GALES–KINGSCLIFF

PTY LTD
ABN: 75 093 540 080

Annual Review

for the

Cudgen Lakes Sand Quarry

1 July 2024 to 30 June 2025

Compiled by:

RWCorkery&co

September 2025

ACKNOWLEDGEMENT

R.W. Corkery & Co. acknowledge and pay our respects to the Traditional Custodians of the lands comprising NSW and Australia on which our projects are located. We appreciate the knowledge, advice and involvement of the Elders and extended Aboriginal community that contribute to our Projects and extend our respect to all Aboriginal and Torres Strait Islander peoples.

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Compiled for:

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Ref No. 617/47 September 2025

RWCorkery&co

Title Block

Name of Operation	Cudgen Lakes Sand Quarry
Name of Operator	Kingscliff Sands Pty Limited
Development consent / project approval #	Project Approval MP05_0103B
Name of holder of development consent / project approval	Gales-Kingscliff Pty Ltd
Mining Lease #	Not Applicable
Name of holder of mining lease	Not Applicable
Water licence #	WAL 40902
Name of holder of water licence	Gales-Kingscliff Pty Ltd
MOP/RMP start date	Not Applicable
MOP/RMP end date	Not Applicable
Annual Review start date	01/07/2024
Annual Review end date	30/06/2025

I, Stephen Segal, certify that, to the best of my knowledge, this audit report is a true and accurate record of the compliance status of the Cudgen Lakes Sand Quarry for the period 1 July 2024 to 30 June 2025 and that I am authorised to make this statement of behalf of Gales-Kingscliff Pty Ltd.

Note.

a) The Annual Review is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, $1 million and for an individual, $250,000.

b) The Crimes Act 1900 contains other offences relating to false and misleading information: Section 192G (Intention to defraud by false or misleading statement – maximum penalty 5 years imprisonment); Section 307A, 307B and 307C (false or misleading application/information/documents – maximum penalty 2 years imprisonment or $22,000, or both).

Name of authorised reporting officer	Stephen Segal
Title of authorised reporting officer	Director
Signature of authorised reporting officer	
Date	29 September 2025

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1. Statement of Compliance

The compliance status of relevant approvals was reviewed for the reporting period and is summarised in **Table 1.1**. It was determined that, during the reporting period, there were a total of four non-compliances, one relating to EPL12385 and three relating to Project Approval MP05_0103B. These non-compliances are further discussed in Section 11.

The non-compliances recorded during the reporting period have been ranked according to the risk matrix included in **Table 1.2**.

Table 1.1
Statement of Compliance

Were all conditions of the relevant approval(s) complied with?	Yes / No
Project Approval MP05_0103B	No
Environment Protection Licence 12385	No

Table 1.2
Non-compliances

Relevant Approval	Condition	Condition Description (summary)	Compliance Status	Comment	Where Addressed In Annual Review
MP05_0103B	2(2)	Carry out the Project in accordance with the conditions of the approval.	Non-compliant	Non-compliances with the conditions of the approval were recorded.	Section 11
MP05_0103B	3(7)	The Proponent must implement the Air Quality Management Plan as approved.	Non-compliant	Samples were not collected for the December 2024/January 2025 period due to a communication error between site and the monitoring consultants.	Sections 6.4 and 11
MP05_0103B	3(18)	The Proponent must implement the Soil and Water Management Plan as approved.	Non-compliant	Sample collection was not undertaken during December 2024 due to a communication error between site and the monitoring consultants.	Section 7.2 and 11
EPL 12385	M2.1	Undertake monitoring in accordance with the locations, analytes, and frequency specified.	Non-compliant	Monitoring was unable to be undertaken at EPL Point 5 (MB10) due to the bore being damaged. This non-compliance was reported through the 2024/2025 Annual Return	Section 7.3 and 11

Compliance Status Key

Risk level	*Colour Code*	*Description*
High	*Non-compliant*	*Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence.*
Medium	*Non-compliant*	*Non-compliance with:* • *potential for serious environmental consequences, but is unlikely to occur; or* • *potential for moderate environmental consequences, but is likely to occur.*
Low	*Non-compliant*	*Non-compliance with:* • *potential for moderate environmental consequences, but is unlikely to occur; or* • *potential for low environmental consequences, but is likely to occur.*
Administrative non-compliance	*Non-compliant*	*Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions).*

2. Introduction

2.1 Overview of Operations

The Cudgen Lakes Sand Quarry (the Quarry) is located at Cudgen approximately 1km south of the Tweed River and 8km south of the New South Wales/Queensland Border (see **Figure 2.1**). Project Approval MP05_0103B was granted 16 June 2009 and has since been modified as follows.

a) Modification 1 (MOD 1) – 19 February 2016, including the addition of an initial processing area with operations planned to remain south of the existing alignment of Altona Road for a period of at least 5 years from commencement.

b) Modification 2 (MOD 2) – 22 January 2019, including utilisation of the 'Initial' Processing Area as the long-term Processing Area, consolidation of the Northern and Southern Extraction Areas into a single lake and increase of the final lake batters to 1:3 (V:H).

The approved layout of the operations is shown in **Figure 2.2** whilst surrounding land ownership and residences are shown in **Figure 2.3**.

Operations at the Quarry were physically commenced on 13 September 2016, site establishment activities commenced on 26 June 2017, and the first extraction campaign commenced 30 October 2017 and ceased on 8 February 2018. During April 2020 extraction operations recommenced and processing operations and road transportation of Quarry products commenced for the first time. Details on the activities undertaken during the current reporting period are provided in Section 4.

The approval for the realignment of Altona Road (DA05/1450) was physically commenced in 2011 through the placement of sub-base material in the eastern section of the road realignment.

Further approvals (DA 20/0965 and DA22/0145) were also determined by Tweed Shire Council on 12 May 2021 and 8 March 2024 respectively for the application of fill material to Lot 21 DP1082482 (the northern Quarry lot) to raise the level of land. The purpose of the fill in the short term will be to raise the level of the land to achieve improved pasture for existing grazing practices occurring on the land. In the medium to longer term the majority of the fill will be utilised to create future sports fields external to the lake area. With further filling to raise the land to the Q100 design flood level, and subject to development approval, some parts of the fill area may be used for alternative urban land use activities, as contemplated by Council's Kingscliff Development Control Plan and Gales master planning.

2.2 Scope and Format

This is the fifteenth (15th) Annual Review submitted for the Quarry, following one Annual Environmental Management Report, and is applicable for the period 01 July 2024 to 30 June 2025 ("the reporting period"). The information presented within this Annual Review is based on information compiled by R.W. Corkery & Co. Pty. Limited and provided by Gales-Kingscliff Pty Limited ("the Company"), Kingscliff Sands Pty Limited, and HMC Environmental Consulting.

Figure 2.1
LOCALITY PLAN

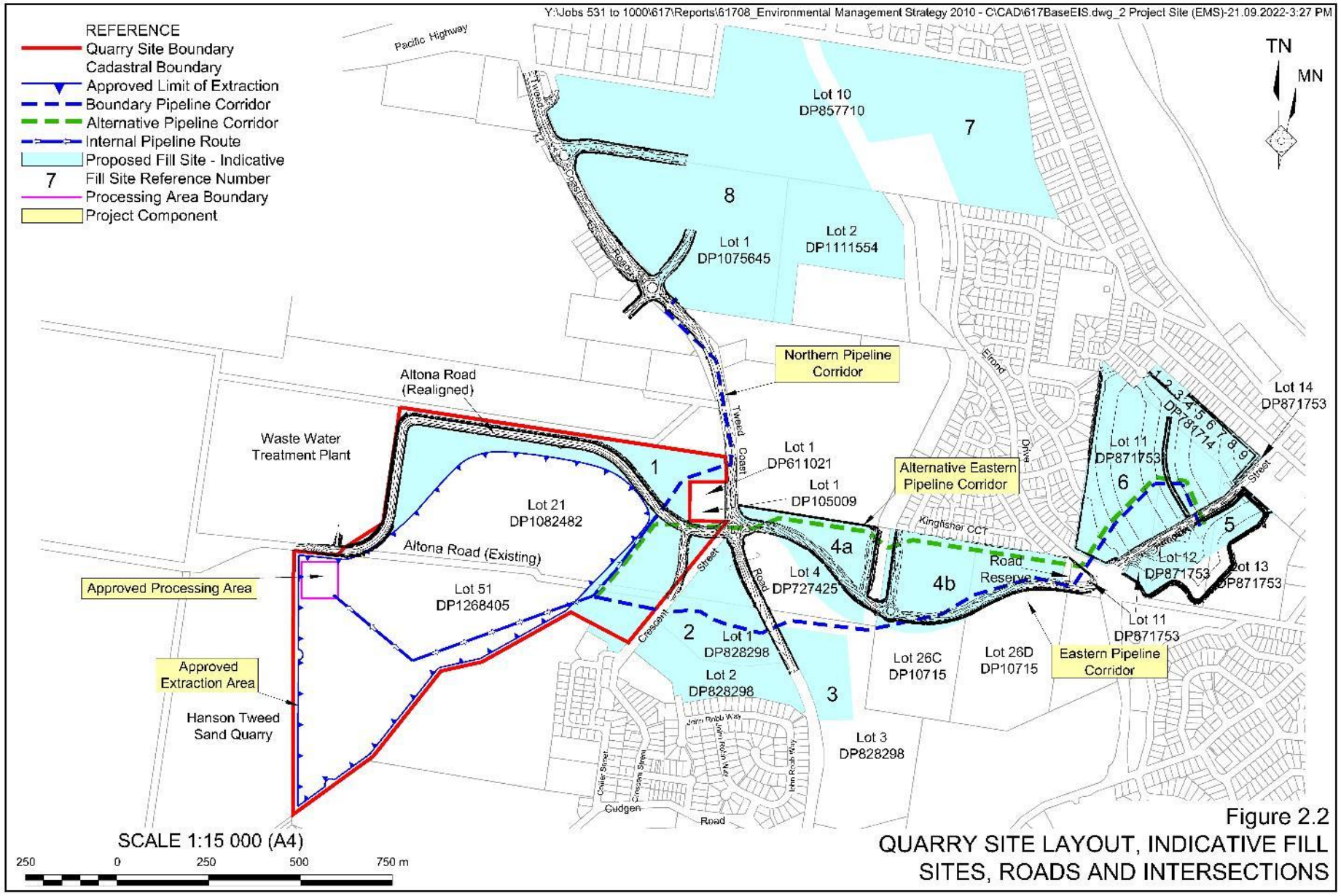
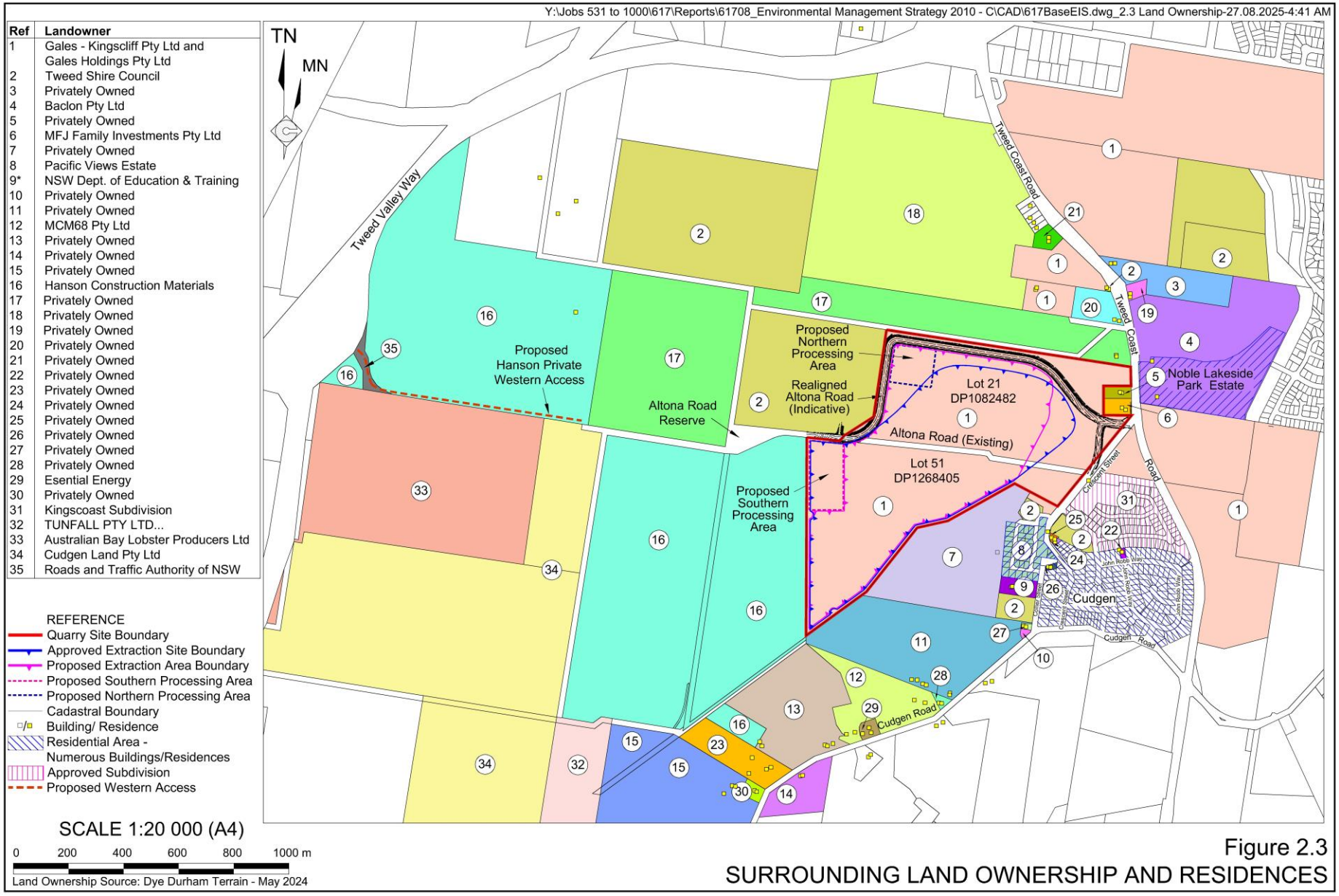


Figure 2.2
QUARRY SITE LAYOUT, INDICATIVE FILL SITES, ROADS AND INTERSECTIONS



Ref	Landowner
1	Gales - Kingscliff Pty Ltd and Gales Holdings Pty Ltd
2	Tweed Shire Council
3	Privately Owned
4	Baclon Pty Ltd
5	Privately Owned
6	MFJ Family Investments Pty Ltd
7	Privately Owned
8	Pacific Views Estate
9*	NSW Dept. of Education & Training
10	Privately Owned
11	Privately Owned
12	MCM68 Pty Ltd
13	Privately Owned
14	Privately Owned
15	Privately Owned
16	Hanson Construction Materials
17	Privately Owned
18	Privately Owned
19	Privately Owned
20	Privately Owned
21	Privately Owned
22	Privately Owned
23	Privately Owned
24	Privately Owned
25	Privately Owned
26	Privately Owned
27	Privately Owned
28	Privately Owned
29	Esential Energy
30	Privately Owned
31	Kingscoast Subdivision
32	TUNFALL PTY LTD...
33	Australian Bay Lobster Producers Ltd
34	Cudgen Land Pty Ltd
35	Roads and Traffic Authority of NSW

REFERENCE
- Quarry Site Boundary
- Approved Extraction Site Boundary
- Proposed Extraction Area Boundary
- Proposed Southern Processing Area
- Proposed Northern Processing Area
- Cadastral Boundary
- Building/ Residence
- Residential Area - Numerous Buildings/Residences
- Approved Subdivision
- Proposed Western Access

Figure 2.3
SURROUNDING LAND OWNERSHIP AND RESIDENCES

The report generally follows the format and content requirements identified in the *Annual Review Guideline* dated October 2015 and the approval and licencing requirements, as applicable for the reporting period.

2.3 Key Personnel Contact Details

The key personnel contact names, position and phone numbers during the reporting period are as follows.

Name	Company	Position	24 Hour Contact
Brad Holloway	Kingscliff Sands	Operations Manager	0449 965 772
Nick Gould	Kingscliff Sands	Production Manager	0432 762 595
Stephen Segal	Gales-Kingscliff	Director	0414 322 455

3. Approvals

The Quarry operates in accordance with the approvals listed in **Table 3.1**.

Table 3.1
Cudgen Lakes Sand Quarry – Consents, Leases and Licences

Consent/Lease/Licence	Issue Date	Expiry Date	Details / Comments
Project Approval MP05_0103B[1]	16/06/2009 MOD1 – 19/02/2016 MOD2 – 22/01/2019	31/12/2047	Issued by the (then) Department of Planning.
Environment Protection Licence 12385[1]	18/11/2005 (licence version dated 09/02/2024)	Not Applicable	Issued by NSW Environment Protection Authority (EPA). Renewed annually.
Water Access Licence 40902	09/11/2016	Not Applicable	Issued by Water NSW. Includes 700ML water allocation. Nominated works 30CA321269.
Water Supply Works and Use Approval 30CA321269	01/07/2016	28/02/2031	Issued by Water NSW at commencement of *Water Sharing Plan for the North Coast Coastal Sands Groundwater Sources 2016*.
DA 05/1450	18/08/2006	Not Applicable	Issued by Tweed Shire Council for the realignment of Altona Road.
DA 20/0965[2]	12/05/2021	Not Applicable	Issued by Tweed Shire Council for filling of land within Lot 21 DP1082482.

[1] A compliance review is included in **Appendix 1** reflecting the conditions relevant as at the end of this reporting period.

[2] Activities associated with DA 20/0965 and DA22/0145 are not directly related to the Quarry and will be managed separately to activities undertaken under Project Approval MP05_0103B.

There were no modifications or variations to any approvals or licences during the reporting period. However, a modification application (MOD4) for Project Approval MP05_0103B was submitted on 26 of June 2025 and is further discussed in Section 4.3.

It is noted that initial discussions with the Natural Resources Access Regulator (NRAR) in 2019 indicate that the Water Supply Works and Use Approval may have been issued in error. This is supported by the fact that, as the Quarry is a State Significant Development, Section 4.41 of the *Environmental Planning and Assessment Act 1979* states that a water use approval or water management work approval under the *Water Management Act 2000* is not required. Notwithstanding, the Water Access Licence and associated water allocation remain valid and are required for the ongoing operations.

4. Operations Summary

4.1 Extraction Operations

During the reporting period extraction activities focused upon sand recovery through dredging. Dredging was undertaken on a total of 172 days during the reporting period. A total of approximately[1] 178,044m^3 of sand was extracted during the reporting period. **Table 4.1** provides the production summary.

Table 4.1
Production Summary

Material	Approved limit (specify source)	Previous reporting period (actual)	This reporting period (actual)	Next reporting period (forecast)
Waste Rock / Overburden[1]	NA	0	0	0
ROM[1]	NA	0	0	0
Coarse Reject[2#]	NA	3,535m^3	3,561m^3	4,000m^3
Fine Reject [2^]	NA	5,303m^3	5,341m^3	6,000m^3
Saleable Product (transported by road)	300,000t [MP05_0103B *Condition 2(9)*]	264,409t	267,066t	300,000t
Total Extraction	650,000m^3 [MP05_0103B *Condition 2(8)*]	176,773m^3	178,044m^3	200,000m^3
Imported VENM	45,000t [MP05_0103B *Condition 2(10)*]	0	0	0

1. The Quarry does not generate waste rock / overburden or 'Run of Mine' material.
2. Whilst some coarse materials and fines will be generated through sand washing, there are no approval limits applicable to these materials. It is also noted that the coarse reject comprises shells which are considered a raw material / product.

\# Estimate based upon average of 2% of raw material comprising shells (stockpiled as a raw material).

^ Estimate based upon average of 3% silt content washed and returned to the Silt Retention Pond.

4.2 Processing and Road Transportation

During the reporting period Gales-Kingscliff maintained the use of the previously installed CDE sand wash plant, EvoWash, and radial stacker. All dredged sand, i.e. a total of approximately 178,044m^3 of sand was processed through the wash plant during the reporting period.

During the reporting period a total of 267,066t of products were transported from the Quarry by road. The highest daily number of truck loads occurred on 24 June 2025 with 82 laden-trucks dispatched, however, truck transport was highly variable, with an average of 23 truck loads per day being dispatched during the reporting period.

[1] Bulk density testing indicates a loose density of 1.36t/m^3 and 'tight' (in-situ) density of 1.5t/m^3. Extraction volumes are based upon conversion of measured tonnes to in-situ volume.

4.3 Other Operations During the Reporting Period

The status of the Quarry at the end of the reporting period is presented in **Figure 4.1** and a summary of other Quarry related activities during the reporting period provided as follows.

- The extension of water management bunding was completed around the extraction area north of Altona Road.
- The fixed wash plant was maintained, including regular checks of machinery, including the dredge and loader, and services, and maintenance of the electrical switch board.
- An existing loader was replaced with a current more efficient model.
- Planting of vegetation along the eastern and southern boundary of the current northern extraction pond was undertaken to trial rehabilitation establishment (further discussed in Section 8).
- Continued maintenance of surface water control and drainage structures, including maintenance of the channel providing water from the dredge pond to the wash plant.
- Continued environmental monitoring, including noise, air quality, and water monitoring. Results of this monitoring are summarised in Sections 6 and 7.
- Replacement of fencing along the northern and southern boundaries of the northern extraction area due to damage caused by grazing.
- Vegetation maintenance around the site office and entrance to the processing area including weed spraying and whipper snipping and slashing/grazing of the southern section of the Quarry Site.
- The Groundwater Assessment prepared by Australasian Groundwater and Environmental Consultants Pty Ltd and submitted to address Project Approval MP05_0103B Schedule 3 Condition 25 was approved 18 December 2024.
- An updated version of the Soil and Water Management Plan (SWMP), originally submitted December 2023, was submitted in January 2025 and resubmitted in May 2025 addressing agency comments. The updated SWMP was approved 23 September 2025.
- An updated version of the Air Quality Management Plan (AQMP) was submitted January 2025 and was approved on 6 June 2025.

A modification application, MOD4, was also submitted during the reporting period. Key components of the proposed modification include the following.

- Realignment of the northern section of the Extraction Area from east to west to permit the realisation of final land uses in the eastern section of the Quarry Site at an earlier date.
- Expansion of the existing 1ha processing area to approximately 3.3ha to provide sufficient space for a stockpile of washed sand and stockpiling of multiple products whilst maintaining quality control. This would include extension / relocation of the existing amenity bunding to the extent of the expanded processing area.

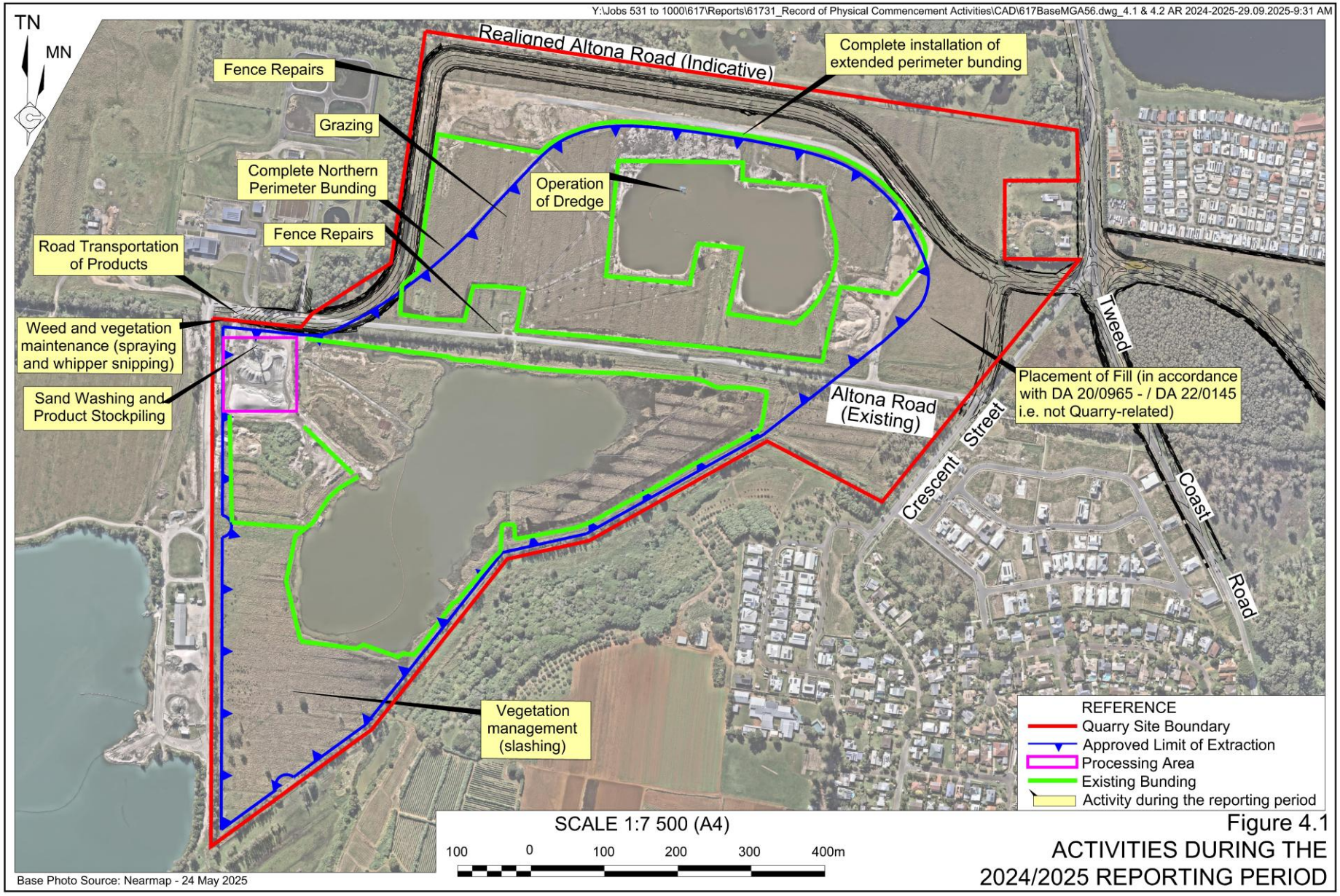


Figure 4.1
ACTIVITIES DURING THE 2024/2025 REPORTING PERIOD

- Construction and operation of a 2.25ha northern processing area to the north of Altona Road.
- Increase the rate of road transportation from 300,000tpa to 500,000tpa.
- Increase the rate of material importation from 45,000tpa to 150,000tpa.
- Increase road transportation limits with an additional 30 laden trucks per hour via the eastern, widened access from Altona Road only.
- Various proposed updates to the Statement of Commitments.

Depending on the approval status of MOD4, components of the above may commence during the next reporting period.

Non-Quarry related operations north of Altona Road also continued in accordance with the Council Development Consent DA20/0965 and DA22/0145.

4.4 Next Reporting Period

Activities planned to be undertaken during the next reporting period are summarised as follows and displayed on **Figure 4.2**.

Extraction, Processing and Transportation

Extraction will continue during the next reporting period by both dredge and, if required, excavator/front-end loader for the production of saleable products, including sand and soil products. These products will be transported via road. The volume of products will be dependent upon customer demand but has nominally been estimated at (but would not exceed, unless MOD4 application approval allows) 300,000t (approximately 200,000m^3). Based on the predicted volumes, extraction would extend further north towards the approved northern limit of extraction and, subject to approval of the proposed MOD4 application, extraction towards the proposed eastern limit.

Further dredging for hydraulic transfer of sand to fill sites is considered unlikely during the next reporting period.

Monitoring

Noise and water monitoring will continue to be undertaken as applicable and in accordance with the conditional requirements of Project Approval MP05_0103B and the approved management plans. Acid sulfate soil testing will also be undertaken as required for any products which are not washed through the wash plant. As dry processing operations are not anticipated, deposited dust monitoring is not expected to be required (in accordance with the updated AQMP approved in June 2025).

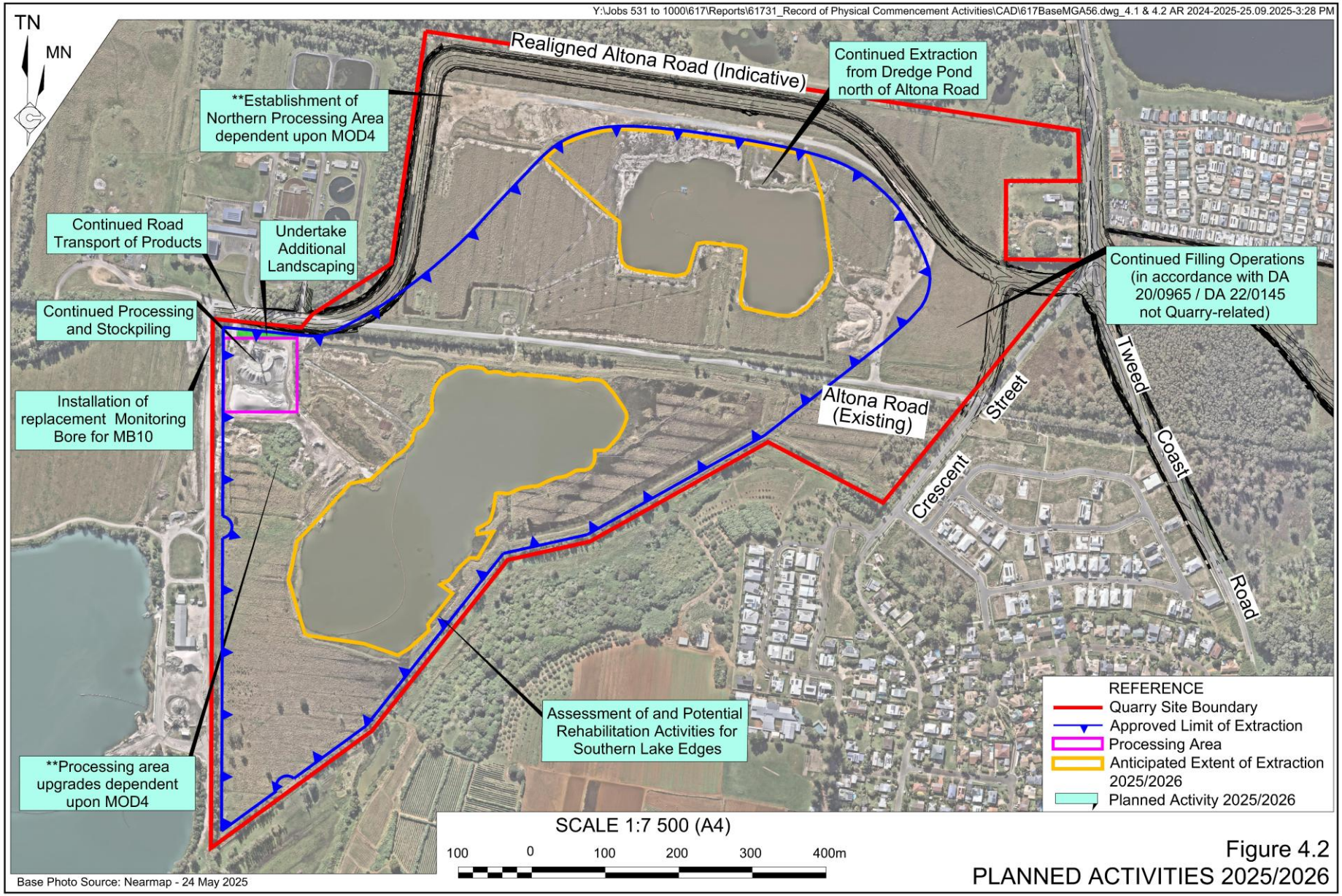


Figure 4.2
PLANNED ACTIVITIES 2025/2026

5. Actions Required from Previous Annual Review

The 2023/2024 Annual Review was submitted to DPHI via the Major Project Portal on 30 September 2024. A copy of the 2023/2024 Annual Review was also separately emailed to Tweed Shire Council, Water NSW, NRAR, and EPA. The 2023/2024 Annual Review was receipted by DPE on 30 September 2024 and accepted 18 October 2024. Specific follow up actions were provided and included the following.

1. *Schedule 5, Condition 13b: requires that the Annual Review include a comprehensive review of the monitoring results and complaints records of the project over the previous financial year, which includes a comparison of these results against the relevant predictions in the documents listed in condition 3 of Schedule 2. NSW Planning notes that while Table A of the Annual Review states that "The works completed during the reporting period are considered to be generally consistent these documents", NSW Planning does not consider this to be a comprehensive review of the monitoring results against the documents listed in Condition 3 of Schedule 2 of the Approval.*

   NSW Planning requests that future Annual Reviews provide a comprehensive review of the monitoring results over the previous financial year, which includes a comparison of these results against the documents listed in Condition 3 of Schedule 2 of the Approval.

2. *Schedule 5, Condition 13 (c): requires that the Annual Review detail any non-compliance over the past financial year, and describe what actions were (or are being) taken to rectify the non-compliance and avoid reoccurrence. NSW Planning notes that the Annual Review identified non-compliances with Schedule 5, Conditions 9 and 10 of the Approval (incident notification and reporting), as up to approximately 27 water exceedances had not been reported to NSW Planning in accordance with these conditions. The water exceedances identified in the Annual Review do not provide relevant information such as the dates, time and monitoring results of each of the exceedances.*

   NSW Planning cannot determine whether the incident report submitted by the Project via the Major Projects Portal (ref: MP05_0103B-PA-17) identifies all the relevant water quality-related non-compliances identified in the Annual Review and will investigate this matter further. NSW Planning requests that future Annual Reviews provide the required information for each non-compliance of the Approval.

DPHI also requested the 2023/2024 Annual Review be published on the Company's website.

A comparison of the monitoring results against the monitoring results of previous years and against the predictions in previous assessments supporting MP05_0103B has been included against each environmental aspects in Sections 6 and 7.

Section 11 provides additional information in relation to all non-compliances and incident reports submitted during the reporting period.

6. Environmental Performance

6.1 Summary of Environmental Performance

A summary of environmental performance for the principal environmental aspects is provided in **Table 6.1**. Further detail regarding specific environmental aspects is also provided in the following subsections. Environmental performance relating to water is discussed in Section 7.

Table 6.1
Environmental performance

Aspect	Approval criteria / EIS prediction	Performance during the reporting period	Trend/key management implications	Implemented/proposed management actions
Noise	47dB(A) day & evening. 44dB(A) shoulder.	No complaints were received. Calculated noise contributions from the Quarry were below the project-specific noise criteria during operational periods.	No trends identifiable. Currently no management implications.	No other specific management measures were required during the reporting period.
Blasting	Blasting is not an approved activity.	No blasting undertaken.	Nil.	Nil.
Air Quality	PM_{10} 24hr = 50ug/m^3 PM_{10} Annual = 30ug/m^3 TSP Annual = 90ug/m^3 Dep Dust Annual = 4g/m^2/month	No complaints were received. Rolling annual average exceeded annual criteria at DG3 on four occasions, however, elevated dust was not a result of Quarry activities.	No trends identifiable. Currently no management implications.	No other specific management measures currently proposed.
Biodiversity	Establish rehabilitation bond. No significant impacts predicted.	No native vegetation was disturbed.	No trends applicable. Currently no management implications.	An updated rehabilitation bond calculation was approved by DPHI on 18 June 2024 for $340,263. A rehabilitation bond of $250,000 is also held by the (then) Department of Primary Industries – Water.
Heritage	Prepare Aboriginal Cultural Heritage Management Plan. No items of heritage have been located.	No heritage items were identified or disturbed.	No trends applicable. Currently no management implications.	No further specific management measures currently proposed.
Acid Sulfate Soils	Manage acid sulfate soils in accordance with an Acid Sulfate Soil Management Plan.	No acid sulfate soil issues were identified. No unwashed sand was produced during the reporting period.	No acid generation potential has been identified in topsoil (upper 250mm of soil). Topsoil is not considered an acid sulfate soil risk. Revised management measures outlined in updated management plan approved 20 July 2021.	Implementation of Acid Sulfate Soil Management Plan.

6.2 Meteorological Monitoring

Meteorological monitoring is undertaken utilising an on-site automatic rain gauge (installed 1 January 2017) and the Bureau of Meteorology's Tweed Heads Golf Course Station 58056 and Coolangatta Station 040717. A summary of the rainfall data during the reporting period is presented in **Table 6.2** whilst monthly wind roses are presented in **Figures 6.1a** and **6.1b**.

Table 6.2
Monthly Rainfall Records

	Total Monthly Rainfall (mm)												
Period	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	**Total**
2017	154.2	67.0	404.6	41.2	141.0	192.8	34.8	4.2	0.0	176.6	195.2	72.8	1484.4
2018	70.8	308.0	211.4	93.0	63.0	73.0	35.4	52.0	92.6	189.4	36.2	91.6	1316.4
2019	10.0	88.2	323.0	148.8	67.8	125.6	17.4	13.8	9.0	35.8	40.6	81.6	961.6
2020	281.2	953.0	276.6	44.4	108.0	81.2	214.2	20.0	42.8	137.2	18.2	558.0	2734.8
2021	159.2	210.6	781.2	238.6	107.8	56.2	141.0	19.4	53.8	215.2	182.0	248.0	2413.0
2022	226.0	614.8	592.0	175.0	316.8	15.0	190.4	30.4	217.2	251.8	40.6	169.8	2839.8
2023	97.0	194.2	93.0	75.6	214.2	13.2	58.6	21.4	35.8	68.0	306.2	136.2	1313.4
2024	393.0	162.8	255.2	261.6	255.0	14.4	154.4	***174.0***	***108.8***	***221.0***	***408.0***	***376.6***	2784.8
2025	***393.2***	***156.8***	***806.4***	***191.8***	***223.2***	***98.0***	***120.8***						
Bold italics = values relevant to this reporting period.													

Total rainfall during the 2024/2025 reporting year was 3,278.6mm, 1,567.6mm above the long-term average rainfall of 1711.0mm recorded at the Tweed Heads Gold Club Station No. 58056. The month with the lowest recorded rainfall was June 2025 with 98.0mm, while the month with the highest rainfall was March 2025 with 806.4mm.

Wind direction during the reporting period was broadly consistent with typical local patterns, with winds predominately from the south and southwest for most months. A northerly component was more pronounced in the late winter through early summer, notably September 2024 and January to March 2025. Calm conditions varied during the reporting period, ranging from approximately 6.5% (July 2024) to about 1.5% (February 2025), with relatively higher calm percentages observed in July 2024 and May to June 2025.

6.3 Noise

Environmental Management

Noise management was undertaken in accordance with the approved Noise Management Plan as relevant. The principal noise management measures during the reporting period included the use of broadband reversing alarms, proper equipment maintenance, and adherence to operational hours. The impact assessment considered both the established impact assessment criteria and the cumulative noise criteria.

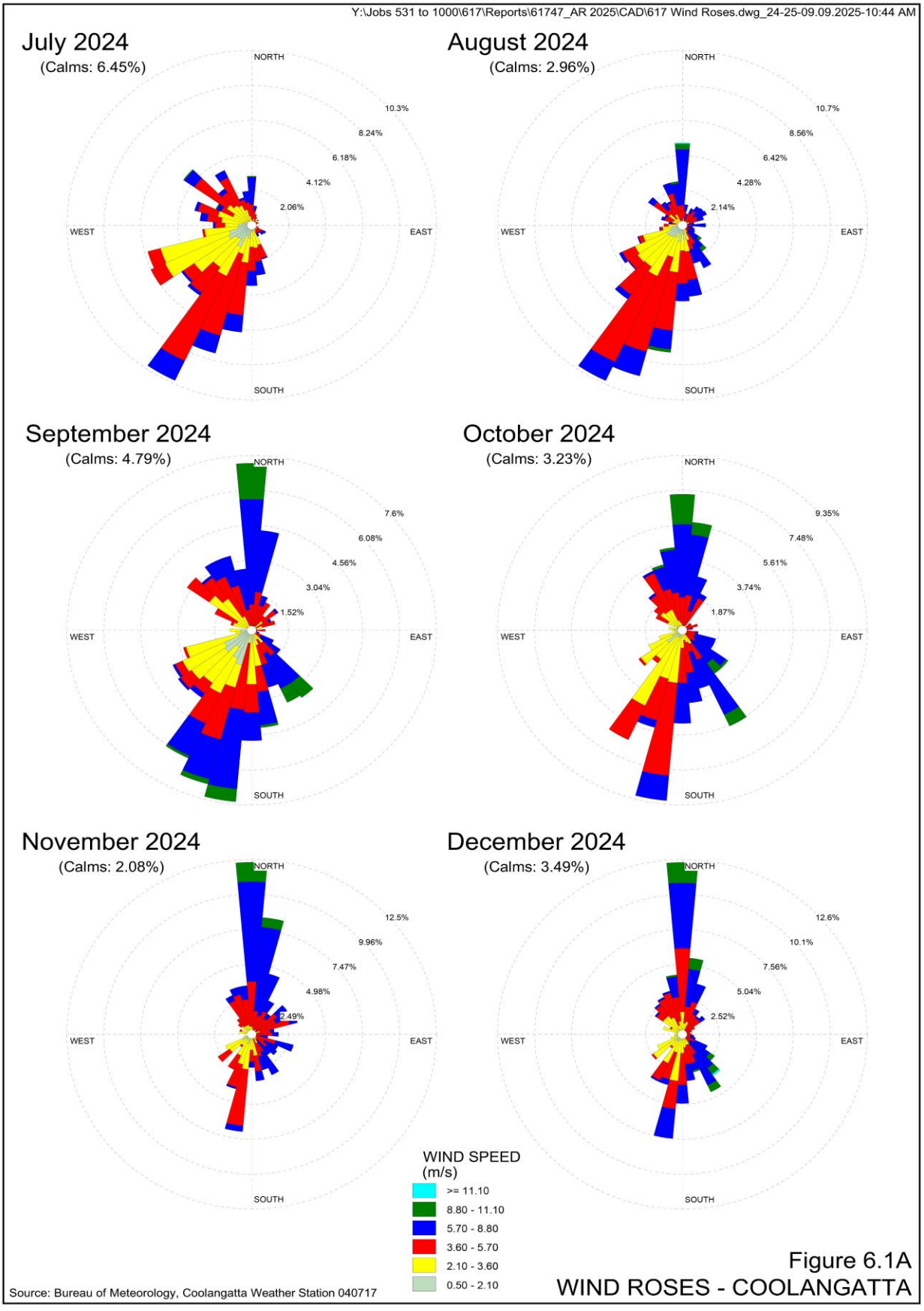


Figure 6.1A
WIND ROSES - COOLANGATTA

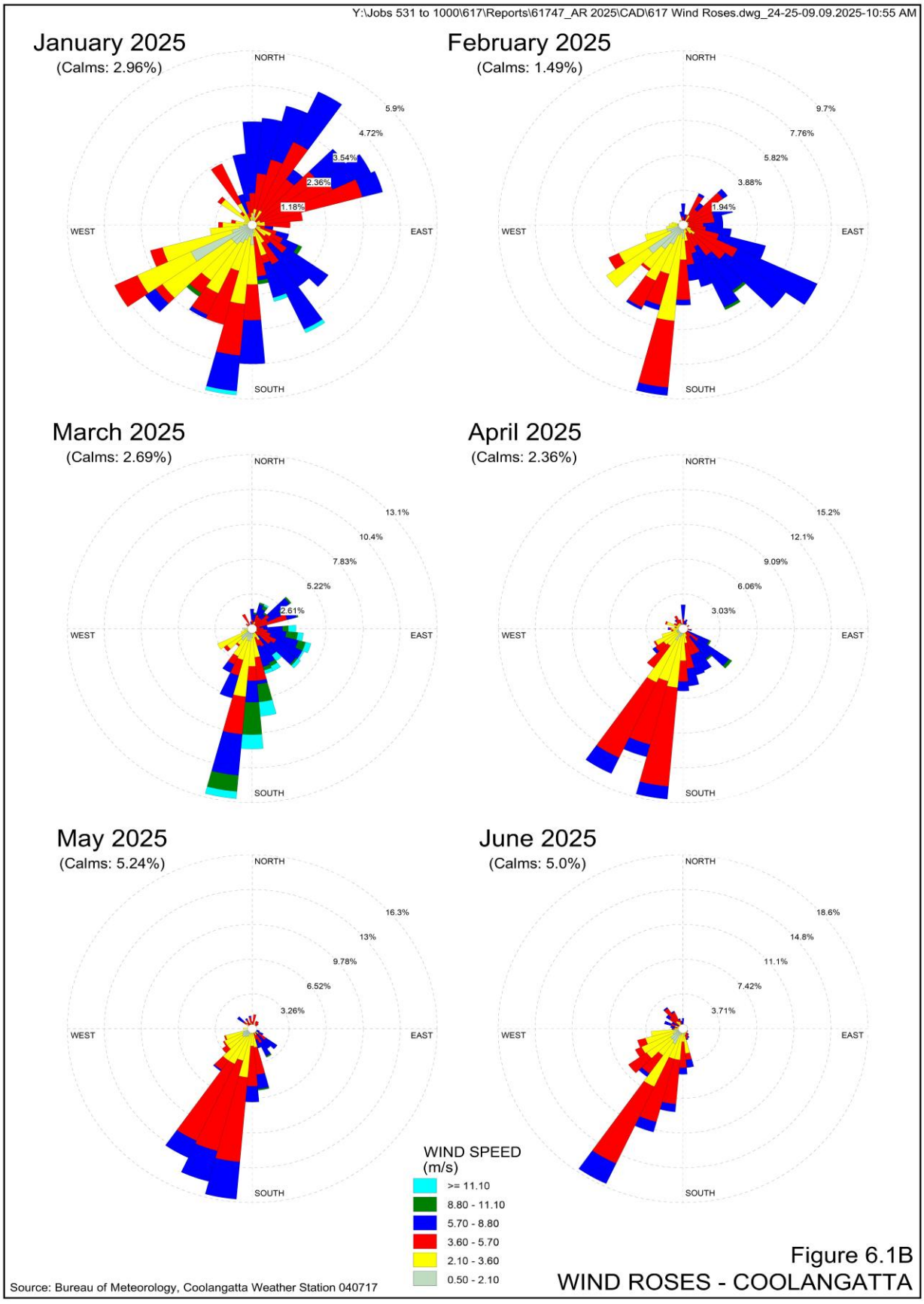


Figure 6.1B
WIND ROSES - COOLANGATTA

Environmental Performance

During the reporting period noise monitoring was undertaken annually in accordance with the approved Noise Management Plan. Noise monitoring was undertaken 20 December 2024.A summary of the monitoring results for the reporting period is provided in **Table 6.3** and a copy of the monitoring report is provided as **Appendix 2**.

Table 6.3
Summary of Attended Noise Monitoring Results (December 2024)

Location[1]	Maximum Predicted Contribution[2]	Criteria	Attended Monitoring	Calculated Contribution[3]	Comments
	dB(A) $LA_{eq(15\ min)}$				
G *216 Tweed Coast Rd*	46.4	47	45	41	Noise from other sources such as traffic noise from Tweed Coast Road dominated background. Noise from operations not measurable / distinguishable above background.
O *607 Cudgen Rd*	37.5	47	47	44	Noise from other sources such as traffic noise from Pacific Highway dominated background. Noise from operations not audible or measurable above background.
Pacific Views Estate *Via Collier St*	45.5	47	49	45	Noise from other sources such as traffic noise from Pacific Highway dominated background. Noise from operations not audible or measurable above background
DD *34A Crescent St*	44.2	47	47	32	Noise from other sources such as traffic noise from Tweed Coast Road dominated background. Noise from operations not audible or measurable / distinguishable above background.
F *64 John Robb Way*	41.4	47	47	30	Noise from other sources such as traffic noise from Tweed Coast Road dominated background. Noise from operations not audible / distinguishable above background.

Note 1: See **Figure 7.1**.

Note 2: Maximum predicted Quarry noise under adverse weather conditions (Rumble, 2008). Pacific Views Estate formerly Location B.

Note 3: Based on measurements of noise at 20m from operational equipment plus distance attenuation for receivers.

Source: Craig Hill Acoustics – Modified after Tables 7.1 and 8.1.

In summary, total noise levels at all monitoring locations equalled or exceeded the project-specific criteria (47dB(A) $LA_{eq(15\ min)}$) during monitoring, except at Location G, which recorded a value of 45dB(A) $LA_{eq(15\ min)}$. However, noise from the Cudgen Lakes Sand Quarry could not be isolated and, in most cases, was not distinguishable or measurable due to the continuous nature of the surrounding noise sources (e.g. traffic noise from Pacific Highway and Tweed Coast Road). As a result, Quarry specific noise levels could not be measured through direct monitoring at the specified monitoring locations.

In order to assess compliance and in accordance with the approved NMP, near-field measurements of noise generated by equipment operating at the Quarry were undertaken. The contribution of each item was then calculated using attenuation associated with the distance of equipment from monitoring locations and then combined to provide a total calculated noise contribution from the Quarry.

The calculated contributions were all below the project-specific noise criteria, with the highest contribution calculated as 45dB(A) at the Pacific Views Estate monitoring location.

No Quarry-related noise complaints or enquiries were received during the reporting period. Calculations of the measured noise levels from the operating equipment on-site suggest that the operations would remain within the 47LAeq criteria and are unlikely to significantly contribute to the 50LAeq cumulative criteria. Additionally, an analysis of pre-project data reveals that the ambient LAeq levels during the day and evening rarely fall below the project's design thresholds, complicating the process of identifying compliance.

A summary of previous noise monitoring results is presented in Table 8.1 of **Appendix 2**. In summary, noise monitoring within the reporting period was considered to be generally consistent with previous monitoring results.

A review of the noise monitoring results during the reporting period against the predicted noise levels identified in the original 2008 Environmental Assessment for the Quarry indicates that the Quarry is currently operating under below the maximum predicted noise levels for the operational status except for Location O. It should be noted that the calculated contribution does not take into account additional attenuation (such as ground absorption) that is accounted for within quantitative noise models.

As noise monitoring result indicate a pattern generally consistent with previous monitoring data and predicted levels, it is considered that the current noise management practices for the Quarry have remained effective.

Reportable Incidents and Further Improvements

No exceedances of noise criteria were recorded and currently no further improvements are planned.

6.4 Air Quality

Environmental Management

Dust management measures are implemented in accordance with the approved AQMP. During the reporting period the principal dust management measure was ongoing visual monitoring and, if required, use of sprinklers to dampen the road surfaces and stockpiles within the processing area, use of a rumble grid and wheel wash to remove sand from truck tyres and sweeping of any materials that are tracked onto Altona Road.

Sand is principally extracted through dredging and is wet processed. Where soil and sand were extracted / recovered from stockpiles by excavator, the material was moist and only transported a short distance. As weather conditions were generally extremely wet throughout the reporting period the need for water application was extremely limited.

Environmental Performance

The results of deposited dust monitoring at three locations (see **Figure 7.1**) during the reporting period are presented in **Table 6.4** whilst the results of all deposited dust monitoring undertaken to date are provided in **Appendix 3**. It is noted that, following approval of the updated Air Quality Management Plan (AQMP), deposited dust monitoring for the Quarry has been ceased. The approved AQMP specifies that deposited dust monitoring is not required except during dry processing operations. As the Quarry is currently operating exclusively under wet processing, the monitoring program was suspended.

Table 6.4
Summary of Deposited Dust Monitoring Results – 2024/2025

Samples On	Samples Off	Month	Deposited Dust (g/m²/month)					
			DG1		DG2		DG3	
			Insoluble Matter	Rolling Annual Average	Insoluble Matter	Rolling Annual Average	Insoluble Matter	Rolling Annual Average
26/06/2024	23/07/2024	Jul-24	0.77	2.60	0.67	3.11	0.45	1.97
23/07/2024	23/08/2024	Aug-24	0.98	2.66	0.67	2.95	9.69	3.02
23/08/2024	24/09/2024	Sep-24	0.16	2.66	0.26	2.34	*194	NS
24/09/2024	23/10/2024	Oct-24	NT	NT	NT	NT	9.0	**4.12**
23/10/2024	24/11/2024	Nov-24	5.70	2.95	1.20	1.64	11	**4.98**
24/11/2024	21/12/2024	Dec-24	NS	NS	NS	NS	NS	NS
21/12/2024	21/01/2025	Jan-25	NS	NS	NS	NS	NS	NS
21/01/2025	21/02/2025	Feb-25	0.18	1.82	0.63	0.78	0.64	**4.68**
21/02/2025	21/03/2025	Mar-25	NT	NT	NT	NT	NT	NT
21/03/2025	23/04/2025	Apr-25	0.48	1.71	13.0	2.62	0.18	**4.87**
23/04/2025	21/05/2025	May-25	0.80	1.60	8.8	3.39	NT	NT
Monthly Minimum			**0.16**	**-**	**0.26**	**-**	**0.18**	**-**
Monthly Maximum			**5.70**	**-**	**13.0**	**-**	**9.69**	**-**
Average 2024/2025			**1.30**		**3.60**		**5.16**	**-**

NT – Not Tested (sample broken in transit)
NS – No sample collected due to miscommunication with monitoring consultant.
** Sample contaminated and not included in statistical summary*

Samples collected from monitoring locations DG1 and DG2 in October 2024, DG3 in May 2025 and from all monitoring locations in March 2025 were broken in transit and could not be analysed. For the months of December 2024 and January 2025 samples were not collected due to a miscommunication between site and the monitoring consultants HMC. This was reported as a non-compliance and is discussed further below and in Section 11.

During the reporting period monthly deposited dust levels ranged from 0.16g/m^2/month to 13.0g/m^2/month and averaged between 1.30g/m^2/month (at DG1) to 5.16g/m^2/month (at DG3). Elevated levels were regularly recorded at location DG3, including the sample for September which was contaminated with extremely high levels of organic matter (194g/m^2/month) and therefore excluded from the statistical summary. As a result of continuing high levels of organic matter the rolling average monthly deposited dust levels at location DG3 exceeded the criteria of 4g/m^2/month from October 2024. These exceedances were investigated and incident reports provided to DPHI confirming that the exceedances were not the result of Quarry activities. This was concluded on the following basis.

- DG3 has previously recorded extremely high levels of contamination with organic matter (51.08g/m^2/month July 2023, 67.9g/m^2/month November 2023, and 65.0g/m^2/month January 2024).
- The Quarry was operating as a wet dredging and processing operation, producing sand products and as a result is unlikely to generate significant quantities of dust.
- The Tweed area experienced above average rainfall during the reporting period, nearly double the annual average (see Section 6.2).

- DG3 is located a considerable distance (~1km) from Quarry activities that could generate dust (i.e. the processing area). DG1 is located a similar direction and slightly closer distance from the processing area and does not reflect similar spikes in total insoluble solids.

Contamination with organic matter has been an issue across all dust gauges since monitoring commenced. Due to the extremely flat nature of the surrounding area there are no suitable locations available to place the gauges that are not exposed to organic inputs from time to time.

To demonstrate the level of contamination by organic matter samples collected in May 2025 were also tested for ash content. Ash content provides an indication of the non-organic content. The ash content for DG1 was 0.6g/m^2/month (compared with total insoluble solids of 0.8g/m^2/month) and for DG2 <0.1g/m^2/month (compared with total insoluble solids of 8.8g/m^2/month). As noted in **Table 6.4**, the bottle for DG3 was broken in transit and could not be analysed. The results demonstrate that, when elevated dust levels are recorded, the principal cause is organic material (i.e. not dust from the Quarry).

No air quality complaints were received during the reporting period.

Historic air quality monitoring results are presented as **Appendix 3**. A review of the results for the reporting period against data for previous periods indicate that the rolling annual average at DG1 is slightly greater than previous periods, and at DG2 showed a decline before returning to previous trend values. The rolling annual average at DG3 recorded a shallow rise during 2023/2024 before rising steeply during the reporting period. As outlined above, these trends have been driven by organic matter.

When accounting for organic matter contributions, air quality monitoring results during the reporting period are considered to be generally consistent with the predicted deposited dust levels identified in the original 2008 Environmental Assessment for the Quarry (which ranged from 1.6 to 2.8g/m^2/month). It is therefore considered that the air quality management systems currently in place at the Quarry remain effective.

Reportable Incidents and Further Improvements

During the reporting period incident reports were submitted for the exceedances of the annual average deposited dust criteria. These were reported consistent with the Trigger Action Response Plan (TARP) outlined within the (then) approved 2020 AQMP. As the Quarry was determined not to be the cause of the elevated results further actions for dust mitigation were not required.

An incident report was also submitted to report a non-compliance resulting from the missed sample collection over December 2024/January 2025. Whilst no adverse environmental impacts were considered to have resulted, to ensure that further non-compliance does not occur, Kingscliff Sands will formally notify Gales, HMC and RWC of any plans for extended non-operational periods. In lieu of a formal notification, HMC will ensure that staff remain allocated for sample collection.

Reportable incidents during the reporting period are also discussed in Section 11.

6.5 Biodiversity

The original rehabilitation bond for $163,375 was previously lodged and accepted by the (then) DPE on 12 April 2017. In accordance with *Condition 3(35)* of MP05_0103B the rehabilitation bond was last reviewed, updated and subsequently approved by DPHI on 18 June 2024 with a bond amount of $340,263. Gales has been in regular contact with the Department regarding the additional bond amount which is currently being secured by Gales through establishment of an additional bank guarantee.

Notably, consultation with DPHI and DCCEEW Water remain ongoing in relation to an existing additional $250,000 rehabilitation bond held by DCCEEW for the Quarry which may duplicate rehabilitation provisions and is not otherwise considered in the calculation of the $340,263 bond with DPHI.

No disturbance of native vegetation was required during the reporting period and no specific biodiversity management measures, or monitoring was deemed necessary. No incidents occurred during the reporting period and no further improvements are currently planned. Ongoing informal assessment of the rehabilitation status of the Quarry Site will continue to be undertaken and, if considered sufficient advanced, formal survey may be undertaken. This will form the basis for rehabilitation planning and potential further review of the RMP and is further discussed in Section 8.

6.6 Heritage

Environmental Management

The Quarry Manager and Operations Manager for Kingscliff Sands Pty Limited were previously inducted by the Tweed Local Aboriginal Land Council on 16 March 2020 in accordance with the approved Aboriginal Cultural Heritage Management Plan. No further management measures were required during the reporting period.

Environmental Performance, Reportable Incidents, and Further Improvements

No Aboriginal heritage sites were identified during the reporting period no reportable incidents occurred. No further improvements are currently planned or deemed necessary.

6.7 Acid Sulfate Soils

Environmental Management

During the reporting period no land-based extraction of sand was undertaken / raw sand products were produced. As such, no acid sulfate soil testing was required. It is noted that testing of soil material (the upper 250mm of profile) is not required.

Environmental Performance, Reportable Incidents, and Further Improvements

No reportable acid sulfate soil incidents occurred during the reporting period. Currently no further improvements to acid sulfate soil management are planned. The results of ongoing testing will continue to be reviewed and, where appropriate, updates to the SWMP sought to rationalise testing.

6.8 Other Environmental Management Aspects

In accordance with MP05_0103B *Condition 3(40)*, a summary of waste management is also provided. As discussed in Section 4.1, it is estimated that less than 2% of the washed material was oversize and consisted almost entirely of shells. The shells have been stockpiled and are considered a raw material and is being assessed for incorporation into products. It is also estimated that on, on average, less than 3% of washed material was fines material. All fines were returned to the Silt Retention Pond to settle at depths of at least 4m below water.

In relation to non-production wastes, Council domestic general waste and recycling services are available to the site. Non-production wastes volumes are minimal and include lunch, domestic style and consumable wastes which were managed through the 240L bins provided by Council. The site portaloo continued to be serviced on an as required basis by Kingscliff Hire, a licenced service provider.

7. Water Management

7.1 Water Take

Applicable water licencing held for the Quarry operations include Water Supply Works and Use Approval 30CA321269 and Water Access Licence (WAL) 40902, which has a water share component of 700ML. The Quarry Site is located within the *Water Sharing Plan for the North Coast Coastal Sands Groundwater Sources 2016*, which commenced on 1 July 2016.

Water take during the reporting period totalled approximately 142.63ML and is estimated to be comprised of the following components.

- Extraction of 178,044m^3 sand[2] = 124.6ML.
- A 10% water loss through incorporation into products = 17.8ML.
- Water utilised for dust suppression = 0.23ML.

It is noted that total rainfall (3,278.6mm) far exceeded evaporation[3] (1,574.1mm) during the reporting period. Therefore, no additional take for evaporative losses is required to be accounted for.

As no sand was hydraulically transferred to fill sites, no tailwater losses occurred during the reporting period.

7.2 Surface Water

Environmental Management

The principal surface water management measure is bunding which has been installed around both the extraction ponds to prevent both external water from running into the extraction area and to prevent water from discharging from within the extraction area (excluding during flood events).

Further bunding around the outer perimeter of the northern dredge pond was also formed during the reporting period and was completed during the reporting period to provide for the maximum future extent of extraction north of the existing Altona Road. Stripped topsoil and disturbed areas not required for ongoing operations have previously been temporarily rehabilitated through the re-establishment of pasture grass.

Additionally, a Silt Return Pond and return channel between the processing area and pond with a pipe over 3m below the water surface has been created to provide for the effective return of fines.

No further surface water controls were required during the reporting period.

[2] Conservatively assume that 100% of sand is extracted from below the water table. As per the approved *Soil and Water Management Plan*, the volume of groundwater inflow required to replace 1m^3 of sand extracted from below the water table is conservatively estimated to be 0.7m^3 (i.e. 700L).
[3] Pan Evaporation recorded at SILO data point Chinderah Golf Course (-28.25, 153.55).

It is noted that surface water management for filling operations north of Altona Road are undertaken in accordance with Council DA 20/0965 and DA22/0145.

Environmental Performance

Water monitoring during the reporting period was undertaken within the extraction pond (north and south of existing Altona Road) and surrounding groundwater bores. Dredging operations and processing of extracted material occurred over a total of 172 days during the reporting period, with a maximum continuous operating period of 6 days.

In reviewing and interpreting the monitoring results it should be noted that the extraction pond effectively represents a 'window' into the groundwater table and is therefore interconnected with the surrounding groundwater aquifer. Results of monitoring within the surrounding groundwater monitoring bores is provided in Section 7.3.

Monitoring was undertaken at three locations within the southern lake including two edge locations (DP2 and DP3) as well as one in the approximate centre of the pond (DP1), and one monitoring location on the edge of the northern dredge pond (DP4) (see **Figure 7.1**). Monitoring at 1m or 2m depth intervals to the bottom of the extraction pond also occurs at monitoring location DP1. Depth sampling did not occur during this reporting period (refer below to 'Reportable Incidents').

A summary of the surface water monitoring results is provided in **Table 7.1** and key analytes and historical trends are displayed graphically in **Figure 7.2**. A full copy of the raw data is presented in **Appendix 4**. As no discharges occurred during the reporting period, no monitoring was undertaken at the EPL monitoring locations positioned at the extraction pond spillways (see **Figure 7.1**).

Physical Parameters and Major Cations and Anions

During the reporting period, pH levels across the monitored sites, as shown in **Figure 7.2a**, have remained relatively stable ranging between 6.9 and 8.7. The small fluctuations observed are well within expected variability. Additionally, consistent with the majority of surrounding groundwater monitoring bores, the pH within the extraction pond has largely remained slightly alkaline. The lowest pH of 6.9 was recorded at DP3 during the October 2024 sampling round. The highest pH of 8.7 was recorded at DP4 during the March 2025 sampling period.

Figure 7.2b illustrates the Electrical Conductivity (EC) across the dredge ponds at the Quarry. The analysis reveals a general decrease in EC at all sites, particularly from October 2024. This reduction is consistent across all sites and likely reflects the significant rainfall received during the reporting period. It is expected that this trend will reverse as rainfall levels return to average. Notwithstanding the decline, the recorded EC levels remain generally consistent with previous EC monitoring results since commencement of operations and remains within the water quality objectives of the SWMP.

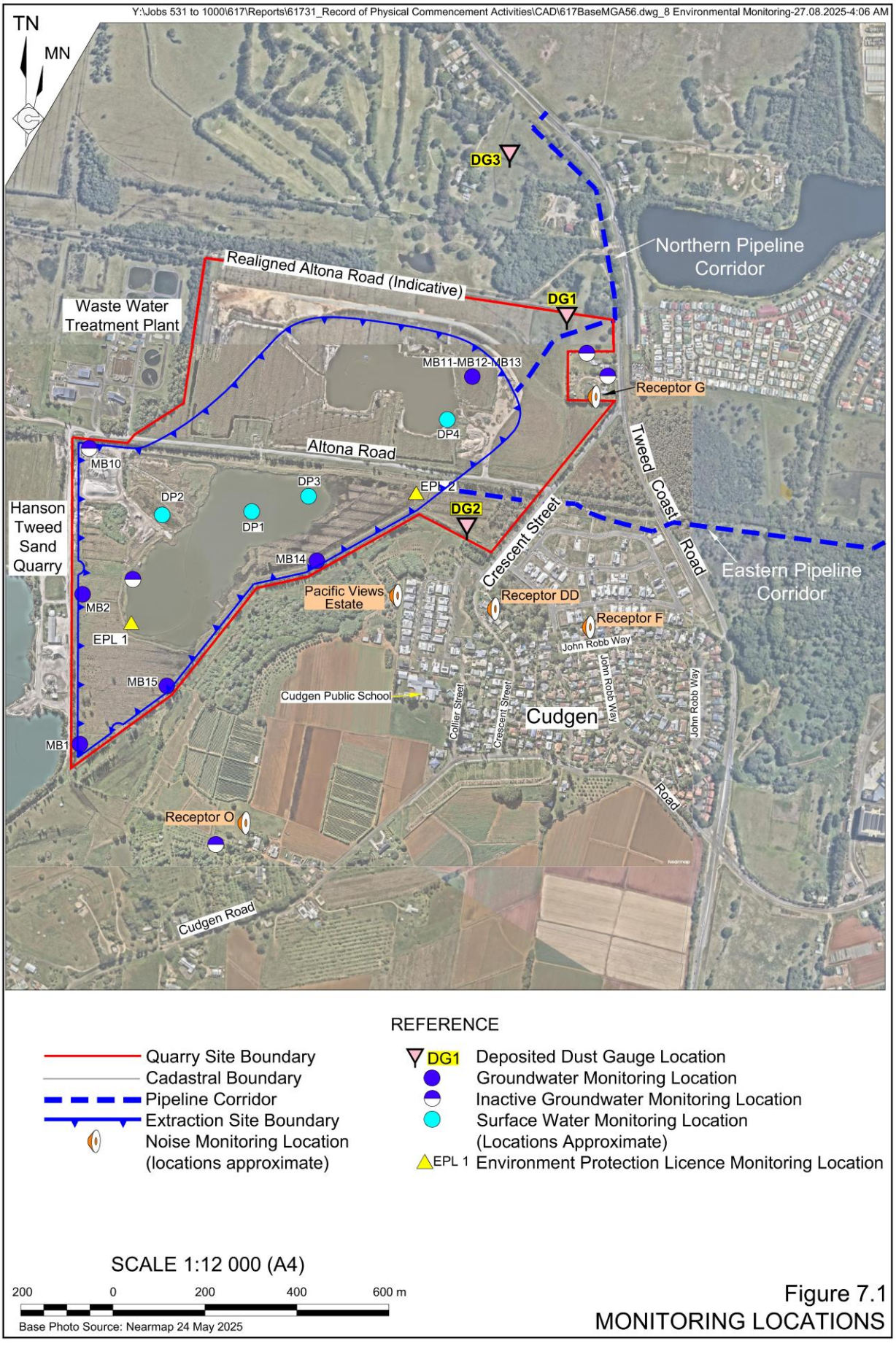
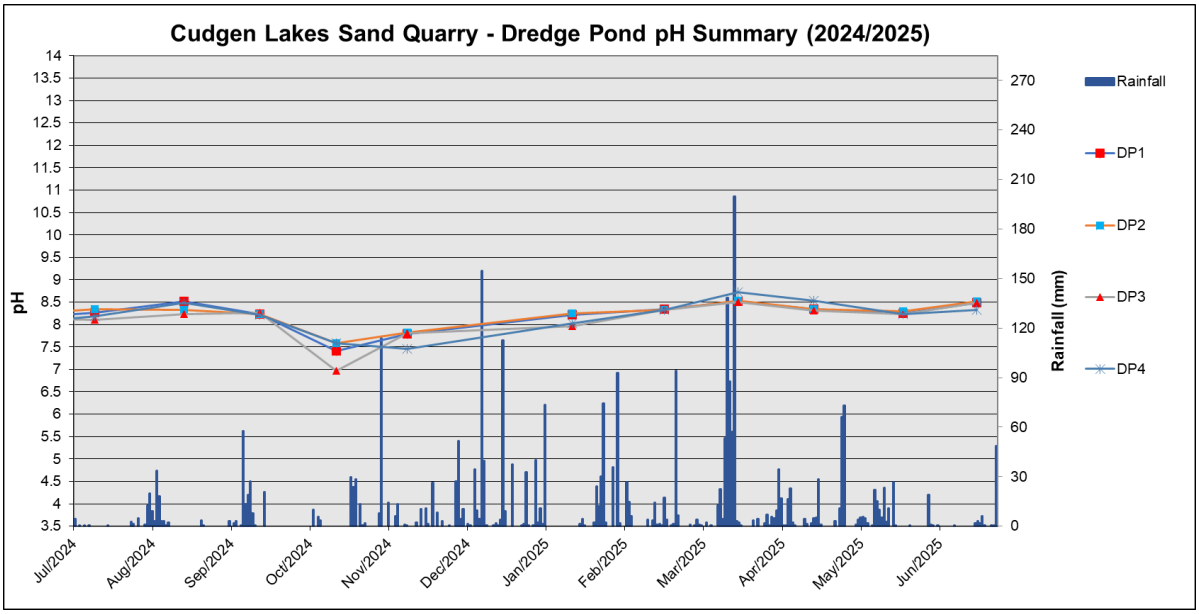


Figure 7.1
MONITORING LOCATIONS



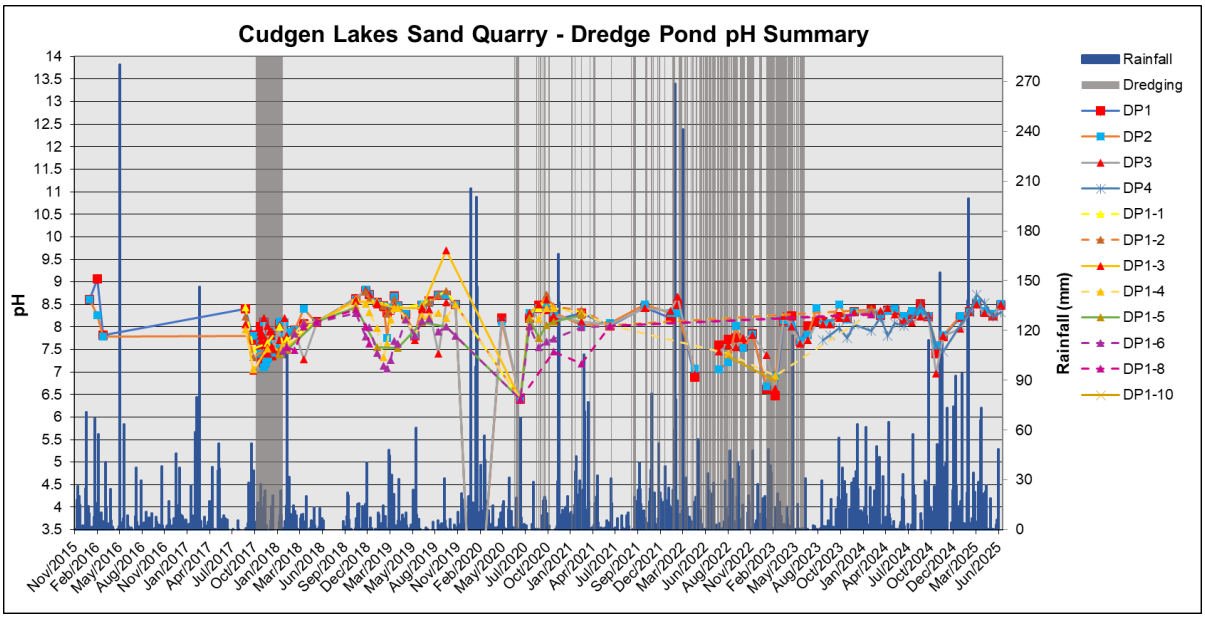
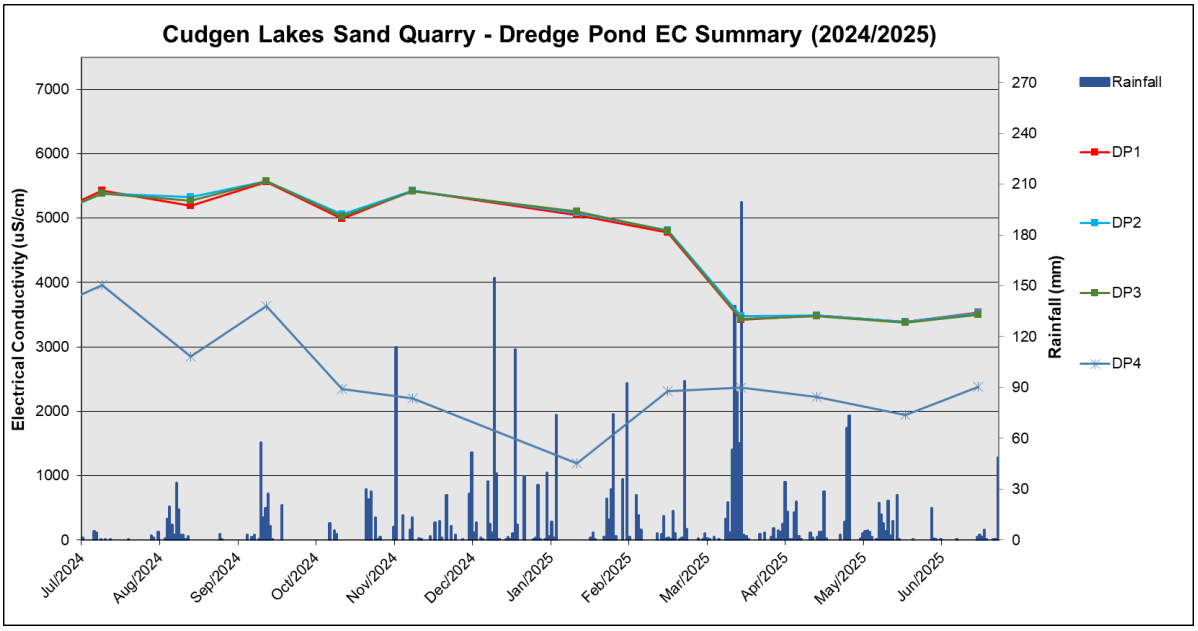


Figure 7.2a
Surface Water Quality Parameters – pH



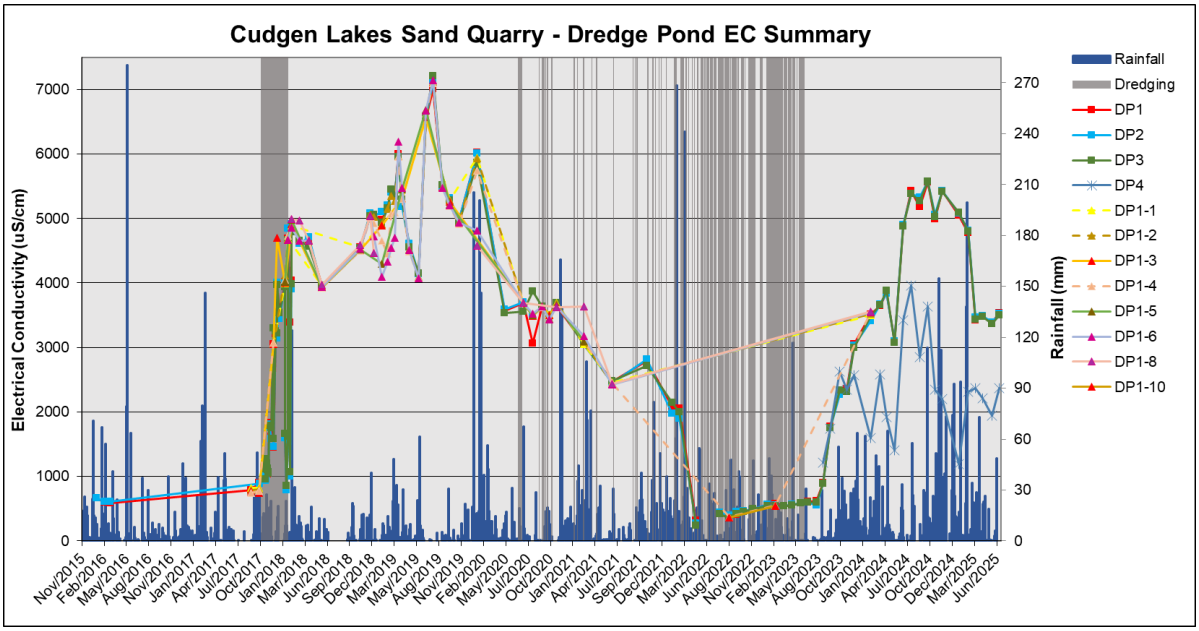


Figure 7.1b
Surface Water Quality Parameters – EC

Table 7.1
Surface Water Monitoring Data Summary

		Physical Parameters							Major Cations & Anions							Metals			Nutrients / Bacteria / Algae								
Parameters		**Temp °C**	**pH**	**Electrical Conductivity uS/cm**	**Dissolved Oxygen mol/L**	**Redox mV**	**Turbidity NTU**	**Oil & Grease mg/L**	**Sodium mg/L**	**Calcium mg/L**	**Magnesium mg/L**	**Potassium mg/L**	**Chloride mg/L**	**Sulfate mg/L**	**Bicarbonate mg/L**	**Aluminium mg/L**	**Arsenic mg/L**	**Iron (filterable) mg/L**	**Total Phosphorous mg/L**	**Reactive Phosphorous mg/L**	**Total Nitrogen mg/L**	**Nitrite mg/L**	**Nitrate mg/L**	**TKN mg/L**	**Ammonia mg/L**	**NOx mg/L**	**Potentially Toxic Cyanobacteria**	**Chlorophyll a**
Objectives		*-*	*6.5-9.0*	*<6192*	*>6*	*-*	*5-20*	*10*	*<813*	*-*	*<119*	*<40*	*<1390*	*<800*	*<400*	*<0.5*	*<0.42*	*<20*	*-*	*-*	*-*	*-*	*-*	*-*	*<20*	*-*	*<50000*	*<10*
DP1																												
Pre-Extraction	**Average**	26.6	8.27	717	6.78	108.0	**44.4**	4	85	30	14	8	148	27	85	0.093	0.001	0.03	0.042	0.017	0.82	0.01	0.03	0.82	0.02	0.02	5	6
	Maximum	28.3	**9.07**	901	9.24	192.0	**156.0**	5	132	46	21	8	236	57	130	0.190	0.002	0.07	0.090	0.020	1.10	0.01	0.03	1.10	0.02	0.03	5	10
	Minimum	24.5	7.71	591	**5.87**	48.7	**0.9**	2	64	24	11	7	110	14	57	0.030	0.001	0.01	0.010	0.010	0.50	0.01	0.02	0.50	0.01	0.02	5	2
Reporting Period (2024/2025)	**Average**	23.5	8.21	4569	6.79	-116.6	8.1	0.0	635	121	98	24	1225	315	164	0.01	0.001	0.05	0.03	0.00	0.50	0.02	0.01	0.49	0.02	0.05	2707	6
	Maximum	28.2	8.51	5566	9.66	119.5	**31.0**	0.0	771	139	118	28	1380	371	189	0.01	0.001	0.05	0.16	0.00	0.70	0.04	0.05	0.70	0.06	0.40	12500	**18**
	Minimum	16.9	7.41	3391	**4.81**	-836.2	0.7	0.0	448	90	66	18	957	238	135	0.01	0.001	0.05	0.01	0.00	0.40	0.01	0.01	0.40	0.01	0.01	85	1
All Results (2015-2025)	**Average**	23.5	8.02	2900	6.17	46.1	**41.1**	4.6	514.5	96	77.2	19	936.0	227.5	161.59	0.03	0.0015	0.05	0.04	0.00	0.92	0.01	0.09	0.83	0.05	0.11	16273	9
	Maximum	30.9	**9.07**	**7007**	10.67	224.0	**593.0**	5.0	**833**	153	**125**	28	**1400**	407	270	0.19	0.005	0.07	0.36	0.02	2.10	0.05	0.46	1.60	0.37	0.60	**284000**	**51**
	80th Percentile	27.0	8.47	4962	8.18	147.0	**54.7**	5.0	729.2	130	110	24	1340	319.6	218.8	0.03	0.002	0.05	0.05	0.01	1.20	0.01	0.13	1.20	0.08	0.33	14900	**13**
	Median	23.4	8.11	3082	**5.98**	69.8	8.2	5.0	602	110	91	22	1085	266.5	169	0.01	0.002	0.05	0.03	0.00	0.90	0.01	0.01	0.75	0.02	0.02	605	7
	20th Percentile	20.6	7.69	888	**4.18**	-71.5	3.3	4.2	190	45	19.4	8	214.4	56.2	112.4	0.01	0.001	0.05	0.01	0.00	0.60	0.01	0.01	0.50	0.01	0.01	5	2
	Minimum	15.7	**6.40**	318	**0.20**	-836.2	-9.7	2.0	41	14	6	3	75	14	33	0.01	0.001	0.01	0.01	0.00	0.40	0.01	0.01	0.40	0.01	0.01	5	1
DP2																												
Pre-Extraction	**Average**	26.3	8.12	695	**4.87**	114.7	**39.1**	3	65	26	12	8	117	15	95	0.073	0.002	0.03	0.04	0.020	0.89	-	-	0.9	0.02	0.02	5	9
	Maximum	27.5	8.61	890	6.41	194.0	**143.0**	4	67	27	12	8	120	16	96	0.100	0.002	0.07	0.05	0.020	0.94	-	-	0.9	0.02	0.02	5	9
	Minimum	23.7	7.79	613	**3.43**	58.8	**3.5**	2	64	25	12	7	110	14	94	0.050	0.001	0.01	0.04	0.020	0.82	-	-	0.8	0.02	0.02	5	9
Reporting Period (2024/2025)	**Average**	23.4	8.23	4595	7.07	-49.5	3.2	0.0	624.7	121	96.6	24	1227.3	328.6	156	0.01	0.001	0.05	0.03	0.00	0.49	0.01	0.01	0.49	0.02	0.05	1569	5
	Maximum	28.0	8.53	5575	9.57	108.7	9.2	0.0	749	141	113	27	1360	387	167	0.01	0.001	0.05	0.17	0.00	0.60	0.04	0.04	0.60	0.08	0.40	7700	**13**
	Minimum	16.7	7.59	3390	**5.39**	-99.5	0.4	0.0	446	91	66	18	962	240	136	0.01	0.001	0.05	0.01	0.00	0.40	0.01	0.01	0.40	0.01	0.01	85	1
All Results (2015-2025)	**Average**	23.5	8.00	2944	6.34	69.7	**69.0**	4.7	527.8	99	80.4	19	977.6	238.6	163.5	0.02	0.0016	0.05	0.07	0.00	1.04	0.01	0.09	0.95	0.05	0.11	21339	9
	Maximum	32.0	8.83	**7136**	10.60	1322.0	**1000.0**	5.0	**844**	151	**126**	28	**1420**	406	270	0.10	0.005	0.07	0.96	0.02	5.80	0.05	0.46	5.40	0.36	0.60	**409000**	**40**
	80th Percentile	27.0	8.43	5013	8.42	177.4	**54.9**	5.0	732.6	128	112.2	25	1342	319.6	216	0.03	0.002	0.05	0.06	0.01	1.20	0.01	0.13	1.20	0.07	0.32	17860	**12**
	Median	23.1	8.08	3215	6.38	63.9	7.8	5.0	607.5	110	92.5	22	1130	292.5	166	0.01	0.002	0.05	0.02	0.00	0.93	0.01	0.01	0.80	0.02	0.02	750	7
	20th Percentile	20.6	7.60	907	**4.11**	-76.9	3.6	4.6	314.8	68	50.4	13	616	158.4	126	0.01	0.001	0.05	0.01	0.00	0.60	0.01	0.01	0.50	0.01	0.01	5	3
	Minimum	16.3	**6.40**	271	**0.19**	-110.3	0.4	2.0	37	14	6	2	64	14	36	0.01	0.001	0.01	0.01	0.00	0.40	0.01	0.01	0.40	0.01	0.01	5	1

Red and **bold** values exceed the objective value for that analyte. IS - Insufficient data for statistical analysis. NS = No Sample Required. ND = No Data NLM= No Longer Monitored

Table 7.1 (Cont'd)
Surface Water Monitoring Data Summary

		Physical Parameters							Major Cations & Anions							Metals			Nutrients / Bacteria / Algae								
Parameters		Temp °C	pH	Electrical Conductivity uS/cm	Dissolved Oxygen mol/L	Redox mV	Turbidity NTU	Oil & Grease mg/L	Sodium mg/L	Calcium mg/L	Magnesium mg/L	Potassium mg/L	Chloride mg/L	Sulfate mg/L	Bicarbonate mg/L	Aluminium mg/L	Arsenic mg/L	Iron (filterable) mg/L	Total Phosphorous mg/L	Reactive Phosphorous mg/L	Total Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	TKN mg/L	Ammonia mg/L	NOx mg/L	Potentially Toxic Cyanobacteria	Chlorophyll a
Objectives		***-***	***6.5-9.0***	***<6192***	***>6***	***-***	***5-20***	***10***	***<813***	***-***	***<119***	***<40***	***<1390***	***<800***	***<400***	***<0.5***	***<0.42***	***<20***	***-***	***-***	***-***	***-***	***-***	***-***	***<20***	***-***	***<50000***	***<10***
DP3																											
Pre-Extraction	**Average**	27.3	7.87	898	7.17	63.4	**139.0**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	7
	Maximum	27.3	7.87	898	7.17	63.4	**139.0**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	7
	Minimum	27.3	7.87	898	7.17	63.4	**139.0**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	7
Reporting Period (2024/2025)	**Average**	23.8	8.11	4578	6.85	-45.6	3.8	0.0	614.3	120	96	23	1244.6	319	164.6	0.01	0.001	0.05	0.03	0.00	0.54	0.01	0.02	0.52	0.02	0.06	1569	5
	Maximum	28.3	8.50	5572	9.58	113.5	11.1	0.0	716	137	113	26	**1400**	381	186	0.01	0.001	0.05	0.16	0.00	0.70	0.04	0.07	0.60	0.07	0.40	7700	**13**
	Minimum	18.4	6.96	3372	**5.36**	-97.5	0.5	0.0	461	94	67	18	964	229	135	0.01	0.001	0.05	0.01	0.00	0.40	0.01	0.01	0.40	0.01	0.01	85	1
All Results (2015-2025)	**Average**	23.4	7.97	3030	6.24	52.0	**41.0**	5.0	554.93	104	84.4	20	1029.4	250.4	169.2	0.02	0.0016	0.05	0.06	0.00	0.91	0.01	0.09	0.81	0.05	0.12	22018	9
	Maximum	30.8	8.81	**7215**	10.50	225.0	**627.0**	5.0	**846**	155	**126**	28	**1400**	405	273	0.05	0.005	0.10	1.29	0.01	1.80	0.04	0.45	1.50	0.55	0.60	**418000**	**48**
	80th Percentile	26.7	8.38	4938	8.09	162.0	**45.0**	5.0	730.6	129	110	25	1328	319.6	224	0.03	0.002	0.05	0.06	0.01	1.20	0.01	0.15	1.10	0.06	0.34	20900	**13**
	Median	23.1	8.04	3338	6.29	73.0	7.8	5.0	612	110	95	22	1180	294	170	0.01	0.002	0.05	0.02	0.00	0.90	0.01	0.01	0.75	0.02	0.02	790	7
	20th Percentile	20.7	7.60	1068	**4.21**	-73.0	2.9	5.0	428.8	79	67	16	792.2	187.8	135.2	0.01	0.001	0.05	0.01	0.00	0.60	0.01	0.01	0.50	0.01	0.01	5	2
	Minimum	16.2	**6.40**	236	**0.19**	-180.1	-9.7	5.0	46	13	6	3	71	21	35	0.01	0.001	0.05	0.01	0.00	0.30	0.01	0.01	0.30	0.01	0.01	5	1
DP4																											
Pre-Extraction	**Average**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Maximum	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Minimum	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Reporting Period (2024/2025)	**Average**	24.0	8.19	2490	7.12	-48.1	11.6	0.0	273	83	44.7	12	574.3	182	124.7	0.03	0.001	0.05	0.02	0.00	0.72	0.01	0.02	0.71	0.02	0.10	37053	8
	Maximum	29.6	8.72	3956	9.51	115.7	**26.6**	0.0	305	90	50	13	642	202	128	0.07	0.001	0.05	0.05	0.01	0.90	0.04	0.09	0.90	0.03	0.90	**236000**	**28**
	Minimum	16.3	7.45	1189	**5.40**	-109.1	4.6	0.0	235	78	35	11	516	160	120	0.01	0.001	0.05	0.01	0.00	0.50	0.01	0.01	0.50	0.01	0.01	5	2
All Results (2015-2025)	**Average**	23.8	8.06	2250	7.17	-53.7	**22.3**	0.0	269.1	107	47.6	13	499.8	235.4	147.6	0.04	0.001	0.05	0.03	0.00	0.77	0.01	0.07	0.70	0.03	0.16	18622	7
	Maximum	30.2	8.72	3956	9.77	115.7	**116.0**	0.0	437	150	73	18	642	355	200	0.15	0.001	0.05	0.07	0.01	1.10	0.05	0.32	1.00	0.11	0.90	**236000**	**28**
	80th Percentile	26.8	8.32	2719	9.49	-54.0	**25.5**	0.0	357	143	65	16	628.4	338.2	188.8	0.09	0.001	0.05	0.04	0.00	0.90	0.02	0.17	0.80	0.06	0.30	5984	9
	Median	23.9	8.04	2330	7.01	-63.8	12.5	0.0	287.5	102	49.5	13	555.5	218	131	0.01	0.001	0.05	0.03	0.00	0.80	0.01	0.01	0.70	0.02	0.01	210	5
	20th Percentile	19.9	7.78	1518	**5.34**	-82.4	9.2	0.0	174	75	31.2	10	339.4	146.8	117.4	0.01	0.001	0.05	0.01	0.00	0.60	0.01	0.01	0.60	0.01	0.01	5	2
	Minimum	16.3	7.45	686	**3.99**	-109.1	4.6	0.0	62	63	16	6	101	94	107	0.01	0.001	0.05	0.01	0.00	0.40	0.01	0.01	0.40	0.01	0.01	5	1

Red and **bold** values exceed the objective value for that analyte. IS - Insufficient data for statistical analysis. NS = No Sample Required. ND = No Data NLM= No Longer Monitored

Cations and anions followed a similar trend to EC throughout the reporting period, with decreases in all analytes. All cations and anions recorded were below the relevant SWMP objectives excluding one chloride sample at DP3 on 23 October 2024 which slightly exceeded the objective. Continued monitoring of the cations and anions will be undertaken during the next reporting period to confirm trends, which are anticipated to return to an upward trend, subject to rainfall moderating.

During the reporting period turbidity ranged from 0.42 NTU to 31.0 NTU with an average of 6.7 NTU across all sites. Turbidity generally exceeded the objective range of 5 to 20 NTU, however turbidity during the reporting period was significantly less than the average turbidity for the previous reporting period of 21.5 NTU. Notably, the objective is only applicable during discharge. No discharges occurred during the reporting period. Turbidity during the reporting period trended downwards with exceedances of the upper objective value of 20 NTU recorded on three occasions. These occurred at DP1 in January 2025 (31.0 NTU), at DP4 in May 2025 (26.6 NTU), and at DP4 again in June 2025 (24.7 NTU). Most other results were below the lower objective value of 5 NTU, indicating limited disturbance of deposited silts.

During the reporting period the dissolved oxygen objective as specified in the currently approved May 2021 SWMP was exceeded on 12 occasions, five times at DP1 (January, February, March, May and June 2025), once at DP2 (January 2025), four times at DP3 between (January, February, March and June 2025), and twice at DP4 (February and June 2025). The deviations were minor, with recorded values only slightly below the criterion of 6mg/L, ranging from 4.81mg/L to 5.99mg/L. These exceedances are consistent with previous monitoring results and reflects the mixing of the deeper deoxygenated water with the surface layers. In recognition of this, the dissolved oxygen objective has been updated in the SWMP was awaiting approval throughout the reporting period.

No visible oil and grease was detected during the reporting period.

Metals

The monitored metals filterable iron, aluminium, and arsenic all consistently remained well below the quality objectives with no discernible trends or variance from monitoring results during pervious periods.

Nutrients

Elevated nutrient levels have been recorded in pre-extraction baseline monitoring and in surrounding groundwater bores. This is reflective of past and current agricultural activities within and surrounding the Quarry both on the floodplain and the Cudgen Plateau.

Ammonia recorded remained below the objective value of 20mg/L at all sites for the entire reporting period.

Blue-Green Algae

At most monitoring locations during the reporting period, potentially toxic cyanobacteria were below the limit of reporting, with values recorded as 5 cells/mL, significantly below the maximum cell count of 50,000 cells/mL. However, cyanobacteria exceeded the relevant threshold on two occasions at DP4 (January and February 2025), these exceedances followed a non-operational period over the 2024 Christmas period. Given the results recorded to date within the Cudgen Lakes Sand Quarry and the ongoing presence of blue-green algae in the adjacent Hanson

Tweed Sand Quarry, algal blooms are expected to regularly occur within the extraction pond, particularly during non-operational periods in summer.

Erosion and Sediment Control

During the reporting period monthly inspections were undertaken of the Quarry site to ensure that all necessary erosion and sediment controls are in place and working effectively, particularly around the edges of the extraction pond, rehabilitation areas and access tracks. No issues were identified during the reporting period.

Comparison with Predictions

In summary, the 2008 Environmental Assessment did not undertake water solute modelling and therefore specific predictions were not provided. However, it was anticipated that the EC within the final lake would be in the order of 2,500µS/cm, similar to levels within the Hanson Tweed Sand Plant pond at that time. No other impacts of significance were anticipated. To date the median EC for all surface monitoring results is generally consistent with the expected EC with continued variations expected as the dredging continues to expand both laterally and at depth. All other analytes have generally remained consistent with background or behaved as expected (i.e. increased turbidity and reduced dissolved oxygen at surface during operations).

Reportable Incidents

During the reporting period incident reports were submitted in relation to dissolved oxygen at monitoring locations DP1 and DP3 with two consecutive exceedances of the trigger value within the currently approved May 2021 SWMP. Notably, the updated SWMP which is awaiting approval includes clarification that the DO objective only applies to surface samples during periods of non-operation (when deeper deoxygenated water is not being mixed with the surface layers).

An incident report was also submitted for non-compliance with the requirements of the SWMP monitoring frequency, due to a missed round of sampling in December 2024 resulting from a miscommunication of the operational status. This missed round of sampling included depth sampling.

These incident reports are further discussed in Section 11.

Further Improvements

During the reporting period an exceedance register was established and is utilised to review monthly results against the approved TARPs. This has been successfully applied and therefore, subject to the approval of the updated SWMP, no further improvements are currently planned.

7.3 Groundwater

Environmental Management

As outlined in Section 7.2, the extraction pond is effectively a ‘window’ into the groundwater table and is the principal location for potential interactions with the local groundwater environment. The key management measures for groundwater are therefore:

- ensuring that extractions rates do not cause drawdown beyond those predicted;

- monitoring of water quality to ensure that drawdown is not resulting in a reduction in pH (which would indicate oxidation of acid sulfate soils); and
- storage of all hydrocarbons in accordance with the relevant Australian Standards.

As no dredging occurred within the southern lake no specific measures were required to manage drawdown from the lake. However, whilst the volume continues to increase within the northern extraction pond, the relatively small volume and fact that the silt return reports to the southern lake, there is still a need to use the previously established water transfer system to pump water from the existing southern lake to the new northern extraction pond to maintain water levels. This will be maintained during the next reporting period until the pond is of sufficient size to maintain acceptable water levels during dredging.

During the reporting period contingency management measures (as outlined within the proposed updated SWMP) were trialled in relation to rising iron levels in bore MB11, located directly adjacent to the northern extraction pond (and within the approved extraction area). This involved pumping of water out of the bore into the pond. The action of pumping the water into the pond results in aeration and oxidation of the dissolved iron into sediments which settle within the pond. This management measure appeared to be successful with a reduction in iron levels within MB11 and no increase within the northern pond.

Monitoring did not indicate the need for any other alteration to existing management measures relating to water quality. Limited volumes of hydrocarbons were stored within the Quarry Site during the reporting period and were appropriately stored within a service van.

Environmental Performance

The groundwater resources within the local area are located within two aquifers, namely the Quaternary sands beneath the Tweed River floodplain and the Tertiary basalts of the Cudgen Plateau. It is expected that freshwater from the Tertiary basalts flows northwards into the Quaternary sands resulting in a wedge of freshwater that thins northwards towards the Tweed River. Beneath this, water quality is largely influenced by the degree of mixing between the freshwater from the Cudgen Plateau, as well as rainfall recharge directly to the Quaternary sands, and the deep saline waters originally derived from estuarine and marine infiltration.

Groundwater levels and water quality were monitored in five dedicated monitoring bores, throughout the reporting period (see **Figure 7.1**). It is noted that monitoring bore MB10 was damaged could not be sampled during the reporting period. A replacement bore or utilisation of a suitable existing nearby bore is being investigated and will be implemented during the next reporting period. A number of the groundwater loggers required replacing during the reporting period and quotes have been sought to replace these loggers as well as for the remaining old loggers which have been encountering issues when downloading data.

Groundwater Levels

During the reporting period, annual extraction rates (178,044m^3) remained well below the approved maximum of 650,000m^3. As such operations had no appreciable effects on water level and minimal volumes of water take (see Section 7.1). Therefore, groundwater levels recorded are generally a reflection of natural fluctuations and, to a lesser extent, surrounding activities.

Figure 7.3 presents the groundwater levels and rainfall recorded during the reporting period. The lowest water level recorded during the reporting period was -0.840m AHD at MB11 on 8 September 2024 and the highest water level was 1.564m AHD (i.e. above ground surface) at MB15 on 10 March 2025.

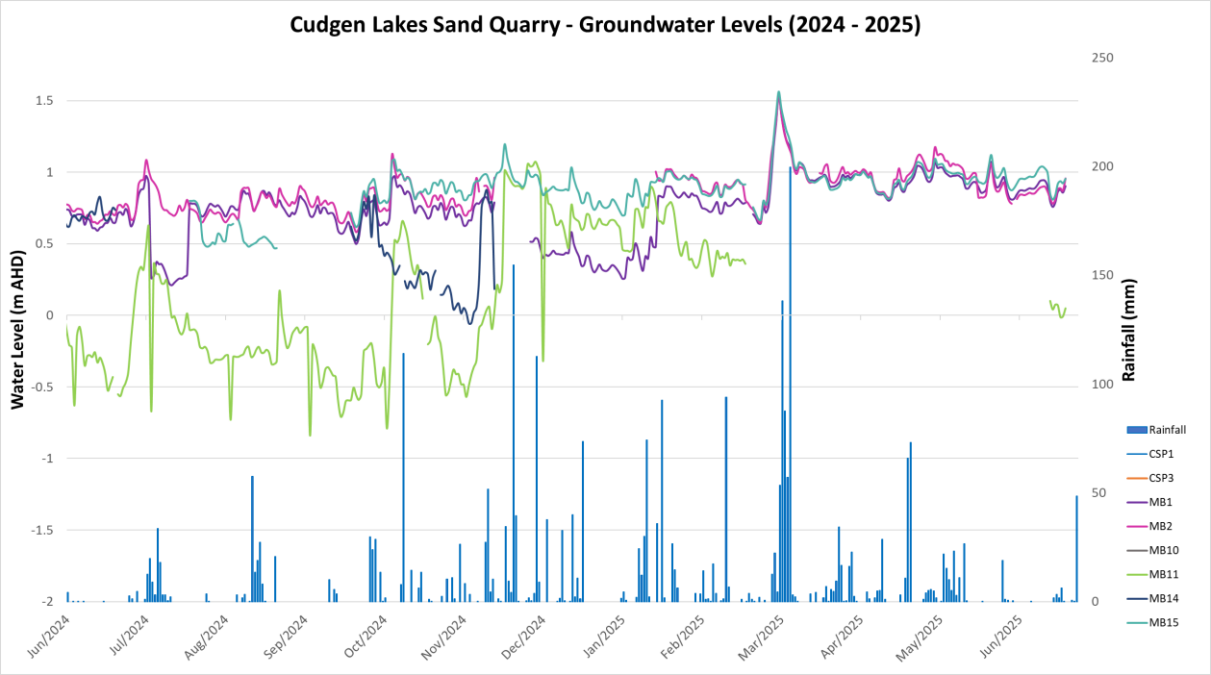


Figure 7.2a
Groundwater Levels – 2024/2025 Reporting Period

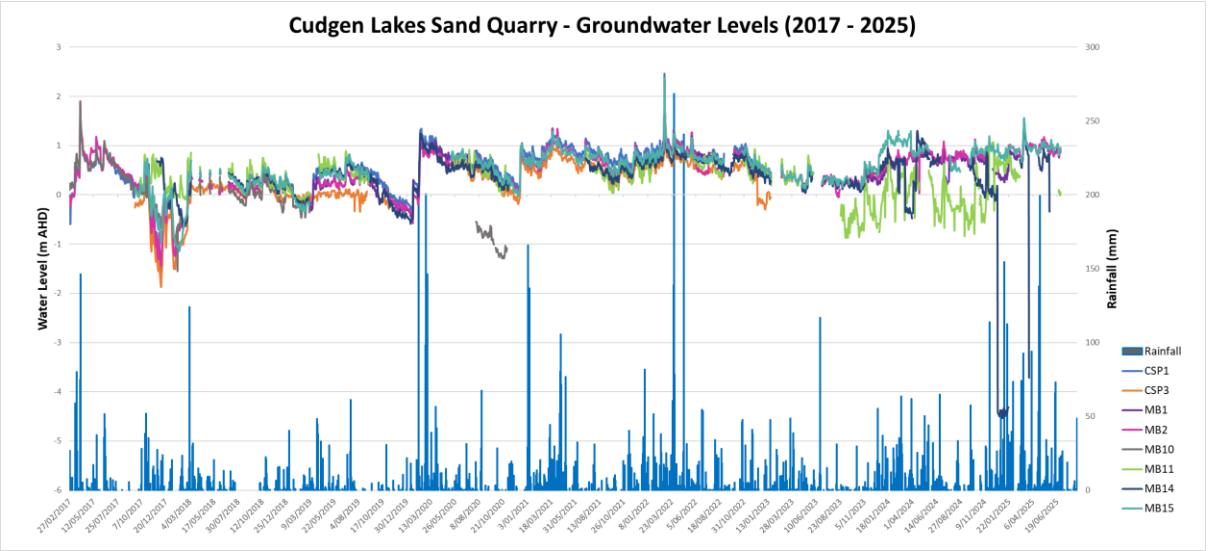


Figure 7.3b
Groundwater Levels – 2017 - 2025

Increased rainfall during January 2025 and April 2025, resulted in temporary rises in groundwater levels across all monitoring sites. Overall, the data reflects a dynamic interaction between rainfall and groundwater levels, with periods of increased rainfall generally leading to short-term increases in groundwater levels. This is consistent with previous groundwater assessments and the conceptual groundwater model for this groundwater system.

Groundwater Quality

A summary of groundwater monitoring results is provided in **Table 7.2** and key analytes are displayed graphically in **Figure 7.4.** The full range of historical data is presented in **Figure 7.5** to assist with interpreting long-term trends. A full copy of the monitoring data is presented in **Appendix 5**.

