COASTWIDE CIVIL

SHELL COVE BOATHARBOUR
STAGE 2 AND BREAKWATERS
MONTHLY MONITORING SUMMARY
August 2020

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APPROVED COMPANY ISO 14001 Environmental Management Systems QMS Certification Services

Contents

1. Preliminaries

1.1. Background

This project involves the construction of a boat harbour consisting of inner and outer harbour basins located behind an existing beach dune system in what is currently a degraded swamp, and an access channel across the beach. Included in the boat harbour project are:

- inner and outer harbour basins;
- boardwalk/promenade surrounding the inner and outer harbours;
- regional boat launching ramp located in the outer harbour;
- 470m long rock breakwater on the northern side of the access channel;
- 282m long rock groyne on the southern side of the access channel;
- dune construction and beach nourishment;
- land platform works for hotel, shopping centre, residential development, marina support facilities and dry boat storage surrounding the boat harbour;
- a staged 300 berth floating marina in the inner harbour;
- vessel fuelling facilities and sewage pump out facilities in the outer harbour; and
- a boat lift and hardstand area for vessel maintenance.

The works are to be conducted over multiple stages. Coastwide Civil have won the contract to conduct Stage 2 works. In addition, Coastwide Civil have also won the contract to construct the breakwaters for the boatharbour. The environmental management plan and practices in place for the Stage 2 project have broadened to also cover the breakwater works.

The main components of Stage 2 works are:

- Excavation of the remainder of the Boatharbour which was not excavated in Stage 1
- Surcharging (and removal) of the P2B Surcharge Area and any incomplete portions of the P3 Surcharge Area
- Removal of the surcharge material from Surcharge P1A, P1B and P2A
- Construct edge treatment for the Boatharbour
- Install boardwalk piles
- Construct boat ramp in the Outer Harbour

The main components of the Breakwater works are:

- the construction of a 470m long breakwater north of the channel
- 280m groyne (smaller breakwater) south of the channel
- full excavation of the entrance channel
- Installation of navigation aids (navigation lights and buoys)
- Construction of permanent access roads along the breakwater and groyne

1.2. Introduction

This document provides a summary of monthly environmental performance on site. It includes the following:

- Section 2 outlines monitoring requirements as per the conditions of the Environmental Protection Licence (EPL), the Site Environmental Management Plan (SEMP) and the Construction Environmental Management Plan (CEMP);
- Sections 3 to 5 detail the results of environmental monitoring undertaken on site; and
- Results of any lab testing are included as Appendix B. A copy of rainfall monitoring results for the month is attached as Appendix C.

2. Monitoring Requirements

2.1. Water Quality.

Water Quality Inbound and Outbound Channels

Monitoring Locations – See Appendix A - Site Map for location of monitoring points
As nominated in EPL 12426, Section 2, P1.3

Station no.	Location	Testing Required
10	Upstream Location – Runoff into site from West	Oil and Grease, pH, Total Suspended Solids, Turbidity and Colour
11	Upstream Location– Runoff into site from North	Oil and Grease, pH, Total Suspended Solids, Turbidity and Colour
14	Upstream Location – Runoff into site from South	Oil and Grease, pH, Total Suspended Solids, Turbidity and Colour
21	Southern Channel – Downstream of Precinct B1 and C1	Oil and Grease, pH, Total Suspended Solids, Turbidity and Colour

Monitoring Requirements
As nominated in EPL 12426, Section 5, M2.
No limit values for monitoring of inflows and outflows are specified in the EPL.

Station no.	Testing Requirement	Compliance Criteria	Frequency
10,11,14,21	Oil and Grease	Not specified in EPL	Special Frequency 2 – daily if turbidity >5NTU at MP8,9,12, otherwise weekly
	pH	Not specified in EPL	
	Total Suspended solids	Not specified in EPL	
	Turbidity	Not specified in EPL	

Near Shore Monitoring

Monitoring Locations – See Appendix A - Site Map for location of monitoring points
As nominated in EPL 12426, Section 2, P1.3 for MP8 and 9:

Station no.	Location	Testing Required
8	Surf zone, 100m south of groyne	Colour, Turbidity
9	Surf zone 100m north of breakwater	Colour, Turbidity

Monitoring Requirements
Limit criteria for points 8 and 9 are as established in the SEMP Section 11.4.

The EPL establishes a 5 NTU turbidity trigger value at points 8 and 9 to initiate monitoring at monitoring points 10, 11, 14 and 21 as per special frequency 2.

Station no.	Testing Requirement	Compliance Criteria	Frequency
8, 9	Turbidity	<5 NTU	Special Frequency 1 – weekly during dry weather, daily during wet weather (>20mm rainfall within 24 hours in rain gauge), daily during any water break out on site Daily during marine works
	Colour	Visual Assessment	

The amber alert level triggers an investigation and review of the source of turbidity, and may prompt and adjustment in site practices if the source of turbidity is due to marine construction.

Station no.	Testing Requirement	Action Criteria	Frequency
8, 9	Turbidity	>15 NTU (Amber Alert)	Special Frequency 1 – weekly during dry weather, daily during wet weather (>20mm rainfall within 24 hours in rain gauge), daily during any water break out on site Daily during marine works

Storage Pond Monitoring

Monitoring Locations – See Appendix A - Site Map for location of monitoring points
As nominated in EPL 12426, Section 2, P1.3:

Station no.	Location	Testing Required
22	West of Boatharbour Excavation	Oil and Grease, Suspended Solids, Acidity, Turbidity, Nitrate, Nitrogen (Ammonia), Biochemical Oxygen Demand (BOD)
23	Outer Boatharbour	Oil and Grease, Suspended Solids, Acidity, Turbidity, Nitrate, Nitrogen (Ammonia), Biochemical Oxygen Demand (BOD)

Monitoring Requirements
As nominated in EPL 12426, Section 5, M2 for monitoring requirements and Section 3, L2 for concentration limits:

