established as a work zone in 2009, the translocation area is continually increasing in biodiversity and condition. The translocation fenced area is in excellent condition, the main issues occurring within the surrounding area to the translocation zone is the presence of *A. virginicus* and *E. curvula*. Ensuring *A. adenophora* remains absent within the area and in drainage lines has also been a priority for the zone.

6.1 Works Undertaken

Outline of Works	Methodology	Objective Achieved
Control of invasive grasses	De-seeding and crowning out A. virginicus and E. curvula inside and outside the translocation fenced area.	By suppressing the invasive grasses from spreading seed and encroaching into the translocation area, we ensured the area remains in good condition and native species are not outcompeted.
Regular sweeps of area	 Manually removing A. adenophora and any other exotic species within drainage lines and throughout biodiversity offset area near translocation zone. 	Regular scans of site ensure the condition of the site is monitored and no infestations occur within the translocation zone or the biodiversity offset area.

6.2 Recommendations for Future Works

• Continued suppression of *A. virginicus* and *E. curvula and* conduct regular sweeps to ensure translocation area and the biodiversity offset remain in good condition.



Figure 30: De-seeding of A. virginicus on edge of Haerses Road translocation



 $\textit{Figure 31: Northern Haerses Road translocation fence line free from A.\ virginicus\ and\ E.\ curvula$



Figure 32: South west boundary of Haerses Road translocation



Figure 33: Haerses Road translocation



Figure 34: Western boundary of Haerses Road translocation

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7. Haerses Road Quarry Visual Screen Buffer

Plantings established as a visual screen buffer on Haerses Road was worked for the first half of the yearly contract, as of February 2020 road works have restricted access to the site. This priority of this site was in controlling *Rubus sp.*, *A. virginicus* and *E. curvula* from impacting the plantings.

7.1 Works Undertaken

Outline of Works	Methodology	Objective Achieved
Control of Rubus sp.	 Scrape and paint and 	Reduced overall presence of
	spraying of Rubus sp.	Rubus sp. and prevented
	along both sides of	the species from effecting
	buffer plantings.	plantings.
Control of invasive grasses	 De-seeded, sprayed 	Prevented A. virginicus and
	and crowned out A.	E. curvula from
	virginicus and E.	outcompeting plantings and
	curvula.	prevented seed dispersal.
Regular sweeps	 Scanned area for 	Prevented infestations of
	annual weeds and	invasive species introduced
	woody weeds.	from road or surrounding
		farmland.

7.2 Recommendations of Future Works

• Subject to the road works currently in progress at the site, continued works controlling *Rubus sp.* and in invasive grasses would be beneficial for the plantings.

8. Summary of Works

Zone	JUL	AUG	SEP	ОСТ	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	Total
Admin	1	1	0.5	1	1.5	0	1	2	1.5	1	1	8.5	20
HR - Biodiversity Offset	0	7.5	8	34.5	15.5	0	15	36.5	22.5	4	8	12.5	164
HR - Translocation & Planting	8	0	0	0	22	0	0	11	10	0	0	0	51
HR - Visual Screen Buffer	7.5	2.5	10	3	6	0	11	0	0	0	0	0	40
ONR - Other	5	0	1	9	0	0	0	8	0	0	0	0	23
ONR - Lots 1 & 2	27	12	0	0	18	0	41.5	31	57	38.5	47	12.5	284.5
ONR - Native Vegetation Corridor	5	8	11	21	21	0	0	26	8	10	5	12.5	127.5