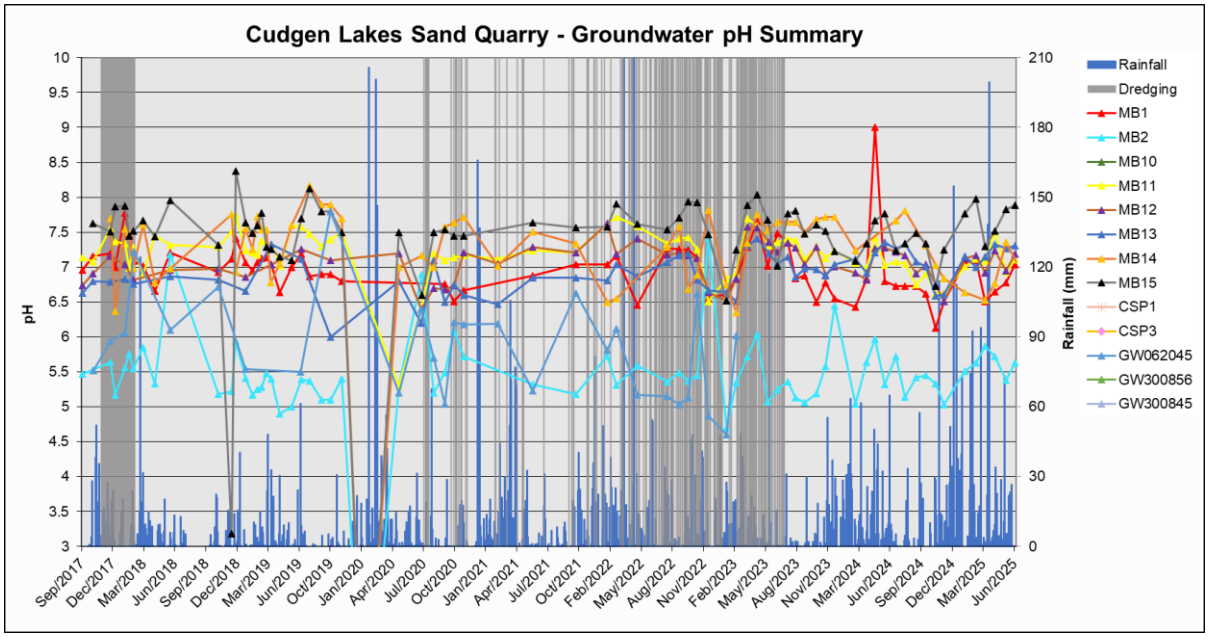


Figure 7.3a
Groundwater Quality Parameters – pH (All Bores)

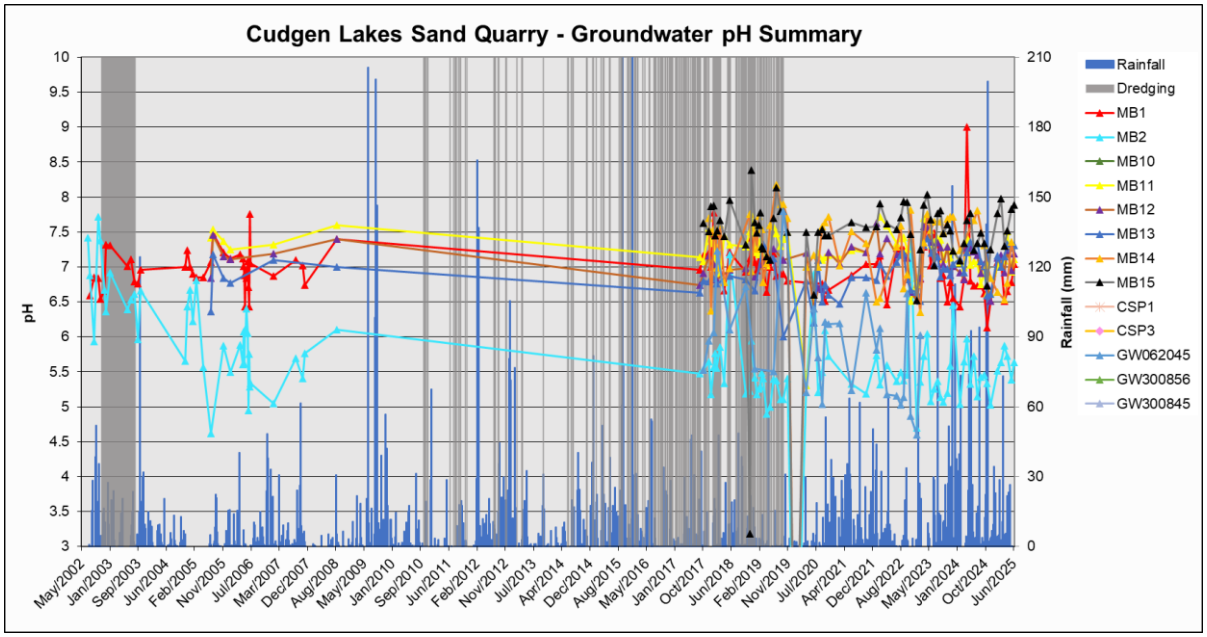


Figure 7.4b
Long Term Groundwater Quality Parameters – pH (All Bores)

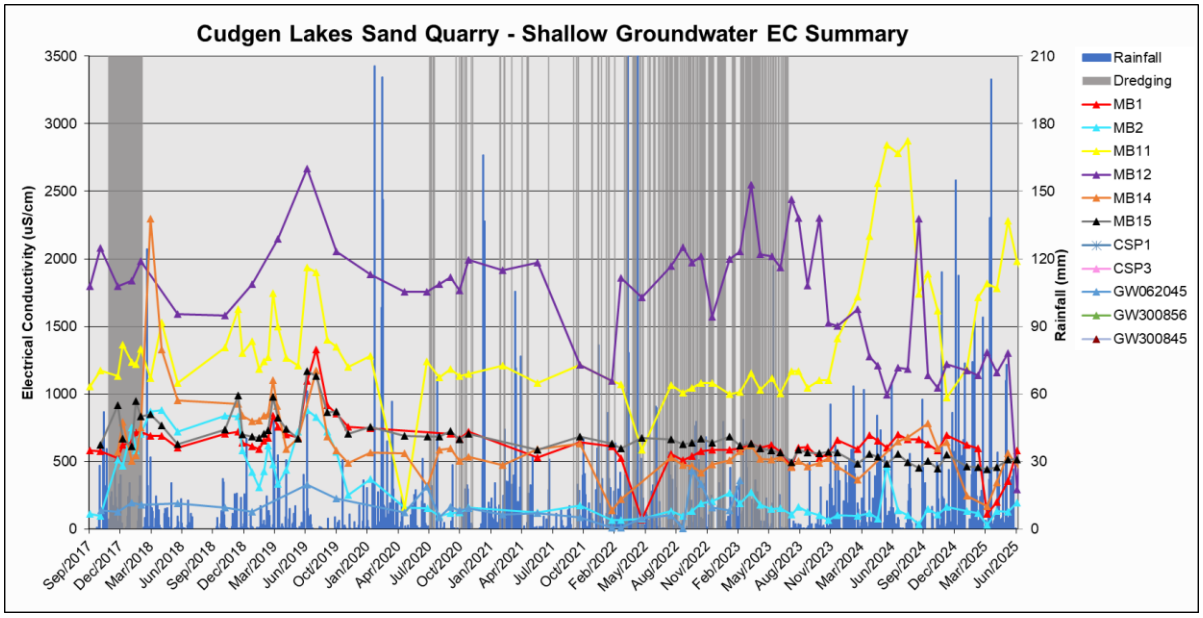


Figure 7.4c
Groundwater Quality Parameters – Electric Conductivity (Shallow Bores)

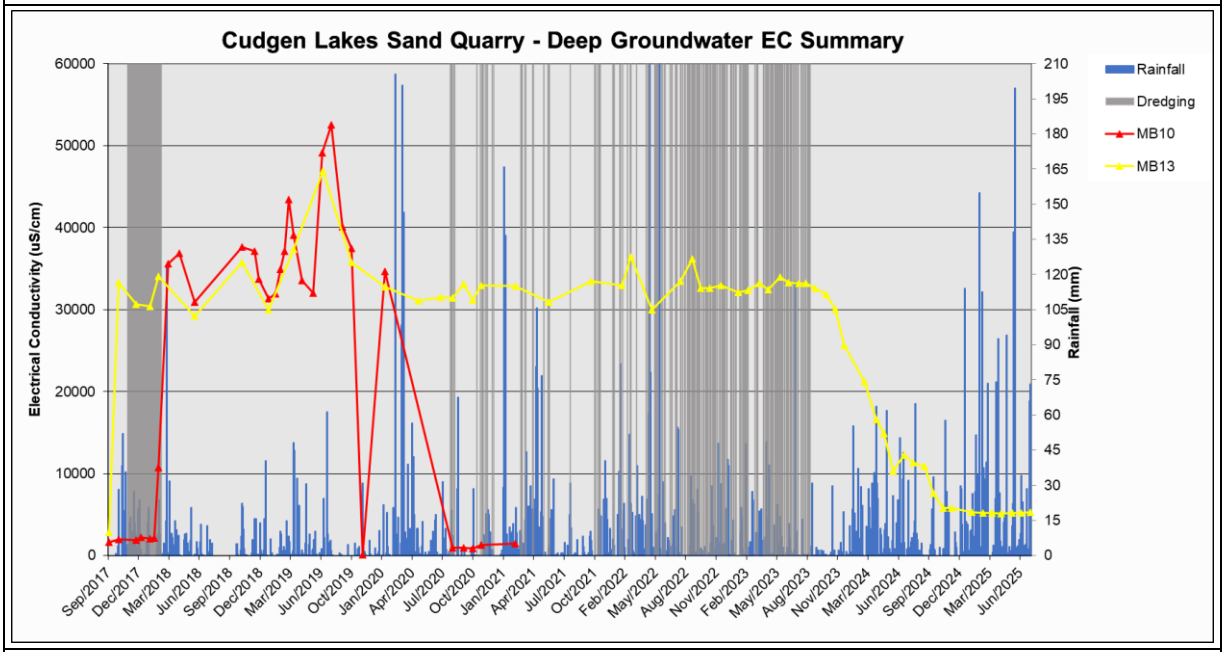


Figure 7.4d
Groundwater Quality Parameters – Electric Conductivity (Deep Bores)

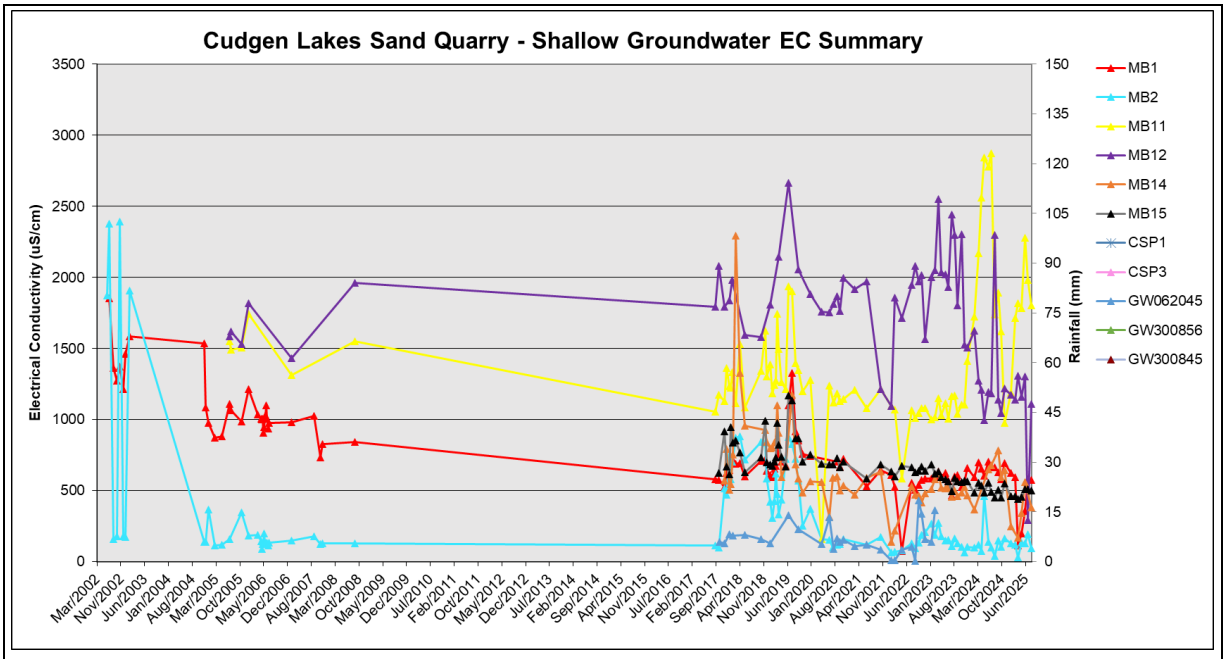


Figure 7.5e
Long Term Groundwater Quality Parameters – Electrical Conductivity (Shallow Bores)

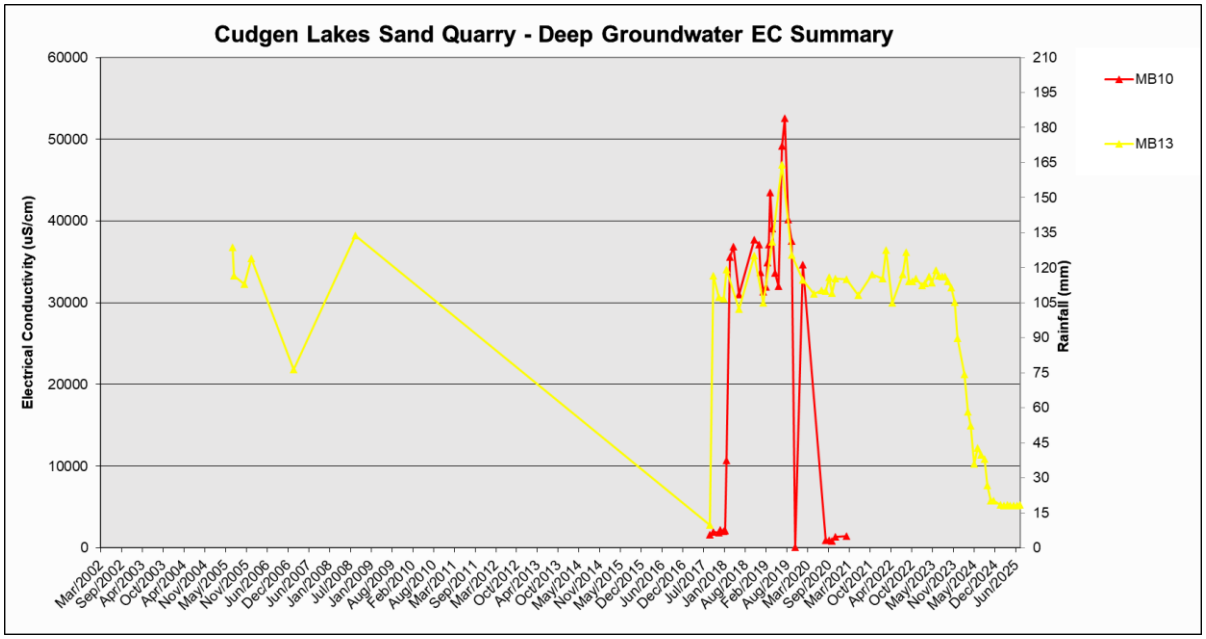


Figure 7.5f
Long Term Groundwater Quality Parameters – Electrical Conductivity (Deep Bores)

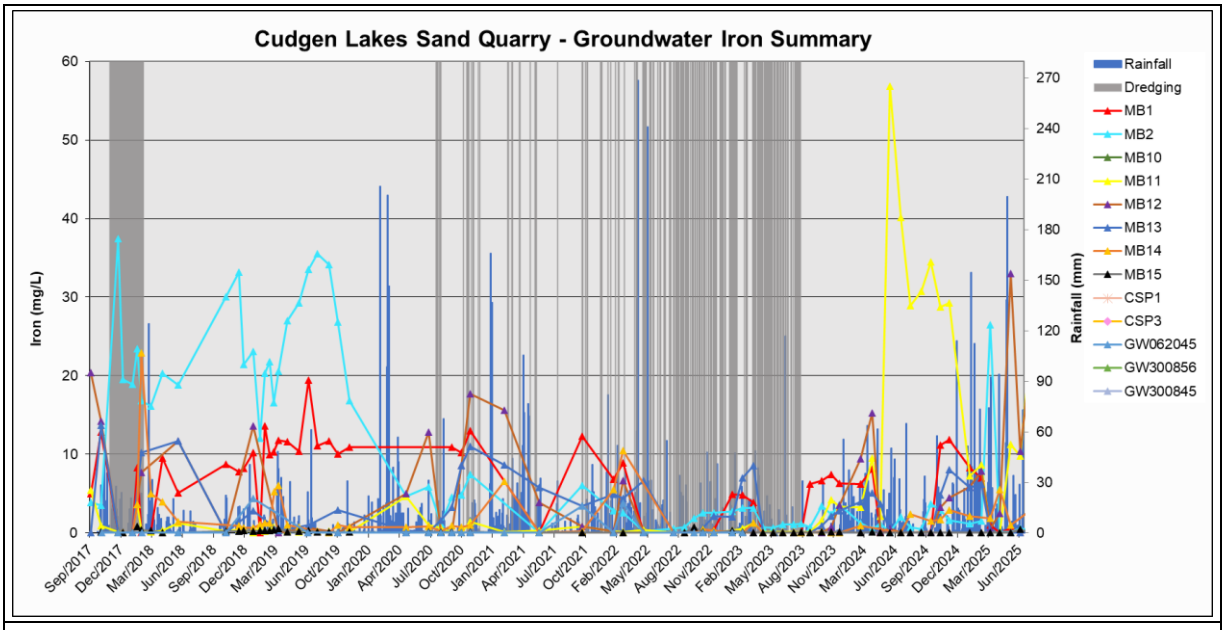


Figure 7.4g
Groundwater Quality Parameters – Iron (All Bores)

Physical Parameters and Major Cations and Anions

Groundwater monitoring data to date supports the expected hydrogeological environment, with water within the Quaternary sand aquifer essentially fresh in the upper 5m to 10m with increasing salinity with increased depth and towards the Tweed River. Iron levels at the Quarry have also been identified as consistent with the presence of iron in the sediments, specifically the iron rich ferrosols, and surface waters of the region.

Figures 7.4a and **7.4b** summarise groundwater pH levels at the Cudgen Lakes Sand Quarry. The pH levels recorded across all years to date generally range between 6 and 8, reflecting slightly acidic to neutral conditions, with some fluctuations including occasional drops below 6 and spikes above 8. Monitoring data for the reporting period indicates that pH levels have stabilised within a narrower range, suggesting more consistent groundwater conditions, with pH generally remaining near neutral to slightly acidic for all sites except MB2. Whilst pH levels at MB2 fell below the SWMP objective, pH 5.14 in July 2024 and pH 5.03 in November 2024, both remained above the minimum pre-extraction pH of 4.62. No discernible trend in pH at MB2 was recorded with the average pH remaining generally consistent with the long-term average for all data.

Figures 7.4c to **7.4f** illustrates the EC trends in both shallow and deep groundwater bores at the Cudgen Lakes Sand Quarry. Throughout the reporting period, EC levels at all shallow groundwater bore sites remained below the water quality objective of 3,000µS/cm. The average EC for these sites was generally consistent with the long-term average, with a slight increasing trend toward the end of the reporting period. Deep groundwater bore MB13 recorded a steady trend of decreasing EC levels, remaining relatively stable from October 2024 through the end of the reporting period at values not exceeding 6,000µS/cm. EC levels at all bores remain within expected values.

Table 7.2
Groundwater Monitoring Data Summary

		Physical							Major Cations & Anions							Metals			Nutrients							
Parameters		**Temp °C**	**pH**	**Electrical Conductivity uS/cm**	**Dissolved Oxygen mol/L**	**Redox mV**	**Turbidity NTU**	**Oil & Grease mg/L**	**Sodium mg/L**	**Calcium mg/L**	**Magnesium mg/L**	**Potassium mg/L**	**Chloride mg/L**	**Sulfate mg/L**	**Bicarbonate mg/L**	**Aluminium mg/L**	**Arsenic mg/L**	**Iron (filterable) mg/L**	**Total Phosphorous mg/L**	**Reactive Phosphorous mg/L**	**Total Nitrogen mg/L**	**Nitrite mg/L**	**Nitrate mg/L**	**TKN mg/L**	**Ammonia mg/L**	**NOx mg/L**
MB1																										
Pre-Extraction	**Average**	20.80	6.98	1080	**0.96**	-233.01	18.20	5.00	39.23	130.54	20.77	4.83	64.11	220.05	185.86	0.05	0.00	9.18	0.29	0.01	0.65	0.01	0.01	0.65	0.34	0.01
	Maximum	21.80	7.76	1854	7.66	23.00	**35.00**	5.00	58.00	193.00	36.00	5.00	124.00	492.00	292.00	0.14	0.00	**22.00**	0.46	0.01	0.70	0.01	0.01	0.70	0.39	0.01
	Minimum	19.80	**6.43**	576	**0.05**	-1398	**1.40**	5.00	31.00	77.00	13.00	4.00	35.00	10.00	110.00	0.01	0.00	0.24	0.11	0.01	0.60	0.01	0.01	0.60	0.28	0.01
Reporting Period (2024/2025)	**Average**	19.00	6.72	518	2.53	0.52	39.8	NLM	24	76.55	7.18	3.91	28.45	1.73	226.73	0.01	0.00	3.67	0.17	0.00	1.00	0.01	0.24	0.77	0.31	0.24
	Maximum	24.93	7.10	694	3.96	37.90	283.0	NLM	32	112.00	9.00	4.00	34.00	5.00	343.00	0.01	0.00	11.90	0.23	0.00	1.10	0.01	0.50	1.00	0.49	0.50
	Minimum	0.30	**6.13**	112	1.06	-18.70	4.2	NLM	15	7.00	4.00	3.00	23.00	1.00	34.00	0.01	0.00	0.05	0.12	0.00	0.80	0.01	0.10	0.60	0.05	0.10
All Results (2002-2025)	**Average**	21.38	6.97	790	1.61	-64.02	61.0	5.00	30	98.66	11.24	4.03	39.27	52.99	269.18	0.02	0.00	6.21	0.20	0.02	1.05	0.01	0.07	1.05	0.56	0.07
	Maximum	26.00	**9.00**	1854	7.66	194.90	2546.8	5.00	58	193.00	36.00	9.00	124.00	492.00	**596.00**	0.14	0.01	**22.00**	1.28	0.11	6.60	0.01	0.50	6.60	4.99	0.50
	80th Percentile	23.82	7.18	1011	2.69	-0.53	42.8	5.00	35	116.00	12.00	5.00	47.00	96.00	324.80	0.01	0.00	11.20	0.23	0.02	1.40	0.01	0.10	1.40	0.62	0.11
	Median (50th Percentile)	21.79	6.98	696	1.11	-31.70	8.3	5.00	30	99.00	10.00	4.00	32.00	4.00	280.50	0.01	0.00	6.28	0.17	0.01	0.80	0.01	0.01	0.75	0.43	0.01
	20th Percentile	19.47	6.72	586	0.33	-113.30	2.9	5.00	26	83.00	8.00	3.00	26.20	1.00	231.00	0.01	0.00	0.05	0.11	0.01	0.60	0.01	0.01	0.60	0.28	0.01
	Minimum	0.30	**6.13**	74	0.05	-1398.00	-8.6	5.00	11	6.00	3.00	3.00	20.00	1.00	24.00	0.01	0.00	0.05	0.04	0.00	0.01	0.01	0.01	0.09	0.01	0.01
MB2																										
Pre-Extraction	**Average**	21.25	6.07	**3833**	**0.74**	5.13	`10.85	5.00	16.46	0.76	0.69	14.92	25.85	15.40	16.16	**2.03**	0.01	6.60	0.08	0.05	0.70	0.01	0.01	0.70	0.24	0.01
	Maximum	21.70	7.72	2394	**5.09**	216.00	14.40	5.00	23.00	1.80	2.00	20.00	45.00	27.00	60.00	**6.37**	0.01	9.50	0.08	0.07	0.80	0.01	0.01	0.80	0.29	0.01
	Minimum	20.80	**4.62**	88	**0.16**	-130.00	7.30	5.00	12.00	0.20	0.20	4.00	10.00	0.90	7.00	0.43	0.01	3.12	0.07	0.03	0.60	0.01	0.01	0.60	0.19	0.01
Reporting Period (2024/2025)	**Average**	19.00	6.72	518.27	2.53	0.52	39.8	ND	24	76.55	7.18	3.91	28.45	1.73	226.73	0.01	0.00	3.67	0.17	0.00	1.00	0.01	0.24	0.77	0.31	0.24
	Maximum	24.93	7.10	694.00	3.96	37.90	283.0	ND	32	112.00	9.00	4.00	34.00	5.00	343.00	0.01	0.00	11.90	0.23	0.00	1.10	0.01	0.50	1.00	0.49	0.50
	Minimum	0.30	**6.13**	112.00	1.06	-18.70	4.2	ND	15	7.00	4.00	3.00	23.00	1.00	34.00	0.01	0.00	0.05	0.12	0.00	0.80	0.01	0.10	0.60	0.05	0.10
All Results (2002-2025)	**Average**	21.38	6.97	790.31	1.61	-64.02	61.0	5.00	30	98.66	11.24	4.03	39.27	52.99	269.18	0.02	0.00	6.21	0.20	0.02	1.05	0.01	0.07	1.05	0.56	0.07
	Maximum	26.00	**9.00**	1854.00	7.66	194.90	2546.8	5.00	58	193.00	36.00	9.00	124.00	492.00	**596.00**	0.14	0.01	**22.00**	1.28	0.11	6.60	0.01	0.50	6.60	4.99	0.50
	80th Percentile	23.82	7.18	1011.20	2.69	-0.53	42.8	5.00	35	116.00	12.00	5.00	47.00	96.00	324.80	0.01	0.00	11.20	0.23	0.02	1.40	0.01	0.10	1.40	0.62	0.11
	Median (50th Percentile)	21.79	6.98	695.50	1.11	-31.70	8.3	5.00	30	99.00	10.00	4.00	32.00	4.00	280.50	0.01	0.00	6.28	0.17	0.01	0.80	0.01	0.01	0.75	0.43	0.01
	20th Percentile	19.47	6.72	586.20	0.33	-113.30	2.9	5.00	26	83.00	8.00	3.00	26.20	1.00	231.00	0.01	0.00	0.05	0.11	0.01	0.60	0.01	0.01	0.60	0.28	0.01
	Minimum	0.30	**6.13**	74.00	0.05	-1398.0	-8.6	5.00	11	6.00	3.00	3.00	20.00	1.00	24.00	0.01	0.00	0.05	0.04	0.00	0.01	0.01	0.01	0.09	0.01	0.01

Red and **bold** values exceed the objective value for that analyte. IS - Insufficient data for statistical analysis. NS = No Sample Required. ND = No Data NLM - No Longer Monitored **=Monitoring has ceased

Table 7.2 (Cont'd)
Groundwater Monitoring Data Summary

		Physical							Major Cations & Anions							Metals			Nutrients							
Parameters		**Temp °C**	**pH**	**Electrical Conductivity uS/cm**	**Dissolved Oxygen mol/L**	**Redox mV**	**Turbidity NTU**	**Oil & Grease mg/L**	**Sodium mg/L**	**Calcium mg/L**	**Magnesium mg/L**	**Potassium mg/L**	**Chloride mg/L**	**Sulfate mg/L**	**Bicarbonate mg/L**	**Aluminium mg/L**	**Arsenic mg/L**	**Iron (filterable) mg/L**	**Total Phosphorous mg/L**	**Reactive Phosphorous mg/L**	**Total Nitrogen mg/L**	**Nitrite mg/L**	**Nitrate mg/L**	**TKN mg/L**	**Ammonia mg/L**	**NOx mg/L**
MB10 (broken)																										
Pre-Extraction	**Average**	21.80	7.53	32513	**2.15**	-72.81	9.49	5.00	4552.80	150.70	617.20	201.78	8229.80	1282.00	609.75	0.09	0.00	0.62	3.02	2.89	157.00	3.80	0.69	153.00	147.00	4.49
	Maximum	23.70	**8.75**	**74900**	**4.11**	107.00	13.00	5.00	**7500.00**	233.00	**1150.00**	**292.00**	**14750.00**	**2490.00**	**852.00**	0.34	0.00	1.96	3.32	3.22	162.00	4.39	1.20	157.00	**158.00**	5.59
	Minimum	19.90	7.07	1605	**0.38**	-187.00	5.97	5.00	94.00	30.00	17.00	24.00	194.00	77.00	247.00	0.01	0.00	0.01	2.71	2.56	152.00	3.20	0.18	149.00	136.00	3.38
Reporting Period (2024/2025)	**Average**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Maximum	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	Minimum	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
All Results (2002-2023)	**Average**	22.80	7.47	28124	**1.76**	-83.12	18.36	5.00	4624.65	181.50	701.48	167.85	8162.03	1244.25	844.59	0.05	0.00	0.64	1.35	1.30	50.93	0.45	0.16	47.81	43.55	0.60
	Maximum	26.30	**8.75**	**74900**	**5.40**	149.00	**268.00**	5.00	**7610.00**	293.00	**1170.00**	**292.00**	**14750.00**	**2490.00**	**1170.00**	0.34	0.01	15.50	3.35	3.86	186.00	4.39	1.20	184.00	**174.00**	5.59
	80th Percentile	24.48	7.71	**37644**	**2.73**	46.96	**24.00**	5.00	**7104.00**	234.60	1100.00	241.00	12280.00	1797.80	1124.00	0.05	0.01	0.27	2.71	2.08	104.92	0.75	0.29	68.82	44.52	0.99
	Median (50th Percentile)	23.15	7.45	33600	**1.81**	-94.65	**4.55**	5.00	6515.00	208.50	999.00	213.00	11800.00	1675.00	955.00	0.05	0.01	0.09	1.03	1.01	30.20	0.02	0.02	30.20	27.20	0.05
	20th Percentile	20.89	7.20	2136	**0.48**	-205.00	**0.86**	5.00	105.00	140.80	18.20	26.00	200.00	77.20	510.00	0.01	0.00	0.05	0.90	0.90	3.28	0.01	0.01	16.36	13.79	0.01
	Minimum	19.50	6.50	73	**0.00**	-273.00	**-11.10**	5.00	27.00	30.00	16.00	6.00	39.00	64.00	247.00	0.01	0.00	0.01	0.01	0.00	0.34	0.01	0.01	0.50	0.13	0.01
MB11																										
Pre-Extraction	**Average**	19.95	7.28	1446	**1.02**	-107.33	**27.20**	5.00	103.33	209.00	58.00	12.67	146.00	415.67	333.00	**0.75**	0.00	4.18	0.53	0.14	3.70	0.01	0.01	3.70	1.64	0.01
	Maximum	20.80	7.60	1743	**2.11**	-74.00	**43.10**	5.00	220.00	289.00	72.00	19.00	311.00	520.00	**432.00**	**3.13**	0.00	11.00	0.64	0.27	4.60	0.01	0.01	4.60	1.80	0.01
	Minimum	19.10	6.81	1056	**0.37**	-144.00	11.30	5.00	34.00	168.00	45.00	9.00	47.00	328.00	235.00	0.01	0.00	0.87	0.42	0.01	2.80	0.01	0.01	2.80	1.48	0.01
Reporting Period (2024/2025)	**Average**	19.95	6.98	1805.36	2.36	-12.12	168.65	NLM	29.36	261.18	64.73	11.36	36.09	678.91	243.91	0.01	0.00	17.20	0.19	0.00	0.97	0.01	0.02	0.97	0.27	0.02
	Maximum	25.55	7.51	2871.00	3.81	3.20	668.00	NLM	46.00	450.00	**139.00**	17.00	65.00	**1500.00**	324.00	0.01	0.00	**34.50**	0.22	0.00	1.10	0.01	0.05	1.10	0.35	0.05
	Minimum	1.48	6.62	974.00	1.24	-33.70	47.30	NLM	13.00	104.00	20.00	8.00	14.00	153.00	183.00	0.01	0.00	0.05	0.17	0.00	0.80	0.01	0.01	0.80	0.13	0.01

Red and **bold** values exceed the objective value for that analyte. IS - Insufficient data for statistical analysis. NS = No Sample Required. ND = No Data NLM - No Longer Monitored **=Monitoring has ceased

Table 7.2 (Cont'd)
Groundwater Monitoring Data Summary

		Physical								Major Cations & Anions							Metals			Nutrients								
Parameters		**Temp °C**	**pH**	**Electrical Conductivity uS/cm**	**Dissolved Oxygen mol/L**	**Redox mV**	**Total Suspended Solids mg/L**	**Turbidity NTU**	**Oil & Grease mg/L**	**Sodium mg/L**	**Calcium mg/L**	**Magnesium mg/L**	**Potassium mg/L**	**Chloride mg/L**	**Sulfate mg/L**	**Bicarbonate mg/L**	**Aluminium mg/L**	**Arsenic mg/L**	**Iron (filterable) mg/L**	**Total Phosphorous mg/L**	**Reactive Phosphorous mg/L**	**Total Nitrogen mg/L**	**Nitrite mg/L**	**Nitrate mg/L**	**TKN mg/L**	**Ammonia mg/L**	**NOx mg/L**
MB11 (Cont'd)																											
All Results (2002-2025)	**Average**	21.57	7.21	1391.49	2.05	-73.43	23.70	59.49	5.00	40.62	194.24	51.61	10.37	54.00	390.84	316.97	0.08	0.00	4.78	0.36	0.35	2.17	0.02	0.11	2.21	1.46	0.12
	Maximum	27.10	7.75	2871.00	7.67	297.10	140.00	668.00	5.00	220.00	592.00	**173.00**	19.00	311.00	**2240.00**	**500.00**	3.13	0.06	**56.80**	1.37	1.75	11.80	0.33	1.30	11.70	9.71	1.30
	80th Percentile	24.50	7.46	1722.00	3.21	-8.26	33.20	80.62	5.00	42.00	207.00	54.60	11.00	52.00	469.20	360.00	0.02	0.00	4.58	0.61	0.56	2.94	0.02	0.19	3.32	1.90	0.23
	Median (50th Percentile)	21.35	7.26	1240.00	1.80	-35.60	11.00	13.10	5.00	35.00	171.00	45.00	10.00	46.00	281.00	337.00	0.01	0.00	0.38	0.27	0.26	1.60	0.01	0.01	1.55	1.00	0.01
	20th Percentile	19.62	7.02	1082.00	0.53	-174.38	5.00	2.34	5.00	27.40	149.80	38.00	9.00	40.40	172.80	274.60	0.01	0.00	0.10	0.19	0.10	0.98	0.01	0.01	1.00	0.24	0.01
	Minimum	1.48	5.30	157.80	0.10	-354.00	5.00	-5.50	5.00	13.00	2.00	1.00	2.00	14.00	11.00	3.00	0.01	0.00	0.05	0.08	0.01	0.01	0.01	0.01	0.01	0.01	0.01
MB12																											
Pre-Extraction	**Average**	21.30	7.08	1713	**0.72**	-74.97	15.00	13.60	5.00	49.17	328.67	53.83	11.67	100.50	608.83	267.40	0.20	0.00	6.99	0.11	0.02	0.60	0.01	0.01	0.60	0.34	0.01
	Maximum	21.90	7.46	2080	**1.65**	-54.00	15.00	**20.10**	5.00	66.00	433.00	59.00	13.00	147.00	720.00	329.00	**0.74**	0.00	**20.40**	0.11	0.02	0.60	0.01	0.01	0.60	0.34	0.01
	Minimum	20.70	6.74	1433	**0.09**	-98.00	15.00	7.10	5.00	39.00	219.00	46.00	10.00	54.00	410.00	223.00	0.01	0.00	1.31	0.11	0.01	0.60	0.01	0.01	0.60	0.33	0.01
Reporting Period (2024/2025)	**Average**	19.75	7.00	1204.91	2.34	-9.14	NLM	68.87	NLM	46.73	151.27	17.64	7.64	83.91	141.18	296.00	0.02	0.00	6.20	0.12	0.00	1.23	0.01	0.09	1.17	0.38	0.09
	Maximum	25.04	7.24	2297.00	3.95	28.90	NLM	281.00	NLM	58.00	183.00	22.00	9.00	107.00	248.00	364.00	0.09	0.01	33.00	0.31	0.00	1.60	0.02	0.13	1.60	0.63	0.13
	Minimum	1.26	6.51	292.00	1.19	-22.60	NLM	6.30	NLM	9.00	2.00	2.00	4.00	14.00	4.00	10.00	0.01	0.00	0.05	0.02	0.00	1.00	0.01	0.05	0.90	0.25	0.05
All Results (2002-2025)	**Average**	20.81	7.07	1704.75	2.58	-6.81	29.44	42.82	5.00	63.79	265.46	35.38	10.21	140.28	473.87	289.87	0.03	0.00	4.10	0.06	0.01	0.71	0.01	0.17	0.59	0.23	0.18
	Maximum	26.50	7.63	2667.00	7.95	192.80	155.00	281.00	5.00	108.00	433.00	59.00	13.00	474.00	**814.00**	378.00	**0.74**	0.01	**33.00**	0.32	0.03	1.60	0.02	0.50	1.60	0.67	0.50
	80th Percentile	23.87	7.27	2019.00	3.82	35.34	38.00	64.48	5.00	87.00	329.00	44.60	12.00	246.00	693.80	328.60	0.01	0.00	8.42	0.11	0.01	1.00	0.01	0.37	0.90	0.37	0.38
	Median (50th Percentile)	20.70	7.13	1795.00	1.91	-19.10	24.50	20.85	5.00	58.00	288.00	38.00	11.00	106.00	520.00	298.00	0.01	0.00	0.56	0.03	0.01	0.60	0.01	0.08	0.60	0.26	0.10
	20th Percentile	19.27	6.84	1219.00	1.16	-69.00	5.00	6.81	5.00	43.40	177.60	21.00	8.40	68.00	203.40	250.00	0.01	0.00	0.05	0.01	0.00	0.50	0.01	0.02	0.28	0.02	0.02
	Minimum	1.26	**6.40**	292.00	0.09	-177.90	5.00	0.30	5.00	9.00	2.00	2.00	4.00	14.00	4.00	10.00	0.01	0.00	0.05	0.01	0.00	0.01	0.01	0.01	0.10	0.01	0.01

Red and **bold** values exceed the objective value for that analyte. IS - Insufficient data for statistical analysis. NS = No Sample Required. ND = No Data NLM - No Longer Monitored **=Monitoring has ceased

Table 7.2 (Cont'd)
Groundwater Monitoring Data Summary

		Physical								Major Cations & Anions							Metals			Nutrients							
Parameters		**Temp °C**	**pH**	**Electrical Conductivity uS/cm**	**Dissolved Oxygen mol/L**	**Redox mV**	**Total Suspended Solids mg/L**	**Turbidity NTU**	**Oil & Grease mg/L**	**Sodium mg/L**	**Calcium mg/L**	**Magnesium mg/L**	**Potassium mg/L**	**Chloride mg/L**	**Sulfate mg/L**	**Bicarbonate mg/L**	**Aluminium mg/L**	**Arsenic mg/L**	**Iron (filterable) mg/L**	**Total Phosphorous mg/L**	**Reactive Phosphorous mg/L**	**Total Nitrogen mg/L**	**Nitrite mg/L**	**Nitrate mg/L**	**TKN mg/L**	**Ammonia mg/L**	**NOx mg/L**
MB13																											
Pre-Extraction	**Average**	22.35	6.84	29572	**0.86**	-112.10	26.00	**3.75**	5.00	6500.00	960.00	**1227.17**	192.67	10701.67	**2490.00**	385.80	0.23	0.00	8.44	0.42	0.02	1.85	0.01	0.16	1.70	1.37	0.16
	Maximum	24.00	7.18	**38200**	**2.97**	-34.00	26.00	5.90	5.00	**6940.00**	2350.00	**2040.00**	**240.00**	**15198.00**	**4000.00**	534.00	**0.75**	0.01	19.00	0.56	0.02	2.90	0.01	0.30	2.90	2.59	0.30
	Minimum	20.70	**6.36**	2826	**0.05**	-250.00	26.00	**1.60**	5.00	5700.00	533.00	888.00	127.00	247.00	2110.00	194.00	0.01	0.00	0.05	0.27	0.01	0.80	0.01	0.02	0.50	0.14	0.02
Reporting Period (2024/2025)	**Average**	19.65	7.08	6607.36	2.43	-12.57	NLM	13.41	NLM	754.18	395.18	184.64	39.18	1456.73	1216.36	407.36	0.01	0.00	2.31	0.16	0.00	0.90	0.01	0.27	0.63	0.22	0.27
	Maximum	24.96	7.34	11360.00	3.87	26.90	NLM	56.50	NLM	1510.00	468.00	296.00	55.00	3140.00	1250.00	464.00	0.01	0.00	8.03	0.24	0.00	1.50	0.01	0.66	0.80	0.34	0.66
	Minimum	1.56	6.59	5149.00	1.01	-30.80	NLM	0.50	NLM	511.00	285.00	143.00	31.00	964.00	1150.00	383.00	0.01	0.00	0.05	0.12	0.00	0.60	0.01	0.01	0.50	0.01	0.01
All Results (2002-2025)	**Average**	21.01	6.92	26513.95	2.04	-30.99	14.50	30.27	5.00	4771.54	548.79	783.34	137.26	8710.07	1840.33	471.45	0.05	0.00	3.39	0.33	0.22	3.06	0.04	0.21	3.13	2.59	0.26
	Maximum	25.42	7.41	**46890.00**	9.15	195.80	33.00	169.00	5.00	**7080.00**	2350.00	**2040.00**	**240.00**	**15198.00**	**4000.00**	**597.00**	**0.75**	0.01	19.00	1.20	0.85	11.50	0.35	2.00	11.50	9.21	2.05
	80th Percentile	23.56	7.18	33440.00	2.92	-4.20	22.00	53.26	5.00	6474.00	599.80	985.20	174.00	11400.00	2110.00	532.00	0.05	0.01	6.58	0.57	0.50	4.86	0.03	0.34	4.86	4.53	0.46
	Median (50th Percentile)	21.00	6.92	32168.50	1.86	-24.80	13.50	16.50	5.00	5860.00	544.00	924.00	157.00	10800.00	1940.00	476.50	0.05	0.01	1.94	0.22	0.05	2.70	0.01	0.01	2.90	2.40	0.02
	20th Percentile	19.16	6.67	11360.00	0.84	-67.40	5.40	4.34	5.00	1662.00	417.20	346.40	69.00	3304.00	1266.00	420.40	0.01	0.00	0.05	0.09	0.01	0.76	0.01	0.01	0.76	0.53	0.01
	Minimum	1.56	**6.00**	2826.00	0.05	-267.00	5.00	0.40	5.00	458.00	276.00	143.00	31.00	247.00	1130.00	194.00	0.01	0.00	0.05	0.02	0.00	0.01	0.01	0.01	0.01	0.01	0.01
MB14																											
Reporting Period (2024/2025)	**Average**	20.44	7.04	503.00	1.91	-1.81	NLM	41.10	NLM	27.25	46.38	10.88	7.38	52.75	19.88	136.00	0.09	0.00	2.38	0.58	0.00	6.20	0.01	0.01	6.20	4.01	0.01
	Maximum	25.70	7.81	784.00	3.77	65.40	NLM	210.00	NLM	48.00	92.00	20.00	20.00	98.00	38.00	215.00	0.22	0.00	5.51	0.99	0.00	11.90	0.01	0.01	11.90	7.92	0.01
	Minimum	1.38	6.53	171.00	0.54	-53.40	NLM	5.40	NLM	11.00	4.00	2.00	2.00	18.00	2.00	21.00	0.02	0.00	1.01	0.17	0.00	0.50	0.01	0.01	0.50	0.09	0.01
All Results (2002-2025)	**Average**	21.79	7.31	627.85	2.34	-31.81	24.54	30.81	5.00	49.02	60.56	15.92	5.72	76.10	39.30	175.77	0.02	0.00	1.80	0.18	0.04	0.73	0.01	0.04	0.71	0.34	0.04
	Maximum	28.30	8.17	2296.00	10.30	210.70	195.00	217.40	5.00	182.00	154.00	39.00	20.00	491.00	181.00	321.00	0.22	0.02	**22.90**	0.99	0.47	11.90	0.10	0.37	11.90	7.92	0.37
	80th Percentile	23.60	7.70	796.20	3.68	41.48	30.00	34.60	5.00	78.40	69.60	20.00	6.60	100.40	44.20	200.80	0.02	0.00	2.35	0.26	0.05	0.54	0.01	0.03	0.44	0.10	0.02
	Median (50th Percentile)	21.90	7.50	566.00	1.70	-39.90	14.50	15.80	5.00	33.00	58.00	15.00	5.00	49.00	31.00	185.00	0.01	0.00	0.74	0.12	0.01	0.30	0.01	0.01	0.30	0.06	0.01
	20th Percentile	20.62	6.85	469.20	0.73	-116.64	6.00	5.40	5.00	25.00	48.00	12.00	5.00	36.00	24.40	161.00	0.01	0.00	0.05	0.10	0.01	0.20	0.01	0.01	0.20	0.02	0.01
	Minimum	1.38	**6.35**	137.00	-0.30	-244.00	5.00	0.55	5.00	11.00	4.00	2.00	2.00	17.00	2.00	21.00	0.01	0.00	0.05	0.05	0.00	0.01	0.01	0.01	0.10	0.01	0.01

Red and **bold** values exceed the objective value for that analyte. IS - Insufficient data for statistical analysis. NS = No Sample Required. ND = No Data NLM - No Longer Monitored **=Monitoring has ceased

Table 7.2 (Cont'd)
Groundwater Monitoring Data Summary

		Physical								Major Cations & Anions							Metals			Nutrients								
Parameters		**Temp °C**	**pH**	**Electrical Conductivity uS/cm**	**Dissolved Oxygen mol/L**	**Redox mV**	**Total Suspended Solids mg/L**	**Turbidity NTU**	**Oil & Grease mg/L**	**Sodium mg/L**	**Calcium mg/L**	**Magnesium mg/L**	**Potassium mg/L**	**Chloride mg/L**	**Sulfate mg/L**	**Bicarbonate mg/L**	**Aluminium mg/L**	**Arsenic mg/L**	**Iron (filterable) mg/L**	**Total Phosphorous mg/L**	**Reactive Phosphorous mg/L**	**Total Nitrogen mg/L**	**Nitrite mg/L**	**Nitrate mg/L**	**TKN mg/L**	**Ammonia mg/L**	**NOx mg/L**
MB15																											
Pre-Extraction	**Average**	21.10	7.54	590.00	**0.33**	-119.80	14.00	**36.45**	5.00	101.00	32.50	12.00	7.00	78.50	42.50	212.50	0.28	0.00	0.74	0.28	0.22	0.45	0.01	0.01	0.45	0.19	0.01
	Maximum	21.60	7.63	625.00	**0.65**	-87.00	14.00	**62.00**	5.00	116.00	40.00	14.00	8.00	83.00	48.00	217.00	**0.52**	0.00	1.35	0.33	0.22	0.60	0.01	0.01	0.60	0.26	0.01
	Minimum	20.60	7.45	555.00	**0.01**	-152.60	14.00	10.90	5.00	86.00	25.00	10.00	6.00	74.00	37.00	208.00	0.03	0.00	0.13	0.22	0.21	0.30	0.01	0.01	0.30	0.12	0.01
Reporting Period (2024/2025)	**Average**	20.08	7.49	481.09	2.19	-46.61	NLM	2.11	NLM	49.82	39.55	9.82	6.82	36.55	14.36	185.82	0.02	0.00	0.10	0.25	0.00	0.80	0.01	0.06	0.77	0.61	0.06
	Maximum	25.85	7.98	549.00	3.59	-26.20	NLM	5.90	NLM	62.00	51.00	12.00	7.00	42.00	20.00	206.00	0.10	0.00	0.50	0.37	0.00	1.60	0.01	0.15	1.60	1.41	0.15
	Minimum	0.48	6.73	442.00	1.19	-73.20	NLM	0.30	NLM	39.00	32.00	8.00	6.00	30.00	8.00	168.00	0.01	0.00	0.05	0.16	0.00	0.40	0.01	0.01	0.30	0.01	0.01
All Results (2002-2025)	**Average**	21.78	7.48	659.72	1.83	-65.71	9.58	8.72	5.00	73.01	44.82	13.24	8.37	70.66	35.28	196.18	0.02	0.00	0.17	0.23	0.15	0.70	0.02	0.07	0.67	0.30	0.05
	Maximum	26.09	8.38	1170.00	6.45	203.70	24.00	69.94	5.00	144.00	83.00	23.00	14.00	121.00	138.00	228.00	**0.52**	0.01	1.35	0.78	0.22	4.80	0.18	1.07	4.80	1.41	0.46
	80th Percentile	24.04	7.81	738.00	2.53	-30.22	15.20	14.68	5.00	86.00	55.00	17.00	10.00	94.80	53.00	211.80	0.01	0.00	0.26	0.28	0.17	0.84	0.01	0.03	0.88	0.44	0.04
	Median (50th Percentile)	21.70	7.53	637.00	1.49	-55.95	7.00	3.80	5.00	71.00	42.00	12.00	8.00	79.00	31.00	196.00	0.01	0.00	0.08	0.20	0.14	0.40	0.01	0.01	0.40	0.26	0.01
	20th Percentile	20.05	7.29	540.00	0.55	-148.80	5.00	1.10	5.00	58.00	34.40	10.00	7.00	44.00	14.40	182.00	0.01	0.00	0.05	0.17	0.11	0.30	0.01	0.01	0.30	0.16	0.01
	Minimum	0.48	**3.18**	442.00	0.01	-224.40	5.00	-7.10	5.00	10.00	25.00	8.00	6.00	23.00	4.00	128.00	0.01	0.00	0.05	0.05	0.08	0.01	0.01	0.01	0.01	0.01	0.01

Red and **bold** values exceed the objective value for that analyte. IS - Insufficient data for statistical analysis. NS = No Sample Required. ND = No Data NLM - No Longer Monitored **=Monitoring has ceased

At all groundwater monitoring locations, all major cations and anions sampled during the reporting period were generally below the relevant SWMP objective. However, MB11 recorded an exceedance of the upper limit of the magnesium objective of 100mg/L, with a concentration of 139mg/L in July 2024. In addition, sulfate objective of 800mg/L was exceeded on two occasions, one in July 2024 with a concentration of 1,500mg/L and another one in May 2025 with a value of 981mg/L. It is noted that a trend of increased magnesium and sulfate was recorded from March 2024 with levels subsequently dropping below the objective from August 2024. Whilst pH levels remained near neutral, elevated iron levels were also recorded from June 2024 to November 2024, following a similar but slightly delayed rise, peak and decline compared with magnesium and sulfate.

Both the rise and fall in magnesium, sulfate and iron is expected to have resulted from local oxidation of acid sulfate soils with pH buffered by the existing buffering capacity within the sand profile. Whilst this has not previously been recorded, it was anticipated in the 2008 Environmental Assessment which stated that the Project "*may lead to the generation of acidic water. It is expected that the buffering capacity of the sand and sediments below -5.0m AHD would be sufficient to maintain the extraction pond water at a neutral pH.*"

No visible oil and grease was reported during the reporting period.

Metals

Figure 7.4g shows the iron concentrations at the Cudgen Lakes Sand Quarry. Metal values recorded at all bores during the reporting period generally remained within the relevant objective values with the exception of iron levels at MB11 as discussed above.

An increase in iron levels at MB11 (11.3mg/L) and MB12 (33mg/L) also occurred in May 2025. As discussed above, the contingency measure of pumping out MB12 into the dredge pond to remove and precipitate the dissolved iron was undertaken. Iron levels decreased in both bores during the June 2025 sampling to 9.78mg/L and 10.4mg/L respectively, indicating that this contingency measure may be a suitable approach to manage the short-term effects from acidification adjacent to the dredge pond.

Nutrients

Nutrient levels across both extraction ponds remained slightly elevated throughout the reporting period, consistent with previous reporting periods.

Elevated nutrient levels have consistently been recorded in pre-extraction baseline monitoring and in surrounding groundwater bores. This is reflective of past and current agricultural activities within and surrounding the Quarry both on the floodplain and the Cudgen Plateau. Given that the approved Quarry activities themselves do not influence nutrient levels within the surrounding groundwater bores, groundwater quality objectives are not specified in the approved *Soil and Water Management Plan* for the Quarry and ongoing monitoring of nutrients within groundwater is undertaken only to improve the understanding of potential impacts from surrounding activities on water quality within the dredge pond.

Comparison with Predictions

In summary, the 2008 Environmental Assessment anticipated that "water quality at surrounding bores would not be significantly affected as a result of the Project". However, the 2008

Environmental Assessment also anticipate that the Project "may lead to the generation of acidic water. It is expected that the buffering capacity of the sand and sediments below -5.0m AHD would be sufficient to maintain the extraction pond water at a neutral pH.

The monitoring results to date support these predictions with water levels remaining within predicted levels. Notwithstanding, the reduction in groundwater levels at MB11 and MB12 during the reporting period (following the commencement of dredging within the northern extraction pond immediately adjacent MB11, MB12 and MB13), pH levels remained near neutral. This indicates that the existing buffering capacity was sufficient to neutralise any acidification of acid sulfate soils in the vicinity of MB11. The elevated magnesium, sulfate and iron during this period are therefore consistent with this process and are expected to represent a short term / transient change in water quality as dredging progresses within this area. This is supported by the July and August 2024 monitoring data, which record a continuing decline in these analytes.

Reportable Incidents

During the reporting period the maximum objective criterion for Iron (filterable) of 20mg/L for MB11 was exceeded from July 2024 to November 2024. In accordance with the SWMP these are reportable incidents and were reported to DPHI.

Further Improvements

During the next reporting period a replacement bore will be resolved for MB10. Groundwater level logger replacements for multiple monitoring sites will also be undertaken. During the reporting period an exceedance register was established and is utilised to review monthly results against the approved TARPs. This has been successfully applied and therefore, subject to approval of the updated SWMP, no further improvements to the SWMP are currently planned.

8. Rehabilitation

8.1 Rehabilitation Performance During the Reporting Period

Figure 8.1 shows the status of disturbance and rehabilitation at the end of the reporting period whilst **Table 8.1** provides a summary of the disturbance and rehabilitation areas.

Table 8.1
Rehabilitation Summary

Quarry Area Type	Previous Reporting Period (Actual) Year 15 (ha)	This Reporting Period (Actual) Year 16 (ha)	Next Reporting Period (Forecast) Year 17 (ha)
Total Quarry footprint[1]	21.7	23.9	26.0
Total active disturbance[1]	21.7	23.9	26.0
Land being prepared for rehabilitation	0	0	0
Land under active rehabilitation	0	0	0
Completed rehabilitation	0	0	0

Note: 1. Includes areas of temporary rehabilitation.

The total active disturbance area increased during the reporting period with extraction activities continuing in the northern dredge pond towards the northern extraction boundary and the formation of the water management bunding around the perimeter of the northern pond area.

The current active disturbance area of 23.9ha includes an approximately 12.8ha pond area (~8.7ha southern lake and ~4.1ha northern pond), 0.6ha silt return pond area, and approximately 1.0ha processing area. The majority of the remaining areas are considered to have been previously temporarily rehabilitated with re-established pasture.

An approximately 8.2ha area of disturbance is also present in relation filling works associated with DA 20/0965 and DA22/0145. As these works are managed under separate approval and not directly related to Quarry operations, these areas are not included in **Table 8.1**.

Maintenance activities mainly consisted of slashing/grazing, spot spraying of grass, whipper snipping around the office and entrance, and fencing repairs required by grazing. During the reporting period an excavator was utilised to flatten the eastern and southern batters of the current northern extraction pond to 1:3 V:H and tubestock was planted from just within the water line out to a width of up to 3m. These works are considered temporary but minimise environmental disturbance. The intent of the plantings is to trial the establishment of tubestock in 'freshly completed' areas that have not already natural established vegetation (such as has occurred along the boundary of the southern extraction area).

Monthly visual monitoring of the site was undertaken to ensure no noxious weeds, such as Amazonian Frogbit and Kidney Mud Plantain were present on site following identification of the weeds near the Kingscliff Waste Water Treatment Plant and east of Tweed Coast Road during 2023/2024. No aquatic weeds have been observed to date within the extraction ponds.

8.2 Actions for the Next Reporting Period

Rehabilitation activities during the next reporting period are expected to be limited to ongoing maintenance activities, including weed control. Whilst not a requirement, additional landscaping works are also planned to be undertaken along the northern perimeter of the processing area to improve the visual appeal upon entry to the area. Pending the construction of an extended processing area (subject to approval of MOD4), planting of tubestock may also occur on visual barriers constructed for the extended area.

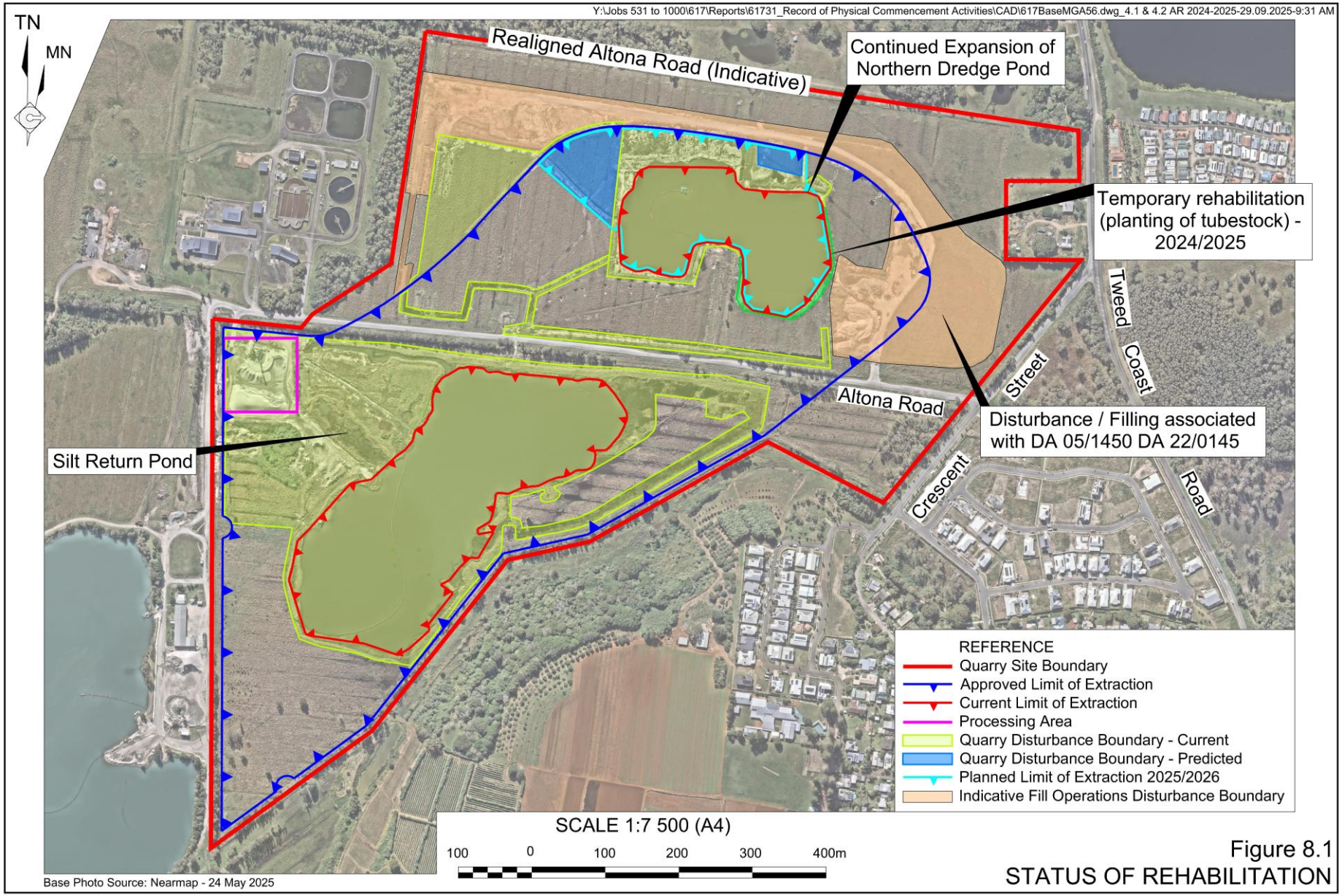


Figure 8.1
STATUS OF REHABILITATION

9. Community

9.1 Community Complaints

No complaints were received during the current reporting period and the Community Consultative Committee (CCC) confirmed during the 21 February 2025 meeting that they had not heard of complaints in the community.

9.2 Community Liaison

The principal form of formal community consultation relating to the Quarry during the reporting period was via the CCC. During the reporting period, the CCC consisted of following representatives.

- The CCC Chairperson – Mr Michael Ulph who was appointed by (then) DPE to the role of chairperson in May 2022.
- Community members – Ms Felicia Cecil and Mr Barry Green who were approved by (then) DPE on 14 November 2016. Mr Lloyd Goddard (as a potential community representative) and Mr James Owen (representing Business Kingscliff) were also present at the 21 February 2025 meeting.
- Company representatives – Dr Stephen Segal and Mrs Lisa Peled of Gales-Kingscliff and Mr Matt and Mr Brad Holloway and Nick Gould of Kingscliff Sands Pty Limited/JBM Developments. Mr Gavin Johnson of Johnson Planning & Development was also present as an observer.
- Tweed Shire Council representatives – Ms Colleen Forbes, Team Leader Development Assessment, and Mr Ray Clark.

During the reporting period, the CCC meeting was convened on 21 February 2025. During the February 2025 meeting key matters or issues discussed included installation of the wheel wash, installation of the water management bunding north of Altona Road, widening works on Altona Road (under separate DA), upgrades to the wash plant, the proposed MOD4, and other updates on activities undertaken and planned.

The report / minutes provided an overview of activities during the current reporting period.

Continued CCC meetings will be undertaken at times set by the CCC. Minutes from these meetings/reports will also continue to be placed on the Company website and reported through the respective Annual Review.

10. Independent Audit

In accordance with *Condition 5(14)* of PA 05_0103, an independent audit was undertaken by James Hart Consulting on 9 November 2022 and finalised 20 December 2022. The final audit and response was submitted to the Department on 24 January 2023. This is the second independent audit for the Quarry.

A review of the status of the response plan as at the end of this reporting period is provided in **Table 10.1**.

The next Independent Environmental Audit is due and will be undertaken in November/December 2025.

Table 10.1
2022 Independent Audit – Action Response Plan Status

No.	Audit Recommendation	Action / Response	Proposed Timing	Status Update
NC-01	It is recommended that all non-compliances identified are addressed and closed out. Consider implementing a process to track compliance requirements and status.	Compliance requirements and status to continue to be tracked internally and reported through the Annual Review process.	Annually as part of the Annual Review.	Actions have been generally implemented as planned. Further closing out of non-compliances will be reported in future Annual Reviews.
NC-02	A copy of the DRG Extractive Materials Return form should be included in the Annual Review.	It is noted that the Extractive Materials Return for each financial year is due after the respective Annual Review and is submitted directly to the Resources Regulator. A copy of the previous year's Extractive Materials Return will be included as an appendix to future Annual Reviews.	Annually as part of the Annual Review.	The Extractive Materials Return form is included in each relevant Annual Review. **Complete.**
NC-03	Noise monitoring should be scheduled and completed as required by the approved Noise Management Plan.	An incident report was lodged in 2021 with action responses. These actions have been implemented with subsequent noise monitoring completed in accordance with the approved Noise Management Plan and reported through the Annual Review process.	Annually as part of the Annual Review.	Noise Monitoring has been completed for the 2024-2025 reporting period as required by the approved Noise Management Plan. Future noise monitoring will be scheduled to ensure it is undertaken as required by the NMP. **Complete.**
NC-04	Inspections required by Section 4.4 of the SWMP should be completed and records retained.	Review inspection checklist / form for recording the required information and ensure addresses all requirements.	By 31 January 2023.	The workplace inspection checklist was updated to include inspection of erosion and sediment controls. **Complete**
		Ongoing inspections to be undertaken and recorded utilising the template and reported through the Annual Review.	Ongoing and annually as part of the Annual Review.	The updated workplace inspection checklist has been implemented since February 2023 and commentary is provided in Section 7.2. **Complete**
NC-05	Surface water monitoring should be conducted in accordance with Section 7.5 of the SWMP and records retained.	Review template form / spread sheet for recording the weekly monitoring information and ensure addresses all requirements.	By 31 January 2023.	Template reviewed. Monitoring undertaken by external consultant on monthly basis. The SWMP has been revised to remove weekly monitoring given the consistency of water quality within the pond over a long period of operations and was approved September 2025. **Complete**
		Ongoing weekly monitoring to be undertaken (in accordance with the SWMP) and recorded utilising the template and reported through the Annual Review.	Ongoing and annually as part of the Annual Review.	

Table 10.1 (Cont'd)
2022 Independent Audit – Action Response Plan Status

No.	Audit Recommendation	Action / Response	Proposed Timing	Status Update
NC-06	The draft Rehabilitation Management Plan should be updated and resubmitted to DPE for acceptance.	The draft Rehabilitation Management Plan will be updated to address agency comments and resubmitted to DPE with a request for approval.	Submission prior to 31 March 2023.	The updated Rehabilitation Management Plan was approved on 1 February 2024. **Complete**
NC-07	Update the website to include all required information.	The Gales-Kingscliff website was previously upgraded to a new site with some documentation not migrated. A review of the website will be undertaken to identify any additional documentation gaps and all documentation required uploaded.	Documentation to be uploaded prior to 28 February 2023.	A review of the website was undertaken and all documents required by the PA have been uploaded. Up to date versions of these documents will also be uploaded as they are approved/required. **Complete.**
NC-08	Annual Returns should be submitted within the required timeframe.	Internal reporting checklists have previously been updated to reflect the updated Annual Return date. The 2022 Annual Return was submitted within the required reporting date.	No further action required.	Noted. No further action. **Complete**
NC-09	Instal a height gauge within the extraction pond to enable monitoring of water levels	A new height gauge has been installed to replace the previous gauge removed due to dredging. Elevations to be added using laser level.	By 31 January 2023	**Complete**.
		During a future modification application, it will be proposed to update Statement of Commitment 5.2 to be consistent with the approved Soil and Water Management Plan which provides for multiple measurement options. "*Levels will be measured either via the calibrated height gauge, water level sensor, or calibrated water level monitor on the dredge*"	During future modification of Project Approval.	MOD 4 lodged 26 June 2025 simplifies the Statement of Commitment to be consistent with measures outlined within the approved Soil and Water Management Plan. Awaiting determination of MOD4.

11. Incidents and Non-compliances During the Reporting Period

During the reporting period there were no official cautions, penalty notices or prosecution proceedings. However, a warning letter was received on 3 July 2025 in relation to non-compliances with air quality and surface water sample collection. The missed sample collection was reported via an incident report submitted via the Major Project Portal. A number of incident reports were also submitted in relation to the results of deposited dust monitoring and water quality monitoring.

Table 11.1 provides a summary of the non-compliances recorded during the reporting period, including the date, details of the non-compliance, cause and actions taken. These non-compliance were reported through an incident report submitted 31 January 2025 and the 2024/2025 EPL Annual Return.

A further eight incident reports were submitted during the reporting period as a result of a Trigger Action Response Plan (TARP) outlined in an approved management plan but do not correspond to a non-compliance. Copies of each incident report is reproduced in **Appendix 7** and provides full details of each reported exceedance. A summary of the incident reports is provided as follows.

Dissolved Oxygen Levels within Dredge Pond

During the reporting period the dissolved oxygen objective as specified in the approved May 2021 SWMP was exceeded on 12 occasions, five times at DP1 (January, February, March, May and June 2025), once at DP2 (January 2025), four times at DP3 between (January, February, March and June 2025), and twice at DP4 (February and June 2025). The deviations were minor, with recorded values only slightly below the criterion of 6mg/L, ranging from 4.81mg/L to 5.99mg/L.

These exceedances are consistent with previous monitoring results and reflect the mixing of the deeper deoxygenated water with the surface layers. In recognition of this, the dissolved oxygen objective was updated in the SWMP, originally submitted in December 2023 and re-submitted in January 2025 for approval clarifying that the DO objective only applies during periods of inactivity when the mixing action of dredging or water pumping in not affecting surface oxygen levels. The updated SWMP remained awaiting approval throughout the reporting period and was subsequently approved September 2025. No further action is required.

Water Quality within Groundwater Monitoring Bore MB11

MB11 recorded exceedances of the upper limit of the magnesium and sulfate objectives between March and July 2024 and the dissolved iron objective between May and November 2024. Whilst the pH levels remained near neutral throughout this time, as outlined in Section 7.3, the rise and fall in magnesium, sulfate and iron levels is expected to have resulted from local oxidation of acid sulfate soils with pH buffered by the existing buffering capacity within the sand profile. Though this had not previously been recorded, it was anticipated in the 2008 Environmental Assessment which stated that the Project "*may lead to the generation of acidic water. It is expected that the buffering capacity of the sand and sediments below -5.0m AHD would be sufficient to maintain the extraction pond water at a neutral pH.*"

Table 11.1
Summary of Non-Compliances and Incident Reports

Relevant approval	Condition	Condition Description	Date / Location	Particulars of non-compliance	Cause	Actions taken / Proposed	Prevention of Recurrence
MP05_0103B	2(2)	Non-compliances with the conditions of the approval were recorded.	2024/25 reporting period	Non-compliances with the conditions of the approval were recorded.	As outlined for each non-compliance.	As outlined for each non-compliance.	As outlined for each non-compliance.
MP05_0103B	3(7)	Implement air quality monitoring in accordance with the approved AQMP	December 2024 / January 2025	Air quality monitoring not undertaken over the December 2024/January 2025 period.	Sampling was not completed due to a communication error between site and the monitoring consultants regarding the operational status of the site	Incident report submitted 31 Jan 2025. Air Quality and surface water monitoring requirements clarified and re-confirmed with monitoring consultant and operator.	Revised monitoring scheduling system to include the operator advising by email the monitoring Consultant, Gales and RWC of any plans for extended non-operational periods. In the event of any uncertainties samples are to be collected in accordance with operational sampling frequencies.
MP05_0103B	3(18)	Implement surface water and groundwater monitoring in accordance with the approved SWMP		Monitoring not undertaken during December 2024 despite operations occurring (dredging, processing, truck movements). This constitutes a breach of the SWMP monitoring requirements.			
EPL 12385	M2.1	Undertake monitoring in accordance with specified locations, analytes, and frequency	2024/25 (one sample required), EPL Point 5 (MB10)	Monitoring was unable to be undertaken at EPL Point 5 (MB10) due to the bore being damaged. A replacement bore is to be established / alternative site nominated. This non-compliance was reported through the 2024/2025 Annual Return	The monitoring bore at EPL Point 5 (MB10) has been damaged by earthmoving equipment during works for placement of transformer.	A replacement bore or use of a suitable nearby existing bore is being investigated and will be implemented during the next reporting period.	Earthworks for transformer, parking area, and landscaping completed. Replacement bore to be located beyond the limit of vehicular access to prevent future damage. Bore inspection/maintenance and staged logger replacement program to ensure monitoring reliability

Whilst localised acid sulfate soil oxidation was expected to occur, the monitoring results demonstrated that the buffering capacity within the sand profile was sufficient to maintain a near neutral pH. Furthermore, groundwater in the vicinity of the pond will have been drawn into the pond as a result of the slightly reduced water levels within the northern dredge pond. As such, dissolved iron in proximity of MB11 will also have been drawn into the northern dredge pond. As the levels of dissolved iron within the dredge pond remained consistently low, the total amount of iron liberated from oxidation would be low relative to the pond water volume.

In addition to these measures, contingency measures were written into the updated SWMP and, as discussed in Section 7.3, were tested during the reporting period. Specifically, groundwater was pumped out of the bore into the pond. The action of pumping the water into the pond results in aeration and oxidation of the dissolved iron into sediments which settle within the pond. This management measure appeared to be successful with a reduction in iron levels within MB11 and no increase of dissolved iron within the northern pond. Currently no additional actions or measures are considered necessary beyond ongoing monitoring and application of contingency measures if required.

Deposited Dust Levels in Guage D3

As outlined in Section 6.4, the rolling annual average deposited dust levels exceeded the 4g/m^2/month criteria at D3 from October 2024. These exceedances were investigated and incident reports provided to DPHI confirming that the exceedances were not the result of Quarry activities and as such are not a non-compliance with Condition 3(8) which states "*The Proponent must ensure that particulate matter generated by the project do not cause exceedances of the criteria*".

The result of the exceedance was determined to be contamination with organic matter, which has been an issue across all dust gauges since monitoring commenced. Due to the extremely flat nature of the surrounding area there are no suitable locations available to place the gauges that are not exposed to organic inputs from time to time.

12. Activities to be Completed in the Next Reporting Period

Activities planned to be completed during the next reporting period are outlined in Section 4.3 and planned improvements in environmental management practices in Sections 6 and 7. In summary, the key activities planned for the next reporting period are as follows.

- Modifications subject to approval of the MOD4 application.
- Continued extraction of sand and soil by dredge and excavator and sale of products by road.
- Continued environmental monitoring, including re-instatement of monitoring bore MB10 and replacement of groundwater loggers (subject to approval of the updated SWMP).
- Continued community consultation to inform the community about Quarry activities and development on the Quarry site.

Appendices

Appendix 1 Compliance Review
Table A: Project Approval MP05_0103B
Table B: Statement of Commitments
Table C: Environment Protection Licence 12385
Appendix 2 Noise Monitoring Results
Appendix 3 Air Quality Monitoring Results
Appendix 4 Surface Water Monitoring Results
Appendix 5 Groundwater Monitoring Results
Appendix 6 Extractive Materials Return
Appendix 7 Incident Reports

Appendix 1

Compliance Review

Table A: Project Approval MP 05_0103B

Table B: Statement of Commitments

Table C: Environment Protection Licence 12385

(No. of pages including blank pages = 54)

Table A
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 2 ADMINISTRATIVE CONDITIONS				
OBLIGATION TO MINIMISE HARM TO THE ENVIRONMENT				
1.	In addition to meeting the specific performance measures and criteria established under this approval, the Proponent must implement all reasonable and feasible measures to prevent, and if prevention is not reasonable and feasible, minimise any material harm to the environment that may result from the construction and operation of the project, and any rehabilitation required under this approval.	Compliant	All reasonable and feasible measures to minimise potential for harm were implemented during the reporting period.	A, D
TERMS OF APPROVAL				
2.	The Proponent, in acting on this approval, must carry out the project in accordance with: (a) the conditions of this approval; and (b) all written directions of the Secretary.	**Non-Compliant**	The Company has generally undertaken operations in accordance with the conditions of this approval. However, non-compliance with some conditions have been recorded for this reporting period. No written directions have been received during the reporting period.	D
3.	The Proponent, in acting on this approval, must carry out the project generally in accordance with the EA, EA MOD 1, EA MOD2 and project layout.	Compliant	The works completed during the reporting period are considered to be generally consistent these documents.	A, D
4.	The conditions of this approval and directions of the Secretary prevail to the extent of any inconsistency, ambiguity or conflict between them and a document referenced in condition 3 of this Schedule. In the event of an inconsistency, ambiguity or conflict between any of the documents referenced in condition 3 of this Schedule, the most recent document prevails.	Noted	-	-
5.	Consistent with the requirements of this approval, the Secretary may make written directions to the Proponent in relation to: a) the content of any strategy, study, system, plan, program, review, audit, notification, report or correspondence submitted under or otherwise made in relation to this approval, including those that are required to be, and have been, approved by the Secretary; and b) the implementation of any actions or measures contained in any such document referred to in (a) above. *Note: For the purposes of this condition, there will be an inconsistency between documents if it is not possible to comply with both documents, or in the case of a condition of approval or direction of the Secretary, and a document, if it is not possible to comply with both the condition or direction, and the document.*	Not Applicable	No directions from the Secretary arose during the reporting period.	A

* D = Documentation sighted A = Advised by Company O = On-site Observation

Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 2 ADMINISTRATIVE CONDITIONS (Cont'd)				
LIMITS ON APPROVAL				
Quarrying Operations				
6.	The Proponent may carry out quarrying operations on the site until 31 December 2047. *Note: Under this approval, the Proponent is required to rehabilitate the site and carry out additional requirements and undertakings to the satisfaction of the Secretary. Consequently, this approval will continue to apply in all respects other than the right to conduct quarrying operations until the rehabilitation of the site and those requirements and undertakings have been carried out to the standard required by the applicable conditions.*	Noted	-	-
7.	The Proponent must not undertake extraction of extractive materials to a depth greater than -20 metres AHD.	Compliant	To date extraction has reached a maximum depth of -20m AHD within the northern extraction area (utilising GPS enabled and programable electric dredge).	A
8.	The Proponent must not extract more than 650,000 cubic metres of quarry products from the site in any financial year.	Compliant	A total of approximately 178,044m^3 of sand was extracted during the reporting period.	A, D
Quarry Product Transport				
9.	The Proponent must not transport more than 300,000 tonnes of quarry products from the site by road in any financial year.	Compliant	A total of 267,066t of product was transported by road during the reporting period.	A, D
10.	The Proponent must not import more than 45,000 tonnes of VENM (or material that otherwise meets the classification of VENM as approved by the EPA) to the site in any financial year. The Proponent must ensure that all VENM imported to the site does not contain waste.	Compliant	No VENM was imported during the reporting period under Project Approval MP05_05_0103B.	A
11.	Prior to the upgrade of Altona Road and the Tweed Coast Road / Crescent Street intersection, as required under conditions 27 and 29 of Schedule 3, the Proponent may dispatch up to: (a) 4 laden trucks per hour; and (b) 10 laden trucks per day between the hours of 9.00 am and 3.00 pm.	No Longer Applicable	During the 2020/2021 reporting period road upgrade works were completed by Hanson Construction Materials, including upgrade works to Altona Road and the Tweed Coast Road / Crescent Street intersection. These works also satisfy the requirements of Schedule 3 Conditions 27 and 29. Council confirmed their satisfaction of the works through the issue of a Works as Executed Compliance Certificate dated 7 May 2020.	A, D
12.	Following the completion of road upgrades required under conditions 27 and 29 of Schedule 3, the Proponent must not dispatch more than 12 laden trucks from the site in any hour, during the hours specified in Table 1.	Compliant	Trucking records confirm that hourly laden trucks did not exceed 12 per hour.	A, D

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

<table>
<tr><th>Cond. No.</th><th>Conditional Requirement</th><th>Compliance</th><th>Comments</th><th>Basis*</th></tr>
<tr><td colspan="5">SCHEDULE 2 ADMINISTRATIVE CONDITIONS (Cont'd)</td></tr>
<tr><td colspan="5">LIMITS ON APPROVAL (Cont'd)</td></tr>
<tr><td colspan="5">Hours of Operation</td></tr>
<tr><td>13.</td><td>The Proponent shall comply with the operating hours in Table 1.
Table 1: Operating Hours
<table>
<tr><th>Activity</th><th>Permissible Hours</th></tr>
<tr><td>Site establishment, dry processing, product transport by road, VENM receipts, other quarrying operations not specified in this table</td><td>• 7.00 am to 6.00 pm Monday to Friday
• 7.00 am to 1.00 pm Saturday
• At no time on Sundays or public holidays</td></tr>
<tr><td>Sand extraction by dredging and pumping to the processing plant, wet processing.</td><td>• 7.00 am to 10.00 pm Monday to Friday
• 7.00 am to 4.00 pm Saturday
• At no time on Sundays or public holidays</td></tr>
<tr><td>Sand extraction by dredging and pumping to fill sites.</td><td>• 7.00 am to 6.30 pm Monday to Friday
• 7.00 am to 1.00 pm Saturday
• At no time on Sundays or public holidays</td></tr>
<tr><td>Operation of dredge to fill pipeline with water or pipeline flushing</td><td>• 6.30 am to 7.00 pm Monday to Friday
• 6.30 am to 1.30 pm Saturday
• At no time on Sundays or public holidays</td></tr>
<tr><td>Maintenance (if inaudible at neighbouring residences)</td><td>Any day</td></tr>
</table></td><td>Compliant</td><td>Site records and advice confirm activities undertaken within approved hours of operation.</td><td>A, D</td></tr>
<tr><td>14.</td><td>The following activities may be carried out outside the hours specified in condition 13. above:
(a) delivery or dispatch of materials as requested by Police or other public authorities; and
(b) emergency work to avoid the loss of lives, property or to prevent environmental harm.
In such circumstances, the Proponent must notify the Secretary and affected residents prior to undertaking the activities, or as soon as is practical thereafter.</td><td>Not Applicable</td><td>No such requests or emergency works have been received / required to date.</td><td>A</td></tr>
<tr><td colspan="5">STRUCTURAL ADEQUACY</td></tr>
<tr><td>15.</td><td>The Proponent must ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures, are constructed in accordance with the relevant requirements of the BCA.
Notes:
• Under Part 4A of the EP&A Act, the Proponent is required to obtain construction and occupation certificates for the proposed building works; and
• Part 8 of the EP&A Regulation sets out the requirements for the certification of the project.</td><td>Compliant</td><td>No buildings or structures on site require certification or assessment against the Building Code of Australia.</td><td>A, D</td></tr>
</table>

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 2 ADMINISTRATIVE CONDITIONS (Cont'd)				
DEMOLITION				
16.	The Proponent shall ensure that all demolition work is carried out in accordance with *AS 2601-2001: The Demolition of Structures*, or its latest version.	Not Yet Applicable	No demolition work has been required to date.	A
PROTECTION OF PUBLIC INFRASTRUCTURE				
17.	The Proponent shall: a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the project; and b) relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of the project. *Note: This condition does not apply to damage to roads caused as a result of general road usage or as otherwise addressed by contributions required by condition 19 of Schedule 2.*	Compliant	No repair works or relocation of public infrastructure was required during the reporting period.	A, D
OPERATION OF PLANT AND EQUIPMENT				
18.	The Proponent must ensure that all plant and equipment used at the site, or to monitor the performance of the project is: a) maintained in a proper and efficient condition; and b) operated in a proper and efficient manner.	Compliant	Equipment repair and servicing was undertaken during the reporting period to ensure proper and efficient equipment condition. No issues with equipment operation arose during the reporting period.	A
CONTRIBUTIONS				
19.	The Proponent must pay to Council a financial contribution toward the upgrade and construction of distributor roads (other than Altona Road and the upgrade of the Tweed Coast Road / Crescent Street intersection). The contribution must be: a) determined in accordance with the Tweed Road Contributions Plan September 2016 (as indexed); b) paid prior to the dispatch of any laden trucks from the site, unless otherwise agreed by Council; c) reported in the Annual Review. *Note: The upgrade and maintenance of Altona Road is subject to conditions 25 and 26 of Schedule 3. The upgrade of the Tweed Coast Road / Crescent Street intersection is subject to condition 27 of Schedule 3.*	Compliant	Correspondence from Council dated 7 September 2016 confirms Council's acceptance that the contribution be paid prior to receipt of VENM to the site. The contribution amount was confirmed with Tweed Shire Council on 13 October 2020 and subsequently paid (i.e. prior to receipt of VENM).	A
COMPLIANCE				
20.	The Proponent must ensure that all of its employees, contractors (and their sub-contractors) are made aware of, and are instructed to comply with, the conditions of this approval relevant to activities they carry out in respect of the project.	Compliant	Kingscliff Sands induct all employees and contractors with all works under the direct supervision of the Operations Manager. The Operations Manager maintains copies of all approvals on site which are accessible to all employees / contractors.	A

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 2 ADMINISTRATIVE CONDITIONS (Cont'd)				
PRODUCTION DATA				
21.	The Proponent must: a) from the commencement of quarrying operations provide annual quarry production data to DRG using the standard form for that purpose; and b) include a copy of this data in the Annual Review.	Compliant Compliant	The 2023/24 Extractive Material Return form was submitted as required and is reproduced as **Appendix 6** of this Annual Review The 2024/2025 return is due by 31 October 2025. Production data is presented in Section 4.1 and the 2023/24 Extractive Material Return.	A, D
LIMITS OF EXTRACTION				
22.	The Proponent must ensure that the surveyed boundaries of the approved limits of extraction are clearly marked at all times in a permanent manner that allows operating staff and inspecting officers to clearly identify those limits. *Note: The limit of extraction includes the area described in the documents listed in condition 3 of Schedule 2, and shown conceptually on the project layout plan in Appendix 1.*	Compliant	The modified extraction boundary (per MOD2) has been surveyed by registered surveyors (B&P Surveys) and star pickets placed with ~2m high orange electrical conduit to enhance the visibility of the markers.	A, D
PIPELINE CORRIDOR				
23.	Prior to commencing work to install pipeline corridors (shown conceptually in Appendix 1), the Proponent must submit for the approval of the Secretary: a) a survey plan of the route of the pipeline; b) evidence that this route does not require native vegetation clearing; c) evidence that the fill sites have approval for filling; and d) in relation to the eastern pipeline: (i) evidence that any vegetation cleared from the eastern pipeline corridor following the date of this approval has been lawfully carried out in accordance with another approval; (ii) details of proposed measures to protect vegetation during pipeline installation, operation and removal; and (iii) details of measures, developed in consultation with OEH, to provide opportunities for the Wallum Froglet to cross the eastern pipeline.	Compliant	Neumann Contractors emailed DPE the required information for the section of pipeline between the Quarry Site and the Cudgen Heights fill site 5 and 19 July 2017. DPE approved installation of the pipeline by letter dated 31 July 2017. No additional sections of pipeline were placed during the reporting period.	A, D
24.	The Proponent must maintain the pipelines, ensuring that any leak or maintenance issues are detected and repaired to the satisfaction of the Secretary.	Not Applicable	The pipelines during the 2017/2018 reporting period were maintained and inspected by Neumann Contractors. However, following the completion of filling of the Cudgen Heights area the pipelines were removed. Therefore, no inspections or maintenance were applicable to this reporting period.	A, D

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

<table>
<tr><th>Cond. No.</th><th>Conditional Requirement</th><th>Compliance</th><th>Comments</th><th>Basis*</th></tr>
<tr><td colspan="5">SCHEDULE 2 ADMINISTRATIVE CONDITIONS (Cont'd)</td></tr>
<tr><td colspan="5">PROCESSING AREA</td></tr>
<tr><td>25.</td><td>The Proponent must ensure that the office facilities for the processing area:
a) are designed with ventilation emanating from the side facing away from the Kingscliff Waste Water Treatment Plant; and
b) have air conditioning facilities installed prior to occupation.</td><td>Compliant</td><td>The office facilities placed within the Processing Area include appropriate ventilation away from the WWTP and air conditioning facilities.</td><td>A</td></tr>
<tr><td colspan="5">SCHEDULE 3 SPECIFIC ENVIRONMENTAL CONDITIONS</td></tr>
<tr><td colspan="5">NOISE</td></tr>
<tr><td colspan="5">Operational Noise Criteria</td></tr>
<tr><td>1.</td><td>The Proponent must ensure that the noise generated by the project does not exceed the criteria in Table 2 at any residence on privately-owned land.
Table 2: Noise criteria dB(A)
<table>
<tr><th>Receiver Location</th><th>Day & Evening $LA_{eq(15\ min)}$ dB(A)</th><th>Shoulder $LA_{eq(15\ min)}$ dB(A)</th></tr>
<tr><td>Residences on privately owned land</td><td>47</td><td>44</td></tr>
</table>
Noise generated by the project is to be measured in accordance with the relevant requirements of the NSW Industrial Noise Policy. Appendix 3 sets out the meteorological conditions under which these criteria apply and the requirements for evaluating compliance with these criteria.
However, the noise limits in Table 2 do not apply if the Proponent has an agreement with the relevant landowner to exceed the noise criteria, and the Proponent has advised the department in writing of the terms of the agreement.</td><td>Compliant</td><td>Noise monitoring during the reporting period confirmed noise contributions from the Quarry remained below the criteria.</td><td>D</td></tr>
<tr><td colspan="5">Cumulative Noise Criteria</td></tr>
<tr><td>2.</td><td>The Proponent shall take all reasonable and feasible measures to ensure that noise generated by the project combined with the noise generated by other industrial development does not exceed the following amenity criteria on any privately-owned land, to the satisfaction of the Secretary:
• $L_{Aeq\ (11\ hour)}$ 50 dB(A) – Day;
• $L_{Aeq\ (4\ hour)}$ 45 dB(A) – Evening; and
• $L_{Aeq(9\ hour)}$ 40 dB(A) – Night.</td><td>Compliant</td><td>Whilst the cumulative amenity criterion was exceeded, noise monitoring confirms this was the result of surrounding noise sources. Operations were limited using appropriately sized and maintained equipment with the noise contributions from Quarry activities well below the relevant criteria. Therefore, it is considered all reasonable and feasible measure were taken.</td><td>A, D</td></tr>
</table>

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 3 SPECIFIC ENVIRONMENTAL CONDITIONS (Cont'd)				
NOISE (Cont'd)				
Operating Conditions				
3.	The Proponent must: a) implement best practice management to minimise the construction, operational and road transportation noise of the project; b) minimise the noise impacts of the project during meteorological conditions when the noise criteria in this approval do not apply (see Appendix 3); c) carry out attended noise monitoring (at least every 3 months or as otherwise agreed by the Secretary) to determine whether the project is complying with the operational noise criteria in Table 2 (see Appendix 3); and d) regularly assess noise monitoring data and modify and/or stop operations on site to ensure compliance with the relevant conditions of this approval, to the satisfaction of the Secretary. *Note: Monitoring under this approval is not required at all residences and the use of representative monitoring locations can be used to demonstrate compliance with criteria, if agreed to by the Secretary.*	Compliant	All equipment utilised in operations was appropriately sized and maintained to ensure efficient operations with the lowest noise generation. Use of broadband reversing alarms were also utilised to minimise tonal noise. Operations were also restricted to the approved hours of operation. Noise monitoring was undertaken during the reporting period. No modification to operations has been deemed necessary to date. Noise monitoring and management is further discussed in Section 6.3.	A, D
Noise Management Plan				
4.	The Proponent must prepare a Noise Management Plan for the project to the satisfaction of the Secretary. This plan must:	Compliant	Administrative updates were made to the Noise Management Plan and approved 13 February 2025.	
	a) be prepared by a suitably qualified and experienced person/s whose appointment has been endorsed by the Secretary;		The Department confirmed by letter 18 April 2019 that RWC was suitably qualified to prepare the noise management plan.	D
	b) be submitted to the Secretary for approval within three months of the determination of Modification 2;		The updated management plan was submitted to the Department on 22 April 2019, resubmitted 30 April 2020 and approved 22 June 2020.	D
	c) be prepared in consultation with the EPA;		EPA confirmed via email on 18 April 2019 that they would not be providing comments on the updated plan.	D
	d) describe the measures to be implemented to ensure: - compliance with the noise criteria and operating conditions of this approval; - best practice management is being employed; and - the noise impacts of the project are minimised during meteorological conditions under which the noise criteria in this approval do not apply (see Appendix 3);		Section 3 of the 2025 Noise Management Plan outlines the noise management measures.	D
	e) describe the proposed noise management system; and		Section 5 of the 2025 Noise Management Plan outlines the noise management system.	D

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

<table>
<tr><th>Cond. No.</th><th>Conditional Requirement</th><th>Compliance</th><th>Comments</th><th>Basis*</th></tr>
<tr><td colspan="5">SCHEDULE 3 SPECIFIC ENVIRONMENTAL CONDITIONS (Cont'd)</td></tr>
<tr><td colspan="5">NOISE (Cont'd)</td></tr>
<tr><td colspan="5">Noise Management Plan (Cont'd)</td></tr>
<tr><td>4.
(Cont'd)</td><td>f) include a monitoring program to be implemented to measure noise from the project against the noise criteria in Table 2, and which evaluates and reports on the effectiveness of the noise management system on site.
The Proponent must implement the Noise Management Plan as approved from time to time by the Secretary.</td><td></td><td>Section 5 of the 2025 Noise Management Plan outlines the noise monitoring program.

The Noise Management Plan was appropriated implemented during the reporting period.</td><td>D

A, D</td></tr>
<tr><td colspan="5">AIR QUALITY</td></tr>
<tr><td colspan="5">Air Quality Impact Assessment Criteria</td></tr>
<tr><td>8.</td><td>The Proponent must ensure that particulate matter generated by the project do not cause exceedances of the criteria listed in Table 3 at any privately-owned land.
Table 3
<table>
<tr><th>Pollutant</th><th>Averaging period</th><th colspan="2">Criterion</th></tr>
<tr><td>Particulate matter < 10 µm (PM_{10})</td><td>Annual</td><td colspan="2">[a,c] 25 µg/m^3</td></tr>
<tr><td></td><td>24-hour</td><td colspan="2">[b] 50 µg/m^3</td></tr>
<tr><td>Particulate matter < 2.5 ($PM_{2.5}$)</td><td>Annual</td><td colspan="2">[a, c] 8 µg/m^3</td></tr>
<tr><td></td><td>24-hour</td><td colspan="2">[b] 25 µg/m^3</td></tr>
<tr><td>Total suspended particulate (TSP)</td><td>Annual</td><td colspan="2">[a,c] 90 µg/m^3</td></tr>
<tr><td>[d] Deposited dust</td><td>Annual</td><td>[b] 2 g/m^2/month</td><td>[a] 4 g/m^2/month</td></tr>
</table>
Notes:
a Total impact (i.e. incremental increase in concentrations due to the project plus background concentrations due to all other sources).
b Incremental impact (i.e. incremental increase in concentrations due to the project on its own).
c Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed by the Secretary.
d Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.</td><td>Compliant</td><td>Air quality monitoring was undertaken in accordance with the approved Air Quality Management Plan.
Deposited dust levels remained below the criteria for the reporting period at DG1 and DG2. Deposited dust levels exceeded the criteria at DG3, however, investigation confirmed that the cause of the exceedance was not the result of Quarry operations (being due to organic matter).</td><td>A, D</td></tr>
<tr><td colspan="5">Operating Conditions</td></tr>
<tr><td>6.</td><td>The Proponent must:
a) implement best management practice to minimise the dust emissions of the project, including routinely watering haul roads being used by heavy vehicles and equipment;</td><td>Compliant</td><td>Previously disturbed areas have been stabilised through re-establishment of pasture. Visual monitoring of dust generation indicated that no additional controls were required beyond the natural moisture content of the materials.</td><td>A, D</td></tr>
</table>

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 3 SPECIFIC ENVIRONMENTAL CONDITIONS (Cont'd)				
AIR QUALITY (Cont'd)				
Operating Conditions (Cont'd)				
6 (Cont'd)	b) regularly assess meteorological and air quality monitoring data to guide the day-to-day planning of operations and implementation of air quality mitigation measures to ensure compliance with the relevant conditions of this approval;	Compliant	The Production Manager advises that meteorological conditions and visible dust generation routinely observed through operational days to determine if any further actions were required.	A
	c) minimise the air quality impacts of the project during adverse meteorological conditions and extraordinary events (see Note c to Table 3 above);	Not Applicable	The Production Manager confirmed that no extraordinary events effecting air quality occurred during the reporting period.	A
	d) monitor and report on compliance with the relevant air quality conditions in this approval; and	Compliant	Operational deposited dust monitoring is reported in Section 6.4 of this report.	A, D
	e) minimise surface disturbance of the site, other than as permitted under this approval, to the satisfaction of the Secretary.	Compliant	All areas of disturbance not required for immediate operation and which can feasibly be revegetated have been stabilised with pasture cover.	A, D
Air Quality Management Plan				
7.	The Proponent must prepare an Air Quality Management Plan for the project to the satisfaction of the Secretary. This plan must:	**Non-Compliant**	An updated Air Quality Management Plan was approved 6 June 2025.	
	a) be prepared by suitably qualified and experienced person/s whose appointment has been endorsed by the Secretary;		The Department confirmed by letter 18 April 2019 that R.W. Corkery & Co Pty Limited was suitably qualified to prepare the Air Quality Management Plan.	D
	b) be prepared in consultation with the EPA;		Consultation was undertaken with EPA for the 2025 update via the Major Project Portal	D
	c) be submitted to the Secretary within three months of the determination of Modification 2;		The original updated management plan was submitted to the Department on 22 April 2019 , resubmitted 30 April 2020 and approved 22 June 2020.	D
	d) describe the measures to be implemented to ensure: - compliance with the air quality criteria and operating conditions of this approval; - best practice management is being employed; and - the air quality impacts of the project are minimised during adverse meteorological conditions and extraordinary events;		Section 3 of the 2025 Air Quality Management Plan outlines the air quality management measures.	D
	e) describe the air quality management system in detail; and		Section 7 of the approved Air Quality Management Plan outlines the air quality management system.	D

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 3 SPECIFIC ENVIRONMENTAL CONDITIONS (Cont'd)				
AIR QUALITY (Cont'd)				
Air Quality Management Plan (Cont'd)				
7. (Cont'd)	f) include an air quality monitoring program that: - is capable of evaluating the performance of the project against the air quality criteria; - adequately supports the air quality management system; and - includes a protocol for determining any exceedances of the air quality criteria. The Proponent must implement the Air Quality Management Plan as approved from time to time by the Secretary.		The 2020 Air Quality Management Plan was implemented up to May 2025. The updated 2025 version took effect in June 2025 and will remain in use for the next reporting period. Samples were not collected for the December 2024/January 2025 period due to a communication error between site and the monitoring consultants. An incident report was submitted in relation to this non-compliance.	D
Meteorological Monitoring				
8.	For the life of the project, the Proponent must ensure that there is a suitable meteorological station operating in the vicinity of the site that complies with the requirements in the *Approved Methods for Sampling and Analysis of Air Pollutants in New South Wales* guideline.	Compliant	Reliance is placed upon an on-site rain gauge, the BOM Coolangatta Station No. 040717 and BOM Tweed Heads Golf Course Station No. 058056. Rain and wind data is presented in Section 6.2 of this Annual Review.	A, D
Greenhouse Gas Emissions				
9.	The Proponent must implement all reasonable measures to minimise the release of greenhouse gas emissions from the site.	Compliant	Given the limited scale of activities, appropriate maintenance, operation and sizing of equipment for tasks are considered reasonable measures and were implemented.	A, D
SOIL AND WATER				
Water Supply				
10.	The Proponent must ensure that it has sufficient water for all stages of the project, and if necessary, adjust the scale of operations under this approval to match its available water supply. *Note: Under the Water Act 1912 and/or the Water Management Act 2000, the Proponent is required to obtain all necessary water licences for the project.*	Compliant	Gales holds Water Access Licence 40902 which provides for 'take' of up to 700ML per year. Water take remained below the licence limits (see Section 7.1).	D
Water Discharges				
11.	The Proponent must comply with the discharge limits in any EPL for the site, or with section 120 of the POEO Act.	Compliant	No discharge occurred during the reporting period.	A
Fines Management				
12.	The Proponent must ensure that: a) no potential acid sulfate soil is removed from the site, unless adequately neutralised in accordance with methods approved under the Soil and Water Management Plan (see condition 18 below);	Compliant	Unwashed materials were not transported from the Quarry during the reporting period.	A, D

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 3 SPECIFIC ENVIRONMENTAL CONDITIONS (Cont'd)				
SOIL AND WATER (Cont'd)				
Fines Management (Cont'd)				
12. (Cont'd)	b) all excavated potential acid sulfate soil fines material is discharged into the dredge pond at a depth greater than 3 metres below the water surface as soon as possible to prevent oxidisation; and	Compliant	All fines have been returned to the pond a least 3m below the water.	AD
	c) all fines are deposited to a final depth of at least 8 metres below the water surface, unless an alternative method(s) is approved by the EPA and the Secretary. *Note: Acid sulfate soils are as defined in the NSW Acid Sulfate Soils Manual.*	Compliant	Fines deposited during the reporting period will also ultimately settle at the base of the dredge pond.	A, D
Flood Management				
13.	All earthworks, including drainage and bunding works, must be contained wholly within the site.	Compliant	The processing area, extraction pond and associated bunding is contained wholly within the site.	D
14.	The Proponent must cease dredging and processing activities not less than 24 hours prior to the commencement of overflow from any dredge pond. No dredging or processing may occur when the dredge ponds are overflowing.	Not Yet Applicable	No overflows of the dredge pond bunding occurred during the reporting period. Notwithstanding, dredging and processing did not occur during periods of localised flooding.	A, D
15.	The Proponent must ensure that the flood storage capacity of the site throughout all stages of the project is not less than the pre-project flood storage capacity, unless otherwise agreed by the Secretary. Details of the available flood storage capacity must be reported in each Annual Review. *Note: The Secretary may agree to a reduction in the pre-existing flood storage capacity of the site in the event that separate development consent is granted for development on the site.*	Compliant	Based on the extraction pond area (which creates additional flood storage through removal of material above the water table), the area filled under DA20/0695, and the processing area, net flood storage capacity has increased. Agreement of the Secretary will be sought prior to a reduction in flood storage capacity as approved under separate DA20/0695.	D
16.	The Proponent must ensure that the top of the earth bunding around the extraction ponds does not exceed 1.8 m AHD. Spillways shall be provided at the eastern and western extents of each bund and must be a minimum of 50 m wide and not exceed 1.3 m AHD. Bunds and spillways must be suitably surfaced (for example grassed or rock lined) to avoid scour and erosion during storm and flood events.	Compliant	All bunding surrounding the southern extraction area has been constructed in accordance with these requirements. The existing bunding around the northern extraction pond also includes spillways in accordance with these requirements. Additional bunding and replacement spillways will be completed during the next reporting period in accordance with discussions with EPA.	A, D
17.	The Proponent must ensure the pad of the processing area does not exceed a height of 1.8 m AHD.	Compliant	The construction of the Processing Area was completed during the previous reporting period. Levels at the processing area pad have been retained to 1.8m AHD. The transformer pad has been formed to 3.8m AHD per Essential Energy requirements – it is noted that the transformer is owned and controlled by Essential Energy.	A

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 3 SPECIFIC ENVIRONMENTAL CONDITIONS (Cont'd)				
SOIL AND WATER (Cont'd)				
Soil and Water Management Plan				
18.	Within three months of the determination of Modification 2, unless otherwise agreed by the Secretary, the Proponent must prepare a Soil and Water Management Plan for the project in consultation with EPA, Water NSW, DoI and Council, to the satisfaction of the Secretary. This plan must be prepared by a suitably qualified expert whose appointment has been approved by the Secretary, and include: a) a Site Water Balance; b) an Erosion and Sediment Control Plan; c) a Surface Water Monitoring Program d) a Groundwater Monitoring Program; e) a Blue-Green Algae Management Plan; The Proponent must implement the approved plan as approved from time to time by the Secretary	**Non-Compliant**	Extensions were granted by the Department on 18 April and 31 May 2019 for the submission of the updated Soil and Water Management Plan (SWMP) by 8 July 2019. The updated SWMP was submitted to the Department on 8 July 2019. A copy of the SWMP was also provided to the required agencies for comment on 24 June 2019. The Department approved of RWC, AGEC and HMC as being suitably qualified to prepare the SWMP on 31 May 2019. Section 3 of the SWMP. Section 4 of the SWMP. Section 7 of the SWMP. Section 6 of the SWMP. Section 8 of the SWMP. The updated SWMP was approved 20 July 2021. A further update was approved 23 September 2025 (i.e. beyond this reporting period). Sample collection was not undertaken during December 2024 due to a communication error between site and the monitoring consultants. An incident report was submitted in relation to this non-compliance.	A, D
19.	The Site Water Balance must include details of: a) sources and security of water supply; b) water use and management on site; c) any off-site water transfers; d) reporting procedures; and e) measures to be implemented to minimise clean water use on site.	Compliant	 Section 3.2 of the SWMP. Section 3.3 of the SWMP. Section 3.3 of the SWMP. Section 9 of the SWMP. Section 3.5 of the SWMP.	D
20.	The Erosion and Sediment Control Plan must: a) be consistent with the relevant requirements of Department of Housing's *Managing Urban Stormwater: Soil and Construction,* the NSW Acid Sulfate Soil Advisory Committee's *Acid Sulfate Soil Manual*, and relevant Council codes, or most recent versions of these documents; b) describe construction and operational activities that could cause soil erosion, sedimentation or generation of acid sulfate soils;	Compliant	 Sections 4.1 and 5.1 of SWMP. Sections 4.2 and 5.2 of the SWMP.	D

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 3 SPECIFIC ENVIRONMENTAL CONDITIONS (Cont'd)				
SOIL AND WATER (Cont'd)				
Soil and Water Management Plan (Cont'd)				
20 (Cont'd)	c) describe the location, function, and capacity of soil and water management and control structures during construction, stabilisation and operational stages;		Section 4.3 of the SWMP.	
	d) describe measures to minimise soil erosion and the potential for the transport of sediment to downstream waters;		Section 4.3 of the SWMP.	
	e) define procedures for managing the potential acid sulfate soils on the site;		Sections 5.3 and 5.4 of the SWMP.	
	f) define procedures for managing water releases from the site; and		Section 7.8 of the SWMP.	
	g) define procedures for the maintenance of soil and water management structures on the site during the life of the project.		Section 4.4 of the SWMP.	
21.	The Surface Water Monitoring Program must include:	Compliant		D
	a) a detailed description of the surface water management system;		Section 7.2 of the SWMP.	
	b) surface water impact assessment criteria;		Section 7.4 of the SWMP.	
	c) a program to monitor bank and bed stability; and		Section 4.4 of the SWMP.	
	d) a program to monitor and manage pH in the dredge pond;		Section 7.5 of the SWMP.	
	e) a program to monitor and report on adverse impacts of the project on surface water flows and quality, including any surface water discharges; and		Sections 7.7 and 7.8 of the SWMP.	
	f) a protocol for the investigation, notification and mitigation of identified exceedances of the surface water impact assessment criteria.		Section 7.7 of the SWMP.	
22.	The Groundwater Monitoring Program must include:	Compliant		D
	a) detailed baseline data on groundwater levels and quality, based on statistical analysis;		Section 6.2 of the SWMP.	
	b) groundwater impact assessment criteria;		Section 6.3 of the SWMP.	
	c) a program to monitor and report on adverse impacts of the project on groundwater flows and quality;		Sections 6.4 and 6.5 of the SWMP.	
	d) a program to monitor groundwater level effects on vegetation, and on groundwater supply to adjoining properties; and		Section 6.4 of the SWMP.	
	e) a protocol for the investigation, notification and mitigation of identified exceedances of the groundwater impact assessment criteria.		Section 6.5 of the SWMP.	

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 3 SPECIFIC ENVIRONMENTAL CONDITIONS (Cont'd)				
SOIL AND WATER (Cont'd)				
Soil and Water Management Plan (Cont'd)				
23.	The Blue-Green Algae Management Plan must: a) be consistent with extant guidelines for blue-green algae management including the National Health and Medical Research Council's Guidelines for Managing Risks in Recreational Water; b) describe the measures that would be implemented to prevent and control the sources of algal blooms over the short, medium and long term; c) include a detailed recovery plan that aims to reduce algae levels to meet the water quality completion criteria in the Rehabilitation Management Plan; d) include reasonable and feasible measures to reduce nutrient levels in the pond/s over the short, medium and long term, and include interim water quality targets for nutrients based on continual improvement and established water quality objectives for the Tweed River catchment; and e) define procedures for the management and notification of identified algal blooms.	Compliant	Section 8.2 of the SWMP. Section 8.5 of the SWMP. Section 8.5 of the SWMP. Sections 8.5 and 8.6 of the SWMP. Section 8.8 of the SWMP.	D
Additional Groundwater Requirements				
24.	Within six months of the determination of Modification 2, the Proponent must: a) review the site's existing groundwater monitoring data (including water quality data) and groundwater management and mitigation measures; b) identify any additional monitoring, management or mitigation measures required to achieve the site's groundwater impact assessment criteria, as required under condition 22(c) of this Schedule; and c) prepare an amended Groundwater Monitoring Program to reflect any additional measures, to the satisfaction of the Secretary.	No Longer Applicable	As part of the updated SWMP an extensive review was completed of the existing water monitoring data and management measures. These details are included as part of the updated SWMP. The completion of this review was advised within the correspondence to the Department with the submission of the SWMP on 8 July 2019.	D
25.	Prior to extracting beyond the previously-proposed realigned Altona Road (as shown in Figure 2 of the Department's Assessment Report for Modification 2), the Proponent, following consultation with DoI, must:	Compliant	Extraction was maintained south of the previously proposed Altona Road until approval of the required Groundwater Assessment on 18 December 2024.	A, D

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 3 SPECIFIC ENVIRONMENTAL CONDITIONS (Cont'd)				
SOIL AND WATER (Cont'd)				
Additional Groundwater Requirements (Cont'd)				
25. (Cont'd)	a) update the existing groundwater model for the project to address the consolidated extraction area as approved under Modification 2; b) re-assess the potential groundwater impacts of the project; and c) review and if necessary revise the Groundwater Monitoring Program and the groundwater management and mitigation measures for the project in response to the updated groundwater modelling; to the satisfaction of the Secretary.			
TRANSPORT				
Site Access				
26.	The Proponent must ensure that all heavy vehicle access to and from the site is via the Tweed Coast Road/Crescent Street/Altona Road route. Heavy vehicles must not travel via Crescent Street through Cudgen Village, except for local deliveries to Cudgen Village.	Compliant	The Transport Management Plan and associated Truck Drivers Code of Conduct details explicitly the approve transportation route and excluded roads.	D
Upgrade and Maintenance of Altona Road				
27.	The Proponent must upgrade Altona Road between the site entrance and intersection with Crescent Street. This upgrade must: a) include two additional passing bays along the current alignment of Altona Road, each having sufficient length to readily accommodate a laden truck and dog trailer combination, to the satisfaction of the Council; and b) be funded by the Proponent, or by a cost sharing agreement between the Proponent and the owner of the Tweed Sand Quarry, in consultation with Council.	Compliant	Hanson, operator of the Tweed Sand Quarry sought and received approval for the construction of a single longer passing bay. Upgrade works were completed by Hanson during the reporting period with Council confirming satisfaction with the works through the issue of a Works as Executed Compliance Certificate dated 7 May 2020.	A, D
28.	By 20 August 2019, the Proponent must enter into a cost sharing agreement with the owner of the Tweed Sand Quarry, in consultation with Council, for the maintenance of Altona Road between the site entrance and intersection with Crescent Street. This agreement must: c) provide for ongoing repairs and maintenance of the road; d) apply to the existing or any future approved alignment of Altona Road; and	Compliant	Previously a draft agreement was prepared between Gales and Hanson, in consultation with Council, a number of matters remained in dispute. A request for an extension was requested from DPIE on 21 August 2019. A response to the time extension was not received from the Department with the draft agreement ultimately referred to the Secretary for resolution on 25/09/19. Whilst a response was not received, during the reporting period Gales, Hanson and Council have operated in accordance with the agreement without dispute.	D, A

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 3 SPECIFIC ENVIRONMENTAL CONDITIONS (Cont'd)				
TRANSPORT (Cont'd)				
Upgrade and Maintenance of Altona Road (Cont'd)				
28. (Cont'd)	c) provide for proportionate and equitable contributions between the Proponent and the owner of the Tweed Sand Quarry (based on actual annual product road transport or other measure/s agreed by the parties). If a cost sharing agreement cannot be reached or if there is any dispute regarding the finalisation of the terms of the cost sharing agreement, or its implementation, then either party may refer the matter to the Secretary for resolution.			
29	The Proponent must upgrade the intersection of Crescent Street and Tweed Coast Road. This upgrade must: a) provide for the construction of an acceleration lane of not less than 200 metres in length on Tweed Coast Road, northbound from the intersection, to the satisfaction of Council (as roads authority); b) provide for channelised right turn treatment (line marking only) on Tweed Coast Road for vehicles turning right into Crescent Street; c) be designed and constructed in accordance with Austroads Guidelines, Australian Standards and RMS Supplements; and d) be funded by the Proponent, or by a cost sharing agreement between the Proponent and the owner of the Tweed Sand Quarry, in consultation with Council; If a cost sharing agreement cannot be reached or if there is any dispute regarding the finalisation of the terms of the cost sharing agreement, or its implementation, then either party may refer the matter to the Secretary for resolution. *Note: The proposed road works on Tweed Coast Road (MR450) will be captured by Section 138 of the Roads Act 1993. Concept Design is to be submitted to Tweed Shire Council for referral to Roads and Maritime for concurrence under Section 138 of the Roads Act 1993.*	Compliant	Upgrade works were completed by Hanson during the reporting period with Council confirming satisfaction with the works through the issue of a Works as Executed Compliance Certificate dated 7 May 2020.	A, D
Operating Conditions				
30.	The Proponent must: a) provide sufficient parking on-site for all project-related traffic and visitors, in accordance with Council parking code and ensure that no on street parking is undertaken.	Compliant	No on-street parking occurred during the reporting period. On-site parking is available within the Processing Area.	A

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 3 SPECIFIC ENVIRONMENTAL CONDITIONS (Cont'd)				
TRANSPORT (Cont'd)				
Operating Conditions (Cont'd)				
30. (Cont'd)	b) ensure that trucks do not enter the site prior to 7.00 am on any day;	Compliant	Records of operational hours confirms no transportation activities commenced prior to 7:00am.	A, D
	c) ensure that on-site parking and pedestrian facilities are adequately signposted;	Compliant	Signage has been placed.	A
	d) ensure that all laden trucks entering or exiting the site have their loads covered;	Compliant	The Operations Manager advises that the loader operator checks all trucks.	A
	e) ensure that all laden trucks exiting the site are cleaned of material that may fall from vehicles, before leaving the site;	Compliant	The Operations Manager advises that the loader operator checks all trucks.	A
	f) use its best endeavours to ensure that appropriate signage is displayed on all trucks used to transport quarry products from the project so they can be easily identified by road users; and	Compliant	The need for appropriate signage is specified in the Drivers Code of Conduct.	A
	g) keep accurate records of all laden truck movements to and from the site and publish a summary of these records on its website every month.	Compliant	Records of laden trucks are provided on the Company website.	A, D
Transport Management Plan				
31.	The Proponent must prepare a Traffic Management Plan for the project to the satisfaction of the Secretary. This plan must: a) be prepared by suitably qualified and experienced person/s whose appointment has been endorsed by the Secretary; b) be prepared in consultation with RMS, Transport for NSW and Council, and in accordance with the RTA – Traffic Control at Worksites Manual; c) describe the processes in place for the management of truck movements entering and exiting the site; d) prohibit trucks departing the site from turning right from Crescent Street to Tweed Coast Road; e) include a Drivers' Code of Conduct that includes: - details of the safe and quiet driving practices that must be used by drivers travelling to and from the quarry;	Compliant	Approval for the staged submission of the Traffic Safety Plan was issued by DPE 9 September 2016. The 'Stage 1' Traffic Management Plan, for physical commencement activities, was prepared in consultation with Council and RMS and approved by DPE 12/09/16. The 'Stage 2' Traffic Management Plan for works to enable commencement of dredging was prepared in consultation with Council and RMS and approved by DPE 25/05/17. The Operational Transport Management Plan was prepared in consultation with Council and RMS/TfNSW and approved by DPIE 21/05/20. The approved TMP address all requirements. Dispatch of product trucks commenced 22 May 2020.	