Station no.	Testing Requirement	Compliance Criteria	Frequency
22, 23	Oil and Grease	Not visible	Prior to any release into the clean water system. Daily during any discharge from the storage pond.
	Suspended Solids	<50 mg/L	
	Acidity	4.0 – 8.5 pH	
	Turbidity	Not specified in EPL /CEMP	
	Nitrate	Not specified in EPL /CEMP	
	Nitrogen (Ammonia)	Not specified in EPL /CEMP	
	Biochemical Oxygen Demand (BOD)	Not specified in EPL /CEMP	

2.2. Noise

Monitoring Locations – See Appendix A - Site Map for location of monitoring points
As nominated in EPL 12426, Section 2, P1.4:

Station no.	Location
17	Southernmost property on Boollwarroo Parade
18	Nearest residence on Mary, William or Sophia Streets
19	Eastern intersection of Wharf Parade and The Promontory Drive

Monitoring Requirements

As nominated in EPL 12426, Section 3, L4:

"For any exceedance of the background noise level by more than 10 dB(A) the licensee must undertake community liaison and consultation in order to identify and implement any additional reasonable and feasible noise mitigation options.

L4.2 5dB(A) must be added to the measured noise levels if the noise is substantially tonal or impulsive in character."

Table 4.6 of the CEMP summarises noise trigger values based on background levels determined by Wilkinson Murray in 2005 as:

Parameter	Trigger Value	Measurement Location
Construction Noise	LAeq,15 min: 51 dBA	Nearest residence on Boollwarroo Parade
	LAeq,15 min: 46 dBA	Nearest residence on Mary, William or Sophia Streets
	LAeq,15 min: 43 dBA	Nearest residence on Marina Drive

2.3. Air Quality

Monitoring Locations – See Appendix A - Site Map for location of monitoring points
As nominated in EPL 12426 Section 2, P1.1:

Station no.	Location
1	Southernmost property on Boollwarroo Parade
2	Nearest residence on Mary, William or Sophia Streets
3	Eastern intersection of Wharf Parade and The Promontory Drive

Monitoring Requirements
Compliance limit criteria are not specified in the EPL. As per SEMP, Section 8:

Station no.	Testing Requirement	Compliance Criteria	Frequency
1,2,3	Dust	<4g / m^2 / month, or <2g / m^2/ month over background levels	Monthly

2.4. Vibration

Monitoring Locations – See Appendix A - Site Map for location of monitoring points
Monitoring Points are not specified in the EPL. Points as nominated in SEMP Section 8 are:

Station no.	Location
1	Southernmost property on Boollwarroo Parade
2	Nearest residence on Mary, William or Sophia Streets
3	Corner of Marina Drive and Wharf Parade

Monitoring Requirements
As per CEMP, Section 4.7.4:

Station no.	Testing Requirement	Compliance Criteria	Frequency
1,2,3	vibration	Vibration dose: <0.4 $m/s^{1.75}$	Once during initial stages of work by plant likely to cause vibration

2.5. Blasting

Monitoring Locations – See Appendix A - Site Map for location of monitoring points
As nominated in EPL 12426 Section 5, M7.1:

Station no.	Location
1	Southernmost property on Boollwarroo Parade
2	Nearest residence on Mary, William or Sophia Streets
3	Corner of Marina Drive and Wharf Parade

Monitoring Requirements
As nominated in EPL 12426 Section 3 L5.1 – 5.4 and Section 5, M7.2:

Station no.	Testing Requirement	Compliance Criteria	Frequency
1,2,3	vibration	<5mm/s for 95% of blasts <10mm/s for all blasts	During each blast
1,2,3	overpressure	<115 dB for 95% of blasts <120 dB for 100% of blasts	During each blast

2.6. Acid Sulphate Soils

Monitoring Requirements
As nominated in EPL 12426 Section 4, O5.11-5.14:

"Any acid sulphate soils disturbed during the project must be managed in accordance with the document titled "ACID SULPHATE SOIL MANUAL, ASSMAC 1998".

From the time when the acid sulphate soil is exposed to the atmosphere:
a) the licensee must complete a log of odour observations. These observations must continue for a duration of 20 consecutive days and be used to assess compliance with the odour condition/s of this licence and to assess the risks of odours impacting residential areas under worst-case wind conditions.
b) the licensee has 30 days to submit the log of odour observations to the EPA together with an assessment of actual and potential odour impacts on the nearest residential areas.

3. Water Quality

3.1. Near Shore Monitoring – Monitoring Points 8 and 9

Test Results

Test frequency: Special Frequency 1 (Weekly in dry weather, daily in wet weather and daily during break out). To be completed daily during marine works.

Date	Pollutant	MP 8	MP 9
31/08/2020	*Colour*	Clear	Clear
	Turbidity	4.2	3.45
28/08/2020	Colour	Clear	Clear
	Turbidity	1.22	3.82
27/08/2020	Colour	Clear	Clear
	Turbidity	0.97	4.09
26/08/2020	Colour	Clear	Clear
	Turbidity	3.53	3.99
25/08/2020	Colour	Clear	Clear
	Turbidity	2.17	3.96
24/08/2020	Colour	Clear	Clear
	Turbidity	2.23	2.54
23/08/2020	Colour	Clear	Clear
	Turbidity	3.11	4.19
22/08/2020	Colour	Clear	Clear
	Turbidity	2.76	4.32
21/08/2020	Colour	Clear	Clear
	Turbidity	3.69	4.33
20/08/2020	Colour	Clear	Clear
	Turbidity	0.00	3.62
19/08/2020	Colour	Clear	Clear
	Turbidity	4.98	4.79
18/08/2020	Colour	Clear	Clear
	Turbidity	2.76	2.41
17/08/2020	Colour	Clear	Clear
	Turbidity	1.37	0.55
14/08/2020	Colour	Clear	Clear
	Turbidity	1.38	**7.38**
13/08/2020	Colour	Clear	Clear
	Turbidity	**8.58**	4.98
12/08/2020	Colour	Clear	Clear
	Turbidity	**14.12**	**8.03**
11/08/2020	Colour	Clear	Clear
	Turbidity	**17.99**	**12.70**
10/08/2020	Colour	Clear	Clear
	Turbidity	**25.26**	**12.50**