9. Herbicide Spray Records

Date	Operator name	Herbicide name	Wind description	Areas	Qty	Vol (L)
14/08/2019	Mark Fellows	Flupropanate	Light Air	ONR - NVC	10 g	2
26/09/2019	Mark Fellows	Starane, Fluroxypyr- meptyl	Light Air	HR - Screen plantings	30 ml	10
26/09/2019	Joshua Freeman	Round-up, Glyphosate	Light Air	ONR - NVC	50 ml	5
28/11/2019	Will Pearce	Round-up, Glyphosate	Light Breeze	HR - Biodiversity Offset	100 ml	10
28/11/2019	Joshua Freeman	Round-up, Glyphosate	Light Breeze	ONR - Lot 2	130 ml	13
28/11/2019	Will Pearce	Round-up, Glyphosate	Light Breeze	ONR - Lot 2	130 ml	13
15/01/2020	Joshua Freeman	Round-up, Glyphosate	Light Breeze	HR -Visual Screen Buffer	20 ml	2
28/01/2020	Joshua Freeman	Garlon, Triclopyr	Light Breeze	HR - Visual Screen Buffer	34 ml	20
4/02/2020	Will Pearce	Round-up, Glyphosate	Light Breeze	ONR - Old Plantation	100 ml	10
4/02/2020	Joshua Freeman	Round-up, Glyphosate	Light Breeze	ONR - Lot 2	100 ml	10
4/02/2020	Will Pearce	Round-up, Glyphosate	Light Breeze	ONR - Lot 2	100 ml	10
11/02/2020	Joshua Freeman	Round-up, Glyphosate	Light Air	HR - Biodiversity Offset	260 ml	26
24/02/2020	Joshua Freeman	Round-up, Glyphosate	Light Breeze	ONR - Lot 2	150 ml	15
28/02/2020	Darius Ottignon	Round-up, Glyphosate	Light Air	ONR - Lot 2	100 ml	10
14/04/2020	Joshua Freeman	Round-up, Glyphosate	Light Breeze	ONR - Old Plantation	100 ml	10
14/04/2020	Joshua Freeman	Round-up, Glyphosate	Light Breeze	ONR - Lot 1	200 ml	20
27/04/2020	Joshua Freeman	Round-up, Glyphosate	Light Air	ONR - Lot 1	300 ml	30
27/04/2020	Joshua Freeman	Round-up, Glyphosate	Light Air	ONR - Lot 1	80 ml	8
11/05/2020	Joshua Freeman	Round-up, Glyphosate	Light Breeze	HR - Biodiversity Offset	150 ml	15

10. Weed Species Controlled

Common name	Scientific name	Control method
Bridal Creeper	Asparagus asparagoides	Manual treatment
Asparagus	Asparagus aethiopicus	Manual treatment
Turkey Rhubarb	Acetosa sagittata	Manual treatment, spraying
Moth vine	Araujia sericifera	Manual treatment
Lantana	Lantana camara	Cut and paint, manual treatment, spraying
Blackberry	Rubus fruticosus	Manual treatment, spraying
Ochna	Ochna serrulata	Scrape and paint
Senna	Senna pendula	Cut and paint, manual treatment
Wild Tobacco	Solanum mauritianum	Manual treatment
Crofton weed	Ageratina adenophora	Manual treatment, slashing, spraying
Bidens - Cobblers Peg	Bidens pilosa	Manual treatment, slashing, spraying
Fleabane	Conyza spp.	Manual treatment, spraying
Paddy's Lucerne	Sida rhombifolia	Cut and paint, manual treatment
Blackberry Nightshade	Solanum nigrum	Manual treatment
Purple Top	Verbena bonariensis	Manual treatment, slashing, spraying
Ehrharta	Ehrharta erecta	Manual treatment
Paspalum	Paspalum dilatatum	Manual treatment, spraying
Couch common	Cynodon dactylon	Manual treatment, spraying
Umbrella Sedge	Cyperus eragrostis	Manual treatment
Carpet Grass	Axonopus affinis	Manual treatment
African Lovegrass	Eragrostis curvula	Manual treatment, slashing, spraying
Chickweed mouse ear	Cerastium spp.	Manual treatment
Flatweed	Hypochaeris sp	Manual treatment
Fishbone fern	Nephrolepis cordifolia	Manual treatment
Whisky grass	Andropogon virginicus	Manual treatment, slashing, spraying
Summer grass	Digitaria sanguinalis	Manual treatment, spraying
Castor Oil	Ricinus communis	Cut and paint, manual treatment, spraying
Stinking Roger	Tagetes spp.	Manual treatment, slashing, spraying
Pigeon Grass	Setaria spp.	Manual treatment
		Cut and paint, manual treatment, scrape and
Ink weed	Phytolacca octandra	paint
Parramatta grass	Sporobolus africanus	Manual treatment
Rhodes grass	Chloris gayana	Manual treatment
Paspalum, large	Paspalum urvillei	Manual treatment, spraying
Dandelion	Taraxacum spp.	Manual treatment
Spear thistle	Cirsium vulgare	Manual treatment