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 3 SPECIFIC ENVIRONMENTAL CONDITIONS (Cont'd)				
TRANSPORT (Cont'd)				
Transport Management Plan (Cont'd)				
31. (Cont'd)	- a map of the primary haulage route; - safety initiatives for haulage through residential areas, school zones and along school bus routes; - an induction process for vehicle operators and regular toolbox meetings; - complaints resolution and disciplinary procedures; and - details of community consultation - measures for peak haulage periods. f) describe the measures to be put in place to ensure compliance with the Drivers' Code of Conduct; g) include details of the measures to be implemented to minimise traffic safety issues and disruption to local road users during road upgrade works; and (h) propose measures to minimise the transmission of dust and tracking of material onto the surface of public roads from vehicles leaving the quarry. The Proponent must not dispatch any trucks from the site until the Traffic Management Plan is approved by the Secretary. The Proponent must implement the approved Traffic Management Plan as approved from time to time by the Secretary.		Further updates to the TMP were approved 12 February 2025.	
REHABILITATION				
Rehabilitation Objectives				
32.	The Proponent must rehabilitate the site to the satisfaction of the Secretary. This rehabilitation must be generally consistent with the proposed rehabilitation activities described in the documents listed in condition 3 of Schedule 2, and comply with the objectives in Table 4.	Not Yet Applicable	No areas have yet become available for final rehabilitation. Notwithstanding, it is noted that 'temporary' rehabilitation of soil stockpiles and bunding has been completed. Natural re-establishment has occured and planting of tubestock has also been undertaken.	A, D

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 3 SPECIFIC ENVIRONMENTAL CONDITIONS (Cont'd)				
REHABILITATION (Cont'd)				
Rehabilitation Objectives (Cont'd)				
32. (Cont'd)	**Table 4: Rehabilitation Objectives** **Feature** / **Objective** All areas of the site affected by the project: • Safe • Hydraulically and geotechnically stable, including the dredge pond margins (particularly where subject to regular wind and wave action) • Non-polluting • Fit for the intended post-extraction land use(s) • Final landform integrated with surrounding natural landforms as far as is reasonable and feasible, and minimising visual impacts when viewed from surrounding land Surface Infrastructure: • Decommissioned and removed, unless otherwise agreed by the Secretary Dredge Pond: • Perimeter of dredge pond landscaped and vegetated using native tree and understorey species and, where necessary, non-invasive groundcover suitable for the final land use • Natural looking bank design with curved lake boundaries, with a variety of bank treatments (e.g. beaches, wetlands) providing a variety of habitats. • Minimise the extent and persistence of algae blooms • Water quality fit for the intended post-extraction land use(s)			
Progressive Rehabilitation				
33.	The Proponent must rehabilitate the site progressively as soon as reasonably practicable following disturbance. All reasonable steps must be taken to minimise the total area exposed at any time. Interim stabilisation and temporary vegetation strategies must be employed when areas prone to dust generation, soil erosion and weed incursion cannot be permanently rehabilitated.	Compliant	No areas have yet become available for final rehabilitation. Notwithstanding, it is noted that 'temporary' rehabilitation of soil stockpiles and bunding has been completed therefore achieving a minimum practical exposed area.	A, O
Rehabilitation Management Plan				
34.	The Proponent must prepare a Rehabilitation Management Plan for the project to the satisfaction of the Secretary. This plan must:	Compliant		
	a) be prepared by a suitably qualified and experienced person/s whose appointment has been endorsed by the Secretary;		RWC was approved as being suitably qualified to prepare the Rehabilitation Management Plan (RMP) on 31 May 2019.	D
	b) be prepared in consultation with Council, Water NSW, DoI and OEH;		The RMP was supplied to these agencies for review on 1 July 2019.	D
	c) be submitted to the Secretary within three months of the determination of Modification 2, unless the Secretary agrees otherwise;		Extensions were granted by the Department on 18 April and 31 May 2019 for the submission of the updated RMP by 8 July 2019. The updated RMP was approved on 1 February 2024.	
	d) describe how the rehabilitation of the site and pipeline corridors would achieve the objectives identified in Table 4;		Sections 3.2 and 3.3 of the RMP.	D

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 3 SPECIFIC ENVIRONMENTAL CONDITIONS (Cont'd)				
REHABILITATION (Cont'd)				
Rehabilitation Management Plan (Cont'd)				
34. (Cont'd)	e) describe the short, medium, and long term measures that would be implemented to: - rehabilitate and stabilise the site and pipeline corridors; and - manage the restored vegetation and wetland habitat established on the site;		Section 3.2 of the RMP.	D
	f) include detailed performance and completion criteria for the rehabilitation and stabilisation of the site (including appropriate water quality criteria);		Sections 3.4 and 4.3 of the RMP.	D
	g) include a detailed description of the measures to be implemented to: - enhance existing vegetation and increase littoral and terrestrial habitat potential; - protect areas outside the disturbance areas, including vegetation adjoining pipelines; - manage impacts on fauna, including measures to enable Wallum Froglet to cross the eastern pipeline; - control terrestrial and aquatic weeds and pests; - control access; and - reduce the visual impacts of the project;		Section 3.2 of the RMP.	D
	h) include a program to monitor, independently audit and report on the effectiveness of the measures in paragraph (g) above, and progress against the detailed performance and completion criteria in paragraph (f);		Section 3.5 of the RMP.	D
	i) include a vegetation clearance protocol;		Section 3.3.8 of the RMP.	D
	j) include a Long-Term Management Strategy, which: - defines the objectives and criteria for quarry closure and post-extraction management; - investigates options for the future use of the site; - describes the measures that would be implemented to minimise or manage the ongoing environmental effects of the project; and - describes how the performance of these measures would be monitored over time;		Section 4 of the RMP.	D
	k) describe the potential risks to successful rehabilitation and/or revegetation, including a description of the contingency measures that would be implemented to mitigate these risks; and		Section 3.6 of the RMP.	D

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 3 SPECIFIC ENVIRONMENTAL CONDITIONS (Cont'd)				
REHABILITATION (Cont'd)				
Rehabilitation Management Plan (Cont'd)				
34. (Cont'd)	l) detail who is responsible for monitoring, reviewing, and implementing the plan. The Proponent must implement the approved Rehabilitation Management Plan as approved from time to time by the Secretary.		Section 3.7 of the RMP. The RMP was approved on 1 February 2024 and has been implemented.	D
Rehabilitation Bond				
35.	Within 6 months of the approval of the Rehabilitation Management Plan, the Proponent must lodge a Rehabilitation Bond with the Department to ensure that the rehabilitation of the site is undertaken in accordance with the performance and completion criteria set out in the plan and the relevant conditions of approval. The sum of the bond must be an amount agreed to by the Secretary and determined by: a) calculating the cost of rehabilitating all disturbed areas of the site, taking into account the likely surface disturbance over the next 3 years of quarrying operations; and b) employing a suitably, independent and experienced person to verify the calculated costs. The calculation of the Rehabilitation Bond must be submitted to the Department for approval at least 1 month prior to the lodgement of the bond	Not Yet Applicable	A rehabilitation bond was previously established (correspondence from DPE dated 12/04/17 confirms receipt of bank guarantee for the agreed rehabilitation bond of $163,375). A review of the bond was completed within 3 months of the RMP approval. A revised bond calculation of $340,263 was approved by DPHI 18 June 2024.	A, D
36.	The Rehabilitation Bond must be reviewed and if required, an updated bond must be lodged with the Department within 3 months following: a) any update or revision to the Rehabilitation Management Plan; b) the completion of an Independent Environmental Audit; or c) in response to a request by the Secretary. *Notes:* • If the rehabilitation of the site area is completed (or partially completed) to the satisfaction of the Secretary, then the Secretary will release the bond (or relevant part of the bond). If the rehabilitation of the site is not completed to the satisfaction of the Secretary, then the Secretary will call in all or part of the bond, and arrange for the completion of the relevant works. • If capital and other expenditure required by the Rehabilitation Management Plan is largely complete, the Secretary may waive the requirement for lodgement of a bond in respect of the remaining expenditure.	Compliant	The RMP was approved on 1 February 2024. Within 3 months of the approval of the RMP, the rehabilitation bond was reviewed and submitted to the Department for approval. A revised bond calculation of $340,263 was approved by DPHI 18 June 2024. No request has been received from the Secretary.	A, D

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 3 SPECIFIC ENVIRONMENTAL CONDITIONS (Cont'd)				
ABORIGINAL CULTURAL HERITAGE				
Aboriginal Cultural Heritage Management Plan				
37.	The Proponent must prepare an Aboriginal Cultural Heritage Management Plan to the satisfaction of the Secretary. This plan must: a) be prepared in consultation with the relevant Aboriginal communities; b) be submitted to the Secretary for approval prior to carrying out any development; and c) include a description of the: • Aboriginal cultural heritage induction protocol for employees; • process for Aboriginal inspection of excavations for the northern pipeline corridor; • measures that would be implemented if any new Aboriginal objects or skeletal remains are discovered during the project either within or beyond the area of disturbance; and • process for identifying a long-term storage location should Aboriginal relics be discovered within the project site requiring salvage. The Proponent must implement the approved Aboriginal Cultural Heritage Management Plan as approved from time to time by the Secretary.	Compliant	The Aboriginal Cultural Heritage Management Plan (ACHMP) was implemented as applicable during the reporting period. Prepared in consultation with Tweed-Byron LALC (correspondence dated 01/03/11) The ACHMP was submitted to the then DoP 09/02/11 and approved 14/05/14. An updated version was approved 05/07/17. Section 7 of the ACHMP. Section 8 of the ACHMP. Section 10 and Appendix 1 of the ACHMP. Section 12 of the ACHMP. As confirmed to the Department on 16 April 2019, as a result of the MOD2 approval, only administrative updates were required to the existing plan. Further administrative updates were approved 13 February 2025.	A, D
VISUAL				
38.	The Proponent must establish and subsequently maintain the vegetation screen around the extraction area within 12 months of the date of this approval. *Note: The vegetation screen must be detailed in the Rehabilitation Management Plan required under Schedule 3.*	Compliant	Vegetation screening was previously planted adjacent to Tweed Coast Road and Crescent Street, fencing installed to exclude cattle and slashing of grass undertaken within the fenced off area to assist tree growth. Supplemental planting was also completed during September 2017 with maintenance (principally weed spraying and fence repair) occurring as required – See Section 8 of this report.	A, D

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 3 SPECIFIC ENVIRONMENTAL CONDITIONS (Cont'd)				
VISUAL (Cont'd)				
39.	The Proponent must implement all reasonable measures to minimise the visual and off-site lighting impacts of the project to the satisfaction of the Secretary.	Compliant	The use of topsoil on the bund walls containing the existing pasture species ensured that the bund wall's groundcover was rapidly established. Planting of shrubs on the eastern and southern boundary of the Initial Processing Area was also completed during October 2017.	A, D
WASTE				
40.	The Proponent must: a) manage on-site sewage treatment and disposal in accordance with the requirements of its EPL, and to the satisfaction of the EPA and Council; b) minimise the waste generated by the project; c) ensure that the waste generated by the project is appropriately stored, handled, and disposed of; and d) report on waste management and minimisation in the Annual Review, to the satisfaction of the Secretary.	Compliant	During the reporting period all sewage wastes were collected in a portaloo system and removed from site by a licenced waste contractor. Minimal wastes were generated and were appropriately removed by licenced contractors or Council for disposal at a licenced facility. A summary of waste management is presented in Section 6.8.	A
41.	Except as expressly permitted in an EPL, the Proponent must not receive waste at the site for storage, treatment, processing, reprocessing or disposal.	Compliant	No wastes were received to the site.	A
LIQUID STORAGE				
42.	The Proponent must ensure that all tanks and similar storage facilities (other than for water) are protected by appropriate bunding or other containment, in accordance with the relevant Australian Standards.	Compliant	No hydrocarbon tanks were retained on site during the reporting period. A mobile road-registered fuel tanker service was used to refuel the mobile equipment.	A
Dangerous Goods				
43.	The Proponent must ensure that the storage, handling, and transport of dangerous goods are conducted in accordance with the relevant *Australian Standards*, particularly AS1940 and AS1596, and the *Dangerous Goods Code*.	Compliant	Only minor volumes of hydrocarbons (20L and 5L oil and grease containers) were stored on-site within a service van. No spills or other issues occurred during the reporting period.	A
SCHEDULE 4 ADDITIONAL PROCEDURES				
Notification of Landowners				
1.	As soon as practicable and no longer than 7 days after obtaining monitoring results showing an exceedance of any criteria in Schedule 3 the Proponent must:	Not Yet Applicable	Criteria specified within Schedule 3 include air quality and noise. No exceedance of noise criteria occurred. Whilst an exceedance of Deposited Dust Criteria occurred, the requirement is that this not be caused by the Project. Notwithstanding, DG3 is located on Company-owned land. Therefore no 'notification' events have occurred.	A, D

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 4 ADDITIONAL PROCEDURES (Cont'd)				
Notification of Landowners (Cont'd)				
1. (Cont'd)	a) notify the affected landowners and tenants in writing of the exceedance, and provide quarterly monitoring results, to each affected party until the project is again complying with the relevant criteria; and b) publish on its website the full details of the exceedance. Any exceedance of any criteria in Schedule 3 is an incident that must be notified to the Department in accordance with conditions 9 to 12 of Schedule 5. For any exceedance of the air quality criteria or air quality measures in Schedule 3, the Proponent must also provide to any affected land owners and tenants a copy of the fact sheet entitled "Mine Dust and You" (NSW Minerals Council, 2011).			
Independent Review				
2.	If a landowner considers the project to be exceeding the relevant criteria in Schedule 3, they may ask the Secretary in writing for an independent review of the impacts of the project on their land. If the Secretary is not satisfied that an independent review is warranted, the Secretary will notify the landowner in writing of that decision, and the reasons for that decision, within 21 days of the request for a review. If the Secretary is satisfied that an independent review is warranted, within 3 months, or as otherwise agreed by the Secretary and the landowner, the Proponent must: a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to: - consult with the landowner to determine their concerns; - conduct monitoring to determine whether the project is complying with the relevant criteria in Schedule 3; and - if the project is not complying with that criteria, identify measures that could be implemented to ensure compliance with the relevant criteria; b) give the Secretary and landowner a copy of the independent review. c) comply with any written requests made by the Secretary to implement any findings of the review.	Not Yet Applicable	Request for independent review has not been received to date.	A

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 5 ENVIRONMENTAL MANAGEMENT AND MONITORING CONDITIONS				
Environmental Management Strategy				
1.	The Proponent must prepare and implement an Environmental Management Strategy for the project to the satisfaction of the Secretary. This strategy must:	Compliant		A, D
	a) be submitted to the Secretary for approval within three months of the determination of Modification 2;		The updated EMS was submitted to the Department on 22 April 2019.	
	b) provide the strategic framework for environmental management of the project;		Section 1.2 of the EMS.	
	c) identify the statutory requirements that apply to the project;		Section 3.0 of the EMS.	
	d) describe the role, responsibility, authority, and accountability of the key personnel involved in the environmental management of the project.		Section 4.0 of the EMS.	
	e) describe the procedures that would be implemented to:			
	• keep the local community and relevant agencies informed about the construction, operation and environmental performance of the project;		Section 6.1 of the EMS.	
	• receive, record, handle and respond to complaints;		Section 6.2 of the EMS.	
	• resolve any disputes that may arise during the life of the project;		Section 6.3 of the EMS.	
	• respond to any non-compliance;		Section 7 of the EMS.	
	• respond to emergencies; and		Section 9 of the EMS.	
	d) include:			
	• reference to any strategies, plans and programs approved under the conditions of this approval; and		Section 5 of the EMS.	
	• a clear plan depicting all the monitoring to be carried out under the conditions of this approval.		Section 5 of the EMS.	
	The Proponent must implement the Environmental Management Strategy as approved from time to time by the Secretary.		Approval of the updated EMS remains pending.	
Management Plan Requirements				
2.	The Proponent must ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include:	Compliant	Each management plan includes these components as relevant to each plan.	D
	a) a summary of relevant background or baseline data;			

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 5 ENVIRONMENTAL MANAGEMENT AND MONITORING CONDITIONS (Cont'd)				
Management Plan Requirements (Cont'd)				
2. (Cont'd)	a) a summary of relevant background or baseline data; b) a description of: - the relevant statutory requirements (including any relevant approval, licence or lease conditions); - any relevant limits or performance measures/criteria; and - the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures; c) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria; d) a program to monitor and report on the: - impacts and environmental performance of the project; and - effectiveness of any management measures (see (c) above); e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible; f) a program to investigate and implement ways to improve the environmental performance of the project over time; (g) a protocol for managing and reporting any: - incidents; - complaints; and - non-compliances with statutory requirements; h) a protocol for periodic review of the plan; and i) a document control table that includes version numbers, dates when the management plan was prepared and reviewed, names and positions of the person/s who prepared and reviewed the management plan, a description of any revisions made and the date of the Secretary's approval. *Note: The Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.*			

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 5 ENVIRONMENTAL MANAGEMENT AND MONITORING CONDITIONS (Cont'd)				
Application of Existing Management Plans				
3.	The Proponent must continue to apply existing approved management plans, strategies or monitoring programs that have most recently been approved under this approval, until the approval of a similar plan, strategy or program following a modification to this approval.	No Longer Applicable	Following the MOD2 approval, previous management plans were applied to the extent applicable until superseded by approved updated management plans.	D
COMMUNITY CONSULTATIVE COMMITTEE				
8.	The Proponent must operate a Community Consultative Committee (CCC) for the project to the satisfaction of the Secretary. This CCC must be operated in general accordance with the Department's *Community Consultative Committee Guidelines: State Significant Projects (2016),* for the duration of quarrying operations and for at least 6 months following the completion of quarrying operations. *Notes:* • The CCC is an advisory committee. • In accordance with the guidelines, the Committee should comprise an independent chair and appropriate representation from the Proponent, Council and the local community.	Compliant	The CCC was established in July 2017 with the approval of the Independent Chairperson by DPE 8 July 2017 and new chairperson in May 2022. Community and Council members of the CCC were approved by DPE 14 November 2016. The inaugural CCC meeting was held 07/04/17. The CCC continued to operate during the reporting period (see Section 9.2).	A, D
Revision of Strategies, Plans & Programs				
4.	Within 3 months of: a) the submission of an incident report under condition 10 of this Schedule; b) the submission of an Annual Review under condition 13 of this Schedule; c) the submission of an Independent Environmental Audit under condition 14 of this Schedule; or d) the approval of any modification to the conditions of this approval. the Proponent must review the suitability of all strategies, plans and programs required under this approval. Where this review leads to revisions in any such document, then within 6 weeks of the review the revised document must be submitted for the approval of the Secretary. *Notes:* *This is to ensure that strategies, plans and programs are regularly updated to incorporate any measures recommended to improve the environmental performance of the project.*	Compliant	All management plans have continued to be reviewed. Following a review of the suitability of the SWMP, a review and update of the plan was completed during the reporting period. The SWMP was submitted to the Department for consultation in December 2023. An updated version was submitted in January 2025 and resubmitted in May 2025 in response to agency comments. An updated AQMP was also updated in January 2025 and approved June 2025.	A, D

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 5 ENVIRONMENTAL MANAGEMENT AND MONITORING CONDITIONS (Cont'd)				
COMMUNITY CONSULTATIVE COMMITTEE (Cont'd)				
Staging, Combining and Updating Strategies, Plans or Programs				
5.	With the approval of the Secretary, the Proponent may: a) prepare and submit any strategy, plan or program required by this approval on a staged basis (if a clear description is provided as to the specific stage and scope of the project to which the strategy, plan or program applies, the relationship of the stage to any future stages and the trigger for updating the strategy, plan or program); b) combine any strategy, plan or program required by this approval (if a clear relationship is demonstrated between the strategies, plans or programs that are proposed to be combined); and c) update any strategy, plan or program required by this approval (to ensure the strategies, plans and programs required under this approval are updated on a regular basis and incorporate additional measures or amendments to improve the environmental performance of the project).	Not Applicable	No requests to stage or combine plans, strategies or programs were made during the reporting period. Updated management plans were submitted in accordance with the relevant conditional requirements.	A, D
Evidence of Consultation				
6.	Where the conditions of this approval require consultation with an identified party, the Proponent must: a) consult with the relevant party prior to submitting the subject document; and b) provide details of the consultation undertaken, including: - the outcome of that consultation, matters resolved and unresolved; and - details of any disagreement remaining between the party consulted and the Proponent and how the Proponent has addressed any unresolved matters.	Compliant	A summary of consultation (to date) for the updated SWMP was included as an appendix to the respective plan. Further consultation correspondence will continue to be provided to the Department as received / required.	D
7.	However, if the Secretary agrees, a strategy, plan or program may be prepared without consultation being undertaken with an identified party required under a condition of this approval.	Not Applicable	No formal requests have been made to the Department not to undertake consultation.	A

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 5 ENVIRONMENTAL MANAGEMENT AND MONITORING CONDITIONS (Cont'd)				
REPORTING				
Incident Notification, Reporting and Response				
9.	The Department must be notified in writing to compliance@planning.nsw.gov.au immediately after the Proponent becomes aware of an incident.	Compliant	Exceedances of water and air quality objectives were recorded during the reporting period and were reported as incidents. As requested, notifications were made via the Major Project Portal.	A, D
10	Within 7 days of the date of the incident, the Proponent must provide the Secretary and any relevant agencies with a detailed report on the incident, and such further reports as may be requested. This report must include the time and date of the incident, details of the incident, measures implemented to prevent re- occurrence and must identify any non-compliance with this approval.	Compliant	Exceedances of water and air quality objectives were recorded during the reporting period, and written reports were prepared within 7 days of each notification.	A, D
11.	Any written requirements of the Secretary or relevant public authority (as determined by the Secretary) which may be given at any point in time, to address the cause or impact of an incident must be complied with and within any timeframe specified by the Secretary or relevant public authority.	Not Applicable	No written requirements were given to address the reported incidents.	A, D
12.	If statutory notification is provided to EPA as required under the POEO Act in relation to the project, such notification must also be provided to the Secretary within 24 hours after the notification was provided to EPA.	Not Applicable	No statutory notification was required to be provided to EPA during the reporting period.	A, D
Annual Review				
13.	By the end of September each year, or other timing as may be agreed by the Secretary, the Proponent must submit a report to the Department reviewing the environmental performance of the project, to the satisfaction of the Secretary. This review must: a) describe the project (including any rehabilitation) that was carried out in the previous financial year, and the project that is proposed to be carried out over the current financial year;	Compliant	The 2023/2024 Annual Review (this report) was submitted to DPHI on 30/09/24 Sections 4 and 8 describe the activities, including rehabilitation, undertaken during the reporting period.	D

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 5 ENVIRONMENTAL MANAGEMENT AND MONITORING CONDITIONS (Cont'd)				
REPORTING (Cont'd)				
Annual Review (Cont'd)				
13.	b) include a comprehensive review of the monitoring results and complaints records of the project over the previous financial year, which includes a comparison of these results against the: - relevant statutory requirements, limits or performance measures/criteria; - requirements of any plan or program required under this approval; - monitoring results of years prior; and - relevant predictions in the documents listed in condition 3 of Schedule 2; c) detail any non-compliance over the past financial year, and describe what actions were (or are being) taken to rectify the non-compliance and avoid reoccurrence; d) evaluate and report on: - the effectiveness of the noise and air quality management systems; and - compliance with the performance measures, criteria and operating conditions in this approval; e) identify any trends in the monitoring data over the life of the project; f) identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and (g) describe what measures will be implemented over the current financial year to improve the environmental performance of the project. The Proponent must ensure that copies of the Annual Review are submitted to Council and are available to the CCC and any interested person upon request.		Section 6 and 7 provide a review of the results against the relevant limits, requirements and previous / baseline monitoring results. Sections 1 and 11 and Appendix 1 provide details of non-compliances. Section 6 and Table 6.1 provide an evaluation. Section 6 provides a summary of any discernible trends. Section 6 would provide discuss any discrepancies. However, none have been identified to date. Section 6 outlines planned / further improvements to environmental management. Copies of the Annual Review has also been provided to Council, CCC and other relevant agencies and was made publicly available on the Gales website.	
Independent Environmental Audit				
6.	Within 2 years of the commencement of quarrying operations and every 3 years thereafter, unless the Secretary directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the project. The primary purposes of the audit are to ascertain information in relation to the environmental performance of the project and the adequacy of strategies, plans and programs. Audits must:	Compliant	Site establishment activities commenced 26 June 2017 with extraction operations commencing 30 October 2017. James Hart Consulting was formally commissioned 6 September 2022 to undertake the second Independent Environmental Audit. The independent audit team held suitable certifications and were endorsed by the Department on 16 September 2022 and the audit inspection completed 6 November 2022. The next independent audit must be commissioned prior to 30 October 2025.	A, D

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 5 ENVIRONMENTAL MANAGEMENT AND MONITORING CONDITIONS (Cont'd)				
REPORTING (Cont'd)				
Independent Environmental Audit (Cont'd)				
6. (Cont'd)	a) be led and conducted by a suitably qualified, experienced, and independent team of experts whose appointment has been endorsed by the Secretary; b) include consultation with the relevant agencies and the CCC; c) assess the environmental performance of the project and whether it is complying with the relevant requirements in this approval and any relevant EPL or water licences for the project (including any assessment, strategy, plan or program required under these approvals); d) review the adequacy of any strategies, plan or programs required under the abovementioned approvals; e) recommend measures or actions to improve the environmental performance of the project, and/or any strategy/plan/program required under this approval; and f) be conducted and reported to the satisfaction of the Secretary. *Note: This audit team must be led by a suitably qualified auditor and include experts in any fields specified by the Secretary.*		The 2022 audit addressed all required components and was confirmed by the Department as being satisfactory on 24 January 2023.	
Independent Environmental Audit				
15.	Within 12 weeks of commencing each audit, unless otherwise agreed by the Secretary, the Proponent must submit a copy of the audit report to the Secretary and other agencies that requests it, together with its response to any recommendations contained in the audit report, and a timetable for the implementation of the recommendations. The Proponent must implement these recommendations, to the satisfaction of the Secretary.	Compliant	The final audit and its response were submitted to DPE within 12 weeks of commencement of the audit.	A, D
Access to Information				
10.	Within 1 month of the approval of Modification 2, and for the life of the project, the Proponent must: a) make the following information and documents (as they are obtained or approved) publicly available on its website: - the documents listed in conditions 2 and 3 of Schedule 2; - current statutory approvals for the project;	Compliant	Copies of all required documents have been made available on the Gales website.	D

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 5 ENVIRONMENTAL MANAGEMENT AND MONITORING CONDITIONS (Cont'd)				
REPORTING (Cont'd)				
Access to Information (Cont'd)				
10. **(Cont'd)**	- all approved strategies, plans and programs required under the conditions of this approval; - regular reporting on the environmental performance of the project in accordance with the reporting arrangements in any plans or programs approved under the conditions of this approval; - a comprehensive summary of the monitoring results of the project, reported in accordance with the specifications in any conditions of this approval, or any approved plans and programs; - a summary of the current stage and progress of the project; - contact details to enquire about the project or to make a complaint; - a complaints register, updated monthly; - the Annual Reviews of the project; - any Independent Environmental Audit as described in condition 14 above, and the Proponent's response to the recommendations in any audit; and - any other matter required by the Secretary; and b) keep this information up-to-date, to the satisfaction of the Secretary.			
APPENDIX 3 - NOISE COMPLIANCE ASSESSMENT				
Applicable Meteorological Conditions				
1.	The noise criteria in Table 2 are to apply under all meteorological conditions except the following: a) wind speeds greater than 3 m/s at 10 m above ground level; or b) temperature inversion conditions between 1.5°C and 3°C/100 m and wind speed greater than 2 m/s at 10 m above ground level; or c) temperature inversion conditions greater than 3°C/100 m.	Noted	There were no instances during the reporting period where these meteorological conditions needed to be taken into account for noise compliance.	A, D

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Table A (Cont'd)
Compliance Review – Project Approval 05_0103B

Cond. No.	Conditional Requirement	Compliance	Comments	Basis*
SCHEDULE 5 ENVIRONMENTAL MANAGEMENT AND MONITORING CONDITIONS (Cont'd)				
APPENDIX 3 - NOISE COMPLIANCE ASSESSMENT (Cont'd)				
Compliance Monitoring				
2.	Within three months of the determination of Modification 2, unless otherwise agreed by the Secretary, the Applicant must undertake a noise compliance assessment. The assessment must be conducted by a suitably qualified and experienced acoustical practitioner and must assess compliance with noise criteria presented above. A report must be provided to the Department and EPA within 1 month of the assessment.	No Longer Applicable	A request was lodged with the Department on 16 April 2019 for the compliance assessment to be completed within 3 months of the recommencement of extraction operations. Approval was received from the Department on 18 April 2019. Noise monitoring addressing this was undertake at recommencement of extraction operations in 2020 (i.e. prior to this reporting period).	D
3.	Unless the Secretary agrees otherwise, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the NSW Industrial Noise Policy (as amended from time to time), in particular the requirements relating to: a) monitoring locations for the collection of representative noise data; b) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; c) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration; and d) the use of an appropriate modifying factor for low frequency noise to be applied during compliance testing at any individual residence if low frequency noise is present (in accordance with the NSW Noise Policy for Industry (2017, or its latest version) Fact Sheet C) and before comparison with the specified noise levels in the approval.	No Longer Applicable	The monitoring was carried out in accordance with the relevant requirements.	D

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Table B
Compliance Review – Statement of Commitments (SoC)

SoC No.	Commitment	Compliance	Comments	Basis*
1. Sand Extraction and Processing				
1.1	Ensure terminal extraction batters are formed no steeper than 1:3 (V:H) (excludes stabilised backfilled final landform batters).	Not Yet Applicable	Terminal extraction batters have not yet been formed.	A, D
2. Waste Management				
2.1	Dispose all recyclables and general waste in appropriate waste receptacles.	Compliant	Any waste generated during the reporting period was removed by the service contractor or Council for disposal at a licenced facility.	A
2.2	Use non-saleable oversize materials for final landform creation / return to the extraction area.	Compliant	Oversize material not suitable as a product was returned to the extraction pond.	A, D
2.3	Intern any oversize materials suspected of being acid generating so they settle beneath at least 8m of water.	Not Yet Applicable	Oversize material consisted of vegetative material (grass), shells and rocks and was not considered to be potentially acid generating (given the shell content).	A, D
3. Rehabilitation				
3.1	Progressively backfill selected finalised sections of the southern extraction pond to create wetland areas.	Not Yet Applicable	Terminal extraction batters have not yet been formed to enable backfilling.	A, D
3.2	Stabilise all earthworks and disturbed areas no longer required for Quarry-related activities in order to minimise erosion and sedimentation, dust lift-off and to reduce visual intrusion.	Compliant	Pasture has been established on the surface of the bund walls, topsoil stockpiles.	A, D
3.3	Cross-rip all unsealed roads and remove all buildings and structures not required for the final land use.	Not Yet Applicable	No areas have become available for final rehabilitation.	A, D
4. Flooding and Drainage				
4.1	Construct and maintain shallow spillways (approximate elevation 1.3m AHD) within the bunds surrounding the extraction pond at the eastern and western extent of the bunding.	Compliant	Spillways have been constructed to the required height.	A
4.2	Remove sections of bunding once floodwaters have peaked to allow floodwaters trapped behind the bunds to drain freely to the western drainage channel as the flood recedes.	Not Yet Applicable	No flood water was required to be released from the dredge pond during the reporting period.	A, D
4.3	Maintain drainage paths outside of the bunded and filled areas to allow floodwaters to drain freely.	Not Yet Applicable	No obstructions or works that would alter drainage paths outside of the approved extraction areas occurred during the reporting period.	A, D
4.4	Prepare a flood evacuation plan to ensure that personnel respond appropriately to a warning of an imminent Tweed River overbank flood.	Compliant	The Quarry operator has prepared a flood evacuation plan.	A, D
4.5	Realign the western drainage channel within the Altona Road reserve to provide an equivalent or more efficient drain.	Not Yet Applicable	Altona Road has not yet been realigned.	A, D

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Table B (Cont'd)
Compliance Review – Statement of Commitments (SoC)

SoC No.	Commitment	Compliance	Comments	Basis*
5. Groundwater				
5.1	Adjust sand extraction rates to ensure that groundwater drawdown levels remain within the predicted limits.	Not Applicable	Extraction rates were not required to be adjusted during the reporting period.	A, D
5.2	Install a height gauge within the extraction pond so that water levels can be monitored daily to m AHD.	Compliant	Gauges have been installed in both the northern and southern ponds.	A
5.3	Continue groundwater monitoring following the cessation of extraction and placement of VENM.	Not Yet Applicable	Extraction operations and VENM placement has not permanently ceased.	A, D
5.4	Compile an annual summary of all monitoring results and forward to Water NSW as part of the Annual Review for the site.	Compliant	A detailed monitoring summary has been included as part of this Annual Review which has been provided to Water NSW.	A, D
5.5	Consult with each likely affected landowner and investigate complaints of poor water quality in neighbouring dams/bores.	Not Yet Applicable	Potentially affected landholders have previously been consulted. No issues or complaints arose during the reporting period.	A, D
5.6	Negotiate an agreement with each affected landholder in the event water quality or quantity is adversely affected to either: • deepen the existing bore or install a replacement bore; • pay a cash compensation equal to the assessed cost of deepening the bore; • provide an alternative water supply, such as from the extraction ponds or groundwater bore registered to the Proponent; or • provide an appropriately sized rainwater storage tank to enhance property water storage.	Not Yet Applicable	No landholders have been adversely affected.	A, D
5.7	Implement the provision of an alternative water supply or other agreed compensation.	Not Applicable	The R. Julius water supplies have not been adversely effected.	A, D
5.8	Provide copies of any negotiated agreements to the Department of Planning and Department of Water and Energy for their records.	Compliant	The signed agreement with R.W. Julius has been provided to the then DPE and Water NSW.	A, D
6. Surface Water				
6.1	Reduce sand extraction and temporarily cease VENM placement if a significant deterioration in extraction pond water quality occurs, until the source is identified and appropriate amelioration measures are implemented.	Not Applicable	No significant deterioration of extraction pond water occurred during the reporting period.	A, D
6.2	Regularly monitor surface water to provide an accurate assessment of the adequacy of practices implemented as part of the operation.	Compliant	Monitoring data reviewed and critically analysed monthly.	A, D

* D = Documentation sighted A = Advised by Company O = On-site Observation

Table B (Cont'd)
Compliance Review – Statement of Commitments (SoC)

SoC No.	Commitment	Compliance	Comments	Basis*
7. Acid Sulfate Soils and Sediments, Soil Contamination and Agricultural Suitability				
7.1	Convey return water (from both the wash plant and fill sites) in a manner which ensures fines / silts remain in suspension and do not settle in the return pipelines. If a pipeline is not used, undertake sluicing in a manner that ensures turbulent flow and sufficient velocity to prevent the deposition of fines material within the drainage line.	Compliant	A silt return channel has been constructed in order to provide sufficient head pressure for return water to discharge via a pipe 3m below the pond surface.	A
7.2	Do not extract residual clay material from the base of the sand resource.	Compliant	Extraction operations to date have remained above the expected residual marine clays.	A, D
7.3	Ensure a suitably qualified or trained person assesses imported material (VENM) in accordance with the ASSMAC guidelines and confirms its classification as VENM prior to acceptance at the Quarry Site.	Compliant	Imported VENM was classified and VENM certificates retained. No VENM imported during the reporting period.	A, D
7.4	Place VENM(b) received at the premises which is intended to be dredged or interned at the base of the extraction pond within the nominated period.	Not Yet Applicable	VENM(b) (PASS) has not yet been imported to the Quarry.	A, D
7.5	Retain records of monitoring together with the application rates of the alkaline amendment used as neutralising agents. Provide these records to statutory authorities upon request.	Compliant	These monitoring records have been retained and reported in the respective Annual Reviews. No requests for supply of additional records has been received to date.	A, D
7.6	Obtain documentation for each truck load of VENM(b) received at the Quarry Site that demonstrates that the excavation of VENM(b) and its transport and handling has been conducted in accordance with the NSW ASS Manual to prevent the generation of acid.	Not Yet Applicable	Importation of VENM(b) has not yet commenced.	A, D
7.7	Retain documentation for each truck load of VENM(b) received at the site which indicates: • the details of the originating site (name, address, owner and developer, contact details); • the details of the transportee (name, address, contact details, vehicle registration); • date and time of the extraction of the VENM(b); • pH of the VENM(b) at the time of its extraction, and at the time immediately prior to its placement underwater; and • the name of the person (certified practicing soil scientist) who assessed the material and classified it as VENM(b).	Not Yet Applicable	Importation of VENM(b) has not yet commenced.	A, D
7.8	Ensure verification of neutralising agent application volumes and verification results are available.	Not Yet Applicable	Importation of VENM(b) has not yet commenced.	A, D
7.9	Treat any acid sulfate material excavated on site at determined rates prior to use in earthen bunds or for rehabilitation.	Not Applicable	No acid sulfate material was excavated during the reporting period for use in earthen bunds or for rehabilitation.	A, D

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Table B (Cont'd)
Compliance Review – Statement of Commitments (SoC)

SoC No.	Commitment	Compliance	Comments	Basis*
7. Acid Sulfate Soils and Sediments, Soil Contamination and Agricultural Suitability (Cont'd)				
7.10	Collect and analyse samples of acid sulfate soil material that is to be recovered through excavation (i.e. not dredged) and is not to be washed using a hydrocyclone (or similar).	Not Applicable	All extracted material during the reporting period was washed.	A
7.11	Incorporate an alkaline amendment into the excavated acid sulfate material at the calculated rate (based on the results of sampling).	Not Applicable	All extracted material during the reporting period was washed.	A
7.12	Complete the validation sampling of treated material in accordance with the approved Acid Sulfate Soil Management Plan.	Not Applicable	All extracted material during the reporting period was washed.	A
7.13	Construct bunding around the extraction and processing areas to control drainage.	Compliant	Bunding has been constructed around the southern dredge pond and northern dredge pond to control drainage.	A, D
7.14	Ensure all surface water and runoff from the extraction and processing areas drains or is pumped into the extraction ponds.	Compliant	All water within the active extraction area is internally draining. The processing area also drains back into the bunded extraction area.	A, D
7.15	Audit the effectiveness of the operational safeguards and monitoring by an external environmental consultant.	Compliant	HMC previously completed an audit of the acid sulfate soil monitoring and management.	D
7.16	Test the pH of the water into which the VENM(b) is placed to ensure it is not less than 6.5 at any time.	Not Yet Applicable	Importation of VENM(b) has not yet commenced.	A, D
7.17 & 7.18	Undertake monitoring in accordance with the approved Acid Sulfate Soil Management Plan in relation to VENM(b) receipt and processing / internment.	Not Yet Applicable	Importation of VENM(b) has not yet commenced.	A, D
7.19	Test the pH of the VENM(b) immediately prior to under-water disposal / backfilling to ensure the pH is not less than 5.5.	Not Yet Applicable	Importation of VENM(b) has not yet commenced.	A, D
7.20	Undertake internal environmental audits of VENM(b) receipt and treatment during the initial stages of the operation to ensure appropriate treatment is being conducted and records are up to date.	Not Yet Applicable	Importation of VENM(b) has not yet commenced.	A, D
7.21	Complete the following in the event that validation or monitoring criteria are exceeded for any extracted materials. • Test the acid neutralising capacity of the material. • Incorporate alkaline amendments at the appropriate rate if the measured acid neutralising capacity is insufficient to neutralise the existing and potential acidity. • Undertake validation testing following treatment and apply additional alkaline amendments as required. Repeat process until compliance with action criteria is met.	Not Applicable	Previous validation testing results did not exceed criteria.	A, D

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Table B (Cont'd)
Compliance Review – Statement of Commitments (SoC)

SoC No.	Commitment	Compliance	Comments	Basis*
7. Acid Sulfate Soils and Sediments, Soil Contamination and Agricultural Suitability (Cont'd)				
7.22	Terminate VENM(b) receipt at the premises if the pH of the water falls below accepted levels, until approval to continue is received in writing from the DECC(EPA).	Not Applicable	Importation of VENM(b) has not yet commenced.	A, D
7.23	Complete the following in the event monitoring criteria are exceeded for imported VENM(b). • Test the acid neutralising capacity of the material. • Incorporate alkaline amendments at the appropriate rate if the measured acid neutralising capacity is insufficient to neutralise the existing and potential acidity. • Undertake validation testing following treatment and apply additional alkaline amendments as required. Repeat process until compliance with action criteria is met.	Not Applicable	Note: Repeated commitment. See SoC 7.21	A, D
7.24	Undertake the following as soon as possible after becoming aware that any waste/material accepted at the premises is not VENM. • Notify the EPA in writing. • Remove the material/waste from the premises and dispose of it at a facility licensed to take such waste.	Not Applicable	Unauthorised waste material has not been accepted to the premises.	A, D
7.25	Implement a procedure to audit all further incoming loads from that waste origin site prior to accepting any further waste, until such time as the results of such audits demonstrate that the waste origin site's screening and assessment procedures have been corrected to prevent further miss-classification of waste.	Not Applicable	Unauthorised waste material has not been accepted to the premises.	A, D
7.26	Introduce hydrated lime at the appropriate rate if the extraction pond water quality fails accepted levels and ensure target pH level of 6.5 is not "overshot" leading to severely alkaline conditions (pH>9.0).	Not Applicable	Monitoring did not record pH levels below the trigger action levels and therefore no treatment was required.	A, D
8. Flora and Fauna				
8.1	Progressively rehabilitate completed works within the Quarry Site to maximise cover of native vegetation in appropriate areas and minimise opportunities for erosion and weed invasion.	Not Yet Applicable	No final areas have become available for rehabilitation. Temporary rehabilitation has been completed on the bund walls and topsoil stockpile using pasture species thereby minimising potential erosion and weed invasion.	A, D
8.2	Define and clearly mark vegetation for retention prior to the commencement of site establishment to ensure that native vegetation clearing is confined only to those areas required.	Not Yet Applicable	Commitment relates to the pipeline corridors, principally the section of the eastern corridor east of Tweed Coast Road – the pipelines have not yet been installed in that location.	A, D
8.3	Control noxious weeds on the Quarry Site.	Compliant	Weed control is undertaken as part of the current cattle agistment.	A

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Table B (Cont'd)
Compliance Review – Statement of Commitments (SoC)

SoC No.	Commitment	Compliance	Comments	Basis*
8. Flora and Fauna (Cont'd)				
8.4	Place pipelines within pipeline corridors so as to avoid the need to clear trees or shrubs, wherever possible.	Compliant	The pipelines installed to the Cudgen Heights fill site minimised disturbance to vegetation and did not disturb any native vegetation. No pipelines placed in the corridors during the reporting period.	A, D
8.5	Utilise local native plant species recommended by Idyll Spaces (2008) for rehabilitation and landscaping within and adjacent the final lake (Note: vegetation set back from the final lake would reflect the specific land use – e.g. sporting fields, gardens, etc).	Not Yet Applicable	No final areas have become available for rehabilitation.	A, D
8.6	Undertake replacement planting of the same tree species within the same area in the unlikely event that a small number of trees are required to be removed for the laying of the pipelines.	Not Yet Applicable	No native tree species were disturbed as a result of the pipeline to the Cudgen Heights fill site.	A, D
9. Aquatic Ecology				
9.1	During the realignment of the western drainage channel as part of the realignment of Altona Road. • maintain the original connection to other upstream and downstream drainage channels; • avoid stranding native fish and, where possible, relocate them to similar habitat; • ensure fish free passage through the channel is made available where permanent crossings are to be constructed (e.g. access road crossings); and • consult with DPI – Fisheries officers during the realignment process.	Not Yet Applicable	Altona Road has not yet been realigned.	A, D
9.2	Create wetlands along finalised sections of the extraction pond in accordance with the approved Landscape Management Plan.	Not Yet Applicable	No final batters have yet been formed.	D
9.3	Undertake frequent and regular monitoring of temperature, dissolved oxygen, nutrients, colour and concentrations of blue-green algae.	Compliant	Regular water quality monitoring was undertaken (see Section 7).	A, D
9.4	Obtain samples and readings from the dredge pond in accordance with the approved Blue Green Algae Management Plan.	Compliant	Monitoring was undertaken in accordance with the approved Blue-Green Algal Management Plan during the reporting period.	A, D
10. Traffic and Transport				
10.1	No vehicles permitted to turn right from Crescent Street to Tweed Coast Road. (Note: Light vehicles travelling south from the Quarry Site would be directed to travel on Crescent Street/Cudgen Road.	Compliant	Drivers were instructed not to turn right through the Drivers Code of Conduct.	A, D
10.2	No heavy vehicles to turn right from Altona Road to Crescent Street.	Compliant	Drivers were instructed not to turn right through the Drivers Code of Conduct.	A, D

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Table B (Cont'd)
Compliance Review – Statement of Commitments (SoC)

SoC No.	Commitment	Compliance	Comments	Basis*
10. Traffic and Transport (Cont'd)				
10.3	Weigh all product trucks using the on-site weighbridge or other suitable weigh system and ensure all RMS weight restrictions are adhered to.	Compliant	All product trucks were loaded using a front-end loader with calibrated weigh cells.	A, D
10.4	Inform all truck drivers and staff of road rules, speed restrictions and considerate driving practices.	Compliant	Drivers instructed of rules and restrictions through the Drivers Code of Conduct.	A, D
10.5	Ensure all drivers are aware of all relevant operational hours.	Compliant	Drivers instructed of operational hours through the Drivers Code of Conduct.	A, D
10.6	Undertake mechanical road sweeping of Altona Road and site access roads.	Compliant	During the reporting period manual sweeping of Altona Road was not required (following installation of wheel wash).	A
10.7	Cover all product loads to reduce dust lift off.	Compliant	The loader operator instructs all product truck drivers to cover their loads prior to leaving site.	A
10.8	Realign Altona Road in accordance with DA 05/1450 (or other applicable development consent).	Not Yet Applicable	Operations will not reach a point that requires the realignment of Altona Road for some time.	A, D
10.9	Implement appropriate management controls including the use of warning signs and manual traffic control during the laying of pipelines adjacent to Tweed Coast Road and during the underboring of the road crossings.	Not Yet Applicable	The pipelines have not yet been installed.	A, D
10.10	Establish a telephone complaints line to enable any traffic-related incidents, unsafe operation or general concern to be reported. Investigate all complaints and act decisively on substantiated incidents.	Compliant	A telephone complaints line is advertised on the Company website.	A, D
10.11	Implement a truck driver's code of conduct required to be signed by all Company employed or contracted truck drivers. The code will outline each truck driver's responsibility and the process to be undertaken in the event of a complaint.	Compliant	The Drivers Code of Conduct is included within the approved Transportation Management Plan.	A, D
11. Noise				
11.1	Fit all mobile vehicles on the site with broadband type reversing beepers or alternative safety devices such as strobe lights and / or cameras.	Compliant	All mobile equipment that required reversing alarms were fitted with broadband type alarms.	A
11.2	Regularly service all equipment on site.	Compliant	Repairs and maintenance were undertaken during the reporting period as required.	A, D
11.3	Maintain the internal road network to an acceptable standard to limit body noise from empty trucks.	Compliant	The internal road to the extraction area has been appropriately surfaced.	A,O

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Table B (Cont'd)
Compliance Review – Statement of Commitments (SoC)

SoC No.	Commitment	Compliance	Comments	Basis*
11. Noise (Cont'd)				
11.4	Undertake a monitoring program to demonstrate that noise emissions from the Quarry Site are within the Quarry specific noise limits at the surrounding assessment locations.	Compliant	Compliance noise monitoring confirmed compliance with applicable noise limits.	D
11.5	Regularly review the extent of noise monitoring throughout the life of the Project to ensure meaningful data is being collected.	Compliant	Noise monitoring reviewed as part of the updated Noise Management Plan approved 13 February 2025 and as part of each Annual Review. No further adjustments are currently planned.	D
12. Air Quality				
12.1	Install water sprays or other suitable controls to minimise dusts generated during screening and dry processing.	Compliant	All processing during the reporting period was undertaken as a wet process.	A, D
12.2	Undertake progressive rehabilitation / stabilisation of available areas of disturbance (e.g. finalised sections or backfilled areas of the extraction ponds).	Not Yet Applicable	No final rehabilitation areas have become available. Notwithstanding, disturbed areas are temporarily rehabilitated to pasture where possible.	A, D
12.3	Clean accumulated tracked road mud, dry dusts, sand or spillages on Altona Road using a street sweeper.	Compliant	Prevention of sand tracking was achieved through use of wheel wash. No manual sweeping was required during the reporting period.	A
12.4	Cover product trucks loads to prevent wind-borne losses and spillages.	Compliant	The loader operator instructs all product truck drivers to cover their loads prior to leaving site.	A
12.5	Undertake monitoring in accordance with the Air Quality Monitoring Program.	Compliant	Monitoring during the reporting period was undertaken in accordance with the updated AQMP approved 22 June 2020.. The approved AQMP 2025 specifies that deposited dust monitoring is not required except during dry processing.	A, D
12.6	Annually review the dust monitoring program to ensure that the data being collected is meaningful.	Compliant	An updated AQMP was submitted January 2025 and approved on 6 June 2025.	A, D
12.7	Ensure the screening and blending plant does not exceed a daily average processing rate greater than 100tph.	Not Yet Applicable	Dry processing operations have not yet commenced.	A, D

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Table B (Cont'd)
Compliance Review – Statement of Commitments (SoC)

SoC No.	Commitment	Compliance	Comments	Basis*
13. Aboriginal Heritage				
13.1	Invite Aboriginal stakeholders to observe during the burying of the pipelines within the northern pipeline corridor.	Not Yet Applicable	The pipelines have not yet been installed within the northern pipeline corridor.	A, D
13.2	Stop works at and adjacent to any Aboriginal sites or relics, if found.	Not Applicable	No Aboriginal sites have been identified.	A
13.3	Contact the regional archaeologist of the Coffs Harbour OEH and relevant Aboriginal Stakeholders if any Aboriginal sites or relics, if found.	Not Applicable	No Aboriginal sites have been identified.	A
13.5	Complete inductions and training in accordance with the approved Aboriginal Cultural Heritage Management Plan.	Compliant	The Quarry Operator has been 'inducted' by the Tweed LALC.	A
13.6	Undertake consultation with Aboriginal representatives in relation to the ongoing management of identified items of Aboriginal heritage.	Not Applicable	No Aboriginal sites have been identified.	A
14. Visibility				
14.1	Construct a 2m high bund on the eastern and southern perimeter of the processing area and plant with native shrub species.	Compliant	These bunds have previously been established and planted with native shrub species.	A, D
14.2	Progressively rehabilitate the Quarry Site such that non-vegetated areas would be minimised.	Compliant	No final rehabilitation areas have become available. Notwithstanding, disturbed are temporarily rehabilitated to pasture where possible.	A, D
14.3	Maintain the Quarry Site in a clean and tidy condition at all times.	Compliant	The Quarry Site is maintained in a clean and tidy condition.	A
14.4	Position and direct floodlights or other lighting to minimise light emissions, with lighting not required at any given time not used.	Compliant	Floodlights directing light onto the plant have been utilised for security purposes as advised by security consultants.	A

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Table C
Compliance Review – Environmental Protection Licence 12385

<table>
<tr><th>Cond. No.</th><th>Commitment</th><th>Compliance</th><th>Comments</th><th>Basis*</th></tr>
<tr><td colspan="5">1. Administrative Controls</td></tr>
<tr><td colspan="5">A1 What the licence authorises and regulates</td></tr>
<tr><td>A1.1</td><td>This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.
Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.
<table>
<tr><th>Scheduled Activity</th><th>Fee Based Activity</th><th>Scale</th></tr>
<tr><td>Extractive Activities</td><td>Land-based extractive activity</td><td>> 100000 - 500000 T annual capacity to extract, process or store</td></tr>
</table></td><td>Compliant</td><td>Approximately 267,066t (178,044m^3) of sand was extracted during the reporting period.</td><td>A, D</td></tr>
<tr><td>A1.2</td><td>The licensee must not carry on any scheduled activities until the scheduled development works are completed, except as elsewhere provided in this licence.</td><td>Compliant</td><td>Scheduled development works related to creation of the initial dredge pond. These works were completed in 2006.</td><td>D</td></tr>
<tr><td colspan="5">A2 Premises or plant to which this licence applies</td></tr>
<tr><td>A2.1</td><td>The licence applies to the following premises:
<table>
<tr><th>Premises Details</th></tr>
<tr><td>CUDGEN LAKES</td></tr>
<tr><td>ALTONA DRIVE</td></tr>
<tr><td>CUDGEN</td></tr>
<tr><td>NSW 2487</td></tr>
<tr><td>LOT 21 DP 1082482, LOT 51 DP 1268405</td></tr>
<tr><td>ALSO INCLUDES ROAD EASEMENTS FOR CRESCENT STREET AND ALTONA ROAD.</td></tr>
</table></td><td>Noted</td><td>-</td><td>-</td></tr>
<tr><td colspan="5">A3 Other Activities</td></tr>
<tr><td>A3.1</td><td>This licence applies to all other activities carried on at the premises, including:
<table>
<tr><th>Ancillary Activity</th></tr>
<tr><td>Crushing, grinding or separating</td></tr>
<tr><td>Water-based extractive activity</td></tr>
</table></td><td>Compliant</td><td>Water based extraction and separating (through washing) occurred during the reporting period.</td><td>-</td></tr>
<tr><td colspan="5">A4 Information supplied to the EPA</td></tr>
<tr><td>A4.1</td><td>Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.
In this condition the reference to "the licence application" includes a reference to:
a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and
the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.</td><td>Compliant</td><td>Activities during the reporting period were consistent with all relevant application information.</td><td>A, D</td></tr>
<tr><td colspan="5">* D = Documentation sighted A = Advised by Company O = On-site Observation</td></tr>
</table>

Table C (Cont'd)
Compliance Review – Environmental Protection Licence 12385

Cond. No.	Commitment	Compliance	Comments	Basis*
2 Discharges to Air and Water and Applications to Land				
P1 Location of monitoring/discharge points and areas				
P1.1	The following utilisation areas referred to in the table below are identified in this licence for the purposes of the monitoring and/or the setting of limits for any application of solids or liquids to the utilisation area.	Noted	-	-
P1.2	The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.	Noted	Monitoring undertaken at these monitoring points as applicable.	D

EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
1	Water Quality Monitoring Point	Water Quality Monitoring Point	Dredge Pond South Spillway West - Identified as EPL 1 in the site map submitted to the EPA on 31 October 2023 (DOC23/1005480)
2	Water Quality Monitoring Point	Water Quality Monitoring Point	Dredge Pond South Spillway East - Identified as EPL 2 in the site map submitted to the EPA on 31 October 2023 (DOC23/1005480)
4	Groundwater Monitoring - MB15		Groundwater monitoring bore. Defined as MB15 in Gales-Kingscliff Pty Ltd, Soil and Water Management Plan for the Cudgen Lakes Sand Quarry, December 2023 (GKSWMP). Location described in Section 6.4.2 and Figure 6.3.
5	Groundwater Monitoring - MB10		Groundwater monitoring bore. Defined as MB10 in Gales-Kingscliff Pty Ltd, Soil and Water Management Plan for the Cudgen Lakes Sand Quarry, December 2023 (GKSWMP). Location described in Section 6.4.2 and Figure 6.3.
6	Groundwater Monitoring - MB11		Groundwater monitoring bore. Defined as MB11 in Gales-Kingscliff Pty Ltd, Soil and Water Management Plan for the Cudgen Lakes Sand Quarry, December 2023 (GKSWMP). Location described in Section 6.4.2 and Figure 6.3.
7	Water Quality Monitoring Point	Water Quality Monitoring Point	Dredge Pond North Spillway West - Identified as EPL 7 in the site map submitted to the EPA on 31 October 2023 (DOC23/1005480)
8	Water Quality Monitoring Point	Water Quality Monitoring Point	Dredge Pond North Spillway East - Identified as EPL 8 in the site map submitted to the EPA on 31 October 2023 (DOC23/1005480)

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Table C (Cont'd)
Compliance Review – Environmental Protection Licence 12385

Cond. No.	Commitment	Compliance	Comments	Basis*
3 Limit Conditions				
L1 Pollution of waters				
L1.1	Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.	Compliant	No pollution of waters is deemed to have occurred during the reporting period.	A, D
L1.2	Exceedance of the quality limits specified in this licence for the discharge of TSS, pH and Oil and Grease from Points 1, 2, 7, or 8, or exceedance of a volume limit for discharges from Points 1, 2, 7, or 8, are permitted if the discharge occurs solely as a result of rainfall at the premises exceeding a total of 82.5 millimetres over any consecutive five day period.	Not Applicable	No discharges occurred during the reporting period.	A, D
L1.3	The licensee must take all practical measures to avoid or minimise TSS, pH etc. contained in wet weather discharges.	Not Applicable	No discharges occurred during the reporting period.	A, D
L2 Concentration Limits				
L2.1	For each monitoring/discharge point or utilisation area specified in the table\s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.	Not Applicable	No discharges occurred during the reporting period.	A, D
L2.2	Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.	Not Applicable	No discharges occurred during the reporting period.	A, D
L2.3	To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table\s.	Noted	-	-
L2.4	Water and/or Land Concentration Limits **POINT 1,2,7,8** Pollutant / Units of Measure / 50 Percentile concentration limit / 90 Percentile concentration limit / 3DGM concentration limit / 100 percentile concentration limit Oil and Grease / Visible / / / / nil pH / pH / / / / 6.5 - 8.5 TSS / milligrams per litre / / / / 50	-	-	-
L3 Waste				
L3.1	The licensee must not cause, permit or allow any waste generated outside the premises to be received at the premises for storage, treatment, processing, reprocessing or disposal or any waste generated at the premises to be disposed of at the premises, except as expressly permitted by the licence.	Compliant	No wastes were received to the Quarry during the reporting period.	A, D
L3.2	Virgin Excavated Natural Material (VENM) may be received at the premises for the purpose of land application.	Noted	No VENM was imported during the reporting period as part of the approved Quarry operations.	A, D

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Table C (Cont'd)
Compliance Review – Environmental Protection Licence 12385

Cond. No.	Commitment	Compliance	Comments	Basis*
3 Limit Conditions (Cont'd)				
L4 Noise limits				
L4.1	Noise from the premises where extraction is occurring (being Lot 51 DP 1268405 and Lot 21 DP 1082482) must not exceed an LAeq (15 minute) noise emission criterion of 47 dB(A) between the hours of 7am to 10pm, and 44dB(A) between the hours of 630am to 7am, except as expressly provided by this licence.	Compliant	Noise monitoring undertaken during the reporting period confirms compliance with the noise criteria.	D
L4.2	Noise from the premises where extraction is occurring (being Lot 51 DP 1268405 and Lot 21 DP 1082482) is to be measured at: residences on privately owned land; and, locations specified in Section 7 (b) of Schedule 3 of Project Approval 75J Project Application 05_0103, or the current modification, to determine compliance with this condition.	Compliant	As above.	D
L4.3	The noise limits set out in L4.1 apply under all meteorological conditions except for the following: a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or b) Temperature inversion conditions up to 3ºC/100m and wind speeds greater than 2 metres/second at 10 metres above ground level; or c) Temperature inversion conditions greater than 3ºC/100m.	Compliant	There were no instances during the reporting period where these meteorological conditions needed to be taken into account for noise compliance.	A
L5 Hours of operation				
L5.1	This licence only allows activities to be carried out from the premises where extraction is occurring (being Lot 51 DP1268405 and Lot 21 DP 1082482) within the following times as follows: site establishment, sand or soil extraction by excavator, dry processing, product transport by road, other quarry related activities, maintenance (if audible at neighbouring residences)[Monday to Friday - 7am to 6pm, Saturday - 7am to 1pm, Sunday and Public Holidays - nil]; sand extraction by dredging and pumping to the processing plant, wet processing [Monday to Friday - 7am to 10pm, Saturday - 7am to 4pm, Sunday and Public Holidays - nil]; Sand extraction by dredging and pumping to fill sites [Monday to Friday - 7am to 6.30pm, Saturday - 7am to 1pm, Sunday and Public Holidays - nil]; operation of dredge to fill pipeline with water or pipeline flushing [Monday to Friday - 6.30am to 7pm, Saturday - 6.30am to 1.30pm, Sunday and Public Holidays - nil]; maintenance (if inaudible at neighbouring residences)[any day, any time].	Compliant	All activities occurred within the approved hours.	D
4 Operating Conditions				
O1 Activities must be carried out in a competent manner				
O1.1	Licensed activities must be carried out in a competent manner. This includes: a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.	Compliant	All processing and transportation activities were undertaken in a competent manner and wastes appropriately disposed of.	A, D

* D = Documentation sighted A = Advised by Company O = On-site Observation

Table C (Cont'd)
Compliance Review – Environmental Protection Licence 12385

Cond. No.	Commitment	Compliance	Comments	Basis*
4 Operating Conditions (Cont'd)				
O2 Maintenance of plant and equipment				
O2.1	All plant and equipment installed at the premises or used in connection with the licensed activity: a) must be maintained in a proper and efficient condition; and b) must be operated in a proper and efficient manner.	Compliant	All equipment was appropriately maintained and operated during the reporting period. Where required, repairs were undertaken to ensure proper operation.	A
O3 Dust				
O3.1	The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.	Compliant	Temporary stabilisation of soil bunding and topsoil stockpile has been achieved through re-establishment of pasture grass. No complaints or issues have arisen.	A, D
O4 Processes and management				
O4.1	Any pond subject to dredging, or containing turbid water due to recent dredging must be maintained and operated to prevent discharges of any water from these ponds. A vegetated barrier must be used at all times to ensure that the active dredge and fines placement area / pond are isolated from stormwater drainage channels.	Compliant	The grassed bunding surrounding the dredge pond prevents discharge of water from the pond.	A, D
O4.2	The licensee must maximise the diversion of run-on waters from lands upslope and around the site whilst land disturbance activities are being undertaken.	Compliant	The grassed bunding surrounding the dredge pond prevents the inflow of surface water (except in flood events).	D
O4.3	The licensee must ensure that sampling point(s) for water discharged from the Dredge Pond(s) and Sediment Dam are provided and maintained in an appropriate condition to permit: a) the clear identification of each Dredge Pond and Sediment Dam and discharge point(s); b) the collection of representative samples of the water discharged from the Dredge Pond(s) and Sediment Dam; and c) access to the sampling point(s) at all times by an authorised officer of the EPA.	Compliant	Access to the dredge pond was maintained throughout the reporting period except where local flooding as a result of significant rainfall events prevented safe access.	A, D
O4.4	All liquid chemicals, fuels and oils must be stored in tanks or containers inside suitable bund(s). Bunds are to be designed, constructed and maintained in accordance with all relevant Australian Standards.	Compliant	No diesel was stored on site with a mobile refuelling tanker service utilised for refuelling. Minor quantities of oil and grease (20L and 5L) were appropriately stored within a service van.	A

* D = Documentation sighted A = Advised by Company O = On-site Observation

Table C (Cont'd)
Compliance Review – Environmental Protection Licence 12385

<table>
<tr><th>Cond. No.</th><th>Commitment</th><th>Compliance</th><th>Comments</th><th>Basis*</th></tr>
<tr><td colspan="5">O5 Other operating conditions</td></tr>
<tr><td>O5.1</td><td>The licensee must assess and manage any acid sulfate soil (ASS) and potential acid sulfate soil PASS) in accordance with the current Acid Sulfate Soils Manual published by the NSW Acid Sulfate Soil Management Advisory Committee (ASSMAC).</td><td>Compliant</td><td>Activities to date have been undertaken in accordance with the Acid Sulfate Soil Management Plan.</td><td>A, D</td></tr>
<tr><td colspan="5">5. Monitoring and Recording Conditions</td></tr>
<tr><td colspan="5">M1 Monitoring records</td></tr>
<tr><td>M1.1</td><td>The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.</td><td>Compliant</td><td>The monitoring records have been retained as required.</td><td>D</td></tr>
<tr><td>M1.2</td><td>All records required to be kept by this licence must be:
a) in a legible form, or in a form that can readily be reduced to a legible form;
b) kept for at least 4 years after the monitoring or event to which they relate took place; and
c) produced in a legible form to any authorised officer of the EPA who asks to see them.</td><td>Compliant</td><td>Monitoring has been retained in a legible form for more than 4 years. No requests from an EPA officer were received.</td><td>A, D</td></tr>
<tr><td>M1.3</td><td>The following records must be kept in respect of any samples required to be collected for the purposes of this licence:
a) the date(s) on which the sample was taken;
b) the time(s) at which the sample was collected;
c) the point at which the sample was taken; and
d) the name of the person who collected the sample.</td><td>Compliant</td><td>Monitoring records contain all required information.</td><td>D</td></tr>
<tr><td colspan="5">M2 Requirement to monitor concentration of pollutants discharged</td></tr>
<tr><td>M2.1</td><td>For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:</td><td rowspan="2">Non-Compliant</td><td rowspan="2">Monitoring was unable to be undertaken at EPL Point 5 (MB10) due to the bore being damaged. A replacement bore is to be established / alternative site nominated.
This non-compliance was reported through the 2024/2025 Annual Return.</td><td rowspan="2">D</td></tr>
<tr><td>M2.2</td><td>Water and/ or Land Monitoring Requirements.
POINT 1,2,7,8
<table>
<tr><th>Pollutant</th><th>Units of measure</th><th>Frequency</th><th>Sampling Method</th></tr>
<tr><td>Oil and Grease</td><td>Visible</td><td>Special Frequency 1</td><td>Visual Inspection</td></tr>
<tr><td>pH</td><td>pH</td><td>Special Frequency 1</td><td>Probe</td></tr>
<tr><td>Total suspended solids</td><td>milligrams per litre</td><td>Special Frequency 1</td><td>Grab sample</td></tr>
</table>
POINT 4,5,6
<table>
<tr><th>Pollutant</th><th>Units of measure</th><th>Frequency</th><th>Sampling Method</th></tr>
<tr><td>Ammonia</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr>
<tr><td>Chloride</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr>
<tr><td>Electrical conductivity</td><td>microsiemens per centimetre</td><td>Yearly</td><td>Grab sample</td></tr>
<tr><td>pH</td><td>pH</td><td>Yearly</td><td>Grab sample</td></tr>
<tr><td>Standing Water Level</td><td>metres (Australian Height Datum)</td><td>Yearly</td><td>No method specified</td></tr>
<tr><td>Sulfate</td><td>milligrams per litre</td><td>Yearly</td><td>Grab sample</td></tr>
</table></td></tr>
</table>

* D = Documentation sighted A = Advised by Company O = On-site Observation

Table C (Cont'd)
Compliance Review – Environmental Protection Licence 12385

Cond. No.	Commitment	Compliance	Comments	Basis*
M2 Requirement to monitor concentration of pollutants discharged (Cont'd)				
M2.3	Special Frequency 1 means: sampling once <24 hours prior to; and, sampling the discharge daily during, each discharge event arising from rainfall of less than 82.5mm falling in total over a period of up to five days duration.	Noted	No wet weather discharge occurred during the reporting period.	-
M3 Testing methods - concentration limits				
M3.1	Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.	Noted	-	A
M4 Environmental Monitoring				
M4.1	The licensee is required to install and maintain a rainfall depth measuring device.	Compliant	A rain gauge is maintained on site.	A, D
M4.2	Rainfall at the premises must be measured and recorded in millimetres per 24 hour period, at the same time each day. Note: The rainfall monitoring data collected in compliance with Condition M4.2 can be used to determine compliance with L1.2.	Compliant	As above.	A, D
M5 Recording of pollution complaints				
M5.1	The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.	Compliant	No complaints were received during the reporting period.	A, D
M5.2	The record must include details of the following: a) the date and time of the complaint; b) the method by which the complaint was made; c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect; d) the nature of the complaint; e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and f) if no action was taken by the licensee, the reasons why no action was taken.	Compliant	No complaints were received during the reporting period.	A, D
M5.3	The record of a complaint must be kept for at least 4 years after the complaint was made.	Compliant	The complaint record has been retained (with one complaint having been previously recorded in the past 4 years).	A, D
M5.4	The record must be produced to any authorised officer of the EPA who asks to see them.	Not Applicable	No requests received during the reporting period.	A

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Table C (Cont'd)
Compliance Review – Environmental Protection Licence 12385

Cond. No.	Commitment	Compliance	Comments	Basis*
M6 Telephone complaints line				
M6.1	The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.	Compliant	The mobile phone contact for the Quarry Operator, 0449 965 772, was the relevant complaints contact during the reporting period.	A, D
M6.2	The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.	Compliant	The complaints number is included on the Company website.	A, D
M6.3	The preceding two conditions do not apply until 3 months after: the date of the issue of this licence.	No Longer Applicable	The licence was issued 18/11/2005 (i.e. more than 3 months prior).	D
M7 Other monitoring and recording conditions				
M7.1	For the purposes of monitoring for compliance with the noise limit conditions of this licence (condition L4) noise emitted from the premises must be measured or computed at 30 metres from the nearest residential dwelling/s over a period of 15 minutes using the "FAST" response on the sound level meter. A modifying factor correction must be applied for tonal, impulsive, or intermittent noise in accordance with the current NSW Noise Policy for Industry by NSW EPA.	Compliant	Noise monitoring was undertaken in accordance with these requirements.	D
6 Reporting Conditions				
R1 Annual return documents				
R1.1	The licensee must complete and supply to the EPA an Annual Return in the approved form comprising: 1. a Statement of Compliance; and 2. a Monitoring and Complaints Summary. 3. Statement of Compliance - Licence Conditions, 4. a Statement of Compliance - Load based Fee, 5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan, 6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data; and 7. a Statement of Compliance - Environmental Management Systems and Practices. At the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.	Compliant	The completed annual return for the period 1 July 2024 to 30 June 2025 was submitted on 22 August 2025.	D
R1.2	An Annual Return must be prepared in respect of each reporting period, except as provided below.	Compliant	The completed annual return for the period 1 July 2024 to 30 June 2025 was submitted on 22 August 2025.	D

* D = Documentation sighted A = Advised by Company O = On-site Observation

Table C (Cont'd)
Compliance Review – Environmental Protection Licence 12385

Cond. No.	Commitment	Compliance	Comments	Basis*
6 Reporting Conditions (Cont'd)				
R1 Annual return documents (Cont'd)				
R1.3	Where this licence is transferred from the licensee to a new licensee: a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.	Not Applicable	The licence has not been transferred.	D
R1.4	Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on: a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.	Not Applicable	The licence has not been surrendered.	D
R1.5	The Annual Return for the reporting period must be supplied to the EPA by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').	Compliant	The completed annual return for the period 1 July 2024 to 30 June 2025 was submitted on 22 August 2025.	D
R1.6	The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.	Compliant	Copies of annual returns retained for more than 4 years.	A
R1.7	Within the Annual Return, the Statement of Compliance must be certified and the Monitoring and Complaints Summary must be signed by: a) the licence holder; or b) by a person approved in writing by the EPA to sign on behalf of the licence holder. Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period. Note: An application to transfer a licence must be made in the approved form for this purpose.	Compliant	The Annual Return was signed by the licence holder.	D
R2 Notification of environmental harm				
R2.1	Notifications must be made by telephoning the Environment Line service on 131 555.	Noted	-	-
R2.2	The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred. Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.	Not Applicable	No environmental harm occurred during the reporting period.	A, D

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Table C (Cont'd)
Compliance Review – Environmental Protection Licence 12385

Cond. No.	Commitment	Compliance	Comments	Basis*
6 Reporting Conditions (Cont'd)				
R3 Written report				
R3.1	Where an authorised officer of the EPA suspects on reasonable grounds that: a) where this licence applies to premises, an event has occurred at the premises; or b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence, and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.	Not Applicable	No requests received.	A
R3.2	The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.	Not Applicable	No requests received.	A
R3.3	The request may require a report which includes any or all of the following information: a) the cause, time and duration of the event; b) the type, volume and concentration of every pollutant discharged as a result of the event; c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event; d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort; e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants; f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and g) any other relevant matters.	Not Applicable	No requests received.	A
R3.4	The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.	Not Applicable	No requests received.	A
7 General Conditions				
G1 Copy of licence kept at the premises or plant				
G1.1	A copy of this licence must be kept at the premises to which the licence applies.	Compliant	A copy is retained on-site.	A
G1.2	The licence must be produced to any authorised officer of the EPA who asks to see it.	Not Applicable	No requests received.	A
G1.3	The licence must be available for inspection by any employee or agent of the licensee working at the premises.	Compliant	A copy is retained on-site and is available upon request.	A

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Table C (Cont'd)
Compliance Review – Environmental Protection Licence 12385

Cond. No.	Commitment	Compliance	Comments	Basis*
8 Special Conditions				
E1 Engineer Report				
E1.1	Bunding and spillways must be constructed in accordance with Mortons Urban Solutions Engineering Response submitted to the EPA on 11 December 2023, and maintained in accordance with the current Soil and Water Management Plan for the site.	Compliant	Construction of the extended bunding around the extent of the northern site has been completed.	A, D

* D = Documentation sighted A = Advised by Company O = On-site Observation

Appendix 2

Noise Monitoring Results

(Total No. of pages including blank pages = 30)

CRAIG HILL ACOUSTICS. ACOUSTIC, CONSULTING, ENGINEERING AND DESIGNS

CRAIG HILL ACOUSTICS

Acoustic Consultants

QLD & NSW

Cudgen Lakes Sand Quarry

Compliance Noise Monitoring

Friday, 20 December 2024

CRAIG HILL ACOUSTICS. 7 View Ct . Palm Beach .Qld 4221 .
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DOCUMENT CONTROL PAGE

Cudgen Lakes Sand Quarry

Reference :201224/1

Report prepared for	Gales-Kingscliff Pty Limited
Date	Friday, 20 December 2024
Site	Cudgen Lakes Sand Quarry
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Signed	Craig Hill (manager) author
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1.0 INTRODUCTION

The purpose of this report is to examine noise levels from quarry operations for compliance. Attended monitoring was conducted on the 18th December 2024 at noise sensitive receivers identified in the conditions of approval to establish the compliance status.
Activities on the day were related to dredging and loading product to road registered trucks.

Table 1.1 Equipment being used at the time of the test

CDE (Wash Plant)
Loader (Volvo 180)
Road Trucks and dogs
Dragflow Electric Dredge El180

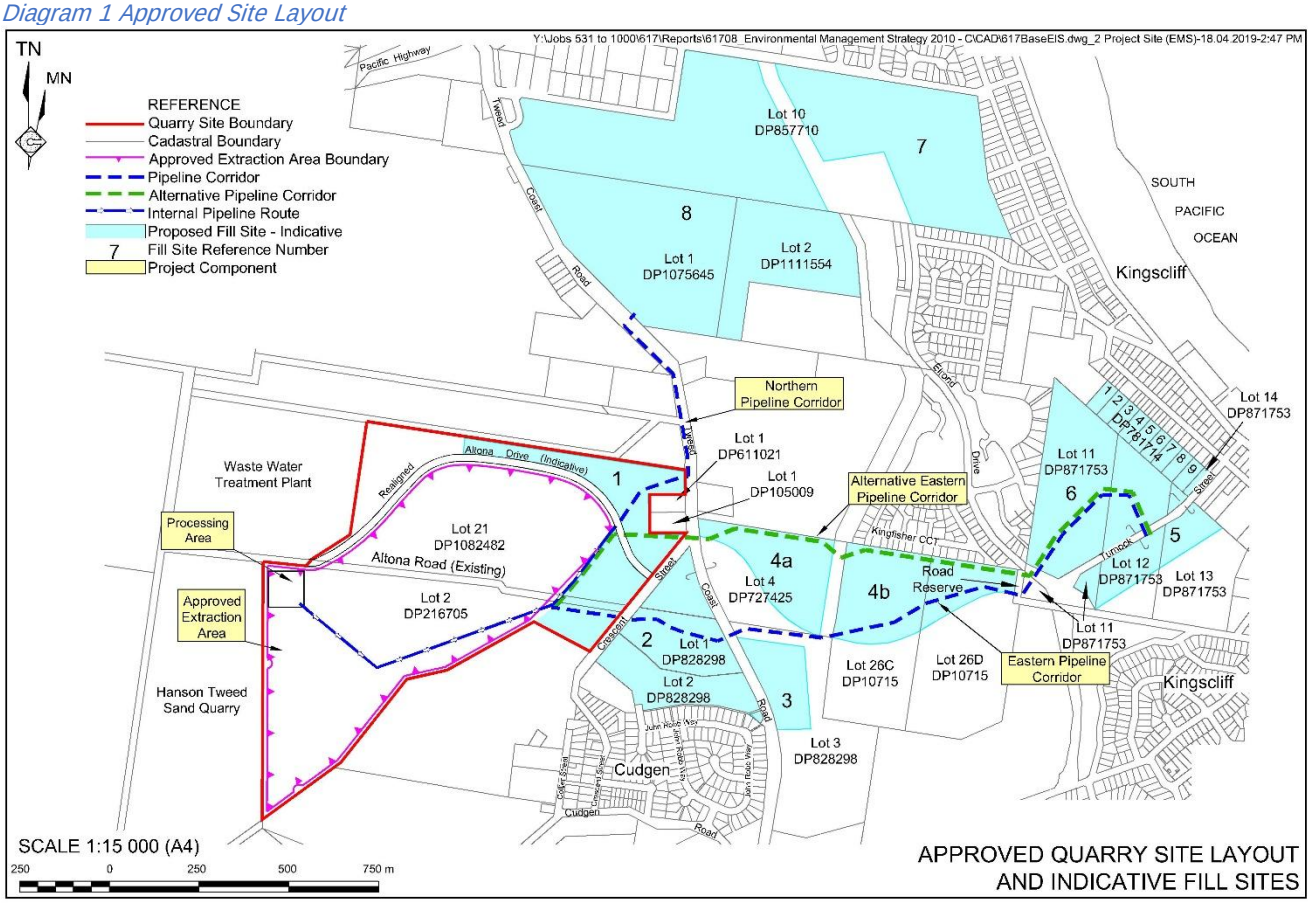
Table 1.2 Hours of operation

Activity	Permissible Hours
Site establishment, dry processing, product transport by road, VENM receipts, other quarrying operations not specified in this table	• 7.00 am to 6.00 pm Monday to Friday • 7.00 am to 1.00 pm Saturday • At no time on Sundays or public holidays
Sand extraction by dredging and pumping to the processing plant, wet processing.	• 7.00 am to 10.00 pm Monday to Friday • 7.00 am to 4.00 pm Saturday • At no time on Sundays or public holidays
Sand extraction by dredging and pumping to fill sites.	• 7.00 am to 6.30 pm Monday to Friday • 7.00 am to 1.00 pm Saturday • At no time on Sundays or public holidays
Operation of dredge to fill pipeline with water or pipeline flushing	• 6.30 am to 7.00 pm Monday to Friday • 6.30 am to 1.30 pm Saturday • At no time on Sundays or public holidays
Maintenance (if inaudible at neighbouring residences)	Any day

Table 1.3 Operational Activities

Activity	Day	Time
Site establishment, sand or soil extraction by excavator, dry processing, product transport by road, VENM receipts, other quarry related activities, maintenance (if audible at neighbouring residences)	Monday – Friday	7:00am to 6:00pm
	Saturday	7:00am to 1:00pm
	Sunday and Public Holidays	Nil

Diagram 1 Approved Site Layout



2.0 LOCATION OF MONITORING

- *Receptor G – Residence - 216 Tweed Coast Road. (line of sight to operations)*
- *Receptor O – Residence - 607 Cudgen Road.(line of sight to operations)*
- *Receptor Pacific Views Estate – Residences – via Collier Street (located to rear of new residences). (line of sight to operations)*
- *Receptor DD – Residence - 34A Crescent Street.(no line of sight)*
- *Receptor F – Residence - 64 John Robb Way. (no line of sight)*

Diagram 2 Monitoring locations

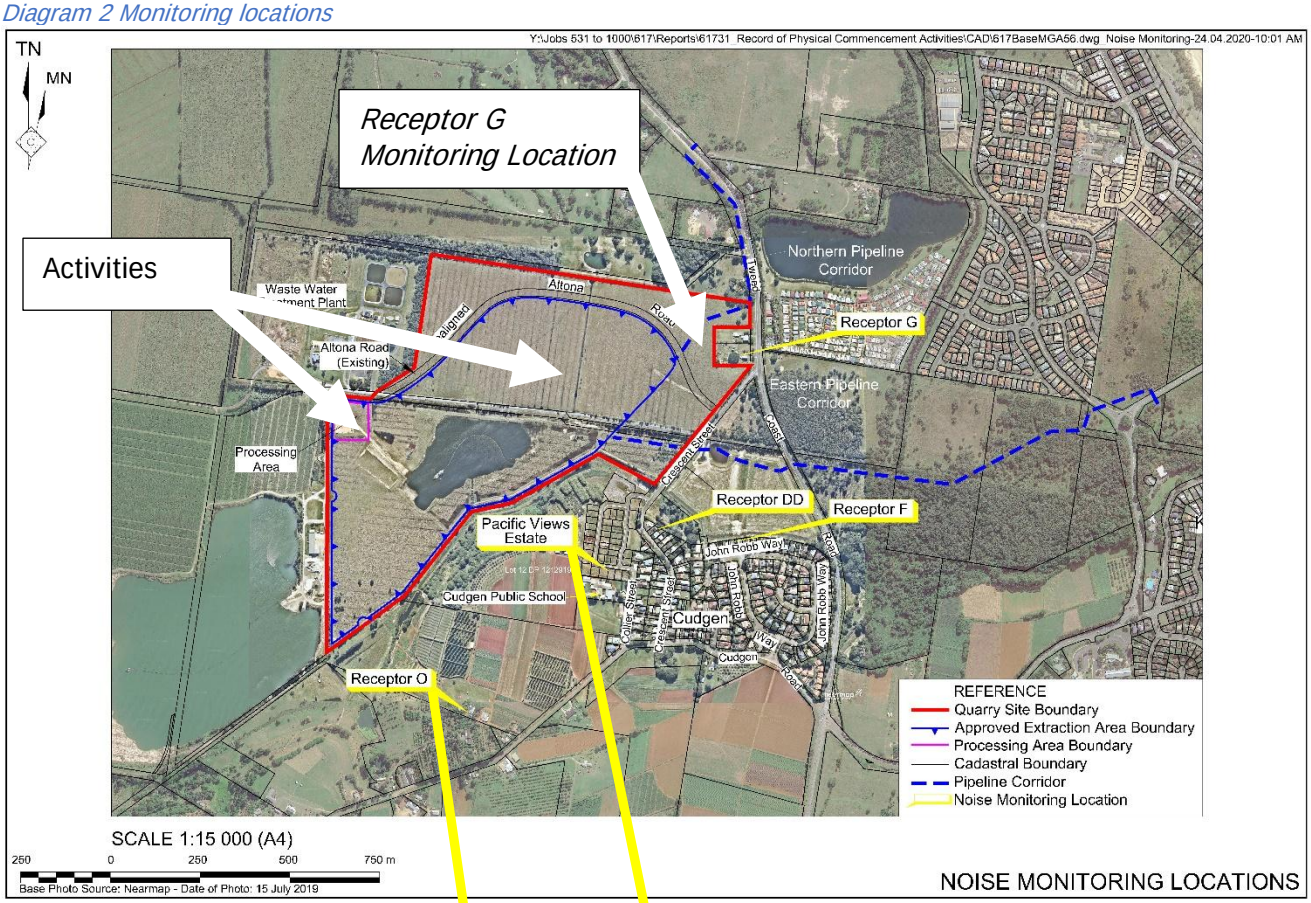
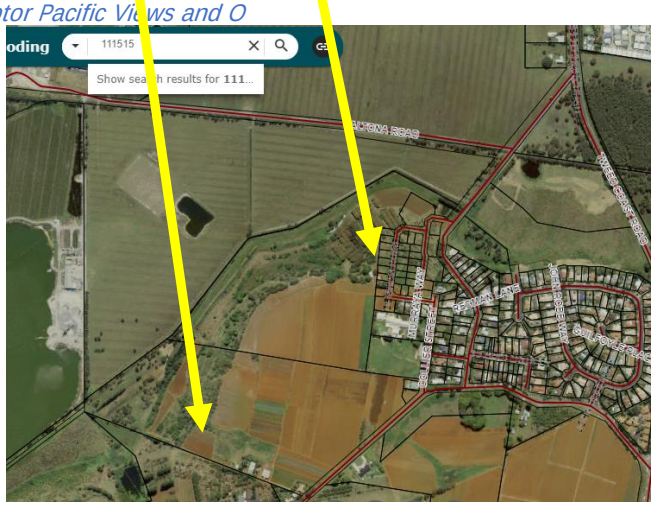
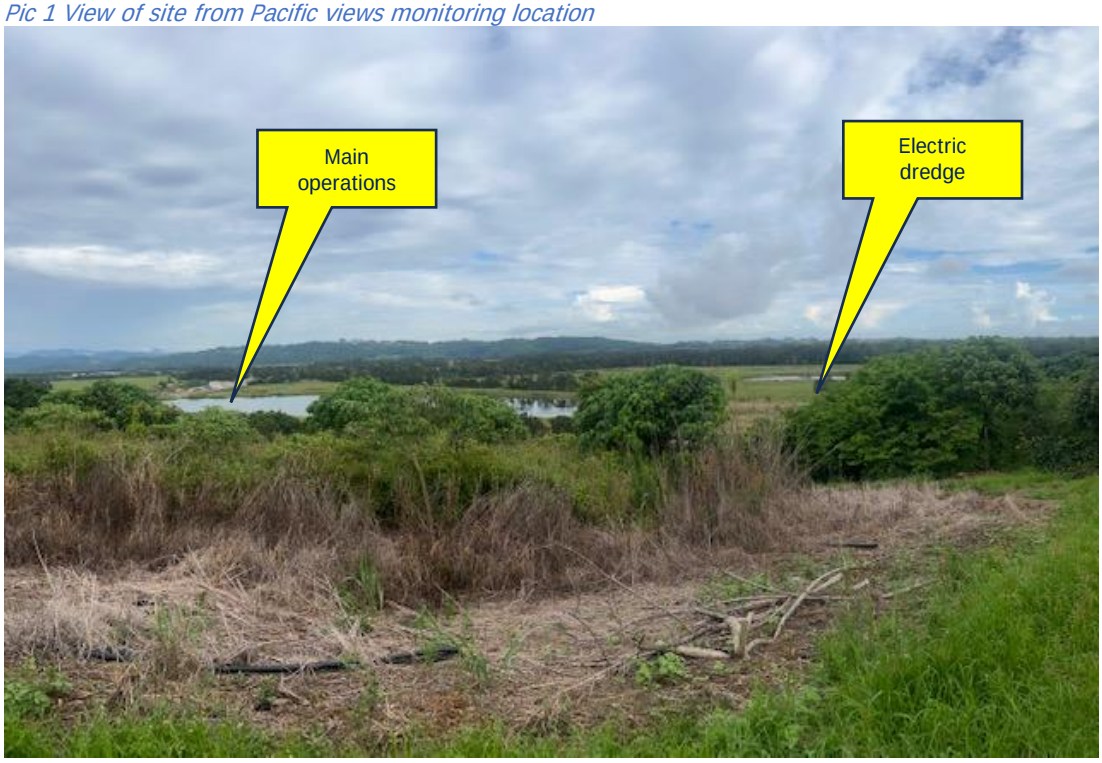


Diagram 3 Relocation of Receptor Pacific Views and O



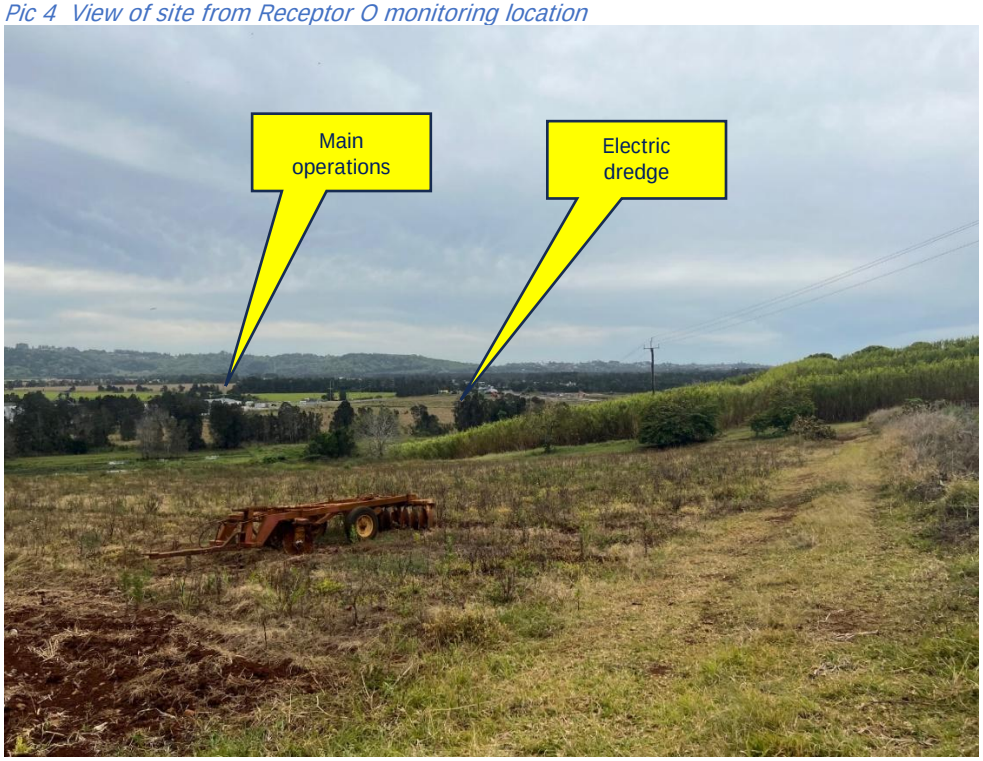
Pic 1 View of site from Pacific views monitoring location



Pic 2 Zoomed in above pic main operations

Pic 3 Zoomed in Electric dredge

Pic 4 View of site from Receptor O monitoring location



3.0 CRITERIA

The relevant impact assessment and cumulative noise criteria as specified in Schedule 3 Conditions 3 and 4 of Project Approval 05_0103B are as follows.

3.1 Impact Assessment Criteria

Table 3.1 Impact Assessment Criteria

Receiver Location	Day and Evening LAeq (15 min) dB(A)
Residences on privately owned land	47

3.2 Cumulative Noise Criteria

The project combined with the noise generated by other industrial development does not exceed the following amenity criteria on any privately owned land.

LAeq (11 hour) 50 dB(A) – Day;
LAeq (4 hour) 45 dB(A) - Evening and
LAeq(9 hour) 40 dB(A) - Night

L_{A90} corresponds to the A-weighted sound pressure level which is exceeded for 90% of the time. This parameter is used to measure the background noise level.

L_{Aeq} corresponds to the equivalent or energy-averaged level

4.0 SOUND MEASUREMENTS

4.1 Equipment

The following equipment was utilised during the test assessments:
Svantec Type 1, Sound and Vibration Analyser Model 977C Serial N0 98824, calibrated November 2024.
Svantec SV-33B Sound Level Calibrator Serial No 127992, calibrated August 2024.
The above equipment complies with the requirements of Australian Standards 1259.2 1990, Sound Level Meters, Part 2 Integrating – Averaging, as required by the Australian Standards.
Equipment was calibrated before the tests and checked after and found to be within the acceptable drift.
The above equipment complies with the requirements in IEC 61672.

4.2 Atmospheric Conditions

The atmospheric conditions during the period of monitoring are provided in Table 4.1.

Table 4.1 Atmospheric Conditions

Humidity	90%
Wind Speed	0
Wind Direction	-
Atmospheric Pressure	1010 hpa
Cloud Cover	0%
Temp	28C

5.0 TESTING

The following tests were carried out at locations G, O, Pacific Views Estate, DD and F within 30m of affected dwellings where practical as indicated on the attached site plan.
Tests conducted on 18 December 2024 between 0900 and 1100 hrs DST

- *Receptor G – Residence - 216 Tweed Coast Road. (rear boundary)*
- *Receptor O – Residence – 607 Cudgen Road. (rear boundary)*
- *Receptor Pacific Views Estate – Residences – via Collier Street. (opposite rear boundary of new residences)*
- *Receptor DD – Residence - 34A Crescent Street. (rear boundary)*
- *Receptor F – Residence - 64 John Robb Way. (rear boundary)*

5.1 On site equipment 18 December 2024

Table 5.1 Equipment on site at the time of the test 18/12/2024

On site equipment	LAeq 15 min at 20 metres
CDE Wash Plant	76
Loader (Hyundai HL-770	71
Road Trucks	66
Dredge (new electric)	48

5.2 Equipment used during previous tests

Table 5.2 Equipment being used previous tests

Date:20/12/ 2023	Previous tests LAeq 15 min at 20 metres
Operating equipment	
CDE Wash Plant	76
Loader (Hyundai HL-770	71
Excavator	66
Road Trucks	66
Dredge (electric)	48
Date:08/03/2022	
CDE Wash Plant	76
Loader (Hyundai HL-770	71
Excavator (Doosan DX 420 LCA)	66
Road Trucks	66
Dredge (electric)	48
Date 01/10/2021	
CDE Wash Plant (nil product)	76
Loader (Hyundai HL-770	71
Excavator (Doosan DX 420 LCA)	66
Road Trucks	66
Date 05/08/2021	
CDE Wash Plant (nil product)	76
Loader (Hyundai HL-770	71
Excavator (Doosan DX 420 LCA)	66
Road Trucks	66
Date 18/06/2021	
CDE Wash Plant (nil product)	-
Loader (Hyundai HL-770	71
Road Trucks	66
Date 10/12/2021	
Loader (Hyundai HL-770	71
Excavator (Doosan DX 420 LCA)	66
Roller compactor CA302	68
Screener Sanvik(QA331)	70
Date 10/07/2020	
Loader (Hyundai HL-770	71
Excavator (Doosan DX 420 LCA)	66
Date April 2020	
Operating equipment	LAeq
Screener (QA331)	70
Loader (Cat 926H)	67
Excavator (Cat 329D)	68
End loader and screener	72

6.0 Attended monitoring results and criteria compliance

The results of attended monitoring and criteria compliance are presented in Table 6.1 below.

Table 6.1 Attended monitoring 18/12/2024

Receptor & Time hrs	Attended Testing LAeq 15 minutes	> Project Criteria (47 LAeq 15min)	> Cumulative Criteria (50 LAeq 11 hrs)	Comments
G 0900-0915	45	-2	-5	Noise from other sources such as traffic noise from Tweed Coast Road dominated background. Noise from operations not measurable / distinguishable above background.
O 0930-0945	47	0	-3	Noise from other sources such as traffic noise from Pacific Highway dominated background. Noise from operations not audible or measurable above background.
Pacific Views 0955-1005	49	+2	-1	Noise from other sources such as traffic noise from Pacific Highway dominated background. Noise from operations not audible or measurable above background
DD 1010-1035	47	0	-3	Noise from other sources such as traffic noise from Tweed Coast Road dominated background. Noise from operations not audible or measurable / distinguishable above background.
F 1045-1100	47	0	-3	Noise from other sources such as traffic noise from Tweed Coast Road dominated background. Noise from operations not audible / distinguishable above background.

7.0 PREDICTED LEVELS

Measurements were undertaken at approximately 20m from equipment during operations and distance attenuation applied to establish possible levels at monitoring locations.
Table 7.1 shows predicted compliance to the criteria for nominated equipment operations.

Table 7.1 Predicted levels of on site equipment based on measurements at 20m

Receiver and source	LAeq	Source SPL @20m	Characteristic	Adjust character	Corrected LAeq 20m	Correction LAeq 20m	No of events 15 min	Duration of event	Correct 15min	Adjusted source	Distance	Minus distance attenuation	Building sound shell shielding	Adj building shield and distance attenuation	Barrier correction line or sight correction	Adj barrier correction	>47 LAeq 15 min	>50 LAeq 11 hrs
G																	47	50
Elec dredge	48	48	0	48	0	48	1	900	0	48	880	15	0	15	0	15	-32	-35
Wash	71	71	0	71	0	71	1	900	0	71	880	38	0	38	0	38	-9	-12
Loader	66	66	0	66	0	66	1	900	0	66	880	33	0	33	0	33	-14	-17
Excavator	66	66	0	66	0	66	1	900	0	66	880	33	0	33	0	33	-14	-17
Trucks	63	63	0	63	0	63	1	900	0	63	880	30	0	30	0	30	-17	-20
Total																41	-6	-9
O																		
Elec dredge	48	48	0	48	0	48	1	900	0	48	600	18	0	18	0	18	-29	-32
Elec dredge	71	71	0	71	0	71	1	900	0	71	600	41	0	41	0	41	-6	-9
Wash	66	66	0	66	0	66	1	900	0	66	600	36	0	36	0	36	-11	-14
Loader	66	66	0	66	0	66	1	900	0	66	600	36	0	36	0	36	-11	-14
Excavator	63	63	0	63	0	63	1	900	0	63	600	33	0	33	0	33	-14	-17
Trucks																44	-3	-6
PV																		
Elec dredge	48	48	0	48	0	48	1	900	0	48	555	19	0	19	0	19	-28	-31
Wash	71	71	0	71	0	71	1	900	0	71	555	42	0	42	0	42	-5	-8
Loader	66	66	0	66	0	66	1	900	0	66	555	37	0	37	0	37	-10	-13
Excavator	66	66	0	66	0	66	1	900	0	66	555	37	0	37	0	37	-10	-13
trucks	63	63	0	63	0	63	1	900	0	63	555	34	0	34	0	34	-13	-16
Total																45	-2	-5
DD																		
Elec dredge	48	48	0	48	0	48	1	900	0	48	780	16	0	16	10	6	-41	-44
Wash	71	71	0	71	0	71	1	900	0	71	780	39	0	39	10	29	-18	-21
Loader	66	66	0	66	0	66	1	900	0	66	780	34	0	34	10	24	-23	-26
Excavator	66	66	0	66	0	66	1	900	0	66	780	34	0	34	10	24	-23	-26
Trucks	63	63	0	63	0	63	1	900	0	63	780	31	0	31	10	21	-26	-29
Total																32	-15	-18
F																		
Elec dredge	48	48	0	48	0	48	1	900	0	48	900	15	0	15	10	5	-42	-45
Wash	71	71	0	71	0	71	1	900	0	71	900	38	0	38	10	28	-19	-22
Loader	66	66	0	66	0	66	1	900	0	66	900	33	0	33	10	23	-24	-27
Excavator	66	66	0	66	0	66	1	900	0	66	900	33	0	33	10	23	-24	-27
Trucks	63	63	0	63	0	63	1	900	0	63	900	30	0	30	10	20	-27	-30
Total																30	-17	-20

Some of equipment not in use on the day but included in prediction to demonstrate compliance

$Lp(R2) = Lp(R1) - 20 \cdot Log_{10}(R2/R1)$
Where:
Lp(R1) = Sound Pressure Level at Initial location.
Lp(R2) = Sound Pressure Level at the new location.
R1 = Distance from the noise source to initial location.
R2 = Distance from noise source to the new location.
Logarithmic addition=10*LOG(SUM(10^(user range/10)))

8.0 DISCUSSION AND CONCLUSIONS

Noise from operations were not audible or measurable above ambient levels at locations G, O, Pacific Views, DD and F.

Distance calculations of equipment noise levels from plant in Table 7.1 shows that operations would be within the criteria of 47LAeq and not likely to be a major contributor the 50 LAeq cumulative criteria.

Monitoring for accumulative levels was only conducted over 15 minutes. These predictions would be relative for continuous operations over an 11 hour period. For shorter duration operations this figure would be reduced by 2 to 5 dB with breaks for lunch and working an 8 hour day.

Table 8.1 Compliance monitoring

Receptor	Pre-project / Baseline Levels	Compliance Monitoring LAeq 15 min												Project Criteria and Latest Test		
		Previous attended testing												Latest tests LAeq 15 min	LAeq 15 min	LAeq 11 hr
	Unattended logger original report	23/08/05	10/07/17	30/08/18	20/04/20	20/04/20	10/12/20	18/06/21	05/08/21	01/10/21	08/04//22	08/08/22	20/12/23	18/12/24	>Impact Criteria day and evening 47LAeq	>Cumulative Criteria Day >50LAeq
G	62	63	62	57	55	56	57	55	50	49	47	47	46	45	-2	-5
O			64	46	48	52	53	52	49	51	50	48	48	47	0	-3
Pacific Views	55	51	57	48	55	53	52	51	51	50	51	48	50	49	+2	-1
DD	55	53	58	56	56	53	52	50	49	51	52	50	48	47	0	-3
F	58	54	43	57	59	55	47	50	48	50	49	49	48	47	0	-3

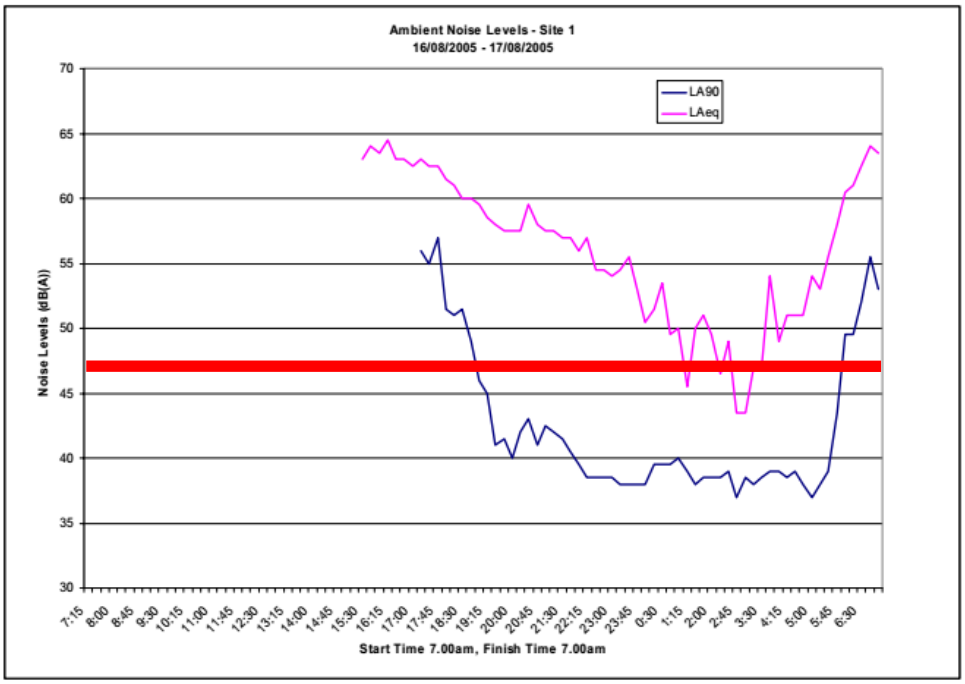
Monitored levels in the area are not unusual for daytime compliance testing. Examination of pre-project data shows ambient LAeq for day and evening rarely drops below the project design levels making it difficult to enable compliance identification.