07/08/2020	Colour	Clear	Clear
	Turbidity	1.37	**12.80**
06/08/2020	Colour	Clear	Clear
	Turbidity	4.3	**11.03**
05/08/2020	Colour	Clear	Clear
	Turbidity	4.58	**11.44**
04/08/2020	Colour	Clear	Clear
	Turbidity	**11.91**	**13.31**
03/08/2020	Colour	Clear	Clear
	Turbidity	4.11	**6.57**
CEMP Compliance Limit	*Turbidity*	**5**	**5**
SEMP Amber Alert Level	*Turbidity*	**15**	**15**
EPL Special Frequency 2 Trigger Value	*Turbidity*	**5**	**5**

Comments on Results

- Since the commencement of breakwater construction in the ocean on 07/09/16, an amber alert system has been implemented. As part of this system, an exceedance of 15 NTU at MP8 or MP9 triggers an amber alert, as detailed in Section 11.4 of the Site Environmental Management Plan.
- Turbidity at MP8 exceeded the 5 NTU compliance limit five times during the month;
    - 4th August due to choppy conditions on the rocks,
    - From 10th to 13th August due to the storm event.
- Turbidity at MP9 exceeded the 5 NTU compliance limit nine times during the month;
    - From 3rd to 7th due to generally large surf breaking on the shore,
    - From 10th to 12th due to the storm event,
    - 14th August due to large swell.
- There were 2 Amber Alerts recorded at MP8 during August 2020.
    - Both the 10th and the 11th of August were immediately following a severe rain event during which there was uncontrolled discharge of turbid water.
- There were no Amber Alerts recorded at MP9 during August 2020.

3.2. Surface Water: Inbound flow– Monitoring Points 10, 11, 14, 21 Outbound Flow

Test Results

Test frequency: Special Frequency 2 (Weekly, or daily when turbidity at MP8 or 9 is greater than 5 NTU). On days where a monitoring point is not listed below, water was not flowing at that location.

Date	Monitoring Point	Oil and Grease	pH	Turbidity (NTU)	Colour	Total Suspended Solids (mg/L)
31/08/2020	MP10	Not Visible	7.83	36.39	Clear	
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
28/08/2020	MP10	Not Visible	8.04	8.71	Clear	
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
27/08/2020	MP10	Not Visible	8.21	6.94	Clear	
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
26/08/2020	MP10	Not Visible	8.44	5.64	Clear	
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
25/08/2020	MP10	Not Visible	8.34	26.56	Clear	
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
24/08/2020	MP10	Not Visible	8.21	5.8	Clear	4
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
23/08/2020	MP10	Not Visible	8.33	23.56	Clear	13
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
22/08/2020	MP10	Not Visible	8.36	20.05	Clear	17
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				

Date	Monitoring Point	Oil and Grease	pH	Turbidity (NTU)	Colour	Total Suspended Solids (mg/L)
21/08/2020	MP10	Not Visible	7.88	16.15	Clear	8
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
20/08/2020	MP10	Not Visible	8.06	11.92	Clear	5
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
19/08/2020	MP10	Not Visible	7.88	7.97	Clear	4
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
18/08/2020	MP10	Not Visible	7.89	3.36	Clear	1
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
17/08/2020	MP10	Not Visible	7.93	9.22	Clear	2
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
14/08/2020	MP10	Not Visible	7.84	4.75	Clear	1
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
13/08/2020	MP10	Not Visible	7.87	18.41	Clear	4
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
12/08/2020	MP10	Not Visible	7.84	9.88	Clear	3
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
11/08/2020	MP10	Not Visible	7.86	14.5	Clear	8
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				

Date	Monitoring Point	Oil and Grease	pH	Turbidity (NTU)	Colour	Total Suspended Solids (mg/L)
10/08/2020	MP10	Not Visible	8.09	25.17	Clear	23
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
07/08/2020	MP10	Not Visible	7.97	16.29	Clear	9
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
06/08/2020	MP10	Not Visible	7.93	6.77	Clear	2
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
05/08/2020	MP10	Not Visible	8.00	7.06	Clear	2
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
04/08/2020	MP10	Not Visible	7.93	9.85	Clear	<1
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
03/08/2020	MP10	Not Visible	7.84	10.27	Clear	<1
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				

Comments on Results

- Inbound streams:
  - MP10 was flowing 23 times in the month of August.
  - MP11, MP14 and MP21 did not flow in the month of August.
- Notable Rainfall Events:
  - 178mm of rain fell between 7th and 11th August.
  - 15mm of rain fell on 15th August.

3.3. Storage Pond – Monitoring Points 22 and 23

Test Results

Test frequency: Daily during discharge.