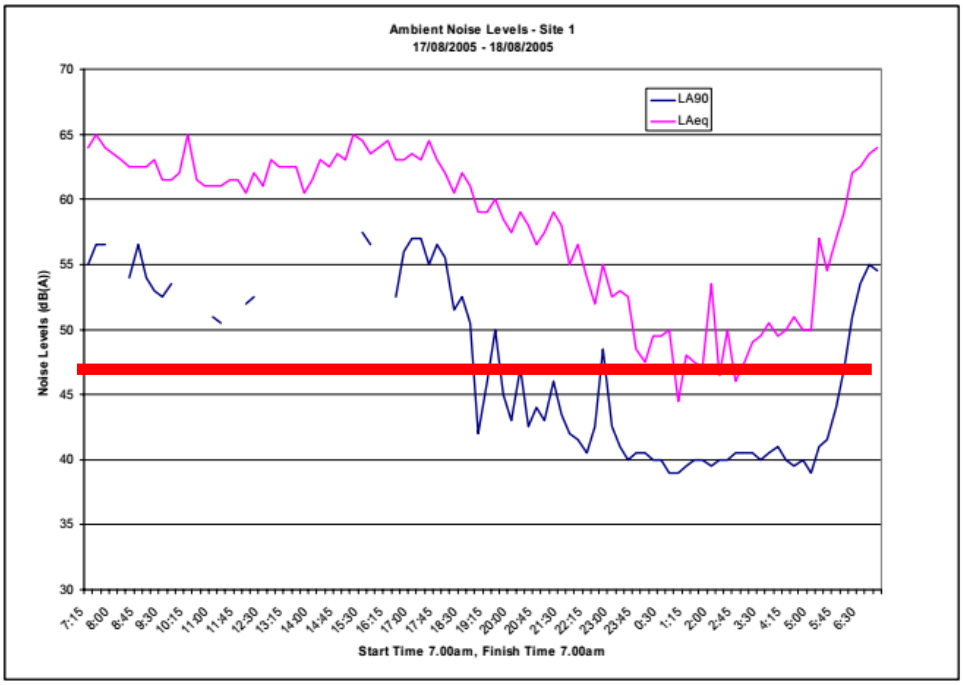
To better demonstrate this, Appendix A shows graphs for the pre-project monitoring (Rumble Report No. 617/04 unattended logger). The project criteria for day and evening periods of 47LAeq is indicated by the straight red line. From Appendix A it can be seen that the LAeq levels generally do not fall below the project criteria until the night time period, at which time the Quarry is not approved to operate. This issue will be further considered during future monitoring events.

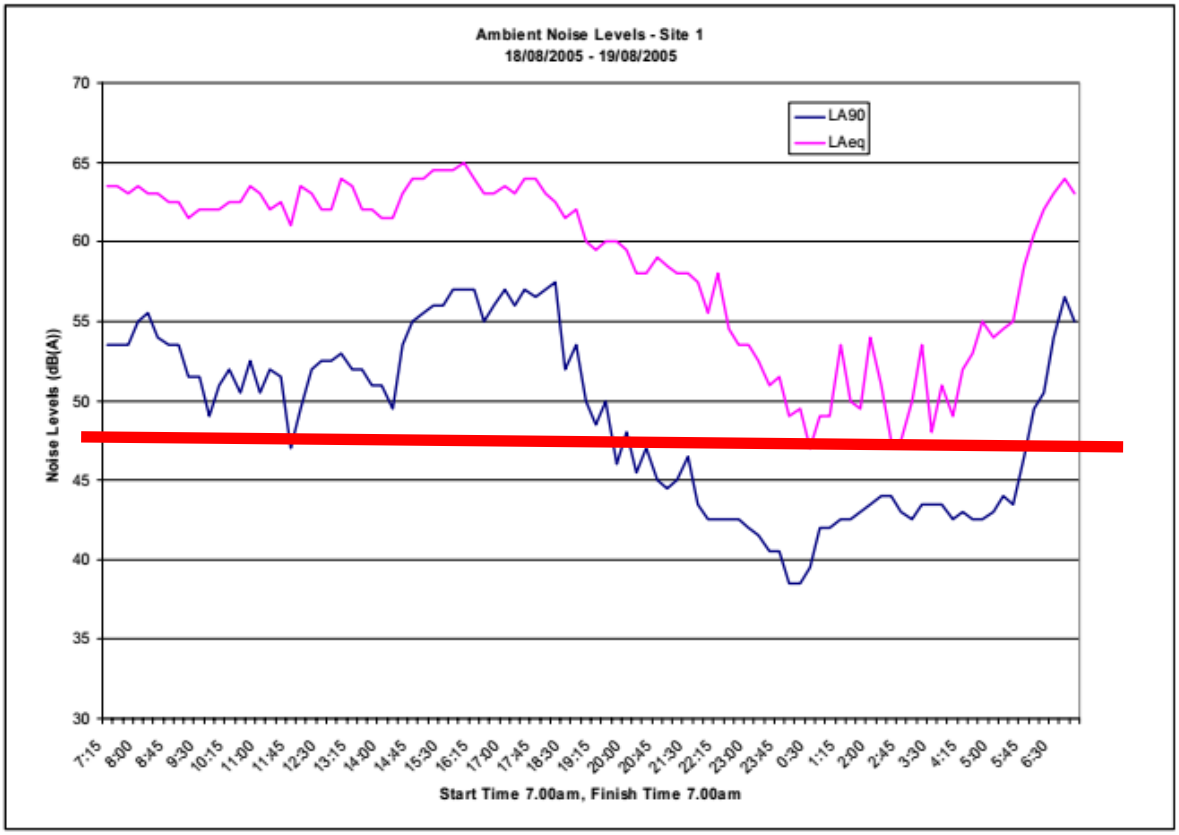
APPENDIX A PRE CONSTRUCTION TESTING

Measurements taken by Ron Rumble Pty Ltd and originally presented in Ron Rumble, (2008). Noise Assessment Report 61704- Part B.

SPECIALIST CONSULTANT STUDIES 8 - 87 **GALES-KINGSCLIFF PTY LTD**
Part 8 – Noise Assessment *Cudgen Lakes Sand Extraction Project*
Report No. 617/04



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18/08/2005 - 19/08/2005
LA90
LAeq
Noise Levels (dB(A))
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55
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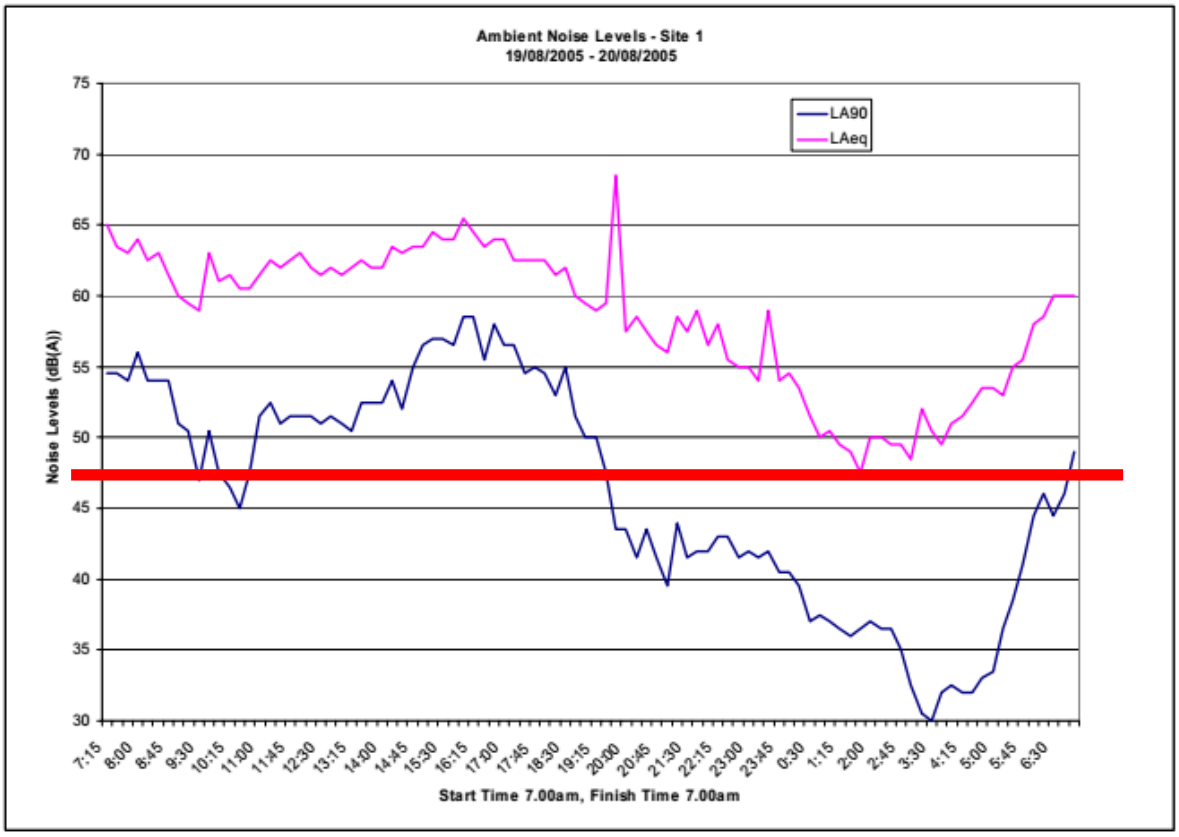
30
7:15 8:00 8:45 9:30 10:15 11:00 11:45 12:30 13:15 14:00 14:45 15:30 16:15 17:00 17:45 18:30 19:15 20:00 20:45 21:30 22:15 23:00 23:45 0:30 1:15 2:00 2:45 3:30 4:15 5:00 5:45 6:30
Start Time 7.00am, Finish Time 7.00am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LA90
LAeq
Noise Levels (dB(A))
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70
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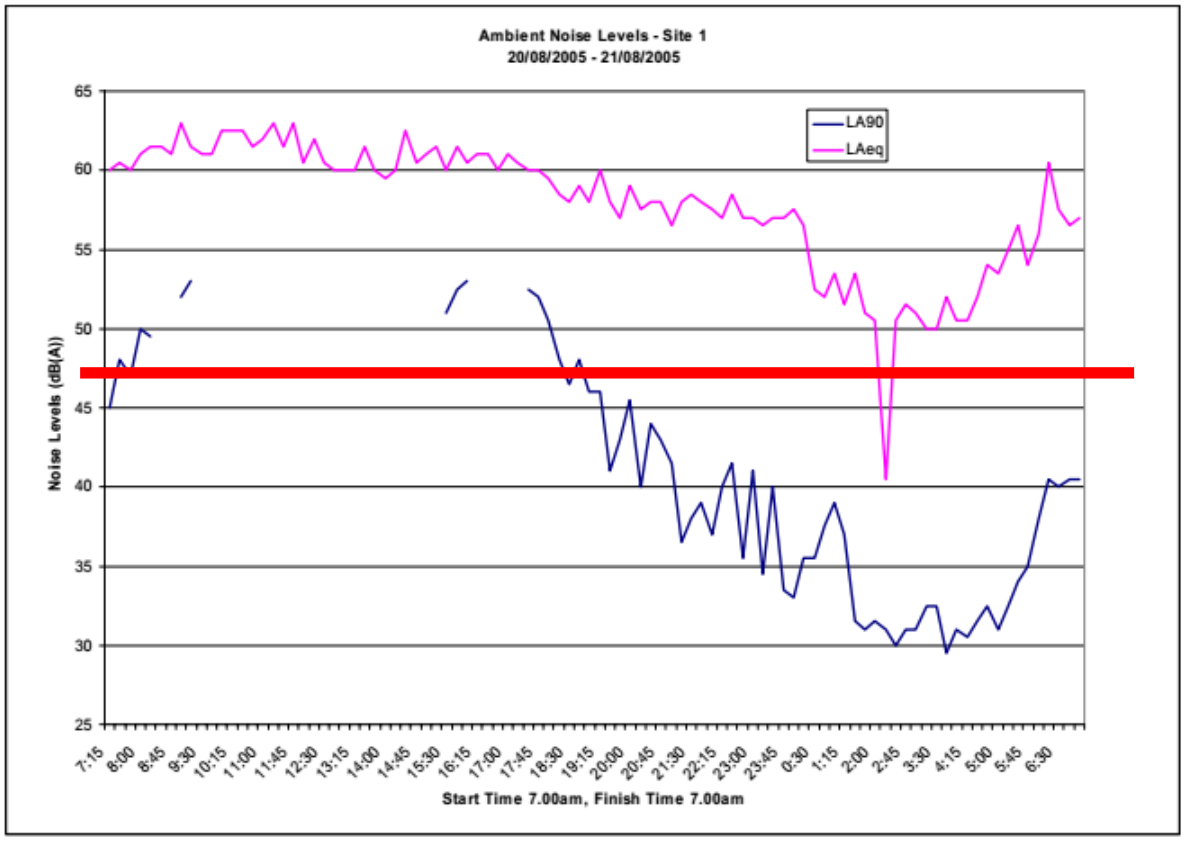
7:15 8:00 8:45 9:30 10:15 11:00 11:45 12:30 13:15 14:00 14:45 15:30 16:15 17:00 17:45 18:30 19:15 20:00 20:45 21:30 22:15 23:00 23:45 0:30 1:15 2:00 2:45 3:30 4:15 5:00 5:45 6:30
Start Time 7.00am, Finish Time 7.00am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20/08/2005 - 21/08/2005
LA90
LAeq
Noise Levels (dB(A))
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5:45
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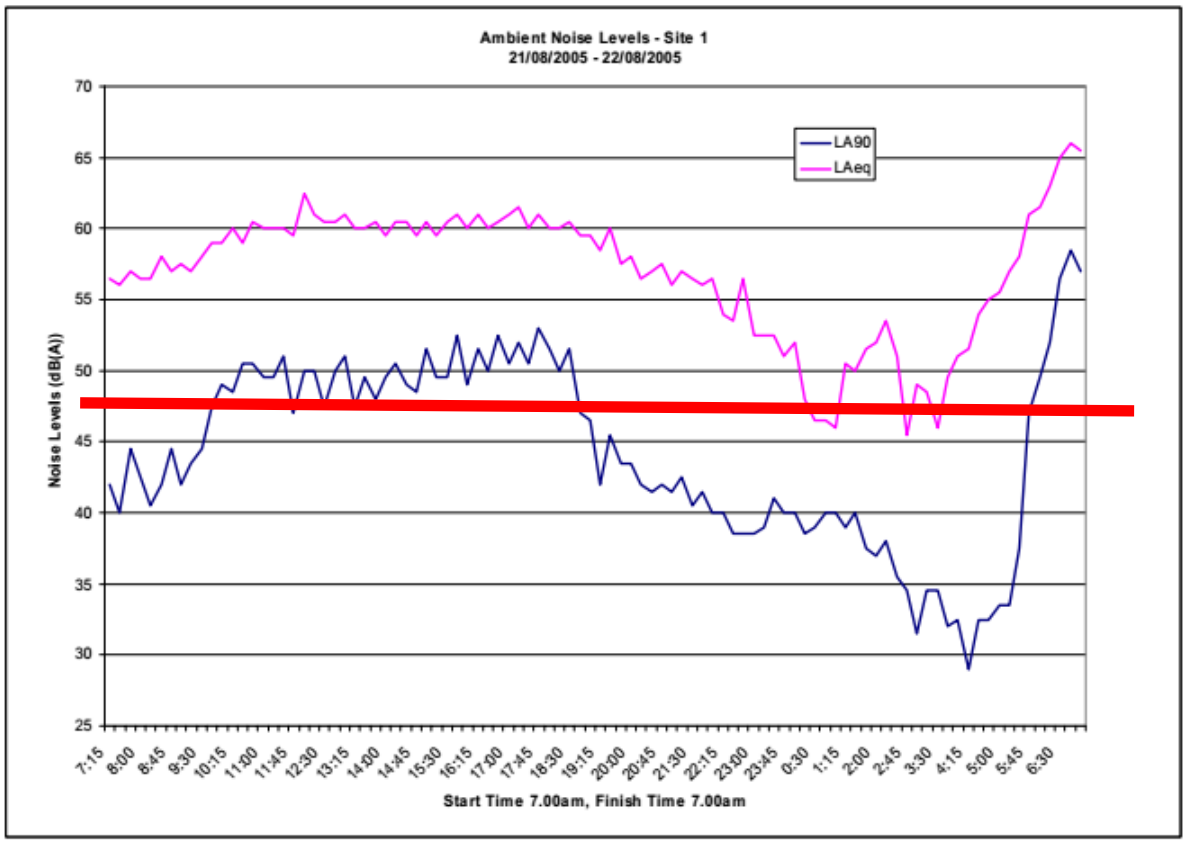
Start Time 7.00am, Finish Time 7.00am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21/08/2005 - 22/08/2005
LA90
LAeq
Noise Levels (dB(A))
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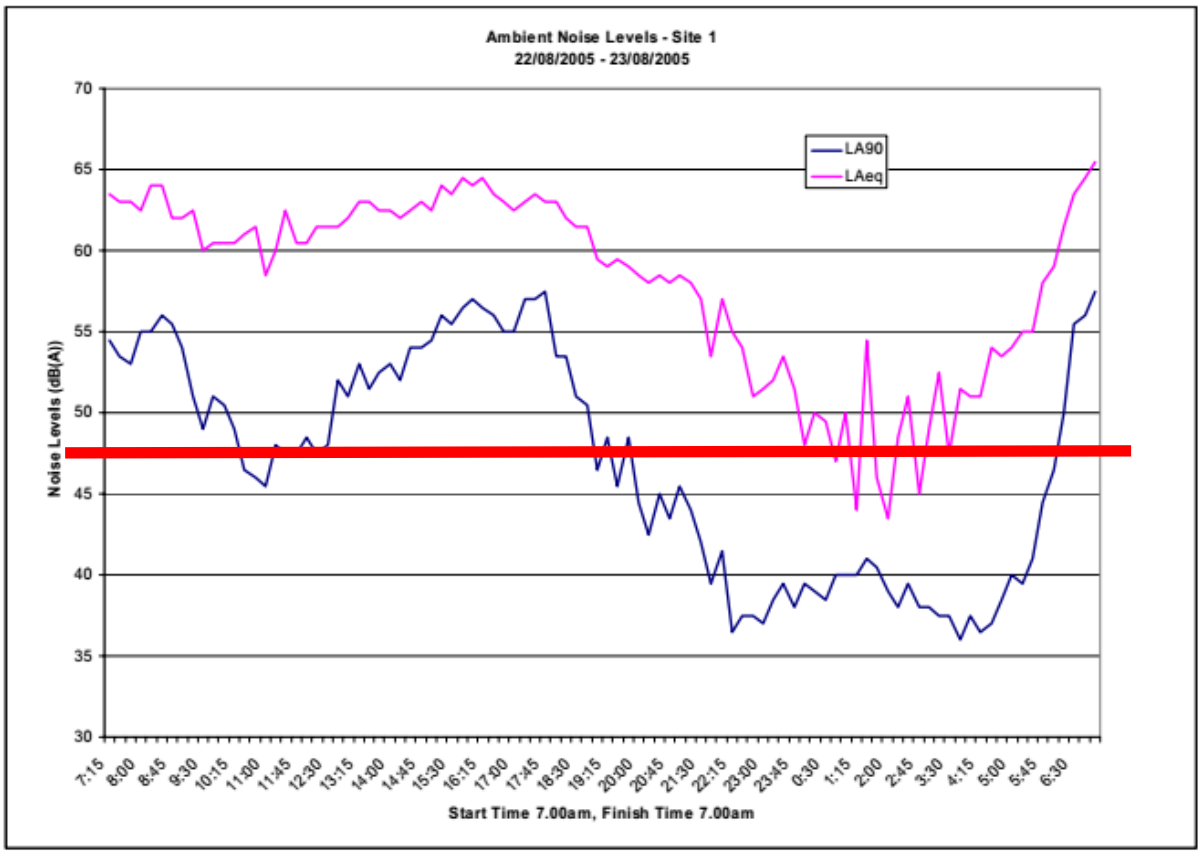
Start Time 7.00am, Finish Time 7.00am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22/08/2005 - 23/08/2005
LA90
LAeq
Noise Levels (dB(A))
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65
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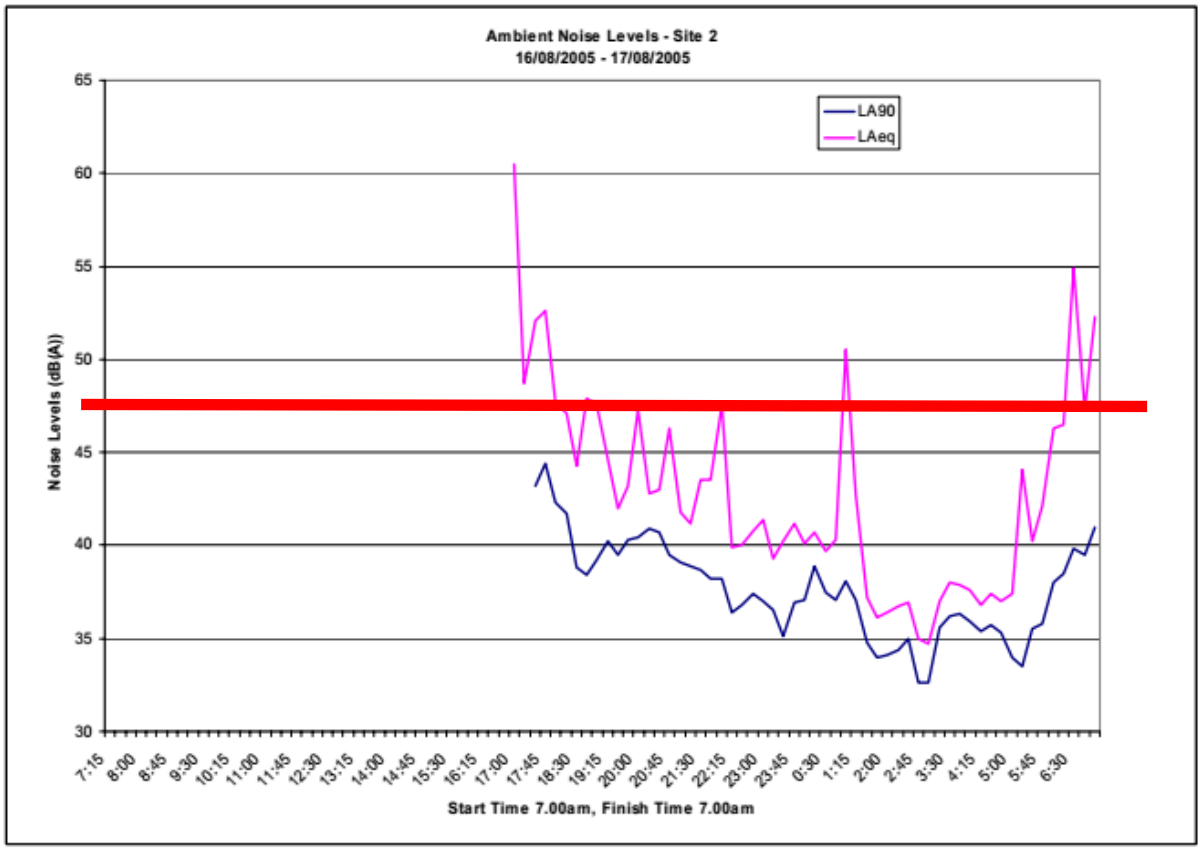
Start Time 7.00am, Finish Time 7.00am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16/08/2005 - 17/08/2005
LA90
LAeq
Noise Levels (dB(A))
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60
55
50
45
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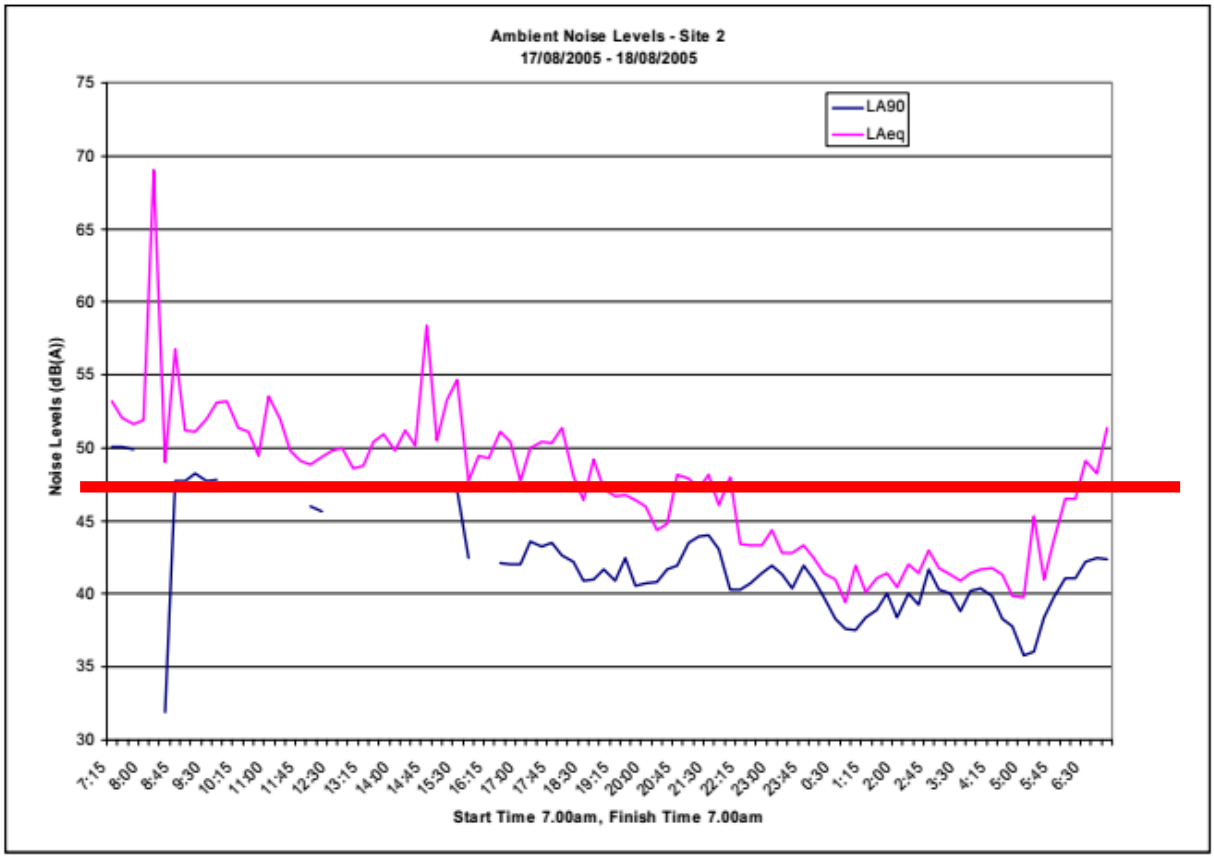
Start Time 7.00am, Finish Time 7.00am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17/08/2005 - 18/08/2005
LA90
LAeq
Noise Levels (dB(A))
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60
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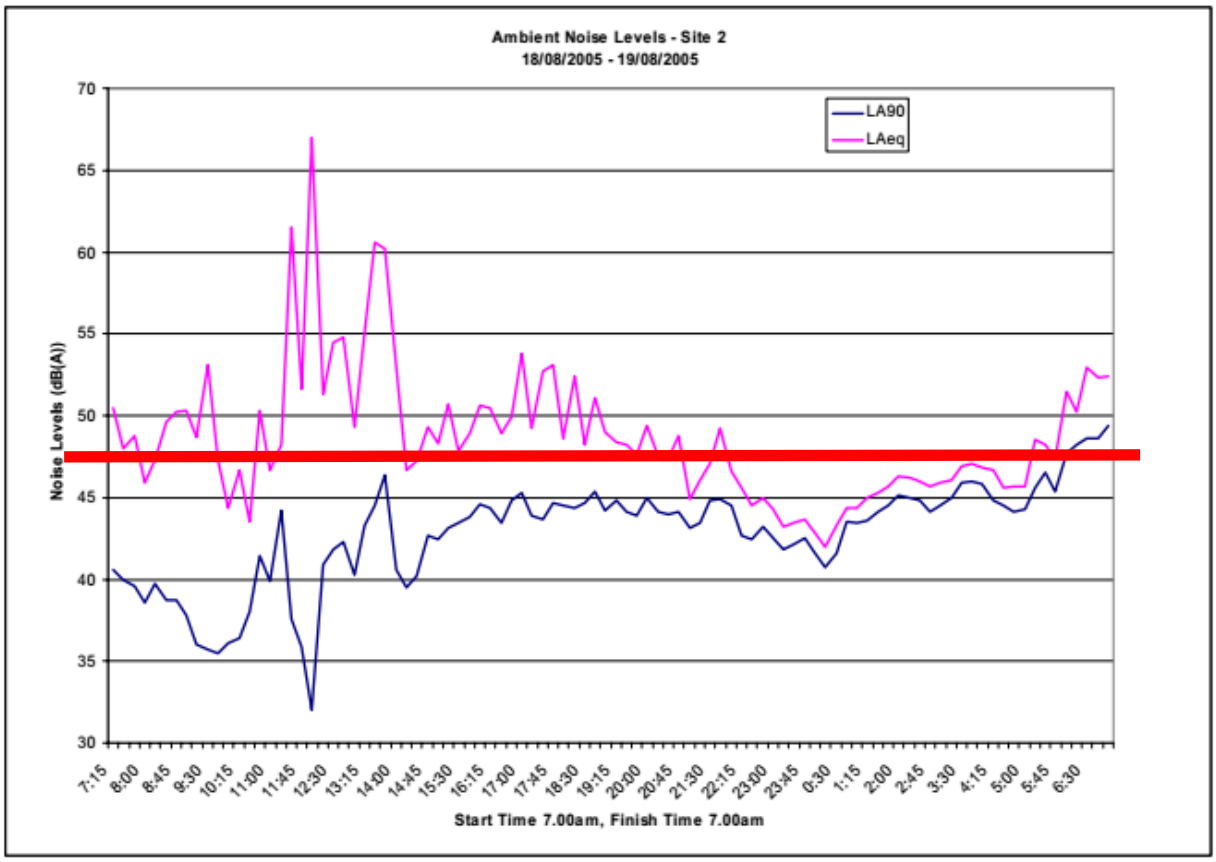
Start Time 7.00am, Finish Time 7.00am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LAeq
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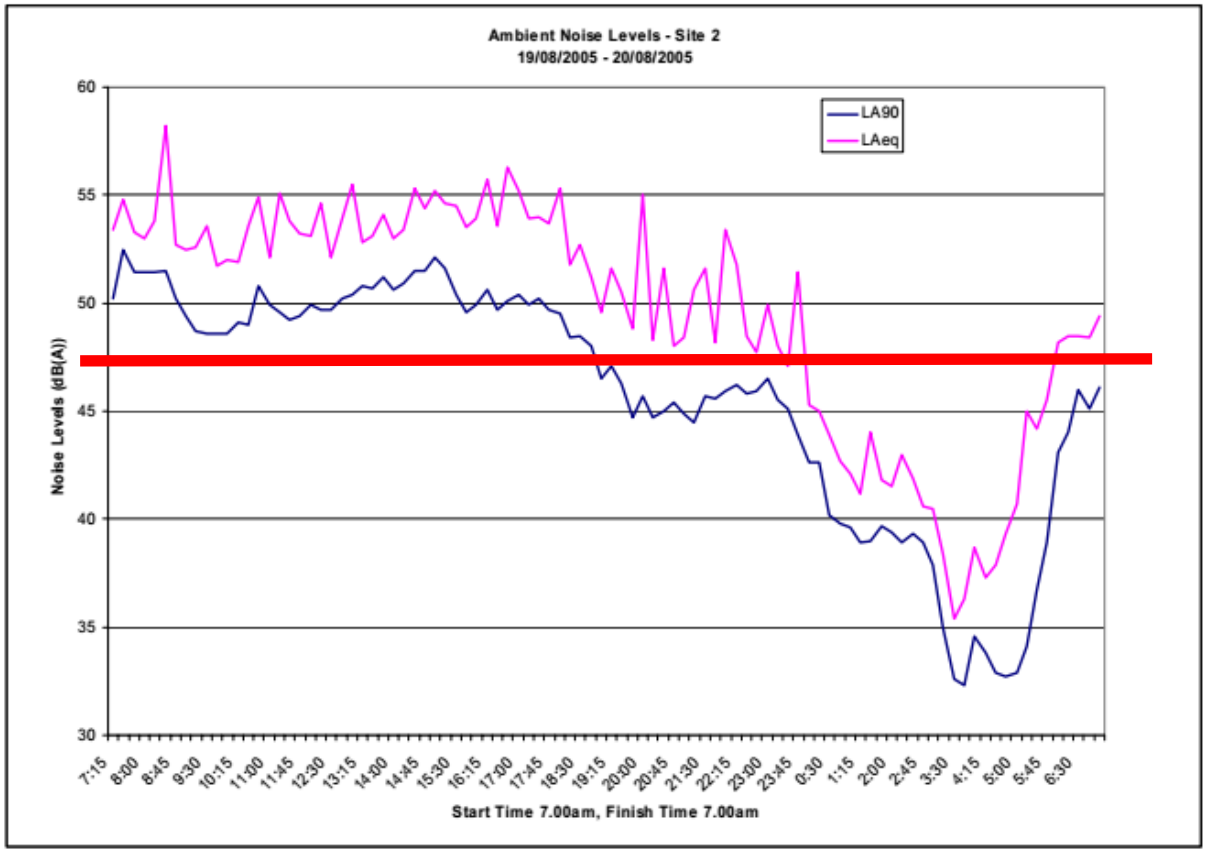
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LAeq
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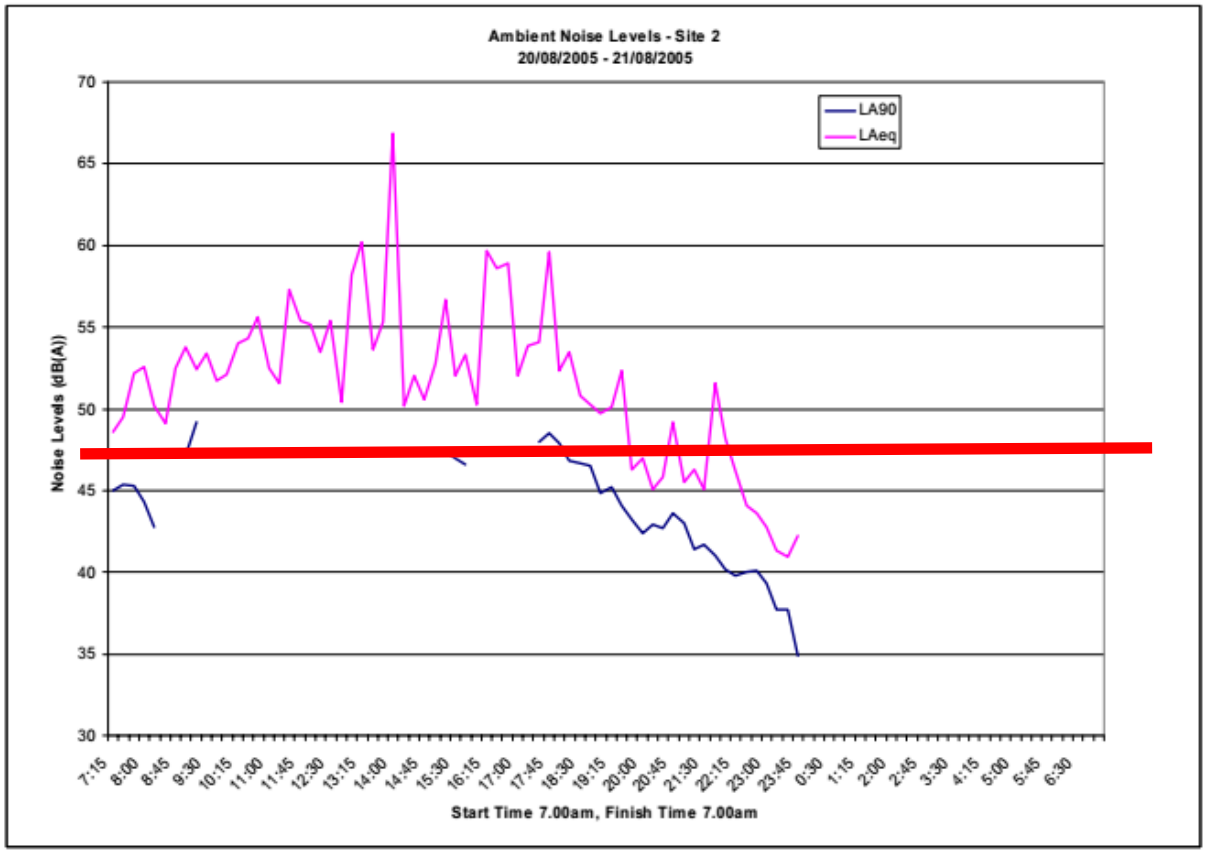
Start Time 7.00am, Finish Time 7.00am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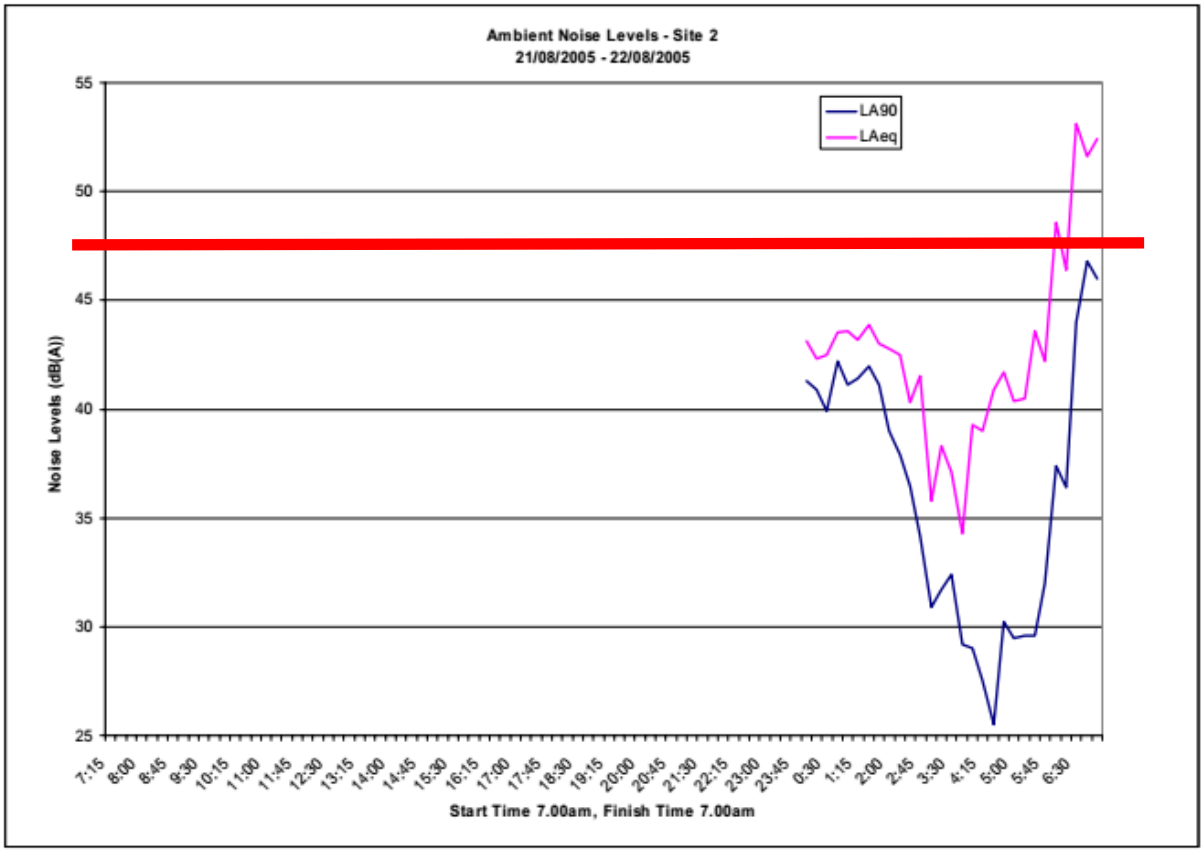
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21/08/2005 - 22/08/2005
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LAeq
Noise Levels (dB(A))
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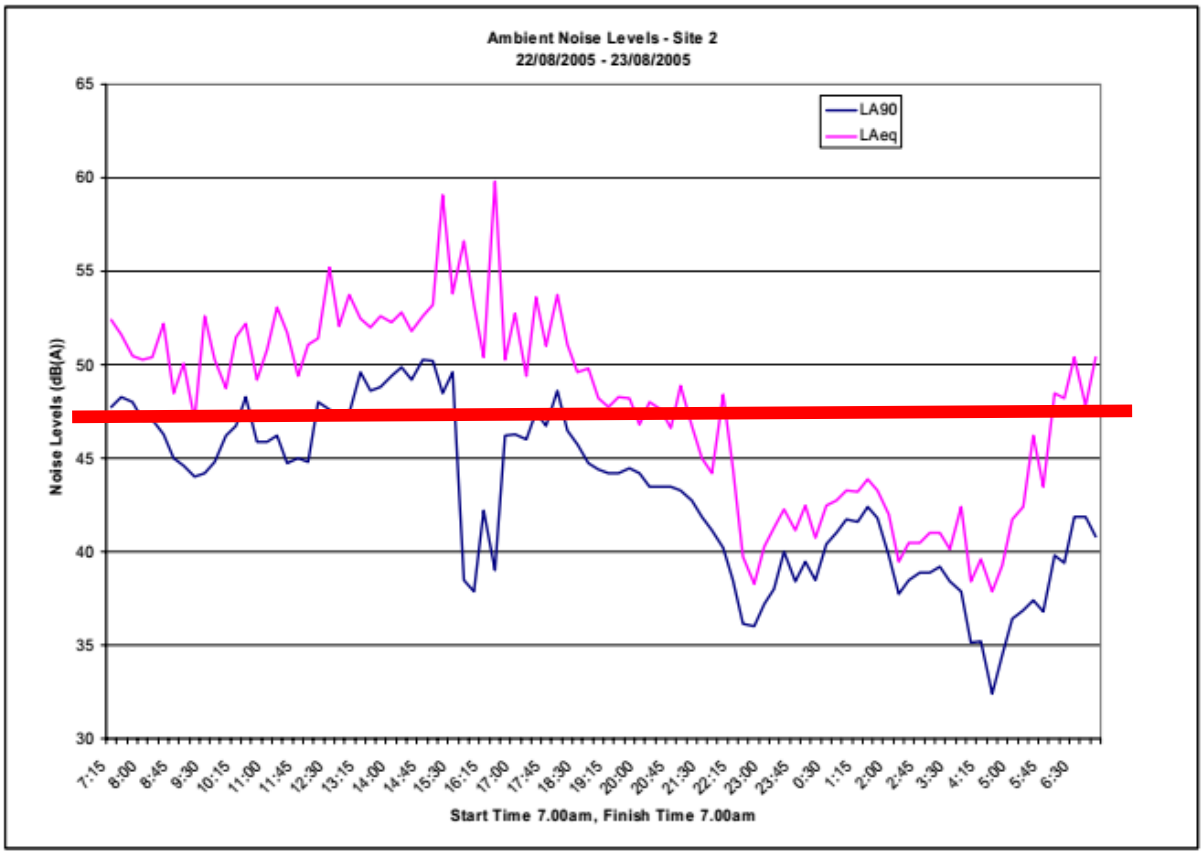
Start Time 7.00am, Finish Time 7.00am


Ambient Noise Levels - Site 2
22/08/2005 - 23/08/2005
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Noise Levels (dB(A))
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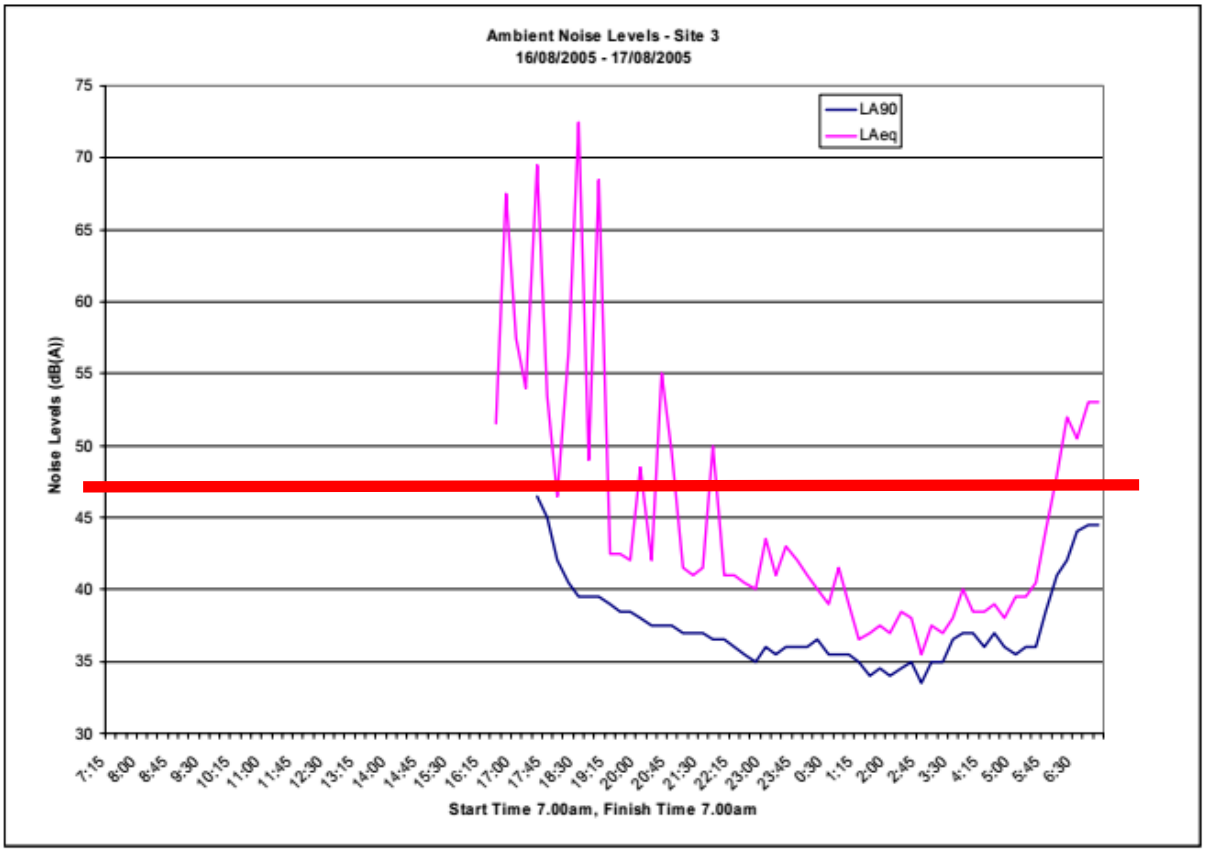
Ambient Noise Levels - Site 3
16/08/2005 - 17/08/2005
LA90
LAeq
Noise Levels (dB(A))
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7:15 8:00 8:45 9:30 10:15 11:00 11:45 12:30 13:15 14:00 14:45 15:30 16:15 17:00 17:45 18:30 19:15 20:00 20:45 21:30 22:15 23:00 23:45 0:30 1:15 2:00 2:45 3:30 4:15 5:00 5:45 6:30
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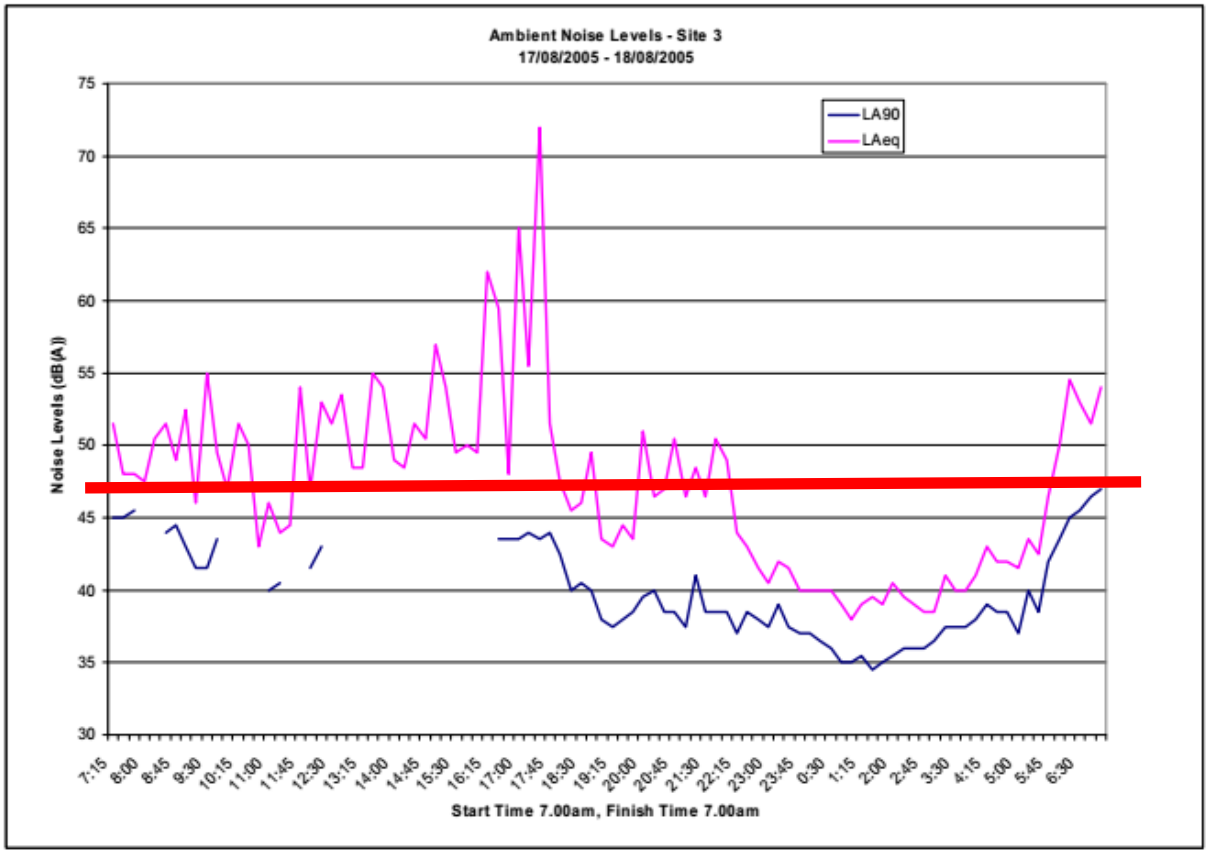
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17/08/2005 - 18/08/2005
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LAeq
Noise Levels (dB(A))
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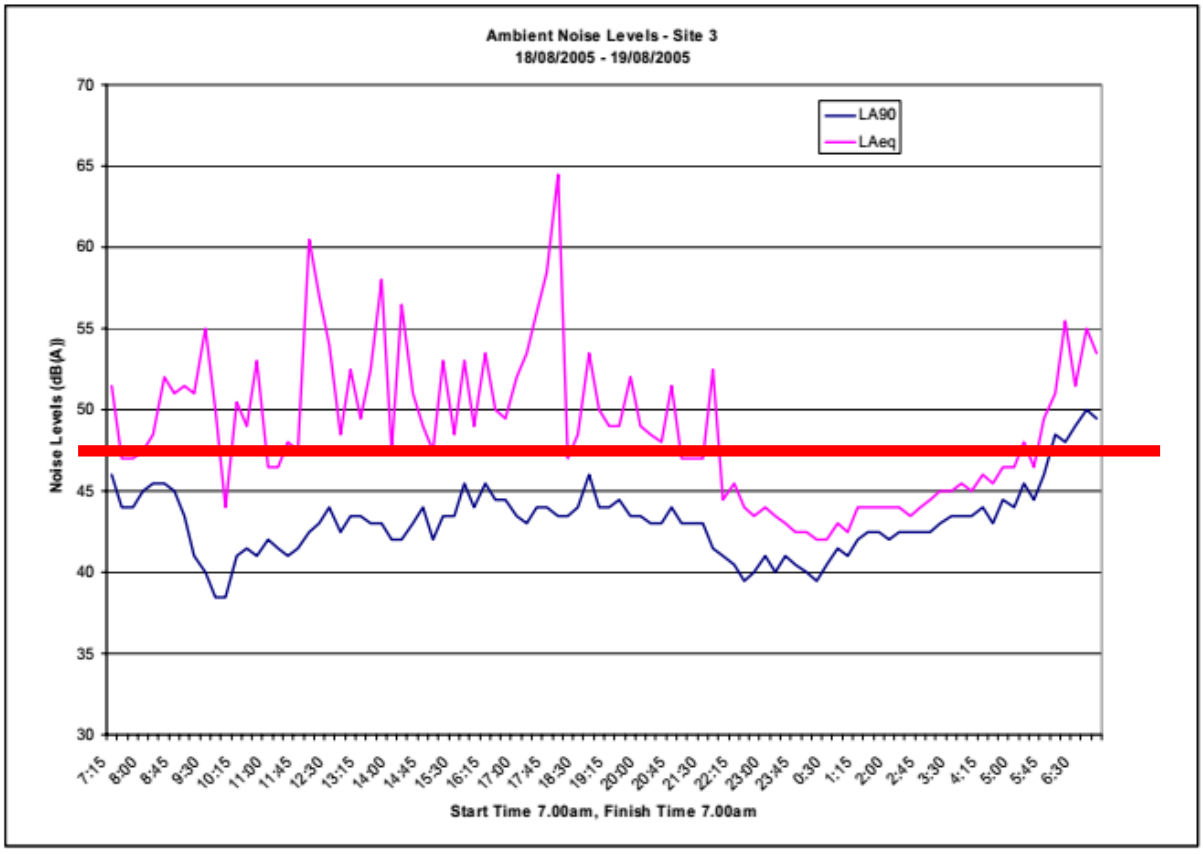
Ambient Noise Levels - Site 3
18/08/2005 - 19/08/2005
LA90
LAeq
Noise Levels (dB(A))
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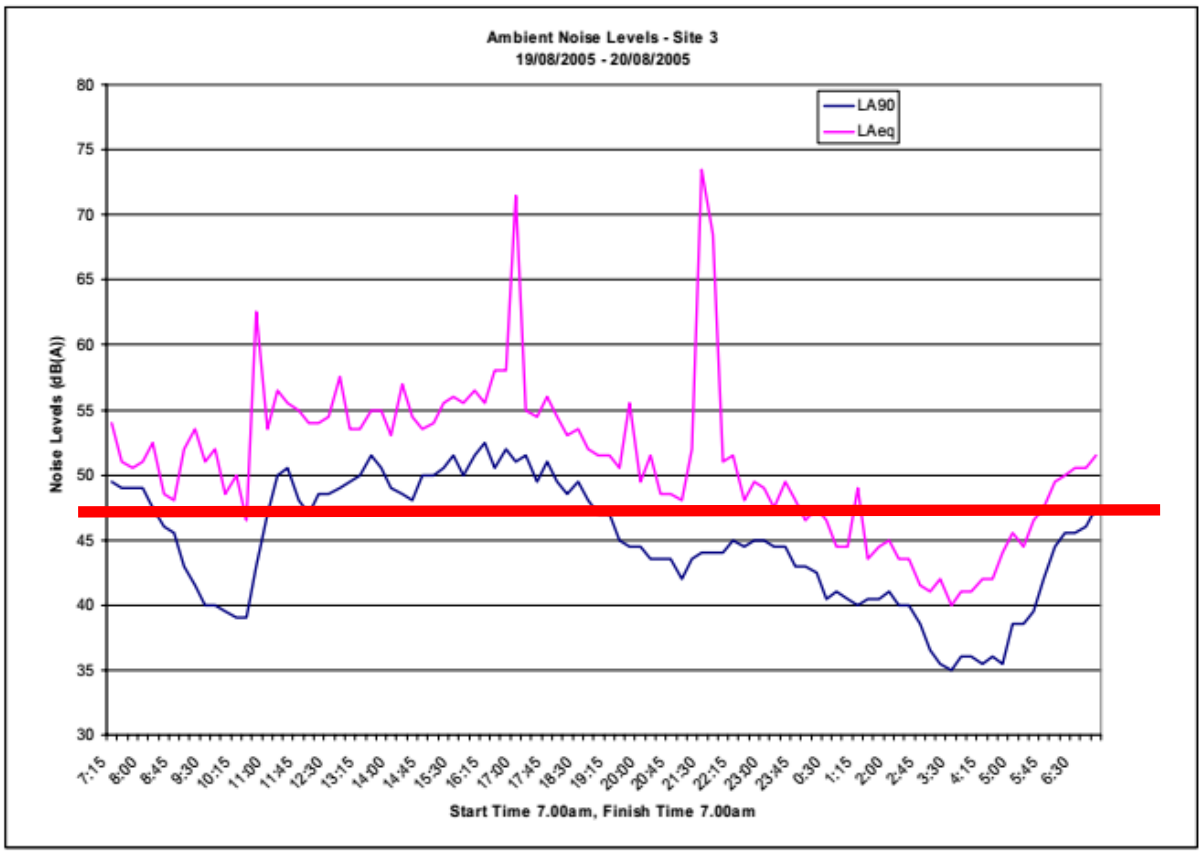
1:15
2:00
2:45
3:30
4:15
5:00
5:45
6:30
Start Time 7.00am, Finish Time 7.00am


Ambient Noise Levels - Site 3
19/08/2005 - 20/08/2005
LA90
LAeq
Noise Levels (dB(A))
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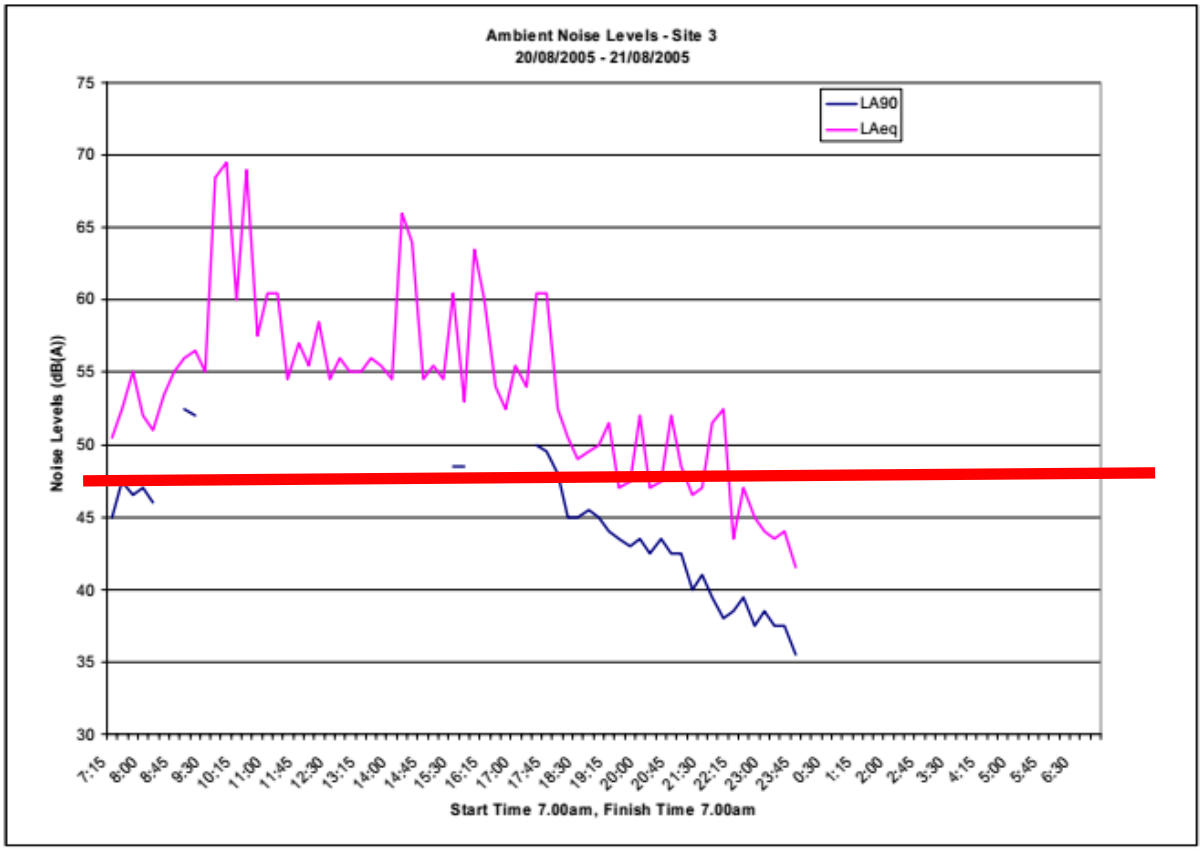
Start Time 7.00am, Finish Time 7.00am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20/08/2005 - 21/08/2005
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Noise Levels (dB(A))
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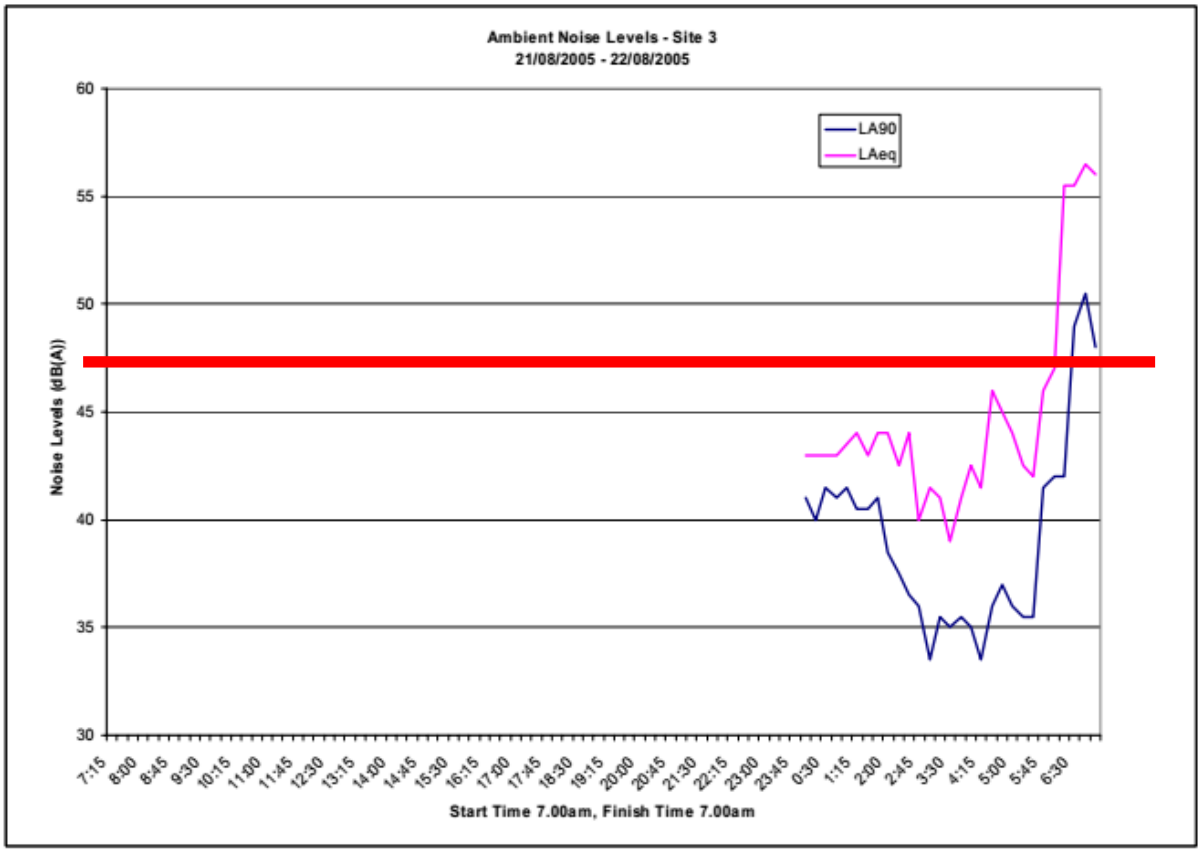
Ambient Noise Levels - Site 3
21/08/2005 - 22/08/2005
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LAeq
Noise Levels (dB(A))
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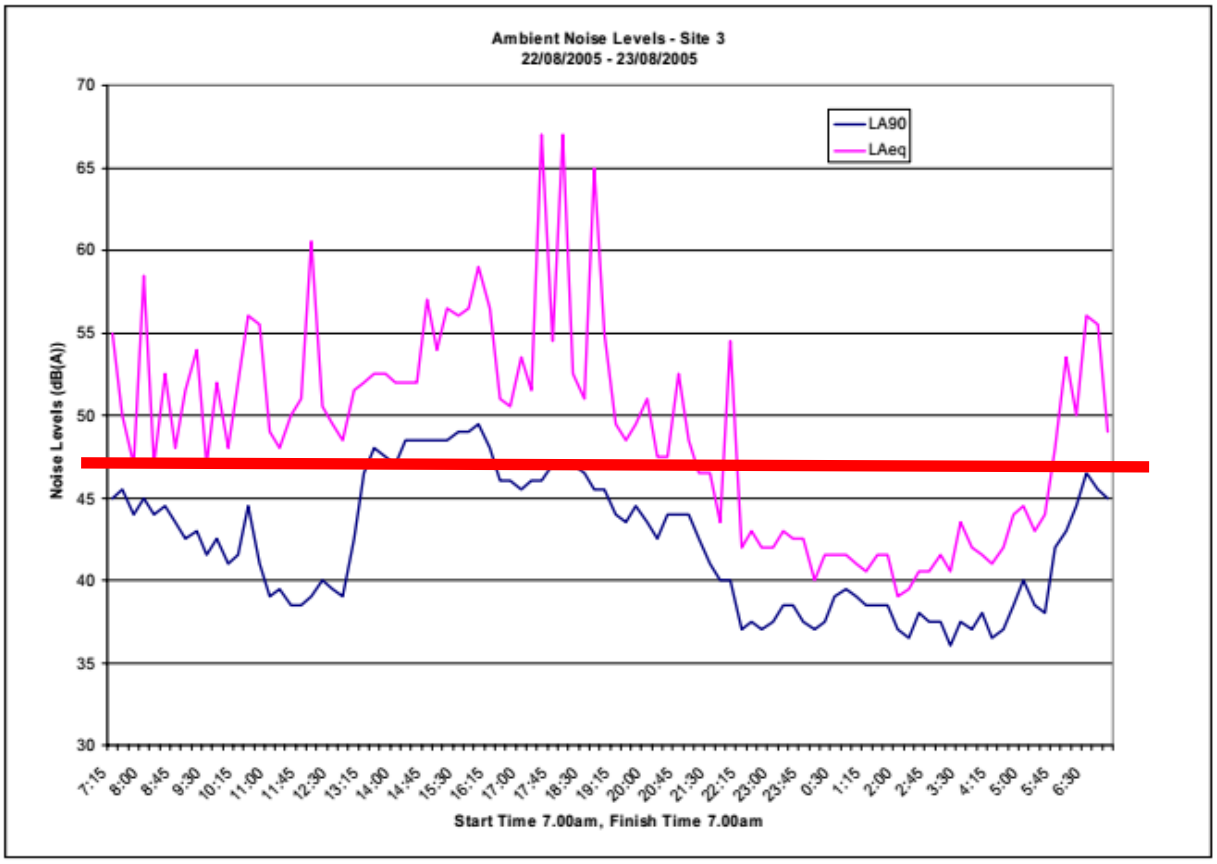
Start Time 7.00am, Finish Time 7.00am


Ambient Noise Levels - Site 3
22/08/2005 - 23/08/2005
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LAeq
Noise Levels (dB(A))
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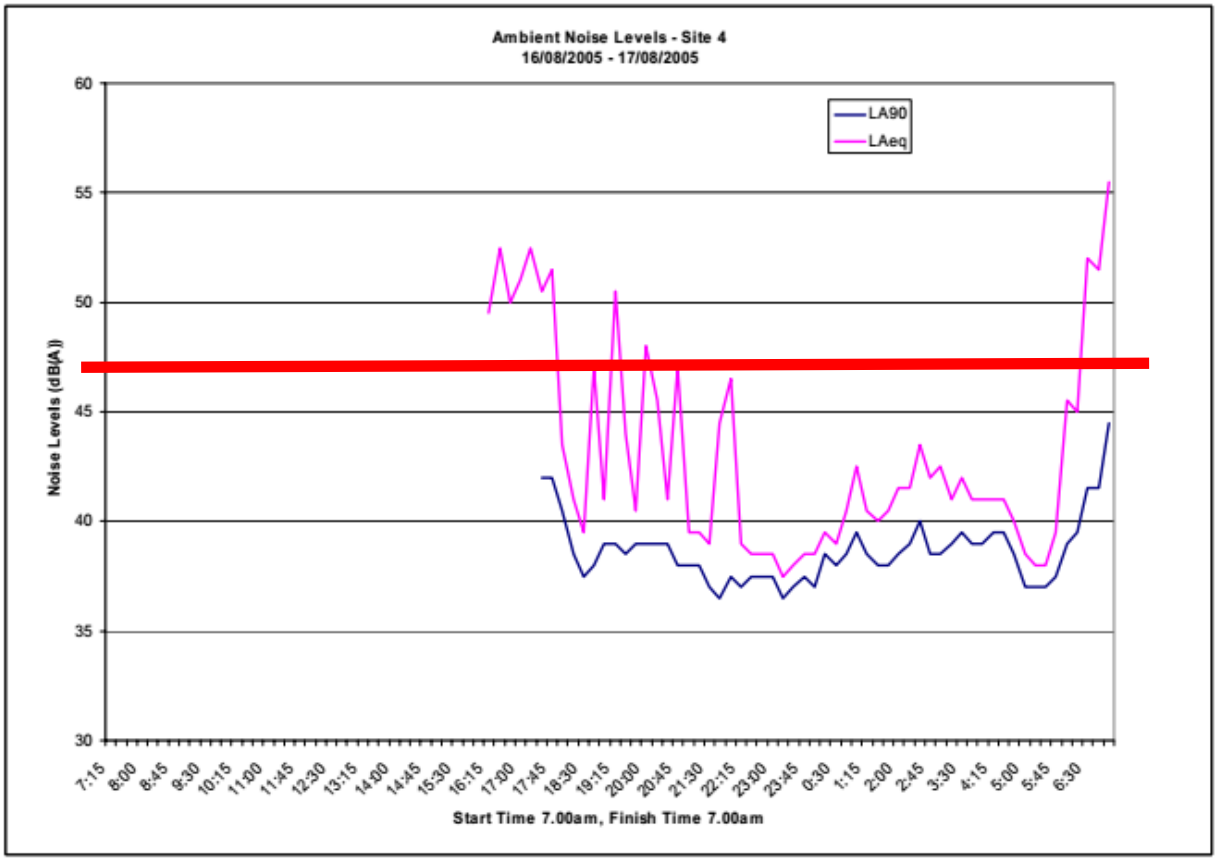
Start Time 7.00am, Finish Time 7.00am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16/08/2005 - 17/08/2005
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LAeq
Noise Levels (dB(A))
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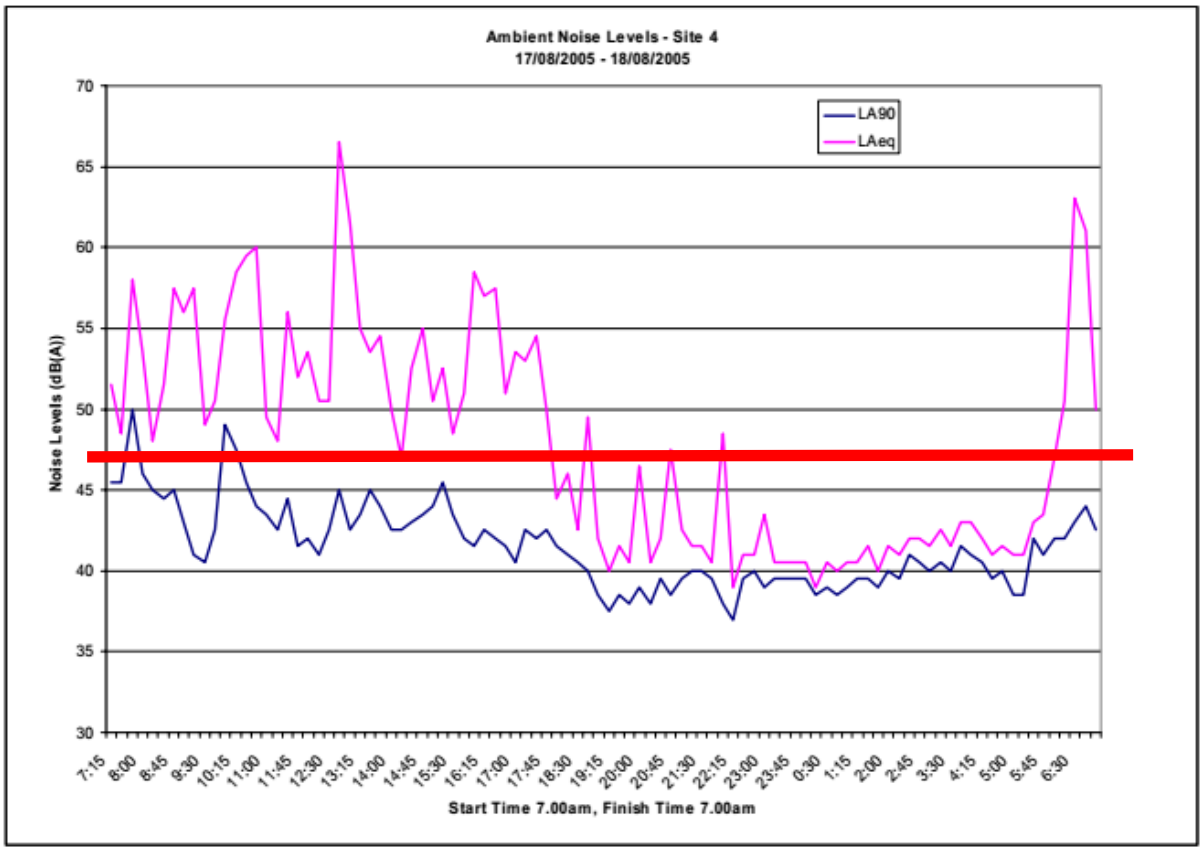
Start Time 7.00am, Finish Time 7.00am


Ambient Noise Levels - Site 4
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Noise Levels (dB(A))
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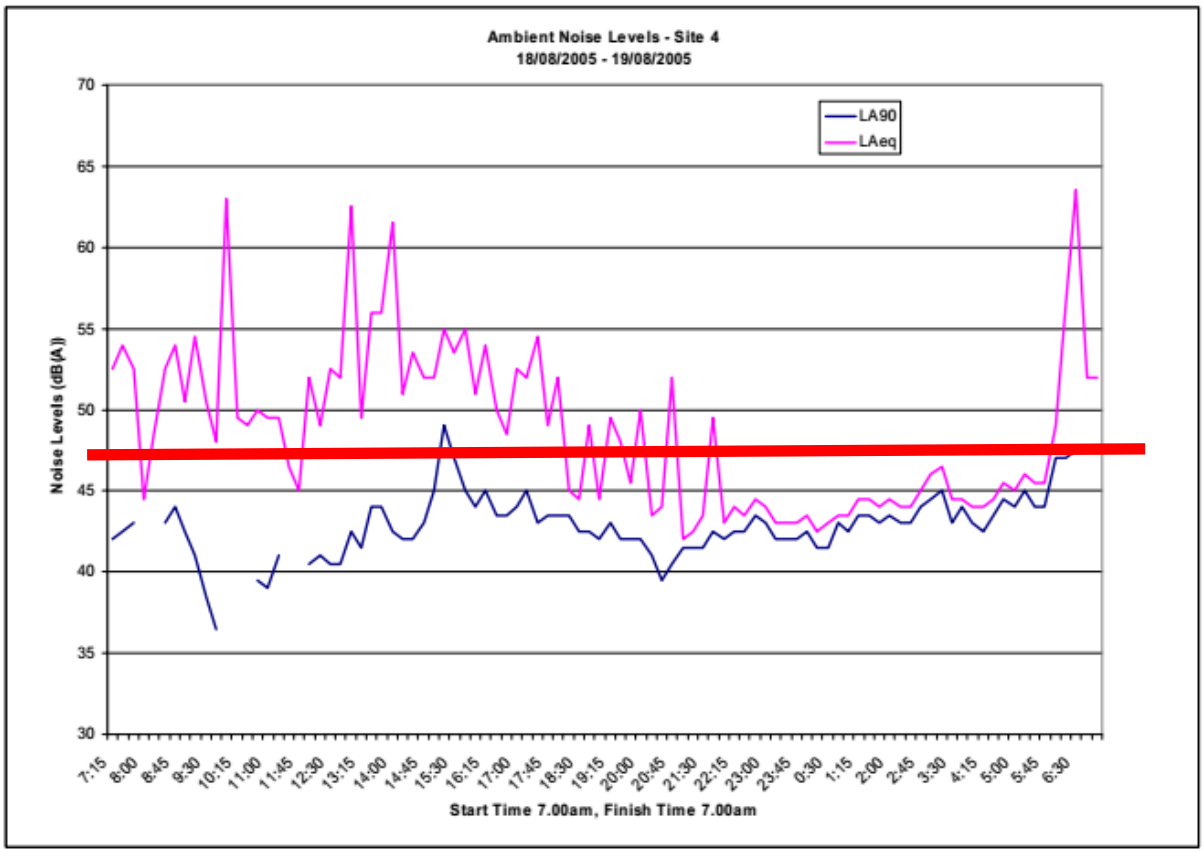
Start Time 7.00am, Finish Time 7.00am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18/08/2005 - 19/08/2005
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LAeq
Noise Levels (dB(A))
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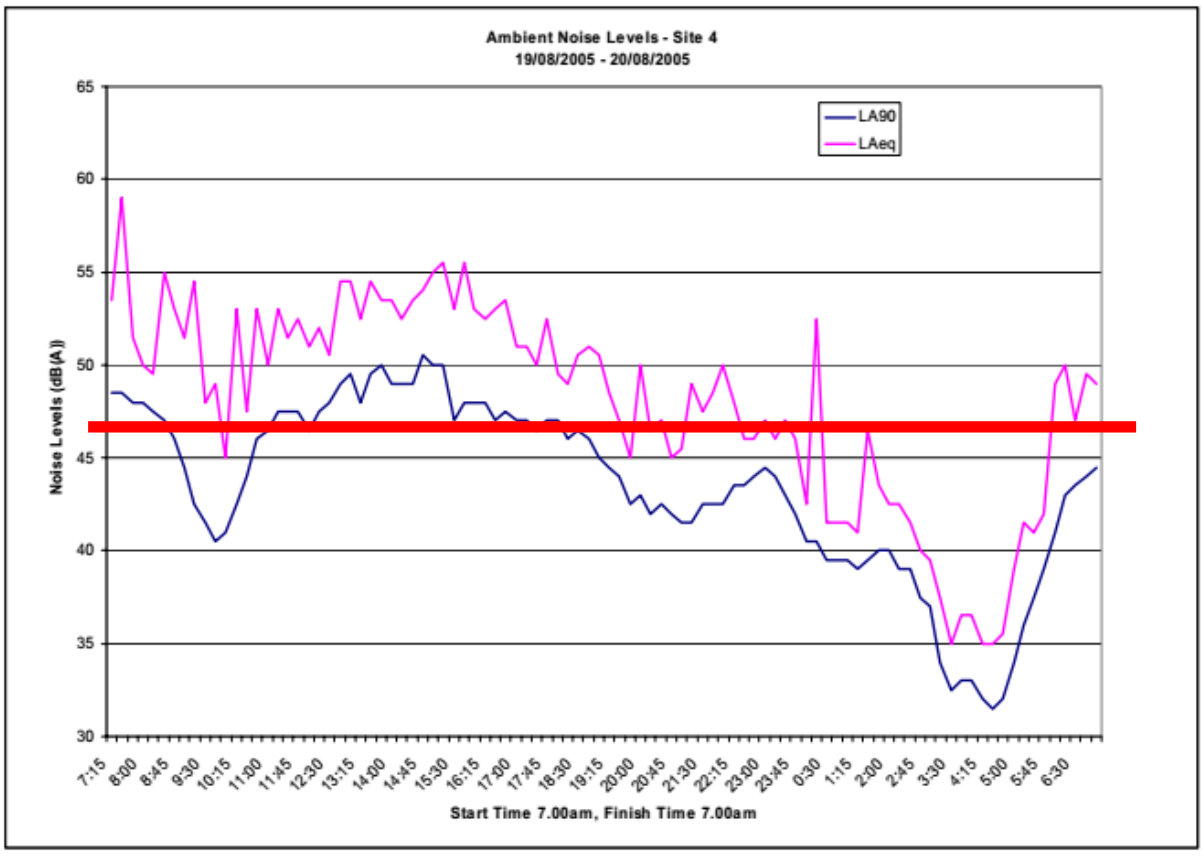
Start Time 7.00am, Finish Time 7.00am


Ambient Noise Levels - Site 4
19/08/2005 - 20/08/2005
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LAeq
Noise Levels (dB(A))
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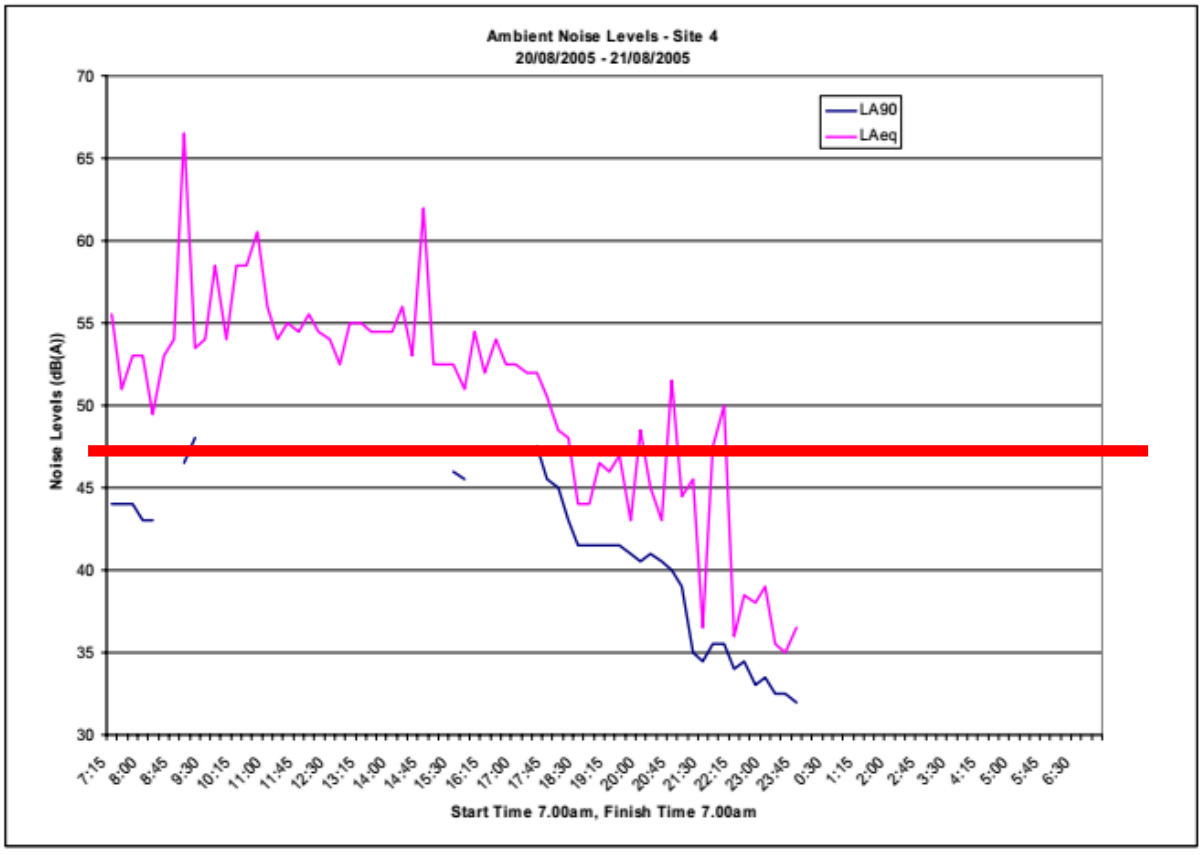
Start Time 7.00am, Finish Time 7.00am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20/08/2005 - 21/08/2005
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Noise Levels (dB(A))
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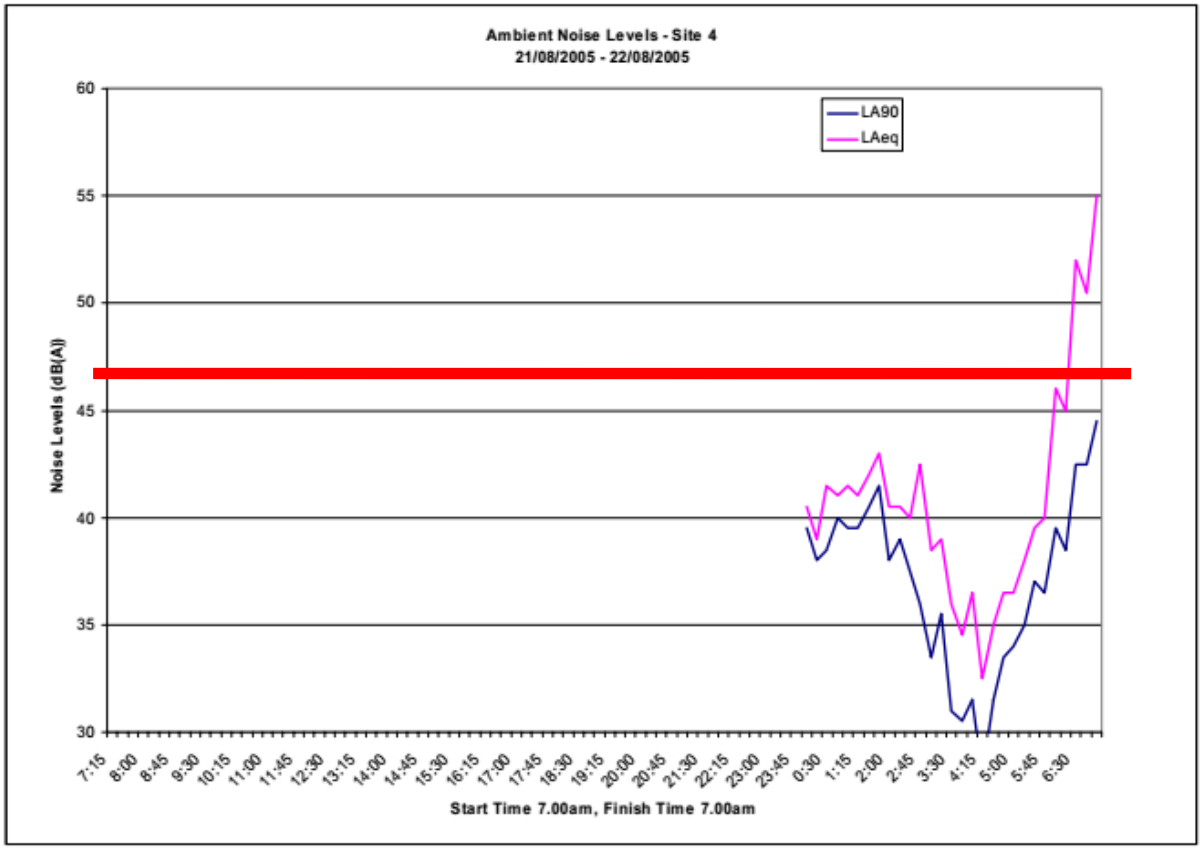
Start Time 7.00am, Finish Time 7.00am


Ambient Noise Levels - Site 4
21/08/2005 - 22/08/2005
LA90
LAeq
Noise Levels (dB(A))
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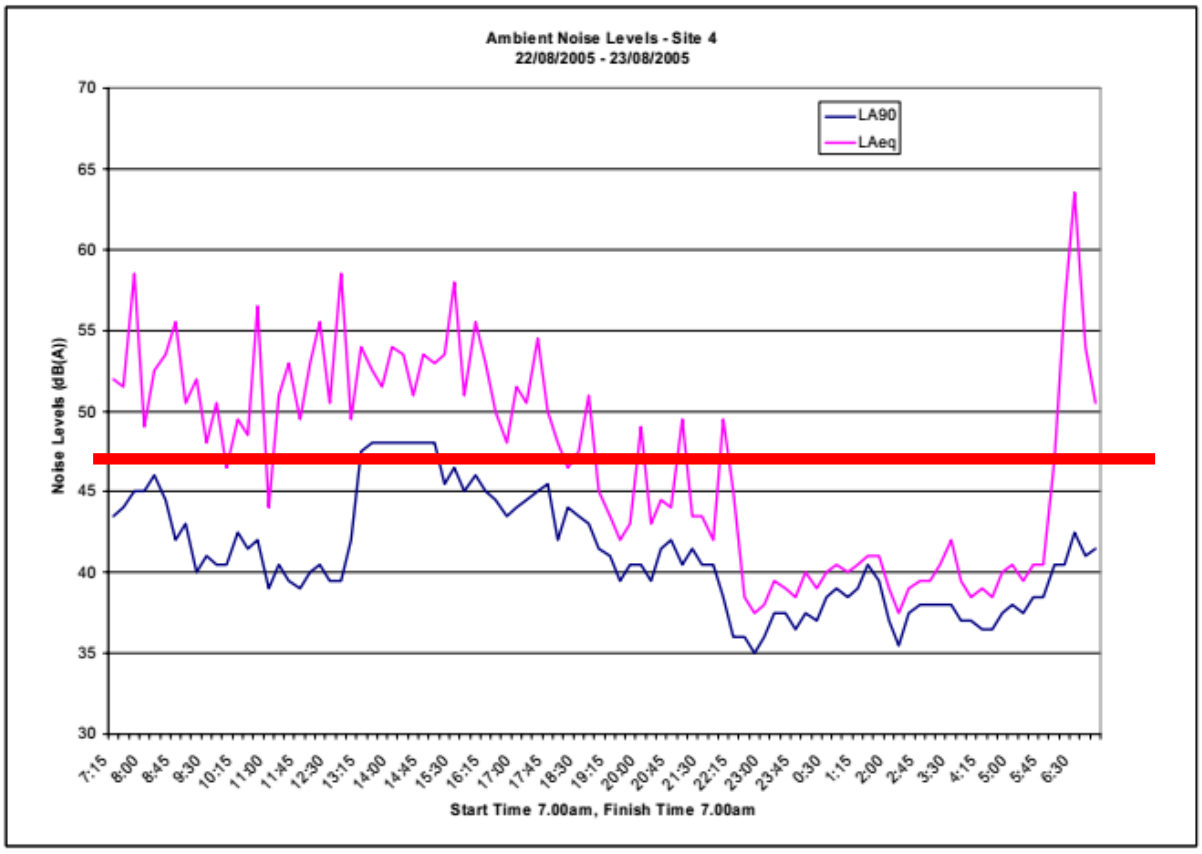
Start Time 7.00am, Finish Time 7.00am


Ambient Noise Levels - Site 4
22/08/2005 - 23/08/2005
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LAeq
Noise Levels (dB(A))
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Start Time 7.00am, Finish Time 7.00am

Appendix 3

Air Quality Monitoring Results

(Total No. of pages including blank pages = 3)

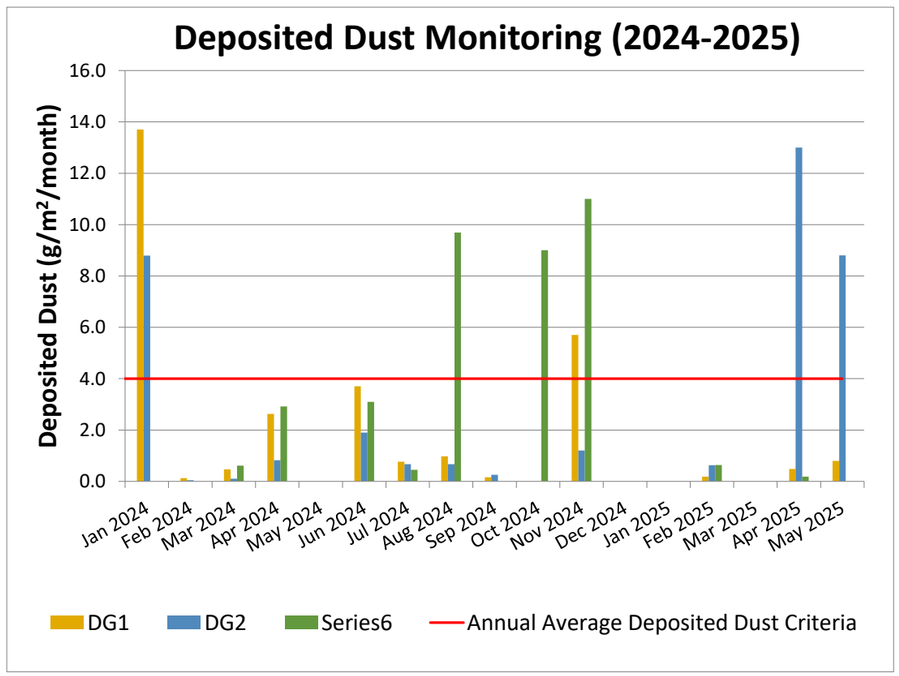
Cudgen Lakes Sand Quarry

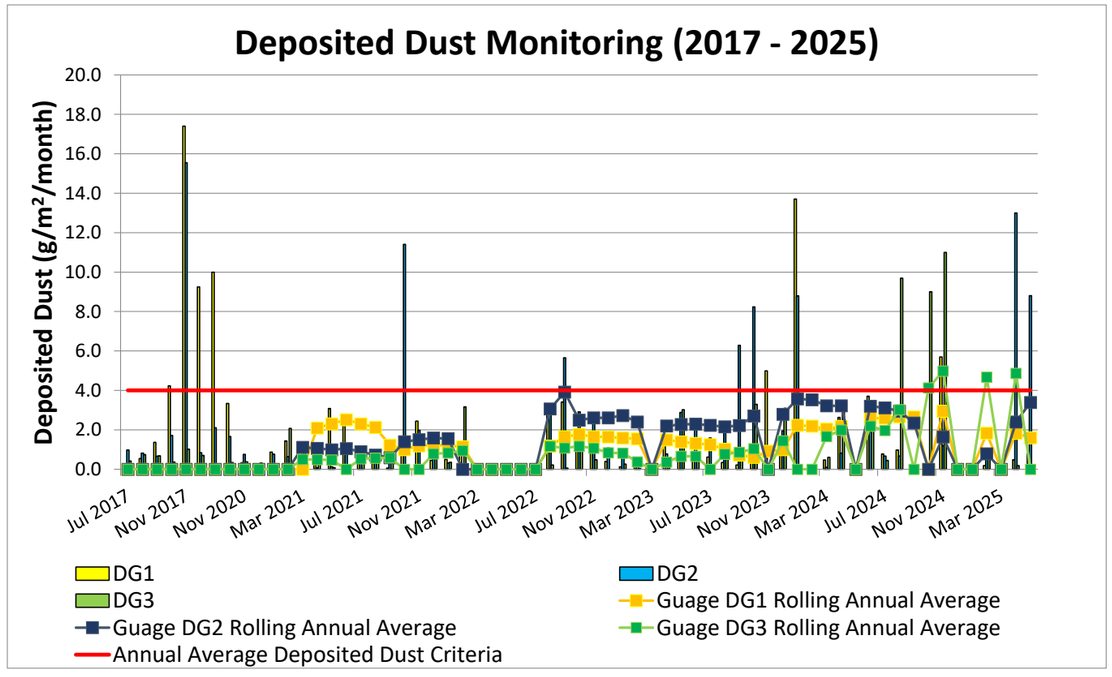
Deposited Dust Monitoring

Samples On	Samples Off	Month	DG1		DG2		DG3		Annual Criteria	Comments
			Insoluble Matter	Rolling Annual Average	Insoluble Matter	Rolling Annual Average	Insoluble Matter	Rolling Annual Average		
11/07/2017	10/08/2017	Jul-17	0.28	ID	0.98	ID	0.42	ID	4	
10/08/2017	9/09/2017	Aug-17	0.54	ID	0.82	ID	0.74	ID	4	DG1 - cloudy/organic matter.
9/09/2017	9/10/2017	Sep-17	1.36	ID	0.66	ID	0.68	ID	4	
9/10/2017	8/11/2017	Oct-17	4.23	ID	1.71	ID	0.36	ID	4	DG1 - cloudy/organic matter.
8/11/2017	9/12/2017	Nov-17	17.4	ID	15.55	ID	1.02	ID	4	DG1 - cloudy/organic matter. DG2 - green/organic matter. DG3 - slightly green/funnel missing. Only dredging undertaken at Quarry (i.e. no dust generating activities) - earthworks activiites occuring southeast of Quarry.
9/12/2017	9/01/2018	Dec-17	9.25	ID	0.84	ID	0.7	ID	4	DG1 - cloudy/organic matter. DG2 - insects. Only dredging undertaken at Quarry (i.e. no dust generating activities) - earthworks activiites occuring southeast of Quarry.
9/01/2018	9/02/2018	Jan-18	3.56	ID	0.39	ID	1.04	ID	4	DG1 - cloudy/organic matter. DG2 - organic matter. Only dredging undertaken at Quarry (i.e. no dust generating activities) - earthworks activiites occuring southeast of Quarry.
14/04/2020	14/05/2020	Apr-20	13.35	ID	0.64	ID	0.86	ID	4	DG1 - Insects, seeds, two frogs (deceased & semi mature). DG2 - Bird droppings, insects, seeds. DG3 - Insects.
14/05/2020	12/06/2020	May-20	0.85	ID	1.00	ID	0.35	ID	4	DG1 - Grass & seeds, live tree frog removed. DG2 - Ants, seeds, relatively clear. DG3 - Grass & seeds, ants, relatively clear.
12/06/2020	13/07/2020	Jun-20	0.21	ID	0.10	ID	0.13	ID	4	DG1 - Bee, seeds, bird droppings on funnel. DG2 - Insects, seeds, feather. DG3 - Insects, seeds.
13/07/2020	13/08/2020	Jul-20	2.66	ID	2.11	ID	0.17	ID	4	DG1 - Film on surface, ants, seeds. DG2 - Film on surface, ants, seeds. DG3 - Clear, few seeds, few insects.
13/08/2020	11/09/2020	Aug-20	2.6	ID	2.70	ID	0.40	ID	4	DG1 - Bird poo, algae, milky, seeds. DG2 - Seeds, milky. DG3 - Clear, algae, fly.
11/09/2020	13/10/2020	Sep-20	10	ID	2.10	ID	0.20	ID	4	DG1 - Dark grey/black colour, dead frog, bugs, bettles, flies, grass seeds. DG2 - Bird poo, spider, grass seeds, milky colour. DG3 - Clear, spider.
13/10/2020	10/11/2020	Oct-20	3.34	ID	1.66	ID	0.34	ID	4	DG1 - Insects, grass seeds, algae?, water is brown. DG2 - 20 bettles, bird poos, insects, grass seed, water is clear. DG3 - Bettle, insects, grass seeds, algae, water is clear.
10/11/2020	10/12/2020	Nov-20	0.33	ID	0.75	ID	0.37	ID	4	All sites - insects, grass seed, clear.
1/12/2020	11/01/2021	Dec-21	0.02	ID	0.04	ID	0.32	ID	4	All sites - insects, grass seeds. DG2 - Analysed sample volume (0.35L) reduced due to breakage.
11/01/2021	8/02/2021	Jan-21	0.87	ID	0.76	ID	0.00	ID	4	DG1 & DG2 - insects and grass seeds. DG3 - grass seeds.
8/02/2021	9/03/2021	Feb-21	1.44	ID	0.64	ID	2.07	ID	4	All sites - insects, grass seeds, clear.
9/03/2021	9/04/2021	Mar-21	NS	NS	0.83	1.11	0.80	0.50	4	DG2 & DG3 - insects, grass seeds, clear. DG1 sample broken during collection.
9/04/2021	10/05/2021	Apr-21	0.74	2.10	0.07	1.06	0.69	0.49	4	DG1 - grass seeds, insects, bird poo, cloudy. DG2 - grass seeds, ants. DG3 - Bird poo, grass seeds, slightly cloudy.
10/05/2021	7/06/2021	May-21	3.08	2.30	0.12	0.99	0.08	0.46	4	DG1 - insects, grass seeds, algae, cloudy. DG2 - grass seeds, insects, clear. DG3 -
7/06/2021	7/07/2021	Jun-21	2.62	2.52	0.75	1.04	NS	NS	4	DG1 - grass seeds, insects, clear. DG2 - grass seeds, insects, clear. DG3 - grass seeds, bird poo, insects, algae, clear.
7/07/2021	6/08/2021	Jul-21	0.28	2.30	0.29	0.89	0.58	0.53	4	DG1 - grass, insects, clear. DG2 - grass, insects, clear. DG3 - grass, insects, bird droppings.
6/08/2021	6/09/2021	Aug-21	0.60	2.12	0.59	0.72	0.76	0.56	4	DG1 - grass seeds, insects, clear. DG2 - grass seeds, clear. DG3 - grass seeds, insects, clear.
6/09/2021	8/10/2021	Sep-21	0.06	1.22	0.55	0.59	0.45	0.59	4	All- ants
8/10/2021	9/11/2021	Oct-21	0.90	0.99	11.41	1.40	NS	NS	4	DG1-bugs, fine org. matter, DG2- dirt, large org. matter
9/11/2021	8/12/2021	Nov-21	2.44	1.19	1.98	1.50	NS	NS	4	DG2-bugs
8/12/2021	7/01/2022	Dec-21	0.45	1.23	1.06	1.59	1.62	0.78	4	All- fine org. matter
7/01/2022	9/02/2022	Jan-22	0.50	1.19	0.32	1.55	0.35	0.82	4	DG2 fine organic matter, all sites insects, grass (seeds)
9/02/2022	10/03/2022	Feb-22	0.87	1.14	**17.37***	NS	3.16	0.94	4	DG2 fine organic matter, cloudy
10/03/2022	27/04/2022	Mar-22	NS	NS	NS	NS	NS	NS	4	No samples due to flooding
27/04/2022	27/04/2022	Apr-22	NS	NS	NS	NS	NS	NS	4	No samples due to flooding
27/04/2022	23/05/2022	May-22	NS	NS	NS	NS	NS	NS	4	No samples due to flooding
23/05/2022	29/06/2022	Jun-22	NS	NS	NS	NS	NS	NS	4	Bottles reset
30/06/2022	26/07/2022	Jul-22	NS	NS	NS	NS	NS	NS	4	
27/07/2022	25/08/2022	Aug-22	2.97	1.17	3.05	3.06	0.22	1.16	4	fine org. matter, cloudy, yellow
26/08/2022	28/09/2022	Sep-22	3.41	1.65	5.65	3.91	0.06	1.08	4	
28/09/2022	26/10/2022	Oct-22	1.75	1.77	2.91	2.50	1.56	1.16	4	fine org. matter
26/10/2022	24/11/2022	Nov-22	1.57	1.65	2.65	2.61	0.48	1.06	4	dead bugs, yellow, yellow, cloudy, dead bugs
24/11/2022	21/12/2022	Dec-22	0.39	1.64	1.08	2.61	0.00	0.83	4	beetles/ants, large org. matter , fine org. matter

21/12/2022	22/01/2023	Jan-23	0.12	1.58	1.01	2.73	0.26	0.82	4	
22/01/2023	23/02/2023	Feb-23	0.57	1.54	0.43	2.40	0.04	0.37	4	seeds and ants
23/02/2023	27/03/2023	Mar-23	NS	NS	NS	NS	NS	NS	4	Samples not analysed, bottles broken during transit
27/03/2023	24/04/2023	Apr-23	1.17	1.49	0.77	2.19	0.28	0.36	4	seeds and bugs
24/04/2023	24/05/2023	May-23	0.55	1.39	2.88	2.27	3.02	0.66	4	small bugs/bugs, sticks, algae, fine org. matter, Green
24/05/2023	23/06/2023	Jun-23	0.66	1.32	2.44	2.29	0.69	0.66	4	fine and large org. matter, cloudy
23/06/2023	25/07/2023	Jul-23	0.62	1.25	1.59	2.22	***51.08**	NS	4	grass, plant material, org. matter, cloudy, brown. DG3 sample invalid due to high proportion of organic matter.
25/07/2023	23/08/2023	Aug-23	0.34	1.01	2.32	2.16	1.26	0.77	4	DG1 - spider, cricket, fine org. matter, DG2 - fine org. matter, cloudy, DG3 - twigs, bugs, fine org. matter
23/08/2023	19/09/2023	Sep-23	0.22	0.72	6.29	2.22	1.04	0.86	4	DG1-bugs, fine org. matter, DG2-twig, org. matter, cloudy, yellow, DG3-seed shells, org. matter, cloudy
19/09/2023	25/10/2023	Oct-23	0.45	0.61	8.23	2.70	3.29	1.04	4	DG1-bugs, org. matter, DG2-seeds, grass, fine org. matter, cloudy, brown, DG3-algae, fine org. matter, cloudy
25/10/2023	22/11/2023	Nov-23	4.99	0.92	***23.89**	NS	***67.9**	NS	4	DG1 - algae, bugs, fine org. matter, DG2 - algae, bugs, org. matter, DG3 - algae, bugs, fine org. matter, cloudy, yellow. DG2 & DG3 samples invalid due to high proportion of organic matter.
22/11/2023	20/12/2023	Dec-23	1.23	0.99	1.94	2.79	3.09	1.44	4	DG1- bugs, algae, twigs, fine org. matter, DG2- bugs, algae, fine org. matter, DG3- fine org. matter
20/12/2023	19/01/2024	Jan-24	13.70	2.23	8.79	3.57	***65**	NA	4	DG1 - bugs, algae, twigs, fine org. matter, DG2- bugs, algae, fine org. matter, DG3 - fine org. matter. DG3 sample deemed invalid due to high proportion of organic matter
19/01/2024	21/02/2024	Feb-24	0.13	2.19	0.05	3.53	NS	NS	4	DG1- leaves, seeds, fine org. matter, cloudy, DG2-insects, fine org. matter, cloudy, DG3- bottle broken in transit to lab
21/02/2024	22/03/2024	Mar-24	0.47	2.04	0.1	3.22	0.61	1.66	4	DG1- bug, seeds, fine org. matter, cloudy, DG2-fine org. matter, DG3-bugs, fine org. matter
22/03/2024	22/04/2024	Apr-24	2.63	2.17	0.82	3.22	2.92	1.99	4	DG1- Fine org. matter, green colour, algae, cloudy, DG2-fine org. matter, DG3-fine org. matter, yellow, cloudy, seeds, algae, insects
22/04/2024	31/05/2024	May-24	NS	NS	NS	NS	NS	NS	4	
31/05/2024	26/06/2024	Jun-24	3.70	2.59	1.9	3.20	3.1	2.19	4	DG1- Insects, grass (seeds), org. matter, DG2-Insects, grass (seeds), org. matter, DG3-Insects, grass (seeds), org. matter
26/06/2024	23/07/2024	Jul-24	0.77	2.60	0.67	3.11	0.45	1.97	4	DG1- moth, mosquitoes, fine org. matter, cloudy, DG2-mosquitoes, fine org. matter, cloudy, DG3-mosquitoes, fine org. Matter
23/07/2024	23/08/2024	Aug-24	0.98	2.66	0.67	2.95	9.69	3.02	4	DG1- sticks, fine org. matter, DG2-insects, fine org. matter, DG3-sticks, lots of organic matter, insects
23/08/2024	24/09/2024	Sep-24	0.16	2.66	0.26	2.34	***194**	NS	4	DG1- fine org. Matter DG2-fine org. matter, DG3-seeds/dirt/sand, fine org. matter, brown
24/09/2024	23/10/2024	Oct-24	NS	NS	NS	NS	9	**4.12**	4	DG1 & DG2 - sample broken during collection. DG3 - Sticks, sediment present, broken bug shells
23/10/2024	24/11/2024	Nov-24	5.70	2.95	1.2	1.64	11	**4.98**	4	DG1 - Bugs, DG2 - Insects, DG3 - Bugs
24/11/2024	21/12/2024	Dec-24	NS	NS	NS	NS	NS	NS	4	
21/12/2024	21/01/2025	Jan-25	NS	NS	NS	NS	NS	NS	4	DG1- Organic Matter, Insects, Grass Seeds, DG2-Organic Matter, Insects, DG3-Significant organic matter including insects and grass seeds
21/01/2025	21/02/2025	Feb-25	0.18	1.82	0.63	0.78	0.64	**4.68**	4	DG1- Organic Matter, Insects, Grass Seeds, DG2-Organic Matter, Insects, DG3-Organic matter including insects and grass seeds
21/02/2025	21/03/2025	Mar-25	NS	NS	NS	NS	NS	NS	4	
21/03/2025	23/04/2025	Apr-25	0.48	1.83	13	2.39	0.18	**4.87**	4	DG1-Organic Matter, Grass Seeds, DG2-Organic Matter, Insects. Water green/brown colour. Funnel clogged with bird droppings, Ash content 1.8 indicating significant organic matter, DG3-Organic matter including insects and grass seeds
23/04/2025	21/05/2025	May-25	0.80	1.60	8.8	3.39	NS	NS	4	DG1-Organic Matter, Grass Seeds, awaiting results, DG2-Organic Matter, Insects. Water slightly turbid brown colour, Ash content less than 0.1 indicating significant organic matter, DG3-Bottle broken during transit
Monthly Minimum (g/m^2)			**0.12**	**-**	**0.05**	**-**	**0.04**	**-**	**-**	
Monthly Maximum (g/m2)			**13.70**	**-**	**13.00**	**-**	**11.00**	**-**	**-**	
Average (g/m2)			**1.77**	**-**	**2.95**	**-**	**2.81**	**-**	**-**	

ID = Insufficient Data *Sample assessed as contaminated. Result not included in statistical analysis.
NS - No Sample / Invalid Sample (broken, inaccessible, contaminated, etc)





Appendix 4

Surface Water Monitoring Results

(Total No. of pages including blank pages = 22)

Cudgen Lakes Sand Quarry

Environmental Monitoring - Surface Water

Project Approval (PA):	05_0103B
Environmental Protection Licence (EPL):	12385
Licensee:	Gales-Kingscliff Pty Limited
Licensee Address:	20 Ginahgulla Road Bellevue Hill, NSW 2023
Premises:	Cudgen Lakes Altona Drive Cudgen, NSW 2487
Licensee Website:	http://www.galeskingscliff.com.au/
Licensee Website - Monitoring Results:	https://www.galeskingscliff.com.au/reports
EPA Public Register:	https://www.epa.nsw.gov.au/licensing-and-regulation/public-registers
Monitoring Month:	Jun-25
Report prepared on:	24/07/2025
Originator:	R.W. Corkery & Co. Pty Limited

Monitoring Requirements - Surface Water

EPL 12385 Requirements

Monitoring Points - Water and Land

EPL Condition	EPA Identification Number	Site ID	Type of Monitoring Point	Type of Discharge Point	Location Description*
P1.2	1	EPL 1	Water Quality Monitoring Point	Water Quality Monitoring Point	Dredge Pond South Spillway West
	2	EPL 2	Water Quality Monitoring Point	Water Quality Monitoring Point	Dredge Pond South Spillway East
** See 'Monitoring Map' tab.*					

Limit Conditions

EPL Condition	EPA Identification Number	Site ID	Pollutant	Units of Measure	50 Percentile Concentration Limit	90 Percentile Concentration Limit	3DGM Concentration Limit	100 Percentile Concentration Limit	Monitoring Frequency	Sampling Method
L2.4	1 & 2	EPL1 & EPL2	Oil & Grease	Visible	N/A	N/A	N/A	nil	Special Frequency 1*	Visual Inspection
			pH	pH	N/A	N/A	N/A	6.5 - 8.5	Special Frequency 1*	Probe
			Total Suspended Solids (TSS)	milligrams per litre (mg/L)	N/A	N/A	N/A	50	Special Frequency 1*	Grab Sample
**Special Frequency 1: sampling once <24 hours prior to; and, sampling the discharge daily during, each discharge event arising from rainfall of less than 82.5mm falling in total over a period of up to five days duration.*										

Management Plan Requirements - Soil and Water Management Plan

Version: ***May 2021***

Note: The Soil and Water Management Plan (SWMP) fulfils the requirement for a Surface Water Monitoring Program under Condition 21 of Schedule 3 of PA 05_0103.

Water Quality Objectives - Dredge Pond

Parameters	Units of Measure	Objective	Comment
pH	pH	6.5 - 9.0	Upper objective value reflects upper limit of recorded data.~
Electrical Conductivity (EC)	micro Siemens per centimetre (µS/cm)	6192	Objective value reflects upper limit of recorded data.~
Dissolved Oxygen (DO)	milligrams per litre (mg/L)	>6*	Original objective value retained.**
Turbidity	NTU	<20	Original objective value retained.**
Sodium (Na)	milligrams per litre (mg/L)	813	Objective value reflects upper limit of recorded data.~
Magnesium (Mg)	milligrams per litre (mg/L)	119	Objective value reflects upper limit of recorded data.~
Potassium (K)	milligrams per litre (mg/L)	<40	Original objective value retained.**
Chloride (Cl)	milligrams per litre (mg/L)	1390	Objective value reflects upper limit of recorded data.~
Sulfate (SO4)	milligrams per litre (mg/L)	<800	Original objective value retained.**
Bicarbonate (HCO3)	milligrams per litre (mg/L)	<400	Original objective value retained.**
Aluminium (Al)	milligrams per litre (mg/L)	<0.5	Original objective value retained.**
Arsenic (As)	milligrams per litre (mg/L)	<0.42	Derived from Australian and New Zealand Guidelines for Fresh and Marine Water Quality – 90% protection for freshwater species.
Filterable Iron (Fe)	milligrams per litre (mg/L)	<20	Original objective value retained.**
Ammonia (NH3)	milligrams per litre (mg/L)	<20	Original objective value retained.**

**Applicable to surface samples only (i.e. monitoring points DP1, DP2, DP3).*

***Objective value as specified in the original conditions for PA 05_0103.*

~ Data recorded between September 2015 and April 2019.

Monitoring Points - Parameters, Locations & Frequency

Occurrence	Frequency	Parameters	Units of Measure	Measurement Type	Sampling Method	Location ID
Operational Periods[1]	Twice Daily (prior to dredging & at cessation)	Standing Surface Water Level (Dredge Pond)	m AHD	Field	Calibrated height gauge, water level sensor or calibrated water level monitor	On Dredge
	Weekly	Temperature	degrees Celsius (°C)	Field	Probe	DP1, DP2, DP3, DP4
		pH	pH			
		Electrical Conductivity (EC)	micro Siemens per centimetre (µS/cm)			
		Oxygen Reduction Potential (ORP)	millivolts (mV)			
		Turbidity	NTU			
		Dissolved Oxygen (DO)	milligrams per litre (mg/L)			
		Oil and Grease	Present / Absent	Visual Inspection	Visual	
	Monthly	Total Phosphorous (P)	milligrams per litre (mg/L)	Laboratory	Grab Sample	DP1, DP2, DP3, DP4
		Total Nitrogen (N)	milligrams per litre (mg/L)			
		Orthophosphate (Reactive Phosphorous)	milligrams per litre (mg/L)			
		Ammonia Nitrogen	milligrams per litre (mg/L)			
		NOx Nitrogen	milligrams per litre (mg/L)			
		Oil and Grease	Present / Absent	Visual Inspection	Visual	
		Weather - Cloud Cover	Sunny / Overcast			
		Weather - Rain	Raining / Dry			
		Water Colour and Appearance	Cloudy / Clear			
		Odour	Present / Absent			
		Frothing	Present / Absent			
		Floating Debris	Present / Absent			
		Nuisance Organisms (e.g. Macrophytes, Phytoplankton Scum,	Present / Absent			
		Chlorophyll a	mg/m^3	Laboratory	Grab Sample (Composite)	Composite of DP1, DP2, DP3 & DP4
		Total Algal Cell Count	cells/mL			
		Total Algal Biovolume	mm^3/L			
		Potentially Toxic Cyanobacteria Cell Count	cells/mL			
		Potentially Toxic Cyanobacteria Biovolume	mm^3/L			
		Toxins (cytotoxic cylindrospermopsin)	micrograms per litre (µg/L)			
	Quarterly	Major Cations*	milligrams per litre (mg/L)	Laboratory	Grab Sample	DP1, DP2, DP3, DP4
		Major Anions**	milligrams per litre (mg/L)			
		Filterable Iron	milligrams per litre (mg/L)			
		Aluminium	milligrams per litre (mg/L)			
		Arsenic	milligrams per litre (mg/L)			
	6-Monthly (Summer & Winter)	Temperature	degrees Celsius (°C)	Field	Probe	DP1-1, DP1-2, etc. (at 1m depth and then every 2m depth interval to the pond base)
		pH	pH			
		Electrical Conductivity (EC)	micro Siemens per centimetre (µS/cm)			
		Oxygen Reduction Potential (ORP)	millivolts (mV)			
		Turbidity	NTU			
		Dissolved Oxygen (DO)	milligrams per litre (mg/L)			
		Oil and Grease	Present / Absent	Visual Inspection	Visual	
		Major Cations*	milligrams per litre (mg/L)	Laboratory	Grab Sample	
		Major Anions**	milligrams per litre (mg/L)			
		Filterable Iron	milligrams per litre (mg/L)			
		Aluminium	milligrams per litre (mg/L)			
		Arsenic	milligrams per litre (mg/L)			
		Total Phosphorous (P)	milligrams per litre (mg/L)			
		Total Nitrogen (N)	milligrams per litre (mg/L)			
		Orthophosphate (Reactive Phosphorous)	milligrams per litre (mg/L)			
		Ammonia Nitrogen	milligrams per litre (mg/L)			
		NOx Nitrogen	milligrams per litre (mg/L)			
		Chlorophyll a	mg/m^3			
		Total Algal Cell Count	cells/mL			
		Total Algal Biovolume	mm^3/L			
		Potentially Toxic Cyanobacteria Cell Count	cells/mL			
		Potentially Toxic Cyanobacteria Biovolume	mm^3/L			
		Toxins (cytotoxic cylindrospermopsin)	micrograms per litre (µg/L)			

Non-Operational Periods[2]	Quarterly	Temperature	degrees Celsius (°C)	Field	Probe	DP1, DP2, DP3, DP4
		pH	pH			
		Electrical Conductivity (EC)	micro Siemens per centimetre (µS/cm)			
		Oxygen Reduction Potential (ORP)	millivolts (mV)			
		Turbidity	NTU			
		Dissolved Oxygen (DO)	milligrams per litre (mg/L)			
		Total Phosphorous (P)	milligrams per litre (mg/L)	Laboratory	Grab Sample	
		Total Nitrogen (N)	milligrams per litre (mg/L)			
		Orthophosphate (Reactive Phosphorous)	milligrams per litre (mg/L)			
		Ammonia Nitrogen	milligrams per litre (mg/L)			
		NOx Nitrogen	milligrams per litre (mg/L)			
		Chlorophyll a	mg/m^3			
		Total Algal Cell Count	cells/mL			
		Total Algal Biovolume	mm^3/L			
		Potentially Toxic Cyanobacteria Cell Count	cells/mL			
		Potentially Toxic Cyanobacteria Biovolume	mm^3/L			
		Toxins (cytotoxic cylindrospermopsin)	micrograms per litre (µg/L)			
		Oil and Grease	Present / Absent	Visual Inspection	Visual	
		Weather - Cloud Cover	Sunny / Overcast			
		Weather - Rain	Raining / Dry			
		Water Colour and Appearance	Cloudy / Clear			
		Odour	Present / Absent			
		Frothing	Present / Absent			
		Floating Debris	Present / Absent			
		Nuisance Organisms (e.g. Macrophytes, Phytoplankton Scum,	Present / Absent			
	6-Monthly (Summer & Winter)	Temperature	degrees Celsius (°C)	Field	Probe	DP1-1, DP1-2, etc. (at 1m depth and then every 2m depth interval to the pond base)
		pH	pH			
		Electrical Conductivity (EC)	micro Siemens per centimetre (µS/cm)			
		Oxygen Reduction Potential (ORP)	millivolts (mV)			
		Turbidity	NTU			
		Dissolved Oxygen (DO)	milligrams per litre (mg/L)			
		Oil and Grease	Present / Absent	Visual Inspection	Visual	
		Major Cations*	milligrams per litre (mg/L)	Laboratory	Grab Sample	
		Major Anions**	milligrams per litre (mg/L)			
		Filterable Iron	milligrams per litre (mg/L)			
		Aluminium	milligrams per litre (mg/L)			
		Arsenic	milligrams per litre (mg/L)			
		Total Phosphorous (P)	milligrams per litre (mg/L)			
		Total Nitrogen (N)	milligrams per litre (mg/L)			
		Orthophosphate (Reactive Phosphorous)	milligrams per litre (mg/L)			
		Ammonia Nitrogen	milligrams per litre (mg/L)			
		NOx Nitrogen	milligrams per litre (mg/L)			
		Chlorophyll a	mg/m^3			
		Total Algal Cell Count	cells/mL			
		Total Algal Biovolume	mm^3/L			
		Potentially Toxic Cyanobacteria Cell Count	cells/mL			
		Potentially Toxic Cyanobacteria Biovolume	mm^3/L			
		Toxins (cytotoxic cylindrospermopsin)	micrograms per litre (µg/L)			

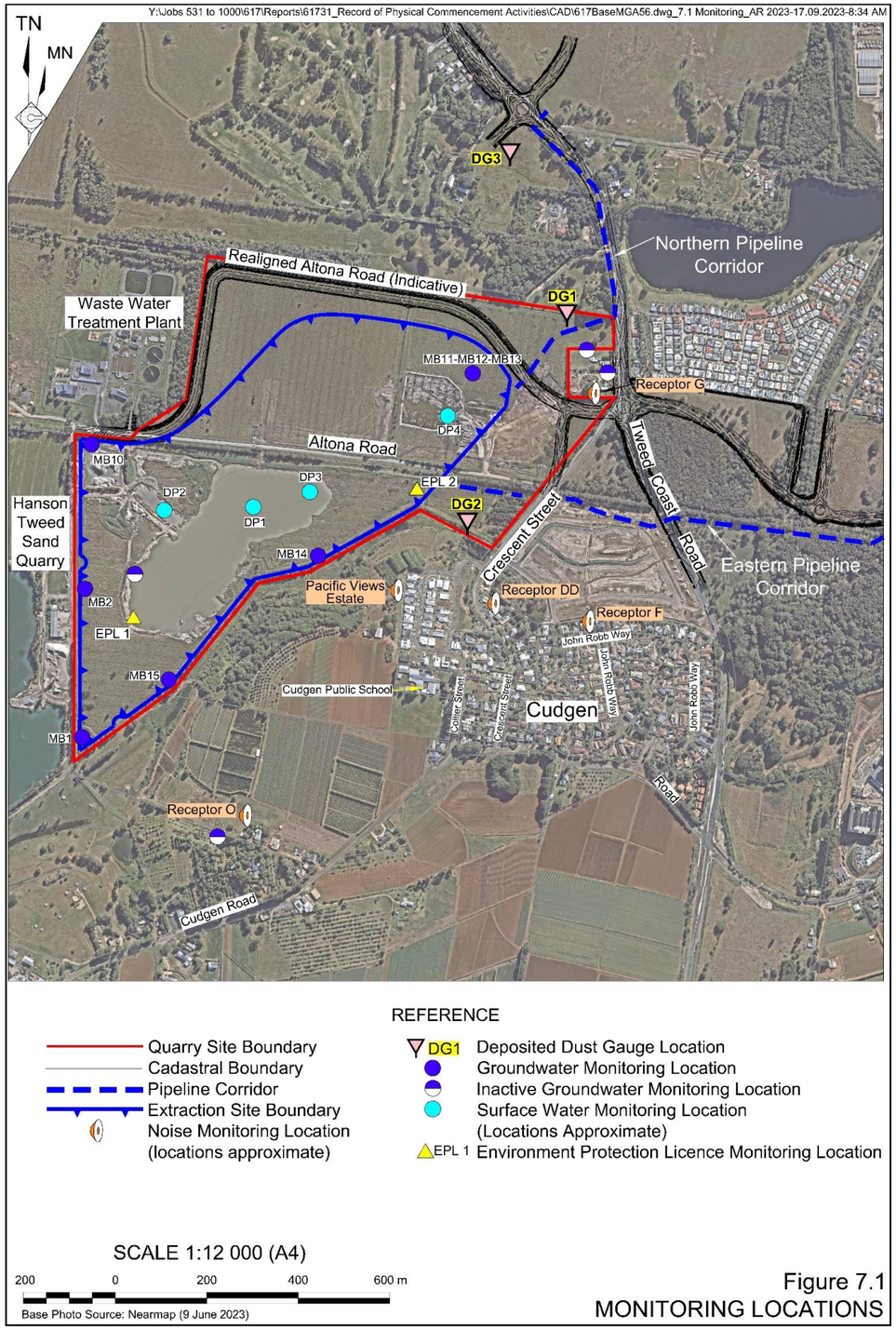
[1] Operational Periods = periods during which extraction and/or processing of material, and/or the placement of fines and/or VENM material, is occurring at the Quarry.

[2] Non-Operational Periods = periods during which no extraction, processing, fines placement or VENM placement activities are occurring. Note: for surface water monitoring purposes, non-operational periods also include periods during which transportation activities alone occur.

**Major Cations = Sodium, Calcium, Magnesium & Potassium*

***Major Anions = Chloride, Sulfate & Bicarbonate*

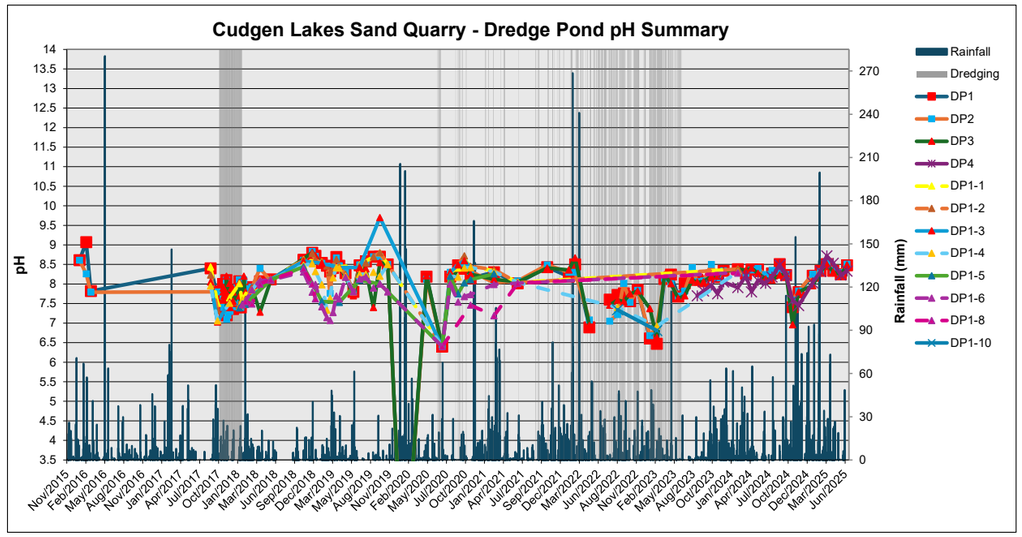
Monitoring Location Map - Surface Water

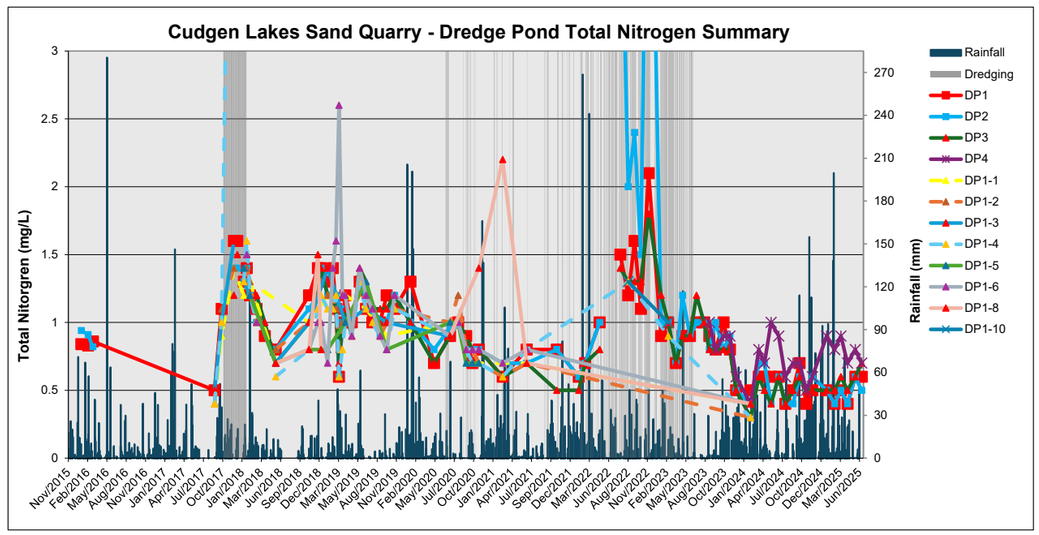


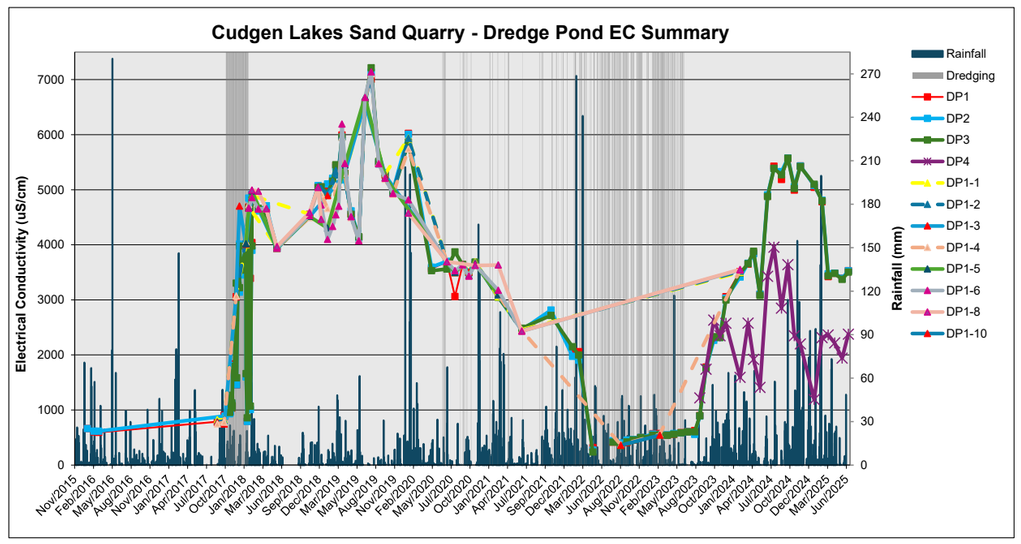
Monitoring Point Location Description

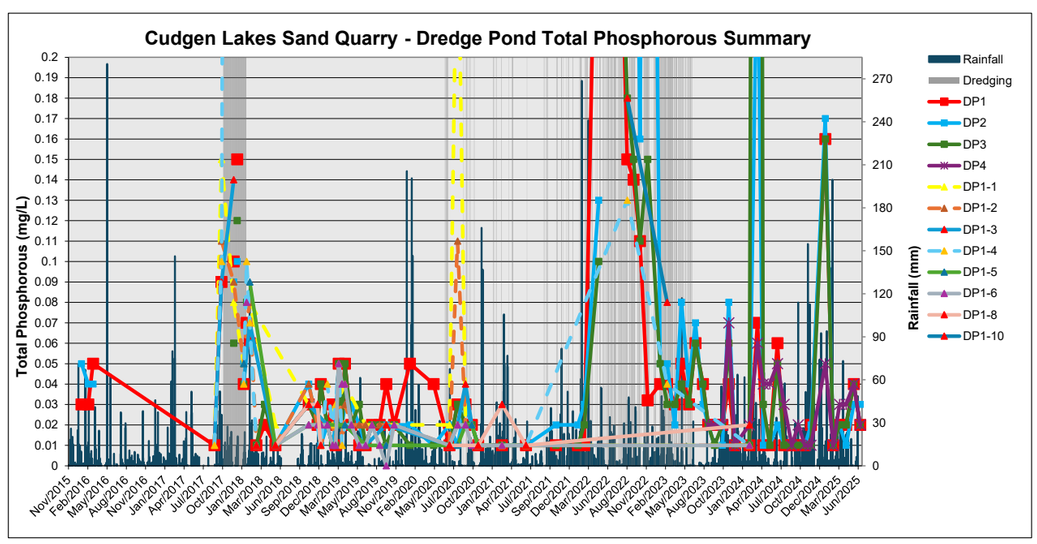
The three dredge pond monitoring locations are shown indicatively in the monitoring location map. The three locations include two edge locations (DP2 and DP3) and one in the approximate middle of the southern dredge pond (DP1) and northern dredge pond (DP4). All depth measurements are to be taken at location DP1 at a depth of 1m and then at 2m intervals to the current floor of the dredge pond. Given the changing size and shape of the dredge pond the precise location of each monitoring point will vary over time and will be selected by the monitoring consultant based upon the pond condition at the time of sampling.

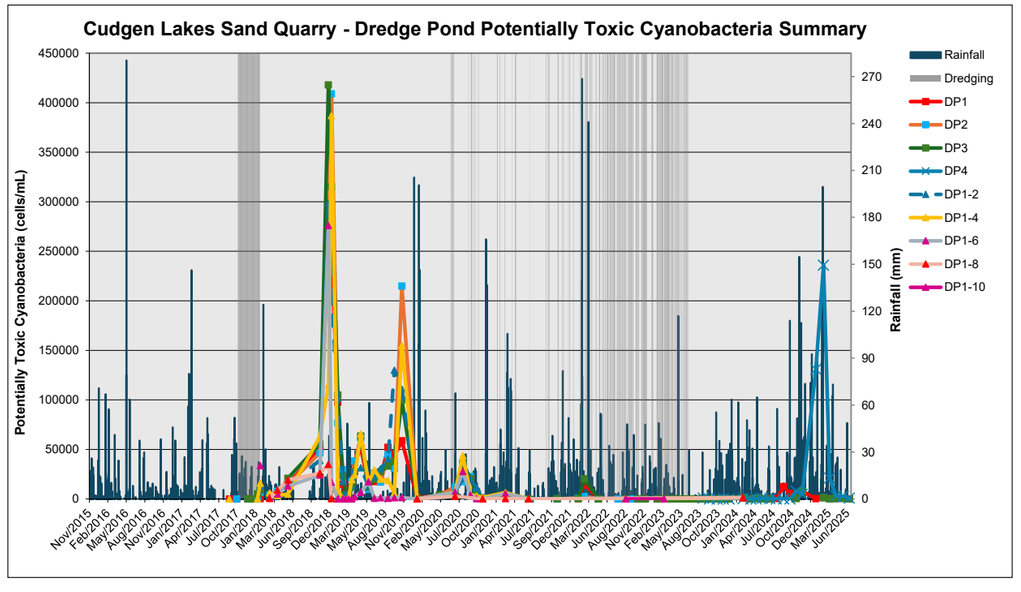
617 - CUDGEN LAKES SAND QUARRY
Surface Water Quality Monitoring Summary

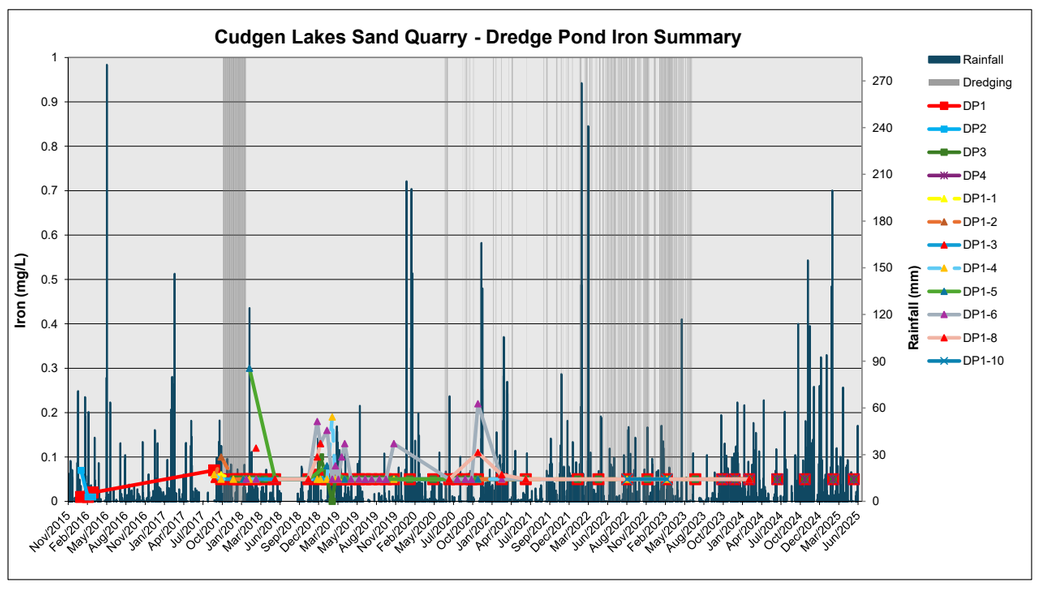












Site: DP1			Physical									Major Cations & Anions							Metals			Nutrients								Bacteria / Algae			
Sample Date		Comments/ Flow	Water Level m AHD	Temp °c	pH	ElectricalConductivity uS/cm	Dissolved Oxygen mol/L	Redox mV	Total Suspended Solids mg/L	Turbidity NTU	Oil & Grease mg/L	Sodium mg/L	Calcium mg/L	Magnesium mg/L	Potassium mg/L	Chloride mg/L	Sulfate mg/L	Bicarbonate mg/L	Aluminium mg/L	Arsenic mg/L	Iron (filterable) mg/L	Total Phosphorous mg/L	Reactive Phosphorous mg/L	Total Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	TKN mg/L	Ammonia mg/L	NOx mg/L	Faecal coliforms cells/ml	Enterococci cells/ml	Potentially Toxic Cyanobacteria	Chlorophyll a
		Objectives	-	-	*6.5-9*	*<6192*	*>6*			*<20*	*10*	*<813*		*<119*	*<40*	*<1390*	*<800*	*<400*	*<0.5*	*<0.42*	*<20*							*<20*		-	-	*<50000*	*<10*
Pre-Extraction	2015-11-30	Fine Sunny Approx 30mm rain previous week (BoM - Coolangatta)		24.5	8.47	591	6.12	148	8.8	4	2		24	11	7	120	20	57	0.19	0.002	0.01	0.04	0.02	0.81			0.81	0.02	0.02	860	**860**		
	2016-01-26	Fine, Clear, some algae, catttle & ducks		27.3	8.61	663	**5.87**	192	4.3	3.8	2	64	25	12	7	120	16	76	0.08	0.001	0.01	0.03	0.02	0.84			0.84	0.02	0.02	128	174		
	2016-02-25	Algae, ducks,low turbidity		25.8	**9.07**	601	6.04	104	1.7	2.1	4	69	26	12	8	120	15	58	0.04		0.01	0.03	0.02	0.83			0.83	0.02	0.02	4800	360		
	2016-03-17	Sample taken in 20cm of clear water. Surface chop caused by wind. Cattle surrounding dam. Water birds. Approx 80mm rain previous week (BoM - Coolangatta).		26.8	7.82	593	**5.97**	70	7	5.9	4	64	26	12	8	110	14	92	0.16	0.001	0.02	0.05	0.02	0.86			0.86	0.02	0.02	270	820		
	2017-09-04			26.2	8.4	786	9.24	132	5	0.9	5	132	33	21	8	236	57	98	0.06	0.001	0.07	0.01	0.01	0.5	0.01	0.02	0.5	0.02	0.02	40	10	5	2
	2017-10-05			28.3	7.71	901	7.36	48.7	68	**138**	5	95	46	17	7	182	40	130	0.03	0.001	0.05	0.09	0.01	1.1	0.01	0.03	1.1	0.01	0.03	320	1180		
	2017-10-08	Algae/chrorophyll only to lab		27.2	7.81	886	6.83	61.2		**156**																					5	10
2017/2018	2017-10-30	**Commencement of extraction**																															
	2017-10-30	Daily monitoring requirement for first 2 weeks of dredging.		23.4	8.0	1056	**4.23**	224																									
	2017-10-31	Daily monitoring requirement for first 2 weeks of dredging.		20.1	7.9	1069	**4.28**	210																									
	2017-11-01	Daily monitoring requirement for first 2 weeks of dredging.		22.1	7.9	1061	**4.25**	216																									
	2017-11-02	Daily monitoring requirement for first 2 weeks of dredging.		22.4	7.6	980	**2.78**	2.12																									
	2017-11-03	Daily monitoring requirement for first 2 weeks of dredging.		20.2	7.7	1142	**3.26**	206																									
	2017-11-06	Daily monitoring requirement for first 2 weeks of dredging.		22.4	7.6	1042	**4.18**	214																									
	2017-11-07	Daily monitoring requirement for first 2 weeks of dredging.		22.1	7.3	1031	**3.76**	210																									
	2017-11-08	Daily monitoring requirement for first 2 weeks of dredging.		21.9	8.0	1090	**3.93**	212																									
	2017-11-09	Daily monitoring requirement for first 2 weeks of dredging.		21.7	7.7	1052	**4.05**	209																									
	2017-11-10	Daily monitoring requirement for first 2 weeks of dredging.		21.5	7.9	1067	**4.02**	204																									
	2017-11-13	Daily monitoring requirement for first 2 weeks of dredging.		21.1	7.4	1767	**4.2**	132																									
	2017-11-14	Daily monitoring requirement for first 2 weeks of dredging.		21.7	8.1	1837	**4**	122																									
	2017-11-15	Daily monitoring requirement for first 2 weeks of dredging.		21	7.2	1795	**3.9**	134																									
	2017-11-21	Daily monitoring requirement for first 2 weeks of dredging.		21.5	7.4	1623	**4.6**	133																									
	2017-11-28			27.3	7.4	3058	**3.14**	50.4	55	**97**	5	454	110	72	19	874	197	237	0.01	0.001	0.05	0.1	0.01	1.6	0.01	0.12	1.5	0.32	0.12	110	2160	5	6
	2017-11-30	Weekly monitoring requirement.		21.6	7.6	1455	**4.8**	143																									
	2017-12-06	Weekly monitoring requirement.		22	7.8	3210	6.53	206																									
	2017-12-13	Weekly monitoring requirement.		22.9	7.8	3150	**3.95**	147																									
	2017-12-13	Birds on Dredge pond and surrounds		27	7.36	3991	**0.2**	107		**125.3**		563	121	89	22	992	261	234	0.01	0.001	0.05	0.15	0.01	1.6	0.01	0.01	1.6	0.16	0.01			5	**28**
	2017-12-20	Weekly monitoring requirement.		22.8	7.7	3550	**4.15**	157																									
	2018-01-11	Birds on Dredge pond and surrounds		30.9	8.07	4012	**2.17**	-0.7	12	**20.1**	5	628	136	97	24	1090	270	240	0.01	0.002	0.05	0.04	0.01	1.3	0.01	0.01	1.3	0.02	0.01	110	90	825	**13**
	2018-01-12	Weekly monitoring requirement.		21.8	7.7	1610	**4.16**	172																									
	2018-01-17	Weekly monitoring requirement.		20.9	7.4	797	**3.43**	116																									
	2018-01-23	Weekly monitoring requirement.		21.8	7.7	1569	**4.12**	168																									
	2018-01-24	Birds on Dredge pond and surrounds		27.4	7.54	4685	**3.27**	36.2		**55.2**		606	129	96	22	1240	296	223	0.01	0.002	0.05	0.07	0.01	1.4	0.01	0.02	1.4	0.21	0.02			355	**24**
	2018-01-31	Weekly monitoring requirement.		20.5	7.8	3391	**5.73**	161																									
	2018-02-07	Birds on Dredge pond and surrounds		26.6	7.72	4915	**5.21**	30.9		19.5	5	693	137	103	24	1350	315	264	0.01	0.002	0.05	0.06	0.01	1.2	0.01	0.01	1.2	0.1	0.01	20	40		**22**
	2018-02-07	Weekly monitoring requirement.		19.1	7.8	4040	**5.68**	111																									
	8/02/2018	**Last day of first extraction campaign.**																															
	2018-03-08	Water Birds on Dredge Pond, no algae visible, slight brown/green tinge to pond water, level		25	7.92	4642	**5.33**	63		10.1		602	126	93	22	1180	307	237	0.04	0.002	0.05	0.01	0.01	1.1	0.01	0.01	1.1	0.02	0.01			1940	**51**
	2018-04-13	Birds on Dredge pond and surrounds. Algae numbers significantly reduced. Field measurements, algae counts and chlorophyll only for vertical profile samples in dredge pond.		26	8.07	4659	7.37	134		0.6		636	134	100	24	1120	263	245	0.02	0.002	0.05	0.02	0.01	0.9	0.01	0.01	0.9	0.01	0.1			6980	**12**
	2018-05-31	Aquatic Birds on dredge pond		19.6	8.12	3960	**5.59**	61		6.8	5	663	135	101	23	1290	313	270	0.02	0.002	0.05	0.01	0.01	0.8	0.01	0.03	0.8	0.06	0.03	20	50	14900	9
2018/2019	2018-10-25			25.1	8.62	4553	6.59	80	5	15.2	5	671	121	100	22	1250	334	205	0.05	0.005	0.05	0.03	0.01	1.2	0.01	0.01	1.2	0.06	0.01	110	40	**50300**	**13**
	2018-12-03	S/W WIND TBC		27.6	8.8	5061	8.76	44.2	12	10.1		642	112	99	22	1310	301	188	0.03	0.001	0.06	0.02	0.01	1.4	0.01	0.02	1.4	0.02	0.02			**284000**	**15**
	2018-12-17			26.5	8.72	5048	9.92	13	7	11.3		686	107	99	24	1170	302	171	0.06	0.002	0.05	0.04	0.01	1.4	0.01	0.01	1.4	0.05	0.01			**247000**	**31**
	2019-01-15			29.4	8.54	4978	**4.93**	26.5	6	7.5	5	813	116	119	27	1320	298	148	0.02	0.002	0.05	0.02	0.01	1.3	0.01	0.01	1.3	0.05	0.01	270	410	**97700**	**15**
	2019-02-07	Aquatic Birds and Cattle. No algal scum on surface. No Oil and grease sampling. Hut mud DP1-8		28.8	8.47	5172	7.84	-43.6	18	10.3		691	94	98	22	1380	364	172	0.04	0.002	0.05	0.03	0.005	1.4	0.01	0.01	1.4	0.01	0.01			14900	10
	2019-02-21			27.8	8.32	5440	8.14	16.8	7	**23.8**		755	110	115	26	1380	328	161	0.03	0.002	0.05	0.01	0.001	1.1	0.01	0.01	1.1	0.06	0.01			5090	5
	2019-03-06	Cattle on site and near dredge pond. Aquatic birds on dredge pond. No visible algal scum		26.8	8.41	5352	8.93	-41.6	5	1.2		730	110	110	24	1390	323	194	0.02	0.002	0.05	0.05	0.008	0.6	0.01	0.01	0.6	0.01	0.01			1200	8
	2019-03-21			28.1	8.69	5995	**5.72**	-110	5	3.24		738	110	112	26	1340	296	171	0.03	0.002	0.05	0.03	0.001	1	0.01	0.01	1	0.02	0.01			13400	**11**
	2019-04-03			24.3	8.47	5298	**5.27**	109		8.2	5	757	124	117	24	1250	303	188	0.03	0.002	0.05	0.05	0.003	1.2	0.01	0.01	1.2	0.03	0.01	230	120	36800	9
	2019-05-01			23.4	8.28	4559	8.52	40.9	5	4.3		786	127	**123**	26	1310	297	189	0.01	0.002	0.05	0.02	0.001	1	0.01	0.01	1	0.03	0.01			**52000**	10
	2019-06-05			17.9	7.8	4140	6.9	57.2	6	-9.7		706	125	111	24	1300	292	226	0.01	0.002	0.05	0.01	0.004	1.3	0.02	0.04	1.2	0.37	0.06			12700	**12**
2019/2020	2019-07-03			18.7	8.48	**6549**	**5.17**	85		1.1	5	728	124	110	24	1290	256	226	0.01	0.001	0.05	0.01	0.001	1.1	0.02	0.11	1	0.13	0.13	430	1800	17700	**11**
	2019-07-31	Aquatic birds on drdge pond, no visible algal scum on dredge pond, no cattle on site.		18	8.58	**7007**	6.54	111.2	5	7.4		717	126	109	24	1330	311	216	0.01	0.001	0.05	0.02	0.001	1	0.01	0.1	0.9	0.03	0.1			21700	7
	2019-09-03	Water birds, yellow/brown water colour. Posible machine activity recently.		20.9	8.7	5475	7.4	123.1	5	8.2		721	122	110	23	1350	328	188	0.01	0.001	0.05	0.02	0.001	1	0.01	0.01	1	0.01	0.01			**52100**	8
	2019-10-02			25	8.7	5298	**5.3**	91.8	5	5.7	5	760	132	114	25	1370	308	193	0.01	0.002	0.05	0.04	0.001	1.2	0.01	0.01	1.2	0.02	0.01	10	10	42900	10
	2019-11-06	Aquatic birds present. Cattle present. Low water level		23	8.5	4974	8.8	115.5	5	5.7		735	105	109	25	1350	318	187	0.02	0.002	0.05	0.02	0.001	1.1	0.01	0.01	1.1	0.01	0.01			**58700**	**15**
	2020-01-15	Aquatic birds present. Cattle present. Low water level. pH meter calibration issue - spurious data		28.3	**10.6***	6025	8	72.3	5	3.1		**833**	121	**125**	28	**1400**	335	167	0.01	0.001	0.05	0.05	0.001	1.3	0.01	0.01	1.3	0.01	0.01	500	420	870	8
	2020-04-28	Land-based extraction commenced 16/04/20		24.6	8.19	3565	8.71	43.4	5	**20.8**	5	523	64	77	18	1000	183	134	0.01	0.002	0.05	0.04	0.001	0.7	0.01	0.01	0.7	0.03	0.01	20	100	4160	1
2020/2021	2020-07-07	Clear.		16.7	**6.4**	3691	9.1	124	5	2.8	5	581	85	88	20	1010	205	180	0.01	0.002	0.05	0.01	0.002	0.9	0.01	0.04	0.9	0.17	0.04	60	10	11800	
	2020-08-12	Clear		18.6	8.19	3061	10.5	82	9	6.6	5	546	88	83	19	1030	182	169	0.01	0.002	0.05	0.03	0.001	1	0.01	0.04	0.9	0.05	0.05	50	20	24600	8
	2020-09-16			21.4	8.48	3640	10.67	95.8	15	**55.43**	5	564	87	83	19	1080	197	148	0.01	0.002	0.05	0.03	0.002	0.9	0.01	0.01	0.9	0.02	0.01	10	30	21000	**13**
	2020-10-14			24.4	8.39	3503	9.85	62.1	8	13	5	553	96	82	19	1040	228	141	0.02	0.002	0.05	0.02	0.001	0.7	0.01	0.01	0.7	0.01	0.01			7510	1
	2020-11-11			24.4	8.15	3649	9.44	74.1	5	2.5		552	88	82	19	1070	233	143	0.03	0.002	0.05	0.01	0.001	0.8	0.01	0.01	0.8	0.06	0.01	30	280	1280	5
	2021-02-24	Clear		26.8	8.3	3061	8.35	69.8	5	6.1		436	77	67	15	905	192	126	0.03	0.002	0.05	0.01	0.001	0.6	0.01	0.01	0.6	0.01	0.01	640	280	3690	4
	2021-06-10	Clear		17.6	8.02	2465	8.8	50.6	5	4.35		392	70	56	14	762	165	136	0.02	0.002	0.05	0.01	0.001	0.8	0.02	0.04	0.7	0.2	0.06	30	10	5	2
2021/2022	2021-10-20	Clear		24.71	8.43	2791	6.95	-95.1		4.5												0.01	0.002	0.8	0.01	0.01	0.6	0.01	0.01			5	3
	2022-01-25	Clear		27.55	8.19	2084	6.13	-105.6		10	NV	341	72	48	12	659	142	122	0.02	0.001	0.05	0.01	0.001	0.6	0.01	0.01	0.6	0.04	0.01			330	2
	2022-02-22	Clear		28.54	8.5	2058	6.37	-115.7		11	NV											0.01	0.002	0.7	0.01	0.01	0.7	0.06	0.01			14900	2
	2022-04-27	Cloudy		22.76	6.89	318	6.58	-36.1		**28**	NV	41	14	6	3	75	21	33	0.02	0.001	0.05	0.36	0.004	1	0.01	0.18	0.8	0.05	0.15			5	5
	2022-05-23	Due to major flood event, high rainfall, and poor drainage the site was deemed inaccessible to undertake sampling during May 2022.																															

2022-06-22	Due to previous major flood events, ongoing rain and slow drainage, the site was deemed inaccessible to undertake sampling during June 2022.

2022/2023	2022-07-27	Cloudy, Turbid		15.7	7.60	416	6.12	126.0		**593.0**												0.30	0.004	1.5	0.01	0.33	1.2	0.01	0.33			5	5
	2022-08-31	Cloudy, Very Turbid		19.1	7.72	367	6.80	204.9		**410.0**		58	27	8	4	90	30	55	0.01	0.001	0.05	0.15	0.002	1.2	0.01	0.42	0.8	0.04	0.42			5	**11**
	2022-09-28	Cloudy, Turbid		23.2	7.76	408	6.77	-90.7		**312.0**												0.14	0.002	1.6			1.2	0.01	0.38			5	5
	2022-10-26	Cloudy, Turbid		26.4	7.56	454	**5.05**	106.9														0.11	0.003	1.1	0.01	0.39	0.7	0.01	0.39			5	2
	2022-11-29	Cloudy, Turbid		23.6	7.85	497	**4.21**	75.2		**187.0**		48	37	7	4	92	40	64	0.01	0.001	0.05	0.03	0.004	2.1	0.01	0.46	1.6	0.08	0.46			5	**22**
	2023-01-23	Cloudy, Turbid		26.9	6.61	569	8.00	164.3		**76.9**												0.04	0.001	0.9			0.5	0.01	0.42			5	5
	2023-02-23	Cloudy, Turbid		27.1	**6.47**	573	7.42	173.1		**54.0**		49	43	7	4	82	42	70	0.01	0.001	0.05	0.04	0.001	1.0	0.01	0.38	0.6	0.01	0.38			5	4
	2023-03-29	Cloudy, Turbid		26.1	8.13	541	**2.87**	-50.8		**92.6**												0.03	0.001	0.7			0.4	0.01	0.32			5	5
	2023-04-27	Cloudy, Turbid		21.6	8.24	558	8.16	-54.2		**92.8**												0.05	0.002	0.9	0.02	0.32	0.6	0.05	0.34			5	2
	2023-05-30	Cloudy, Turbid		19.3	7.68	587	**5.90**	-45.6		19.3												0.03	0.001	0.9	0.01	0.40	0.5	0.03	0.40			5	1
	2023-06-28	Cloudy, Turbid		16.4	8.02	605	**5.37**	-61.0		**91.1**		56	43	10	5	100	55	90	0.01	0.001	0.05	0.06	0.003	1.0	0.01	0.38	0.6	0.04	0.38			5	2
2023/2024	2023-07-31	Cloudy, Turbid		18.5	8.11	624	**5.98**	-68.3		**74.2**												0.04	0.001	1.0	0.01	0.36	0.6	0.02	0.36			5	4
	2023-08-23	Cloudy, Turbid		21.6	8.11	898	**4.19**	-77.4		**27.3**												0.02	0.001	0.9	0.01	0.36	0.5	0.07	0.36			5	3
	2023-09-20	Clear		22.7	8.07	1779	9.10	-70.9		8.3												0.02	0.001	0.8	0.05	0.30	0.5	0.03	0.35			5	1
	2023-10-25	Clear		25.2	8.22	2311	9.03	-71.5		**24.3**		277	103	52	13	560	245	135	0.01	0.001	0.05	0.02	0.001	1.0	0.01	0.30	0.7	0.23	0.31			5	2
	2023-11-22	Clear		25.9	8.18	2356	9.22	-81.2		8.4												0.04	0.001	0.8			0.5	0.02	0.25			5	4
	2023-12-19	Clear	7	29.3	8.34	3058	**5.89**	-90.9		7.1		423	138	72	18	763	322	165	0.01	0.001	0.05	0.01	0.003	0.5	0.01	0.01	0.5	0.10	0.01			5	10
	2024-02-21	Clear		29.3	8.38	3515	**5.69**	-82.2		3.4		457	137	69	19	884	318	160	0.01	0.001	0.05	0.01	0.001	0.5	0.01	0.09	0.4	0.01	0.09			1240	2
	2024-03-28	Clear Redox meter failed		25.4	8.26	3649	**4.07**			4.7												0.07	0.001	0.6	0.01	0.05	0.6	0.16	0.05			5	10
	2024-04-22	Clear		23.8	8.37	3849	**4.61**	-87.1		7.9												0.01	0.018	0.6	0.01	0.01	0.6	0.09	0.01			605	10
	2024-05-21	Clear		20.3	8.37	3102	8.18	-82.9		4.2												0.01	0.002	0.6	0.01	0.01	0.6	0.08	0.01			160	**18**
	2024-06-24	Clear	7.5	17.8	8.16	4884	8.11	-73.1		5.9		698	153	109	25	1280	407	188	0.01	0.001	0.05	0.06	0.007	0.6	0.01	0.01	0.6	0.08	0.60			160	**11**
2024/2025	2024-07-23	Clear	8	16.9	8.27	5426	7.57	-81.7		2.9												0.01	0.001	0.4	0.04	0.01	0.4	0.06	0.40			500	**18**
	2024-08-26	Clear	7.5	22.9	8.51	5187	8.47	-106.5		**21.0**												0.01	0.001	0.5	0.02	0.01	0.5	0.03	0.02			12500	8
	2024-09-24	Clear	7	22.4	8.23	5566	7.37	-96.3		3.7												0.01	0.002	0.7	0.04	0.01	0.7	0.01	0.04			5440	6
	2024-10-23	Clear	0.7	23.8	7.41	4994	9.66	95.1		0.7		686	139	110	26	1380	371	189	0.01	0.001	0.05	0.01	0.001	0.4	0.01	0.01	0.4	0.01	0.01			665	6
	2024-11-19	Clear	0.75	25.9	7.79	5432	7.39	119.5		4.5												0.02	0.001	0.5	0.01	0.01	0.5	0.01	0.01			7700	**13**
	2025-01-21	Clear	0.75	27.4	8.21	5043	**4.81**	-68.1		**31.0**												0.16	0.001	0.5	0.01	0.01	0.5	0.01	0.01			360	2
	2025-02-25	Clear	7.5	28.2	8.34	4782	**5.69**	-71.1		1.6		771	133	118	28	1340	336	169	0.01	0.001	0.05	0.01	0.001	0.4	0.01	0.01	0.4	0.01	0.01			1340	1
	2025-03-25	Clear	0.7	26.1	8.51	3421	**5.99**	-836.2		3.3												0.02	0.002	0.5	0.01	0.01	0.5	0.01	0.01			170	7
	2025-04-23	Clear	0.7	24.5	8.34	3483	6.68	-77.1		2.7												0.02	0.001	0.4	0.01	0.01	0.4	0.01	0.01			440	1
	2025-05-27	Clear	0.7	21.8	8.25	3391	**5.60**	-73.8		11.4		448	90	66	18	957	238	135	0.01	0.001	0.05	0.04	0.002	0.6	0.01	0.01	0.6	0.02	0.01			580	1
	2025-06-24	Clear	0.7	18.3	8.48	3530	**5.51**	-86.8		5.8												0.02	0.001	0.6	0.01	0.05	0.5	0.02	0.05			85	4
Reporting Period (2024/2025)	**Average**		3.2	23.5	8.21	4569	6.79	-116.6	0.0	8.1	0.0	635	121	98	24	1225.7	315	164.33	0.01	0.001	0.05	0.03	0.00	0.50	0.02	0.01	0.49	0.02	0.05	0.0	0.0	2707	6
	Maximum		8.0	28.2	8.51	5566	9.66	119.5	0.0	**31.0**	0.0	771	139	118	28	1380	371	189	0.01	0.001	0.05	0.16	0.00	0.70	0.04	0.05	0.70	0.06	0.40	0.0	0.0	12500	**18**
	Minimum		0.7	16.9	7.41	3391	**4.81**	-836.2	0.0	0.7	0.0	448	90	66	18	957	238	135	0.01	0.001	0.05	0.01	0.00	0.40	0.01	0.01	0.40	0.01	0.01	0.0	0.0	85	1
All Results	**Average**		3.8	23.5	8.02	2900	6.17	46.1	10.3	**41.1**	4.6	514.5	96	77.2	19	936.0	227.5	161.6	0.03	0.00159	0.05	0.04	0.00	0.92	0.01	0.09	0.83	0.05	0.11	394.3	403.2	16273	9
	Maximum		8.0	30.9	**9.07**	**7007**	10.67	224.0	68.0	**593.0**	5.0	**833**	153	**125**	28	**1400**	407	270	0.19	0.005	0.07	0.36	0.02	2.10	0.05	0.46	1.60	0.37	0.60	4800.0	2160.0	**284000**	**51**
	80th Percentile		7.5	27.0	8.47	4962	8.18	147.0	10.8	**54.7**	5.0	729.2	130	110	24	1340	319.6	218.8	0.03	0.002	0.05	0.05	0.01	1.20	0.01	0.13	1.20	0.08	0.33	444.0	828.0	14900	**13**
	Median (50th Percentile)		0.8	23.4	8.11	3082	**5.98**	69.8	5.0	8.2	5.0	602	110	91	22	1085	266.5	169	0.01	0.002	0.05	0.03	0.00	0.90	0.01	0.01	0.75	0.02	0.02	110.0	120.0	605	7
	20th Percentile		0.7	20.6	7.69	888	**4.18**	-71.5	5.0	3.3	4.2	190	45	19.4	8	214.4	56.2	112.4	0.01	0.001	0.05	0.01	0.00	0.60	0.01	0.01	0.50	0.01	0.01	20.0	18.0	5	2
	Minimum		0.7	15.7	**6.40**	318	**0.20**	-836.2	1.7	-9.7	2.0	41	14	6	3	75	14	33	0.01	0.001	0.01	0.01	0.00	0.40	0.01	0.01	0.40	0.01	0.01	10.0	10.0	5	1

Red and **bold** values exceed the objective value for that analyte. IS - Insufficient data for statistical analysis. NS = No Sample Required. ND = No Data. NLM = No Longer Monitored
NV - Not visible

Site:	DP2		Physical									Major Cations & Anions							Metals			Nutrients								Bacteria / Algae			
Sample Date		Comments/ Flow	Water Level m AHD	Temp °C	pH	ElectricalConductivity uS/cm	Dissolved Oxygen mol/L	Redox mV	Total Suspended Solids mg/L	Turbidity NTU	Oil & Grease mg/L	Sodium mg/L	Calcium mg/L	Magnesium mg/L	Potassium mg/L	Chloride mg/L	Sulfate mg/L	Bicarbonate mg/L	Aluminium mg/L	Arsenic mg/L	Iron (filterable) mg/L	Total Phosphorous mg/L	Reactive Phosphorous mg/L	Total Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	TKN mg/L	Ammonia mg/L	NOx mg/L	Faecal coliforms cells/ml	Enterococci cells/ml	Potentially Toxic Cyanobacteria	Chlorophyll a
		Objectives	-	-	*6.5-9.0*	*<6192*	*>6*			*<20*	*10*	*<813*		*<119*	*<40*	*<1390*	*<800*	*<400*	*<0.5*	*<0.42*	*<20*							*<20*				*<50000*	*<10*
Pre-Extraction	2015-11-30	No sample collected due to equipment failure. Fine Sunny Approx 30mm rain previous week (BoM - Coolangatta).																															
	2016-01-26	Fine, clear, some algae, cattle & ducks		27.3	**8.61**	663	**5.87**	194	4.3	**4.7**	2	64	25	12	7	120	16	94	0.07	0.001	0.07	0.05	0.020	0.94			0.94	0.02	0.02	128	174		
	2016-02-25	Fine, clear, some algae, ducks		23.7	8.26	613	**3.75**	124	9	5.1	4	67	27	12	8	120	15	96	0.10	0.002	0.01	0.04	0.020	0.91			0.91	0.02	0.02	140	50		
	2016-03-17	Overcast, some algae, water birds, cattle		26.6	7.79	615	**3.43**	82	4.3	**3.5**	4	65	27	12	8	110	14	94	0.05	0.002	0.01	0.04	0.020	0.82			0.82	0.02	0.02	150	**340**		
	2017-10-08	Algae/chrorophyll only to lab		27.5	7.8	890	6.41	58.8		**143**																					5	9
2017/2018	2017-10-30	**Commencement of extraction**																															
	2017-10-30	Daily monitoring requirement for first 2 weeks of dredging.		23.3	7.7	932	**4.25**	230																									
	2017-10-31	Daily monitoring requirement for first 2 weeks of dredging.		20.3	7.7	1029	**4.01**	175																									
	2017-11-01	Daily monitoring requirement for first 2 weeks of dredging.		21.2	7.4	997	**4.11**	192																									
	2017-11-02	Daily monitoring requirement for first 2 weeks of dredging.		21.8	7.7	957	**2.77**	209																									
	2017-11-03	Daily monitoring requirement for first 2 weeks of dredging.		20.4	7.7	1158	**2.96**	204																									
	2017-11-06	Daily monitoring requirement for first 2 weeks of dredging.		22.4	7.6	1118	**4.1**	217																									
	2017-11-07	Daily monitoring requirement for first 2 weeks of dredging.		22	7.6	1098	**3.8**	211																									
	2017-11-08	Daily monitoring requirement for first 2 weeks of dredging.		21.9	7.6	1125	**3.9**	210																									
	2017-11-09	Daily monitoring requirement for first 2 weeks of dredging.		21.4	7.7	1065	**3.98**	204																									
	2017-11-10	Daily monitoring requirement for first 2 weeks of dredging.		21.6	7.8	1069	**3.92**	208																									
	2017-11-13	Daily monitoring requirement for first 2 weeks of dredging.		21.3	7.6	1762	**4.1**	134																									
	2017-11-14	Daily monitoring requirement for first 2 weeks of dredging.		21.5	8.1	1806	**4.3**	124																									
	2017-11-15	Daily monitoring requirement for first 2 weeks of dredging.		20.5	7.1	1769	**4.3**	178																									
	2017-11-21	Daily monitoring requirement for first 2 weeks of dredging.		21.4	7.2	1586	**4.7**	143																									
	2017-11-28								38		5	453	109	71	18	882	198	239	0.01	0.001	0.05	0.09	0.010	1.4	0.01	0.02	1.4	0.13	0.02	150	1180	5	9
	2017-11-30	Weekly monitoring requirement.		21.6	7.3	1458	**5**	154																									
	2017-12-06	Weekly monitoring requirement.		22	7.9	3290	6.28	199																									
	2017-12-13	Weekly monitoring requirement.		22.7	7.8	3140	**3.58**	144																									
	2017-12-13			27	7.42	4010	**0.19**	131		**88.9**		565	122	90	22	996	261	228	0.01	0.001	0.05	0.1	0.010	1.4	0.01	0.01	1.4	0.12	0.01			5	**40**
	2017-12-20	Weekly monitoring requirement.		23.3	7.7	3450	**3.88**	158																									
	2018-01-11			32	8.11	3998	6.8	-0.8	18	**22.1**	5	624	137	95	24	1080	274	241	0.01	0.002	0.05	0.05	0.010	1.3	0.01	0.01	1.3	0.01	0.01	130	120	1250	**12**
	2018-01-12	Weekly monitoring requirement.		21.7	7.6	1600	**4.1**	271																									
	2018-01-17	Weekly monitoring requirement.		20.9	7.4	791	**3.37**	153																									
	2018-01-23	Weekly monitoring requirement.		21.7	7.6	1560	**4.07**	265																									
	2018-01-24			29.1	7.78	4849	**4.88**	41.2		**34.4**		613	130	99	23	1250	298	220	0.01	0.002	0.05	0.08	0.010	1.4	0.01	0.05	1.4	0.21	0.05			6830	**24**
	2018-01-31	Weekly monitoring requirement.		22.3	8.1	1008	**5.02**	1322																									
	2018-02-07			27.3	7.88	4918	**5.35**	32.5		**23.8**	5	680	135	101	24	1340	305	260	0.02	0.002	0.05	0.06	0.010	1.2	0.01	0.02	1.2	0.04	0.02				**25**
	2018-02-07	Weekly monitoring requirement.		21.2	7.8	3900	**5.66**	206																									
	2018-02-08	**Last day of first extraction campaign.**																															
	2018-03-08			25.3	7.92	4614	7.43	63		17.6		584	123	90	21	1180	292	236	0.03	0.002	0.05	0.01	0.010	1	0.01	0.04	1	0.02	0.04			4020	**38**
	2018-04-13			26.2	8.4	4708	8.15	178		**104**																						7880	7
	2018-05-31			19.2	8.08	3929	**4.98**	61		7.1	5	628	127	95	22	1290	311	270	0.01	0.002	0.05	0.01	0.010	0.8	0.01	0.04	0.8	0.07	0.04	60	100	14300	8
2018/2019	2018-10-25			25.1	**8.61**	4535	8.71	82	10	12	5	674	119	100	22	1210	335	190	0.05	0.005	0.05	0.04	0.010	1.1	0.01	0.01	1.1	0.03	0.01	80	110	46500	**12**
	2018-12-03			27.9	**8.83**	5076	9.26	60.1	12	11.4		694	118	108	24	1320	303	181	0.05	0.002	0.05	0.02	0.01	1.2	0.01	0.02	1.2	0.02	0.02			**264000**	**18**
	2018-12-17			26.3	**8.71**	5037	9.65	28	9	9.2		688	107	99	23	1300	294	174	0.04	0.002	0.05	0.01	0.01	1.4	0.01	0.01	1.4	0.01	0.01			**409000**	**32**
	2019-01-15			30.5	**8.53**	5105	**5**	39.5	6	10.7	5	694	97	104	23	1310	297	139	0.03	0.002	0.05	0.02	0.01	1.2	0.01	0.01	1.2	0.05	0.01	180	460	**76800**	**13**
	2019-02-07			29	8.46	5208	7.72	-7.8	5	4.6		772	116	119	27	1370	317	171	0.02	0.002	0.05	0.01	0.005	1.2	0.01	0.01	1.2	0.05	0.01			29500	**12**
	2019-02-21			27.8	7.76	5410	7.76	41.5	5	**39.3**		774	109	116	26	1380	330	158	0.03	0.002	0.05	0.02	0.001	1.2	0.01	0.01	1.2	0.02	0.01			3970	6
	2019-03-06			27	8.43	5367	8.98	11.8	5	2.1		739	112	113	25	1360	318	190	0.02	0.002	0.05	0.05	0.01	0.6	0.01	0.01	0.6	0.01	0.01			835	7
	2019-03-21			28	**8.67**	5954	**5.65**	-109	5	3.22		731	110	110	25	1300	293	165	0.03	0.002	0.05	0.02	0.002	1	0.01	0.01	1	0.02	0.01			18100	6
	2019-04-03			24.8	8.47	5179	**5.24**	107	8	7.9	5	745	125	114	24	1250	299	178	0.04	0.002	0.05	0.03	0.001	1.1	0.01	0.01	1.1	0.02	0.01	240	140	38300	**12**
	2019-05-01			24	8.29	4616	8.78	51.9	5	4.7		782	126	119	26	1310	295	189	0.01	0.002	0.05	0.03	0.001	1	0.01	0.01	1	0.04	0.01			**61500**	9
	2019-06-05			18.4	7.8	4135	7.5	63.9	5	9.9		707	125	111	24	1280	309	224	0.01	0.002	0.05	0.02	0.002	1.3	0.02	0.05	1.2	0.36	0.07			9940	10
2019/2020	2019-07-03			18.6	8.49	**6564**	6.68	85	5	3	5	728	126	112	24	1260	261	227	0.01	0.001	0.05	0.01	0.001	1.2	0.02	0.11	1.1	0.14	0.13	80	140	26000	9
	2019-07-31			18.2	**8.53**	**7136**	6.24	117	5	7.3		719	124	109	24	1350	314	215	0.01	0.001	0.05	0.02	0.001	1.1	0.01	0.11	1	0.02	0.11			17000	8
	2019-09-03			21.4	**8.7**	5497	8.2	122.3	5	6.8		741	125	113	24	1350	330	186	0.01	0.001	0.05	0.02	0.001	0.9	0.01	0.01	0.9	0.02	0.01			44600	8
	2019-10-02			25.1	**8.7**	5312	6.7	80.4	5	5.8	5	755	131	114	25	1380	309	193	0.01	0.002	0.05	0.02	0.001	1	0.01	0.01	1	0.02	0.01	100	10	30800	10
	2019-11-06			23.1	8.5	4977	8.6	37.8	8	3.7		727	105	109	25	1340	319	190	0.02	0.002	0.05	0.02	0.001	1.2	0.01	0.01	1.2	0.02	0.01			**215000**	**14**
	2020-01-15	pH meter calibration issue - spurious data.		28.5	**9.1***	6007	8.2	-77.3	5	4.6		**844**	124	**126**	28	**1420**	322	162	0.01	0.002	0.05	0.02	0.001	1	0.01	0.01	1	0.01	0.01	820	590	5	7
	2020-04-28	Land-based extraction commenced 16/04/20		25.1	8.12	3594	8.81	53.3	5	**24.9**	5	525	64	77	18	1000	188	132	0.01	0.002	0.05	0.01	0.001	0.8	0.01	0.01	0.8	0.02	0.01	40	90	3700	2
2020/2021	2020-07-07	Cloudy.		17.1	**6.4**	3700	9	116	5	3.8	5	602	88	90	20	1020	221	174	0.01	0.002	0.05	0.02	0.006	0.96	0.01	0.04	0.9	0.18	0.04	60	20	11900	
	2020-08-12	Clear		18.4	8.3	3488	10.6	92	5	7.3	5	559	90	82	19	1020	182	168	0.01	0.001	0.05	0.01	0.001	1	0.01	0.04	0.9	0.04	0.05	30	10	17500	9
	2020-09-16			21.6	8.41	3636	10.59	85.1	5	**45.8**	5	570	87	84	19	1080	189	149	0.01	0.002	0.05	0.03	0.001	0.8	0.01	0.01	0.8	0.01	0.01	10	10	22600	**11**
	2020-10-14			24.7	**8.53**	3489	9.46	47.9	5	14.3	5	567	96	82	19	1040	232	136	0.02	0.002	0.05	0.02	0.001	0.8	0.01	0.01	0.8	0.01	0.01			4480	6
	2020-11-11			24.7	8.33	3677	9.31	-21.7	5	3		548	86	81	18	1060	236	143	0.03	0.002	0.05	0.01	0.001	0.8	0.01	0.01	0.8	0.01	0.01	10	180	1160	5
	2021-02-24	Clear		26.7	8.03	3050	8.15	67.4	5	5.6		433	77	65	16	901	194	127	0.04	0.002	0.05	0.01	0.004	0.7	0.01	0.01	0.7	0.2	0.01	620	180	4090	5
	2021-06-10	Clear		17.5	8.08	2451	9.02	78.6	5	3.38		392	69	56	14	782	163	136	0.01	0.002	0.05	0.01	0.001	0.7	0.02	0.04	0.6	0.18	0.06	10	50	5	2
2021/2022	2021-10-20	Clear (New channel NW)		25.52	8.49	2814	6.68	-98.5		5.7	NV											0.02	0.001	0.8	0.01	0.06	0.7	0.1	0.06			5	**11**
	2022-01-25			28.2	8.3	1975	6.43	-110.3		6.1	NV	325	74	48	12	630	140	122	0.02	0.001	0.05	0.02	0.001	0.6	0.01	0.01	0.6	0.04	0.01			946	4
	2022-02-22	Cloudy		30.25	8.3	1904	7.01	-104.6		**32**	NV											0.03	0.002	0.7	0.01	0.01	0.7	0.03	0.01			2590	4
	2022-04-27	Cloudy		22.93	7.08	271	7.1	-46.8		**41**	NV	37	14	6	2	64	22	36	0.01	0.001	0.05	0.13	0.003	1	0.01	0.14	0.9	0.01	0.14			5	5
	2022-05-23	Due to major flood event, high rainfall, and poor drainage the site was deemed inaccessible to undertake sampling during May 2022.																															
	2022-06-22	Due to previous major flood events, ongoing rain and slow drainage, the site was deemed inaccessible to undertake sampling during June 2022.																															

2022/2023	2022-07-27	Cloudy, Very Turbid		16.3	7.05	442	6.34	125.2		**1000.0**												0.96	0.004	4.6	0.01	0.35	4.2	0.1	0.35			5	5
	2022-08-31	Cloudy, Very Turbid		20.6	7.22	400	7.02	209.2		**615.0**		54	32	7	4	89	32	58	0.01	0.001	0.05	0.24	0.002	2.0	0.01	0.46	1.5	0.1	0.46			5	10
	2022-09-28	Cloudy, Very Turbid		22.6	8.02	454	6.97	-103.4		**966.0**												0.46	0.005	2.4			2.1	0.1	0.33			5	5
	2022-10-26	Cloudy, Turbid		25.1	7.53	463	**5.12**	111.9														0.16	0.003	1.5	0.01	0.37	1.1	0.0	0.37			5	2
	2022-11-29	Cloudy, Turbid		23.1	7.84	500	**4.25**	87.9		**759.0**		48	37	7	4	91	41	77	0.01	0.001	0.05	0.74	0.002	5.8	0.01	0.43	5.4	0.0	0.43			5	**22**
	2023-01-23	Cloudy, Turbid		27.0	6.68	561	8.00	158.3		**82.9**												0.05	0.001	1.0			0.6	0.0	0.42			5	5
	2023-02-23	Cloudy, Turbid		26.5	6.90	556	7.15	193.2		**68.5**		44	45	8	4	83	42	72	0.01	0.001	0.05	0.05	0.002	1.0	0.01	0.40	0.6	0.0	0.40			5	4
	2023-03-29	Cloudy, Turbid		26.1	8.15	548	**2.82**	-52.1		**86.1**												0.02	0.001	0.7			0.4	0.0	0.32			5	5
	2023-04-27	Cloudy, Turbid		21.1	8.01	571	8.63	-43.1		**177.1**												0.08	0.002	1.2	0.01	0.29	0.9	0.1	0.29			5	2
	2023-05-30	Cloudy, Turbid		18.9	7.69	583	7.08	-50.5		**82.5**												0.04	0.002	0.9	0.01	0.41	0.5	0.0	0.41			5	1
	2023-06-28	Cloudy, Turbid		16.8	7.82	603	**4.99**	-49.5		**113.0**		57	43	10	5	106	56	91	0.01	0.001	0.05	0.07	0.002	1.0	0.01	0.38	0.6	0.1	0.38			5	2
2023/2024	2023-07-31	Cloudy, Turbid		20.0	8.42	557	**5.80**	-79.8		**71.8**												0.03	0.001	1.0	0.01	0.36	0.6	0.0	0.36			5	4
	2023-08-23	Cloudy, Turbid		20.7	8.06	890	**4.11**	-74.3		**33.9**												0.02	0.001	0.8	0.01	0.37	0.4	0.0	0.37			5	3
	2023-09-20	Cloudy/Turbid		22.7	8.08	1754	10.25	-70.5		**23.1**												0.01	0.001	1.0	0.05	0.31	0.6	0.1	0.36			5	1
	2023-10-25	Clear		25.4	8.50	2265	10.13	-70.9		13.9		274	104	51	13	560	246	135	0.01	0.001	0.05	0.01	0.001	0.8	0.01	0.31	0.5	0.0	0.32			5	2
	2023-11-22	Clear		27.3	8.16	2319	10.06	-79.3		11.5												0.08	0.001	0.9			0.7	0.0	0.24			5	4
	2023-12-19	Clear	7	29.5	8.34	3030	**5.72**	-90.6		7.7		419	138	72	18	774	326	165	0.01	0.001	0.05	0.01	0.003	0.5	0.01	0.01	0.5	0.0	0.01			5	10
	2024-02-21	Clear		29.4	8.33	3414	**5.75**	-79.4		5.1		467	144	69	19	803	323	161	0.01	0.001	0.05	0.01	0.001	0.4	0.01	0.01	0.4	0.0	0.01			1240	2
	2024-03-28	Clear		25.0	8.27	3666	**5.61**			6.2												0.27	0.001	0.7	0.01	0.01	0.7	0.0	0.01			5	10
	2024-04-22	Clear		23.5	8.36	3838	**4.44**	-86.4		8.4												0.01	0.008	0.7	0.01	0.09	0.6	0.1	0.09			605	10
	2024-05-21	Clear		20.2	8.40	3102	8.56	-85.4		5.2												0.01	0.002	0.4	0.01	0.01	0.4	0.0	0.01			160	**18**
	2024-06-24	Clear	7.5	17.2	8.24	4906	8.08	-76.9		5.5		681	151	105	24	1280	406	189	0.01	0.001	0.05	0.02	0.004	0.6	0.01	0.02	0.6	0.1	0.60			160	**11**
2024/2025	2024-07-23	Clear	8	16.7	8.35	5387	7.89	-84.6		2.6												0.01	0.001	0.4	0.04	0.01	0.4	0.08	0.40				
	2024-08-26	Clear	7.5	22.5	8.33	5328	7.71	-99.5		1.6												0.01	0.001	0.4	0.02	0.01	0.4	0.02	0.02				
	2024-09-24	Clear	7	22.5	8.24	5575	7.59	-96.7		4.1												0.01	0.002	0.6	0.02	0.03	0.6	0.0	0.05				
	2024-10-23	Clear	0.7	23.7	7.59	5055	9.57	92.7		0.4		679	141	111	26	1360	387	165	0.01	0.001	0.05	0.01	0.001	0.5	0.01	0.01	0.5	0.0	0.01			665	6
	2024-11-19	Clear	0.75	25.9	7.82	5433	7.21	108.7		4.3												0.02	0.001	0.6	0.01	0.01	0.6	0.02	0.01			7700	**13**
	2025-01-21	Clear	0.75	27.5	8.25	5078	**5.39**	-69.7		1.9												0.17	0.001	0.5	0.01	0.01	0.5	0.02	0.01				
	2025-02-25	Clear	7.5	28.0	8.32	4809	6.26	-70.1		1.6		749	130	113	27	1360	359	167	0.01	0.001	0.05	0.01	0.001	0.4	0.01	0.01	0.4	0.01	0.01			1340	1
	2025-03-25	Clear	0.7	26.1	8.53	3473	6.54	-82.4		3.5												0.02	0.001	0.5	0.01	0.01	0.5	0.01	0.01			170	7
	2025-04-23	Clear	0.7	24.3	8.35	3486	7.12	-77.3		2.8												0.01	0.001	0.4	0.01	0.01	0.4	0.01	0.01			440	1
	2025-05-27	Clear	0.7	22.0	8.29	3390	6.46	-76.9		9.2		446	91	66	18	962	240	136	0.01	0.001	0.05	0.03	0.001	0.6	0.01	0.01	0.6	0.04	0.01			580	1
	2025-06-24	Clear	0.7	18.4	8.51	3527	6.01	-88.8		3.5												0.03	0.002	0.5	0.01	0.04	0.5	0.02	0.04			85	4

Reporting Period (2024/2025)	**Average**	3.2	23.4	8.23	4595	7.07	-49.5	0.0	3.2	0.0	624.7	121	96.667	24	1227.3	328.67	156	0.01	0.001	0.05	0.03	0.00	0.49	0.01	0.01	0.49	0.02	0.05	0.0	0.0	1569	5
	Maximum	8.0	28.0	8.53	5575	9.57	108.7	0.0	9.2	0.0	749	141	113	27	1360	387	167	0.01	0.001	0.05	0.17	0.00	0.60	0.04	0.04	0.60	0.08	0.40	0.0	0.0	7700	**13**
	Minimum	0.7	16.7	7.59	3390	**5.39**	-99.5	0.0	0.4	0.0	446	91	66	18	962	240	136	0.01	0.001	0.05	0.01	0.00	0.40	0.01	0.01	0.40	0.01	0.01	0.0	0.0	85	1
All Results	**Average**	3.8	23.5	8.00	2944	6.34	69.7	7.4	**69.0**	4.7	527.8	99	80.479	19	977.6	238.63	163.5	0.02	0.00165	0.05	0.07	0.00	1.04	0.01	0.09	0.95	0.05	0.11	159.9	208.1	21339	9
	Maximum	8.0	32.0	8.83	**7136**	10.60	1322.0	38.0	**1000.0**	5.0	**844**	151	**126**	28	**1420**	406	270	0.10	0.005	0.07	0.96	0.02	5.80	0.05	0.46	5.40	0.36	0.60	820.0	1180.0	**409000**	**40**
	80th Percentile	7.5	27.0	8.43	5013	8.42	177.4	8.8	**54.9**	5.0	732.6	128	112.2	25	1342	319.6	216	0.03	0.002	0.05	0.06	0.01	1.20	0.01	0.13	1.20	0.07	0.32	180.0	340.0	17860	**12**
	Median (50th Percentile)	0.8	23.1	8.08	3215	6.38	63.9	5.0	7.8	5.0	607.5	110	92.5	22	1130	292.5	166	0.01	0.002	0.05	0.02	0.00	0.93	0.01	0.01	0.80	0.02	0.02	100.0	120.0	750	7
	20th Percentile	0.7	20.6	7.60	907	**4.11**	-76.9	5.0	3.6	4.6	314.8	68	50.4	13	616	158.4	126	0.01	0.001	0.05	0.01	0.00	0.60	0.01	0.01	0.50	0.01	0.01	30.0	20.0	5	3
	Minimum	0.7	16.3	**6.40**	271	**0.19**	-110.3	4.3	0.4	2.0	37	14	6	2	64	14	36	0.01	0.001	0.01	0.01	0.00	0.40	0.01	0.01	0.40	0.01	0.01	10.0	10.0	5	1

Red and **bold** values exceed the objective value for that analyte. IS - Insufficient data for statistical analysis. NS = No Sample Required. ND = No Data. NLM = No Longer Monitored
NV - Not visible

Site:	DP3		Physical									Major Cations & Anions							Metals			Nutrients									Bacteria / Algae			
Sample Date		Comments/ Flow	Water Level m AHD	Temp °C	pH	ElectricalConductivity uS/cm	Dissolved Oxygen mol/L	Redox mV	Total Suspended Solids mg/L	Turbidity NTU	Oil & Grease mg/L	Sodium mg/L	Calcium mg/L	Magnesium mg/L	Potassium mg/L	Chloride mg/L	Sulfate mg/L	Bicarbonate mg/L	Aluminium mg/L	Arsenic mg/L	Iron (filterable) mg/L	Total Phosphorous mg/L	Reactive Phosphorous mg/L	Total Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	TKN mg/L	Ammonia mg/L	NOx mg/L	Faecal coliforms cells/ml	Enterococci cells/ml	Potentially Toxic Cyanobacteria	Chlorophyll a
		Objectives	-	-	*6.5-9.0*	*<6192*	*>6*			*<20*	*10*	*<813*		*<119*	*<40*	*1390*	*<800*	*<400*	*<0.5*	*<0.42*	*<20*							*<20*		*<1000/10*	*<230/100*	*<50000*	*<10*
Pre-Extraction	2017-10-08	Algae/chrorophyll only to lab		27.3	7.87	898	7.17	63.4		139																						5	7
2017/2018	2017-10-30	**Commencement of extraction**																															
	2017-10-30	Daily monitoring requirement for first 2 weeks of dredging.		23.5	7.8	956	4.8	225																									
	2017-10-31	Daily monitoring requirement for first 2 weeks of dredging.		19.4	7.9	1266	4.83	184																									
	2017-11-01	Daily monitoring requirement for first 2 weeks of dredging.		20.5	7.9	1170	4.83	195																									
	2017-11-02	Daily monitoring requirement for first 2 weeks of dredging.		21.9	7.6	1119	2.17	211																									
	2017-11-03	Daily monitoring requirement for first 2 weeks of dredging.		20.7	7.7	1202	3.46	205																									
	2017-11-06	Daily monitoring requirement for first 2 weeks of dredging.		22.5	7.6	1117	4.1	219																									
	2017-11-07	Daily monitoring requirement for first 2 weeks of dredging.		22	7.6	1098	3.82	209																									
	2017-11-08	Daily monitoring requirement for first 2 weeks of dredging.		21.9	7.6	1128	3.88	212																									
	2017-11-09	Daily monitoring requirement for first 2 weeks of dredging.		21.7	7.6	1043	3.94	210																									
	2017-11-10	Daily monitoring requirement for first 2 weeks of dredging.		21.7	7.8	1073	3.97	211																									
	2017-11-13	Daily monitoring requirement for first 2 weeks of dredging.		21.1	7.6	1783	4.2	136																									
	2017-11-14	Daily monitoring requirement for first 2 weeks of dredging.		21.7	8.2	1784	4.8	120																									
	2017-11-15	Daily monitoring requirement for first 2 weeks of dredging.		21.3	7.4	1790	4.1	132																									
	2017-11-21	Daily monitoring requirement for first 2 weeks of dredging.		21.4	7.7	1752	5.3	136																									
	2017-11-28			30.5	8.02	3304	8.66	28.6	16	11.7	5	456	104	73	18	845	192	241	0.02	0.001	0.05	0.06	0.010	1.20	0.01	0.01	1.2	0.02	0.01	260	1620	5	3
	2017-11-30	Weekly monitoring requirement.		21.7	7.4	1584	4.9	129																									
	2017-12-06	Weekly monitoring requirement.		22	7.9	3260	6.31	199																									
	2017-12-13	Weekly monitoring requirement.		22.6	7.8	3220	3.67	153																									
	2017-12-13			28.7	7.89	3977	0.19	92		31.4		562	120	89	22	994	249	225	0.01	0.001	0.05	0.12	0.010	1.50	0.01	0.01	1.5	0.21	0.01			5	25
	2017-12-20	Weekly monitoring requirement.		23.3	7.5	3540	3.57	161																									
	2018-01-11			30.8	8.04	3935	2.14	-0.5	14	25.5	5	612	135	95	24	1090	272	240	0.01	0.002	0.05	0.04	0.010	1.20	0.01	0.01	1.2	0.01	0.01	130	260	5200	16
	2018-01-12	Weekly monitoring requirement.		21.7	7.7	1660	4.3	180																									
	2018-01-17	Weekly monitoring requirement.		20.8	7.5	857	3.4	145																									
	2018-01-23	Weekly monitoring requirement.		21.7	7.7	1620	4.21	178																									
	2018-01-24			27.4	7.53	4665	2.75	5.3	53.7			592	127	94	22	1260	300	224	0.01	0.002	0.05	0.08	0.010	1.50	0.01	0.06	1.4	0.23	0.06			9200	13
	2018-01-31	Weekly monitoring requirement.		23.3	8.2	1068	2.55	168																									
	2018-02-07	Depth 4.7m		26.4	7.52	4786	4.83	28		26.3	5	681	136	101	25	1350	307	266	0.01	0.002	0.05	0.08	0.010	1.30	0.01	0.01	1.3	0.14	0.01				25
	2018-02-07	Weekly monitoring requirement.		20.9	7.8	3980	5.08	201																									
	2018-02-08	**Last day of first extraction campaign.**																															
	2018-03-08			25.1	7.91	4661	5.15	49		11.4		613	127	93	22	1190	249	241	0.03	0.002	0.05	0.01	0.010	1.20	0.01	0.06	1.1	0.01	0.06			1400	48
	2018-04-13			26.2	7.28	4564	7.17	166		0.7		609	131	97	22	1160	322	246	0.02	0.002	0.05	0.03	0.010	1.00	0.01	0.01	1	0.02	0.01			4970	10
	2018-05-31			19.6	8.09	3959	6.08	53		7.9	5	633	127	96	22	1300	311	273	0.01	0.002	0.05	0.01	0.010	0.70	0.01	0.03	0.7	0.06	0.03	50	80	20900	8
2018/209	2018-10-25			24.9	8.65	4541	6.87	79	10	14.8	5	690	121	101	22	1200	323	194	0.05	0.005	0.05	0.03	0.010	1.00	0.01	0.01	1	0.04	0.01	120	50	55600	13
	2018-12-03			27.5	8.81	5042	9.25	116	14	12.4		656	110	100	22	1320	300	180	0.04	0.001	0.05	0.02	0.01	1.2	0.01	0.01	1.2	0.06	0.01			418000	18
	2018-12-17			26.5	8.72	5054	9.71	18	6	10.8		686	107	99	23	1180	300	170	0.04	0.002	0.1	0.04	0.01	1.4	0.01	0.01	1.4	0.05	0.01			315000	32
	2019-01-15			28.9	8.5	4938	4.94	69.5	13	7.3	5	679	96	103	23	1320	302	137	0.03	0.001	0.05	0.02	0.01	1.2	0.01	0.01	1.2	0.05	0.01	90	150	105000	16
	2019-02-07			28.3	8.44	5156	7.62	-70.5	ND	3.1		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	0.005	1.2	0.01	0.02	1.2	0.05	0.02			23200	8
	2019-02-21			28	8.36	5452	8.02	28.8	5	31.6		767	111	115	26	1390	331	154	0.03	0.002	0.05	0.01	0.001	1.1	0.01	0.01	1.1	0.01	0.01			3960	5
	2019-03-06			26.7	8.36	5335	9.04	16.2	5	0.6		721	110	110	24	1380	320	188	0.02	0.002	0.05	0.05	0.006	0.7	0.01	0.01	0.7	0.02	0.01			1040	7
	2019-03-21			27.7	8.46	5954	5.74	-94.8	5	3.21		745	110	112	26	1290	293	162	0.03	0.002	0.05	0.02	0.001	1	0.01	0.01	1	0.01	0.01			12100	9
	2019-04-03			25	8.44	5291	4.91	197	10	7.8	5	746	126	114	24	1240	302	170	0.02	0.002	0.05	0.05	0.002	1.1	0.01	0.01	1.1	0.05	0.01	330	270	27500	9
	2019-05-01			23.2	8.19	4553	7.72	-62	5	6.1		800	127	119	25	1300	294	188	0.01	0.002	0.05	0.02	0.001	0.9	0.01	0.01	0.9	0.04	0.01			63600	10
	2019-06-05			18.4	7.7	4147	7.4	73	6	-9.7		710	128	110	24	1270	306	224	0.01	0.002	0.05	0.03	0.002	1.4	0.02	0.04	1.3	0.36	0.06			11900	11
2019/2020	2019-07-03			19.7	8.39	6587	7.05	87	5	1.8	5	733	125	108	24	1280	249	224	0.01	0.001	0.05	0.01	0.001	1.3	0.02	0.14	1.1	0.14	0.16	50	40	19800	10
	2019-07-31			18.4	8.39	7215	6.6	95.8	5	9.1		702	125	110	24	1330	304	212	0.01	0.001	0.05	0.02	0.001	1.1	0.01	0.11	1	0.01	0.11			27600	7
	2019-09-03			20.8	7.4	5514	9.5	116.4	5	9.6		738	124	111	23	1340	333	175	0.01	0.001	0.05	0.02	0.001	1.1	0.01	0.01	1.1	0.03	0.01			33200	14
	2019-10-02			24.5	8.55	5283	5.9	95.3	5	5.3	5	754	129	113	24	1390	312	194	0.01	0.002	0.05	0.01	0.001	1.1	0.01	0.01	1.1	0.01	0.01	60	40	38400	10
	2019-11-06			22.7	8.5	4938	8.8	126.8	5	5.4		734	106	109	25	1290	318	187	0.02	0.002	0.05	0.02	0.001	1.2	0.01	0.01	1.2	0.02	0.01			100000	15
	2020-01-15	pH meter calibration issue - spurious data.		27.2	13.4*	5864	8	54.2	5	3		846	118	126	28	1400	316	163	0.02	0.001	0.05	0.01	0.001	1	0.01	0.01	1	0.02	0.01	120	80	5	9
	2020-04-28	Land-based extraction commenced 16/04/20.		24.2	8.21	3530	8.83	48.8	5	-2.4	5	531	64	78	18	1000	187	130	0.01	0.002	0.05	0.01	0.001	0.7	0.01	0.01	0.7	0.01	0.01	20	80	4260	3
2020/2021	2020-07-07	Clear.		16.7	6.4	3560	9.3	132	5	2.1	5	590	87	89	20	1020	216	174	0.01	0.002	0.05	0.01	0.005	0.9	0.01	0.02	0.9	0.16	0.02	70	10	5360	
	2020-08-12	Clear		17.8	8.03	3871	10.4	93	5	8.1	5	552	89	85	19	1030	183	165	0.02	0.002	0.05	0.03	0.001	1	0.01	0.04	1	0.05	0.05	20	30	36000	9
	2020-09-16			21.5	8.4	3639	10.5	137	8	95	5	572	87	85	19	1080	191	148	0.01	0.002	0.05	0.02	0.001	0.9	0.01	0.01	0.9	0.11	0.01	10	10	20500	11
	2020-10-14			23.7	8.38	3497	9.7	86.1	5	10.8	5	573	97	84	20	1030	230	141	0.03	0.002	0.05	0.02	0.001	0.8	0.01	0.01	0.8	0.01	0.01			6380	6
	2020-11-11			24.2	8.25	3687	9.35	87.9	5	2.9		549	88	82	19	1040	235	142	0.03	0.002	0.05	0.01	0.001	0.8	0.01	0.01	0.8	0.03	0.01	10	130	915	6
	2021-02-24	Clear		26.6	8.12	3047	8.35	-180.1	5	4		440	77	67	16	903	195	126	0.03	0.002	0.05	0.01	0.001	0.6	0.01	0.01	0.6	0.01	0.01	80	40	4000	5
	2021-06-10	Clear		18	8.05	2483	8.93	49.6	5	35.21		393	70	57	14	779	164	136	0.01	0.002	0.05	0.01	0.001	0.7	0.02	0.04	0.6	0.2	0.06	10	20	5	2
2021/2022	2021-10-20	Clear		23.95	8.41	2718	7.7	-93.4		2.1	NV											0.01	0.002	0.5	0.01	0.01	0.5	0.01	0.01			180	2
	2022-01-25			27.44	8.36	2148	6.55	-113.1		14	NV	338	73	47	12	654	141	120	0.02	0.001	0.05	0.01	0.001	0.5	0.01	0.04	0.5	0.02	0.04			355	2
	2022-02-22	Clear		28.93	8.67	1998	6.65	-125.6		12	NV											0.02	0.002	0.7	0.01	0.01	0.7	0.03	0.01			20400	1
	2022-04-27	Cloudy		22.94	6.94	236	6.43	-39.1		45	NV	46	13	6	3	71	21	35	0.01	0.001	0.05	0.1	0.003	0.8	0.01	0.16	0.6	0.01	0.16			5	5
	2022-05-23	Due to major flood event, high rainfall, and poor drainage the site was deemed inaccessible to undertake sampling during May 2022.																															
	2022-06-22	Due to previous major flood events, ongoing rain and slow drainage, the site was deemed inaccessible to undertake sampling during June 2022.																															