MP22							
	Pollutant						
Date	Oil and Grease	pH*	Total Suspended Solids (mg/L)	Turbidity* (NTU)	Biochemical Oxygen Demand (BOD) (mg/L)	Nitrate (mg/L)	Nitrogen (Ammonia) (mg/L)
31/08/2020	Not Visible	8.18	13	31.49	1.5	0.911	0.100
28/08/2020 Afternoon	Not Visible	8.12		31.97	Awaiting	Results	
28/08/2020 Morning	Not Visible	7.92	20	31.23	1.4	0.884	0.045
27/08/2020	Not Visible	8.30		29.35	Awaiting	Results	
26/08/2020 Afternoon	Not Visible	8.23		31.06	Awaiting	Results	
26/08/2020 Morning	Not Visible	8.25		31.11	Awaiting	Results	
25/08/2020	Not Visible	8.38		31.89	Awaiting	Results	
22/08/2020	Not Visible	8.40	13	30.07	0.9	1.342	0.116
21/08/2020	Not Visible	8.28	12	31.95	0.9	0.909	0.131
20/08/2020 Afternoon	Not Visible	8.00	8	30.80	0.8	1.037	0.201
20/08/2020 Morning	Not Visible	8.17	13	31.77	1.2	0.914	0.129
19/08/2020	Not Visible	8.08	4	31.92	1.3	1.16	0.118
18/08/2020	Not Visible	7.92	5	29.11	1.7	1.12	0.105
17/08/2020	Not Visible	8.15	16	50	1.4	1.06	0.122
10/08/2020	Not Visible	8.10	**109**	118	1.4	0.952	0.150
EPA Discharge Criteria		**4.0 – 8.5**	**50**	-	-	-	-

**Tests undertaken on site by Coastwide Civil*

Remarks – MP22

- During the period from Monday 27th July until Wednesday 29th July approximately 210mm of rain fell at the Shell Cove Boat Harbour Stage 2 site. This resulted in elevated turbidity around site as well as the harbour level rising to approximately 75% of the total harbour capacity. Given the level of turbidity, Coastwide Civil were not able to discharge in order to reduce the water level.
- During the period from Friday 7th August until Monday 10th August approximately 172mm of rain fell at the Shell Cove Boat Harbour Stage 2 site. This rain event added to the water already present in the harbour and caused overtopping of the weir on Sunday 9th August. The weir is designed to overtop to prevent upstream flooding of residences.
- There was uncontrolled discharge over the weir on Sunday 9th August and Monday 10th August, when the Total Suspended Solids was measured at 109mg/L, this in exceedance of the 50mg/L discharge criteria. The intensity of the storm necessitated the opening of a notch in the outer sand bund and the uncontrolled release of water.
- Controlled discharge was undertaken on the above listed days. All site based monitoring and received lab testing results are compliant with discharge criteria.

MP23							
	Pollutant						
Date	Oil and Grease	pH*	Total Suspended Solids (mg/L)	Turbidity* (NTU)	Biochemical Oxygen Demand (BOD) (mg/L)	Nitrate (mg/L)	Nitrogen (Ammonia) (mg/L)
31/08/2020 Afternoon	Not Visible	7.90	4	20.27	<1	0.835	0.018
28/08/2020 Afternoon	Not Visible	7.55		28.19	Awaiting	Results	
28/08/2020 Morning	Not Visible	7.18	35	28.35	<1	0.812	0.258
27/08/2020	Not Visible	8.11		30.77	Awaiting	Results	
26/08/2020 Afternoon	Not Visible	8.05		31.04	Awaiting	Results	
26/08/2020 Morning	Not Visible	8.07		30.92	Awaiting	Results	
25/08/2020	Not Visible	8.04		31.80	Awaiting	Results	
24/08/2020	Not Visible	7.84	22	30.47	0.9	0.855	0.126
23/08/2020 Afternoon	Not Visible	7.68	38	31.71	0.9	0.970	0.091
23/08/2020 Morning	Not Visible	7.91	16	27.15	0.8	0.950	0.109
22/08/2020	Not Visible	8.12	22	30.77	0.8	0.754	0.011
21/08/2020 Afternoon	Not Visible	8.39	30	31.70	1.0	0.762	0.005
21/08/2020 Morning	Not Visible	8.00	18	31.50	0.8	0.767	0.018
20/08/2020	Not Visible	8.07	18	30.12	1.2	0.969	<0.005
19/08/2020	Not Visible	8.17	15	31.88	1.2	1.32	0.142
18/08/2020	Not Visible	7.96	13	29.44	1.0	1.01	0.006
12/08/2020	Not Visible	8.01	36	90	1.6	1.21	0.123
11/08/2020	Not Visible	7.98	40	80	1.3	1.14	0.145
10/08/2020	Not Visible	7.95	**131**	117	1.4	1.09	0.154
06/08/2020	Not Visible	8.34	9	30.38	1.3	1.44	0.153
EPA Discharge Criteria		**4.0 – 8.5**	**50**	-	-	-	-

**Tests undertaken on site by Coastwide Civil*

Remarks – MP23

- During the period from Monday 27th July until Wednesday 29th July approximately 210mm of rain fell at the Shell Cove Boat Harbour Stage 2 site. This resulted in elevated turbidity around site as well as the harbour level rising to approximately 75%. Given the level of turbidity, Coastwide Civil were not able to discharge in order to reduce the water level.
- During the period from Friday 7th August until Monday 10th August approximately 172mm of rain fell at the Shell Cove Boat Harbour Stage 2 site. This rain event added to the water already present in the harbour and caused overtopping of the weir on Sunday 9th August. The weir is designed to overtop to prevent upsteam flooding of residences. In the event of a flood event a notch is excavated in the outer sand bund. The sand bund breached on the afternoon of Sunday 9th August.
- There was uncontrolled discharge from Sunday 9th August until controlled discharge was re-established on Wednesday 12th August. Tests were conducted from Monday 10th August to Wednesday 12th August, samples showed elevated Total Suspended Solids, but only the sample from Monday 10th August was in exceedance, as shown in the table above.
- Controlled discharge was undertaken on the above listed days, excluding 10th to 12th of August. All site based monitoring and received lab testing results are compliant with discharge criteria.

4. Air, Noise and Vibration Testing

4.1. Noise Testing

Test Results

Test frequency: Weekly

Date	Location	Time	Measured Noise Levels	Observed Noise Sources and notes (sound levels in dB)	Estimated L_{Aeq} Contribution	CEMP Trigger Value
27/08/2020	MP17	**14:20 – 14:35**	L_{A10} = 61.7 L_{A90} = 54.3 L_{Aeq} = 55.4 L_{max} = 71.9 L_{min} = 52.0	Excavator – 59.5, 58.8, 56.5, 55.8, 55.6, 56.2, 55.5 Motorbike – 59.9 Construction activity was the dominant noise for the entirety of test. LAeq = LAeq	55.4	**51.0**
	MP18	**14:00 – 14:15**	L_{A10} = 54.6 L_{A90} = 47.2 L_{Aeq} = 47.7 L_{max} = 67.4 L_{min} = 45.2	Birds – 48.1, 67.4, 66.1, 52.4, 62.6, 53.9, 60.1, 57.7 Distant Traffic – 46.9, 47.1, 49.1, 45.2, 47.3 Dominant source of noise was birds CWC construction noise was less than other sources of noise for the entirety of the test. LAeq = LAeq – 6dB	**41.7**	**46.0**
	MP19	**14:40 – 14:55**	L_{A10} = 66.2 L_{A90} = 57.8 L_{Aeq} = 59.8 L_{max} = 77.0 L_{min} = 54.5	Construction – 55.6, 62.8, 58.0, 62.5, 64.3, 64.1, 63.5 Car – 62.2 Horn – 76.8, 73.0, 72.4, 67.5 Construction activity was the dominant noise for the entirety of test. LAeq = LAeq	59.8	**43.0**

Date	Location	Time	Measured Noise Levels	Observed Noise Sources and notes (sound levels in dB)	Estimated L_{Aeq} Contribution	CEMP Trigger Value
20/08/2020	MP17	**13:40 – 13:55**	L_{A10} = 63.2 L_{A90} = 50.1 L_{Aeq} = 56.7 L_{max} = 71.1 L_{min} = 46.5	Birds – 67.4, 62.1, 58.9, 53.4, 55.6, 57.0, 52.8 Car – 64.0, 62.1 Ocean – 48.1, 50.0 Dominant source of noise was birds CWC inaudible. LAeq = LA90 – 10dB	**40.1**	**51.0**
	MP18	**14:00 – 14:15**	L_{A10} = 52.1 L_{A90} = 47.0 L_{Aeq} = 47.9 L_{max} = 72.4 L_{min} = 46.6	Birds – 54.4, 62.7, 53.8, 53.7, 55.1, 58.6 Cars – 61.1, 59.4 Distant Traffic – 51.1, 49.7, 48.4 Dominant source of noise was birds CWC inaudible. LAeq = LA90 – 10dB	**37.0**	**46.0**
	MP19	**14:20 – 14:35**	L_{A10} = 64.1 L_{A90} = 53.3 L_{Aeq} = 57.4 L_{max} = 74.0 L_{min} = 52.1	Excavator – 59.7, 58.4, 61.4, 58.1, 57.3, 55.6 Car – 64.6 Construction activity was the dominant noise for the entirety of test. LAeq = LAeq	57.4	**43.0**

Date	Location	Time	Measured Noise Levels	Observed Noise Sources and notes (sound levels in dB)	Estimated L_{Aeq} Contribution	CEMP Trigger Value
13/08/2020	MP17	**12:20 – 12:35**	L_{A10} = 64.7 L_{A90} = 46.7 L_{Aeq} = 56.7 L_{max} = 82.9 L_{min} = 39.2	Car – 63.3, 64.7, 57.3, 60.0, 73.4, 71.2, 79.7, 80.6 Humans – 53.3, 53.0, 48.66 Bird – 63.3 Ocean – 48.3, 48.0, 48. Aeroplane – 53.2, 54.4 Dominant source of noise was non-coastwide civil vehicles and pedestrians. CWC inaudible. LAeq = LA90 – 10dB	**36.7**	**51.0**
	MP18	**12:00 – 12:15**	L_{A10} = 58.6 L_{A90} = 47.5 L_{Aeq} = 48.1 L_{max} = 75.0 L_{min} = 40.3	Dog Barking – 56.9, 53.4, 54.7, 60.0, 60.2, 55.9 Cars – 58.3, 47.2, 57.6, 48.4, 51.5, 50.1 Birds – 54.4, 59.4, 52.7 Dominant source of noise was non-coastwide civil vehicles. CWC inaudible. LAeq = LA90 – 10dB	**37.5**	**46.0**
	MP19	**11:40 – 11:55**	L_{A10} = 63.9 L_{A90} = 51.4 L_{Aeq} = 55.7 L_{max} = 72.7 L_{min} = 44.1	Excavator – 59.9, 62.3, 56.1, 52.3, 64.5, 70.1, 69.4 Cars – 72.3, 67.4, 64.6 Saw – 59.0, 57.8 Construction activity was the dominant noise for the entirety of test. LAeq = LAeq	**55.7**	**43.0**

Date	Location	Time	Measured Noise Levels	Observed Noise Sources and notes (sound levels in dB)	Estimated L_{Aeq} Contribution	CEMP Trigger Value
05/08/2020	MP17	**11:15 – 11:30**	L_{A10} = 62.7 L_{A90} = 46.3 L_{Aeq} = 54.2 L_{max} = 79.7 L_{min} = 44.6	Cars – 58.1, 57.7 Humans – 54.5 Birds – 63.4, 52.7, 51.1, 53.8, 61.7, 60.4, 53.4 Dominant source of noise was birds CWC inaudible. LAeq = LA90 – 10dB	**36.3**	**51.0**
	MP18	**11:35 – 11:50**	L_{A10} = 54.1 L_{A90} = 47.7 L_{Aeq} = 48.2 L_{max} = 77.1 L_{min} = 46.1	Aeroplane – 59.1, 58.4 Traffic – 49.9 Birds – 61.8, 59.1, 53.2, 53.8, 53.1, 60.0, 61.1 Car – 70.1 Dominant source of noise was birds CWC construction noise was less than other sources of noise for the entirety of the test. LAeq = LAeq – 6dB	**42.2**	**46.0**
	MP19	**12:00 – 12:15**	L_{A10} = 63.7 L_{A90} = 53.7 L_{Aeq} = 57.4 L_{max} = 72.3 L_{min} = 51.8	Construction – 58.4, 58.9, 59.1, 61.4, 61.2, 60.8, 59.7, 59.8 Truck – 70.7, 72.3 Car – 65.4, 60.6 Construction activity was the dominant noise for the entirety of test. LAeq = LAeq	**57.4**	**43.0**