2022/2023	2022-07-27	Cloudy		16.16	7.46	415	6.02	128.6		**627**												0.29	0.002	1.4	0.01	0.32	1.1	0.01	0.32				
	2022-08-31	Cloudy, Very Turbid		20.37	7.59	351	6.93	211.3		**413**		52	24	7	3	89	30	49	0.01	0.001	0.05	0.18	0.001	1.3	0.01	0.43	0.9	0.02	0.43			5	**12**
	2022-09-28	Cloudy, Turbid		21.64	7.55	420	6.86	-80.2		**309**												0.15	0.005	1.3			0.9	0.01	0.37				
	2022-10-26	Cloudy, Turbid		26.8	7.75	457	**4.77**	106.4														0.11	0.003	1.3	0.01	0.39	0.9	0.01	0.39			5	2
	2022-11-29	Cloudy, Turbid		23.42	7.82	497	**4.37**	85.5		**201**		49	37	7	4	86	36	64	0.01	0.001	0.05	0.15	0.005	1.8	0.01	0.45	1.3	0.01	0.45			5	**22**
	2023-01-23	Cloudy, Turbid		26.6	7.37	539	7.94	79.06		**79.15**												0.05	0.001	1.2			0.8	0.01	0.42			5	5
	2023-02-23	Cloudy, Turbid		25.9	6.63	548	7.29	153.7		**54.04**		48	43	7	4	84	41	71	0.01	0.001	0.05	0.03	0.001	1	0.01	0.39	0.6	0.02	0.39			5	4
	2023-03-29	Cloudy, Turbid, Frothin on shore		26.1	8.24	541	**3.12**	-56.1		**86.8**												0.03	0.001	0.7			0.4	0.01	0.31			5	5
	2023-04-27	Cloudy, Turbid		21.5	8.01	559	8.19	-42.1		**95.5**												0.04	0.003	0.9	0.01	0.34	0.6	0.02	0.34			5	2
	2023-05-30	Cloudy, Turbid		18.84	7.63	586	6.47	-46.2		**75.2**												0.03	0.001	0.9	0.01	0.41	0.5	0.01	0.41			5	1
	2023-06-28	Cloudy, Turbid		16.99	7.7	602	**4.82**	-44.7		**82.9**		58	44	10	5	98	55	90	0.01	0.001	0.05	0.06	0.003	1.2	0.01	0.38	0.8	0.07	0.38			5	2
2023/2024	2023-07-31	Cloudy, Turbid		18.62	8.1	604	**5.85**	-72.6		**71.63**												0.04	0.001	1	0.01	0.36	0.6	0.02	0.36			5	4
	2023-08-23	Cloudy, Turbid		21.97	8.05	893	**3.81**	-74.8		**23.9**												0.02	0.001	0.8	0.01	0.35	0.5	0.02	0.35			5	3
	2023-09-20	Clear		21.85	8.06	1758	6.59	-70.7		7.2												0.01	0.001	0.8	0.04	0.31	0.4	0.02	0.35			5	1
	2023-10-25	Clear		25.72	8.2	2332	9.62	-72.3		12.7		275	106	50	14	564	244	136	0.03	0.001	0.05	0.02	0.001	0.8	0.01	0.3	0.5	0.08	0.31			5	2
	2023-11-22	Clear		26.12	8.2	2315	9.81	-84.4		6.5												0.06	0.001	0.8			0.6	0.02	0.25			5	4
	2023-12-19	Clear	7	30.01	8.33	2996	6.49	-90.3		6.9		426	139	72	18	758	312	166	0.01	0.001	0.05	0.01	0.004	0.5	0.01	0.01	0.5	0.55	0.01			5	10
	2024-02-21	Clear		28.77	8.38	3487	6.03	-82.1		4.5		470	142	70	19	906	324	160	0.01	0.001	0.05	0.01	0.001	0.3	0.01	0.01	0.3	0.01	0.01			1240	2
	2024-03-28	Clear		25.52	8.35	3656	**4.88**			5.2												1.29	0.001	0.6	0.01	0.01	0.6	0.02	0.01			5	10
	2024-04-22	Clear		23.55	8.41	3881	**5.36**	-88.5		7.3												0.03	0.003	0.5	0.01	0.01	0.5	0.05	0.01			605	10
	2024-05-21	Clear		20.07	8.27	3079	7.77	-77.5		3.7												0.01	0.002	0.4	0.01	0.01	0.4	0.04	0.01			160	**18**
	2024-06-24	Clear	7.5	17.99	8.13	4877	7.99	-73.4		6.7		702	155	109	25	1290	405	190	0.01	0.001	0.05	0.05	0.001	0.6	0.01	0.01	0.6	0.09	0.6			160	**11**
2024/2025	2024-07-23	Clear	8	20.0	8.10	5386	7.69	-72.9		3.9												0.01	0.001	0.4	0.04	0.01	0.4	0.07	0.40				
	2024-08-26	Clear	7.5	22.9	8.23	5270	7.33	-93.1		2.3												0.01	0.001	0.5	0.02	0.01	0.5	0.02	0.02				
	2024-09-24	Clear	7	22.65	8.26	5572	8.09	-97.5		3.7												0.01	0.002	0.6	0.02	0.03	0.5	0.01	0.05				
	2024-10-23	Clear	0.7	23.8	6.96	5024	9.58	95.5		0.49		666	137	108	25	**1400**	381	186	0.01	0.001	0.05	0.01	0.001	0.5	0.01	0.01	0.5	0.01	0.01			665	6
	2024-11-19	Clear	0.75	25.87	7.8	5421	7.22	113.5		4.1												0.01	0.001	0.5	0.01	0.01	0.5	0.01	0.01			7700	**13**
	2025-01-21	Clear	0.75	27.21	7.96	5098	**5.37**	-56.1		2.1												0.16	0.001	0.5	0.01	0.01	0.5	0.01	0.01				
	2025-02-25	Clear	7.5	28.25	8.32	4797	**5.36**	-70.4		2.2		716	129	113	26	1370	347	173	0.01	0.001	0.05	0.01	0.001	0.5	0.01	0.01	0.5	0.01	0.01			1340	1
	2025-03-25	Clear	0.7	26.19	8.5	3435	**5.87**	-82.7		2.8												0.02	0.002	0.6	0.01	0.01	0.6	0.01	0.01			170	7
	2025-04-23	Clear	0.7	24.49	8.31	3479	6.59	-78.4		2.3												0.02	0.003	0.5	0.01	0.03	0.5	0.02	0.03			440	1
	2025-05-27	Clear	0.7	22.25	8.24	3372	6.26	-72.9		11.1		461	94	67	18	964	229	135	0.01	0.001	0.05	0.04	0.002	0.6	0.01	0.03	0.6	0.02	0.03			580	1
	2025-06-24	Clear	0.7	18.36	8.49	3503	**5.98**	-86.3		6.8												0.02	0.001	0.7	0.01	0.07	0.6	0.03	0.07			85	4

Reporting Period (2024/2025)	**Average**	3.2	23.8	8.11	4578	6.85	-45.6	0.0	3.8	0.0	614.3	120	96	23	1244.67	319	164.67	0.01	0.001	0.05	0.03	0.00	0.54	0.01	0.02	0.52	0.02	0.06	0.0	0.0	1569	5
	Maximum	8.0	28.3	8.50	5572	9.58	113.5	0.0	11.1	0.0	716	137	113	26	**1400**	381	186	0.01	0.001	0.05	0.16	0.00	0.70	0.04	0.07	0.60	0.07	0.40	0.0	0.0	7700	**13**
	Minimum	0.7	18.4	6.96	3372	**5.36**	-97.5	0.0	0.5	0.0	461	94	67	18	964	229	135	0.01	0.001	0.05	0.01	0.00	0.40	0.01	0.01	0.40	0.01	0.01	0.0	0.0	85	1
All Results	**Average**	3.8	23.4	7.97	3030	6.24	52.0	8.7	**41.0**	5.0	554.93	104	84.4	20	1029.44	250.489	169.22	0.02	0.0016	0.05	0.06	0.00	0.91	0.01	0.09	0.81	0.05	0.12	89.4	181.9	22018	9
	Maximum	8.0	30.8	8.81	**7215**	10.50	225.0	53.7	**627.0**	5.0	**846**	155	**126**	28	**1400**	405	273	0.05	0.005	0.10	1.29	0.01	1.80	0.04	0.45	1.50	0.55	0.60	330.0	1620.0	**418000**	**48**
	80th Percentile	7.5	26.7	8.38	4938	8.09	162.0	11.2	**45.0**	5.0	730.6	129	110	25	1328	319.6	224	0.03	0.002	0.05	0.06	0.01	1.20	0.01	0.15	1.10	0.06	0.34	126.0	216.0	20900	**13**
	Median (50th Percentile)	0.8	23.1	8.04	3338	6.29	73.0	5.0	7.8	5.0	612	110	95	22	1180	294	170	0.01	0.002	0.05	0.02	0.00	0.90	0.01	0.01	0.75	0.02	0.02	65.0	65.0	790	7
	20th Percentile	0.7	20.7	7.60	1068	**4.21**	-73.0	5.0	2.9	5.0	428.8	79	67	16	792.2	187.8	135.2	0.01	0.001	0.05	0.01	0.00	0.60	0.01	0.01	0.50	0.01	0.01	14.0	24.0	5	2
	Minimum	0.7	16.2	**6.40**	236	**0.19**	-180.1	5.0	-9.7	5.0	46	13	6	3	71	21	35	0.01	0.001	0.05	0.01	0.00	0.30	0.01	0.01	0.30	0.01	0.01	10.0	10.0	5	1

Red and **bold** values exceed the objective value for that analyte. IS - Insufficient data for statistical analysis. NS = No Sample Required. ND = No Data. NLM = No Longer Monitored

NV - Not visible

Site:	DP4		Physical									Major Cations & Anions							Metals			Nutrients								Bacteria / Algae			
Sample Date		Comments/ Flow	Water Level m AHD	Temp °C	pH	ElectricalConductivity uS/cm	Dissolved Oxygen mol/L	Redox mV	Total Suspended Solids mg/L	Turbidity NTU	Oil & Grease mg/L	Sodium mg/L	Calcium mg/L	Magnesium mg/L	Potassium mg/L	Chloride mg/L	Sulfate mg/L	Bicarbonate mg/L	Aluminium mg/L	Arsenic mg/L	Iron (filterable) mg/L	Total Phosphorous mg/L	Reactive Phosphorous mg/L	Total Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	TKN mg/L	Ammonia mg/L	NOx mg/L	Faecal coliforms cells/ml	Enterococci cells/ml	Potentially Toxic Cyanobacteria	Chlorophyll a
		Objectives	-	-	*6.5-9.0*	*<6192*	*>6*			*<20*		*<813*			*<119*	*<40*	*<1390*	*<800*	*<400*	*<0.5*	*<0.42*	*<20*							*<20*				*<50000*	*<10*
2023/2024	2023-07-31	New northern dredge pond location Cloudy, Turbid		20.31	7.92	686	**5.25**	-56.8		**116**		62	63	16	6	101	94	107	0.01	0.001	0.05	0.04	0.001	1.1	0.01	0.32	0.8	0.06	0.32			5	2
	2023-08-23	Cloudy, Turbid		22.55	7.7	1218	**3.99**	-54.4		**71.3**												0.02	0.001	1	0.01	0.31	0.7	0.11	0.31			900	2
	2023-09-20	Cloudy/Turbid, Frothing on bank		23.65	7.82	1740	9.77	-56.9		**22.9**												0.02	0.001	0.8	0.05	0.23	0.5	0.09	0.28			5	1
	2023-10-25	Clear		26.27	7.97	2632	9.47	-68.5		**20.1**		296	136	58	16	604	320	180	0.01	0.001	0.05	0.02	0.001	0.9	0.03	0.26	0.6	0.07	0.29			5	4
	2023-11-22	Cloudy, Turbid	0	26.43	7.75	2347	9.52	-54.3		13.7												0.07	0.001	0.9			0.7	0.04	0.24			5	5
	2023-12-19	Cloudy, Turbid	-3.5	30.2	8.05	2574	6.78	-75.7		12.4		337	141	63	16	625	334	186	0.01	0.001	0.05	0.01	0.004	0.6	0.01	0.01	0.6	0.01	0.01			5	**12**
	2024-02-21	Cloudy, Turbid		28.15	7.91	1591	6.73	-53.1		17.5		202	114	37	11	399	234	134	0.15	0.001	0.05	0.02	0.002	0.4	0.01	0.01	0.4	0.01	0.01			125	4
	2024-03-28	Cloudy, Turbid		23.81	8.21	2578	**4.55**			17.6												0.06	0.001	0.8	0.01	0.01	0.8	0.01	0.01			5	8
	2024-04-22	Cloudy, Turbid		22.51	7.8	1920	**5.05**	-53.8		**47.5**												0.04	0.004	0.7	0.01	0.01	0.7	0.06	0.01			5	7
	2024-05-21	Cloudy, Turbid		19.25	8.09	1408	8.7	-63.8		12.6												0.04	0.004	1	0.01	0.01	1	0.02	0.01			750	9
	2024-06-24	Clear	-1	17.42	8.02	3428	9.57	-61.2		10.6		437	150	73	18	546	355	200	0.01	0.001	0.05	0.05	0.001	0.9	0.01	0.01	0.9	0.02	0.9			295	6
2024/2025	2024-07-23	Cloudy	4	16.3	8.18	3956	8.22	-72.6		4.6												0.03	0.009	0.6	0.02	0.01	0.6	0.01	0.90			5	2
	2024-08-26	Cloudy		23.9	8.49	2850	7.63	-109.1		9.1												0.01	0.001	0.7	0.01	0.01	0.7	0.02	0.01			5	2
	2024-09-24	Cloudy	-1	23.91	8.21	3638	7.81	-94.5		8.4												0.02	0.003	0.7	0.01	0.01	0.7	0.03	0.01			80	4
	2024-10-23	Cloudy	-0.1	24.6	7.58	2346	9.51	115.7		5.63		279	90	49	13	565	202	128	0.07	0.001	0.05	0.01	0.001	0.5	0.01	0.01	0.5	0.01	0.01			7940	10
	2024-11-19	Cloudy	-0.2	25.6	7.45	2199	7.12	92.4		9.3												0.01	0.003	0.6	0.01	0.01	0.6	0.03	0.01			4680	8
	2025-01-21	Slightly Cloudy		29.6	8.03	1189	6.01	-60.6		9.2												0.05	0.001	0.9	0.01	0.01	0.9	0.03	0.01			**131000**	2
	2025-02-25	Slightly Cloudy	0.1	27.4	8.32	2313	**5.95**	-68.9		9.9		305	78	50	12	642	184	120	0.01	0.001	0.05	0.01	0.001	0.8	0.01	0.01	0.8	0.01	0.01			**236000**	2
	2025-03-25	Slightly Cloudy		26.0	8.72	2364	6.67	-94.8		9.9												0.03	0.003	0.9	0.01	0.09	0.8	0.01	0.09			21200	**28**
	2025-04-23	Slightly Cloudy	0.45	24.5	8.53	2217	6.89	-84.6		10.3												0.03	0.001	0.7	0.01	0.02	0.7	0.03	0.02			3060	7
	2025-05-27	Clear	-0.1	22.6	8.23	1941	7.13	-72.7		**26.6**		235	81	35	11	516	160	126	0.01	0.001	0.05	0.04	0.001	0.8	0.04	0.01	0.8	0.02	0.01			2760	3
	2025-06-24	Clear	0	19.2	8.33	2375	**5.40**	-79.2		**24.7**												0.02	0.001	0.7	0.01	0.02	0.7	0.01	0.02			855	**15**
Reporting Period (2024/2025)	**Average**		0.4	24.0	8.19	2490	7.12	-48.1	0.0	11.6	0.0	273	83	44.7	12	574.3	182	124.7	0.03	0.001	0.05	0.02	0.00	0.72	0.01	0.02	0.71	0.02	0.10	0.0	0.0	37053	8
	Maximum		4.0	29.6	8.72	3956	9.51	115.7	0.0	**26.6**	0.0	305	90	50	13	642	202	128	0.07	0.001	0.05	0.05	0.01	0.90	0.04	0.09	0.90	0.03	0.90	0.0	0.0	**236000**	**28**
	Minimum		-1.0	16.3	7.45	1189	**5.40**	-109.1	0.0	4.6	0.0	235	78	35	11	516	160	120	0.01	0.001	0.05	0.01	0.00	0.50	0.01	0.01	0.50	0.01	0.01	0.0	0.0	5	2
All Results	**Average**		-0.1	23.8	8.06	2250	7.17	-53.7	0.0	**22.3**	0.0	269.1	107	47.6	13	499.8	235.4	147.6	0.04	0.001	0.05	0.03	0.00	0.77	0.01	0.07	0.70	0.03	0.16	0.0	0.0	18622	7
	Maximum		4.0	30.2	8.72	3956	9.77	115.7	0.0	**116.0**	0.0	437	150	73	18	642	355	200	0.15	0.001	0.05	0.07	0.01	1.10	0.05	0.32	1.00	0.11	0.90	0.0	0.0	**236000**	**28**
	80th Percentile		0.3	26.8	8.32	2719	9.49	-54.0	0.0	**25.5**	0.0	357	143	65	16	628.4	338.2	188.8	0.09	0.001	0.05	0.04	0.00	0.90	0.02	0.17	0.80	0.06	0.30	0.0	0.0	5984	9
	Median (50th Percentile)		-0.1	23.9	8.04	2330	7.01	-63.8	0.0	12.5	0.0	287.5	102	49.5	13	555.5	218	131	0.01	0.001	0.05	0.03	0.00	0.80	0.01	0.01	0.70	0.02	0.01	0.0	0.0	210	5
	20th Percentile		-1.0	19.9	7.78	1518	**5.34**	-82.4	0.0	9.2	0.0	174	75	31.2	10	339.4	146.8	117.4	0.01	0.001	0.05	0.01	0.00	0.60	0.01	0.01	0.60	0.01	0.01	0.0	0.0	5	2
	Minimum		-3.5	16.3	7.45	686	**3.99**	-109.1	0.0	4.6	0.0	62	63	16	6	101	94	107	0.01	0.001	0.05	0.01	0.00	0.40	0.01	0.01	0.40	0.01	0.01	0.0	0.0	5	1

Red and **bold** values exceed the objective value for that analyte. IS - Insufficient data for statistical analysis. NS = No Sample Required. ND = No Data. NLM = No Longer Monitored

NV - Not visible

Site: DP1-1			Physical									Major Cations & Anions							Metals			Nutrients								Bacteria / Algae			
Sample Date		Comments/ Flow	Water Level m AHD	Temp °C	pH	ElectricalConductivity uS/cm	Dissolved Oxygen mol/L	Redox mV	Total Suspended Solids mg/L	Turbidity NTU	Oil & Grease mg/L	Sodium mg/L	Calcium mg/L	Magnesium mg/L	Potassium mg/L	Chloride mg/L	Sulfate mg/L	Bicarbonate mg/L	Aluminium mg/L	Arsenic mg/L	Iron (filterable) mg/L	Total Phosphorous mg/L	Reactive Phosphorous mg/L	Total Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	TKN mg/L	Ammonia mg/L	NOx mg/L	Faecal coliforms cells/ml	Enterococci cells/ml	Potentially Toxic Cyanobacteria	Chlorophyll a
		Objectives	-	-	*6.5-9.0*	*<6192*	*>6*			*<20*	*10*	*<813*		*<119*	*<40*	*<1390*	*<800*	*<400*	*<0.5*	*<0.42*	*<20*							*<20*		*<1000/100*	*<230/100*	*<50000*	*<10*
Pre - Extraction	2017-09-04			21.5	8.44	824	7.01	121	5	3.9		129	33	20	8	236	56	98	0.05	0.001	0.06	0.01	0.01	0.4	0.01	0.01	0.4	0.02	0.01	10	10	5	1
	2017-10-05			24	7.51	819	**4.51**	54.4	62	**149**		98	46	17	7	179	39	128	0.07	0.001	0.06	0.15	0.01	0.9	0.01	0.03	0.9	0.16	0.03	480	840		
2017/2018	2017-10-30	**Commencement of extraction**																															
	2017-11-28			26.9	7.65	3066	**3.11**	19.4	53	**85**		456	110	72	18	877	281	237	0.01	0.001	0.05	0.08	0.01	1.4	0.01	0.01	1.4	0.29	0.01	180	100		
	2018-01-11			30.6	8.01	3997	**2.16**	-2	10	**22.1**	5	624	135	96	24	1100	224	239	0.01	0.002	0.05	0.05	0.01	1.2	0.01	0.01	1.2	0.02	0.01	60	120		
	2018-01-24			27.5	7.51	4693	**2.88**	37.3		**53.6**																							
	2018-05-31			19.5	8.12	3959	**5.19**	61		6.9	5	627	128	95	22	1280	290	274	0.01	0.002	0.05	0.02	0.01	0.7	0.01	0.03	0.7	0.06	0.03	40	80	16800	8
	2018-02-07			26.4	7.72	4894	**5.17**	27.8		17.8	5	766	153	114	27	1350	308	263	0.01	0.002	0.05	0.08	0.01	1.3	0.01	0.01	1.3	0.11	0.01	90	80		
	2018-02-08	**Last day of first extraction campaign.**																															
2018 / 2019	2018-10-25			24.9	8.62	4559	**5.93**	80	7	13.8	5	680	121	102	22	1220	334	193	0.05	0.005	0.05	0.03	0.01	1	0.01	0.01	1	0.05	0.01	90	50		
	2019-01-15			28.9	8.56	4899	**4.85**	13.5	5	8	5	693	98	104	24	1320	288	139	0.03	0.002	0.05	0.02	0.01	1.2	0.01	0.01	1.2	0.05	0.01	190	370		
	2019-04-03			24.6	8.44	5300	**4.84**	96.9	8	7.5	5	735	125	112	24	1240	298	173	0.03	0.002	0.05	0.04	0.002	1.2	0.01	0.01	1.2	0.04	0.01	340	160		
2019 / 2020	2019-07-03			18.7	8.49	**6553**	**5.75**	85	5	4.4	5	729	125	110	24	1270	248	221	0.01	0.001	0.05	0.02	0.001	1.1	0.01	0.12	1	0.13	0.13	100	140		
	2019-10-02			24.2	8.8	5286	6.5	65.9	5	7.7	5	758	131	115	25	1380	315	189	0.01	0.002	0.05	0.02	0.001	0.9	0.01	0.01	0.9	0.01	0.01	10	10		
	2020-01-15	Aquatic birds present. Cattle present. Low water level. pH meter calibration issue - spurious data		28.4	**10.2***	5940	8	82.3	5	3		**838**	122	**121**	28	**1410**	316	164	0.01	0.001	0.05	0.02	0.002	1.1	0.01	0.01	1.1	0.03	0.01	350	270		
2020/2021	2020-07-07	Clear.		16.8	**6.4**	3694	9.1	121	5	2.6	5	602	87	90	20	1020	195	183	0.01	0.002	0.05	0.02	0.007	1	0.01	0.04	1	0.104	0.04	120	10		
	2020-08-12	Clear		18	8.3	3490	10.5	90	5	6.6	5	552	91	85	19	1020	185	162	0.01	0.001	0.05	0.29	0.001	1	0.01	0.04	1	0.04	0.05	20	10		
	2020-09-16			21.4	8.41	3640	10.71	94.5	6	**60.1**	5	565	87	83	18	1080	193	149	0.03	0.002	0.05	0.02	0.001	0.8	0.01	0.01	0.8	0.01	0.01	10	10		
	2020-10-14			24.5	8.63	3510	9.78	67.6	5	15.3	5	566	98	83	20	1040	230	139	0.03	0.002	0.05	0.02	0.001	0.8	0.01	0.01	0.8	0.02	0.01				6
	2020-11-11			24.6	8.44	3691	9.5	77.4	5	2.4		534	86	80	18	1050	238	145	0.03	0.002	0.05	0.01	0.001	0.7	0.01	0.01	0.7	0.01	0.01	70	240		
	2021-02-24	Clear		26.7	8.34	3053	8.56	20.5	5	4.8		439	78	66	16	905	195	126	0.03	0.002	0.05	0.01	0.007	0.7	0.01	0.01	0.7	0.01	0.01	220	180		
	2021-06-10	Clear		17.5	8.04	2456	8.79	53.1	5	3.75		400	72	58	14	767	166	136	0.01	0.002	0.05	0.01	0.001	0.7	0.02	0.04	0.6	0.18	0.06	20	40		
2021/2022	N/A																																
2022/2023	2022-08-31	Cloudy, Very Turbid		18.59	7.64	353	6.79	212.4		**428**		53	24	7	3	88	30	50	0.01	0.001	0.05	0.16	0.004	1.1	0.01	0.43	0.7	0.01	0.43			5	10
	2023-02-23	Cloudy, Turbid		27	6.5	568	7.5	200.3		**57.64**		49	43	7	4	84	42	71	0.01	0.001	0.05	0.04	0.001	1	0.01	0.41	0.6	0.02	0.41			5	4
2023/2024	2024-02-21	Clear		29.53	8.38	3499	**5.49**	-81.8		4.9		492	152	73	20	891	326	160	0.01	0.001	0.05	0.01	0.001	0.4	0.01	0.01	0.4	0.02	0.01			1240	2

Reporting Period (2023/2024)	**Average**	-	29.5	8.38	3499	**5.49**	-81.8	ND	4.9	ND	492	152	73	20	891	326	160	0.01	0.001	0.05	0.01	0.001	0.4	0.01	0.01	0.4	0.02	0.01	ND	ND	ND	ID
	Maximum	-	29.5	8.38	3499	**5.49**	-81.8	ND	4.9	ND	492	152	73	20	891	326	160	0.01	0.001	0.05	0.01	0.001	0.4	0.01	0.01	0.4	0.02	0.01	ND	ND	ND	ID
	Minimum	-	29.5	8.38	3499	**5.49**	-81.8	ND	4.9	ND	492	152	73	20	891	326	160	0.01	0.001	0.05	0.01	0.001	0.4	0.01	0.01	0.4	0.02	0.01	ND	ND	ND	ID
All Results	**Average**	-	23.9	8.04	3598	6.64	69.5	12	**42.1**	5	518	98	78	18	946	218	165	0.02	0.002	0.05	0.05	0.005	0.9	0.01	0.06	0.9	0.06	0.06	133	151	3611	5
	Maximum	-	30.6	8.80	**6553**	10.71	212.4	62	**428.0**	5	**838**	153	**121**	28	**1410**	334	274	0.07	0.005	0.06	0.29	0.010	1.4	0.02	0.43	1.4	0.29	0.43	480	840	16800	10
	80th Percentile	-	27.7	8.52	4976	9.18	101.7	9	**58.1**	5	731	129	111	24	1296	311	227	0.03	0.002	0.05	0.08	0.010	1.2	0.01	0.04	1.2	0.12	0.05	244	246	ID	ID
	Median (50th Percentile)	-	24.6	8.32	3691	6.50	67.6	5	7.7	5	566	98	84	20	1045	234	161	0.01	0.002	0.05	0.02	0.003	1.0	0.01	0.01	0.9	0.04	0.01	90	90	5	5
	20th Percentile	-	18.7	7.59	2130	**4.77**	20.3	5	3.9	5	292	62	43	12	555	122	127	0.01	0.001	0.05	0.01	0.001	0.7	0.01	0.01	0.7	0.01	0.01	18	10	ID	ID
	Minimum	-	16.8	**6.40**	353	**2.16**	-81.8	5	2.4	5	49	24	7	3	84	30	50	0.01	0.001	0.05	0.01	0.001	0.4	0.01	0.01	0.4	0.01	0.01	10	10	5	1

Red and **bold** values exceed the objective value for that analyte. IS - Insufficient data for statistical analysis. NS = No Sample Required. ND = No Data. NLM = No Longer Monitored

Site: DP1-2			Physical									Major Cations & Anions							Metals			Nutrients								Bacteria / Algae			
Sample Date		Comments/ Flow	Water Level m AHD	Temp °C	pH	ElectricalConductivity uS/cm	Dissolved Oxygen mol/L	Redox mV	Total Suspended Solids mg/L	Turbidity NTU	Oil & Grease mg/L	Sodium mg/L	Calcium mg/L	Magnesium mg/L	Potassium mg/L	Chloride mg/L	Sulfate mg/L	Bicarbonate mg/L	Aluminium mg/L	Arsenic mg/L	Iron (filterable) mg/L	Total Phosphorous mg/L	Reactive Phosphorous mg/L	Total Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	TKN mg/L	Ammonia mg/L	NOx mg/L	Faecal coliforms cells/ml	Enterococci cells/ml	Potentially Toxic Cyanobacteria	Chlorophyll a
	Objectives		-	-	*6.5-9.0*	*<6192*	*>6*			*<20*	*10*	*<813*		*<119*	*<40*	*<1390*	*<800*	*<400*	*<0.5*	*<0.42*	*<20*							*<20*		*<1000/100*	*<230/100*	*<50000*	*<10*
Pre-Extraction	2017-09-04			20.1	8.23	787	6.86	126	5	1.9		134	33	21	8	237	57	97	0.04	0.001	0.05	0.01	0.01	0.4	0.01	0.02	0.4	0.02	0.02	40	10	5	2
	2017-10-05			23	7.32	798	3.32	63.8	46	166		96	46	17	7	176	44	131	0.11	0.001	0.1	0.11	0.01	1.1	0.01	0.02	1.1	0.17	0.02	450	1010		
2017/2018	2017-10-30	**Commencement of extraction**																															
	2017-11-28			26.8	7.53	3048	3.21	19	53	99		454	108	72	18	878	198	238	0.01	0.001	0.05	0.09	0.01	1.4	0.01	0.01	1.4	0.3	0.01	60	130		
	2018-01-11			28.3	7.49	4114	2.17	-0.9	13	23.2	5	648	136	100	24	1130	281	242	0.01	0.002	0.05	0.05	0.01	1.4	0.01	0.01	1.4	0.31	0.01	30	50	5	8
	2018-01-24			27.4	7.5	4679	2.31	33		70.2		685	146	110	26	1250	301	223	0.01	0.002	0.05	0.07	0.01	1.4	0.01	0.01	1.4	0.12	0.01			12700	30
	2018-02-07			26.2	7.61	4903	6.96	21		23.6	5	693	138	102	25	1350	311	265	0.01	0.002	0.05	0.08	0.01	1.3	0.01	0.02	1.3	0.12	0.02	40	60		
	2018-02-08	**Last day of first extraction campaign**																															
	2018-03-08			24.8	7.89	4658	3.29	61		14.9		600	125	92	22	1180	229	240	0.03	0.002	0.05	0.01	0.01	1	0.01	0.02	1	0.01	0.02			2360	29
	2018-04-13			24.9	8.11	4663	6.7	113		7.1																						5160	7
	2018-05-31			19.4	8.12	3944	5.95	61		7.8	5	634	128	96	22	1270	290	270	0.01	0.002	0.05	0.01	0.01	0.8	0.01	0.05	0.7	0.07	0.05	40	90	14200	8
2018/2019	2018-10-25			24.7	8.61	4524	6.54	79	8	15.2	5	673	119	100	22	1230	329	196	0.05	0.005	0.05	0.04	0.01	1	0.01	0.01	1	0.03	0.01	120	50	38800	13
	2018-12-03			27.3	8.78	5056	8.53	67.7	13	9.6		643	110	99	22	1320	306	180	0.03	0.001	0.05	0.02	0.01	1.2	0.01	0.01	1.2	0.09	0.01			299000	16
	2018-12-17			26.2	8.61	5022	8.78	-11	9	9.6		686	106	99	23	1170	282	175	0.04	0.002	0.05	0.01	0.01	1.3	0.01	0.01	1.3	0.12	0.01			199000	32
	2019-01-15			29	8.55	4913	7.26	1.8	6	9.5	5	693	97	104	23	1310	300	135	0.03	0.002	0.05	0.02	0.01	1.2	0.01	0.01	1.2	0.04	0.01	180	170	102000	16
	2019-02-07			28.4	8.46	5153	7.75	-77.5	9	6.1		776	117	118	27	1350	314	162	0.02	0.002	0.05	0.02	0.005	1.2	0.01	0.01	1.2	0.02	0.01			17600	12
	2019-02-21			23.7	8.29	5351	7.98	-4.8	5	22.5		766	110	114	26	1380	345	154	0.03	0.002	0.05	0.01	0.001	1.1	0.01	0.01	1.1	0.05	0.01			3430	6
	2019-03-06			26.1	8.38	5268	8.95	-7.5	5	2.4		733	113	111	25	1360	321	189	0.02	0.002	0.05	0.05	0.005	0.8	0.01	0.01	0.8	0.01	0.01			955	7
	2019-03-21			27.8	8.63	5968	5.77	-106	8	3.22		732	110	111	25	1290	287	161	0.03	0.002	0.05	0.01	0.001	1	0.01	0.01	1	0.01	0.01			13100	9
	2019-04-03			24.9	8.43	5300	4.23	92	13	6.7	5	721	124	111	24	1240	301	177	0.03	0.001	0.05	0.03	0.001	1	0.01	0.01	1	0.04	0.01	120	110	29300	11
	2019-05-01			23.1	8.25	4518	8.14	19.6	5	4.5		726	120	110	24	1290	286	189	0.01	0.002	0.05	0.02	0.003	1	0.01	0.01	1	0.04	0.01			31400	13
	2019-06-05			17.9	7.8	4096	6.8	57.7	5	-9.8		724	133	115	26	1270	302	225	0.01	0.002	0.05	0.02	0.003	1.3	0.02	0.04	1.2	0.36	0.06			13200	12
2019 / 2020	2019-07-03			18.5	8.47	6558	5.65	85	5	1.6	5	706	123	106	24	1260	252	224	0.03	0.001	0.05	0.02	0.001	1.1	0.02	0.11	1	0.14	0.13	90	60	22000	11
	2019-07-31			17.9	8.54	7123	5.65	109.2	5	5.2		733	129	113	24	1340	312	217	0.01	0.001	0.05	0.02	0.001	1.1	0.01	0.11	1	0.01	0.11			30500	8
	2019-09-03			19.7	8.7	5468	7.3	127	5	7.3		780	127	120	25	1340	333	188	0.01	0.001	0.05	0.02	0.001	0.9	0.01	0.01	0.9	0.02	0.01			40300	8
	2019-10-02			24	8.8	5278	6	65.5	6	7.4	5	761	131	114	25	1370	308	190	0.01	0.002	0.05	0.02	0.001	1	0.01	0.01	1	0.01	0.01	40	20	130000	10
	2019-11-06	Aquatic birds present. Cattle present. Low water		22.7	8.5	4942	8.7	117.1	13	3.9		735	105	109	25	1320	319	186	0.02	0.002	0.05	0.02	0.001	1.1	0.01	0.01	1.1	0.03	0.01			111000	13
	2020-01-15	Aquatic birds present. Cattle present. Low water level. pH meter calibration issue - spurious data		27.4	12.6*	5934	7.9	90.1	5	4.3		831	121	123	28	1410	315	162	0.01	0.002	0.05	0.01	0.002	1	0.01	0.01	1	0.03	0.01	350	460	5	8
2020/2021	2020-07-07	Clear.		16.8	6.4	3692	9.1	119	5	3	5	586	86	88	20	1010	217	175	0.01	0.002	0.05	0.01	0.004	1	0.01	0.04	1	0.24	0.04	80	10	7160	
	2020-08-12	Clear		17	8.3	3494	10.4	90	5	7.6	5	544	87	82	18	1030	182	170	0.01	0.002	0.05	0.11	0.001	1.2	0.01	0.04	1.1	0.04	0.05	20	10	20600	12
	2020-09-16			21	8.5	3633	10.72	95.7	5	33.5	5	570	88	84	19	1080	193	149	0.01	0.001	0.05	0.02	0.001	0.8	0.01	0.01	0.8	0.02	0.01	10	10	19600	9
	2020-10-14			23.5	8.72	3496	9.78	68.1	5	13.5	5	578	100	85	20	1040	231	142	0.02	0.002	0.05	0.02	0.001	0.8	0.01	0.01	0.8	0.01	0.01			11600	6
	2020-11-11			23.7	8.45	3675	9.49	76.6	5	2.9		551	88	82	19	1060	236	144	0.03	0.002	0.05	0.01	0.001	0.7	0.01	0.01	0.7	0.01	0.01	40	120	1260	6
	2021-02-24	Clear		26.6	8.37	3084	8.92	35.2	5	4.6		441	78	66	16	910	197	126	0.03	0.002	0.05	0.01	0.001	0.6	0.01	0.01	0.6	0.01	0.01	120	120	6260	5
	2021-06-10	Clear		17.3	8.03	2438	8.77	57.5		3.92		397	71	58	14	787	164	134	0.01	0.002	0.05	0.01	0.001	0.7	0.02	0.04	0.6	0.18	0.06	40	20	5	2
2021/2022	N/A																																
2022/2023	2022-08-31	Cloudy, Very Turbid		17.69	7.44	367	6.77	208.1		448		51	24	7	3	89	31	49	0.01	0.001	0.05	0.15	0.002	1.2	0.01	0.45	0.8	0.01	0.45			5	10
	2023-02-23	Cloudy, Turbid		26.4	7.1	553	7.24	220.4		44.56		50	43	8	4	86	42	71	0.01	0.001	0.05	0.04	0.002	1	0.01	0.38	0.6	0.01	0.38			5	3
2023/2024	2024-02-21	Clear		28.81	8.38	3520	4.04	-82.1		5.4		454	140	67	19	910	318	162	0.01	0.001	0.05	0.01	0.001	0.3	0.01	0.01	0.3	0.01	0.01			1240	2
Reporting Period (2023/2024)	**Average**		-	28.8	8.38	3520	4.04	-82.1	ND	5.4	ND	454	140	67	19	910	318	162	0.01	0.001	0.05	0.01	0.001	0.3	0.01	0.01	0.3	0.01	0.01	ND	ND	1240	2
	Maximum		-	28.8	8.38	3520	4.04	-82.1	ND	5.4	ND	454	140	67	19	910	318	162	0.01	0.001	0.05	0.01	0.001	0.3	0.01	0.01	0.3	0.01	0.01	ND	ND	1240	2
	Minimum		-	28.8	8.38	3520	4.04	-82.1	ND	5.4	ND	454	140	67	19	910	318	162	0.01	0.001	0.05	0.01	0.001	0.3	0.01	0.01	0.3	0.01	0.01	ND	ND	1240	2
All Results	**Average**		-	23.6	8.15	4167	6.89	58.1	10	30.3	5	588	105	89	21	1078	250	175	0.02	0.002	0.05	0.03	0.005	1.0	0.01	0.04	1.0	0.08	0.05	104	139	35871	11
	Maximum		-	29.0	8.80	7123	10.72	220.4	53	448.0	5	831	146	123	28	1410	345	270	0.11	0.005	0.10	0.15	0.010	1.4	0.02	0.45	1.4	0.36	0.45	450	1010	299000	32
	80th Percentile		-	27.4	8.60	5291	8.86	111.5	13	23.4	5	733	129	113	25	1340	315	224	0.03	0.002	0.05	0.05	0.010	1.2	0.01	0.04	1.2	0.14	0.05	132	138	39100	13
	Median (50th Percentile)		-	24.4	8.37	4591	7.10	64.7	5	7.4	5	673	110	100	23	1240	287	175	0.01	0.002	0.05	0.02	0.002	1.0	0.01	0.01	1.0	0.03	0.01	50	60	13100	9
	20th Percentile		-	18.9	7.55	3248	4.80	0.2	5	3.5	5	454	86	68	18	910	194	136	0.01	0.001	0.05	0.01	0.001	0.8	0.01	0.01	0.7	0.01	0.01	38	10	765	6
	Minimum		-	16.8	6.40	367	2.17	-106.0	5	-9.8	5	50	24	7	3	86	31	49	0.01	0.001	0.05	0.01	0.001	0.3	0.01	0.01	0.3	0.01	0.01	10	10	5	2

Red and **bold** values exceed the objective value for that analyte. IS - Insufficient data for statistical analysis. NS = No Sample Required. ND = No Data. NLM = No Longer Monitored

Site:	DP1-4		Physical									Major Cations & Anions							Metals			Nutrients								Bacteria / Algae			
Sample Date		Comments/ Flow	Water Level m AHD	Temp °C	pH	ElectricalConductivity uS/cm	Dissolved Oxygen mol/L	Redox mV	Total Suspended Solids mg/L	Turbidity NTU	Oil & Grease mg/L	Sodium mg/L	Calcium mg/L	Magnesium mg/L	Potassium mg/L	Chloride mg/L	Sulfate mg/L	Bicarbonate mg/L	Aluminium mg/L	Arsenic mg/L	Iron (filterable) mg/L	Total Phosphorous mg/L	Reactive Phosphorous mg/L	Total Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	TKN mg/L	Ammonia mg/L	NOx mg/L	Faecal coliforms cells/ml	Enterococci cells/ml	Potentially Toxic Cyanobacteria	Chlorophyll a
		Objectives	-	-	*6.5-9.0*	*<6192*	*>6*			*<20*	*10*	*<813*		*<119*	*<40*	*<1390*	*<800*	*<400*	*<0.5*	*<0.42*	*<20*							*<20*		*<1000/100*	*<230/100*	*<50000*	*<10*
Pre-Ex	2017-09-04			17.9	7.95	746	**5.57**	125	7	4.8		131	33	20	8	234	57	97	0.05	0.001	0.06	0.01	0.01	0.4	0.02	0.02	0.4	0.04	0.04			5	2
	2017-10-05			22.7	7.06	777	**1.79**	81.1	61	**166**		90	46	17	6	173	43	134	0.01	0.001	0.05	0.1	0.01	1	0.01	0.02	1	0.2	0.02	290	850		
2017/2018	2017-10-30	**Commencement of extraction**																															
	2017-11-28			26.8	7.51	3072	**2.85**	17	2660	**102**		451	108	72	18	883	224	236	0.01	0.001	0.05	1.81	0.01	7.3	0.01	0.01	7.3	0.24	0.01	100	220		
	2017-12-13																																
	2018-01-11			28.1	7.42	4052	**0.68**	-20	7	**22**	5	636	134	100	24	1130	269	240	0.01	0.002	0.05	0.04	0.01	1.3	0.01	0.01	1.3	0.33	0.01	10	10	250	6
	2018-01-24			27.8	7.59	4729	**2.49**	23		**101**		681	146	108	25	1250	300	222	0.01	0.002	0.05	0.1	0.01	1.6	0.01	0.03	1.6	0.24	0.03			15900	**22**
	2018-02-07			25.3	7.57	4981	**4.57**	24		**58.7**	5	710	140	106	26	1380	308	260	0.02	0.002	0.05	0.07	0.01	1.2	0.01	0.02	1.2	0.2	0.02	70	70		
	2018-02-08	**Last day of first extraction campaign**																															
	2018-03-08			24.3	7.85	4651	**3.37**	53		14.2		602	127	93	22	1190	285	238	0.03	0.002	0.05	0.01	0.01	1	0.01	0.01	1	0.01	0.01			6120	**30**
	2018-04-13			24.9	8.1	4651	6.16	131		8.7																						3380	5
	2018-05-31			19.2	8.11	3931	**5.65**	60.3		7.7	5	629	129	95	22	1270	286	261	0.01	0.002	0.05	0.01	0.01	0.6	0.01	0.02	0.6	0.06	0.02	40	80	4980	8
2018/2019	2018-10-25			21.1	8.48	4493	**5.24**	88	6	11.7	5	674	121	102	22	1250	332	210	0.05	0.005	0.05	0.02	0.01	0.8	0.01	0.01	0.8	0.04	0.01	20	10	**62800**	**14**
	2018-12-03			25.8	8.52	5015	**5.15**	40.5	8	4.3		624	108	97	22	1310	305	201	0.03	0.001	0.05	0.02	0.01	1.1	0.01	0.01	1.1	0.06	0.01			**115000**	**15**
	2018-12-17			25.2	8.32	4925	**3.15**	-54	8	3.8		690	110	100	24	1180	289	176	0.03	0.002	0.05	0.01	0.01	1.2	0.01	0.01	1.2	0.05	0.01			**387000**	**30**
	2019-01-15			27.1	7.98	4657	**0.33**	-206.6	5	5.3	5	684	103	102	23	1290	301	190	0.02	0.002	0.05	0.04	0.01	1.1	0.01	0.01	1.1	0.05	0.01	10	20	9170	9
	2019-02-07			23.4	7.33	4450	**0.78**	-209.4	14	**33.4**		710	128	103	22	1250	286	264	0.02	0.002	0.19	0.02	0.005	1.1	0.01	0.01	1.1	0.05	0.01			225	**89**
	2019-02-21			24.8	7.63	5070	**0.91**	-219.7	5	**39.5**		765	111	114	25	1360	333	187	0.02	0.002	0.05	0.03	0.004	1.2	0.01	0.01	1.2	0.05	0.01			155	**18**
	2019-03-06			24.6	8.16	5090	6.35	-103	5	3.1		731	112	110	24	1350	306	206	0.02	0.002	0.05	0.05	0.005	0.6	0.01	0.01	0.6	0.01	0.01			760	**12**
	2019-03-21			26.8	8.42	5953	**4.18**	-34	5	3.22		752	111	113	26	1290	288	178	0.03	0.002	0.05	0.01	0.002	0.8	0.01	0.01	0.8	0.02	0.01			19500	6
	2019-04-03			24.5	8.41	5301	**4.46**	74.4	5	7.5	5	748	128	114	24	1230	292	181	0.02	0.002	0.05	0.02	0.003	1	0.01	0.01	1	0.06	0.01	110	120	24200	10
	2019-05-01			22.8	8.2	4491	7.64	7.9	5	4.6		783	131	**121**	26	1300	286	188	0.01	0.002	0.05	0.02	0.001	0.9	0.01	0.01	0.9	0.03	0.01			**65600**	**11**
	2019-06-05			17.8	7.8	4086	6.8	58.8	5	-9.8		714	128	112	25	1280	297	226	0.01	0.002	0.05	0.01	0.002	1.3	0.02	0.04	1.2	0.37	0.06			16600	10
2019/2020	2019-07-03			18.2	8.25	**6627**	**4.67**	85	5	2.9	5	733	127	110	24	1280	260	229	0.01	0.001	0.05	0.01	0.001	1.1	0.02	0.12	1	0.17	0.14	100	430	29400	7
	2019-07-31			17.5	8.25	**7103**	**4.89**	111.9	5	7.5		704	122	107	24	1340	311	231	0.01	0.001	0.05	0.02	0.001	1	0.01	0.14	0.9	0.04	0.14			20000	8
	2019-09-03			18.4	8.3	5479	**5.1**	137.6	5	5.7		741	125	112	24	1340	328	216	0.01	0.001	0.05	0.01	0.002	0.9	0.01	0.01	0.9	0.02	0.01			18700	9
	2019-10-02			20.5	8.2	5192	**3.2**	46.2	5	1.3	5	752	128	111	25	1330	296	230	0.01	0.002	0.05	0.01	0.001	0.8	0.01	0.01	0.8	0.01	0.01	10	10	6080	6
	2019-11-06	Aquatic birds present. Cattle present. Low water level		22.5	8.5	4917	8.4	98.1	6	5.9		739	106	109	25	1310	318	190	0.02	0.002	0.05	0.02	0.001	1.1	0.01	0.01	1.1	0.01	0.01			**155000**	**15**
	2020-01-15	pH meter calibration issue - spurious data.		26.7	**10***	5738	7.7	89.2	5	4		**833**	123	**124**	28	**1410**	322	164	0.01	0.001	0.05	0.02	0.005	1	0.01	0.01	1	0.01	0.01	420	140	5	10
Reporting Period (2021/2	2020-07-07	Clear.		16.6	**6.4**	3695	9	115	5	2.8	5	605	88	91	20	1020	197	175	0.01	0.002	0.05	0.01	0.004	0.9	0.01	0.04	0.9	0.15	0.04	40	10	6860	
	2020-08-12	Clear		16.8	8.2	3496	9.6	89	12	7.6	5	535	91	82	19	1020	182	166	0.01	0.002	0.05	0.02	0.001	1	0.01	0.04	0.9	0.06	0.05	50	10	43800	8
	2020-09-16			19.4	8.18	3629	8.41	108.1	5	**23.42**	5	575	88	85	19	1080	191	174	0.01	0.001	0.05	0.02	0.001	0.8	0.01	0.01	0.8	0.06	0.01	20	80	4170	**11**
	2020-10-14			21	8.41	3445	**5.64**	94.8	5	16.1	5	563	94	82	19	1030	224	171	0.01	0.002	0.05	0.02	0.001	0.7	0.01	0.01	0.7	0.01	0.01			2940	5
	2020-11-11			22.9	8.42	3659	8.96	75.1	5	3.1		544	87	81	19	1050	232	146	0.03	0.002	0.05	0.01	0.003	0.7	0.01	0.01	0.7	0.04	0.01	20	50	1560	7
	2021-02-24	Clear		25.7	8.31	3095	8.07	50.6	5	3.7		430	76	65	16	911	198	128	0.03	0.002	0.05	0.01	0.004	0.6	0.01	0.01	0.6	0.1	0.01	140	80	6390	7
	2021-06-10	Clear		17.4	8.04	2448	8.73	62.8		3.88		390	69	56	14	758	163	138	0.01	0.002	0.05	0.01	0.001	0.8	0.02	0.04	0.7	0.23	0.06	10	70	5	3
2021/2022	N/A																																
2022/2023	2022-08-31	Cloudy, Very Turbid		16.98	7.4	370	6.73	206.1		**371**		52	25	7	3	92	30	49	0.01	0.001	0.05	0.13	0.002	1.3	0.01	0.48	0.8	0.02	0.48			5	10
	2023-02-23	Cloudy, Turbid		26.2	6.92	556	6.92	243.9		**65.64**		48	43	7	4	85	42	71	0.01	0.001	0.05	0.04	0.002	0.9	0.01	0.39	0.5	0.02	0.39			5	2
2023/2024	2024-02-21	Clear		27.9	8.31	3541	**5.13**	-77.2		8.3		483	145	71	20	912	325	163	0.01	0.001	0.05	0.01	0.001	0.3	0.01	0.01	0.3	0.01	0.01			1240	3

Reporting Period (2023/2024)	**Average**	-	23.7	7.54	1489	6.26	124.3	NS	**148.3**	NS	194	71	28	9	363	132	94	0.01	0.001	0.05	0.06	0.002	0.8	0.01	0.29	0.5	0.02	0.29	NS	NS	417	5
	Maximum	-	27.9	8.31	3541	6.92	243.9	NS	**371.0**	NS	483	145	71	20	912	325	163	0.01	0.001	0.05	0.13	0.002	1.3	0.01	0.48	0.8	0.02	0.48	NS	NS	1240	10
	Minimum	-	17.0	6.92	370	**5.13**	-77.2	NS	8.3	NS	48	25	7	3	85	30	49	0.01	0.001	0.05	0.01	0.001	0.3	0.01	0.01	0.3	0.01	0.01	NS	NS	5	2
All Results	**Average**	-	22.7	7.96	4114	**5.26**	40.9	106	**31.2**	5	587	105	89	20	1073	249	187	0.02	0.002	0.05	0.08	0.005	1.1	0.01	0.05	1.1	0.09	0.05	86	133	31146	**13**
	Maximum	-	28.1	8.52	**7103**	9.60	243.9	2660	**371.0**	5	**833**	146	**124**	28	**1410**	333	264	0.05	0.005	0.19	1.81	0.010	7.3	0.02	0.48	7.3	0.37	0.48	420	850	**387000**	**89**
	80th Percentile	-	26.5	8.39	5151	7.92	110.4	8	**37.1**	5	741	128	112	25	1326	310	231	0.03	0.002	0.05	0.04	0.010	1.2	0.01	0.04	1.2	0.19	0.05	122	172	32280	**15**
	Median (50th Percentile)	-	23.2	8.16	4492	**5.20**	61.6	5	7.5	5	674	111	100	22	1250	286	188	0.01	0.002	0.05	0.02	0.004	1.0	0.01	0.01	0.9	0.05	0.01	40	70	6120	9
	20th Percentile	-	18.0	7.52	3235	**2.97**	-28.4	5	3.4	5	457	87	71	18	911	192	149	0.01	0.001	0.05	0.01	0.001	0.7	0.01	0.01	0.7	0.01	0.01	10	10	211	6
	Minimum	-	16.6	**6.40**	370	**0.33**	-219.7	5	-9.8	5	48	25	7	3	85	30	49	0.01	0.001	0.05	0.01	0.001	0.3	0.01	0.01	0.3	0.01	0.01	10	10	5	2

Red and **bold** values exceed the objective value for that analyte. IS - Insufficient data for statistical analysis. NS = No Sample Required. ND = No Data

Site: DP1-6			Physical									Major Cations & Anions							Metals			Nutrients								Bacteria / Algae			
Sample Date		Comments/ Flow	Water Level m AHD	Temp °C	pH	Electrical Conductivity uS/cm	Dissolved Oxygen mol/L	Redox mV	Total Suspended Solids mg/L	Turbidity NTU	Oil & Grease mg/L	Sodium mg/L	Calcium mg/L	Magnesium mg/L	Potassium mg/L	Chloride mg/L	Sulfate mg/L	Bicarbonate mg/L	Aluminium mg/L	Arsenic mg/L	Iron (filterable) mg/L	Total Phosphorous mg/L	Reactive Phosphorous mg/L	Total Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	TKN mg/L	Ammonia mg/L	NOx mg/L	Faecal coliforms cells/ml	Enterococci cells/ml	Potentially Toxic Cyanobacteria	Chlorophyll a
		Objectives	-	-	*6.5-9.0*	*<6192*	*>6*			*<20*	*10*	*<813*		*<119*	*<40*	*<1390*	*<800*	*<400*	*<0.5*	*<0.42*	*<20*							*<20*		*<1000/100*	*<230/100*	*<50000*	*<10*
2017/2018	2017-10-30	**Commencement of extraction**																															
	2018-01-24			27.4	7.47	4667	**2.09**	34.4		**95**		605	131	97	23	1250	302	220	0.01	0.002	0.05	0.08	0.01	1.5	0.01	0.01	1.5	0.21	0.01			33600	**21**
	2018-02-07			24.8	7.56	4858	**1.11**	23.1		10																							
	2018-02-08	**Last day of first extraction campaign.**																															
	2018-03-08			24.3	7.85	4651	**3.37**	53		14.2		630	133	96	23	1230	238	252	0.02	0.002	0.05	0.01	0.01	1	0.01	0.01	1	0.01	0.01			1220	**39**
	2018-04-13			24.9	8.09	4655	6.34	138		4.3																						5030	5
	2018-05-31			19.4	8.1	3942	**5.38**	59		7.1	5	630	127	95	22	1280	283	271	0.01	0.002	0.05	0.01	0.01	0.7	0.01	0.03	0.7	0.07	0.03	50	70	12900	8
2018/2019	2018-10-25			19.6	8.31	4531	**3.12**	82	5	3.1	5	710	124	105	23	1270	344	220	0.05	0.005	0.05	0.02	0.01	0.8	0.01	0.01	0.8	0.03	0.01	70	20	24100	8
	2018-12-03			21.6	7.79	5041	**2.31**	-130	10	2.3		637	122	100	22	1310	287	275	0.02	0.002	0.18	0.02	0.01	1	0.01	0.01	1	0.11	0.01			276000	8
	2018-12-17			23.4	7.99	4724	**1.5**	-130	5	2.1		654	122	95	23	1140	276	225	0.02	0.001	0.13	0.02	0.01	1	0.01	0.01	1	0.04	0.01			16900	5
	2019-01-15			21.8	7.42	4098	**0.3**	-276.5	5	2.3	5	648	121	98	22	1240	278	265	0.01	0.002	0.16	0.02	0.01	0.7	0.01	0.01	0.7	0.04	0.01	30	90	5	4
	2019-02-07			20.2	7.14	4332	**0.11**	-268.3	19	2.3		731	148	114	25	1270	274	302	0.01	0.002	0.05	0.01	0.005	1.4	0.01	0.01	1.4	0.56	0.01			75	2
	2019-02-21			20.6	7.07	4545	**0.45**	-219.7	5	16		728	137	111	25	1310	271	304	0.01	0.002	0.08	0.01	0.001	1.6	0.01	0.01	1.6	0.83	0.01			5	5
	2019-03-06			21.3	7.27	4701	**0.64**	-313	5	3.4		692	133	107	23	1320	196	342	0.01	0.002	0.05	0.05	0.005	2.6	0.01	0.01	2.6	1.43	0.01			5	4
	2019-03-21			24.4	7.69	6192	**0.56**	-53	5	3.37		751	120	115	26	1340	283	239	0.02	0.002	0.1	0.04	0.002	1.2	0.01	0.01	1.2	0.14	0.01			5	**14**
	2019-04-03			24	7.62	5477	**0.21**	-38.7	9	12.2	5	733	132	113	24	1260	311	217	0.02	0.002	0.13	0.04	0.003	1.2	0.01	0.01	1.2	0.04	0.01	60	80	2110	**46**
	2019-05-01			22.8	8.17	4511	7.4	-7.4	6	5.9		786	130	118	26	1310	287	187	0.02	0.002	0.05	0.02	0.001	0.9	0.01	0.01	0.9	0.03	0.01			6590	**11**
	2019-06-05			17.7	7.8	4071	6.9	63.5	5	-9.7		722	130	113	25	1280	294	218	0.01	0.002	0.05	0.01	0.003	1.4	0.02	0.04	1.3	0.38	0.06			17400	10
2019/2020	2019-07-03			18.1	8.13	**6676**	**2.41**	86	5	1.6	5	724	125	110	24	1300	255	234	0.01	0.001	0.05	0.01	0.001	1.2	0.02	0.1	1.1	0.33	0.12	260	210	580	5
	2019-07-31			17.5	8.18	**7141**	**1.92**	114.4	5	9.9		672	118	102	23	1320	313	232	0.01	0.001	0.05	0.02		1.1	0.01	0.12	1	0.19	0.12			1180	6
	2019-09-03			17.8	7.9	5473	**2.7**	153	5	2.7		730	123	110	23	1330	316	218	0.01	0.002	0.05	0.01	0.001	0.9	0.01	0.03	0.9	0.17	0.03			590	4
	2019-10-02			20.1	8	5207	**1.46**	5	5	1.3	5	736	129	112	24	1350	303	242	0.01	0.002	0.05	0.01	0.001	0.8	0.01	0.01	0.8	0.02	0.01	90	40	1180	2
	2019-11-06			18.8	7.8	4932	**1.5**	-154.9	5	-3.1		702	108	104	24	1250	281	256	0.01	0.002	0.13	0.02	0.001	1.2	0.01	0.01	1.2	0.42	0.01			1320	3
	2020-01-15	pH meter calibration issue - spurious data.		21.8	10.7*	4817	**1.3**	-162.4	5	12.9		791	124	119	27	1360	302	186	0.01	0.001	0.05	0.15	0.025	1.3	0.01	0.01	1.3	0.02	0.01	10	20	5	**149**
2020/2021	2020-07-07	Clear.		16.7	**6.4**	3691	9	114	5	2.7	5	596	87	90	20	1020	194	175	0.01	0.002	0.05	0.01	0.002	0.9	0.01	0.03	0.9	0.14	0.03	50	10	6780	
	2020-08-12	Clear		17	8	3529	7.8	93	5	11.5	5	547	89	82	19	1020	188	168	0.02	0.002	0.05	0.02	0.001	1	0.03	0.02	1	0.15	0.05	10	20	27700	5
	2020-09-16			17.5	7.54	3635	**3.38**	122.1	5	**20.94**	5	562	87	83	19	1080	192	177	0.01	0.001	0.05	0.02	0.001	0.8	0.02	0.01	0.8	0.09	0.02	10	10	3810	6
	2020-10-14			18.3	7.68	3431	**1.19**	-99.8	5	16.1	5	526	90	79	18	1020	216	176	0.02	0.002	0.05	0.01	0.001	0.8	0.01	0.01	0.8	0.25	0.01			360	8
	2020-11-11			19.3	7.73	3638	**2.33**	-109.5	5	5.2		541	86	82	19	1040	219	170	0.01	0.002	0.22	0.01	0.001	0.8	0.01	0.01	0.8	0.14	0.01	60	160	125	5
	2021-02-24	Clear		25.1	7.99	3173	**4.89**	55.6	5	5.7		450	80	68	16	936	199	136	0.02	0.002	0.05	0.01	0.001	0.7	0.01	0.01	0.7	0.02	0.01	60	20	5380	7
	2021-06-10	Clear		17.2	8.02	2431	8.51	63.1		3.95		403	72	58	15	774	168	134	0.01	0.001	0.05	0.01	0.001	0.8	0.02	0.04	0.7	0.2	0.06	10	60	5	1
2021/2022	N/A																																
2022/2023	2022-08-31	Cloudy, Very Turbid		16.68	7.4	363	6.51	205.1		**394**		50	24	7	3	90	31	50	0.01	0.001	0.05	0.14	0.002	1.2	0.01	0.46	0.7	0.01	0.46			5	10
	2023-02-23	Cloudy, Turbid		25.9	7.25	548	6.93	248.4		**61.67**		47	43	7	4	86	42	71	0.01	0.001	0.05	0.03	0.001	1	0.01	0.4	0.6	0.01	0.4			5	3
2023/2024	2024-02-21	Clear		27.79	8.29	3543	**4.74**	-76.5		8.2		460	142	68	19	910	330	164	0.01	0.001	0.05	0.01	0.001	0.4	0.01	0.01	0.4	0.02	0.01			1240	3

Reporting Period (2023/2024)	**Average**	-	27.8	8.29	3543	**4.74**	-76.5	NS	8.2	NS	460	142	68	19	910	330	164	0.01	0.001	0.05	0.01	0.001	0.4	0.01	0.01	0.4	0.02	0.01	NS	NS	1240	3
	Maximum	-	27.8	8.29	3543	**4.74**	-76.5	NS	8.2	NS	460	142	68	19	910	330	164	0.01	0.001	0.05	0.01	0.001	0.4	0.01	0.01	0.4	0.02	0.01	NS	NS	1240	3
	Minimum	-	27.8	8.29	3543	**4.74**	-76.5	NS	8.2	NS	460	142	68	19	910	330	164	0.01	0.001	0.05	0.01	0.001	0.4	0.01	0.01	0.4	0.02	0.01	NS	NS	1240	3
All Results	**Average**	-	21.1	7.73	4288	**3.39**	-10.2	6	**22.8**	5	606	111	92	21	1123	249	211	0.01	0.002	0.07	0.03	0.005	1.1	0.01	0.05	1.0	0.20	0.05	59	62	14394	**14**
	Maximum	-	27.8	8.31	**7141**	9.00	248.4	19	**394.0**	5	791	148	119	27	1360	344	342	0.05	0.005	0.22	0.15	0.025	2.6	0.03	0.46	2.6	1.43	0.46	260	210	276000	**149**
	80th Percentile	-	24.6	8.10	5107	6.67	114.2	5	14.9	5	731	132	113	25	1318	303	263	0.02	0.002	0.12	0.04	0.010	1.3	0.01	0.04	1.3	0.31	0.06	74	104	15300	**11**
	Median (50th Percentile)	-	20.4	7.80	4538	**2.37**	28.8	5	5.5	5	651	123	99	23	1255	277	219	0.01	0.002	0.05	0.02	0.002	1.0	0.01	0.01	1.0	0.13	0.01	50	40	1220	6
	20th Percentile	-	17.6	7.41	3537	**0.92**	-140.0	5	2.3	5	529	87	80	19	1020	194	168	0.01	0.001	0.05	0.01	0.001	0.8	0.01	0.01	0.7	0.02	0.01	10	18	5	3
	Minimum	-	16.7	**6.40**	363	**0.11**	-313.0	5	-9.7	5	47	24	7	3	86	31	50	0.01	0.001	0.05	0.01	0.001	0.4	0.01	0.01	0.4	0.01	0.01	10	10	5	1

Red and **bold** values exceed the objective value for that analyte. IS - Insufficient data for statistical analysis. NS = No Sample Required. ND = No Data

Site: DP1-8			Physical									Major Cations & Anions							Metals			Nutrients								Bacteria / Algae			
Sample Date		Comments/ Flow	Water Level m AHD	Temp °C	pH	Electrical Conductivity uS/cm	Dissolved Oxygen mol/L	Redox mV	Total Suspended Solids mg/L	Turbidity NTU	Oil & Grease mg/L	Sodium mg/L	Calcium mg/L	Magnesium mg/L	Potassium mg/L	Chloride mg/L	Sulfate mg/L	Bicarbonate mg/L	Aluminium mg/L	Arsenic mg/L	Iron (filterable) mg/L	Total Phosphorous mg/L	Reactive Phosphorous mg/L	Total Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	TKN mg/L	Ammonia mg/L	NOx mg/L	Faecal coliforms cells/ml	Enterococci cells/ml	Potentially Toxic Cyanobacteria	Chlorophyll a
		Objectives	-	-	*6.5-9.0*	*<6192*	*>6*			*<20*	*10*	*<813*		*<119*	*<40*	*<1390*	*<800*	*<400*	*<0.5*	*<0.42*	*<20*							*<20*		*<1000/100*	*<230/100*	*<50000*	*<10*
2017/2018	2017-10-30	**Commencement of extraction**																															
	2018-02-07			25.7	7.55	4994	**4.64**	18		**153**																				40	80		
	2018-03-08			24.7	7.49	4973	**0.72**	15.3		7.4		633	134	97	23	1240	176	262	0.04	0.002	0.12	0.01	0.01	1.2	0.01	0.01	1.2	0.04	0.01			540	**26**
	2018-04-13			25	8	4656	6.03	102		6.9																						8790	6
	2018-02-08	**Last day of first extraction campaign.**																															
	2018-05-31			19.6	8.11	3968	**5.71**	57		7.7	5	633	129	95	22	1270	306	271	0.01	0.002	0.05	0.01	0.01	0.7	0.01	0.03	0.7	0.06	0.03	110	170	19100	9
2018/2019	2018-10-25			26.1	8.39	4586	**4.64**	78	5	4.6	5	677	122	101	22	1260	333	221	0.05	0.005	0.05	0.03	0.01	0.8	0.01	0.01	0.8	0.01	0.01	10	90	26000	**13**
	2018-12-03			22.8	8	5042	**4.02**	-111	8	5.2		633	116	99	22	1330	284	294	0.02	0.002	0.1	0.03	0.01	1.5	0.01	0.01	1.5	0.59	0.01			34800	8
	2018-12-17			21.3	7.62	4463	**0.64**	-162	5	1.4		640	118	93	22	1120	264	259	0.02	0.001	0.13	0.01	0.01	0.8	0.01	0.01	0.8	0.01	0.01			405	2
	2019-02-07																																
	2019-02-21	Hit Bottom																															
2019/2020	2020-01-15	pH meter calibration issue - spurious data.		19.6	**9.9***	4577	**1.1**	-246.3	5	3.5		759	132	111	25	1290	229	258	0.01	0.001	0.05	0.04	0.015	2.4	0.01	0.01	2.4	1.22	0.01	60	270	5	6
2020/2021	2020-07-07	Clear.		16.7	**6.4**	3692	8.8	116	5	3.2	5	608	88	91	20	1020	196	175	0.01	0.002	0.05	0.01	0.001	0.9	0.01	0.04	0.9	0.13	0.04	50	10	2680	
	2020-11-11			18	7.46	3625	**1.79**	-185.4	5	3.1		520	83	79	18	1060	212	207	0.01	0.002	0.11	0.01	0.002	1.4	0.01	0.01	1.4	0.17	0.01	40	190	5	2
	2021-02-24	Clear		20.9	7.19	3632	**0.9**	-233.7	5	14.6		517	91	80	19	1050	178	218	0.02	0.004	0.06	0.03	0.003	2.2	0.01	0.01	2.2	1.3	0.01	120	280	390	**34**
	2021-06-10	Clear		17.2	8.02	2434	8.57	62.6		3.97		402	71	58	15	774	170	139	0.01	0.002	0.05	0.01	0.001	0.7	0.02	0.04	0.6	0.2	0.06	10	20	5	1
2021/2022	N/A																																
2022/2023	2022-08-31	Cloudy, Very Turbid		16.7	7.22	371	6.57	205.5		**443**		52	26	7	4	92	31	49	0.01	0.001	0.05	0.17	0.003	1.4	0.01	0.44	1	0.01	0.44			5	10
	2023-02-23	Cloudy, Turbid		25.2	6.62	545	**5.47**	207.4		**106.23**		42	44	7	4	87	41	73	0.01	0.001	0.05	0.04	0.002	0.9	0.01	0.44	0.5	0.01	0.44			5	2
2023/2024	2024-02-21	Clear		27.69	8.28	3552	**4.37**	-76.2		6.8		466	139	69	18	905	331	167	0.01	0.001	0.05	0.02	0.001	0.4	0.01	0.01	0.4	0.02	0.01			1240	3
Reporting Period (2023/2024)	**Average**		-	27.7	8.28	3552	**4.37**	-76.2	NS	6.8	NS	466	139	69	18	905	331	167	0.01	0.001	0.05	0.02	0.001	0.4	0.01	0.01	0.4	0.02	0.01	NS	NS	1240	3
	Maximum		-	27.7	8.28	3552	**4.37**	-76.2	NS	6.8	NS	466	139	69	18	905	331	167	0.01	0.001	0.05	0.02	0.001	0.4	0.01	0.01	0.4	0.02	0.01	NS	NS	1240	3
	Minimum		-	27.7	8.28	3552	**4.37**	-76.2	NS	6.8	NS	466	139	69	18	905	331	167	0.01	0.001	0.05	0.02	0.001	0.4	0.01	0.01	0.4	0.02	0.01	NS	NS	1240	3
All Results	**Average**		-	21.8	7.54	3674	**4.26**	-10.2	5	**51.4**	5	506	99	76	18	961	212	199	0.02	0.002	0.07	0.03	0.006	1.2	0.01	0.08	1.1	0.29	0.08	55	139	6712	9
	Maximum		-	27.7	8.39	5042	8.80	207.4	8	**443.0**	5	759	139	111	25	1330	333	294	0.05	0.005	0.13	0.17	0.015	2.4	0.02	0.44	2.4	1.30	0.44	120	280	34800	**34**
	80th Percentile		-	25.6	8.04	4910	6.46	113.2	6	**87.9**	IS	647	132	99	22	1274	311	264	0.02	0.002	0.11	0.04	0.010	1.6	0.01	0.12	1.6	0.72	0.14	112	272	19100	**16**
	Median (50th Percentile)		-	21.3	7.55	3968	**4.64**	18.0	5	6.8	5	608	116	91	20	1060	212	218	0.01	0.002	0.05	0.02	0.003	0.9	0.01	0.01	0.9	0.06	0.01	45	130	473	6
	20th Percentile		-	17.4	7.08	2658	**0.94**	-180.7	5	3.3	IS	332	66	48	13	638	144	126	0.01	0.001	0.05	0.01	0.001	0.7	0.01	0.01	0.6	0.01	0.01	10	18	5	2
	Minimum		-	16.7	**6.40**	371	**0.64**	-246.3	5	1.4	5	42	26	7	4	87	31	49	0.01	0.001	0.05	0.01	0.001	0.4	0.01	0.01	0.4	0.01	0.01	10	10	5	1

Red and **bold** values exceed the objective value for that analyte. IS - Insufficient data for statistical analysis. NS = No Sample Required. ND = No Data

Site: DP1-10			Physical									Major Cations & Anions							Metals			Nutrients								Bacteria / Algae			
Sample Date		Comments/ Flow	Water Level m AHD	Temp °C	pH	ElectricalConductivity uS/cm	Dissolved Oxygen mol/L	Redox mV	Total Suspended Solids mg/L	Turbidity NTU	Oil & Grease mg/L	Sodium mg/L	Calcium mg/L	Magnesium mg/L	Potassium mg/L	Chloride mg/L	Sulfate mg/L	Bicarbonate mg/L	Aluminium mg/L	Arsenic mg/L	Iron (filterable) mg/L	Total Phosphorous mg/L	Reactive Phosphorous mg/L	Total Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	TKN mg/L	Ammonia mg/L	NOx mg/L	Faecal coliforms cells/ml	Enterococci cells/ml	Potentially Toxic Cyanobacteria	Chlorophyll a
		Objectives	-	-	*6.5-9.0*	*<6192*	*>6*			*<20*	*10*	*<813*		*<119*	*<40*	*<1390*	*<800*	*<400*	*<0.5*	*<0.42*	*<20*							*<20*		*<1000/100*	*<230/100*	*<50000*	*<10*
2022/2023	31/08/2022	Cloudy, Very Turbid		16.95	7.34	359	6.5	215.1		514		54	27	8	4	90	31	50	0.01	0.001	0.05	0.18	0.004	1.3	0.01	0.44	0.9	0.01	0.44			5	10
	23/02/2023	Cloudy, Turbid		25.1	6.81	542	5.46	203.2		103.46		49	44	8	4	85	41	73	0.01	0.001	0.05	0.08	0.003	1	0.01	0.43	0.6	0.01	0.43			5	2
Reporting Period (2022/2023)	**Average**	-	21.0	7.08	451	**5.98**	209.2	NS	**308.7**	NS	52	36	8	4	88	36	62	0.01	0.001	0.05	0.13	0.004	1.2	0.01	0.44	0.8	0.01	0.44	NS	NS	5	6
	Maximum	-	25.1	7.34	542	6.50	215.1	NS	**514.0**	NS	54	44	8	4	90	41	73	0.01	0.001	0.05	0.18	0.004	1.3	0.01	0.44	0.9	0.01	0.44	NS	NS	5	10
	Minimum	-	17.0	6.81	359	**5.46**	203.2	NS	**103.5**	NS	49	27	8	4	85	31	50	0.01	0.001	0.05	0.08	0.003	1.0	0.01	0.43	0.6	0.01	0.43	NS	NS	5	2
All Results	**Average**	-	21.0	7.08	451	**5.98**	209.2	NS	**308.7**	NS	52	36	8	4	88	36	62	0.01	0.001	0.05	0.13	0.004	1.2	0.01	0.44	0.8	0.01	0.44	NS	NS	5	6
	Maximum	-	25.1	7.34	542	6.50	215.1	NS	**514.0**	NS	54	44	8	4	90	41	73	0.01	0.001	0.05	0.18	0.004	1.3	0.01	0.44	0.9	0.01	0.44	NS	NS	5	10
	80th Percentile	-	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS
	Median (50th Percentile)	-	21.0	7.08	451	**5.98**	209.2	NS	**308.7**	NS	52	36	8	4	88	36	62	0.01	0.001	0.05	0.13	0.004	1.2	0.01	0.44	0.8	0.01	0.44	NS	NS	5	6
	20th Percentile	-	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS	IS
	Minimum	-	17.0	6.81	359	**5.46**	203.2	NS	**103.5**	NS	49	27	8	4	85	31	50	0.01	0.001	0.05	0.08	0.003	1.0	0.01	0.43	0.6	0.01	0.43	NS	NS	5	2

Red and **bold** values exceed the objective value for that analyte. IS - Insufficient data for statistical analysis. NS = No Sample Required. ND = No Data

Appendix 5

Groundwater Monitoring Results

(Total No. of pages including blank pages = 22)

Cudgen Lakes Sand Quarry

Environmental Monitoring - Groundwater

Project Approval (PA):	05_0103B
Environmental Protection Licence (EPL):	12385
Licensee:	Gales-Kingscliff Pty Limited
Licensee Address:	20 Ginahgulla Road Bellevue Hill, NSW 2023
Premises:	Cudgen Lakes Altona Drive Cudgen, NSW 2487
Licensee Website:	http://www.galeskingscliff.com.au/
Licensee Website - Monitoring Results:	https://www.galeskingscliff.com.au/reports
EPA Public Register:	https://www.epa.nsw.gov.au/licensing-and-regulation/public-registers
Monitoring Month:	Jun-25
Report prepared on:	24/07/2025
Originator:	R.W. Corkery & Co. Pty Limited

Monitoring Requirements - Groundwater

EPL 12385 Requirements

Monitoring Points - Water and Land

EPL Condition	EPA Identification Number	Site ID	Type of Monitoring Point	Location Description*
P1.2	4	MB15	Groundwater Monitoring - MB15	Groundwater monitoring bore. Defined as MB15 in Gales-Kingscliff Pty Ltd, Soil and Water Management Plan for the Cudgen Lakes Sand Quarry, May 2017 (GKSWMP). Location described in Section 5.2.2 Figure 5.1.
	5	MB10	Groundwater Monitoring - MB10	Groundwater monitoring bore. Defined as MB10 in Gales-Kingscliff Pty Ltd, Soil and Water Management Plan for the Cudgen Lakes Sand Quarry, May 2017 (GKSWMP). Location described in Section 5.2.2 Figure 5.1.
	6	MB11	Groundwater Monitoring - MB11	Groundwater monitoring bore. Defined as MB11 in Gales-Kingscliff Pty Ltd, Soil and Water Management Plan for the Cudgen Lakes Sand Quarry, May 2017 (GKSWMP). Location described in Section 5.2.2 Figure 5.1.
** See 'Monitoring Map' tab.*				

Monitoring Conditions

EPL Condition	EPA Identification Number	Site ID	Pollutant	Units of Measure	Monitoring Frequency	Sampling Method
M2.2	4, 5 & 6	MB 15, MB10 & MB11	Ammonia	milligrams per litre (mg/L)	Yearly	Grab Sample
			Chloride	milligrams per litre (mg/L)	Yearly	Grab Sample
			Electrical Conductivity	milligrams per litre (mg/L)	Yearly	Grab Sample
			Oil and Grease	milligrams per litre (mg/L)	Yearly	Grab Sample
			pH	pH	Yearly	Grab Sample
			Standing Water Level	metres (Australian Height Datum)	Yearly	No method specified
			Sulfate	milligrams per litre (mg/L)	Yearly	Grab Sample
			Total Suspended Solids	milligrams per litre (mg/L)	Yearly	Grab Sample

Management Plan Requirements - Soil and Water Management Plan

Version: ***May-21***

Note: The Soil and Water Management Plan (SWMP) fulfils the requirement for a Groundwater Monitoring Program udner Condition 22 of Schedule 3 of PA 05_0103.

Groundwater Levels

Groundwater drawdowns are not to exceed 1.75m in any of the bores / piezometers over a 6-month (or shorter) period. Any decrease greater than 1.75 over a 6-month (or shorter) period is considered a 'significant decrease'.

Groundwater Quality Objectives

Parameters	Units of Measure	All Bores*	MB2**	MB10**	MB13**	GW62045**	GW300856**
pH	pH	6.5 - 8.5	5.2 - 6.5	-	-	5.5 - 6.8	6.1 - 7.0
Electrical Conductivity (EC)	microSiemens per centimeter (µS/cm)	<3000	-	37344	36384	-	-
Sodium (Na)	milligrams per litre (mg/L)	<500	-	7204	6884	-	-
Magnesium (Mg)	milligrams per litre (mg/L)	<100	-	1082	1146	-	-
Potassium (K)	milligrams per litre (mg/L)	<40	-	249	215	-	-
Chloride (Cl)	milligrams per litre (mg/L)	<1000	-	12811	12600	-	-
Sulfate (SO4)	milligrams per litre (mg/L)	<800	-	1878	2276	-	-
Bicarbonate (HCO3)	milligrams per litre (mg/L)	<400	-	1130	545	-	-
Aluminium (Al)	milligrams per litre (mg/L)	<0.5	1.67	-	-	-	0.72
Filterable Iron (Fe)	milligrams per litre (mg/L)	<20	20.92	-	-	-	-
Ammonia (NH3)	milligrams per litre (mg/L)	<20	-	150	-	-	-
**Unless value is otherwise specified in this table.*							

**Objectives based on 80th percentile of all previous data (to July 2019) except pH which is presented as the 20th to 80th percentile range.*

Monitoring Points - Parameters, Locations & Frequency

Occurrence	Frequency	Parameters	Units of Measure	Measurement Type	Sampling Method	Location ID
Operational Periods[1]	Continuous	Standing Water Level	m (AHD)	Logger (Downloaded Quarterly)	Logger	MB1, MB2, MB10, MB14, CSP1, MB11, MB15
		Temperature	degrees Celsius (°C)			
		Electrical Conductivity (EC)	micro Siemens per centimetre (µS/cm)			MB11, MB15
	Monthly	Standing Water Level	m (AHD)	Field	Probe	MB1, MB2, MB10, MB11, MB12, MB13, MB14, MB15, CSP1, CSP3, GW300856, GW062045
		Temperature	degrees Celsius (°C)			
		pH	pH			
		Electrical Conductivity (EC)	micro Siemens per centimetre (µS/cm)			
		Oxygen Reduction Potential (ORP)	millivolts (mV)			
		Major Cations*	milligrams per litre (mg/L)	Laboratory	Grab Sample	
		Major Anions**	milligrams per litre (mg/L)			
		Filterable Iron	milligrams per litre (mg/L)			
		Aluminium	milligrams per litre (mg/L)			
		Arsenic	milligrams per litre (mg/L)			
	Quarterly	Total Phosphorous (P)	milligrams per litre (mg/L)	Laboratory	Grab Sample	MB1, MB2, MB10, MB11, MB12, MB13, MB14, MB15, CSP1, CSP3, GW300856, GW062045
		Ammonia Nitrogen	milligrams per litre (mg/L)			
		NOx Nitrogen	milligrams per litre (mg/L)			
During Use of Makeup Water from Spear Point Extraction System	During Operation - Frequency Unspecified	Standing Water Level	m (AHD)	Field	Probe	At the end of each line of spear points & a spear point within 10m of each end. At the centre of each line of spear points & a spear point within 10m either side of the centre.
		Temperature	degrees Celsius (°C)			
		pH	pH			
		Electrical Conductivity (EC)	micro Siemens per centimetre (µS/cm)			
		Oxygen Reduction Potential (ORP)	millivolts (mV)			
Non-Operational Periods[2]	Continuous	Standing Water Level	m (AHD)	Logger (Downloaded Quarterly)	Logger	MB1, MB2, MB10, MB14, CSP1, MB11, MB15
		Temperature	degrees Celsius (°C)			
		Electrical Conductivity (EC)	micro Siemens per centimetre (µS/cm)			MB11, MB15
	Quarterly	Temperature	degrees Celsius (°C)	Field	Probe	MB1, MB2, MB10, MB11, MB12, MB13, MB14, MB15, CSP1, CSP3, GW300856, GW062045
		pH	pH			
		Electrical Conductivity (EC)	micro Siemens per centimetre (µS/cm)			
		Oxygen Reduction Potential (ORP)	millivolts (mV)			
		Standing Water Level	m (AHD)			
	6-Monthly	Major Cations*	milligrams per litre (mg/L)	Laboratory	Grab Sample	MB1, MB2, MB10, MB11, MB12, MB13, MB14, MB15, CSP1, CSP3, GW300856, GW062045
		Major Anions**	milligrams per litre (mg/L)			
		Filterable Iron	milligrams per litre (mg/L)			
		Aluminium	milligrams per litre (mg/L)			
		Arsenic	milligrams per litre (mg/L)			
		Total Phosphorous (P)	milligrams per litre (mg/L)			
		Ammonia Nitrogen	milligrams per litre (mg/L)			
		NOx Nitrogen	milligrams per litre (mg/L)			

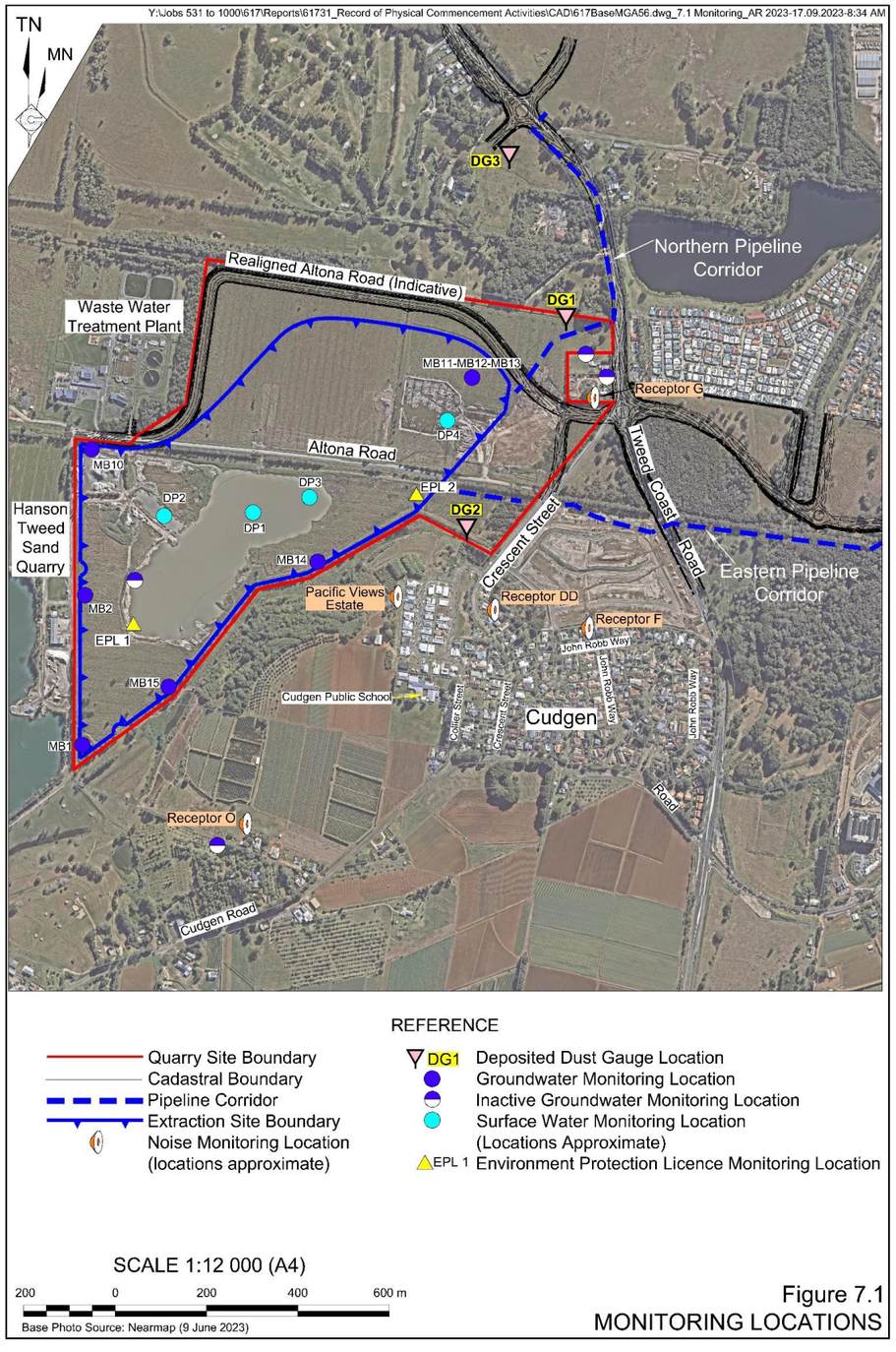
[1] Operational Periods = periods during which extraction and/or processing of material, and/or the placement of fines and/or VENM material, is occurring at the Quarry.

[2] Non-Operational Periods = periods during which no extraction, processing, fines placement or VENM placement activities are occurring. Note: for groundwater monitoring purposes, non-operational periods also include periods during which transportation activities alone occur.

**Major Cations = Sodium, Calcium, Magnesium & Potassium*

***Major Anions = Chloride, Sulfate & Bicarbonate*

Monitoring Location Map - Groundwater



Groundwater Monitoring Bore Location Descriptions

MB1: located at the southwestern boundary between the extraction area and the neighbouring (Hanson Tweed Sand Quarry) sand dredge pond.

MB2: located at the central western boundary between the extraction area and the neighbouring (Hanson Tweed Sand Quarry) sand dredge pond.

MB10: located at the north western boundary between the extraction area and the adjoining Waste Water Treatment Plant.

CSP1–CSP2–CSP3: nested monitoring bore located west of the initial dredge pond and south of the existing Altona Road. This bore has since been removed. This bore has been removed as part of the planned expansion of the dredge pond and the SWMP updated accordingly.

MB11–MB12–MB13: Nested monitoring location within the north-eastern part of the extraction area, north of the existing Altona Road. Noble Lake is located approximately 1km to the northeast.

MB14 and MB15: Replacement bores for MB8A, MB8, MB9 and MB6A, MB6, MB7 which have been damaged over time. Located on the southern boundary of the extraction area; these locations are closest to the two dams and spear points Julius West and Julius East located within the adjoining property owned by R. Julius to the southeast of the Quarry.

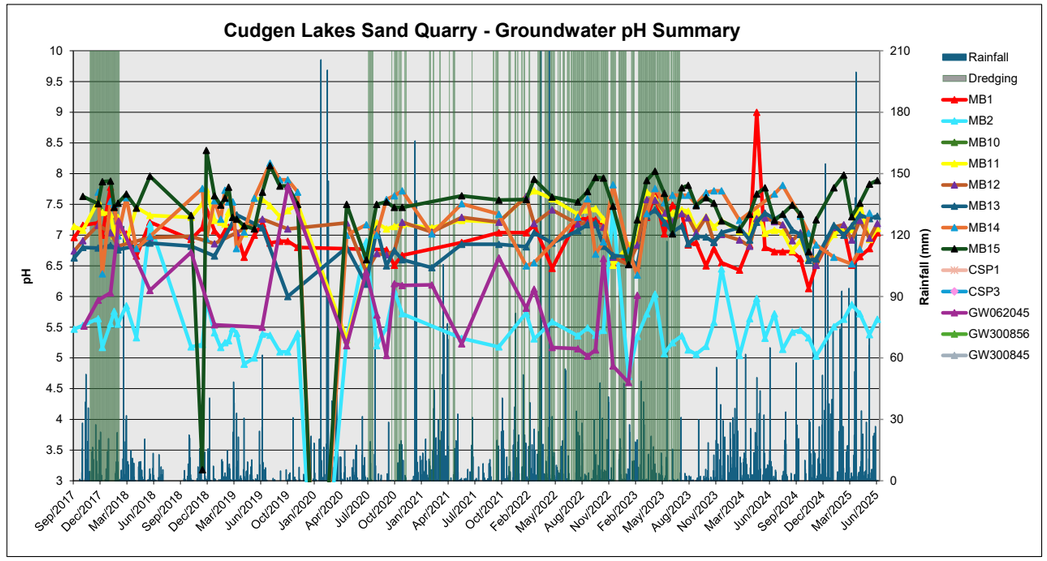
GW062045 and GW300856: Registered groundwater bores located south and east of the Quarry Site.

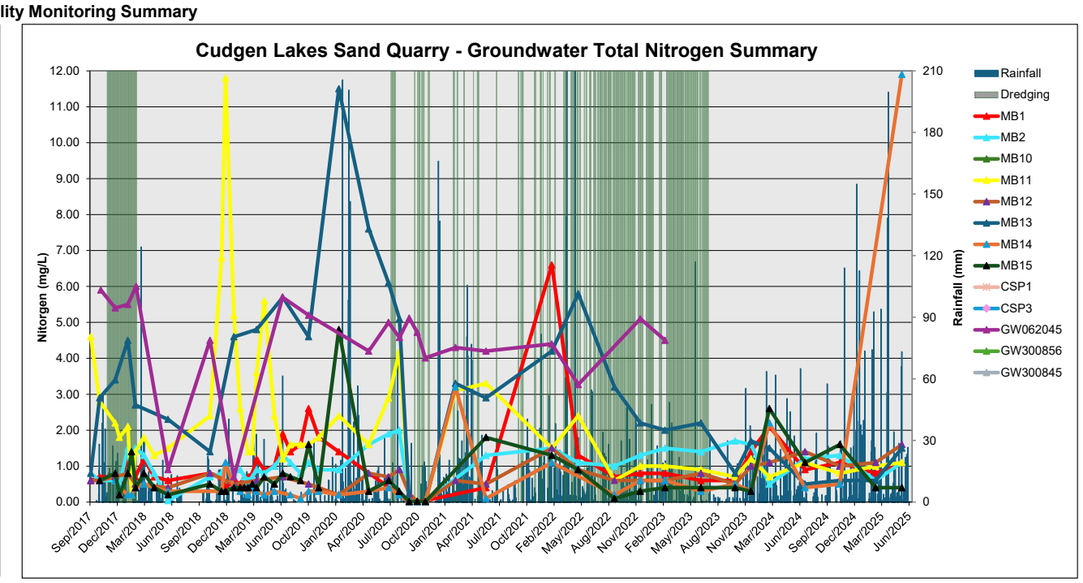
Spearpoint Monitoring Location Descriptions

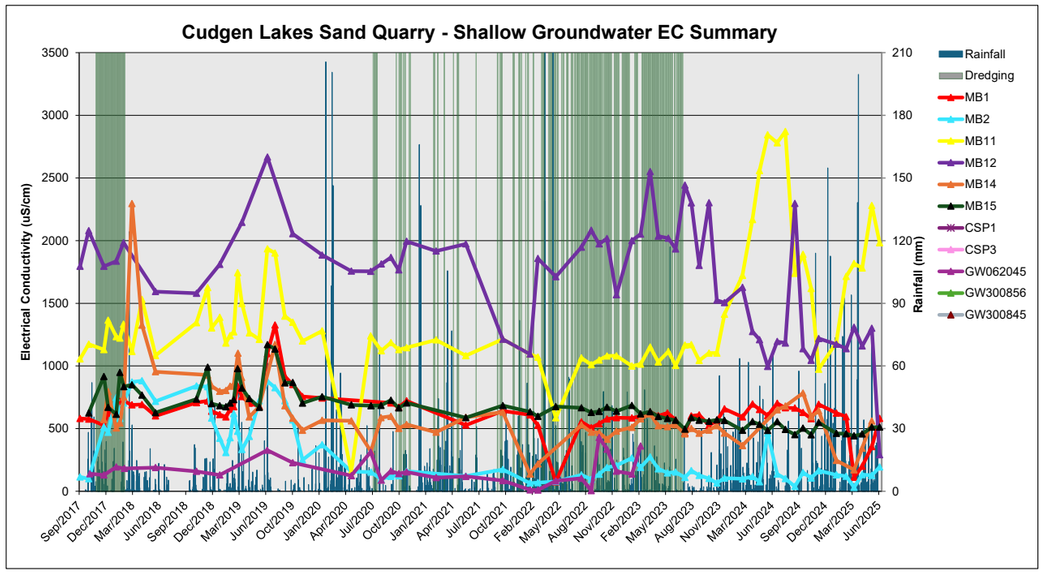
The additional monitoring points would be spear points located:

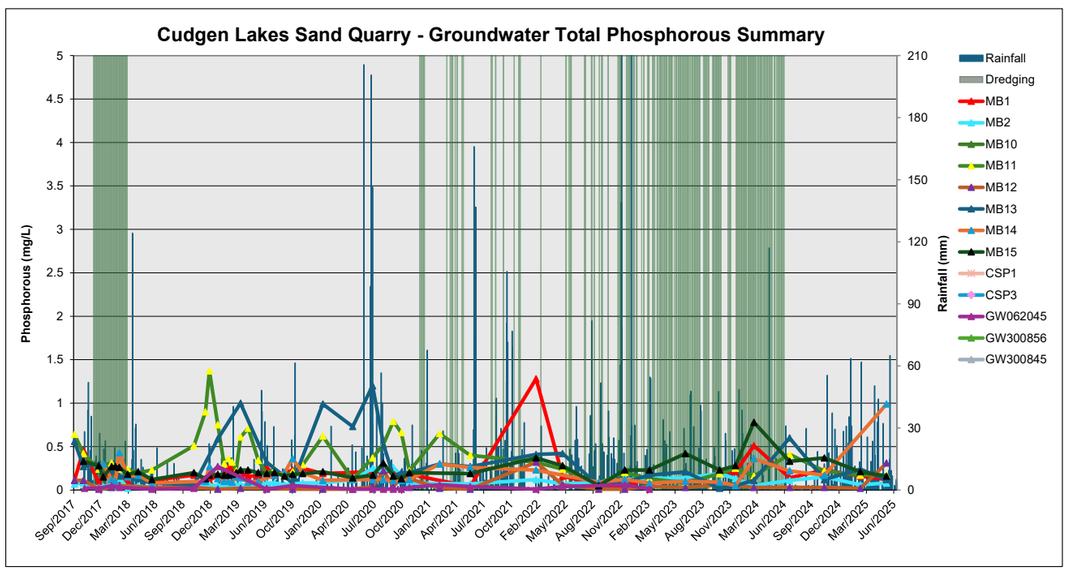
- at the end of each row / line of spear points and a further spear within 10 metres of each end; and
- at the centre of the row / line of spear points and a further spear on either side within 10 metres of the line.

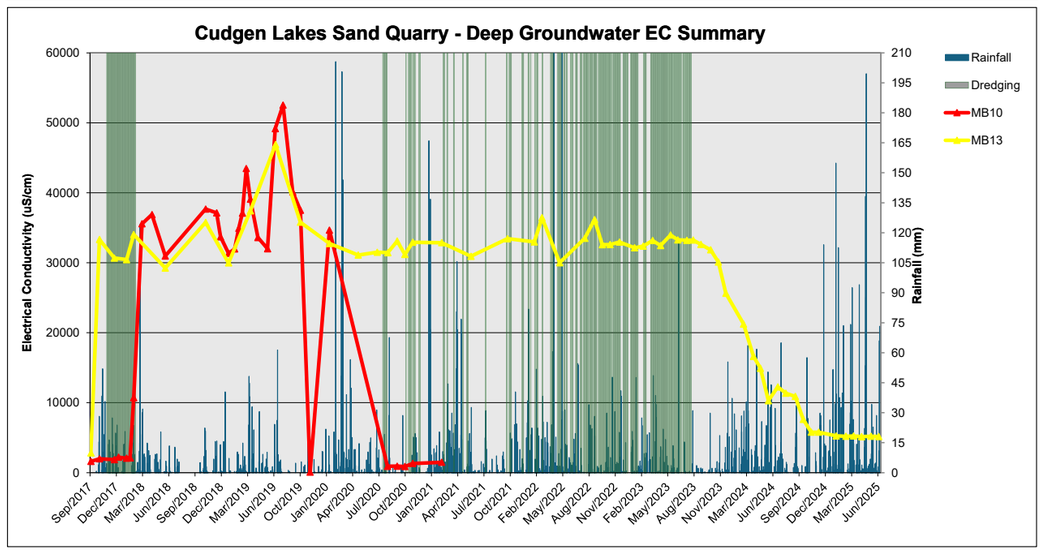
617 - CUDGEN LAKES SAND QUARRY
Groundwater Quality Monitoring Summary

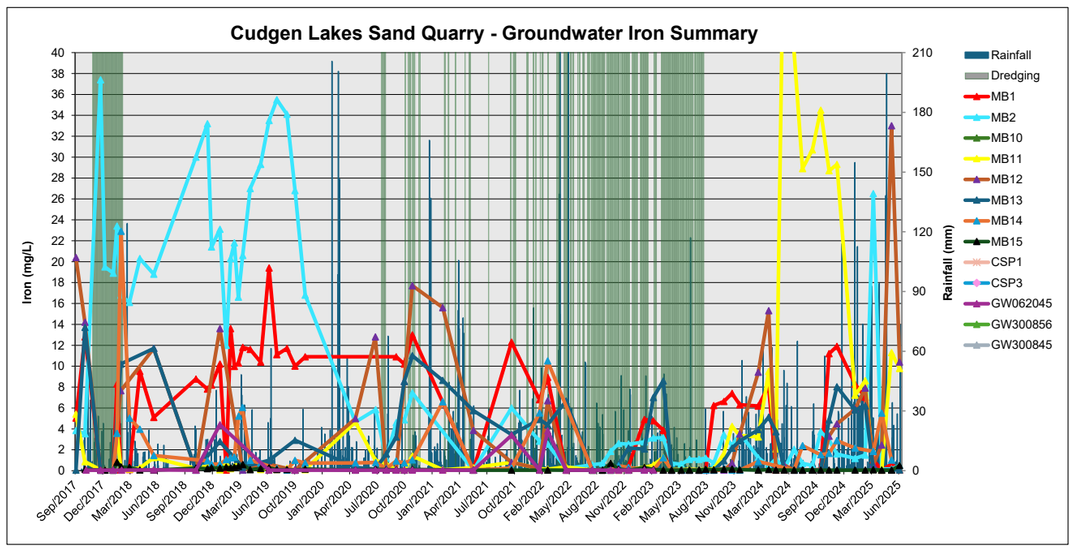












617 - CUDGEN LAKES SAND QUARRY
Groundwater Monitoring Site MB1

Site: MB1			Physical										Major Cations & Anions							Metals			Nutrients							
Sample Date		Comments	Water Level Top of Casing	Water Level m AHD	Temp °C	pH	ElectricalConductivity uS/cm	Dissolved Oxygen mol/L	Redox mV	Total Suspended Solids mg/L	Turbidity NTU	Oil & Grease mg/L	Sodium mg/L	Calcium mg/L	Magnesium mg/L	Potassium mg/L	Chloride mg/L	Sulfate mg/L	Bicarbonate mg/L	Aluminium mg/L	Arsenic mg/L	Iron (filterable) mg/L	Total Phosphorous mg/L	Reactive Phosphorous mg/L	Total Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	TKN mg/L	Ammonia mg/L	NOx mg/L
	Objective		-		-	*6.5-8.5*	*<3000*	-	-	-	-	*<10*	*<500*	-	*<100*	*<40*	*<1000*	*<800*	*<400*	*<0.5*	*<0.42*	*<20*	-	-	-	-	-	-	*<20*	-
Pre-Extraction	2/07/2002					6.98	1516										108	492		0.01		1.09								
	18/07/2002					6.59	1854	0.91																						
	19/07/2002																53	437		0.01		7.15								
	28/08/2002					6.85	1364										35	425		0.01		15.7								
	1/10/2002					6.84	1272	0.64																						
	23/10/2002					6.54	1372	0.91																						
	24/10/2002																55	227		0.09		3.14								
	28/11/2002					6.66	1215	1.07																						
	13/12/2002					7.32	1463	1.28																						
	16/12/2002																59	271		0.01		0.69								
	20/01/2003					7.31	1587										58	287		0.01		3.61								
	24/06/2003					7.01		4.98	23				58	193	36		103	375	230	0.01		3.95								
	22/07/2003					7.11		7.66																						
	28/08/2003					6.79		2.03																						
	29/09/2003					6.76		0.9																						
	24/10/2003					6.96		3.53																						
	30/11/2004					7	1536																							
	16/12/2004					7.24	1087																							
	13/01/2005					7	978																							
	2/02/2005					6.9		0.14																						
	8/03/2005					6.85	872	0.05	-85				40	139	25	5	55	216	153	0.04		18								
	10/05/2005					6.85	880												143											
	19/07/2005					7.07	1109	0.54					44	178	25	5	80	246	165	0.12		19								
	5/08/2005					7.48	1066	0.68																						
	10/11/2005					7.21	985	0.27					31	121	20	5	75	173	142	0.11		13								
	12/01/2006					7.12	1214	0.29					36	136	22	5	63		170	0.11		14								
	7/04/2006					7.18	1036	0.20																						
	3/05/2006					7.12	1005	0.18										161												
	10/05/2006					7.01	1002	0.20	-155				38	135	21	5	42	186	218	0.01		5.51								
	19/05/2006					6.88	1008	0.66																						
	26/05/2006					6.43	905	0.42																						
	1/06/2006					6.92	948	0.48																						
	8/06/2006					6.84	1016	0.36																						
	15/06/2006					7.08	1029	0.21					37	176	25	5	124	191	110	0.14		12								
	23/06/2006					6.71	1100	0.38	-113																					
	29/06/2006					6.43	1006	0.20																						
	6/07/2006					7.76	935	0.21	-168																					
	13/07/2006																		183											
	14/07/2006					7.05	978	0.35																						
	8/02/2007					6.87	979	0.32	-102				45	143	20	5	80	171		0.04		22								
	4/03/2007																													
	29/08/2007					7.1	1026	0.31	-1398				33	113	15	5	40	103	160	0.01		6.51								
	26/10/2007					7.02	733	0.20					32	100	16	5	52	102	181	0.01		0.24								
	14/11/2007					6.74	828	0.26					37	105	17	5	38	96	180	0.01		11								
	2/09/2008					7.4	840																							
	4/09/2017		0.86	0.34	19.8	6.96	581	0.2	-81		1.4	5	43	81	15	4	48	12	292	0.02	0.001	5.04	0.11	0.010	0.60	0.01	0.01	0.6	0.39	0.01
	5/10/2017		0.97	0.23	21.8	7.16	576	1.77	-18.1	32	35	5	36	77	13	4	50	10	275	0.12	0.001	12.8	0.46	0.010	0.70	0.01	0.01	0.7	0.28	0.01
2017/2018	30/10/2017	**Commencement of extraction**																												
	28/11/2017		1.27	-0.07	23.6	7.2	526	1.2	11.5	12	4.9	5	38	77	13	4	41	7	287	0.01	0.001	0.05	0.08	0.010	0.70	0.01	0.21	0.5	0.14	0.22
	13/12/2017		1.13	0.07	25.3	7	624	0.21	-83		4.5		31	87	10	3	32	4	268	0.01	0.001	0.05	0.16	0.010	0.60	0.01	0.01	0.6	0.43	0.01
	11/01/2018		1.38	-0.18	24.8	7.78	642	0.46	-142		5.7	5	31	107	11	4	28	3	317	0.01	0.001	0.05	0.18	0.010	1.20	0.01	0.01	1.2	0.55	0.01
	24/01/2018		1.76	-0.56	23.8	7.48	717	0.52	-32.7		15.8		27	105	9	4	24	6	295	0.01	0.001	8.29	0.14	0.010	1.10	0.01	0.02	1.1	0.78	0.03
	6/02/2018		1.76	-0.56	25	7.09	722	1.15	-109		7.5	5	29	100	10	3	115	27	320	0.01	0.001	0.05	0.12	0.010	0.70	0.01	0.01	0.7	0.47	0.01
	8/02/2018	**Last day of first extraction campaign.**																												
	8/03/2018		0.75	0.45	23.9	7.02	689	0.18	-92		1.8		24	96	11	3	26	7	335	0.01	0.001	0.11	0.11	0.010	1.20	0.01	0.02	1.2	0.56	0.02
	13/04/2018		0.92	0.28	25	6.66	692	2.73	-69		4.3		31	101	11	3	23	14	326	0.01	0.001	9.5	0.18	0.010	0.70	0.01	0.01	0.7	0.29	0.01
	31/05/2018		0.93	0.27	20.7	7.21	601	0.72	-86		0.5	5	21	102	10	3	38	20	316	0.01	0.001	5.1	0.11	0.010	0.60	0.01	0.01	0.6	0.35	0.01
2018/2019	24/10/2018		0.81	0.39	19.3	6.93	707	1.08	-97.1	26	1.2	5	21	92	10	3	38	8	307	0.05	0.005	8.77	0.17	0.010	0.8	0.01	0.01	0.8	0.39	0.01
	3/12/2018		1.08	0.12	21	7.12	721	0.6	-95.7	23	0.2		31	83	10	3	37	9	301	0.01	0.001	7.8	0.13	0.010	0.7	0.01	0.01	0.7	0.36	0.01
	17/12/2018		1.05	0.15	20.8	7.42	639	0.39	-159	29	0.3		31	83	10	3	34	6	284	0.01	0.001	8.2	0.11	0.010	0.4	0.01	0.01	0.4	0.31	0.01
	15/01/2019		1.18	0.02	24.4	7.07	612	0.35	-123.5	24	2.7	5	31	89	10	3	33	10	303	0.01	0.001	10.2	0.17	0.010	0.6	0.01	0.01	0.6	0.38	0.01
	6/02/2019	Cap Missing	1.34	-0.14	23	6.95	593	0.51	-147.9	31	-0.2		37	99	12	3	32	7	298	0.01	0.001	0.05	0.18	0.080	0.5	0.01	0.01	0.5	0.31	0.01
	21/02/2019	No Cattle Noted. MB1 logger dropped to bottom of bore - cattle?	1.41	-0.21	24.4	7.07	654	0.31	-186.9	30	44.6		33	90	11	3	32	4	277	0.01	0.001	13.6	0.26	0.010	0.7	0.01	0.01	0.7	0.44	0.01
	6/03/2019	Cattle on site. Downloaded loggers (elevation & rain). Retrieved logger from MB1	1.41	-0.21	26	7.13	674	0.66	-145	33	9.4		34	92	11	3	41	3	596	0.01	0.001	9.97	0.28	0.003	0.7	0.01	0.02	0.7	0.33	0.02
	20/03/2019		0.95	0.25	24.5	7.14	841	1.21	-21.4	34	0.41		32	100	10	4	28	3	309	0.01	0.001	10.3	0.15	0.004	0.8	0.01	0.01	0.8	0.42	0.01
	4/04/2019		0.84	0.36	24.12	7.04	756	0.61	-17.2		0.37	5	30	119	8	4	24	8	334	0.01	0.001	11.8	0.19	0.010	1.2	0.01	0.01	1.2	0.55	0.01
	30/04/2019		0.96	0.24	22.1	6.64	702	0.36	-122	24	10		29	119	12	4	23	14	347	0.01	0.001	11.6	0.16	0.018	0.9	0.01	0.02	0.09	0.47	0.02
	5/06/2019		1	0.2	21.5	7	679	0.66	-133	26	-8.6		26	118	11	4	25	11	332	0.01	0.001	10.4	0.16	0.003	1	0.01	0.01	1	0.44	0.01

617 - CUDGEN LAKES SAND QUARRY
Groundwater Monitoring Site MB1

2019/2020	4/07/2019		0.81	0.39	21.65	7.19	1098	0.18	-62.2	51	7.8	5	29	132	8	5	24	6	378	0.01	0.001	19.4	0.26	0.001	1.9	0.01	0.01	1.9	0.91	0.01
	31/07/2019	Ants and eggs	0.9	0.3	20.4	6.87	1327	0.33	-114.4	35	14.7		32	116	10	4	39	6	348	0.01	0.001	11.1	0.17	0.045	1.4	0.01	0.01	1.4	0.91	0.01
	4/09/2019	Logger removed on 04/09/19 and replaced on 06/09/19	0.98	0.22	22.1	6.9	918	0.7	-137	17	12.2		44	111	10	4	40	5	336	0.01	0.001	11.7	0.2	0.108	1.6	0.01	0.01	1.6	1.11	0.01
	2/10/2019		1.13	0.07	21.9	6.9	852	1.7	-93.8	26	3.2	5	42	114	10	4	48	1	313	0.01	0.001	10	0.23	0.079	2.6	0.01	0.01	2.6	1.44	0.01
	6/11/2019		1.3	-0.1	21.8	6.8	756	**2.6**	-72.1	**86**	6.1		32	105	10	4	36	2	364	0.01	0.001	10.9	0.25	0.011	1.8	0.01	0.01	1.8	0.97	0.01
	15/01/2020	data logger would not sync. pH 8.4 - meter calibration issue - spurious data.	1.6	-0.4	22.1		744	0.55	-67.9	5	1.3		43	103	10	4	43	2	302				0.19	0.01	1.4	0.01	0.01	1.4	0.62	0.01
	28/04/2020	Monitoring bore damaged (buried during drain cleaning) and requires repair. No sample could be obtained. Bore and logger recovered 10/07/20.																												
2020/2021	16/09/2020		0.61	0.59	20.3	6.76	705	1.39	-113.3	47	2546.77	5	27	112	11	4	27	1	368	0.01	0.001	10.9	0.22	0.017	0.01	0.01	0.01	1.2	0.56	0.01
	14/10/2020	Overcast	0.79	0.41	21.2	6.51	670	2.09	-92.6	30	25.4	5	26	119	11	4	28	1	355	0.01	0.001	10.2	0.18	0.001	0.01	0.01	0.01	1	0.47	0.01
	11/11/2020		0.83	0.37	22	6.67	722	1.69	-94.7	29	4.9		28	117	11	4	27	5	332	0.01	0.001	13	0.18	0.044	0.04	0.01	0.04	1.2	0.62	0.04
	10/06/2021		0.47	0.73	18.9	6.88	528	2.4	7.5	20	48.38		23	93	9	3	26	4	280	0.01	0.001	0.05	0.04	0.001	0.4	0.01	0.05	0.3	0.01	0.05
2021/2022	20/10/2021		0.49	0.71	22.41	7.04	642	1.15	-14.1	NLM	63	NLM	22	100	7	3	28	1	297	0.01	0.001	12.3								
	25/01/2022		0.42	0.78	22.7	7.04	610	2.55	-34.5	NLM	63	NLM	23	107	8	9	22	1	308	0.01	0.004	6.79	1.28		6.6	0.01	0.01	6.6	4.99	0.01
	22/02/2022		0.47	0.73	23.79	7.16	527	1.42	-36.3	NLM	66	NLM	23	99	7	5	29	1	290	0.01	0.001	8.93								
	27/04/2022		0.3	0.9	21.66	**6.46**	74	1.22	-11.5	NLM	83	NLM	12	6	3	3	20	7	24	0.01	0.001	0.05	0.16		1.3	0.01	0.31	1	0.08	0.31
	23/05/2022	Due to major flood event, high rainfall, and poor drainage the site was deemed inaccessible to undertake sampling during May 2022.																												
	22/06/2022	Due to previous major flood events, ongoing rain and slow drainage, the site was deemed inaccessible to undertake sampling during June 2022.																												
2022/2023	27/07/2022	Within a waterlogged area	0.42	0.78	17.6	7.27	554	0.44	107		47		27	78	9	3	24	4	241	0.01	0.001	0.05								
	31/08/2022		0.54	0.66	17.9	7.26	507	1.22	194.9		10.2		26	77	8	3	31	2	235	0.01	0.001	0.05	0.06		0.7	0.01	0.34	0.4	0.03	0.34
	28/09/2022		0.46	0.74	19.9	7.25	539	1.46	-64.6		4.7		31	83	10	5	32	2	260	0.01	0.001	0.05								
	26/10/2022	Clear, waterlogged area	0.35	0.85	21.2	7.14	577	5.56	72.1				28	84	9	3	33	1	270	0.01	0.001	0.05								
	29/11/2022		0.67	0.53	19.6	6.55	587	**2.91**	84.5		4.5		28	90	9	4	32	1	266	0.01	0.001	0.43	0.04		0.8	0.01	0.33	0.5	0.03	0.33
	23/01/2023		0.81	0.39	22.2	6.62	585	2.24	68.9		4.3		26	82	8	3	24	1	277	0.01	0.001	4.9								
	23/02/2023		0.72	0.48	22.1	6.83	599	**2.55**	-82.4		5.5		28	87	9	3	26	1	267	0.01	0.001	4.78	0.14		0.8	0.01	0.02	0.8	0.4	0.02
	29/03/2023	Dead ants and slime in water	0.81	0.39	22.3	7.29	633	1.43	-128.4		41.3		30	87	10	5	30	1	255	0.01	0.001	3.87								
	27/04/2023		0.87	0.33	21.8	7.66	602	**3.43**	-24.2		33.5		28	91	10	4	32	1	262	0.01	0.001	0.05								
	30/05/2023		0.85	0.35	19.5	7.02	625	**1.05**	-13.9		74.9		33	86	11	4	39	2	285	0.01	0.001	0.05								
	28/06/2023		0.80	0.40	18.5	7.49	569	**5.2**	-30.7		30.4		30	75	10	4	34	2	264	0.01	0.001	0.05	0.09		0.6	0.01	0.25	0.3	0.01	0.25
2023/2024	31/07/2023		0.95	0.25	18.2	7.36	464	2.51	-27.9		8.3		30	81	11	4	38	2	257	0.01	0.001	0.05								
	23/08/2023	Laptop battery fail. Loggers returned to HMC offices to download & returned to site 24.08.2023	0.96	0.24	19.2	6.84	601	1.13	-10.1		7.7		35	84	12	4	39	3	268	0.01	0.001	0.05								
	20/09/2023		0.97	0.23	20.3	6.88	609	6.08	-6.1		1.3		34	83	12	4	38	4	276	0.01	0.001	6.24								
	25/10/2023		1.1	0.1	20.9	6.5	526	6.13	-9.4		4.2		31	84	9	4	31	2	248	0.01	0.001	6.62	0.2		0.6	0.01	0.03	0.6	0.34	0.03
	22/11/2023		0.7	0.5	21.7	6.78	563	6.26	-2.1		3.1		30	78	8	3	28	1	246	0.01	0.001	7.4								
	19/12/2023		0.87	0.33	25.5	6.55	658	3.29	1.2		24.1		31	85	10	4	31	2	278	0.01	0.001	6.31	0.21		1.4	0.01	0.05	1.4	0.43	
	21/02/2024	Lots of ants within bore	0.44	0.76	24.6	**6.43**	593	**2.32**	16.4		14.1		29	97	9	6	28	**<1**	284	0.01	0.001	6.18	0.51		2.1	0.01	0.01	2.1	1.2	
	28/03/2024	Ants present Redox meter failed	0.4	0.8	23.2	6.84	697	2.43			15.2		11	114	11	5	35	1	338	0.01	0.001	8.11								
	22/04/2024	Ants present	0.3	0.9	22.1	**9**	652	2.88	-6.9		87.1		29	105	10	5	28	1	299	0.01	0.001	0.05								
	21/05/2024	Ants nesting in the bore casing	0.34	0.86	20.5	6.8	604	2.71	-0.53		67.1		26	117	9	5	31	1	286	0.01	0.001	0.06								
	24/06/2024		0.51	0.69	18.8	6.73	702	2.87	4.3		72.9		26	114	10	4	32	2	329	0.01	0.001	0.05	0.14		0.9	0.01	0.26	0.6	0.03	0.26
2024/2025	23/07/2024		0.4	0.8	16.6	6.73	666	3.96	-1.9		22.8		25	99	8	4	31	1	343	0.01	0.001	0.05								
	26/08/2024		0.41	0.79	19.4	6.73	664	3.8	-10.2		20.9		24	112	8	4	29	1	297	0.01	0.001	0.05								
	24/09/2024	Ants nesting in bore	0.58	0.62	19.3	6.62	629	3.6	-7.1		283		29	101	8	4	30	1	270	0.01	0.001	0.13								
	23/10/2024	Ants nesting in bore	0.36	0.84	19.2	**6.13**	579	3.4	37.9		10.97		24	97	8	4	23	1	289	0.01	0.001	11.2	0.23		1.1	0.01	0.12	1	0.49	0.12
	19/11/2024	Ants nesting in bore	0.33	0.87	20.4	6.51	694	1.58	-4.5		7.7		26	96	7	4	26	1	281	0.01	0.001	11.9								
	21/01/2025		0.2	1	23.6	7.07	624	1.06	-4.9		15.6		31	88	8	4	31	1	273	0.01	0.001	8.27								
	25/02/2025		0.42	0.78	24.9	7.1	595	1.59	-6.4		4.2		32	89	9	4	34	1	258	0.01	0.001	7.03	0.16		0.8	0.01	0.1	0.7	0.39	0.1
	25/03/2025		0.24	0.96	22.4	6.51	112	1.58	18.2		5.1		15	7	4	4	23	3	34	0.01	0.001	1.03								
	23/04/2025		0.32	0.88	23.0	6.65	200	2.21	8.1		8.3		15	19	5	3	26	5	64	0.01	0.001	0.06								
	27/05/2025		0.3	0.9	0.3	6.78	356	3.41	-4.8		17.7		19	46	6	4	29	3	137	0.01	0.001	0.6	0.12		1.1	0.01	0.5	0.6	0.05	0.5
	24/06/2025		0.36		19.9	7.04	582	1.59	-18.7		41.6		27	88	8	4	31	1	248	0.01	0.001	0.05								
Reporting Period (2024/2025)	Average		0.36	0.84	19.00	6.72	518	2.53	0.5	0.00	39.8	0.00	24	76.55	7	3.91	28.45	2	227	0.01	0.00	4	0.17	0.00	1.00	0.01	0.24	0.77	0.31	0.24
	Maximum		0.58	1.00	24.93	7.10	694	3.96	37.9	0.00	283.0	0.00	32	112.00	9	4.00	34.00	5	343	0.01	0.00	12	0.23	0.00	1.10	0.01	0.50	1.00	0.49	0.50
	Minimum		0.20	0.62	0.30	**6.13**	112	1.06	-18.7	0.00	4.2	0.00	15	7.00	4	3.00	23.00	1	34	0.01	0.00	0	0.12	0.00	0.80	0.01	0.10	0.60	0.05	0.10
All Results	Average		0.79	0.41	21.38	6.97	790	1.61	-64.0	30.45	61.0	5.00	30	98.66	11	4.03	39.27	53	269	0.02	0.00	6	0.20	0.02	1.05	0.01	0.07	1.05	0.56	0.07
	Maximum		1.76	1.00	26.00	**9.00**	1854	7.66	194.9	86.00	2546.8	5.00	58	193.00	36	9.00	124.00	492	**596**	0.14	0.01	**22**	1.28	0.11	6.60	0.01	0.50	6.60	4.99	0.50
	80th Percentile		1.08	0.78	23.82	7.18	1011	2.69	-0.5	34.40	42.8	5.00	35	116.00	12	5.00	47.00	96	325	0.01	0.00	11	0.23	0.02	1.40	0.01	0.10	1.40	0.62	0.11
	Median (50th Percentile)		0.81	0.39	21.79	6.98	696	1.11	-31.7	29.00	8.3	5.00	30	99.00	10	4.00	32.00	4	281	0.01	0.00	6	0.17	0.01	0.80	0.01	0.01	0.75	0.43	0.01
	20th Percentile		0.41	0.11	19.47	6.72	586	0.33	-113.3	21.80	2.9	5.00	26	83.00	8	3.00	26.20	1	231	0.01	0.00	0	0.11	0.01	0.60	0.01	0.01	0.60	0.28	0.01
	Minimum		0.20	-0.56	0.30	**6.13**	74	0.05	-1398.0	5.00	-8.6	5.00	11	6.00	3	3.00	20.00	1	24	0.01	0.00	0	0.04	0.00	0.01	0.01	0.01	0.09	0.01	0.01

Red and **bold** values exceed the objective value for that analyte. IS - Insufficient data for statistical analysis. NS = No Sample Required. ND = No Data. NLM = No Longer Monitored

617 - CUDGEN LAKES SAND QUARRY
Groundwater Monitoring Site MB2

Site: MB2			Physical										Major Cations & Anions							Metals			Nutrients								
	Sample Date	Comments	Water Level Top of Casing	Water Level m AHD	Temp °C	pH	Electrical Conductivity uS/cm	Dissolved Oxygen mol/L	Redox mV	Total Suspended Solids mg/L	Turbidity NTU	Oil & Grease mg/L	Sodium mg/L	Calcium mg/L	Magnesium mg/L	Potassium mg/L	Chloride mg/L	Sulfate mg/L	Bicarbonate mg/L	Aluminium mg/L	Arsenic mg/L	Iron (filterable) mg/L	Total Phosphorous mg/L	Reactive Phosphorous mg/L	Total Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	TKN mg/L	Ammonia mg/L	NOx mg/L
	Objective		-		-	*5.2-6.5*	*<3000*	-	-	-	-	*10*	*<500*	-	*<100*	*<40*	*<1000*	*<800*	*<400*	*<1.67*	*<0.42*	*<20.92*	-	-	-	-	-	-	*<150*	-
Pre-Extraction	22/05/2002																20	27		0.86		7.77								
	2/07/2002					7.42	1875										20	17		1.08		7.04								
	18/07/2002					6.88	2380	1.13																						
	19/07/2002																14	17		0.97		7.93								
	28/08/2002					5.93	160										10	18		1.45		9.5								
	1/10/2002					7.72	180	0.67																						
	23/10/2002					7.38	2394	0.86																						
	24/10/2002																22	13		1.5		8.06								
	28/11/2002					6.67	178	0.79																						
	13/12/2002					6.36	174	1.15																						
	16/12/2002																27	19		1.32		8.28								
	20/01/2003					6.92	1909										24	16		1.92		8.84								
	24/06/2003					6.39		0.8	216				18	1	1		24	13	11	0.44		3.13								
	22/07/2003					6.53		5.09																						
	28/08/2003					6.61		3.8																						
	29/09/2003					5.96		0.6																						
	24/10/2003					6.66		3.47																						
	30/11/2004					5.65	138																							
	16/12/2004					6.43	139																							
	13/01/2005					6.67	365																							
	2/02/2005					6.22		0.37																						
	8/03/2005					6.81	115	0.28	-130				15	0.43	0.46	17	22	14	15.9	6.37		9.14								
	10/05/2005					5.56	118												24											
	19/07/2005					4.62	161	0.21					18	0.8	0.4	17	40	17	14.6	3.95		6.57								
	10/11/2005					5.87	348	0.21					15	1.42	0.4	14	45	14	17	4.81		7.38								
	12/01/2006					5.49	182	0.26					17	1.8	0.6	19	34		60	6.16		7.71								
	7/04/2006					5.88	188	0.20																						
	3/05/2006					5.6	142	0.25										23												
	10/05/2006					6.07	88	0.16	-104				12	0.2	0.2	19	14	14	14	0.73		3.12								
	19/05/2006					5.61	123	0.32																						
	26/05/2006					6.1	139	0.23																						
	1/06/2006					6.07	199	0.43																						
	8/06/2006					6.4	139	0.30																						
	15/06/2006					6.05	134	0.28					16	0.5	0.2	20	37	16	11	1.21		4.85								
	23/06/2006					4.95	131	0.23	-29																					
	29/06/2006					5.75	133	0.28																						
	6/07/2006					5.28	115	0.17	-21																					
	13/07/2006																		7.8											
	14/07/2006					5.33	132	0.27																						
	8/02/2007					5.05	150	0.33	-10				16	0.4	0.3	20	27	16		1.98		6.88								
	29/08/2007					5.69	178.4	0.24	110.9				17	0.4	0.6	15	28	16	10	2.08		5.76								
	26/10/2007					5.4	124.4	0.17					23	0.7	1	15	33	14	7	1.42		5.8								
	14/11/2007					5.76	129.3	0.22					22	0.3	2	13	38	21	7	1.5		6.78								
	2/09/2008					6.1	127.6																							
	4/09/2017		1.64	0.31	20.8	5.47	114	0.17	46		7.3	5	12	0.9	0.9	6	16	0.9	16	0.48	0.011	3.84	0.07	0.07	0.80	0.01	0.01	0.8	0.29	0.01
	5/10/2017		1.77	0.18	21.7	5.53	99.9	0.53	-32.7	9	14.4	5	13	1	0.9	4	22	2	11	0.43	0.009	3.54	0.08	0.03	0.60	0.01	0.01	0.6	0.19	0.01
2017/2018	30/10/2017	**Commencement of extraction**																												
	28/11/2017		2.89	-0.94	23.5	5.64	514	2.46	7.2	5	0.3	5	70	4	2	14	125	80	12	0.04	0.004	37.4	0.03	0.01	0.60	0.01	0.01	0.6	0.39	0.01
	13/12/2017		2.34	-0.39	25.4	5.17	470	0.65	-103		5.8		57	7	3	8	102	51	1	0.11	0.004	19.5	0.04	0.02	0.50	0.01	0.01	0.5	0.23	0.01
	11/01/2018		2.69	-0.74	25.1	5.56	749	0.62	-5		6.7	5	119	11	8	26	182	159	1	0.05	0.002	18.9	0.06	0.01	1.50	0.01	0.01	1.5	0.77	0.01
	24/01/2018		2.66	-0.71	24.1	5.76	582	0.34	-5		14.8		72	10	5	7	152	67	12	0.2	0.008	23.4	0.04	0.02	0.80	0.01	0.01	0.8	0.2	0.01
	6/02/2018		2.6	-0.65	26.1	5.55	705	0.37	2		6.2	5	97	20	9	7	162	92	23	0.07	0.014	16.8	0.14	0.01	1.50	0.01	0.01	1.5	0.45	0.01
	8/02/2018	**Last day of first extraction campaign.**																												
	8/03/2018		1.56	0.39	24.2	5.85	872	0.19	-115		6.7		95	25	8	6	185	92	28	0.15	0.007	16.1	0.02	0.02	1.30	0.01	0.01	1.3	0.38	0.01
	13/04/2018		1.67	0.28	24.5	5.33	882	1.28	-20		1.5		116	19	8	6	178	103	12	0.12	0.018	20.3	0.05	0.02	0.80	0.01	0.01	0.8	0.17	0.01
	31/05/2018		1.69	0.26	22.3	7.18	718	0.74	19.4		13.4	5	102	19	7	6	180	100	1	0.15	0.014	18.8	0.02	0.01	0.04	0.01	0.01	0.4	0.19	0.1
2018/2019	24/10/2018		1.5	0.45	20.25	5.18	840	0.31	-8.1	5	0.5	5	96	11	6	10	189	134	17	0.13	0.025	30	0.05	0.01	0.7	0.01	0.01	0.7	0.32	0.01
	3/12/2018		1.77	0.18	22.9	5.22	835	2.85	39.1	9	2.1		99	10	8	13	173	115	15	0.11	0.031	33.2	0.06	0.02	0.8	0.01	0.01	0.8	0.58	0.01
	17/12/2018		1.82	0.13	22.1	5.94	584	2.2	0.3	27	12.6		81	9	6	14	128	119	5	0.13	0.032	21.4	0.06	0.01	1	0.01	0.01	1	0.42	0.01
	15/01/2019		1.9	0.05	23.8	5.41	423	0.38	-71	8	8.2	5	70	10	5	11	100	85	4	0.13	0.026	23.1	0.05	0.01	0.8	0.01	0.01	0.8	0.41	0.01
	6/02/2019		2.05	-0.1	23.5	5.17	309	0.75	61.5	41	7		41	5	4	10	70	57	4	0.15	0.03	12	0.06	0.005	0.9	0.01	0.01	0.9	0.3	0.01
	21/02/2019		2.15	-0.2	23.6	5.25	427.5	0.46	5.4	28	70.6		37	5	3	11	51	36	11	0.17	0.028	20.3	0.05	0.03	0.7	0.01	0.01	0.7	0.14	0.01
	6/03/2019		2.13	-0.18	24.9	5.28	620	0.54	-90.1	5	5.7		89	8	5	10	136	76	17	0.14	0.022	21.8	0.04	0.005	0.6	0.01	0.01	0.6	0.27	0.01
	20/03/2019		1.72	0.23	24.5	5.48	478	0.79	75.4	8	0.23		54	6	4	10	89	60	16	0.18	0.026	16.6	0.06	0.002	0.7	0.01	0.01	0.7	0.27	0.01
	4/04/2019		1.67	0.28	24.39	5.4	333	0.74	76	8	0.16	5	80	8	5	10	134	87	13	0.14	0.031	20.6	0.06	0.002	0.9	0.01	0.01	0.9	0.3	0.01
	30/04/2019		1.94	0.01	22.5	4.9	438	0.61	51.6	6	8.6		78	11	7	13	146	100	10	0.17	0.079	27	0.05	0.017	0.8	0.01	0.01	0.08	0.33	0.01
	5/06/2019		1.72	0.23	21.7	5	722	0.63	4.8	7	8.4		88	6	7	12	148	115	6	0.17	0.046	29.3	0.05	0.004	1	0.01	0.01	1	0.48	0.01
2019/2020	4/07/2019		1.51	0.44	22.05	5.39	879	0.17	-51.2	5	0	5	68	9	6	12	116	80	22	0.2	0.116	33.5	0.08	0.001	1.3	0.01	0.01	1.3	0.56	0.01
	31/07/2019		1.63	0.32	21	5.37	827	3.55	64.5	54	10.3		76	9	7	12	129	100	1	0.21	0.092	35.5	0.08	0.032	1.1	0.01	0.01	1.1	0.37	0.01
	4/09/2019		1.73	0.22	22.2	5.1	722	0.3	64.9	5	18.4		70	9	6	11	129	104	8	0.15	0.063	34.1	0.06	0.015	0.8	0.01	0.01	0.8	0.32	0.01
	2/10/2019		1.87	0.08	21.8	5.1	569	0.5	64.2	62	4.3	5	49	7	5	10	80	57	1	0.21	0.109	26.8	0.07	0.015	1.1	0.01	0.01	1.1	0.28	0.01
	6/11/2019		2.02	-0.07	22.9	5.4	250.8	1.1	21	5	21.5		34	4	3	8	75	53	3	0.24	0.106	16.8	0.08	0.018	0.9	0.01	0.01	0.9	0.36	0.01
	15/01/2020	pH meter calibration issue - spurious data.	2.44	-0.49	23	~8*	372	0.61	-3.5	2	16.6		42	4	3	8	65	36	1				0.08	0.01	0.9	0.01	0.01	0.9	0.35	0.01
	28/04/2020	Land-based extraction commenced 16/04/20.	1.24	0.71	24.7	5.3	157.8	0.94	-67.1	26	452.5	5	17	2	1	4	33	11	3	0.27	0.063	4.66	0.12	0.022	1.6	0.01	0.01	1.6	0.24	0.01

617 - CUDGEN LAKES SAND QUARRY
Groundwater Monitoring Site MB2

2020/2021	7/07/2020	Cloudy	1.35	0.6	21.8	**6.9**	153	0.9	9.2	5	153	5	19	2	1	4	25	10	7	0.46	0.071	5.84	0.25	0.22	1.9	0.01	0.01	1.9	0.2	0.01
	12/08/2020	Clear	1.22	0.73	21	5.2	98	0.77	-47	16	431	5	14	1	1	3	8	7	17	0.39	0.027	1.2	0.21	0.028	2	0.01	0.01	2	0.15	0.01
	16/09/2020		1.36	0.59	20.8	5.49	118.4	2.01	26.1	14	4009.23	5	16	2	1	4	15	8	13	0.62	0.058	4.6	0.26	0.026	0.01	0.01	0.01	2	0.28	0.01
	14/10/2020		1.57	0.38	20.2	6.09	123.3	1.74	-26.7	6	724.5	5	15	2	1	4	25	10	11	0.58	0.051	4.85	0.17	0.006	0.01	0.01	0.01	2	0.29	0.01
	11/11/2020	Cloudy, Odour	1.61	0.34	21.3	5.72	159.7	1.86	-13.9	5	133.7		18	2	1	4	31	8	5	0.49	0.047	7.44	0.08	0.013	0.01	0.01	0.01	1.3	0.24	0.01
	10/06/2021		1.25	0.7	20.6	5.32	121.2	1.23	80.33	10	13.5		17	2	1	4	21	8	11	0.32	0.001	0.05	0.07	0.002	1.3	0.01	0.01	1.3	0.31	0.01
2021/2022	20/10/2021		1.2	0.75	20.9	**5.18**	174	0.53	92.4		10		22	2	2	5	31	8	11	0.34	0.01	6.01								
	25/01/2022		1.13	0.82	24.4	5.73	65	3.05	51.3		15		15	2	1	6	20	2	17	0.13	0.008	2.83	0.12		1.5	0.01	0.03	1.5	0.61	0.03
	22/02/2022		1.2	0.75	25.05	5.31	69	1.83	70.7		14		15	2	15	6	30	2	10	0.12	0.007	2.55								
	27/04/2022		0.98	0.97	22.73	5.59	78	1.68	38.4		45.7		18	2	1	7	32	10	12	0.1	0.007	0.2	0.07		1.1	0.01	0.28	0.8	0.09	0.28
	23/05/2022	Due to major flood event, high rainfall, and poor drainage the site was deemed inaccessible to undertake sampling during May 2022.																												
	22/06/2022	Due to previous major flood events, ongoing rain and slow drainage, the site was deemed inaccessible to undertake sampling during June 2022.																												
2022/2023	27/07/2022		1.12	0.83	18.6	5.36	131	0.41	117		53		17	2	1	15	21	11	27	0.13	0.017	0.56								
	31/08/2022		1.37	0.58	18.66	5.49	96	1.68	210.1		40.2		24	2	2	13	28	11	22	0.19	0.012	0.71	0.09		1	0.01	0.18	0.8	0.01	0.18
	28/09/2022	Groundwater level lower than surrounding bores	1.2	0.75	19.89	5.37	136	1.33	49.1		32.9		17	2	1	16	22	10	26	0.14	0.056	1.85								
	26/10/2022	Clear	1.03	0.92	20.4	5.45	189.9	2.55	86.5				17	3	2	19	28	12	19	0.12	0.051	2.6								
	29/11/2022		1.46	0.49	19.94	**7.42**	206	1.49	-32.1		13.1		16	4	2	21	33	14	21	0.13	0.069	2.54	0.12		1.3	0.01	0.14	1.2	0.24	0.14
	23/01/2023	Ants	1.61	0.34	22	**4.7**	266	2.4	37		22.5		16	3	2	23	23	13	25	0.15	0.15	2.75								
	23/02/2023		1.6	0.35	22.5	5.35	190.5	1.89	64.4		32.8		22	2	2	13	6	1	25	0.45	0.189	3.13	0.13		1.5	0.01	0.01	1.5	0.26	0.01
	29/03/2023	Ants	1.64	0.31	22.93	5.72	274	0.64	-98.1		54.3		25	2	2	10	39	3	26	0.44	0.05	3.16								
	27/04/2023		1.76	0.19	22.92	6.04	179	5.59	62.7		88.9		22	3	2	10	27	8	26	0.33	0.009	0.72								
	30/05/2023		1.56	0.39	21.29	**5.07**	147	0.11	86.5		116		22	3	2	11	28	10	22	0.17	0.007	0.62								
	28/06/2023		1.7	0.25	19.5	5.25	153	3.91	85.7		76.5		24	2	2	10	34	11	19	0.2	0.014	1.09	0.14		1.4	0.01	0.05	1.4	0.18	0.05
2023/2024	31/07/2023		1.75	0.2	20.27	5.36	110	0.13	74.4		64.1		35	3	2	9	36	12	40	0.26	0.009	1.08								
	23/08/2023	Laptop battery fail. Loggers returned to HMC offices to download & returned to site 24.08.2023	1.71	0.24	20.21	**5.13**	165	0.53	78.5		65.1		28	3	2	8	29	14	25	0.26	0.016	1.2								
	20/09/2023		1.68	0.27	20.3	**5.06**	127	5.66	85.5		58.8		21	2	2	9	22	16	29	0.22	0.013	0.73								
	25/10/2023		1.77	0.18	21.03	**5.19**	102	5.51	69.8		52.9		17	2	2	10	21	10	20	0.24	0.07	3.44	0.19		1.7	0.01	0.07	0.07	0.38	0.04
	22/11/2023		1.41	0.54	20.65	5.58	66	5.72	67.1		28.5		15	2	2	8	19	10	19	0.21	0.078	2.4								
	19/12/2023		1.5	0.45	27.06	6.45	105	5.84	43.7		40.5		13	2	1	6	18	7	18	0.49	0.077	3.57	0.13		1.6	0.01	0.02	1.6	0.18	
	21/02/2024		1.13	0.82	24.84	**5.04**	99	4.51	100.1		22.5		10	2	2	9	18	8	10	0.12	0.009	1.24	0.05		0.5	0.01	0.01	0.5	0.15	
	28/03/2024		1.07	0.88	23.72	5.64	117	4.59			36.6		2	2	2	10	20	8	10	0.09	0.005	0.44								
	22/04/2024	Ants present	0.92	1.03	23.08	5.97	76	2.22	58.1		20.2		11	2	2	8	21	5	8	0.09	0.007	1.13								
	21/05/2024	Ants nesting in the bore casing	1.03	0.92	27.53	5.32	463	3.12	81.9		25.1		15	3	3	7	32	5	8	0.04	0.001	0.17								
	24/06/2024	Ants nesting in bore casing	1.2	0.75	20.42	5.72	137	2.14	64.1		64.1		13	2	1	6	23	3	14	0.48	0.017	2.04	0.11		1.2	0.01	0.01	1.2	0.2	0.01
2024/2025	23/07/2024	Ants nesting in bore casing	1.19	0.76	19.3	**5.14**	101	2.85	83.4		49.5		12	3	2	5	24	5	11	0.22	0.004	0.7								
	26/08/2024	Ants nesting in bore casing	1.08	0.87	19.8	5.42	38	3.73	67.8		42.3		16	3	2	4	24	10	11	0.1	0.002	0.5								
	24/09/2024	Ants nesting in bore casing	1.26	0.69	20.5	5.45	150	3.72	84		26.3		15	2	1	6	23	1	12	0.5	0.028	3.73								
	23/10/2024		1.03	0.92	19.3	5.33	106	2.61	86.9		19.18		10	2	2	4	17	2	15	0.23	0.012	2.9	0.15		1.3	0.01	0.0	1.3	0.71	0.01
	19/11/2024		0.97	0.98	21.1	**5.03**	164	0.85	82.5		11.3		10	3	2	3	14	6	15	0.13	0.008	1.6								
	21/01/2025	Ants nesting in bore	0.93	1.02	24.1	5.51	131	1.47	76.8		22.3		9	2	1	4	11	3	14	0.11	0.007	1.17								
	25/02/2025		1.13	0.82	24.4	5.63	120	1.41	80.1		19.5		8	2	1	4	12	2	15	0.16	0.008	1.49	0.06		0.6	0.01	0.0	0.6	0.17	0.01
	25/03/2025		0.97	0.98	23.4	5.87	31	1.68	74.8		17.9		45	183	22	8	82	240	308	0.01	0.001	**26.5**								
	23/04/2025		1.02	0.93	24.5	5.72	133	0.96	75.1		19.3		12	3	2	4	23	6	10	0.06	0.001	0.17								
	27/05/2025		1.1	0.85	1.1	5.38	127	2.01	81.2		40.1		11	3	2	6	22	10	10	0.06	0.001	0.16	0.08		1.1	0.01	0.2	0.9	0.04	0.16
	24/06/2025		1.09		20.0	5.63	194	1.76	71.3		41.9		10	3	2	5	18	8	10	0.12	0.002	0.52								

Reporting Period (2024/2025)	Average	1.07	0.88	19.73	5.45	110	2.13	79.26	0.00	26.77	0.00	14.80	20.60	3.70	4.80	25.20	28.50	42.10	0.16	0.01	3.89	0.10	0.00	1.00	0.01	0.06	0.93	0.31	0.06
	Maximum	1.26	1.02	24.48	5.87	164	3.73	86.90	0.00	49.50	0.00	45.00	183.00	22.00	8.00	82.00	240.00	308.00	0.50	0.03	**26.50**	0.15	0.00	1.30	0.01	0.16	1.30	0.71	0.16
	Minimum	0.93	0.69	1.10	**5.03**	31	0.85	67.80	0.00	11.30	0.00	8.00	2.00	1.00	3.00	11.00	1.00	10.00	0.01	0.00	0.16	0.06	0.00	0.60	0.01	0.01	0.60	0.04	0.01
All Results	Average	1.56	0.39	22.05	5.72	335	1.46	33.29	14.65	109.43	5.00	34.94	6.62	3.12	9.93	54.68	34.51	17.89	0.63	0.03	9.44	0.09	0.02	0.98	0.01	0.03	1.03	0.30	0.03
	Maximum	2.89	1.03	27.53	**7.72**	2394	5.84	216.00	62.00	4009.23	5.00	119.00	183.00	22.00	26.00	189.00	240.00	308.00	6.37	0.19	**37.40**	0.26	0.22	2.00	0.01	0.28	2.00	0.77	0.28
	80th Percentile	1.81	0.82	24.38	6.10	485	2.51	81.62	26.60	58.80	5.00	70.00	8.00	5.00	14.00	104.80	76.80	22.00	0.66	0.06	19.82	0.13	0.03	1.44	0.01	0.01	1.50	0.40	0.01
	Median (50th Percentile)	1.57	0.39	22.15	5.56	158	0.79	51.45	8.00	19.50	5.00	18.00	2.00	2.00	9.50	28.00	14.00	12.50	0.21	0.02	4.85	0.07	0.01	0.90	0.01	0.01	0.90	0.28	0.01
	20th Percentile	1.13	0.14	20.32	5.24	117	0.28	-20.60	5.00	7.00	5.00	14.40	2.00	1.00	5.20	20.00	7.00	7.48	0.12	0.01	1.19	0.05	0.01	0.60	0.01	0.01	0.66	0.18	0.01
	Minimum	0.92	-0.94	1.10	**4.62**	31	0.11	-130.00	2.00	0.00	5.00	2.00	0.20	0.20	3.00	6.00	0.90	1.00	0.01	0.00	0.05	0.02	0.00	0.01	0.01	0.01	0.07	0.01	0.01

Red and **bold** values exceed the objective value for that analyte. IS - Insufficient data for statistical analysis. NS = No Sample Required. ND = No Data. NLM = No Longer Monitored

617 - CUDGEN LAKES SAND QUARRY
Groundwater Monitoring Site MB11

Site: MB11			Physical										Major Cations & Anions							Metals			Nutrients							
Sample Date		Comments	Water Level Top of Casing	Water Level m AHD	Temp °C	pH	ElectricalConductivity uS/cm	Dissolved Oxygen mol/L	Redox mV	Total Suspended Solids mg/L	Turbidity NTU	Oil & Grease mg/L	Sodium mg/L	Calcium mg/L	Magnesium mg/L	Potassium mg/L	Chloride mg/L	Sulfate mg/L	Bicarbonate mg/L	Aluminium mg/L	Arsenic mg/L	Iron (filterable) mg/L	Total Phosphorous mg/L	Reactive Phosphorous mg/L	Total Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	TKN mg/L	Ammonia mg/L	NOx mg/L
	Objective		-		-	*6.5-8.5*	*<3000*	-	-	-	-	*10*	*<500*	-	*<100*	*<40*	*<1000*	*<800*	*<400*	*<0.5*	*<0.42*	*<20*	-	-	-	-	-	-	*<20*	-
Pre-Extraction	16/06/2005					6.81	1625	0.65					220	211	72	19	300	484		3.13		11								
	19/07/2005					7.42	1553	1.00					127	289	65	11	311	456	302	0.64		3.57								
	5/08/2005					7.54	1492	1.13																						
	10/11/2005					7.37	1505	0.54					51	191	50	11	90	520	235	0.15		1.08								
	12/01/2006					7.25	1743	0.40					149	215	67	16	74		432	0.15		3.14								
	3/05/2006																	360												
	8/02/2007					7.32	1312	2.11	-144																					
	2/09/2008					7.6	1552																							
	4/09/2017	Purged for 5 mins to clear debris - sulphide (black) particles & ants removed. Strong odour	1.39	0.2	19.1	7.14	1056	0.37	-74		43.1	5	39	180	49	10	47	328	351	0.39	0.001	5.42	0.64	0.01	4.60	0.01	0.01	4.6	1.48	0.01
	5/10/2017	Few black particles (sulphides)	1.29	0.3	20.8	7.08	1174	1.99	-104	5	11.3	5	34	168	45	9	54	346	345	0.01	0.001	0.87	0.42	0.27	2.80	0.01	0.01	2.8	1.8	0.01
2017/2018	30/10/2017	**Commencement of extraction**																												
	28/11/2017		1.21	0.38	24.5	7.56	1130	0.98	-36.4	5	0.1	5	37	173	48	10	48	335	352	0.01	0.001	0.09	0.24	0.16	2.20	0.33	0.39	1.5	0.54	0.72
	13/12/2017		1.25	0.34	24.5	7.37	1365	0.18	-134		0.7		41	181	55	11	50	347	317	0.01	0.001	0.08	0.29	0.19	1.80	0.06	0.32	1.4	1.15	0.38
	11/01/2018		1.48	0.11	27.1	7.34	1234	1.16	-139		9.4	5	38	192	51	11	46	324	326	0.01	0.001	0.06	0.31	0.28	2.10	0.02	0.02	2.1	1.66	0.04
	24/01/2018		1.56	0.03	24.6	6.99	1222	0.37	-30		6.6		20	33	8	2	17	21	98	0.01	0.001	3.58	0.1	0.01	0.20	0.01	0.02	0.2	0.04	0.02
	6/02/2018		1.37	0.22	25.5	7.29	1334	0.73	-88		3.7	5	39	172	47	10	49	334	341	0.01	0.001	0.38	0.24	0.22	1.40	0.04	0.11	1.3	0.94	0.15
	8/02/2018	**Last day of first extraction campaign.**																												
	8/03/2018		0.77	0.82	23.9	6.89	1115	0.28	-42		7.8		35	170	42	10	55	338	324	0.02	0.001	0.16	0.24	0.16	1.80	0.03	0.56	1.2	0.47	0.59
	13/04/2018		1.24	0.35	24	7.45	1531	3.1	-91		5.4		85	176	52	11	46	337	320	0.01	0.001	0.26	0.2	0.12	1.30	0.03	0.3	1	0.53	0.33
	31/05/2018		1.13	0.46	21.6	7.32	1083	2.02	41		8.8	5	33	160	41	9	43	326	336	0.01	0.001	1.25	0.23	0.03	1.50	0.01	0.07	1.4	0.66	0.08
2018/2019	24/10/2018		1.03	0.56	20.7	7.29	1345	0.14	-238	11	6.7	5	33	166	53	10	52	387	333	0.05	0.005	0.21	0.51	0.34	2.4	0.05	0.2	2.2	1.26	0.25
	3/12/2018		1.48	0.11	22	7.51	1625	2.74	-285	20	9.1		39	201	45	10	83	222	466	0.02	0.001	0.45	0.9	1	6.8	0.01	0.03	6.8	5.9	0.03
	17/12/2018		1.27	0.32	21.6	7.75	1303	0.64	-295	32	13.4		41	161	42	11	115	174	500	0.02	0.001	0.47	1.37	0.89	11.8	0.01	0.08	11.7	9.71	0.08
	15/01/2019		1.56	0.03	24.2	7.24	1388	0.26	-334.6	6	3.7	5	38	177	45	10	81	203	460	0.01	0.001	0.08	0.75	0.63	5.2	0.01	0.01	5.2	5.22	0.01
	6/02/2019		1.63	-0.04	24.8	7.21	1183	1.1	-309	35	2.7		36	165	42	9	54	280	364	0.01	0.001	0.72	0.3	0.261	2.6	0.01	0.01	2.6	1.15	0.01
	21/02/2019		1.72	-0.13	23.4	7.18	1242	0.27	297.1	5	25.5		50	43	45	10	43	286	331	0.01	0.001	0.19	0.36	0.05	1.8	0.01	0.03	1.8	1.18	0.03
	6/03/2019		1.65	-0.06	26.2	7.38	1272	7.07	-243	5	0.6		42	164	43	11	44	277	350	0.05	0.001	0.39	0.32	0.355	1.4	0.1	0.01	1.4	0.96	0.01
	20/03/2019		0.89	0.7	25.5	7.36	1744	0.48	-34.8	8	0.88		44	180	54	12	46	303	343	0.01	0.001	0.73	0.22	0.098	1.4	0.01	0.01	1.4	0.6	0.01
	4/04/2019		0.74	0.85	25.5	7.32	1498	0.34	-33.5	93	0.75	5	50	192	50	12	52	282	367	0.01	0.001	0.08	0.61	0.464	3.6	0.01	0.01	3.6	2.75	0.01
	1/05/2019		0.96	0.63	22.9	7.02	1264	0.1	-354	18	21.2		40	195	50	11	88	172	496	0.01	0.001	0.34	0.71	0.342	5.6	0.01	0.03	5.6	4.42	0.03
	5/06/2019		1.2	0.39	21.2	7.6	1212	2	-288	9	-5.5		42	193	52	11	50	312	360	0.02	0.001	0.11	0.34	0.267	2.4	0.01	0.01	2.4	1.84	0.01
2019/2020	4/07/2019		0.9	0.69	19.83	7.58	1935	0.2	-145.1	5	25.1	5	45	198	54	11	50	319	348	0.01	0.001	0.26	0.19	1.75	1.2	0.01	0.01	1.2	0.78	0.01
	31/07/2019		1.22	0.37	19.4	7.48	1901	2.92	-138.3	5	34.8		36	189	48	10	44	302	369	0.01	0.001	0.13	0.24	0.229	1.6	0.01	0.01	1.6	1.27	0.01
	4/09/2019		1.34	0.25	20.4	7.3	1398	0.6	-100.9	5	40.6		32	167	42	9	42	310	340	0.01	0.001	0.23	0.16	0.1	1.6	0.01	0.01	1.6	1.67	0.01
	2/10/2019		1.52	0.07	21.5	7.4	1349	1	-179.9	5	7.2	5	36	182	45	9	52	236	321	0.01	0.001	0.08	0.21	0.222	1.6	0.01	0.01	1.6	1.04	0.01
	6/11/2019		1.64	-0.05	21	7.5	1199	2.6	-188.2	5	-3.4		39	164	43	10	49	284	357	0.01	0.001	0.1	0.29	0.266	1.8	0.01	0.01	1.8	1.47	0.01
	15/01/2020	pH 12.9 - meter calibration issue - spurious data.	1.8	-0.21	24.8		1280	1.6	-208	12	3.9		35	177	44	11	52	205	336				0.62	0.52	2.4	0.01	0.01	2.4	2.12	0.01
	28/04/2020	Land-based extraction commenced 16/04/20.	1.24	0.35	24.7	5.3	157.8	0.94	-67.1	26	452.5	5	17	2	1	4	33	11	3	0.27	0.063	4.66	0.12	0.022	1.6	0.01	0.01	1.6	0.24	0.01
2020/2021	6/07/2020		1.12	0.47	19.9	6.4	1240	0.9	-130	65	29	5	32	170	45	10	40	259	360	0.01	0.001	1.01	0.37	0.259	2.9	0.01	0.03	2.9	1.58	0.03
	13/08/2020	Clear	0.96	0.63	20.1	7.2	1121	1.9	-123	140	82.7	5	34	168	47	10	44	286	350	0.01	0.001	0.68	0.53	0.256	4.2	0.01	0.01	4.2	1.5	0.01
	16/09/2020		1.08	0.51	19.4	7.1	1186	1.66	-170.7	14	178.03	5	34	169	45	13	46	263	372	0.02	0.001	0.07	0.79	0.605	0.01	0.01	0.01	3.4	2.75	0.01
	14/10/2020		1.43	0.16	20.5	7.14	1130	0.22	-297.8	7	19.5	5	34	181	46	12	52	254	373	0.01	0.001	0.08	0.66	0.653	0.01	0.01	0.01	3.6	3.26	0.01
	11/11/2020	Ants & Eggs, Very Dirty, Strong odour	1.39	0.2	20.5	7.17	1146	1.72	-108.4	11	7		31	184	43	10	42	279	320	0.01	0.001	1.41	0.22	0.2	0.01	0.01	0.01	1.2	0.83	0.01
	24/02/2021	Clear, Strong odour, ants	0.71	0.88	24.6	7.12	1208	0.68	-233.6	23	8.1		35	169	44	11	43	26	337	0.02	0.001	0.09	0.65	0.569	3.1	0.01	0.01	3.1	2.77	0.01
	10/06/2021	Oily film, very strong odour, ants	1.1	0.49	20.4	7.24	1082	1.42	-268.5	65	0.98		27	151	35	9	40	194	381	0.01	0.001	0.28	0.4	0.373	3.3	0.01	0.01	3.3	1.71	0.01
2021/2022	20/10/2021		0.89	0.70	19.42	7.21	1213	2.25	-23.3		4.1		32	165	44	9	41	255	353	0.01	0.001	0.8								
	25/01/2022		0.88	0.71	24.42	7.63	1094	3.7	-70		67		31	190	42	10	35	256	357	0.01	0.001	0.19	0.32		1.5	0.01	0.29	1.2	0.67	0.3
	22/02/2022		0.94	0.65	24.66	7.72	1070	1.89	-69.2		69		32	153	43	10	40	222	320	0.01	0.001	0.14								
	27/04/2022		0.79	0.80	21.99	7.59	586	1.82	-77.4		74		17	83	18	6	20	94	204	0.02	0.007	0.35	0.24		2.4	0.01	1.3	1.1	0.02	1.3
	23/05/2022	Due to major flood event, high rainfall, and poor drainage the site was deemed inaccessible to undertake sampling during May 2022.																												
	22/06/2022	drainage, the site was deemed inaccessible to undertake																												
2022/2023	27/07/2022		0.9	0.69	17.74	7.34	1064	0.34	147.3		2.8		27	136	38	8	30	207	309	0.1	0.001	0.06								
	31/08/2022		1.08	0.51	17.67	7.41	1010	1.82	197.4		3.8		26	139	35	8	44	159	318	0.01	0.001	0.05	0.08		0.6	0.01	0.25	0.4	0.01	0.25
	28/09/2022		0.89	0.7	19.78	7.43	1047	2.17	-74.1		2.1		29	145	41	9	42	205	321	0.01	0.001	0.05								
	26/10/2022	Clear	0.77	0.82	22.2	7.26	1080	3.55	174.5				30	152	40	9	48	187	356	0.01	0.001	0.05								
	29/11/2022		1.27	0.32	19.76	6.51	1081	0.94	94.6		13.1		26	162	32	9	49	160	360	0.01	0.001	0.14	0.2		1	0.01	0.19	0.8	0.15	0.19
	23/01/2023		1.38	0.21	22.3	6.84	999	1.86	11.5		1.2		25	135	32	8	43	134	351	0.01	0.001	0.32								
	23/02/2023		1.04	0.55	23.4	6.91	1015	3.2	-14.5		0.7		26	144	34	8	44	120	337	0.01	0.001	0.54	0.13		1	0.02	0.18	0.8	0.22	0.2
	29/03/2023		1.25	0.34	23.08	7.7	1152	1.48	-25.2		1		30	152	36	9	49	144	324	0.01	0.001	1.27								
	27/04/2023		0.127	1.463	21.79	7.6	1032	3.56	-20.5		24.7		27	160	35	9	49	153	338	0.01	0.001	0.12								
	2/06/2023		1.14	0.45	20.9	7.31	1115	2.45	154		21.3		30	147	38	10	48	195	256	0.01	0.001	0.1								
	28/06/2023		1.16	0.43	17.78	7.36	1004	7.67	-20.7		4.1		28	146	34	9	53	125	367	0.01	0.001	0.13	0.08		0.9	0.01	0.31	0.6	0.03	0.31

617 - CUDGEN LAKES SAND QUARRY
Groundwater Monitoring Site MB11

2023/2024	31/07/2023		1.46	0.13	17.16	7.41	1166	2.66	-29.4		1.9		31	151	42	9	51	205	346	0.01	0.001	0.1								
	23/08/2023	Laptop battery fail. Loggers returned to HMC offices to download & returned to site 24.08.2023	1.94	-0.35	18.65	7.39	1170	2.47	-37.9		19		33	165	47	9	42	237	349	0.01	0.001	0.13								
	20/09/2023		2.21	-0.62	19.17	7.11	1043	6.68	-17.1		77.5		28	149	37	9	43	146	360	0.01	0.001	0.17								
	25/10/2023		2.27	-0.68	19.4	7.3	1103	6.75	-32.1		21		29	139	38	9	39	169	351	0.01	0.001	1.62	0.19		0.7	0.01	0.01	0.01	0.23	0.01
	22/11/2023		1.74	-0.15	21.11	7.13	1103	6.73	-20.5		13.6		31	151	40	9	41	185	338	0.01	0.001	4.25								
	19/12/2023		2.15	-0.56	20.98	7.24	1413	0.34	-26.4		1.6		37	191	52	10	46	354	352	0.01	0.001	3.36	0.25		1.2	0.02	0.12	1.1	0.25	
	21/02/2024		1.24	0.35	23.38	7.06	1722	4.64	-7.4		6.9		36	223	53	11	43	478	335	0.01	0.001	3.23	0.16		0.7	0.02	0.08	0.6	0.22	
	28/03/2024		1.17	0.42	23.43	6.99	2168	3.56			12.4		103	355	**103**	13	52	**984**	293	0.01	0.001	9.5								
	22/04/2024		0.92	0.67	21.58	7.43	2559	3.82	-31.9		140		48	411	**130**	14	52	**1640**	226	0.01	0.001	2.09								
	21/05/2024	Ants present. Water very turbid orange	1.03	0.56	20.71	7.03	2844	3.26	-7.6		392		52	592	**173**	17	52	**2240**	102	0.01	0.001	**56.8**								
	24/06/2024	Water turbid orange	2.05	-0.46	20.47	7.08	2781	3.74	-8.7		332		50	534	**158**	16	44	**2000**	151	0.01	0.001	**40.1**	0.41		1.1	0.06	0.01	1.1	0.33	0.01
2024/2025	23/07/2024	Water turbid orange	1.64	-0.05	18.8	7.05	2871	3.04	-11.6		668		46	450	**139**	17	42	**1500**	183	0.01	0.001	**28.9**								
	26/08/2024	Water turbid orange	1.33	0.26	19.1	6.75	1739	3.81	-10.5		122		24	233	64	11	26	729	190	0.01	0.001	**30.7**								
	24/09/2024	Water turbid orange	2.18	-0.59	19.9	6.91	1891	3.52	-20.2		185		18	173	42	10	23	450	203	0.01	0.001	**34.5**								
	23/10/2024		1.45	0.14	19.8	6.62	1618	2.93	-24.8		60.81		19	189	53	11	18	556	235	0.01	0.001	**28.7**	0.22		0.8	0.01	0.0	**0.8**	0.13	0.01
	19/11/2024		1.47	0.12	21.2	6.63	974	1.24	3.2		87.8		13	104	20	8	14	153	196	0.01	0.001	**29.3**								
	21/01/2025		0.79	0.8	25.1	7.01	1188	1.62	-0.3		147		14	116	23	9	16	200	187	0.01	0.001	7.22								
	25/02/2025		1.36	0.23	25.6	7.12	1714	1.85	-5.5		48.2		37	324	78	12	43	776	274	0.01	0.001	8.61	0.17		1	0.01	0.1	**1**	0.35	0.05
	25/03/2025		0.8	0.79	24.1	7.09	1817	1.85	-8.7		47.3		40	308	67	12	65	755	312	0.01	0.001	0.12								
	23/04/2025		1.07	0.52	23.3	7.51	1782	3.06	-33.7		104		39	285	62	11	60	652	324	0.01	0.001	0.05								
	27/05/2025	Orange flocking	1.48	0.11	1.5	6.93	2281	1.3	-6.1		166		36	375	92	13	40	**981**	277	0.01	0.001	11.3	0.17		1.1	0.01	0.0	**1.1**	0.32	0.01
	24/06/2025		1.41		21.2	7.11	1984	1.78	-15.1		219		37	316	72	11	50	716	302	0.01	0.001	9.78								
Reporting Period (2024/2025)	Average		1.36	0.23	19.95	7.0	1805.4	2.36	-12.12	0.00	168.65	0.00	29.4	261.18	64.7	11.36	36.09	678.9	243.91	0.01	0.001	17.20	0.19	0.00	0.97	0.01	0.02	0.97	0.27	0.02
	Maximum		2.18	0.80	25.55	7.5	2871.0	3.81	3.20	0.00	668.00	0.00	46.0	450.00	**139.0**	17.00	65.00	**1500.0**	324.00	0.01	0.001	**34.50**	0.22	0.00	1.10	0.01	0.05	1.10	0.35	0.05
	Minimum		0.79	-0.59	1.48	6.6	974.0	1.24	-33.70	0.00	47.30	0.00	13.0	104.00	20.0	8.00	14.00	153.0	183.00	0.01	0.001	0.05	0.17	0.00	0.80	0.01	0.01	0.80	0.13	0.01
All Results	Average		1.28	0.31	21.57	7.2	1391.5	2.05	-73.43	23.70	59.49	5.00	40.6	194.24	51.6	10.37	54.00	390.8	316.97	0.08	0.002	4.78	0.36	0.35	2.17	0.02	0.11	2.21	1.46	0.12
	Maximum		2.27	1.46	27.10	7.8	2871.0	7.67	297.10	140.00	668.00	5.00	220.0	592.00	**173.0**	19.00	311.00	**2240.0**	**500.00**	**3.13**	0.063	**56.80**	1.37	1.75	11.80	0.33	1.30	11.70	9.71	1.30
	80th Percentile		1.56	0.68	24.50	7.5	1722.0	3.21	-8.26	33.20	80.62	5.00	42.0	207.00	54.6	11.00	52.00	469.2	360.00	0.02	0.001	4.58	0.61	0.56	2.94	0.02	0.19	3.32	1.90	0.23
	Median (50th Percentile)		1.25	0.35	21.35	7.3	1240.0	1.80	-35.60	11.00	13.10	5.00	35.0	171.00	45.0	10.00	46.00	281.0	337.00	0.01	0.001	0.38	0.27	0.26	1.60	0.01	0.01	1.55	1.00	0.01
	20th Percentile		0.91	0.03	19.62	7.0	1082.0	0.53	-174.38	5.00	2.34	5.00	27.4	149.80	38.0	9.00	40.40	172.8	274.60	0.01	0.001	0.10	0.19	0.10	0.98	0.01	0.01	1.00	0.24	0.01
	Minimum		0.13	-0.68	1.48	**5.3**	157.8	0.10	-354.00	5.00	-5.50	5.00	13.0	2.00	1.0	2.00	14.00	11.0	3.00	0.01	0.001	0.05	0.08	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Red and **bold** values exceed the objective value for that analyte. IS - Insufficient data for statistical analysis. NS = No Sample Required. ND = No Data. NLM = No Longer Monitored

617 - CUDGEN LAKES SAND QUARRY
Groundwater Monitoring Site MB12

Site: MB12			Physical										Major Cations & Anions							Metals			Nutrients							
Sample Date		Comments	Water Level Top of Casing	Water Level m AHD	Temp °C	pH	ElectricalConductivity uS/cm	Dissolved Oxygen mol/L	Redox mV	Total Suspended Solids mg/L	Turbidity NTU	Oil & Grease mg/L	Sodium mg/L	Calcium mg/L	Magnesium mg/L	Potassium mg/L	Chloride mg/L	Sulfate mg/L	Bicarbonate mg/L	Aluminium mg/L	Arsenic mg/L	Iron (filterable) mg/L	Total Phosphorous mg/L	Reactive Phosphorous mg/L	Total Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	TKN mg/L	Ammonia mg/L	NOx mg/L
		Objective	-		-	*6.5-8.5*	*<3000*	-	-	-	-	*10*	*<500*	-	*<100*	*<40*	*<1000*	*<800*	*<400*	*<0.5*	*<0.42*	*<20*	-	-	-	-	-	-	*<20*	-
Pre-Extraction	16/06/2005					6.9	1588	0.68					66	433	54	13	147	706		0.74		2.98								
	19/07/2005					6.8	1587	0.54					43	322	59	12	87	528	223	0.12		1.61								
	5/08/2005					7.5	1619	1.02																						
	10/11/2005					7.150	1531.000	0.110					47.00	219.000	54.000	11.000	62.000	643.000	238.000	0.18		1.310								
	12/01/2006					7.110	1818.000	0.110					39.00	261.000	58.000	12.000	54.000		230.000	0.15		1.450								
	3/05/2006																	410												
	8/02/2007					7.2	1433	1.55	-98.0																					
	2/09/2008					7.4	1962																							
	4/09/2017	Purged for 5 mins to clear debris	1.19	0.18	20.7	6.74	1795	0.09	-54		7.1	5	55	375	52	12	122	646	329	0.01	0.001	20.4	0.11	0.02	0.60	0.01	0.01	0.6	0.33	0.01
	5/10/2017		1.06	0.31	21.9	6.91	2080	1.65	-72.9	15	20.1	5	45	362	46	10	131	720	317	0.009	0.001	14.2	0.11	0.01	0.60	0.01	0.01	0.6	0.34	0.01
2017/2018	30/10/2017	**Commencement of extraction**																												
	28/11/2017		0.99	0.38	24.1	7.16	1795	3.75	8	14	32.7	5	49	363	49	11	138	728	340	0.01	0.001	0.05	0.01	0.01	0.70	0.01	0.3	0.4	0.12	0.3
	11/01/2018		1.24	0.13	25.6	7.04	1836	1.43	-69		21.8	5	44	373	49	11	112	719	304	0.01	0.001	0.05	0.03	0.01	0.80	0.01	0.02	0.8	0.34	0.02
	24/01/2018		1.32	0.05																										
	6/02/2018		1.15	0.22	26.5	6.82	1984	0.74	-81		7.1	5	42	336	46	11	115	686	319	0.01	0.001	7.65	0.05	0.01	0.5	0.01	0.01	0.5	0.38	0.02
	8/02/2018	**Last day of first extraction campaign.**																												
	31/05/2018		0.9	0.47	20.3	6.96	1593	2	45		47.9	5	38	324	40	10	111	658	324	0.01	0.001	11.7	0.03	0.01	0.40	0.01	0.05	0.4	0.36	0.05
2018/2019	24/10/2018		0.79	0.58	19.9	6.98	1580	1.83	-69	5	9.9	5	29	324	43	10	122	771	290	0.05	0.005	0.05	0.03	0.01	0.8	0.02	0.44	0.3	0.1	0.46
	15/01/2019		1.33	0.04	24.4	6.86	1810	0.63	-124.1	32	32.4	5	49	342	42	10	115	653	314	0.01	0.001	13.6	0.01	0.01	0.5	0.01	0.02	0.5	0.38	0.02
	4/04/2019		0.52	0.85	25.03	7.04	2146	2.17	-17.5	43	1.09	5	55	371	43	11	91	664	313	0.01	0.001	0.06	0.02	0.007	0.6	0.01	0.02	0.6	0.38	0.02
2019 / 2020	4/07/2019		0.69	0.68	20.49	7.26	2667	2.77	73.5	29	33.6	5	57	354	41	11	84	596	316	0.01	0.001	0.61	0.02	0.001	0.7	0.01	0.18	0.5	0.25	0.18
	2/10/2019		1.3	0.07	20.7	7.1	2055	3.1	1	5	74.4	5	67	350	41	11	89	666	278	0.01	0.001	0.05	0.01	0.001	0.5	0.01	0.36	0.1	0.01	0.36
	15/01/2020	pH 11.2 - meter calibration issue - spurious data.	1.58	-0.21	22.4		1885	1.7	-80	5	7.4		76	334	39	12	72	673	268				0.01	0.01	0.2	0.01	0.04	0.2	0.03	0.04
	28/04/2020	Land-based extraction commenced 16/04/20.	0.82	0.55	23.3	7.2	1757	6.78	-75.2	28	19.9	5	79	259	35	11	72	675	288	0.01	0.001	4.98	0.01	0.003	0.8	0.01	0.08	0.7	0.37	0.08
2020/2021	6/07/2020		0.9	0.47	20.2	6.4	1755	5.6	28	155	24	5	82	331	36	11	59	790	309	0.01	0.001	12.8	0.04	0.026	0.7	0.01	0.09	0.6	0.31	0.09
	13/08/2020	Clear	0.73	0.64	21.1	6.7	1814	3.8	77	12	138	5	94	302	38	12	64	759	310	0.01	0.001	0.05	0.22	0.001	0.9	0.01	0.06	0.8	0.28	0.06
	16/09/2020		0.87	0.5	19.7	6.68	1866	1.62	172	5	197.64	5	98	308	39	12	64	794	306	0.01	0.001	0.05	0.04	0.004	0.24	0.01	0.24	0.2	0.02	0.24
	14/10/2020		1.21	0.16	20.5	6.74	1766	0.52	-177.9	26	71.8	5	90	317	37	11	64	699	302	0.01	0.001	8.55	0.14	0.001	0.01	0.01	0.01	0.6	0.36	0.01
	11/11/2020	Ants & Eggs	1.16	0.21	20.7	7.21	1995	1.66	-117.1	42	10.4		82	309	36	10	81	756	378	0.01	0.001	17.7	0.13	0.001	0.01	0.01	0.01	0.6	0.31	0.01
	24/02/2021	Clear, ants	0.52	0.85	23.7	7.05	1917	1.33	-145.2	32	25.2		34	314	40	11	68	790	287	0.01	0.001	15.6	0.02	0.002	0.6	0.01	0.04	0.6	0.38	0.04
	10/06/2021		0.89	0.48	20.3	7.29	1974	5.83	2.8	23	5.49		88	318	42	12	86	814	285	0.01	0.001	3.86	0.01	0.001	0.5	0.01	0.43	0.1	0.05	0.43
2021/2022	20/10/2021		0.89	0.48	19.4	7.21	1213	2.25	-23.3		4.1		32	165	44	9	41	255	353	0.01	0.001	0.8								
	25/01/2022		0.88	0.49	24.42	7.63	1094	3.7	-70		67		31	190	42	10	35	256	357	0.01	0.001	0.19	0.32		1.5	0.01	0.29	1.2	0.67	0.3
	22/02/2022		0.72	0.65	24.27	7.19	1858	1.68	-38.2		6		79	317	46	12	248	650	246	0.01	0.001	6.69								
	27/04/2022		0.56	0.81	21.6	7.41	1712	1.71	-66.3		13		87	265	40	9	318	430	193	0.01	0.007	0.05	0.06		0.9	0.01	0.4	0.5	0.03	0.4
	23/05/2022	Due to major flood event, high rainfall, and poor drainage the site was deemed inaccessible to undertake sampling during May 2022.																												
	22/06/2022	Due to previous major flood events, ongoing rain and slow drainage, the site was deemed inaccessible to undertake sampling during June 2022.																												
2022/2023	27/07/2022		0.67	0.7	17.66	7.18	1948	0.37	132.1		22.4		69	266	45	9	260	482	206	0.01	0.001	0.05								
	31/08/2022		0.86	0.51	7.48	7.2	2083	1.71	192.8		4.2		81	278	47	11	303	488	226	0.01	0.001	0.05	0.01		0.6	0.01	0.38	0.2	0.02	0.38
	28/09/2022		0.66	0.71	19.04	7.17	1974	1.8	-58.9		0.3		86	279	42	11	474	462	213	0.01	0.001	0.05								
	26/10/2022	Clear	0.55	0.82	21.1	7.13	2017	3.92	179.8				89	302	42	11	311	481	259	0.01	0.001	0.05								
	29/11/2022		1.06	0.31	19.94	6.64	1568	2.62	94.8		0.3		86	326	38	12	315	482	228	0.01	0.001	0.05	0.01		0.6	0.01	0.42	0.2	0.01	0.42
	23/01/2023		1.16	0.21	21.9	6.52	2000	1.58	129.3		8.62		87	277	39	11	281	486	258	0.01	0.001	0.05								
	23/02/2023		0.81	0.56	23.1	6.84	2052	2.7	96.7		40.9		89	298	41	12	287	477	254	0.01	0.001	0.05	0.04		0.6	0.01	0.18	0.4	0.03	0.18
	29/03/2023		1.02	0.35	23.24	7.58	2551	1.68	-19.2		23.2		108	302	43	12	324	520	233	0.01	0.001	0.05								
	27/04/2023		1.04	0.33	21.47	7.57	2036	5.34	-19.1		60.7		94	288	37	11	285	544	249	0.01	0.001	0.05								
	2/06/2023		0.91	0.46	19.9	7.36	2019	4.72	156		53.1		90	299	34	11	243	531	269	0.01	0.001	0.05								
	28/06/2023		0.94	0.43	17.68	7.22	1934	7.95	-16.9		60.2		84	292	34	12	210	543	290	0.01	0.001	0.05	0.03		0.8	0.01	0.37	0.4	0.01	0.37
2023/2024	31/07/2023		1.23	0.14	17.47	7.35	2443	4.19	-24.5		33.3		107	302	38	12	259	556	294	0.01	0.001	0.05								
	23/08/2023	Laptop battery fail. Loggers returned to HMC offices to download & returned to site 24.08.2023	1.72	-0.35	18.66	7.28	2301	3.62	-26.6		12.4		93	300	36	12	198	572	274	0.01	0.001	0.05								
	20/09/2023		1.98	-0.61	18.83	7.04	1803	6.91	-13.5		2.6		77	281	33	11	147	560	294	0.01	0.001	0.05								
	25/10/2023		2.06	-0.69	19.44	7.29	2303	6.95	-29.5		18.1		78	243	30	11	132	466	276	0.01	0.001	0.05	0.06		0.5	0.01	0.3	0.31	0.01	0.31
	22/11/2023		1.54	-0.17	20.18	6.89	1525	6.89	-6.2		26.4		65	234	28	9	108	402	297	0.01	0.001	0.71								
	19/12/2023		1.93	-0.56	21.28	7.01	1505	1.45	-15.3		28.8		70	221	27	9	122	334	324	0.01	0.001	3.51	0.05		1	0.01	0.03	1	0.2	
	21/02/2024		1.03	0.34	24.55	6.92	1627	0.83	1.5		20.5		64	213	22	10	110	248	340	0.01	0.001	9.42	0.03		1.1	0.02	0.07	1	0.3	
	28/03/2024		0.95	0.42	24.76	6.82	1275	2.34			5.3		21	180	21	9	106	177	357	0.01	0.001	15.3								
	22/04/2024		0.69	0.68	21.57	7.27	1210	0.26	-24.7		216		56	184	20	9	99	138	325	0.01	0.001	0.23								
	21/05/2024		0.82	0.55	18.51	7.28	996	3.41	-23.1		21.2		51	154	18	8	103	151	299	0.01	0.001	0.53								
	24/06/2024		1.83	-0.46	19.61	7.22	1195	2.94	-21.9		104		55	172	18	8	105	118	354	0.01	0.001	0.07	0.03		1.4	0.01	0.5	0.9	0.01	0.5

617 - CUDGEN LAKES SAND QUARRY
Groundwater Monitoring Site MB12

2024/2025	23/07/2024		1.4	-0.03	18.8	7.17	1183	3.19	-20.5		19.5		53	140	16	8	101	94	364	0.01	0.001	0.05								
	26/08/2024		1.11	0.26	18.7	6.91	2297	3.95	-22.6		10.4		51	160	16	8	107	101	298	0.01	0.001	0.09								
	24/09/2024		1.95	-0.58	19.6	7.04	1138	2.75	28.9		69.9		56	161	18	8	104	105	327	0.01	0.001	0.09								
	23/10/2024		1.23	0.14	19.8	6.75	1045	2.69	-20.7		6.62		49	159	19	8	96	111	348	0.01	0.001	3.3	0.03		1	0.02	0.1	**0.9**	0.26	0.1
	19/11/2024		1.27	0.1	21.3	6.51	1219	1.26	-4.3		6.3		53	174	19	8	96	114	361	0.01	0.001	4.48								
	21/01/2025		0.55	0.82	24.3	7.13	1173	2.12	-8.8		13.7		58	163	20	8	106	140	338	0.01	0.001	5.9								
	25/02/2025		1.13	0.24	25.0	7.17	1138	1.68	-7.9		11.7		56	164	21	9	102	146	314	0.01	0.001	7.9	0.02		1.1	0.01	0.1	**1**	0.25	0.13
	25/03/2025		0.57	0.8	23.7	6.92	1309	1.19	-0.2		11.5		9	2	2	4	14	4	10	0.09	0.005	0.59								
	23/04/2025		0.85	0.52	23.6	7.24	1159	3.39	-19.2		208		43	183	22	8	68	243	298	0.01	0.001	2.45								
	27/05/2025		1.26	0.11	1.3	6.95	1301	1.91	-6.7		119		45	182	21	8	68	247	317	0.01	0.001	**33**	0.31		1.6	0.01	0.1	**1.6**	0.63	0.05
	24/06/2025	Orange floccing	1.19		21.3	7.19	292	1.58	-18.5		281		41	176	20	7	61	248	281	0.01	0.001	10.4								

Reporting Period (2024/2025)	Average	1.14	0.24	19.75	7.0	1204.9	2.34	-9.14	0.00	68.87	0.00	46.7	151.27	17.6	7.64	83.91	141.2	296.00	0.02	0.001	6.20	0.12	0.00	1.23	0.01	0.09	1.17	0.38	0.09
	Maximum	1.95	0.82	25.04	7.2	2297.0	3.95	28.90	0.00	281.00	0.00	58.0	183.00	22.0	9.00	107.00	248.0	364.00	0.09	0.005	**33.00**	0.31	0.00	1.60	0.02	0.13	1.60	0.63	0.13
	Minimum	0.55	-0.58	1.26	6.5	292.0	1.19	-22.60	0.00	6.30	0.00	9.0	2.00	2.0	4.00	14.00	4.0	10.00	0.01	0.001	0.05	0.02	0.00	1.00	0.01	0.05	0.90	0.25	0.05
All Results	Average	1.07	0.30	20.81	7.1	1704.8	2.58	-6.81	29.44	42.82	5.00	63.8	265.46	35.4	10.21	140.28	473.9	289.87	0.03	0.001	4.10	0.06	0.01	0.71	0.01	0.17	0.59	0.23	0.18
	Maximum	2.06	0.85	26.50	7.6	2667.0	7.95	192.80	155.00	281.00	5.00	108.0	433.00	59.0	13.00	474.00	**814.0**	378.00	**0.74**	0.007	**33.00**	0.32	0.03	1.60	0.02	0.50	1.60	0.67	0.50
	80th Percentile	1.30	0.64	23.87	7.3	2019.0	3.82	35.34	38.00	64.48	5.00	87.0	329.00	44.6	12.00	246.00	693.8	328.60	0.01	0.001	8.42	0.11	0.01	1.00	0.01	0.37	0.90	0.37	0.38
	Median (50th Percentile)	1.03	0.35	20.70	7.1	1795.0	1.91	-19.10	24.50	20.85	5.00	58.0	288.00	38.0	11.00	106.00	520.0	298.00	0.01	0.001	0.56	0.03	0.01	0.60	0.01	0.08	0.60	0.26	0.10
	20th Percentile	0.73	0.06	19.27	6.8	1219.0	1.16	-69.00	5.00	6.81	5.00	43.4	177.60	21.0	8.40	68.00	203.4	250.00	0.01	0.001	0.05	0.01	0.00	0.50	0.01	0.02	0.28	0.02	0.02
	Minimum	0.52	-0.69	1.26	**6.4**	292.0	0.09	-177.90	5.00	0.30	5.00	9.0	2.00	2.0	4.00	14.00	4.0	10.00	0.01	0.001	0.05	0.01	0.00	0.01	0.01	0.01	0.10	0.01	0.01

Red and **bold** values exceed the objective value for that analyte. IS - Insufficient data for statistical analysis. NS = No Sample Required. ND = No Data. NLM = No Longer Monitored

617 - CUDGEN LAKES SAND QUARRY
Groundwater Monitoring Site MB13

Site:	MB13		Physical										Major Cations & Anions							Metals			Nutrients							
Sample Date		Comments	Water Level Top of Casing	Water Level m AHD	Temp °C	pH	ElectricalConductivity uS/cm	Dissolved Oxygen mol/L	Redox mV	Total Suspended Solids mg/L	Turbidity NTU	Oil & Grease mg/L	Sodium mg/L	Calcium mg/L	Magnesium mg/L	Potassium mg/L	Chloride mg/L	Sulfate mg/L	Bicarbonate mg/L	Aluminium mg/L	Arsenic mg/L	Iron (filterable) mg/L	Total Phosphorous mg/L	Reactive Phosphorous mg/L	Total Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	TKN mg/L	Ammonia mg/L	NOx mg/L
		Objective	-		-	*6.5-8.5*	*<36384*	-	-	-	-	*10*	*<6884*	-	*<1146*	*<215*	*<12600*	*<2276*	*<545*	*<0.5*	*<0.42*	*<20*	-	-	-	-	-	-	*<20*	-
Pre-Extraction	16/06/2005					6.87	32200	0.22					**6940**	1170	**2040**	**215**	**15198**	**4000**		0.75		19								
	19/07/2005					6.36	**36800**	0.24					6870	559	1050	**217**	247	2260	304	0.17		1.8								
	5/08/2005					7.18	33300	1.22																						
	10/11/2005					6.84	32300	0.24					6600	609	925	127	**12600**	2110	401	0.08		10								
	12/01/2006					6.77	35400	0.45					6040	2350	**1370**	**240**	11365		194	0.32		6.06								
	3/05/2006																	2170												
	8/02/2007					7.1	21800	1.48	-250																					
	2/09/2008					7	**38200**																							
	4/09/2017	Purged for 5 mins to clear debris	1.46	0.25	20.7	6.63	2826	0.05	-34		5.9	5	6850	539	1090	200	**12600**	2240	534	0.05	0.005	0.05	0.56	0.02	0.80	0.01	0.3	0.5	0.14	0.3
	5/10/2017		1.63	0.08	24	6.8	33318	2.97	-52.3	26	1.6	5	5700	533	888	157	12200	2160	496	0.009	0.001	13.7	0.27	0.01	2.90	0.01	0.02	2.9	2.59	0.02
2017/2018	30/10/2017	**Commencement of extraction**																												
	28/11/2017		1.53	0.18	24.5	6.79	30674	2.56	-58.2	33	24.2	5	6070	551	935	168	10900	**2300**	544	0.01	0.001	0.05	0.3	0.01	3.40	0.33	0.13	2.9	2.3	0.46
	11/01/2018		1.8	-0.09	24.4	6.83	30446	2.17	-81		39.6		**7080**	629	1060	189	11700	1540	466	0.05	0.005	0.05	0.22	0.01	4.50	0.35	0.33	3.8	2.36	0.68
	24/01/2018		1.88	-0.17																										
	6/02/2018		1.7	0.01	24.3	6.76	34036	2.42	-73		30.1	5	5970	541	908	163	12000	2170	495	0.01	0.001	10.2	0.16	0.01	2.7	0.18	0.09	2.4	2.41	0.27
	8/02/2018	**Last day of first extraction campaign.**																												
	31/05/2018		1.6	0.11	22.1	6.87	29235	0.73	-41		3.8	5	5420	430	821	150	11400	1980	503	0.05	0.005	11.7	0.08	0.01	2.30	0.03	0.05	2.2	2.32	0.08
2018/2019	24/10/2018		1.38	0.33	20.1	6.82	35760	1.33	-24	5	0.7	5	5860	530	892	155	11400	2270	468	0.05	0.005	0.05	0.06	0.01	1.4	0.01	0.01	1.4	1.03	0.01
	15/01/2019		1.9	-0.19	23.4	6.66	29980	0.38	-217.2	19	0.9	5	5200	503	845	147	11400	1990	**547**	0.05	0.005	2.79	0.59	0.01	4.6	0.01	0.01	4.6	4.49	0.01
	4/04/2019	Very dark colour			25.42	7.33	**37420**	0.74	-34	22	23.7	5	6820	595	1020	186	10500	1860	**582**	0.05	0.005	0.34	1	0.848	4.8	0.01	0.01	4.8	3.63	0.01
2019 / 2020	4/07/2019		1.24	0.47	20.72	7.12	**46890**	0.91	72	13	12.2	5	6530	609	1000	182	11100	2000	**571**	0.05	0.005	0.99	0.32	0.325	5.7	0.01	0.01	5.7	4.82	0.01
	2/10/2019		1.85	-0.14	20.4	**6**	35800	2.9	-68.9	6	24.3	5	6700	601	1070	183	11500	2050	488	0.05	0.005	2.91	0.08	0.076	4.6	0.01	0.01	4.6	3.47	0.01
	15/01/2020	pH 9.0 - meter calibration issue - spurious data.	2.12	-0.41	22.9		32749	0.6	-267	7	5.4		6060	568	959	167	11000	1860	**597**				0.99	0.5	11.5	0.01	0.01	11.5	9.21	0.01
	28/04/2020	Land-based extraction commenced 16/04/20.	1.4	0.31	23.4	6.8	31094	1.14	-206.7	16	92.5	5	6520	592	1030	174	11500	2050	**545**	0.05	0.005	0.31	0.73	0.743	7.6	0.01	0.01	7.6	5.79	0.01
2020/2021	6/07/2020		1.47	0.24	20.8	**6.2**	31499	0.9	-156	5	9.4	5	6080	578	954	169	10700	2220	**557**	0.01	0.001	0.14	1.2	0.827	6.1	0.01	0.02	6.1	5.12	0.02
	13/08/2020	Clear	1.3	0.41	21.1	7.1	31437	0.9	-117	5	4.1	5	5830	519	944	158	11100	1880	**581**	0.05	0.005	1.6	0.52	0.492	5.1	0.01	0.01	5.1	4.7	0.01
	16/09/2020		1.41	0.3	19.1	6.5	33096	1.34	-70.3	11	112.75	5	6030	580	932	166	12100	2270	**560**	0.05	0.005	3.22	0.16	0.106	0.01	0.01	0.01	4.2	3.83	0.01
	14/10/2020		1.78	-0.07	20	6.75	31185	0.53	-195	18	5.3	5	6050	576	955	174	11200	2040	491	0.05	0.005	8.55	0.2	0.001	0.01	0.01	0.01	3.6	3.51	0.01
	11/11/2020	Ants & Eggs	1.73	-0.02	21	6.6	32924	1.04	-66.4	22	0.4		6220	588	1040	168	11600	2040	476	0.01	0.005	11	0.2	0.152	0.01	0.01	0.01	3.3	2.94	0.01
	24/02/2021	Clear, ants	1.08	0.63	25.4	**6.47**	32870	1.02	-57.6	14	48.4		6090	621	949	171	11600	**2320**	504	0.05	0.005	8.64	0.3	0.276	3.3	0.01	0.01	3.3	3.38	0.01
	10/06/2021	Ants	1.41	0.3	20.6	6.85	30919	4.45	-47.7	10	97.61		5970	557	905	174	11300	2110	490	0.01	0.001	5.75	0.27	0.001	2.9	0.01	0.01	2.9	2.4	0.01
2021/2022	20/10/2021	Ants	1.22	0.49	20.1	6.85	33440	1.1	-3.6		78		6770	617	1040	204	11000	1870	544	0.05	0.005	3.46								
	25/01/2022		1.2	0.51	23.66	6.81	32976	2.17	-23.1		92		6660	607	1020	180	11400	2060	540	0.05	0.005	4.9	0.41		4.2	0.03	0.38	3.8	3.23	0.41
	22/02/2022		1.28	0.43	23.5	7.04	**36440**	1.39	-29.7		94		5640	491	882	153	11100	1980	481	0.01	0.001	4.39								
	27/04/2022		1.13	0.58	21.7	6.87	30010	1.24	-34.6		101		5070	452	768	139	10400	1720	452	0.05	0.005	6.67	0.42		5.8	0.01	0.45	5.3	4.75	0.45
	23/05/2022	Due to major flood event, high rainfall, and poor drainage the site was deemed inaccessible to undertake sampling during May 2022.																												
	22/06/2022	Due to previous major flood events, ongoing rain and slow drainage, the site was deemed inaccessible to undertake sampling during June 2022.																												
2022/2023	27/07/2022		1.24	0.47	17.7	7.07	33500	0.19	152.4		36		6510	546	954	163	11000	1970	475	0.05	0.005	0.05								
	31/08/2022		1.41	0.3	17.45	7.17	36180	0.85	195.8		0.5		6190	544	947	168	10400	1900	466	0.05	0.005	0.05	0.05		3.2	0.05	2	1.2	0.71	2.05
	28/09/2022		1.22	0.49	18.72	7.2	32580	1.57	-61.1		0.6		6420	532	961	157	10900	2070	506	0.05	0.005	0.05								
	26/10/2022	Clear	1.11	0.6	20.3	6.82	32593	1.97	187.2				5750	632	940	167	11000	2100	524	0.05	0.005	0.61								
	29/11/2022		1.6	0.11	19.2	6.67	32960	0.79	5.1		1.4		6100	548	940	164	11400	2080	497	0.05	0.005	2.16	0.09		2.2	0.03	0.49	1.7	1.19	0.49
	23/01/2023		1.71	0	22.1	6.64	32137	1.86	60.2		22.4		5830	557	906	161	11000	2040	480	0.05	0.005	2.07								
	23/02/2023		1.36	0.35	22.8	6.51	32378	1.96	-24.8		4.9		6350	596	935	169	10600	1820	480	0.05	0.005	7	0.17		2	0.01	0.19	1.8	1.22	0.2
	29/03/2023		1.57	0.14	23.04	7.31	33180	1.13	-4.6		17.4		6070	495	936	149	10500	1920	494	0.05	0.005	8.59								
	27/04/2023		1.6	0.11	21.59	7.41	32460	4.34	-11.4		16.4		6170	631	933	173	10700	2040	463	0.05	0.005	0.05								
	2/06/2023		1.49	0.22	19.3	7.2	33970	3.22	175		22.5		6000	598	924	162	10500	1890	496	0.05	0.005	0.05								
	28/06/2023		1.51	0.2	18.45	7.05	33270	9.15	-11.3		34.5		5550	576	822	162	10600	1880	500	0.05	0.005	0.05	0.21		2.2	0.01	1.55	0.6	0.06	1.55
2023/2024	31/07/2023		0.78	0.93	18.04	7.15	33210	4.43	-18.8		20.3		5120	614	925	155	10800	2010	491	0.05	0.005	0.05								
	23/08/2023	Laptop battery fail. Loggers returned to HMC offices to download & returned to site 24.08.2023	1.27	0.44	18.65	6.86	33240	2.92	-8.1		4.7		6080	558	963	154	10800	1940	469	0.05	0.005	0.05								
	20/09/2023		2.53	-0.82	19.02	6.98	32620	4.69	-10.2		36.5		5660	543	910	157	10400	1990	477	0.05	0.005	0.05								
	25/10/2023		2.6	-0.89	20.7	6.97	31850	4.83	-14.1		8.3		5740	546	913	150	10300	1820	437	0.05	0.005	0.95	0.02		0.8	0.01	0.01	0.01	0.58	0.01
	22/11/2023		2.07	-0.36	20.16	6.88	30100	4.77	-6.7		9.9		5180	492	812	133	9880	1780	447	0.05	0.005	2.16								
	19/12/2023		2.45	-0.74	21.48	7.04	25630	2.1	-15.4		18.2		4520	456	708	125	8330	1640	470	0.01	0.001	2.85	0.05		1.7	0.03	0.01	1.7	1.49	
	21/02/2024		1.52	0.19	24.46	7.12	21240	1.76	-10.4		16.8		3270	362	472	97	6760	1440	463	0.01	0.001	3.92	0.11		1.5	0.04	0.01	1.5	1.09	
	28/03/2024		1.42	0.29	22.76	6.92	16620	2.29			14.9		458	344	458	88	5240	1310	467	0.01	0.001	5.12								
	22/04/2024		1.14	0.57	21.46	7.21	14920	2.18	-21.8		123		2350	302	406	74	4570	1130	422	0.01	0.001	3.73								
	21/05/2024		1.26	0.45	21.05	7.36	10290	2.94	-26.3		169		1890	276	340	69	3950	1290	411	0.01	0.001	0.07								
	24/06/2024		2.26	-0.55	19.56	7.26	12260	2.78	-22.8		61.6		1920	286	356	69	3550	1300	460	0.01	0.001	0.05	0.6		0.5	0.01	0.07	0.4	0.02	0.07
2024/2025	23/07/2024		1.84	-0.13	18.4	7.34	11360	2.66	-30.8		10.3		1510	285	296	55	3140	1220	464	0.01	0.001	0.05								
	26/08/2024		1.52	0.19	18.5	7.08	10900	3.59	-30.5		0.5		1200	329	251	54	2640	1230	397	0.01	0.001	0.05								
	24/09/2024		2.35	-0.64	19.7	7.01	7626	2.66	26.9		14.3		995	390	222	47	1700	1240	403	0.01	0.001	0.05								
	23/10/2024		1.62	0.09	19.6	6.59	5784	2.19	-5.9		2.77		700	365	188	38	1320	1150	420	0.01	0.001	4.85	0.12		0.6	0.01	0.0	0.6	0.34	0.01
	19/11/2024		1.65	0.06	21.3	6.61	5786	1.19	2.8		6.4		627	430	169	37	1100	1240	433	0.01	0.001	8.03								
	21/01/2025		0.92	0.79	24.6	7.16	5254	2.76	-9.3		6.6		571	412	157	34	1040	1200	424	0.01	0.001	5.81								
	25/02/2025		1.5	0.21	25.0	7	5201	1.01	-0.5		5.6		581	468	164	35	1000	1180	391	0.01	0.001	6.21	0.24		0.6	0.01	0.2	0.5	0.32	0.15
	25/03/2025		0.94	0.77	24.3	7.15	5246	2.31	-12.3		6.2		533	411	143	34	964	1210	385	0.01	0.001	0.13								
	23/04/2025		1.23	0.48	23.3	7.33	5149	2.18	-24.9		21.7		511	434	145	32	1020	1250	383	0.01	0.001	0.05								

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27/05/2025	Ants in bore	1.56	0.15	1.6	7.27	5201	3.87	-25.1		16.6		516	398	143	31	1080	1220	395	0.01	0.001	0.08	0.12		1.5	0.01	0.7	0.8	0.01	0.66
24/06/2025		1.57		19.9	7.31	5174	2.28	-28.7		56.5		552	425	153	34	1020	1240	386	0.01	0.001	0.07								

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Reporting Period (2024/2025)	Average	1.52	0.20	19.65	7.08	6607	2.43	-12.57	0.00	13.41	0.00	754	395	185	39	1457	1216	407	0.01	0.00	2.31	0.16	0.00	0.90	0.01	0.27	0.63	0.22	0.27
	Maximum	2.35	0.79	24.96	7.34	11360	3.87	26.90	0.00	56.50	0.00	1510	468	296	55	3140	1250	464	0.01	0.00	8.03	0.24	0.00	1.50	0.01	0.66	0.80	0.34	0.66
	Minimum	0.92	-0.64	1.56	6.59	5149	1.01	-30.80	0.00	0.50	0.00	511	285	143	31	964	1150	383	0.01	0.00	0.05	0.12	0.00	0.60	0.01	0.01	0.50	0.01	0.01
All Results	Average	1.55	0.16	21.01	6.92	26514	2.04	-30.99	14.50	30.27	5.00	4772	549	783	137	8710	1840	471	0.05	0.00	3.39	0.33	0.22	3.06	0.04	0.21	3.13	2.59	0.26
	Maximum	2.60	0.93	25.42	7.41	**46890**	9.15	195.80	33.00	169.00	5.00	**7080**	2350	**2040**	**240**	**15198**	**4000**	**597**	**0.75**	0.01	19.00	1.20	0.85	11.50	0.35	2.00	11.50	9.21	2.05
	80th Percentile	1.82	0.48	23.56	7.18	33440	2.92	-4.20	22.00	53.26	5.00	6474	600	985	174	11400	2110	532	0.05	0.01	6.58	0.57	0.50	4.86	0.03	0.34	4.86	4.53	0.46
	Median (50th Percentile)	1.51	0.21	21.00	6.92	32169	1.86	-24.80	13.50	16.50	5.00	5860	544	924	157	10800	1940	477	0.05	0.01	1.94	0.22	0.05	2.70	0.01	0.01	2.90	2.40	0.02
	20th Percentile	1.24	-0.11	19.16	6.67	11360	0.84	-67.40	5.40	4.34	5.00	1662	417	346	69	3304	1266	420	0.01	0.00	0.05	0.09	0.01	0.76	0.01	0.01	0.76	0.53	0.01
	Minimum	0.78	-0.89	1.56	**6.00**	2826	0.05	-267.00	5.00	0.40	5.00	458	276	143	31	247	1130	194	0.009	0.00	0.05	0.02	0.00	0.01	0.01	0.01	0.01	0.01	0.01

Red and **bold** values exceed the objective value for that analyte. IS - Insufficient data for statistical analysis. NS = No Sample Required. ND = No Data. NLM = No Longer Monitored

617 - CUDGEN LAKES SAND QUARRY
Groundwater Monitoring Site MB14

Site:	MB14		Physical										Major Cations & Anions							Metals			Nutrients							
	Sample Date	Comments	Water Level Top of Casing	Water Level m AHD	Temp °C	pH	ElectricalConductivity uS/cm	Dissolved Oxygen mol/L	Redox mV	Total Suspended Solids mg/L	Turbidity NTU	Oil & Grease mg/L	Sodium mg/L	Calcium mg/L	Magnesium mg/L	Potassium mg/L	Chloride mg/L	Sulfate mg/L	Bicarbonate mg/L	Aluminium mg/L	Arsenic mg/L	Iron (filterable) mg/L	Total Phosphorous mg/L	Reactive Phosphorous mg/L	Total Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	TKN mg/L	Ammonia mg/L	NOx mg/L
		Objective	-		-	*6.5-8.5*	*<3000*	-	-	-	-	*10*	*<500*	-	*<100*	*<40*	*<1000*	*<800*	*<400*	*<0.5*	*<0.42*	*<20*	-	-	-	-	-	-	*<20*	-
2017/2018	30/10/2017	**Commencement of extraction**																												
	28/11/2017				21.1	7.7	572	0.3	-145	195		5	66	48	21	2	32	82	245	0.01	0.001	0.05	0.28	0.1	0.60	0.01	0.01	0.6	0.03	0.01
	13/12/2017		1.7	0.475	23.5	6.37	795	0.85	-42		9.2		50	77	26	3	33	94	284	0.01	0.001	0.05	0.3	0.01	0.40	0.01	0.01	0.4	0.15	0.01
	11/01/2018		2.08	0.095	25.6	7.55	505	0.51	-118		9.1	5	27	61	14	5	37	39	161	0.01	0.001	0.05	0.12	0.01	0.20	0.01	0.01	0.2	0.07	0.01
	24/01/2018		2.33	-0.155	28.3	7.5	545	0.39	-109.2		34.6		20	33	8	2	17	21	98	0.01	0.001	3.58	0.1	0.01	0.2	0.01	0.02	0.2	0.04	0.02
	7/02/2018		2.57	-0.395	22.4	6.99	751	5.91	-125.6		69.4	5	27	59	29	2	38	81	161	0.05	0.005	22.9	0.43	0.01	0.4	0.01	0.01	0.4	0.06	0.01
	8/02/2018	**Last day of first extraction campaign.**																												
	8/03/2018		1.82	0.355	22.6	7.61	2296	2.05	61		14.8		182	154	39	8	491	181	218	0.01	0.001	5.03	0.15	0.01	0.50	0.01	0.02	0.5	0.11	0.02
	13/04/2018		1.78	0.395	23.7	6.78	1326	3.96	-95		2.9		122	94	24	7	277	92	197	0.02	0.001	3.96	0.17	0.01	0.40	0.01	0.01	0.4	0.06	0.01
	31/05/2018		1.75	0.425	21.6	6.98	954	0.61	-6		27.1	5	123	86	23	7	296	84	190	0.01	0.001	1.45	0.08	0.01	0.30	0.01	0.01	0.3	0.06	0.01
2018/2019	3/12/2018		1.92	0.255	21.5	7.76	928	0.81	-121.9	34	17		112	61	23	7	156	49	191	0.01	0.001	0.94	0.1	0.01	0.3	0.01	0.01	0.3	0.06	0.01
	17/12/2018		1.92	0.255	21.7	6.94	840	3.18	-100	42	26.8		85	60	18	6	151	54	185	0.01	0.001	0.63	0.27	0.01	1.1	0.01	0.15	0.9	0.1	0.16
	15/01/2019		2.12	0.055	22.1	7.56	797	0.7	-181.4	45	34	5	99	65	20	7	155	43	193	0.01	0.001	0.63	0.13	0.01	0.4	0.01	0.01	0.4	0.12	0.01
	6/02/2019		2.27	-0.095	22.6	7.26	805	0.32	-161.6	30	13.7		98	60	18	6	143	52	196	0.01	0.001	1.06	0.1	0.022	0.3	0.01	0.01	0.3	0.1	0.01
	21/02/2019		2.37	-0.195	21.9	7.73	838	0.6	210.7	6	217.4		100	143	20	7	143	45	185	0.01	0.001	1.23	0.1	0.01	0.4	0.01	0.01	0.4	0.1	0.01
	6/03/2019		2.36	-0.185	22.9	7.54	851	10.3	-206	14	3.3		83	60	19	6	149	47	194	0.01	0.001	1.29	0.09	0.021	0.2	0.1	0.01	0.2	0.07	0.01
	21/03/2019		7.54	-5.365	24.2	7.54	1102	1.94	-105	26	0.55		85	56	20	5	136	42	196	0.01	0.001	5.22	0.16	0.004	0.4	0.01	0.01	0.4	0.06	0.01
	3/04/2019		1.67	0.505	23.8	6.78	909	1.26	-67	25	8.7	5	80	63	22	5	102	43	205	0.01	0.001	6.06	0.14	0.006	0.3	0.01	0.01	0.3	0.08	0.01
	30/04/2019		1.7	0.475	22.7	7.05	593	-0.3	-244	7	3.1		68	44	14	5	90	33	172	0.01	0.001	0.99	0.09	0.033	0.2	0.01	0.01	0.2	0.06	0.01
	5/06/2019		1.73	0.445	22.1	7.6	675	1.15	-9.5	9	19.2		98	51	14	6	110	28	186	0.01	0.001	0.71	0.1	0.054	0.3	0.01	0.01	0.3	0.03	0.01
2019/2020	4/07/2019	Site inaccessible (too wet)																												
	31/07/2019		1.71	0.465	21.1	8.17	1172	0.77	33.2	5	31.3		76	44	12	5	83	29	202	0.01	0.001	0.21	0.17	0.042	0.2	0.01	0.01	0.2	0.03	0.01
	4/09/2019		1.88	0.295	20.9	7.9	683	0.4	79.1	5	46		38	52	14	5	49	29	168	0.01	0.001	0.05	0.2	0.03	0.1	0.01	0.01	0.1	0.02	0.01
	2/10/2019		2.09	0.085	22.1	7.9	583	2.3	-131.9	14	10.8	5	42	53	15	5	56	29	155	0.01	0.001	0.99	0.36	0.054	0.3	0.01	0.01	0.3	0.01	0.01
	6/11/2019		2.28	-0.105	21.9	7.7	487	1.4	-119.3	18	14.2		30	46	13	5	42	33	169	0.01	0.001	0.73	0.2	0.029	0.3	0.01	0.01	0.3	0.04	0.01
	15/01/2020	Knocked over by cattle. pH meter calibration issue - spurious data.	2.55	-0.375	22.2	10.6'	566	1.7	-39	13	18.5		49	48	12	5	56	25	154				0.11	0.02	0.2	0.01	0.01	0.2	0.04	0.01
	28/04/2020	Land-based extraction commenced 16/04/20.	1.59	0.585	23.4	7	562	0.84	-117.4	22	127.2	5	69	53	17	6	84	30	190	0.01	0.001	0.74	0.12	0.033	0.3	0.01	0.01	0.3	0.05	0.01
2020/2021	7/07/2020		1.66	0.515	21.3	7.17	319	2.57	-59	19	10.3	5	72	53	17	6	83	31	207	0.01	0.001	0.78	0.12	0.47	0.4	0.01	0.01	0.4	0.06	0.01
	12/08/2020	Clear	1.52	0.655	20.9	7	588	1.2	47	15	99	5	52	52	16	5	60	34	196	0.01	0.001	0.2	0.12	0.008	0.2	0.01	0.01	0.2	0.05	0.01
	16/09/2020		1.67	0.505	21.3	7.58	598	1.04	-18.8	8	203.55	5	45	54	16	5	58	43	192	0.01	0.001	0.93	0.11	0.067	0.01	0.01	0.01	0.2	0.04	0.01
	14/10/2020		0.191	1.984	21.5	7.64	502	0.97	-107.9	5	18.8	5	34	58	16	5	48	36	176	0.01	0.001	0.74	0.11	0.024	0.01	0.01	0.01	0.1	0.05	0.01
	11/11/2020		1.93	0.245	21.4	7.72	533	0.69	-156.1	12	21.6		27	62	22	6	46	39	168	0.01	0.001	1.03	0.12	0.052	0.01	0.01	0.01	0.1	0.03	0.01
	24/02/2021	Clear, no cap	1.31	0.865	23.5	7.02	471	2.08	-115.5	5	31.1		50	56	16	5	50	42	175	0.01	0.006	6.6	0.3	0.008	3.2	0.01	0.01	3.2	3.29	0.01
	10/06/2021	Ants	1.57	0.605	20.7	7.51	590	1.68	59.2	15	44.16		48	60	16	5	71	40	186	0.01	0.001	0.07	0.26	0.007	0.1	0.01	0.02	0.1	0.01	0.02
2021/2022	20/10/2021		1.58	0.595	20.5	7.34	632	0.71	-31.1		32		47	57	14	5	61	30	170	0.01	0.001	0.24								
	25/01/2022		1.46	0.715	23.4	6.50	137	2.7	29		45		20	22	6	2	23	24	71	0.03	0.015	5.52	0.23		1.1	0.05	0.05	1.1	0.23	0.04
	22/02/2022		1.49	0.685	23.34	6.55	219	1.54	-1.1		43		24	28	19	5	29	20	87	0.04	0.022	10.5								
	23/05/2022	Due to major flood event, high rainfall, and poor drainage the site was deemed inaccessible to undertake sampling during May 2022.																												
	22/06/2022	Due to previous major flood events, ongoing rain and slow drainage, the site was deemed inaccessible to undertake sampling during June 2022.																												
2022/2023	27/07/2022	Small orange flecks	1.48	0.695	18.18	7.29	529	3.8	131.8		24.8		41	49	13	5	42	30	159	0.01	0.001	0.05								
	31/08/2022		1.65	0.525	18.25	7.59	471	1.54	205.1		7.9		38	51	15	10	46	28	166	0.01	0.001	0.05	0.09		0.2	0.01	0.05	0.2	0.01	0.05
	28/09/2022		1.5	0.675	19.77	6.69	468	1.52	-36.1		16.7		32	53	16	6	46	26	172	0.01	0.001	0.05								
	26/10/2022	Clear	1.31	0.865	21	6.89	414.9	1.44	107.4				27	45	12	4	40	24	130	0.02	0.002	0.46								
	29/11/2022		1.77	0.405	19.64	7.82	480	3.37	58.2		10.4		26	57	13	6	42	23	166	0.01	0.001	0.31	0.12		0.6	0.01	0.22	0.4	0.01	0.22
	23/01/2023		1.95	0.225	22.3	6.75	510	3.05	137.4		12.47		25	55	12	5	36	30	174	0.01	0.001	0.09								
	23/02/2023		1.86	0.315	23.6	6.35	578	4.71	159.2		2.4		25	71	13	6	40	31	178	0.01	0.001	0.05	0.08		0.6	0.01	0.37	0.2	0.01	0.37
	29/03/2023		1.92	0.255	23.6	7.35	618	1.71	-30.4		2.4		29	150	35	9	49	144	321	0.01	0.001	1.24								
	27/04/2023		1.96	0.215	21.95	7.76	522	5.13	-29		0.9		23	70	12	6	38	31	175	0.01	0.001	0.05								
	30/05/2023		1.8	0.375	20.33	7.53	515	3.54	-42.2		0.9		24	69	12	5	38	26	195	0.01	0.001	0.05								
	28/06/2023		1.97	0.205	19.76	7.65	531	4.56	-43.5		5.5		24	64	12	5	39	7	212	0.01	0.001	0.05	0.1		0.3	0.01	0.02	0.3	0.01	0.02
2023/2024	31/07/2023		2	0.175	19.26	7.65	457	2.46	-43.7		7.6		23	62	14	6	38	24	184	0.01	0.001	0.05								
	23/08/2023	Laptop battery fail. Loggers returned to HMC offices to download & returned to site 24.08.2023	1.94	0.235	19.68	7.65	502	3.21	-50.2		19.7		25	60	15	6	36	27	170	0.01	0.001	0.05								
	20/09/2023		1.96	0.215	20.43	7.5	463	6.37	-38.8		3.6		24	62	13	6	35	29	187	0.01	0.001	0.05								
	25/10/2023		2.09	0.085	21.65	7.69	488	6.62	-40.3		3.9		25	67	13	6	36	26	186	0.01	0.001	0.22	0.09		0.5	0.01	0.34	0.34	0.07	0.34
	22/11/2023		1.54	0.635	22.32	7.72	524	6.58	-51.3		11.5		26	64	13	5	34	25	187	0.01	0.001	0.05								
	19/12/2023		1.65	0.525	23.91	7.72	465	3.32	-51.3		1.5		26	72	14	6	31	30	199	0.01	0.001	0.05	0.05		0.3	0.01	0.22	0.1	0.01	
	21/02/2024		1.43	0.745	25.33	7.24	365	5.23	-11.3		33.4		28	49	9	5	37	22	146	0.16	0.002	0.88	0.36		2.2	0.02	0.03	2.1	0.66	
	28/03/2024	No access due to waterlogging		2.175																										
	22/04/2024	No access due to waterlogging		2.175																										
	21/05/2024	No access due to waterlogging		2.175																										
	24/06/2024		1.53	0.645	20.66	7.67	650	2.21	-41.7		15.8		33	80	15	7	62	31	204	0.01	0.001	0.05	0.22		0.4	0.01	0.03	0.4	0.02	0.03

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2024/2025	23/07/2024		1.49	0.685	25.7	7.81	680	3.77	-53.4		18.4		33	68	18	7	61	34	215	0.03	0.001	2.4								
	26/08/2024	Bore damaged and to be repaired																												
	24/09/2024		1.54	0.635	21.4	7.31	784	2.84	-39.9		37.5		48	92	20	8	98	38	208	0.02	0.001	1.53								
	23/10/2024		1.35	0.825	20.6	7.03	595	2.71	65.4		14.21		33	72	16	6	68	34	208	0.02	0.001	1.66	0.17		0.5	0.01	0.01	0.5	0.09	0.01
	19/11/2024	Bore cap needs replacing	1.93	0.245	21.71	6.84	643	1.49	-19.5		13.8		29	58	13	6	53	29	165	0.05	0.001	2.88								
	21/01/2025		1.25	0.925	24.4	6.64	246	1.75	18.5		16.1		11	12	4	2	20	5	43	0.16	0.001	2.17								
	25/02/2025	Bore knocked down and damaged																												
	25/03/2025		1.33	0.845	24.12	6.53	171	1.14	29.1		13.4		12	4	2	5	18	2	21	0.22	0.002	1.85								
	23/04/2025	Ants nesting in bore	1.38	0.795	24.23	6.77	344	0.54	14.6		5.4		22	19	6	5	44	4	56	0.11	0.004	5.51								
	27/05/2025	Bore knocked down and damaged	1.38	0.795	1.38	7.36	561	1.06	-29.3		210		30	46	8	20	60	13	172	0.1	0.003	1.01	0.99		11.9	0.01	0.01	11.9	7.92	0.01
	24/06/2025	Bore knocked down and damaged																												
Reporting Period (2024/2025)		Average	1.46	0.00	20.44	7.04	503.0	1.91	-1.81	0.00	41.10	0.00	27.3	46.38	10.9	7.38	52.75	19.9	136.00	0.09	0.002	2.38	0.58	0.00	6.20	0.01	0.01	6.20	4.01	0.01
		Maximum	1.93	0.93	25.70	7.81	784.0	3.77	65.40	0.00	210.00	0.00	48.0	92.00	20.0	20.00	98.00	38.0	215.00	0.22	0.004	5.51	0.99	0.00	11.90	0.01	0.01	11.90	7.92	0.01
		Minimum	1.25	0.25	1.38	6.53	171.0	0.54	-53.40	0.00	5.40	0.00	11.0	4.00	2.0	2.00	18.00	2.0	21.00	0.02	0.001	1.01	0.17	0.00	0.50	0.01	0.01	0.50	0.09	0.01
All Results		Average	1.85	0.41	21.79	7.31	627.9	2.34	-31.81	24.54	30.81	5.00	49.0	60.56	15.9	5.72	76.10	39.3	175.77	0.02	0.002	1.80	0.18	0.04	0.73	0.01	0.04	0.71	0.34	0.04
		Maximum	7.54	2.18	28.30	8.17	2296.0	10.30	210.70	195.00	217.40	5.00	182.0	154.00	39.0	20.00	491.00	181.0	321.00	0.22	0.022	**22.90**	0.99	0.47	11.90	0.10	0.37	11.90	7.92	0.37
		80th Percentile	2.06	0.72	23.60	7.70	796.2	3.68	41.48	30.00	34.60	5.00	78.4	69.60	20.0	6.60	100.40	44.2	200.80	0.02	0.001	2.35	0.26	0.05	0.54	0.01	0.03	0.44	0.10	0.02
		Median (50th Percentile)	1.74	0.47	21.90	7.50	566.0	1.70	-39.90	14.50	15.80	5.00	33.0	58.00	15.0	5.00	49.00	31.0	185.00	0.01	0.001	0.74	0.12	0.01	0.30	0.01	0.01	0.30	0.06	0.01
		20th Percentile	1.49	0.16	20.62	6.85	469.2	0.73	-116.64	6.00	5.40	5.00	25.0	48.00	12.0	5.00	36.00	24.4	161.00	0.01	0.001	0.05	0.10	0.01	0.20	0.01	0.01	0.20	0.02	0.01
		Minimum	0.19	-5.37	1.38	**6.35**	137.0	-0.30	-244.00	5.00	0.55	5.00	11.0	4.00	2.0	2.00	17.00	2.0	21.00	0.01	0.001	0.05	0.05	0.00	0.01	0.01	0.01	0.10	0.01	0.01

Red and **bold** values exceed the objective value for that analyte. IS - Insufficient data for statistical analysis. NS = No Sample Required. ND = No Data. NLM = No Longer Monitored

617 - CUDGEN LAKES SAND QUARRY
Groundwater Monitoring Site MB15

Site:	MB15		Physical									Major Cations & Anions							Metals			Nutrients							
Sample Date		Comments	Water Level Top of Casing	Water Level m AHD	Temp °C	pH	ElectricalConductivity uS/cm	Dissolved Oxygen mol/L	Redox mV	Total Suspended Solids mg/L	Turbidity NTU	Oil & Grease mg/L	Sodium mg/L	Calcium mg/L	Magnesium mg/L	Potassium mg/L	Chloride mg/L	Sulfate mg/L	Bicarbonate mg/L	Aluminium mg/L	Arsenic mg/L	Iron (filterable) mg/L	Total Phosphorous mg/L	Reactive Phosphorous mg/L	Total Nitrogen mg/L	Nitrite mg/L	Nitrate mg/L	TKN mg/L	Ammonia mg/L	NOx mg/L
		Objective	-		-	*6.5-8.5*	*<3000*	-	-	-	-	*10*	*<500*	-	*<100*	*<40*	*<1000*	*<800*	*<400*	*<0.5*	*<0.42*	*<20*	-	-	-	-	-	-	*<20*	-
2017/2018	4/09/2017		1.06	0.375	20.6	7.45	555	0.01	-87		62	5	86	40	14	8	74	37	208	0.52	0.001	1.35	0.22	0.21	0.30	0.01	0.01	0.3	0.12	0.01
	5/10/2017		1.27	0.165	21.6	7.63	625	0.65	-152.6	14	10.9	5	116	25	10	6	83	48	217	0.03	0.002	0.13	0.33	0.22	0.60	0.01	0.01	0.6	0.26	0.01
	30/10/2017	**Commencement of extraction**																												
	28/11/2017		1.84	-0.405	25.1	7.51	916	1.4	-31.3	8	18.7	5	132	30	14	11	99	91	217	0.01	0.001	0.05	0.28	0.19	0.80	0.03	0.02	0.7	0.51	0.05
	13/12/2017		1.47	-0.035	24.6	7.87	670	0.52	-107		48		68	41	15	8	60	47	176	0.01	0.001	0.05	0.15	0.16	0.20	0.01	0.01	0.2	0.19	0.01
	11/01/2018		1.87	-0.435	24.8	7.88	614	0.48	-183		6.9	5	106	28	12	11	66	53	189	0.01	0.001	0.05	0.27	0.18	0.80	0.02	0.01	0.8	0.48	0.02
	24/01/2018		2.43	-0.995	22.6	7.45	948	0.38	-67.7		23.9		144	32	15	14	119	138	181	0.01	0.001	0.81	0.27	0.14	1.40	0.01	0.01	1.4	0.66	0.01
	7/02/2018		2.39	-0.955	23.4	7.52	835	6.45	-55.3		8.4	5	107	40	18	13	88	83	199	0.01	0.001	0.36	0.26	0.14	0.40	0.01	0.01	0.4	0.39	0.01
	8/02/2018	**Last day of first extraction campaign.**																												
	8/03/2018		0.79	0.645	24.5	7.67	850	0.52	-72		2.4		95	41	15	11	98	79	198	0.01	0.001	0.32	0.18	0.12	0.80	0.01	0.02	0.8	0.48	0.02
	13/04/2018		0.97	0.465	24.9	7.44	767	2.29	87		2.4		78	51	16	10	82	71	186	0.01	0.001	0.07	0.21	0.15	0.40	0.03	0.19	0.2	0.04	0.22
	31/05/2018		1.02	0.415	21.1	7.96	627	0.54	-85		32.9	5	76	42	13	9	79	62	194	0.01	0.001	0.05	0.12	0.11	0.20	0.01	0.03	0.2	0.17	0.03
2018/2019	24/10/2018		0.86	0.575	19.9	7.32	735	0.03	-175	24	13.4	5	71	48	17	9	92	67	190	0.05	0.005	0.24	0.2	0.11	0.5	0.01	0.01	0.5	0.31	0.01
	3/12/2018		1.21	0.225	22.2	3.18	990	2.4	169	16	3.6		61	59	17	8	90	41	206	0.01	0.001	0.19	0.13	0.08	0.3	0.01	0.01	0.3	0.21	0.01
	17/12/2018		1.22	0.215	21.1	8.38	699	0.57	-157	6	1.8		60	56	16	8	89	41	206	0.01	0.001	0.28	0.17	0.11	0.3	0.01	0.01	0.3	0.22	0.01
	15/01/2019		1.44	-0.005	24.7	7.64	683	0.32	-200	5	8	5	64	52	17	9	87	41	203	0.01	0.001	0.24	0.18	0.12	0.4	0.01	0.01	0.4	0.29	0.01
	6/02/2019	Cap Missing	1.62	-0.185	23	7.49	674	0.65	-152.5	12	0		84	48	17	10	84	56	201	0.01	0.001	0.34	0.17	0.105	0.4	0.01	0.02	0.4	0.32	0.03
	21/02/2019		1.73	-0.295	22.7	7.6	703	0.53	203.7	5	1.4		78	83	16	10	83	53	190	0.01	0.001	0.27	0.17	0.14	0.4	0.01	0.01	0.4	0.28	0.01
	6/03/2019		1.68	-0.245	25	7.78	731	0.79	-197	12	1.1		75	45	17	9	87	53	198	0.01	0.001	0.33	0.18	0.136	0.4	0.1	0.01	0.4	0.24	0.01
	20/03/2019		1.03	0.405	24.84	7.29	978	1.06	-25.4	6	0.48		97	42	17	12	93	68	203	0.01	0.001	0.42	0.2	0.113	0.5	0.01	0.01	0.5	0.46	0.01
	4/04/2019		0.88	0.555	23.81	7.26	824	0.45	-30	19	0.4	5	124	46	17	13	98	91	202	0.01	0.001	0.58	0.23	0.134	0.4	0.01	0.01	0.4	0.28	0.01
	30/04/2019		0.99	0.445	22.6	7.15	740	0.64	-135	11	4		80	42	15	10	86	58	196	0.01	0.001	0.1	0.23	0.165	0.7	0.01	0.34	0.4	0.2	0.34
	5/06/2019		1.06	0.375	21.9	7.1	670	0.53	-148	20	-7.1		84	52	16	10	84	53	196	0.01	0.001	0.21	0.2	0.149	0.5	0.01	0.01	0.5	0.31	0.01
2019/2020	4/07/2019		0.65	0.785	21.65	7.7	1170	0.2	32.2	8	20	5	87	50	17	11	86	45	213	0.01	0.001	0.28	0.19	0.169	0.8	0.01	0.01	0.8	0.63	0.01
	31/07/2019		0.99	0.445	20.1	8.13	1135	3.13	-136	5	22		71	60	17	9	85	35	228	0.02	0.001	0.11	0.2	0.188	0.7	0.01	0.01	0.7	0.65	0.01
	4/09/2019		1.14	0.295	21.7	7.8	865	0.7	-147.8	5	7.2		66	60	18	9	98	30	216	0.01	0.001	0.11	0.16	0.146	0.6	0.01	0.01	0.6	0.25	0.01
	2/10/2019		1.34	0.095	22.6	7.8	868	0.9	-180.4	5	0	5	70	69	20	9	121	29	203	0.01	0.001	0.06	0.18	0.154	1.6	0.01	0.01	1.6	0.35	0.01
	6/11/2019		1.58	-0.145	22.6	7.5	704	2	-90.7	20	-3.1		70	46	17	10	84	26	222	0.01	0.001	0.16	0.19	0.123	0.4	0.01	0.01	0.4	0.32	0.01
	15/01/2020	pH meter calibration issue - spurious data.	1.87	-0.435	24.1	8.5'	755	0.7	-149	5	0.9		77	49	17	11	86	4	178				0.21	0.22	4.8	0.01	0.01	4.8	0.28	0.01
	28/04/2020	Land-based extraction commenced 16/04/20.	0.73	0.705	23.6	7.5	689	1.13	-224.4	6	20.8	5	67	46	15	8	101	31	187	0.01	0.001	0.05	0.14	0.16	0.3	0.01	0.01	0.3	0.16	0.01
2020/2021	7/07/2020	Clear, Ants	0.84	0.595	21.1	6.6	683	0.9	-142	8	4.1	5	74	55	16	9	90	39	194	0.01	0.001	0.13	0.17	0.173	0.6	0.01	0.01	0.6	0.19	0.01
	12/08/2020	Clear	0.7	0.735	20.5	7.5	685	1.2	-162	5	6.8	5	71	55	16	9	96	37	200	0.01	0.001	0.11	0.31	0.17	0.3	0.02	0.01	0.3	0.18	0.02
	16/09/2020		0.79	0.645	20.8	7.54	727	1.8	-149.2	8	69.94	5	72	57	16	9	97	52	201	0.01	0.001	0.09	0.16	0.129	0.01	0.01	0.01	0.5	0.16	0.01
	14/10/2020		1.07	0.365	20	7.45	665	1.49	-180.6	6	4.4	5	68	64	15	8	98	40	196	0.01	0.001	0.06	0.13	0.126	0.02	0.01	0.02	0.6	0.15	0.02
	11/11/2020	Ants & Eggs, Odour	1.07	0.365	21.2	7.45	705	1.86	-142.9	5	3.9		63	60	18	9	97	40	188	0.01	0.001	0.12	0.2	0.162	0.01	0.01	0.01	1	0.21	0.01
	10/06/2021		0.74	0.695	19.4	7.64	587	1.34	-150.3	5	1.87		44	67	15	8	69	24	210	0.01	0.001	0.05	0.19	0.077	1.8	0.01	0.02	1.8	0.22	0.02
2021/2022	20/10/2021	Ants	0.68	0.755	20.7	7.57	684	0.85	-45.8		3.7		47	68	16	8	76	14	224	0.01	0.001	0.05								
	25/01/2022		0.6	0.835	23.4	7.58	634	4.16	-65.3		15		49	74	16	10	75	22	221	0.01	0.001	0.05	0.37		1.3	0.02	0.3	1	0.37	0.32
	22/02/2022	Ants	0.65	0.785	22.7	7.91	598	2.49	-78.1		17		58	64	23	10	102	33	193	0.01	0.001	0.06								
	27/04/2022		0.55	0.885	21.39	7.62	676	2.12	-77.9		32		99	32	11	7	100	31	176	0.02	0.001	0.05	0.28		0.9	0.01	0.46	0.4	0.02	0.46
	23/05/2022	Due to major flood event, high rainfall, and poor drainage the site was deemed inaccessible to undertake sampling during May 2022.																												
	22/06/2022	Due to previous major flood events, ongoing rain and slow drainage, the site was deemed inaccessible to undertake sampling during June 2022.																												
2022/2023	27/07/2022		0.63	0.805	17.5	7.54	666	0.38	117		3.6		87	33	11	7	81	34	151	0.01	0.001	0.05								
	31/08/2022		0.77	0.665	18.95	7.71	629	2.12	197.4		3.7		85	33	10	6	89	34	162	0.01	0.001	0.05	0.05		0.1	0.01	0.04	0.1	0.01	0.04
	28/09/2022		0.65	0.785	20.8	7.94	637	1.68	-102.8		1.6		92	28	10	7	117	36	178	0.01	0.002	0.7								
	26/10/2022	Clear, waterlogged area	0.51	0.925	21.7	7.93	671	5.65	83.8				92	37	11	7	82	35	183	0.01	0.002	0.16								
	29/11/2022		0.9	0.535	21.22	7.47	638	2.57	72.5		3.2		86	32	9	6	60	36	128	0.01	0.001	0.05	0.23		0.3	0.01	0.11	0.2	0.04	0.11
	23/01/2023		1.09	0.345	24	6.52	685	2.23	-54.9		0.23		82	36	9	7	57	35	189	0.01	0.001	0.3								
	23/02/2023		0.98	0.455	23.1	7.25	618	1.96	-117.8		-1.9		76	42	11	7	52	25	196	0.01	0.001	0.12	0.23		0.4	0.01	0.05	0.4	0.18	0.05
	29/03/2023		1.1	0.335	23.32	7.89	635	1.22	-100.5		3.5		78	42	11	7	56	28	184	0.01	0.001	0.06								
	27/04/2023		1.15	0.285	22.82	8.04	597	1.65	-43.8		23.4		70	41	10	8	55	28	191	0.01	0.001	0.05								
	30/05/2023		0.97	0.465	19.86	7.68	580	1.2	-49.9		0.8		68	38	10	7	54	29	198	0.02	0.001	0.05								
	28/06/2023		1.15	0.285	18.95	7.02	566	4.48	-16.4		3.9		70	38	10	7	45	15	219	0.01	0.001	0.05	0.42		0.4	0.01	0.01	0.4	0.12	0.01
2023/2024	31/07/2023		1.21	0.225	18.74	7.77	496	0.35	-49.4		6.8		72	42	11	7	45	16	226	0.01	0.001	0.05								
	23/08/2023	Laptop battery fail. Loggers returned to HMC offices to download & returned to site 24.08.2023	1.13	0.305	19.58	7.81	588	1.36	-60.4		7.3		76	39	12	8	23	13	225	0.01	0.001	0.14								
	20/09/2023		1.16	0.275	20.02	7.48	567	5.73	-37.3		3.9		72	39	11	7	49	13	222	0.01	0.001	0.08								
	25/10/2023		1.29	0.145	21.43	7.61	559	5.81	-39.2		3.4		73	39	11	7	46	17	221	0.01	0.001	0.14	0.23		0.4	0.01	0.01	0.01	0.21	0.01
	22/11/2023	Lots of ants within bore	0.79	0.645	22.48	7.52	570	5.83	-42.2		5.1		75	43	11	7	49	16	197	0.01	0.001	0.16								
	19/12/2023		0.91	0.525	26.09	7.23	565	2.02	-32.6		4.4		71	42	11	7	44	19	208	0.01	0.001	0.1	0.28		0.3	0.01	0.01	0.3	0.26	
	21/02/2024	Lots of ants within bore and casing	0.57	0.865	25.0	7.09	486	4.33	-6.4		26.4		67	40	9	9	48	16	201	0.01	0.001	0.05	0.78		2.6	0.18	1.07	1.4	0.46	
	28/03/2024	Ants present	0.53	0.905	24.1	7.34	556	1.65			5.8		10	38	10	8	44	13	217	0.01	0.001	0.11								
	22/04/2024	Ants present	0.45	0.985	23.09	7.67	534	1.31	-43.5		3.2		70	36	9	7	43	11	196	0.01	0.001	0.05								
	21/05/2024		0.55	0.885	20.56	7.77	485	2.58	-47.7		5.4		59	32	8	6	49	9	177	0.01	0.001	0.07								
	24/06/2024	Ants nesting in bore	0.64	0.795	19.48	7.24	556	1.32	-21.9		3.1		66	38	10	7	45	6	210	0.01	0.001	0.05	0.33		1.1	0.01	0.02	1.1	0.42	0.02

617 - CUDGEN LAKES SAND QUARRY
Groundwater Monitoring Site MB15

2024/2025	23/07/2024	Ants nesting in bore	0.63	0.805	20.0	7.34	493	2.03	-31.1		2.9		62	33	9	7	42	8	206	0.01	0.001	0.05								
	26/08/2024	Ants nesting in bore	0.55	0.885	20.6	7.49	452	3.49	-51.2		1.8		58	35	8	7	41	11	168	0.01	0.001	0.07								
	24/09/2024	Ants nesting in bore	0.7	0.735	20.0	7.34	504	3.59	-46.8		5.9		58	32	8	6	34	12	179	0.01	0.001	0.05								
	23/10/2024	Ants nesting in bore	0.51	0.925	20.1	6.73	450	2.55	-73.2		2.43		56	34	8	7	30	16	193	0.01	0.001	0.05	0.37		1.6	0.01	0.01	1.6	1.41	0.01
	19/11/2024	Ants nesting in bore	0.48	0.955	21.26	7.25	549	1.53	-44.3		0.5		54	37	8	7	32	11	198	0.1	0.001	0.05								
	21/01/2025	Ants nesting in bore	0.42	1.015	25.85	7.77	462	1.92	-42.5		3.9		51	34	9	6	33	13	182	0.01	0.001	0.05								
	25/02/2025		0.62	0.815	25.61	7.98	459	2.5	-52.2		0.3		47	41	10	7	37	12	190	0.01	0.001	0.05	0.21		0.4	0.01	0.01	0.4	0.41	0.01
	25/03/2025		0.49	0.945	23.8	7.3	442	2.2	-26.2		0.5		43	44	12	7	38	18	176	0.01	0.001	0.08								
	23/04/2025		0.54	0.895	23.01	7.52	457	1.62	-37.9		1.1		40	46	12	7	41	18	182	0.01	0.001	0.05								
	27/05/2025		0.48	0.955	0.48	7.83	512	1.49	-50.7		1.8		39	48	12	7	38	20	190	0.01	0.001	0.05	0.16		0.4	0.01	0.15	0.3	0.01	0.15
	24/06/2025		0.56		20.24	7.89	512	1.19	-56.6		2.1		40	51	12	7	36	19	180	0.01	0.001	0.5								
Reporting Period (2024/2025)		Average	0.54	0.89	20.08	7.5	481.1	2.19	-46.61	0.00	2.11	0.00	49.8	39.55	9.8	6.82	36.55	14.4	185.82	0.02	0.001	0.10	0.25	0.00	0.80	0.01	0.06	0.77	0.61	0.06
		Maximum	0.70	1.02	25.85	8.0	549.0	3.59	-26.20	0.00	5.90	0.00	62.0	51.00	12.0	7.00	42.00	20.0	206.00	0.1	0.001	0.50	0.37	0.00	1.60	0.01	0.15	1.60	1.41	0.15
		Minimum	0.42	0.74	0.48	6.7	442.0	1.19	-73.20	0.00	0.30	0.00	39.0	32.00	8.0	6.00	30.00	8.0	168.00	0.01	0.001	0.05	0.16	0.00	0.40	0.01	0.01	0.30	0.01	0.01
All Results		Average	0.98	0.44	21.78	7.5	659.7	1.83	-65.71	9.58	8.72	5.00	73.0	44.82	13.2	8.37	70.66	35.3	196.18	0.02	0.001	0.17	0.23	0.15	0.70	0.02	0.07	0.67	0.30	0.05
		Maximum	2.43	1.02	26.09	8.4	1170.0	6.45	203.70	24.00	69.94	5.00	144.0	83.00	23.0	14.00	121.00	138.0	228.00	**0.52**	0.005	1.35	0.78	0.22	4.80	0.18	1.07	4.80	1.41	0.46
		80th Percentile	1.25	0.83	24.04	7.8	738.0	2.53	-30.22	15.20	14.68	5.00	86.0	55.00	17.0	10.00	94.80	53.0	211.80	0.01	0.001	0.26	0.28	0.17	0.84	0.01	0.03	0.88	0.44	0.04
		Median (50th Percentile)	0.91	0.50	21.70	7.5	637.0	1.49	-55.95	7.00	3.80	5.00	71.0	42.00	12.0	8.00	79.00	31.0	196.00	0.01	0.001	0.08	0.20	0.14	0.40	0.01	0.01	0.40	0.26	0.01
		20th Percentile	0.58	0.18	20.05	7.3	540.0	0.55	-148.80	5.00	1.10	5.00	58.0	34.40	10.0	7.00	44.00	14.4	182.00	0.01	0.001	0.05	0.17	0.11	0.30	0.01	0.01	0.30	0.16	0.01
		Minimum	0.42	-1.00	0.48	**3.2**	442.0	0.01	-224.40	5.00	-7.10	5.00	10.0	25.00	8.0	6.00	23.00	4.0	128.00	0.01	0.001	0.05	0.05	0.08	0.01	0.01	0.01	0.01	0.01	0.01

Red and **bold** values exceed the objective value for that analyte. IS - Insufficient data for statistical analysis. NS = No Sample Required. ND = No Data. NLM = No Longer Monitored

Appendix 6

Extractive Materials Return

(Total No. of pages including blank pages = 3)

Extractive Materials Return 2023-24

Form S1 – 1 July 2023 to 30 June 2024

NSW GOVERNMENT | Regional NSW

Please complete the following information to assist in identifying the location of the Quarry

Quarry ID	
RIMS ID	
Operator Name	JBM Development Group
Operator Address	146 Tweed Coast Road, Chinderah
Operator Email	Brad@kingscliffsands.com
Operator Phone Number	0449 965 772
Quarry Name	Kingscliff Sands
Quarry Address	103 Altona Road, Cudgen
Mining Lease(s) – if any	-
Leaseholder(s) Name	-
Leaseholder Email	-
Leaseholder Phone Number	-
Licence or Lease Number – if any (from Crown Lands or other Government Department)	-
Licensee Name	-
Licensee Email	-
Licensee Phone Number	-
Deposited Plan and Lot Number of Quarry	51//DP1268405, 21//DP1082482
Land Owner	Gales Holdings
Nearest Town to Quarry	Chinderah
Local Council Name	Tweed Shire Council
Typical Geology	Natural Fine Sand

For inquiries or to submit completed or nil returns please email: **mineral.royalty@regional.nsw.gov.au**

If no work was done during the year, a **NIL** return must be provided.