Comments on Results

- At MP17, weekly L_{Aeq} levels exceeded the trigger value during one of the four tests in the month of August. The average estimated contribution over the four tests was 42.1dB, which is below the trigger value. MP17 is directly adjacent to an area of surcharge that is being removed and transported, when this work approached the fence line the noise exceeds the trigger value.
- MP18, weekly L_{Aeq} levels did not exceed the trigger value during the month of August.
- At MP19, weekly L_{Aeq} levels exceeded the trigger value during all four tests in the month of August, the average estimated contribution over the four tests was 57.6dB. MP19 is directly adjacent to both the Shell Cove Boat Harbour Stage 2 haul road as well as construction work associated with the Precinct B2C2 filling works.
- No complaints have been received in this month about excessive noise.

4.2. Air Quality

Test Results
Test frequency: Monthly

Date	Pollutant	Point 1	Point 2	Point 3
01/08/2020 – 01/09/2020	*Ash Content (g/m^2/ month)*	0.5	0.3	0.7
	Combustible Matter (g/m^2/ month)	0.2	0.2	<0.1
	Total dust (g/m^2/ month)	0.7	0.5	0.7
SEMP Compliance Limit	***Total dust (g/m^2/ month)***	**4.0**	**4.0**	**4.0**

Comments on Results

- Dust levels at MP1, MP2 and MP3 were compliant with SEMP limit for the month of August.

4.3. Vibration

Test Results
Test frequency: During initial stages of potentially vibratory work

No testing has been required this month.

4.4. Blasting

No Blasting has taken place this month.

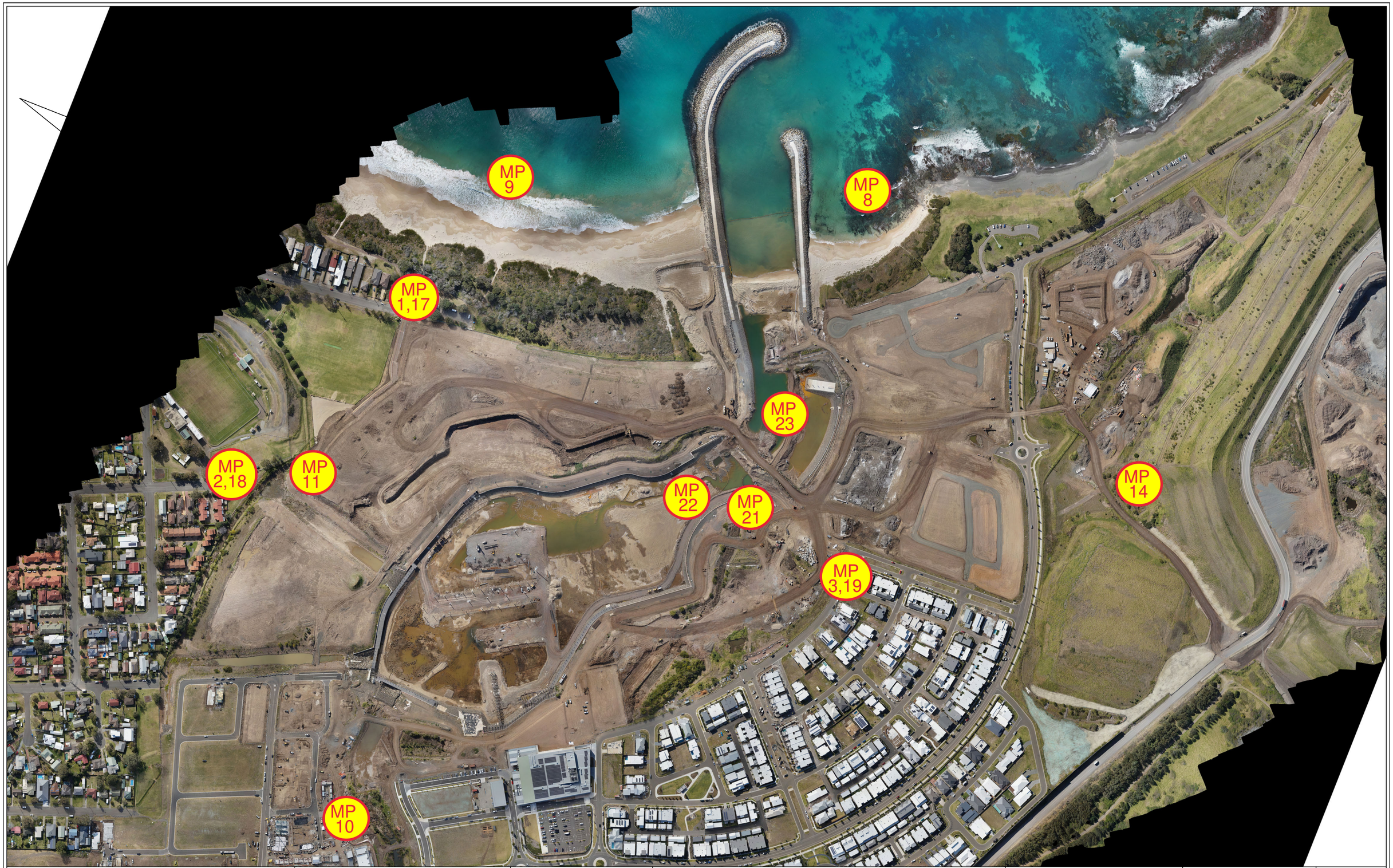
5. Acid Sulphate Soils

5.1. Odour Monitoring

No Acid Sulphate Soil was stockpiled and treated during the month of August 2020.