If completion of the return is unavoidably delayed, an application for extension of time should be requested **before** the due date.

Employment

Include PERSONS in and around the mining establishment (pit or quarry) on quarrying operations, in TRANSPORT, in ADMINISTRATION and PRODUCER-CONSUMERS'S employees, who are engaged in manufacturing (eg of bricks). Head office staff should be excluded (estimate if necessary). Employees on long term service leave or otherwise temporarily absent should be included, but persons on permanent compensation should be omitted.

EMPLOYMENT during the LAST PAY PERIOD of JUNE 2024 All personnel employed at this site including working managers, partner's managers, and contractors.	Employed at site:6

The return should relate to the **above quarrying establishment** and should cover the operations of quarrying and treatment (such as crushing, screening, washing etc.) carried out at or near the quarry. A return is required even if the operations are solely of a developmental nature and whether the area being worked is held under a mining title or otherwise.

Submission of this form by email constitutes a declaration by the Leaseholder (if any) Licensee (if any) or Operator that the information contained in this return is correct, to the best of their knowledge, and that there are no blank spaces left where figures should have been inserted.

Extractive Materials Return 2023-24

Form S1 – 1 July 2023 to 30 June 2024

NSW GOVERNMENT | Regional NSW

Sales During 2023-2024

Production information may be published in aggregated form for statistical reporting. However, production data for individual operations is kept strictly confidential.

Product	Description	Quantity Tonnes
Virgin Materials **Crushed Coarse Aggregates**		
Over 75mm		
Over 30mm to 75mm		
5mm to 30mm		
Under 5mm		
Natural Sand	Washed Fine Sand	264,801
Manufactured Sand		
Prepared Road Base & Sub Base		
Other Unprocessed Materials		
Recycled Materials **Crushed Coarse Aggregates**		
Over 75mm		
Over 30mm to 75mm		
5mm to 30mm		
Under 5mm		
Natural Sand		
Manufactured Sand		
Prepared Road Base & Sub Base		
Other Unprocessed Materials		
River Gravel		
Over 30mm		
5mm to 30mm		
Under 5mm		
Construction Sand	Excluding Industrial	
Industrial Sand		
Foundry, Moulding		
Glass		
Other (Specify)		
Dimension Stone	Building, Ornamental, Monumental	
Quarried in Blocks		
Quarried in Slabs		
Decorative Aggregate	Including Terrazzo	
Loam	Soil for Topdressing, Garden soil, Horticultural purposes)	
TOTAL SITE PRODUCTION		
Gross Value ($) of all Sales		
Type of Material		
Number of Full-Time Equivalent (FTE) Employees	**Employees 6**	**Contractors 2**

Appendix 7

Incident Reports

(Total No. of pages including blank pages = 38)

R.W. CORKERY & CO.
PTY. LIMITED ABN 31 002 033 712
GEOLOGICAL & ENVIRONMENTAL CONSULTANTS

10 October 2024

The Secretary
The Department of Planning, Housing and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Sent by email to: compliance@planning.nsw.gov.au
and submitted via Major Projects Portal

Dear Sir / Madam,

Re: Cudgen Sand Lakes Quarry PA MP05_0103B – Incident Report
Surface Water and Groundwater Monitoring Results

I am writing on behalf of Gales-Kingscliff Pty Limited (Gales) to formally report on the non-compliance with the Trigger Action Response Plan (TARP) as specified within the approved May 2021 Soil and Water Management Plan (the approved SWMP) for the Cudgen Sand Lakes Quarry (the Quarry). This letter also identifies the measures that will be implemented in order to minimise the potential for a future reoccurrence.

Details of the Incident

Surface Water

In accordance with the TARP which forms Section 7.7 of the approved SWMP, the following actions and responses are required when two consecutive surface water quality results for the same location exceed the assessment criteria.

- *Actions:*
  - *Report as an incident and submit formal report to DPE and relevant agencies in accordance with the incident response process outlined within the Environmental Management Strategy.*
- *Response:*
  - *In addition to the responses outlined within the amber alert undertake the following.*
  - *Seek a review of the monitoring data by a suitably qualified consultant.*
  - *Review the need to alter on-site activities or management practices.*
  - *Review the need to temporarily increase the monitoring frequency.*
  - *Update this SWMP as applicable.*

Details of the reported surface water exceedances are provided below in **Table A**. The locations of the monitoring sites is shown in **Figure 7.1**.

ABN: 31 002 033 712
Telephone: (02) 9985 8511
Email: admin@rwcorkery.com
PO Box 1796, Chatswood NSW 2057

Sydney
Orange
Townsville

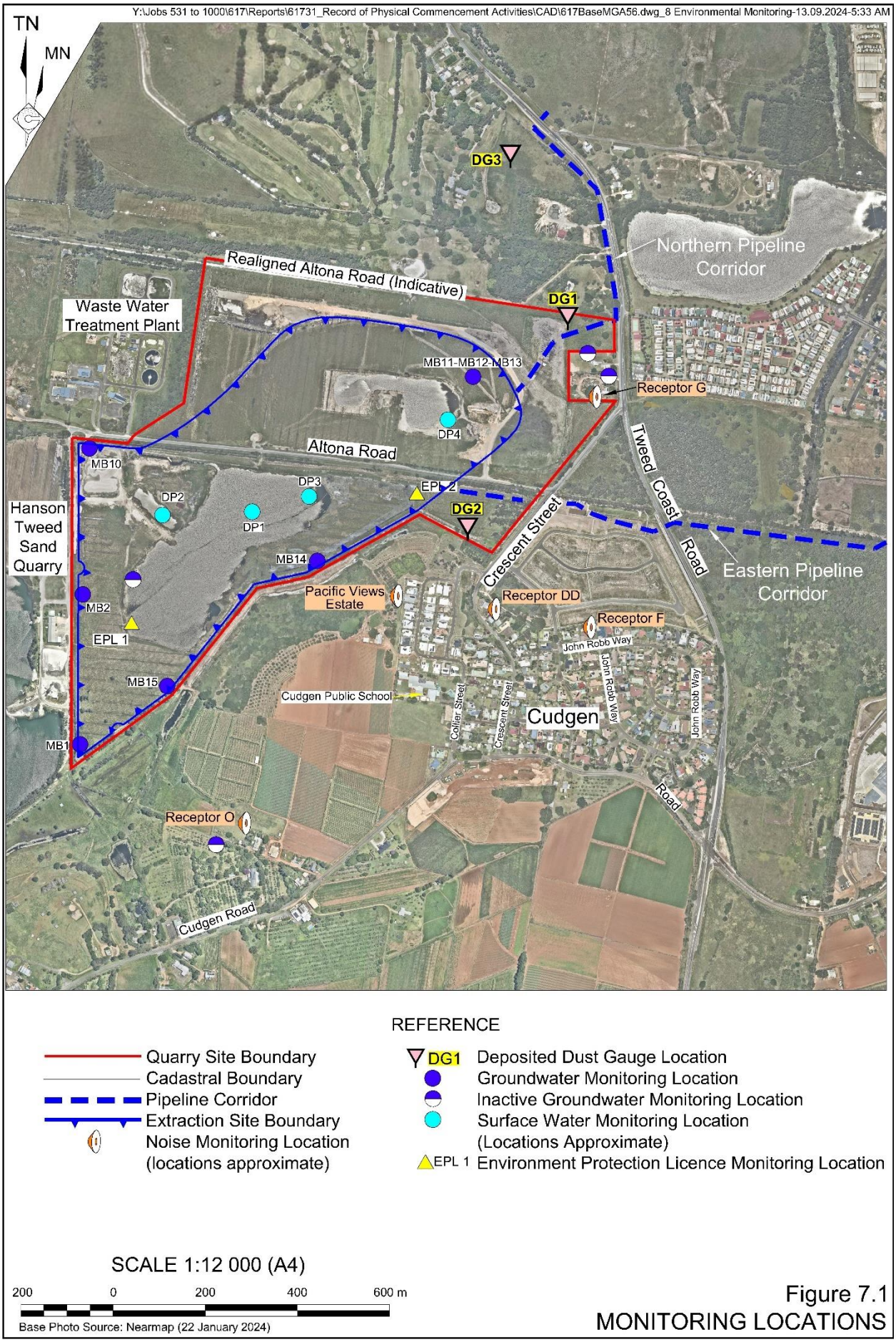

Figure 7.1
MONITORING LOCATIONS

Table A
Summary of Reported Exceedances – Surface Water

Date	Location / Time	Details of Exceedance	Details of non-compliance
30 May 2023	DP1 / 12:03pm	DO 5.90mg/L	Exceedance of SWMP Section 7.4 water quality objective for dissolved oxygen >6mg/L. Amber alert level under SWMP Section 7.7 TARP.
28 June 2023	DP1 / 11:40am	**DO 5.37mg/L**	Exceedance of SWMP Section 7.4 water quality objective for dissolved oxygen >6mg/L. Red alert level under SWMP Section 7.7 TARP – report as incident.
	DP2 / 11:15am	DO 4.99mg/L	Exceedance of SWMP Section 7.4 water quality objective for dissolved oxygen >6mg/L. Amber alert level under SWMP Section 7.7 TARP.
	DP3 / 11:20am	DO 4.82mg/L	Exceedance of SWMP Section 7.4 water quality objective for dissolved oxygen >6mg/L. Amber alert level under SWMP Section 7.7 TARP.
31 July 2023	DP1 / 12:20pm	**DO 5.98mg/L**	Exceedance of SWMP Section 7.4 water quality objective for dissolved oxygen >6mg/L. Red alert level under SWMP Section 7.7 TARP – report as incident.
	DP2 / 11:50am	**DO 5.80mg/L**	Exceedance of SWMP Section 7.4 water quality objective for dissolved oxygen >6mg/L. Red alert level under SWMP Section 7.7 TARP – report as incident.
	DP3 / 11:55am	**DO 5.85mg/L**	Exceedance of SWMP Section 7.4 water quality objective for dissolved oxygen >6mg/L. Red alert level under SWMP Section 7.7 TARP – report as incident.
	DP4 / 12:50pm	DO 5.25mg/L	Exceedance of SWMP Section 7.4 water quality objective for dissolved oxygen >6mg/L. Amber alert level under SWMP Section 7.7 TARP.
August 2023	DP1 / 12:30pm	**DO 4.19mg/L**	Exceedance of SWMP Section 7.4 water quality objective for dissolved oxygen >6mg/L. Red alert level under SWMP Section 7.7 TARP – report as incident.
	DP2 / 12:40pm	**DO 4.11mg/L**	Exceedance of SWMP Section 7.4 water quality objective for dissolved oxygen >6mg/L. Red alert level under SWMP Section 7.7 TARP – report as incident.
	DP3 / 12:15pm	**DO 3.81mg/L**	Exceedance of SWMP Section 7.4 water quality objective for dissolved oxygen >6mg/L. Red alert level under SWMP Section 7.7 TARP – report as incident.
	DP4 / 1:01pm	**DO 3.99mg/L**	Exceedance of SWMP Section 7.4 water quality objective for dissolved oxygen >6mg/L. Red alert level under SWMP Section 7.7 TARP – report as incident.
December 2023	DP1 / 10:58am	DO 5.89mg/L	Exceedance of SWMP Section 7.4 water quality objective for dissolved oxygen >6mg/L. Amber alert level under SWMP Section 7.7 TARP.
	DP2 / 10:51am	DO 5.72mg/L	Exceedance of SWMP Section 7.4 water quality objective for dissolved oxygen >6mg/L. Amber alert level under SWMP Section 7.7 TARP.
February 2024	DP1 / 2:35pm	**DO 5.69mg/L**	Exceedance of SWMP Section 7.4 water quality objective for dissolved oxygen >6mg/L. Red alert level under SWMP Section 7.7 TARP – report as incident.
	DP2 / 2:24pm	**DO 5.75mg/L**	Exceedance of SWMP Section 7.4 water quality objective for dissolved oxygen >6mg/L. Red alert level under SWMP Section 7.7 TARP – report as incident.
March 2024	DP1 / 12:35pm	**DO 4.07mg/L**	Exceedance of SWMP Section 7.4 water quality objective for dissolved oxygen >6mg/L. Red alert level under SWMP Section 7.7 TARP – report as incident.
	DP2 / 12:36pm	**DO 5.61mg/L**	Exceedance of SWMP Section 7.4 water quality objective for dissolved oxygen >6mg/L. Red alert level under SWMP Section 7.7 TARP – report as incident.
	DP3 / 12:30pm	DO 4.88mg/L	Exceedance of SWMP Section 7.4 water quality objective for dissolved oxygen >6mg/L. Amber alert level under SWMP Section 7.7 TARP.
	DP4 / 11:12am	DO 4.55mg/L	Exceedance of SWMP Section 7.4 water quality objective for dissolved oxygen >6mg/L. Amber alert level under SWMP Section 7.7 TARP.

Table A
Summary of Reported Exceedances – Surface Water

Date	Location / Time	Details of Exceedance	Details of non-compliance
April 2024	DP1 / 1:25pm	**DO 4.61mg/L**	Exceedance of SWMP Section 7.4 water quality objective for dissolved oxygen >6mg/L. Red alert level under SWMP Section 7.7 TARP – report as incident.
	DP2 / 1:28pm	**DO 4.44mg/L**	Exceedance of SWMP Section 7.4 water quality objective for dissolved oxygen >6mg/L. Red alert level under SWMP Section 7.7 TARP – report as incident.
	DP3 / 1:20pm	**DO 5.36mg/L**	Exceedance of SWMP Section 7.4 water quality objective for dissolved oxygen >6mg/L. Red alert level under SWMP Section 7.7 TARP – report as incident.
	DP4 / 12:35pm	**DO 5.05mg/L**	Exceedance of SWMP Section 7.4 water quality objective for dissolved oxygen >6mg/L. Red alert level under SWMP Section 7.7 TARP – report as incident.
DO = Dissolved Oxygen **Bold** values indicate exceedance of TARP and requirement to report as an exceedance.			

The consecutive exceedances of the dissolved oxygen objectives outlined in **Table A** are required to be reported as an incident in accordance with the approved SWMP. Notably, the updated SWMP which is awaiting approval subject to resolution of the Schedule 3 Condition 25 Groundwater Assessment includes clarification that the dissolved oxygen objective only applies to surface samples during periods of non-operation (when deeper deoxygenated water is not being mixed with the surface layers). Following approval of the updated SWMP this exceedances would not be considered a reportable incident.

Groundwater

In accordance with the TARP which forms Section 6.5 of the approved SWMP, the following actions and responses are required when two consecutive groundwater quality results for the same location exceed the assessment criteria.

- *Actions:*
  - *Report as an incident and submit formal report to DPE and relevant agencies in accordance with the incident response process outlined within the Environmental Management Strategy.*
- *Response:*
  - *In addition to the responses outlined within the amber alert undertake the following.*
  - *Seek a review of the monitoring data by a suitably qualified consultant.*
  - *Review the need to alter on-site activities or management practices.*
  - *Review the need to temporarily increase the monitoring frequency.*
  - *Update this GWMP as applicable.*

Details of the reported groundwater exceedances are provided below in **Table B**. The locations of the monitoring sites is shown in **Figure 7.1**.

Table B
Summary of Reported Exceedances – Groundwater

Date	Location / Time	Details of Exceedance	Details of non-compliance
August 2023	MB2 / 11:15am	pH 5.13	Exceedance of SWMP Section 6.3.2 water quality objective for pH 5.2 to 6.5. Amber alert level under SWMP Section 6.5 TARP.
September 2023	MB2 / 10:57am	**pH 5.06**	Exceedance of SWMP Section 6.3.2 water quality objective for pH 5.2 to 6.5. Red alert level under SWMP Section 6.5 TARP – report as incident.
October 2023	MB2 / 10:48am	**pH 5.19**	Exceedance of SWMP Section 6.3.2 water quality objective for pH 5.2 to 6.5. Red alert level under SWMP Section 6.5 TARP – report as incident.
March 2024	MB11 / 10:56am	Mg 103mg/L SO_4 984mg/L	Exceedance of SWMP Section 6.3.2 water quality objective for magnesium (100mg/L) and sulfate (800mg/L). Amber alert level under SWMP Section 6.5 TARP.
April 2024	MB11 / 12:48pm	**Mg 130mg/L** **SO_4 1640mg/L**	Exceedance of SWMP Section 6.3.2 water quality objective for magnesium (100mg/L) and sulfate (800mg/L). Red alert level under SWMP Section 6.5 TARP – report as incident.
May 2024	MB11 / 12:00pm	**Mg 173mg/L** **SO_4 2240mg/L** Fe 56.8mg/L	Exceedance of SWMP Section 6.3.2 water quality objective for magnesium (100mg/L) and sulfate (800mg/L). Red alert level under SWMP Section 6.5 TARP – report as incident. Exceedance of SWMP Section 6.3.2 water quality objective for iron (20mg/L). Amber alert level under SWMP Section 6.5 TARP.
June 2024	MB11 / 1:50pm	**Mg 158mg/L** **SO_4 2000mg/L** **Fe 40.1mg/L**	Exceedance of SWMP Section 6.3.2 water quality objective for magnesium (100mg/L), sulfate (800mg/L), and iron (20mg/L). Red alert level under SWMP Section 6.5 TARP – report as incident.
July 2024	MB11 / 1:11pm	**Mg 139mg/L** **SO_4 1500mg/L** **Fe 28.9mg/L**	Exceedance of SWMP Section 6.3.2 water quality objective for magnesium (100mg/L), sulfate (800mg/L), and iron (20mg/L). Red alert level under SWMP Section 6.5 TARP – report as incident.
August 2024	MB11 / 1:20pm	**Fe 30.7mg/L**	Exceedance of SWMP Section 6.3.2 water quality objective for iron (20mg/L). Red alert level under SWMP Section 6.5 TARP – report as incident.

Mg = magnesium SO_4 = sulfate Fe = iron
Bold values indicate exceedance of TARP and requirement to report as an exceedance.

The above is also considered a non-compliance with Project Approval MP05_0103B Schedule 5 Condition 9 which requires that the Proponent must notify the Department immediately after becoming aware of the incident. The need for reporting these results under the TARP was identified as part of the preparation of the Annual Review and therefore the results were not reported immediately.

Potential for Adverse Impacts

The consecutive exceedances of the dissolved oxygen objective recorded at monitoring locations DP1, DP2, DP3, and DP4 is considered to not have resulted in any adverse environmental impacts. This is concluded based on the following.

- The previous surface water quality monitoring results display similar variation in dissolved oxygen during operational periods.
- The dissolved oxygen levels at all surface water monitoring locations DP1, DP2, DP3, and DP4 have since returned to within objective levels and have continued on a stable level since May 2024.
- Given that the site is operational with mixing of deeper deoxygenated water to surface as a result of dredging, dissolved oxygen levels below the criteria value at the surface is consistent

with expectations and previous monitoring during operations and does not represent an issue of concern.

The consecutive exceedances of magnesium, sulfate, and iron objectives at monitoring location MB11 is also considered to not have resulted in any adverse environmental impacts. This is concluded based on the following.

- The 2008 Environmental Assessment stated that the Project "*may lead to the generation of acidic water. It is expected that the buffering capacity of the sand and sediments below -5.0m AHD would be sufficient to maintain the extraction pond water at a neutral pH.*"
- The monitoring results support this prediction. Following commencement of dredging within the northern extraction pond, immediately adjacent MB11, water levels reduced as expected and within predicted levels. This would have resulted in oxidation of any acid sulfate soils within this area, however, pH levels remained near neutral, confirming that the existing buffering capacity was sufficient to neutralise any acidification.
- The elevated magnesium, sulfate and iron during this period are consistent with the byproducts from oxidation processes and are expected to represent a short term / transient change in water quality as dredging progresses within this area. This is supported by the fact that magnesium and sulfate began to increase from December 2023, peaked in May 2024, and has since declined to below the respective objectives. Elevated iron levels did not begin to rise until May 2024 and is expected to also continue to similarly decline below the objective level over the next several months.
- As the northern extraction pond has increased in volume, the groundwater levels have continued to recover. As such further declines in water levels are unlikely and therefore further acidification events such as recorded at MB11 are considered unlikely.

The consecutive exceedances of the pH objective at monitoring location MB2 is considered to not have resulted in any adverse environmental impacts. This is concluded based on the following.

- The pH measurements recorded are below the objective but within trend for the monitoring location.
- Whilst pH levels at MB2 fell below the objective the lowest recorded pH of 5.04 remained above the minimum pre-extraction pH of 4.62.
- The average pH at MB2 during the 2023/2024 period (5.48) remained generally consistent with the long-term average for all data (5.74).

Measures Implemented / to be Implemented to Avoid Future Non-compliance

As outlined above, the updated SWMP which is awaiting approval subject to resolution of the Schedule 3 Condition 25 Groundwater Assessment includes clarification that the dissolved oxygen objective (>6mg/L) will apply to the retained post-operational lake only (i.e. will not apply during the operational period). This change will ensure that the dissolved oxygen objective for surface water at the Quarry is only applicable once operational activities have ceased and objectives are required to be met in order to achieve a healthy and functional ecosystem post-extraction. Therefore, no further action is considered necessary in relation to dissolved oxygen.

As a result of the groundwater non-compliances, a review was undertaken of the circumstances leading to the non-compliances. Following this review, it was determined that the presence of an acid-sulfate soil oxidation event occurring in groundwater caused by dredging operations was within expectations and previously modelled outcomes for groundwater. It has been demonstrated that the

sand profile contains buffering capacity to neutralise this and any future oxidation events at the Quarry. Notwithstanding, as the northern extraction pond has increased in volume, further declines in water levels causing acidification events are considered unlikely.

The cause of low pH at MB2 has previously been reviewed. As noted, MB2 has historically and continually recorded a lower pH that the rest of the groundwater monitoring locations at the Quarry. Given that monitoring does not indicate any trends (towards either lower or higher pH), whilst monitoring data continues to confirm consistency with previous data, no further action is considered necessary.

In relation to the non-compliance with reporting these TARP exceedances immediately, an internal system will be implemented to flag the requirement to report any future exceedance of TARPs in accordance with the SWMP and conditions of consent. This will be coordinated with the monitoring consultant, Gales, the operator (Kingscliff Sands) and RWC to minimise any potential delays in information dissemination.

Should you wish to discuss the above or any other matter relating to the Cudgen Lakes Sand Quarry, please don't hesitate to contact Stephen Segal (0414 322 455) or myself on (02) 9985 8511.

Yours sincerely

Scott Hollamby
Senior Environmental Consultant

Copy: Gales-Kingscliff Pty Limited
Kingscliff Sands
NSW Environment Protection Authority
Tweed Shire Council

R.W. CORKERY & CO.
PTY. LIMITED ABN 31 002 033 712
GEOLOGICAL & ENVIRONMENTAL CONSULTANTS

22 January 2025

The Secretary
The Department of Planning, Housing and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Submitted via Major Projects Portal

Dear Sir / Madam,

Re: Cudgen Sand Lakes Quarry PA MP05_0103B – Incident Report
Groundwater Monitoring Results

I am writing on behalf of Gales-Kingscliff Pty Limited (Gales) to formally report on the non-compliance with the Trigger Action Response Plan (TARP) as specified within the approved May 2021 Soil and Water Management Plan (the approved SWMP) for the Cudgen Sand Lakes Quarry (the Quarry). This letter also identifies the measures that will be implemented in order to minimise the potential for a future reoccurrence. It is noted that the reported non-compliance is considered a continuation of the previously reported incident (submitted 11 October 2024). This report has been updated in response to a request for information received from DPHI 20 January 2025.

Details of the Incident

In accordance with the TARP which forms Section 6.5 of the approved SWMP, the following actions and responses are required when two consecutive groundwater quality results for the same location exceed the assessment criteria.

- *Actions:*
  - *Report as an incident and submit formal report to DPE and relevant agencies in accordance with the incident response process outlined within the Environmental Management Strategy.*
- *Response:*
  - *In addition to the responses outlined within the amber alert undertake the following.*
  - *Seek a review of the monitoring data by a suitably qualified consultant.*
  - *Review the need to alter on-site activities or management practices.*
  - *Review the need to temporarily increase the monitoring frequency.*
  - *Update this GWMP as applicable.*

Details of the reported groundwater exceedances are provided below in **Table A**. The locations of the monitoring sites is shown in **Figure 7.1**. The non-compliances reported in this letter relate to exceedances of the groundwater quality objective of iron (Fe) for the September and October monitoring 2024 events only. Whilst previous months exceedances are included for completeness, these have been previously reported in accordance with Section 6.5 of the approved SWMP. Previous exceedances not related to the current non-compliance have not been repeated.

ABN: 31 002 033 712
Telephone: (02) 9985 8511
Email: admin@rwcorkery.com
PO Box 1796, Chatswood NSW 2057

Sydney
Orange
Townsville

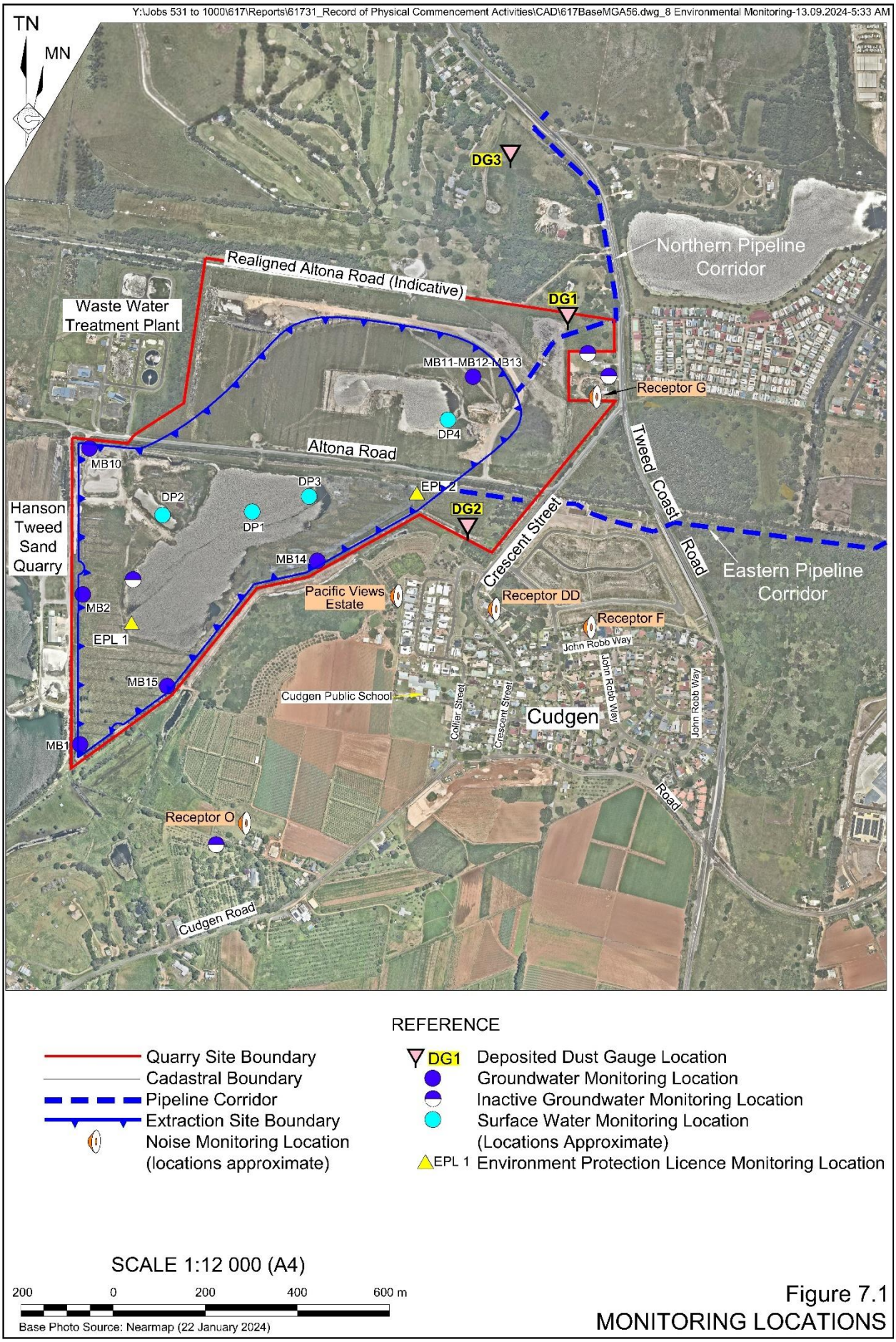

Figure 7.1
MONITORING LOCATIONS

Table A
Summary of Reported Exceedances – Groundwater

Date	Location / Time	Details of Exceedance	Details of non-compliance
28 March 2024	MB11 / 10:56am	Mg 103mg/L SO_4 984mg/L	Exceedance of SWMP Section 6.3.2 water quality objective for magnesium (100mg/L) and sulfate (800mg/L). Amber alert level under SWMP Section 6.5 TARP.
22 April 2024	MB11 / 12:48pm	**Mg 130mg/L** **SO_4 1640mg/L**	Exceedance of SWMP Section 6.3.2 water quality objective for magnesium (100mg/L) and sulfate (800mg/L). Red alert level under SWMP Section 6.5 TARP – report as incident.
21 May 2024	MB11 / 12:00pm	**Mg 173mg/L** **SO_4 2240mg/L** Fe 56.8mg/L	Exceedance of SWMP Section 6.3.2 water quality objective for magnesium (100mg/L) and sulfate (800mg/L). Red alert level under SWMP Section 6.5 TARP – report as incident. Exceedance of SWMP Section 6.3.2 water quality objective for iron (20mg/L). Amber alert level under SWMP Section 6.5 TARP.
24 June 2024	MB11 / 1:50pm	**Mg 158mg/L** **SO_4 2000mg/L** **Fe 40.1mg/L**	Exceedance of SWMP Section 6.3.2 water quality objective for magnesium (100mg/L), sulfate (800mg/L), and iron (20mg/L). Red alert level under SWMP Section 6.5 TARP – report as incident.
23 July 2024	MB11 / 1:11pm	**Mg 139mg/L** **SO_4 1500mg/L** **Fe 28.9mg/L**	Exceedance of SWMP Section 6.3.2 water quality objective for magnesium (100mg/L), sulfate (800mg/L), and iron (20mg/L). Red alert level under SWMP Section 6.5 TARP – report as incident.
26 August 2024	MB11 / 1:20pm	**Fe 30.7mg/L**	Exceedance of SWMP Section 6.3.2 water quality objective for iron (20mg/L). Red alert level under SWMP Section 6.5 TARP – report as incident.
24 September 2024	MB11 / 2:03	**Fe 34.5mg/L**	Exceedance of SWMP Section 6.3.2 water quality objective for iron (20mg/L). Red alert level under SWMP Section 6.5 TARP – report as incident.
23 October 2024	MB11 / 11:38am	**Fe 28.7mg/L**	Exceedance of SWMP Section 6.3.2 water quality objective for iron (20mg/L). Red alert level under SWMP Section 6.5 TARP – report as incident.

Mg = magnesium SO_4 = sulfate Fe = iron
New exceedances since previous incident report
Bold values indicate exceedance of TARP and requirement to report as an exceedance.

The October monitoring data was provided by HMC 27 November 2024, with review completed by RWC and discussed internally 10 December 2024 at which time it was confirmed that notification was required. Initial notification was subsequently reported to DPHI on 10 December 2024.

The previously reported exceedances were identified as part of the Annual Review reporting and were discussed with Gales during finalisation of the Annual Review on 30 September 2024, with initial notification reported to DPHI on 30 September 2024 and the report provided 2 October 2024. As noted in that report, given that the need for reporting was not identified until preparation of the Annual Review this was also reported as being non-compliant with the requirement to immediately notify.

Potential for Adverse Impacts

The consecutive exceedances of iron objectives at monitoring location MB11 is not considered to have resulted in any adverse environmental impacts. This is concluded based on the following.

- The 2008 Environmental Assessment stated that the Project "*may lead to the generation of acidic water. It is expected that the buffering capacity of the sand and sediments below -5.0m AHD would be sufficient to maintain the extraction pond water at a neutral pH.*"
- The monitoring results support this prediction. Following commencement of dredging within the northern extraction pond, immediately adjacent MB11, water levels reduced as expected and within predicted levels. This would have resulted in oxidation of any acid sulfate soils

within this area, however, pH levels remained near neutral, confirming that the existing buffering capacity was sufficient to neutralise any acidification.

- The elevated iron during this period is consistent with being a byproduct from oxidation processes and are expected to represent a short term / transient change in water quality as dredging progresses within this area. This is supported by the fact that magnesium and sulfate began to increase from December 2023, peaked in May 2024, and has since generally declined to below the respective objectives for the last three monitoring months, as previously reported. Elevated iron levels did not begin to rise until May 2024 and, whilst fluctuating slightly, are expected to decline below the objective level over the next several months.
- Iron levels within the dredge pond have remained consistently low (0.05mg/L at DP4 in the northern extraction pond). Given the proximity of MB11 to the pond and fact that groundwater in proximity to the pond will be drawn into the pond (due to the effect of drawdown), the localised increase in iron levels at MB11 are not considered to be resulting in broader increases in iron concentrations. It is also noted that MB11 is a nested bore (screened at 2.5 to 5.5mbgl) with adjacent MB12 (screened 6.5 to 9.5mblg) and MB13 (screened 17.5 to 20.5mbgl) not showing a trending increase in iron levels with results remaining well below the water quality objective.

Measures Implemented / to be Implemented to Avoid Future Non-compliance

As a result of the groundwater non-compliances, a review was undertaken of the circumstances leading to the non-compliances. Following this review, it was determined that the presence of an acid-sulfate soil oxidation event occurring in groundwater caused by dredging operations was within expectations and previously modelled outcomes for groundwater. It has been demonstrated that the sand profile contains buffering capacity to neutralise this and any future oxidation events at the Quarry.

Notwithstanding, as the iron levels have not declined as rapidly as expected, Kingscliff Sands propose to maintain water levels within the northern extraction pond at a higher level until such time as the iron concentrations have fallen below the water quality objective.

Should you wish to discuss the above or any other matter relating to the Cudgen Lakes Sand Quarry, please don't hesitate to contact Stephen Segal (0414 322 455) or myself on (02) 9985 8511.

Yours sincerely

Scott Hollamby
Senior Environmental Consultant

Copy: Gales-Kingscliff Pty Limited
Kingscliff Sands
NSW Environment Protection Authority
Tweed Shire Council

R.W. CORKERY & CO.
PTY. LIMITED ABN 31 002 033 712
GEOLOGICAL & ENVIRONMENTAL CONSULTANTS

14 January 2025

The Secretary
The Department of Planning, Housing and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Sent by email to: compliance@planning.nsw.gov.au
and submitted via Major Projects Portal

Dear Sir / Madam,

Re: Cudgen Sand Lakes Quarry PA MP05_0103B –
Reporting of Deposited Dust Monitoring Gauge Exceedance

I am writing on behalf of Gales-Kingscliff Pty Limited (Gales) to formally report on the exceedance of the annual average deposited dust criteria (assessed as total insoluble solids), as specified within the approved June 2020 Air Quality Management Plan (the approved AQMP) for the Cudgen Sand Lakes Quarry (the Quarry). This letter provides further information on the exceedance. It is noted that the reported non-compliance is not considered a reportable incident in accordance with the AQMP as detailed below.

Details of the Incident

In accordance with the Trigger Action Response Plan (TARP) which forms Section 7.2 of the approved AQMP, in the event of continuing (annual average) exceedance of deposited dust criteria as a result of the Quarry operations, the following actions will be implemented.

- *The DPHI and EPA will be notified, nominating the type and magnitude of the exceedance and the number of affected landowners. The affected landowners will also be notified.*
- *Meteorological conditions for the period of monitoring will be reviewed and the likely source of the elevated particulate matter emissions identified.*
- *Completion of Steps 1 to 4 as for a short term exceedance.*
- *If further monitoring indicates that dust levels continue to exceed the relevant criteria, Gales-Kingscliff Pty Ltd would attempt to negotiate an appropriate arrangement with the landowner(s) to further mitigate or compensate for the impacts of the dust emissions.*

The non-compliance reported in this letter relate to an exceedance of the long-term (average annual) deposited dust over the previous 12 calendar months (December 2023 to November 2024 inclusive) at monitoring site DG3. However, it is noted that during this period only seven recorded measurements are considered valid monitoring results. As such, details of the deposited dust measurements for the previous 12 valid recordings are provided below in **Table A.** Monitoring results for monitoring site DG1 and DG2 are also presented to assist with interpretation. The locations of the monitoring sites are shown in **Figure 7.1.**

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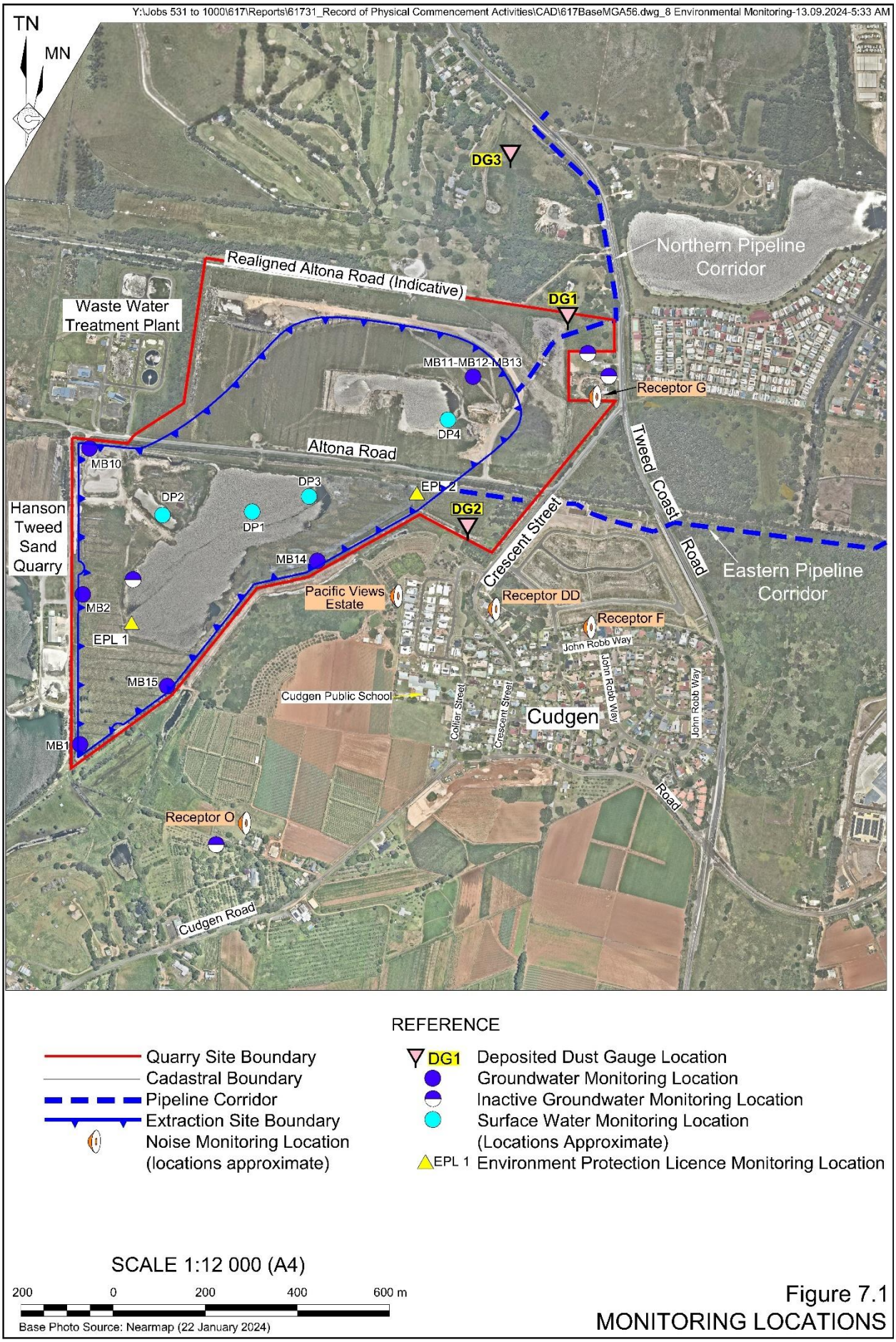
Sydney
Orange
Townsville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TN
MN
DG3
Realigned Altona Road (Indicative)
Northern Pipeline Corridor
Waste Water Treatment Plant
DG1
MB11-MB12-MB13
Receptor G
DP4
Altona Road
MB10
DP3
EPL 2
DP2
DG2
DP1
Tweed Coast Road
Crescent Street
Hanson Tweed Sand Quarry
MB14
Eastern Pipeline Corridor
Pacific Views Estate
Receptor DD
MB2
Receptor F
EPL 1
John Robb Way
MB15
Cudgen Public School
Collier Street
Cudgen
MB1
Receptor O
Cudgen Road
REFERENCE
Quarry Site Boundary
Cadastral Boundary
Pipeline Corridor
Extraction Site Boundary
Noise Monitoring Location (locations approximate)
DG1 Deposited Dust Gauge Location
Groundwater Monitoring Location
Inactive Groundwater Monitoring Location
Surface Water Monitoring Location (Locations Approximate)
EPL 1 Environment Protection Licence Monitoring Location
SCALE 1:12 000 (A4)
200 0 200 400 600 m
Base Photo Source: Nearmap (22 January 2024)
Figure 7.1
MONITORING LOCATIONS

Table A
Summary of Deposited Dust Monitoring Results

Month	DG1		DG2		DG3		Monthly Rainfall
	Total Insoluble Matter	Rolling Annual Average	Total Insoluble Matter	Rolling Annual Average	Total Insoluble Matter	Rolling Annual Average	
Jun-23	0.66	1.32	2.44	2.29	0.69	0.66	19.0
Jul-23	0.62	1.25	1.59	2.22	**51.08**[1]	0.66	47.8
Aug-23	0.34	1.01	2.32	2.16	1.26	0.77	45.4
Sep-23	0.22	0.72	6.29	2.22	1.04	0.86	35.1
Oct-23	0.45	0.61	8.23	2.70	3.29	1.04	78.7
Nov-23	4.99	0.92	**23.89**[1]	2.70	**67.9**[1]	1.10	279.8
Dec-23	1.23	0.99	1.94	2.79	3.09	1.44	125.9
Jan-24	13.70	2.23	8.79	3.57	**65**[1]	1.59	306.7
Feb-24	0.13	2.19	0.05	3.53	NS	1.81	176.3
Mar-24	0.47	2.04	0.1	3.22	0.61	1.66	240.4
Apr-24	2.63	2.17	0.82	3.22	2.92	1.99	242.0
May-24	NS	2.31	NS	3.26	NS	1.84	240.8
Jun-24	3.70	2.59	1.9	3.20	3.10	2.19	13.4
Jul-24	0.77	2.60	0.67	3.11	0.45	1.97	109.4
Aug-24	0.98	2.47	0.67	2.89	9.69	2.83	154.0
Sep-24	0.16	2.29	0.26	2.67	**194**[1]	2.83	101.4
Oct-24	NS	2.29	NS	2.67	9.0	3.45	197.2
Nov-24	5.7	2.70	1.2	2.58	11.0	4.98	116.8

Grey shaded cells represent data applicable to current rolling annual average (12 month) period. Additional results presented to provide 12 valid sample results

NS = Not sampled due to broken bottle or flooding (preventing access during May 2024).

[1] Indicates that the sample was contaminated with high levels of organic matter with results excluded from the statistical summary in consultation with HMC (the monitoring consultant).

Red indicates an exceedance of the long term (annual average) deposited dust criteria as per the approved AQMP.

Following an investigation, the exceedance is considered not to be a result of quarrying activities nor likely to have resulted in any adverse environmental impacts. This is concluded based on the following.

- Cudgen Lakes Sand Quarry is currently operating as a wet dredging operation and as a result, is unlikely to generate significant quantities of dust or that would have potential for adverse environmental impacts.
- The Tweed area experienced above average rainfall for the previous reporting period and therefore potential sources of excess dust emissions from the Quarry (or other local sources) is unlikely due to consistent wet conditions. Notably, four out of five samples excluded from statistical analysis due to excessive organic matter occurred during months of high to very high rainfall.
- DG3 is located a considerable distance (~1km) from Quarry activities that could generate dust (i.e. the processing area). DG1 is located a similar direction and slightly closer distance from the processing area and does not reflect similar spikes in total insoluble solids.
- As noted above, the exceedance has been calculated on the previous 12 months in which only seven samples are valid. Further analysis of the annual rolling average based upon the previous 12 valid samples (including July, August, September and October 2023, noting that July and

November were also contaminated with high levels of organic matter) demonstrates that the annual average deposited dust at DG3 would equal to 3.85g/m^2/month, i.e. remaining below the criteria.

In summary, it is concluded that deposited dust exceedance is not likely to be a result of quarrying activities but rather due to the contamination of samples with organic matter. This is presented by a reanalysis of the monitoring results which demonstrates that, by including the last 12 valid samples, the long term deposited dust criteria would not have been exceeded.

Gales-Kingscliff is currently reviewing all management plans, including the Air Quality Management Plan and will further consider the placement of the deposited dust gauges in order to minimise the contribution of organic matter / provide results representative of quarrying activities.

Should you wish to discuss the above or any other matter relating to the Cudgen Lakes Sand Quarry, please don't hesitate to contact Stephen Segal (0414 322 455) or myself on (02) 9985 8511.

Yours sincerely

Scott Hollamby
Senior Environmental Consultant

Copy: Gales-Kingscliff Pty Limited
Kingscliff Sands
NSW Environment Protection Authority
Tweed Shire Council

R.W. CORKERY & CO.
PTY. LIMITED ABN 31 002 033 712
GEOLOGICAL & ENVIRONMENTAL CONSULTANTS

31 January 2025

The Secretary
The Department of Planning, Housing and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Submitted via Major Projects Portal

Dear Sir / Madam,

Re: Cudgen Sand Lakes Quarry PA MP05_0103B – Incident Report
Reporting of Non-Compliance with Air Quality and Soil and Water Management Plans

I am writing on behalf of Gales-Kingscliff Pty Limited (Gales) to formally report on the non-compliance with the December 2024 round of monitoring for air quality and water quality. In accordance with Project Approval MP05_0103B a non-compliance is classified as an incident and must be reported in accordance with Schedule 5 Conditions 9 and 10.

Background

A prolonged shutdown of dredging and processing was planned for November and December 2024 to allow for extensive corrosion repair and maintenance of the wash plant. Sandblasting, undercoat and topcoat paint application required suitable weather and specific humidity conditions. With the planned shutdown of dredging and production to allow the extensive corrosion repair and maintenance the sample collections were scheduled and undertaken in November and January but not December. Last routine production was on 21 November 2024 and routine production restarted on 8 January 2024. Between 22 November 2024 and 7 January 2025 there was dredging and production on 11 days and no dredging or production on 36 days.

Details of the Incident

The following two non-compliances with Project Approval MP05_0103B are reported.

- Schedule 3 Condition 7 – Air Quality Management Plan (AQMP)

  Non-compliance with the implementation of the AQMP due to a missed round of deposited dust sample collection for the month of December 2024. This applies for all deposited dust gauges, due for collection 24 December 2024 (based on monthly exposure).

- Schedule 3 Condition 18 – Soil and Water Management Plan (SWMP)

  Non-compliance with the implementation of the SWMP due to a missed round of water quality sample collection for the month of December 2024. This applies to all water monitoring locations (both monitoring bores and the dredge pond), nominally due for collection around 19 December 2024 (note: collection is not required on a fixed date).

Both management plans provide for the following changes to monitoring frequency during 'non-operational' periods.

- AQMP – Section 6.2

  "*monitoring ceased during periods of inactivity (i.e. no extraction, no processing and road transportation levels of 10 or less laden trucks per day)*"

- SWMP – Sections 6.4.5 and 7.5.5

  During non-operational periods both groundwater and surface water quality sampling can be reduced to quarterly.

  Groundwater
  "*The sampling frequency for the monitoring parameters and sites during operational periods (when either extraction is occurring or VENM or fines are being placed into the extraction pond[1]) is summarised in* ***Table 6.5*** *and for non-operational periods is summarised in* ***Table 6.6***.

  [1] *In the event other activities such as product transportation occur without the need for extraction or placement of VENM or fines within the dredge pond, this is still considered a non-operational period for the purposes of groundwater monitoring."*

  Surface water
  "*The sampling frequency for the monitoring parameters and sites during operational periods (when either extraction is occurring or VENM or fines are being placed into the extraction pond[4]) is summarised in* ***Table 7.4*** *and for non-operational periods is summarised in* ***Table 7.5***.

  [4] In the event other activities such as product transportation occur without the need for extraction or placement of VENM or fines within the dredge pond, this is still considered a non-operational period for the purposes of surface water monitoring."

It is advised that samples were not collected by the monitoring consultant (HMC Environmental Consulting) due to an understanding that operations were not planned to occur during December and therefore staffing was not organised to complete sampling. However, the operator, Kingscliff Sands, confirmed to RWC 23 January 2025 that operations which trigger the need for monitoring did occur for part of December. Specifically dredging and processing occurred from 9 to 20 December 2024 and laden truck movements exceeded 10 per day during December. As such operational sampling was required to be undertaken.

Potential for Adverse Impacts

The non-compliances are not considered to have resulted in any adverse environmental impacts. Whilst exceedances of air quality and water quality have previously occurred and been reported, the circumstances for these exceedances are understood and results have remained as expected. Results from the January 2025 sampling will be analysed to ensure that expected trends continue.

Measures Implemented / to be Implemented to Avoid Future Non-compliance

As a result of these non-compliances HMC have been instructed to ensure staff remain allocated for sample collection. Kingscliff Sands are to notify HMC, Gales and RWC via email of any plans for extended non-operational periods and any subsequent change to operational status. In the event there is uncertainty, samples are to be collected in accordance with operational sampling frequencies.

Should you wish to discuss the above or any other matter relating to the Cudgen Lakes Sand Quarry, please don't hesitate to contact Stephen Segal (0414 322 455) or myself on (0437 858 511).

Yours sincerely

Scott Hollamby
Senior Environmental Consultant

Copy: Gales-Kingscliff Pty Limited
Kingscliff Sands

R.W. CORKERY & CO.
PTY. LIMITED ABN 31 002 033 712
GEOLOGICAL & ENVIRONMENTAL CONSULTANTS

28 January 2025

The Secretary
The Department of Planning, Housing and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Submitted via Major Projects Portal

Dear Sir / Madam,

Re: Cudgen Sand Lakes Quarry PA MP05_0103B – Incident Report
Groundwater Monitoring Results

I am writing on behalf of Gales-Kingscliff Pty Limited (Gales) to formally report on the non-compliance with the Trigger Action Response Plan (TARP) as specified within the approved May 2021 Soil and Water Management Plan (the approved SWMP) for the Cudgen Sand Lakes Quarry (the Quarry). This letter also identifies the measures that will be implemented in order to minimise the potential for a future reoccurrence. It is noted that the reported non-compliance is considered a continuation of the previously reported incident (MP05_0103B-PA-19).

Details of the Incident

In accordance with the TARP which forms Section 6.5 of the approved SWMP, the following actions and responses are required when two consecutive groundwater quality results for the same location exceed the assessment criteria.

- *Actions:*
  - *Report as an incident and submit formal report to DPE and relevant agencies in accordance with the incident response process outlined within the Environmental Management Strategy.*
- *Response:*
  - *In addition to the responses outlined within the amber alert undertake the following.*
  - *Seek a review of the monitoring data by a suitably qualified consultant.*
  - *Review the need to alter on-site activities or management practices.*
  - *Review the need to temporarily increase the monitoring frequency.*
  - *Update this GWMP as applicable.*

Details of the reported groundwater exceedances are provided below in **Table A**. The locations of the monitoring sites is shown in **Figure 7.1**. The non-compliances reported in this letter relate to exceedances of the groundwater quality objective of iron (Fe) for the October and November monitoring 2024 events only. Whilst previous months exceedances are included for completeness, these have been previously reported in accordance with Section 6.5 of the approved SWMP.

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Sydney
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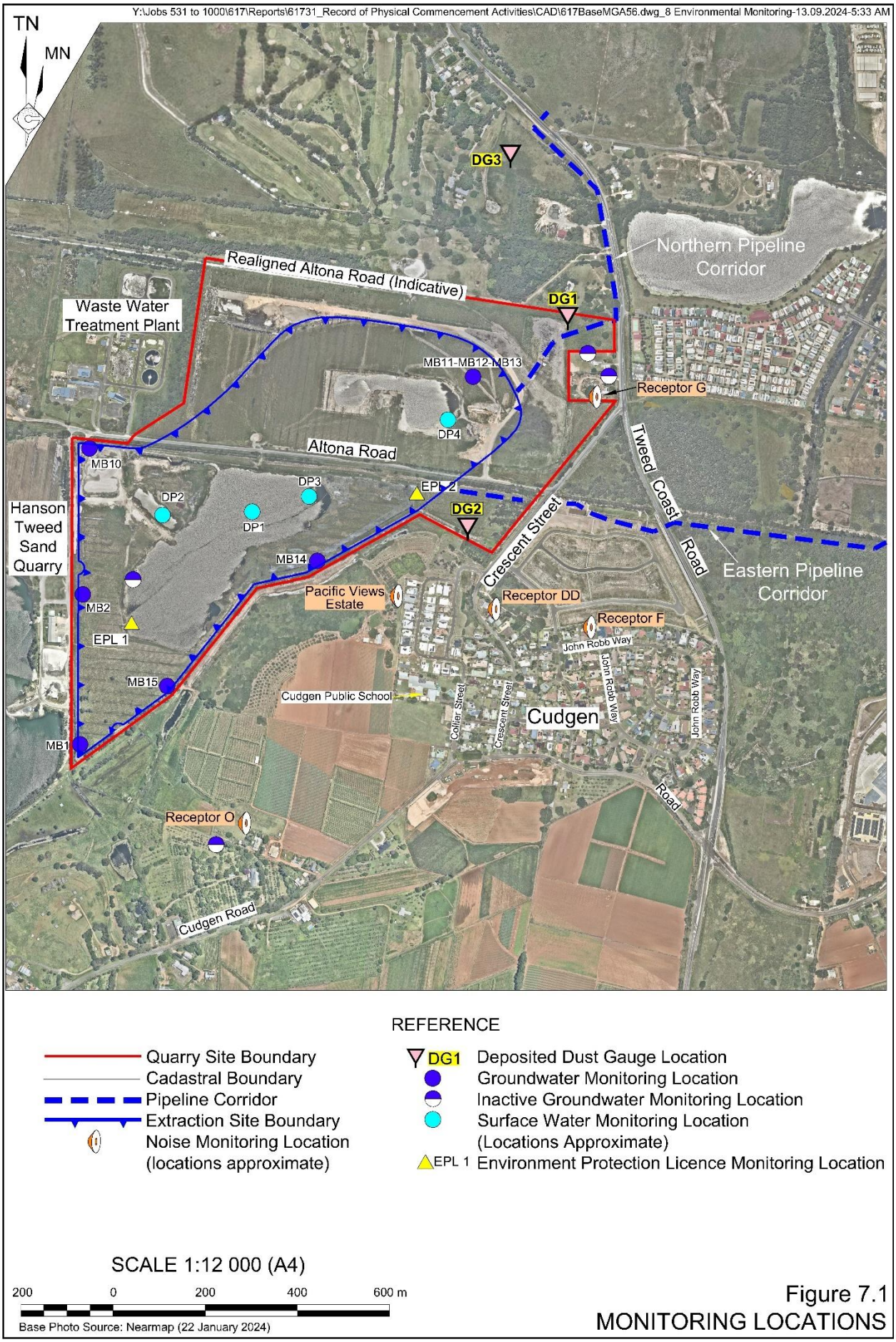
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TN
MN
DG3
Realigned Altona Road (Indicative)
Northern Pipeline Corridor
Waste Water Treatment Plant
DG1
MB11-MB12-MB13
Receptor G
DP4
Altona Road
MB10
DP3
EPL 2
DP2
DG2
Hanson Tweed Sand Quarry
DP1
Tweed Coast Road
Crescent Street
MB14
Eastern Pipeline Corridor
Pacific Views Estate
Receptor DD
Receptor F
MB2
EPL 1
John Robb Way
MB15
Cudgen Public School
Collier Street
Cudgen
MB1
Receptor O
Cudgen Road
REFERENCE
Quarry Site Boundary
Cadastral Boundary
Pipeline Corridor
Extraction Site Boundary
Noise Monitoring Location (locations approximate)
DG1 Deposited Dust Gauge Location
Groundwater Monitoring Location
Inactive Groundwater Monitoring Location
Surface Water Monitoring Location (Locations Approximate)
EPL 1 Environment Protection Licence Monitoring Location
SCALE 1:12 000 (A4)
200 0 200 400 600 m
Base Photo Source: Nearmap (22 January 2024)
Figure 7.1
MONITORING LOCATIONS

Table A
Summary of Reported Exceedances – Groundwater

Date	Location / Time	Details of Exceedance	Details of non-compliance
28 March 2024	MB11 / 10:56am	Mg 103mg/L SO_4 984mg/L	Exceedance of SWMP Section 6.3.2 water quality objective for magnesium (100mg/L) and sulfate (800mg/L). Amber alert level under SWMP Section 6.5 TARP.
22 April 2024	MB11 / 12:48pm	**Mg 130mg/L** **SO_4 1640mg/L**	Exceedance of SWMP Section 6.3.2 water quality objective for magnesium (100mg/L) and sulfate (800mg/L). Red alert level under SWMP Section 6.5 TARP – report as incident.
21 May 2024	MB11 / 12:00pm	**Mg 173mg/L** **SO_4 2240mg/L** Fe 56.8mg/L	Exceedance of SWMP Section 6.3.2 water quality objective for magnesium (100mg/L) and sulfate (800mg/L). Red alert level under SWMP Section 6.5 TARP – report as incident. Exceedance of SWMP Section 6.3.2 water quality objective for iron (20mg/L). Amber alert level under SWMP Section 6.5 TARP.
24 June 2024	MB11 / 1:50pm	**Mg 158mg/L** **SO_4 2000mg/L** **Fe 40.1mg/L**	Exceedance of SWMP Section 6.3.2 water quality objective for magnesium (100mg/L), sulfate (800mg/L), and iron (20mg/L). Red alert level under SWMP Section 6.5 TARP – report as incident.
23 July 2024	MB11 / 1:11pm	**Mg 139mg/L** **SO_4 1500mg/L** **Fe 28.9mg/L**	Exceedance of SWMP Section 6.3.2 water quality objective for magnesium (100mg/L), sulfate (800mg/L), and iron (20mg/L). Red alert level under SWMP Section 6.5 TARP – report as incident.
26 August 2024	MB11 / 1:20pm	**Fe 30.7mg/L**	Exceedance of SWMP Section 6.3.2 water quality objective for iron (20mg/L). Red alert level under SWMP Section 6.5 TARP – report as incident.
24 September 2024	MB11 / 2:03	**Fe 34.5mg/L**	Exceedance of SWMP Section 6.3.2 water quality objective for iron (20mg/L). Red alert level under SWMP Section 6.5 TARP – report as incident.
23 October 2024	MB11 / 11:38am	**Fe 28.7mg/L**	Exceedance of SWMP Section 6.3.2 water quality objective for iron (20mg/L). Red alert level under SWMP Section 6.5 TARP – report as incident.
19 November 2024	MB11 / 1:58pm	**Fe 29.3mg/L**	Exceedance of SWMP Section 6.3.2 water quality objective for iron (20mg/L). Red alert level under SWMP Section 6.5 TARP – report as incident.

Mg = magnesium SO_4 = sulfate Fe = iron
New exceedances relevant to this report
Bold values indicate exceedance of TARP and requirement to report as an exceedance.

The November monitoring data was provided by HMC on 16 December 2024, with review completed by RWC and discussed internally on 9 January 2025. RWC discussed with DPHI via phone call on 10 January 2025 and email 14 January 2025 the expectations regarding the formal reporting of ongoing exceedances of elevated iron levels at MB11. DPHI confirmed via email on 21 January 2025 the expectations of reporting, and subsequently a formal notification of the November exceedance was provided to DPHI on 22 January 2025.

Potential for Adverse Impacts

The consecutive exceedances of iron objectives at monitoring location MB11 is not considered to have resulted in any adverse environmental impacts. This is concluded based on the following.

- The 2008 Environmental Assessment stated that the Project "*may lead to the generation of acidic water. It is expected that the buffering capacity of the sand and sediments below -5.0m AHD would be sufficient to maintain the extraction pond water at a neutral pH.*"
- The monitoring results support this prediction. Following commencement of dredging within the northern extraction pond, immediately adjacent MB11, water levels reduced as expected and within predicted levels. This would have resulted in oxidation of any acid sulfate soils

within this area, however, pH levels remained near neutral, confirming that the existing buffering capacity was sufficient to neutralise any acidification.

- The elevated iron during this period is consistent with being a byproduct from oxidation processes and are expected to represent a short term / transient change in water quality as dredging progresses within this area. This is supported by the fact that magnesium and sulfate began to increase from December 2023, peaked in May 2024, and has since declined to below the respective objectives and continued to decline, being at or below median levels during November 2024. Elevated iron levels did not begin to rise until May 2024 and, whilst fluctuating slightly, are expected to gradually decline below the objective.
- Iron levels within the dredge pond have remained consistently low (0.05mg/L at DP4 in the northern extraction pond). Given the proximity of MB11 to the pond and fact that groundwater in proximity to the pond will be drawn into the pond (due to the effect of drawdown), the localised increase in iron levels at MB11 are not considered to be resulting in broader increases in iron concentrations. It is also noted that MB11 is a nested bore (screened at 2.5 to 5.5mbgl) with adjacent MB12 (screened 6.5 to 9.5mblg) and MB13 (screened 17.5 to 20.5mbgl). These bores have shown an increase in iron levels, consistent with iron moving down in the water column, but remain well below the water quality objective and previously recorded maximum baseline levels.

Measures Implemented / to be Implemented to Avoid Future Non-compliance

As a result of the groundwater non-compliances, a review has previously been undertaken of the circumstances leading to the non-compliances. Following this review, it was determined that the presence of an acid-sulfate soil oxidation event occurring in groundwater caused by dredging operations was within expectations and previously modelled outcomes for groundwater. It has been demonstrated that the sand profile contains buffering capacity to neutralise this and any future oxidation events at the Quarry.

Notwithstanding, as the iron levels have not declined as rapidly as expected, Kingscliff Sands have been maintaining water levels within the northern extraction pond at a higher level (since October 2024) and propose to continue this until such time as the iron concentrations have fallen below the water quality objective.

Should you wish to discuss the above or any other matter relating to the Cudgen Lakes Sand Quarry, please don't hesitate to contact Stephen Segal (0414 322 455) or myself on (02) 9985 8511.

Yours sincerely

Scott Hollamby
Senior Environmental Consultant

Copy: Gales-Kingscliff Pty Limited
Kingscliff Sands
NSW Environment Protection Authority
Tweed Shire Council

R.W. CORKERY & CO.
PTY. LIMITED ABN 31 002 033 712
GEOLOGICAL & ENVIRONMENTAL CONSULTANTS

25 March 2025

The Secretary
The Department of Planning, Housing and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Submitted via Major Projects Portal

Dear Sir / Madam,

Re: Cudgen Sand Lakes Quarry PA MP05_0103B – Incident Report
Surface Water Monitoring Results

I am writing on behalf of Gales-Kingscliff Pty Limited (Gales) to formally report an incident as specified by the Red Alert response specified within the surface water Trigger Action Response Plan (TARP) of the approved May 2021 Soil and Water Management Plan (the approved SWMP) for the Cudgen Sand Lakes Quarry (the Quarry).

Details of the Incident

In accordance with the TARP which forms Section 7.6 of the approved SWMP, the following actions and responses are required when two consecutive surface water quality results for the same location exceed the assessment criteria.

- *Actions:*
  - *Report as an incident and submit formal report to DPE and relevant agencies in accordance with the incident response process outlined within the Environmental Management Strategy.*
- *Response:*
  - *In addition to the responses outlined within the amber alert undertake the following.*
  - *Seek a review of the monitoring data by a suitably qualified consultant.*
  - *Review the need to alter on-site activities or management practices.*
  - *Review the need to temporarily increase the monitoring frequency.*
  - *Update this SWMP as applicable.*

Details of the reported surface water exceedances are provided below in **Table A**. The locations of the monitoring sites are shown in **Figure 7.1**. The exceedances reported in this letter relate to the surface water quality objective of dissolved oxygen (DO) for the January and February 2025 monitoring events at locations DP1 and DP3.

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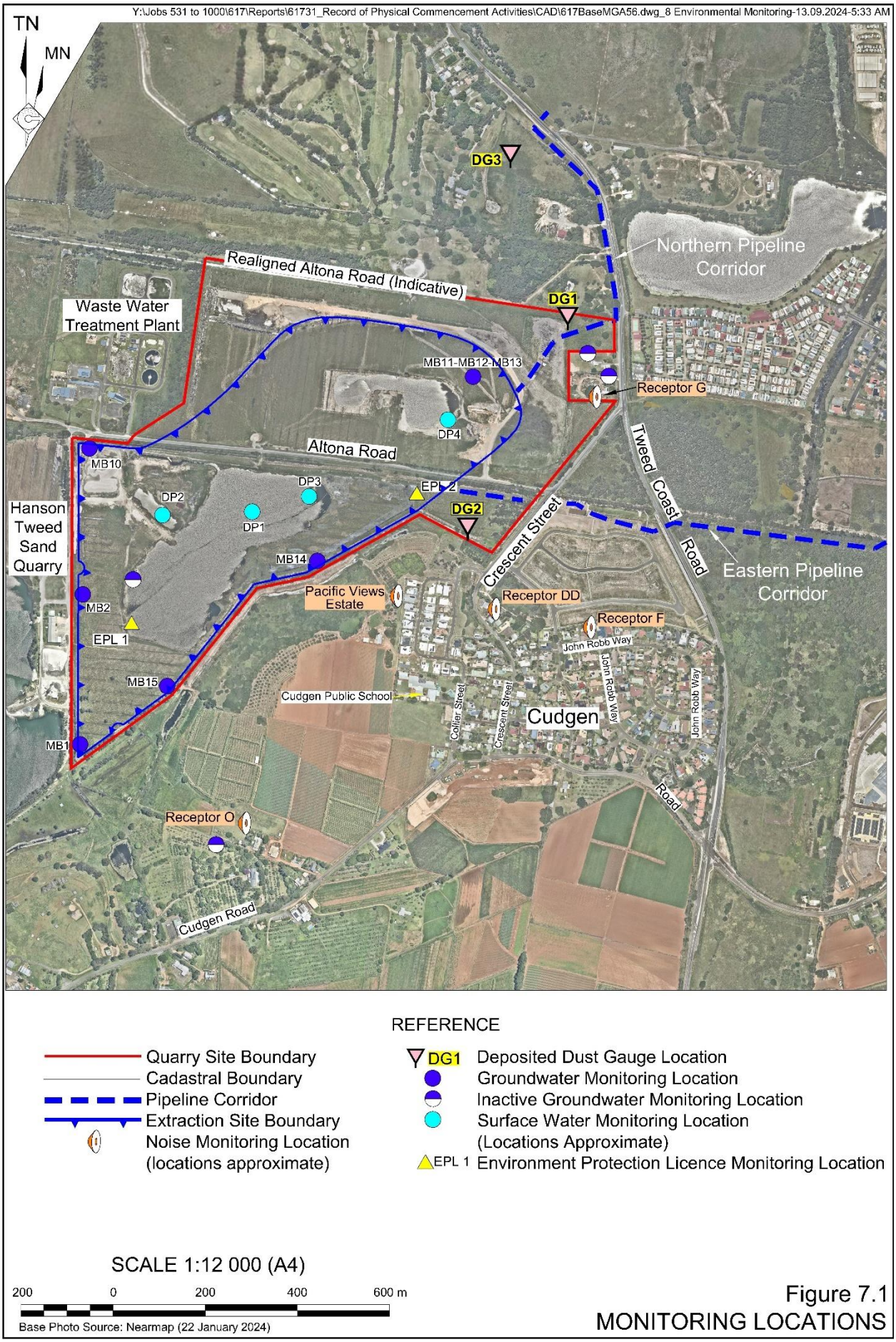
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TN
MN
DG3
Realigned Altona Road (Indicative)
Northern Pipeline Corridor
Waste Water Treatment Plant
DG1
MB11-MB12-MB13
Receptor G
DP4
Altona Road
MB10
DP3
EPL 2
DP2
DG2
DP1
Tweed Coast Road
Crescent Street
Hanson Tweed Sand Quarry
MB14
Eastern Pipeline Corridor
Pacific Views Estate
Receptor DD
MB2
Receptor F
EPL 1
John Robb Way
MB15
Cudgen Public School
Collier Street
Cudgen
MB1
Receptor O
Cudgen Road
REFERENCE
Quarry Site Boundary
Cadastral Boundary
Pipeline Corridor
Extraction Site Boundary
Noise Monitoring Location (locations approximate)
DG1 Deposited Dust Gauge Location
Groundwater Monitoring Location
Inactive Groundwater Monitoring Location
Surface Water Monitoring Location (Locations Approximate)
EPL 1 Environment Protection Licence Monitoring Location
SCALE 1:12 000 (A4)
200 0 200 400 600 m
Base Photo Source: Nearmap (22 January 2024)
Figure 7.1
MONITORING LOCATIONS

Table A
Summary of Reported Exceedances – Surface Water

Date	Location / Time	Details of Exceedance	Details of non-compliance
21 January 2025	DP1 / 12:10pm	DO 4.81mg/L	Exceedance of SWMP Section 7.2 water quality objective for dissolved oxygen (>6mg/L). Amber alert level under SWMP Section 7.6 TARP.
21 January 2025	DP3 / 12:05pm	DO 5.37mg/L	Exceedance of SWMP Section 7.2 water quality objective for dissolved oxygen (>6mg/L). Amber alert level under SWMP Section 7.6 TARP.
25 February 2025	DP1 / 12:25pm	DO 5.69mg/L	Exceedance of SWMP Section 7.2 water quality objective for dissolved oxygen (>6mg/L). Red alert level under SWMP Section 7.6 TARP – report as incident.
25 February 2025	DP3 / 12:20pm	DO 5.36mg/L	Exceedance of SWMP Section 7.2 water quality objective for dissolved oxygen (>6mg/L). Red alert level under SWMP Section 7.6 TARP – report as incident.
DO = Dissolved Oxygen			

The February monitoring data was provided by HMC on 14 March 2025, with review completed by RWC and discussed internally on 20 March 2025. This confirmed that a Red Alert Level TARP had been triggered by two consecutive exceedances of DO at DP 1 and DP3. RWC lodged an initial notification to DPHI via the Major Project Portal on 20 March 2025 and subsequently this formal notification.

Potential for Adverse Impacts

The consecutive exceedances of DO objectives at monitoring locations DP1 and DP3 are considered to not have resulted in any adverse environmental impacts. This is concluded based on the following.

- The low levels of DO observed are considered to be the result of active dredging, processing, and the associated pumping of water causing mixing of the water profile in the ponds. Water from lower in the water column, which contains lower oxygen levels, is brought to the surface, resulting in reduced DO readings at the surface. This has been regularly observed throughout operations.

- The mixing of low oxygenated water is constrained to the dredge pond and, with no discharges occurring during this period, no off-site impacts will have occurred.

The SWMP originally submitted for consultation in December 2023 and re-submitted in January 2025 for approval (currently under review by DPHI) clarifies that criteria for DO is applicable only for surface samples during periods of inactivity, when the mixing action of dredging or water pumping are not affecting surface oxygen levels through bringing deeper deoxygenated water to surface.

Measures Implemented / to be Implemented to Avoid Future Non-compliance

A review was undertaken of the circumstances leading to the non-compliances. It was determined that the low levels of DO occurring in the dredge pond was within expectations due to the mixing of water caused by dredging and processing activities. Furthermore, the SWMP submitted to DPHI for approval acknowledges and addresses this issue through clarification that criteria for DO is applicably only for surface samples during periods of nil operation (i.e. when mixing action of dredging / pumping of water is not affecting surface oxygen levels). Accordingly, Gales anticipates that future Red Alert levels caused by occurrences of DO levels outside of the specified criteria will not persist following approval of the 2025 SWMP.

Should you wish to discuss the above or any other matter relating to the Cudgen Lakes Sand Quarry, please don't hesitate to contact Stephen Segal (0414 322 455) or myself on (02) 9985 8511.

Yours sincerely

Scott Hollamby
Senior Environmental Consultant

Copy: Gales-Kingscliff Pty Limited
Kingscliff Sands
NSW Environment Protection Authority
Tweed Shire Council

R.W. CORKERY & CO.
PTY. LIMITED ABN 31 002 033 712
GEOLOGICAL & ENVIRONMENTAL CONSULTANTS

17 April 2025

The Secretary
The Department of Planning, Housing and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Submitted via Major Projects Portal

Dear Sir / Madam,

Re: Cudgen Sand Lakes Quarry PA MP05_0103B – Incident Report
Surface Water Monitoring Results

I am writing on behalf of Gales-Kingscliff Pty Limited (Gales) to formally report an incident as specified by the Red Alert response specified within the surface water Trigger Action Response Plan (TARP) of the currently approved May 2021 Soil and Water Management Plan (the approved SWMP) for the Cudgen Sand Lakes Quarry (the Quarry).

Details of the Incident

In accordance with the TARP which forms Section 7.6 of the approved SWMP, the following actions and responses are required when two or more consecutive surface water quality results for the same location exceed the assessment criteria.

- *Actions:*
  - *Report as an incident and submit formal report to DPE and relevant agencies in accordance with the incident response process outlined within the Environmental Management Strategy.*
- *Response:*
  - *In addition to the responses outlined within the amber alert undertake the following.*
  - *Seek a review of the monitoring data by a suitably qualified consultant.*
  - *Review the need to alter on-site activities or management practices.*
  - *Review the need to temporarily increase the monitoring frequency.*
  - *Update this SWMP as applicable.*

Details of the reported surface water exceedances are provided below in **Table A**. The locations of the monitoring sites are shown in **Figure 7.1**. The exceedances reported in this letter relate to the surface water quality objective of dissolved oxygen (DO) for the February and March 2025 monitoring events at locations DP1 and DP3. The exceedance of the water quality objective for DO during January and February 2025 was previously reported on 24 March 2025.

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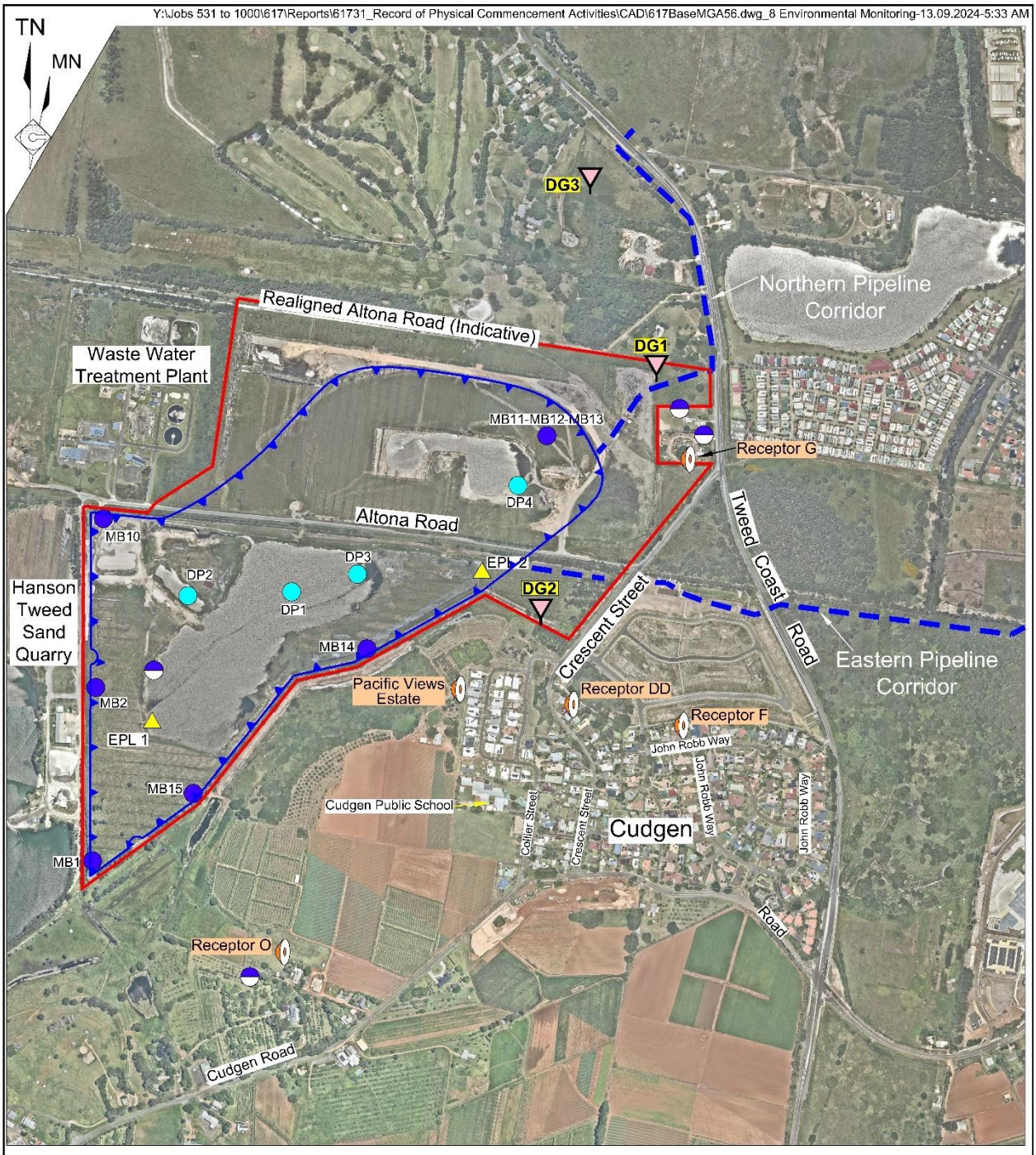

Figure 7.1
MONITORING LOCATIONS

Table A
Summary of Reported Exceedances – Surface Water

Date	Location / Time	Details of Exceedance	Details of non-compliance
21 January 2025	DP1 / 11:05am	DO 4.81mg/L	Exceedance of SWMP Section 7.2 water quality objective for dissolved oxygen (>6mg/L). Amber alert level under SWMP Section 7.6 TARP.
21 January 2025	DP3 / 11:01pm	DO 5.37mg/L	Exceedance of SWMP Section 7.2 water quality objective for dissolved oxygen (>6mg/L). Amber alert level under SWMP Section 7.6 TARP.
25 February 2025	DP1 / 12:25pm	DO 5.69mg/L	Exceedance of SWMP Section 7.2 water quality objective for dissolved oxygen (>6mg/L). Red alert level under SWMP Section 7.6 TARP – report as incident.
25 February 2025	DP3 / 12:20pm	DO 5.36mg/L	Exceedance of SWMP Section 7.2 water quality objective for dissolved oxygen (>6mg/L). Red alert level under SWMP Section 7.6 TARP – report as incident.
25 March 2025	DP1 / 12:15pm	DO 5.99mg/L	Exceedance of SWMP Section 7.2 water quality objective for dissolved oxygen (>6mg/L). Red alert level under SWMP Section 7.6 TARP – report as incident.
25 March 2025	DP3 / 12:00pm	DO 5.87mg/L	Exceedance of SWMP Section 7.2 water quality objective for dissolved oxygen (>6mg/L). Red alert level under SWMP Section 7.6 TARP – report as incident.
DO = Dissolved Oxygen			

The March monitoring data was provided by HMC on 14 April 2025, with review completed by RWC and discussed internally on 16 April 2025. This confirmed that a Red Alert Level TARP had been triggered by further consecutive exceedances of DO at DP1 and DP3. RWC lodged an initial notification to DPHI via email (as there was an error with the Major Project Portal) on 16 April 2025 and subsequently this formal notification.

Potential for Adverse Impacts

The consecutive exceedances of dissolved oxygen objectives at monitoring location DP1 and DP3 are not considered to have resulted in any adverse environmental impacts. This is concluded based on the following.

- The low levels of DO observed are considered to be the result of active dredging, processing, and the associated pumping of water causing mixing of the water profile in the ponds. Water from lower in the water column, which contains lower oxygen levels, is brought to the surface, resulting in reduced DO readings at the surface. This has been regularly observed throughout operations.
- The mixing of low oxygenated water is constrained to the dredge pond and, with no discharges occurring during this period, no off-site impacts will have occurred.

The SWMP originally submitted for consultation in December 2023 and re-submitted in January 2025 for approval (currently under review by DPHI) clarifies that criteria for DO is applicable only for surface samples during periods of inactivity, when mixing actions of dredging or water pumping are not affecting surface oxygen levels through bringing deeper deoxygenated water to surface.

Measures Implemented / to be Implemented to Avoid Future Non-compliance

A review was undertaken of the circumstances leading to the non-compliances. It was determined that the low levels of DO occurring in the dredge pond was within expectations due to the mixing of water caused by dredging and processing activities. Furthermore, the SWMP submitted to DPHI for

approval acknowledges and addresses this issue through clarification that criteria for DO is applicable only for surface samples during periods of nil operation (i.e. when mixing action of dredging / pumping of water is not affecting surface oxygen levels). Accordingly, Gales anticipates that future Red Alert levels caused by occurrences of DO levels outside of the specified criteria will not persist following approval of the 2025 SWMP.

Should you wish to discuss the above or any other matter relating to the Cudgen Lakes Sand Quarry, please don't hesitate to contact Stephen Segal (0414 322 455) or myself on (02) 9985 8511.

Yours sincerely

Scott Hollamby
Senior Environmental Consultant

Copy: Gales-Kingscliff Pty Limited
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NSW Environment Protection Authority
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R.W. CORKERY & CO.
PTY. LIMITED ABN 31 002 033 712
GEOLOGICAL & ENVIRONMENTAL CONSULTANTS

27 May 2025

The Secretary
The Department of Planning, Housing and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Submitted via Major Projects Portal

Dear Sir / Madam,

Re: Cudgen Sand Lakes Quarry PA MP05_0103B –
Reporting of Rolling Annual Average Deposited Dust Exceedances

Further to discussions with the Department, I am writing on behalf of Gales-Kingscliff Pty Limited (Gales) to formally report on the ongoing rolling annual average deposited dust criteria (assessed as total insoluble solids), as specified within the approved June 2020 Air Quality Management Plan (the approved AQMP) for the Cudgen Sand Lakes Quarry (the Quarry). This letter provides further information on the exceedance which remains the result of a previously reported elevated measurement, subsequently determined to be not Quarry-related. It is noted that the reported non-compliance is not considered a reportable incident in accordance with the AQMP as detailed below.

We will also provide separate correspondence regarding the future inclusion / exclusion of outliers and contaminated/invalid results for all State Significant Developments. As discussed, the inclusion of such results effectively invalidates the rolling annual average and I am concerned this will result in a perceived ongoing exceedance/non-compliance, potentially undue community concern, and unnecessary reporting. For example, one high result of 48g/m^2/month would result in the next 12 months of rolling annual average exceeding the criteria, and 12 months of incident reports, even if all further results record zero dust.

Details of the Incident

In accordance with the Trigger Action Response Plan (TARP) which forms Section 7.2 of the approved AQMP, in the event of continuing (annual average) exceedance of deposited dust criteria as a result of the Quarry operations, the following actions will be implemented.

- *The DPHI and EPA will be notified, nominating the type and magnitude of the exceedance and the number of affected landowners. The affected landowners will also be notified.*
- *Meteorological conditions for the period of monitoring will be reviewed and the likely source of the elevated particulate matter emissions identified.*
- *Completion of Steps 1 to 4 as for a short term exceedance.*
- *If further monitoring indicates that dust levels continue to exceed the relevant criteria, Gales-Kingscliff Pty Ltd would attempt to negotiate an appropriate arrangement with the landowner(s) to further mitigate or compensate for the impacts of the dust emissions.*

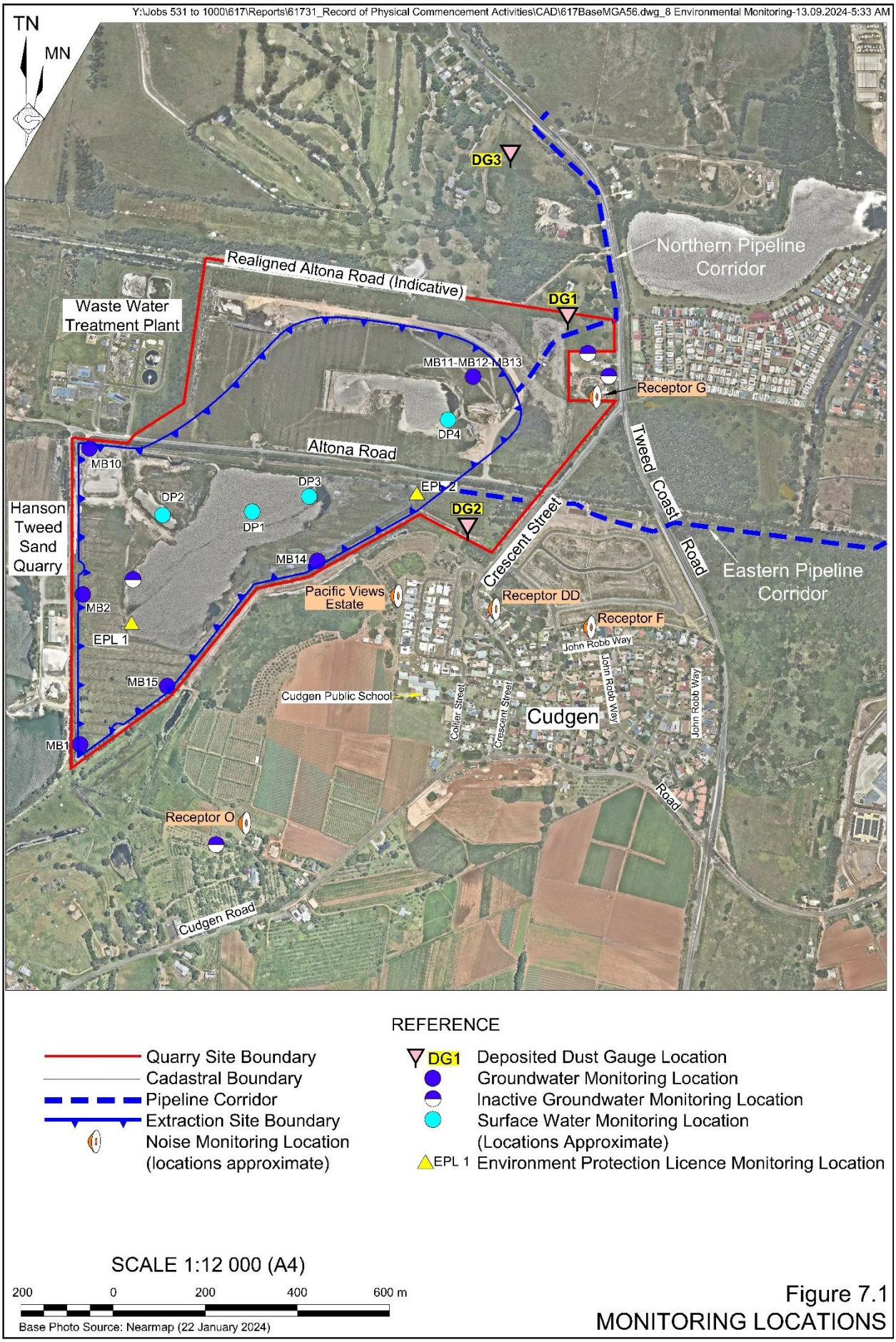
The non-compliance reported in this letter relates to an ongoing exceedance of the long-term (rolling annual average) deposited dust at monitoring site DG3 due to a previously reported elevated measurement which was subsequently determined to be not Quarry-related. It is noted that during the last 12 month averaging period only six recorded measurements are considered valid monitoring results, with a number of months in which flooding prevented access. As such, details of the deposited dust measurements to June 2023 are provided below in **Table A** for context**.** Monitoring results for monitoring site DG1 and DG2 are also presented to assist with interpretation. The locations of the monitoring sites are shown in **Figure 7.1.**

Table A
Summary of Deposited Dust Monitoring Results

Month	DG1		DG2		DG3			Monthly Rainfall
	Total Insoluble Matter	Rolling Annual Average	Total Insoluble Matter	Rolling Annual Average	Total Insoluble Matter	Rolling Annual Average	Average (last 12 valid results)	
Jun-23	0.66	1.32	2.44	2.29	0.69	0.66		19.0
Jul-23	0.62	1.25	1.59	2.22	***51.08**	NS		47.8
Aug-23	0.34	1.01	2.32	2.16	1.26	0.77		45.4
Sep-23	0.22	0.72	6.29	2.22	1.04	0.86		35.1
Oct-23	0.45	0.61	8.23	2.70	3.29	1.04		78.7
Nov-23	4.99	0.92	***23.89**	NS	***67.9**	NS		279.8
Dec-23	1.23	0.99	1.94	2.79	3.09	1.44		125.9
Jan-24	13.70	2.23	8.79	3.57	***65**	NS		306.7
Feb-24	0.13	2.19	0.05	3.53	NS	NS		176.3
Mar-24	0.47	2.04	0.1	3.22	0.61	1.66		240.4
Apr-24	2.63	2.17	0.82	3.22	2.92	1.99	1.38	242.0
May-24	NS	NS	NS	NS	NS	NS	1.38	240.8
Jun-24	3.70	2.59	1.9	3.20	3.1	2.19	1.63	13.4
Jul-24	0.77	2.60	0.67	3.11	0.45	1.97	1.65	109.4
Aug-24	0.98	2.66	0.67	2.95	9.69	3.02	2.45	154.0
Sep-24	0.16	2.66	0.26	2.34	***194**	NS	2.45	101.4
Oct-24	NS	NS	NS	NS	9	**4.12**	3.18	197.2
Nov-24	5.70	2.95	1.2	1.64	11	**4.98**	3.18^	381.6
Dec-24	NS	NS	NS	NS	NS	NS	3.18	321.6
Jan-25	NS	NS	NS	NS	NS	NS	3.18	328.6
Feb-25	0.18	1.82	0.63	0.78	0.64	**4.68**	2.98	156.0
Mar-25	NS	NS	NS	NS	NS	NS	2.98	667.4
Apr-25	0.48	1.71	13	2.62	0.18	**4.87**	2.94	242.4

Grey shaded cells represent data applicable to current rolling annual average (12 month) period. Additional results presented to provide 12 valid sample results
NS = Not sampled due to broken bottle, flooding, or excluded due to outlier causing invalid sample.
* Indicates that the sample was contaminated with high levels of organic matter with results excluded from the statistical summary in consultation with HMC (the monitoring consultant).
^Excludes November 2024 result previously determined to be contaminated with organic matter.
Red indicates an exceedance of the long term (annual average) deposited dust criteria as per the approved AQMP.

It is noted that, since the first notification of deposited dust level exceedance on 14 January 2025, two further samples have been collected (with access restricted due to ongoing flooding issues). Both samples record a very low total insoluble solids level with the rolling annual average continuing to exceed solely as a result of the previously recorded and reported elevated result. As outlined in the 14 January 2025 report these previously recorded elevated levels were determined not to be a result of quarrying activities but rather due to the contamination of samples with organic matter. Additionally, it was noted that by including the last 12 valid samples the long term deposited dust criteria would not have been exceeded.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Receptor DD
Receptor F
MB2
John Robb Way
EPL 1
MB15
Cudgen Public School
Cudgen
Collier Street
Crescent Street
John Robb Way
MB1
Receptor O
Cudgen Road
REFERENCE
Quarry Site Boundary
Cadastral Boundary
Pipeline Corridor
Extraction Site Boundary
Noise Monitoring Location (locations approximate)
DG1 Deposited Dust Gauge Location
Groundwater Monitoring Location
Inactive Groundwater Monitoring Location
Surface Water Monitoring Location (Locations Approximate)
EPL 1 Environment Protection Licence Monitoring Location
SCALE 1:12 000 (A4)
200 0 200 400 600 m
Base Photo Source: Nearmap (22 January 2024)
Figure 7.1
MONITORING LOCATIONS

We trust the above provides sufficient information in relation to the ongoing elevated rolling annual average. Should you wish to discuss the above or any other matter relating to the Cudgen Lakes Sand Quarry, please don't hesitate to contact Stephen Segal (0414 322 455) or myself on (02) 9985 8511.

Yours sincerely

Scott Hollamby
Senior Environmental Consultant

Copy: Gales-Kingscliff Pty Limited
Kingscliff Sands
NSW Environment Protection Authority
Tweed Shire Council

R.W. CORKERY & CO.
PTY. LIMITED ABN 31 002 033 712
GEOLOGICAL & ENVIRONMENTAL CONSULTANTS

07 August 2025

The Secretary
The Department of Planning, Housing and Infrastructure
GPO Box 39
SYDNEY NSW 2001

Submitted via Major Projects Portal

Dear Sir / Madam,

Re: Cudgen Sand Lakes Quarry PA MP05_0103B – Incident Report
Surface Water Monitoring Results – Dissolved Oxygen

I am writing on behalf of Gales-Kingscliff Pty Limited (Gales) to formally report an incident as specified by the Red Alert response specified within the surface water Trigger Action Response Plan (TARP) of the approved May 2021 Soil and Water Management Plan (the approved SWMP) for the Cudgen Sand Lakes Quarry (the Quarry).

Details of the Incident

In accordance with the TARP which forms Section 7.6 of the approved SWMP, the following actions and responses are required when two consecutive surface water quality results for the same location exceed the assessment criteria.

- *Actions:*
  - *Report as an incident and submit formal report to DPE and relevant agencies in accordance with the incident response process outlined within the Environmental Management Strategy.*
- *Response:*
  - *In addition to the responses outlined within the amber alert undertake the following.*
  - *Seek a review of the monitoring data by a suitably qualified consultant.*
  - *Review the need to alter on-site activities or management practices.*
  - *Review the need to temporarily increase the monitoring frequency.*
  - *Update this SWMP as applicable.*

Details of the reported surface water exceedances are provided below in **Table A**. The locations of the monitoring sites are shown in **Figure 7.1**. The exceedances reported in this letter relate to the surface water quality objective of dissolved oxygen (DO) for the May and June 2025 monitoring events at location DP1.

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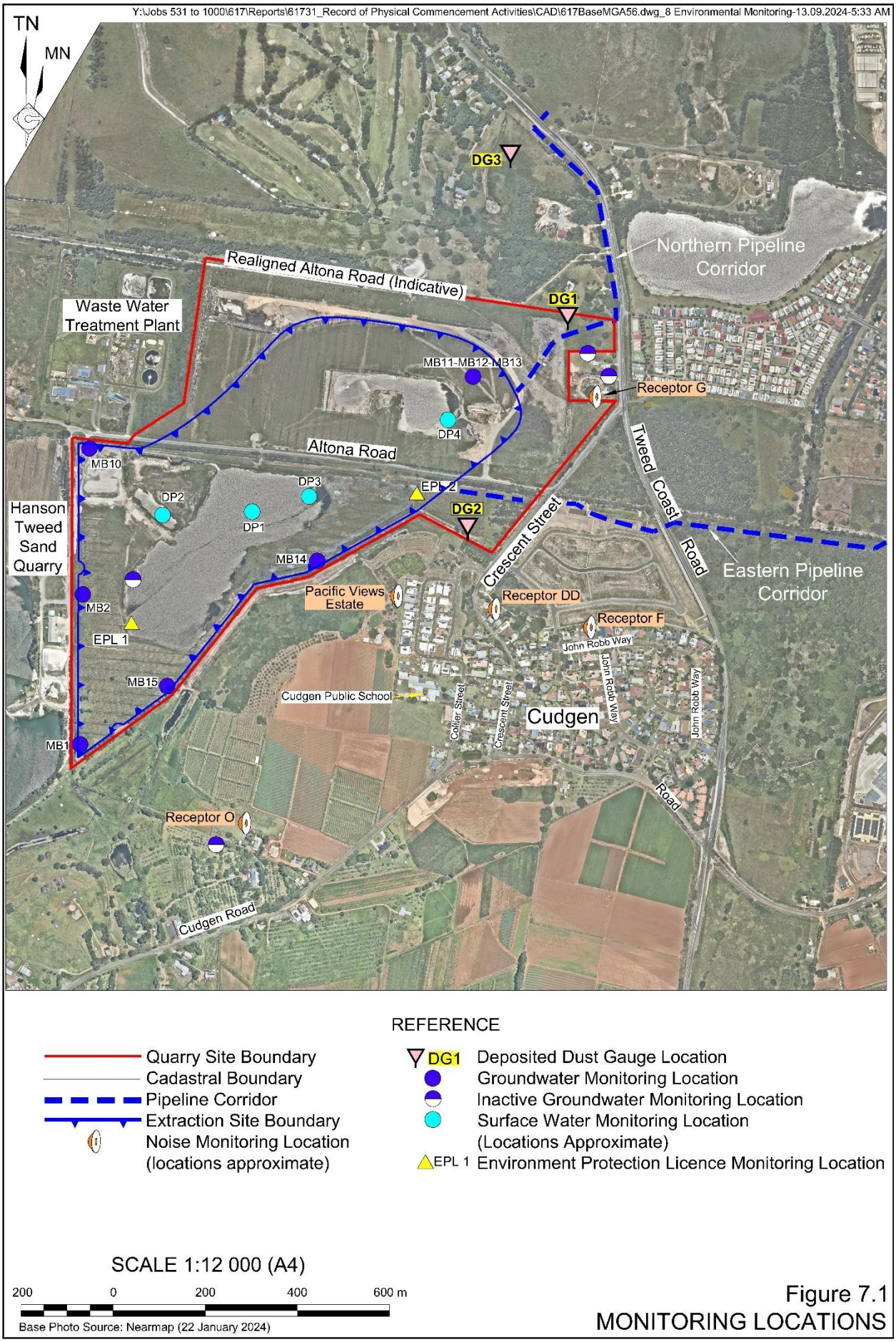

Figure 7.1
MONITORING LOCATIONS

Table A
Summary of Reported Exceedances – Surface Water

Date	Location / Time	Details of Exceedance	Details of non-compliance
30 May 2025	DP1 / 12:40pm	DO 5.90mg/L	Exceedance of SWMP Section 7.2 water quality objective for dissolved oxygen (>6mg/L). Amber alert level under SWMP Section 7.6 TARP.
28 June 2025	DP1 / 11:40am	DO 5.37mg/L	Exceedance of SWMP Section 7.2 water quality objective for dissolved oxygen (>6mg/L). Red alert level under SWMP Section 7.6 TARP – report as incident.
DO = Dissolved Oxygen			

Potential for Adverse Impacts

The consecutive exceedances of DO objectives at monitoring locations DP1 are considered to not have resulted in any adverse environmental impacts. This is concluded based on the following.

- The low levels of DO observed are considered to be the result of active dredging, processing, and the associated pumping of water causing mixing of the water profile in the ponds. Water from lower in the water column, which contains lower oxygen levels, is brought to the surface, resulting in reduced DO readings at the surface. This has been regularly observed throughout operations.

- The mixing of low oxygenated water is constrained to the dredge pond and, with no discharges occurring during this period, no off-site impacts will have occurred.

The SWMP originally submitted for consultation in December 2023 and re-submitted in January 2025 for approval (currently under review by DPHI) clarifies that criteria for DO is applicable only for surface samples during periods of inactivity, when the mixing action of dredging or water pumping are not affecting surface oxygen levels through bringing deeper deoxygenated water to surface.

Measures Implemented / to be Implemented to Avoid Future Non-compliance

A review was undertaken of the circumstances leading to the non-compliances. It was determined that the low levels of DO occurring in the dredge pond was within expectations due to the mixing of water caused by dredging and processing activities. Furthermore, the SWMP submitted to DPHI for approval acknowledges and addresses this issue through clarification that criteria for DO is applicable only for surface samples during periods of nil operation (i.e. when mixing action of dredging / pumping of water is not affecting surface oxygen levels). Accordingly, Gales anticipates that future Red Alert levels caused by occurrences of DO levels outside of the specified criteria will not persist following approval of the 2025 SWMP.

Should you wish to discuss the above or any other matter relating to the Cudgen Lakes Sand Quarry, please don't hesitate to contact Stephen Segal (0414 322 455) or myself on (02) 9985 8511.

Yours sincerely

Scott Hollamby
Senior Environmental Consultant

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