The monitoring of odour from any encountered Acid Sulphate Soil areas is ongoing as per the requirements of the EPL. Completed odour monitoring logs have been forwarded to the EPA as required.

Appendix A – Site Map



No.	Amendment Description	Initials	Date
2			
1			
A3 original	This sheet may be prepared using colour and may be incomplete if copied		

CLIENT:

Co-ordinate System:

Height Datum: A.H.D.

SCALE

DRAWN BY:

DESIGNED BY:

CHECKED BY:

REVIEWED BY:

PROJECT:

COASTWIDE CIVIL
Civil, Marine & Earthworks Contractors
19 Croome Lane, Albion Park, 2527
Phone: (02) 4256 1499
email: info@coastwidecivil.com.au

COASTWIDE CIVIL

DWG/FILE No.

Date:

Rev No.

Sheet

Appendix B
– Lab Testing Results

RESULTS OF WATER ANALYSIS

11 samples supplied by Coastwide Civil Pty Ltd on 20/08/2020. Lab Job No. J7353.

Samples submitted by Cameron Hawke. Your Job: Shell Cove Boat Harbour

19 Croome Lane ALBION PARK NSW 2527

Parameter	Methods reference	Sample 1 MP 10 03/08/20	Sample 2 MP10 04/08/20	Sample 3 MP10 05/08/20	Sample 4 MP10 06/08/20	Sample 5 MP10 07/08/20	Sample 6 MP10 10/08/20	Sample 7 MP10 11/08/20	Sample 8 MP10 12/08/20	Sample 9 MP10 13/08/20	Sample 10 MP10 14/08/20	Sample 11 MP10 17/08/20
	Job No.	*J7353/1*	*J7353/2*	*J7353/3*	*J7353/4*	*J7353/5*	*J7353/6*	*J7353/7*	*J7353/8*	*J7353/9*	*J7353/10*	*J7353/11*
Total Suspended Solids (mg/L)	GFC equiv. filter - APHA 2540-D	<1	<1	2	2	9	23	8	3	4	1	2

Notes:

1. 1 mg/L (milligram per litre) = 1 ppm (part per million) = 1000 µg/L (micrograms per litre) = 1000 ppb (part per billion).
2. Analysis performed according to APHA (2017) 'Standard Methods for the Examination of Water & Wastewater', 23rd Edition, except where stated otherwise.
3. Analysis conducted between sample arrival date and reporting date.
4. ** NATA accreditation does not cover the performance of this service.
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8. Results relate only to the samples tested.
9. This report was issued on 26/08/2020.

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checked: .....
Graham Lancaster
Laboratory Manager

RESULTS OF WATER ANALYSIS

15 samples supplied by Coastwide Civil Pty Ltd on 24/08/2020. Lab Job No. J7491.

Samples submitted by Cameron Hawke. Your Job: Shell Cove Boat Harbour.

19 Croome Lane ALBION PARK NSW 2527

SAMPLE CODES	PARAMETER	Total Suspended Solids (mg/L)	Biochemical Oxygen Demand$_5$ (mg/L O_2)	Nitrate (mg/L N)	Ammonia (mg/L N)
	METHODS REFERENCE/	GFC equiv. filter - APHA 2540-D	APHA 5210-B	APHA 4500 NO_3^--F	APHA 4500 NH_3-H
	JOB NO.				
MP23 06/08/20	*J7491/1*	9	1.3	1.44	0.153
MP22 10/08/20	*J7491/2*	109	1.4	0.952	0.150
MP23 10/08/20	*J7491/3*	131	1.4	1.09	0.154
MP23 11/08/20	*J7491/4*	40	1.3	1.14	0.145
MP23 12/08/20	*J7491/5*	36	1.6	1.21	0.123
MP22 17/08/20	*J7491/6*	16	1.4	1.06	0.122
MP10 18/08/20	*J7491/7*	1	..	..	..
MP22 18/08/20	*J7491/8*	5	1.7	1.12	0.105
MP23 18/08/20	*J7491/9*	13	1.0	1.01	0.006
MP10 19/08/20	*J7491/10*	4	..	..	..
MP22 19/08/20	*J7491/11*	4	1.3	1.16	0.118
MP23 19/08/20	*J7491/12*	15	1.2	1.32	0.142
MP10 20/08/20	*J7491/13*	5	..	..	..
MP22 20/08/20	*J7491/14*	13	1.2	0.914	0.129
MP23 20/08/20	*J7491/15*	18	1.2	0.969	<0.005

Notes:

1. Total metals - samples digested with nitric acid; Total available (acid soluble/ extractable) metals - samples acidified with nitric acid to pH <2;
   Dissolved metals - samples filtered through 0.45µm cellulose acetate and then acidified with nitric acid prior to analysis
2. Metals and salts analysed by Inductively Coupled Plasma - Mass Spectrometry (ICP-MS).
3. 1 mg/L (milligram per litre) = 1 ppm (part per million) = 1000 µg/L (micrograms per litre) = 1000 ppb (part per billion).
4. For conductivity 1 dS/m = 1 mS/cm = 1000 µS/cm.
5. Analysis performed according to APHA (2017) 'Standard Methods for the Examination of Water & Wastewater', 23rd Edition, except where stated otherwise.
6. Analysis conducted between sample arrival date and reporting date.
7. ** NATA accreditation does not cover the performance of this service.
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Graham Lancaster
Laboratory Manager

RESULTS OF WATER ANALYSIS

13 samples supplied by Coastwide Civil Pty Ltd on 27/08/2020. Lab Job No. J7624.

Samples submitted by Cameron Hawke. Your Job: Shell Cove Boat Harbour.

19 Croome Lane ALBION PARK NSW 2527

SAMPLE CODES	PARAMETER	Total Suspended Solids (mg/L)	Biochemical Oxygen Demand$_5$ (mg/L O_2)	Nitrate (mg/L N)	Ammonia (mg/L N)
	METHODS REFERENCE/	GFC equiv. filter - APHA 2540-D	APHA 5210-B	APHA 4500 NO_3^--F	APHA 4500 NH_3-H
	JOB NO.				
MP22 PM 20/8/2020	*J7624/1*	8	0.8	1.037	0.201
MP10 21/8/2020	*J7624/2*	8	..	..	..
MP22 AM 21/8/2020	*J7624/3*	12	0.9	0.909	0.131
MP23 AM 21/8/2020	*J7624/4*	18	0.8	0.767	0.018
MP23 PM 21/8/2020	*J7624/5*	30	1.0	0.762	0.005
MP10 22/8/2020	*J7624/6*	17	..	..	..
MP22 AM 22/8/2020	*J7624/7*	13	0.9	1.342	0.116
MP23 AM 22/8/2020	*J7624/8*	22	0.8	0.754	0.011
MP10 23/8/2020	*J7624/9*	13	..	..	..
MP23 AM 23/8/2020	*J7624/10*	16	0.8	0.950	0.109
MP23 PM 23/8/2020	*J7624/11*	38	0.9	0.970	0.091
MP10 24/8/2020	*J7624/12*	4	..	..	..
MP23 AM 24/8/2020	*J7624/13*	22	0.9	0.855	0.126

Notes:

1. Total metals - samples digested with nitric acid; Total available (acid soluble/ extractable) metals - samples acidified with nitric acid to pH <2;
   Dissolved metals - samples filtered through 0.45µm cellulose acetate and then acidified with nitric acid prior to analysis
2. Metals and salts analysed by Inductively Coupled Plasma - Mass Spectrometry (ICP-MS).
3. 1 mg/L (milligram per litre) = 1 ppm (part per million) = 1000 µg/L (micrograms per litre) = 1000 ppb (part per billion).
4. For conductivity 1 dS/m = 1 mS/cm = 1000 µS/cm.
5. Analysis performed according to APHA (2017) 'Standard Methods for the Examination of Water & Wastewater', 23rd Edition, except where stated otherwise.
6. Analysis conducted between sample arrival date and reporting date.
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Graham Lancaster
Laboratory Manager

RESULTS OF WATER ANALYSIS

14 samples supplied by Coastwide Civil Pty Ltd on 4th September, 2020. Lab Job No.J7969

Samples submitted by Cameron Hawke. Your Job: Shell Cove Boat Harbour

19 Croome Lane ALBION PARK NSW 2527

Parameter	Methods reference	Sample 1 MP10 28/08/2020	Sample 2 MP22 AM 28/08/2020	Sample 3 MP23 AM 28/08/2020	Sample 4 MP10 31/08/2020
	Job No.	*J7969/1*	*J7969/2*	*J7969/3*	*J7969/4*
Total Suspended Solids (mg/L)	GFC equiv. filter - APHA 2540-D	4	20	35	25
Biochemical Oxygen Demand$_5$ (mg/L O_2)	APHA 5210-B	..	1.4	<1	..
Nitrate (mg/L N)	APHA 4500 NO_3^--F	..	0.884	0.812	..
Ammonia (mg/L N)	APHA 4500 NH_3-H	..	0.045	0.258	..

Notes:

1. 1 mg/L (milligram per litre) = 1 ppm (part per million) = 1000 µg/L (micrograms per litre) = 1000 ppb (part per billion).
2. Analysis performed according to APHA (2017) 'Standard Methods for the Examination of Water & Wastewater', 23rd Edition, except where stated otherwise.
3. Analysis conducted between sample arrival date and reporting date.
4. ** NATA accreditation does not cover the performance of this service.
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Graham Lancaster
Laboratory Manager

Sample 5 MP22 AM 31/08/2020	Sample 6 MP23 PM 31/08/2020	Sample 7 MP10 01/09/2020	Sample 8 MP22 AM 01/09/2020	Sample 9 MP23 AM 01/09/2020	Sample 10 MP22 PM 01/09/2020	Sample 11 MP23 PM 01/09/2020	Sample 12 MP10 02/09/2020	Sample 13 MP22 AM 02/09/2020	Sample 14 MP23 AM 02/09/2020
J7969/5	*J7969/6*	*J7969/7*	*J7969/8*	*J7969/9*	*J7969/10*	*J7969/11*	*J7969/12*	*J7969/13*	*J7969/14*
13	4	12	9	9	14	16	5	8	18
1.5	<1	..	<1	<1	2.6	1.0	..	1.5	<1
0.911	0.835	..	1.19	0.680	0.863	0.671	..	0.818	0.576
0.100	0.018	..	0.041	<0.005	0.067	0.056	..	0.094	0.050

Environmental Analysis Laboratory, Southern Cross University,
Tel. 02 6620 3678, website: scu.edu.au/eal

checked: .....
Graham Lancaster
Laboratory Manager

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EW2004008**	Page	: 1 of 2
Client	: **COASTWIDE CIVIL**	Laboratory	: Environmental Division NSW South Coast
Contact	: CAMERON HAWKE	Contact	: Glenn Davies
Address	: 19 Croome Lane Albion Park 2527	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 4/13 Geary Pl, North Nowra 2541 Australia NSW Australia
Telephone	: ----	Telephone	: 02 42253125
Project	: SCBH2	Date Samples Received	: 02-Sep-2020 14:16
Order number	: ----	Date Analysis Commenced	: 04-Sep-2020
C-O-C number	: ----	Issue Date	: 14-Sep-2020 12:29
Sampler	: CAMERON HAWKE		
Site	: ----		
Quote number	: ----		
No. of samples received	: 3		
No. of samples analysed	: 3		

Accreditation No. 825
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ISO/IEC 17025 - Testing

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Zoran Grozdanovski	Laboratory Operator	Newcastle - Inorganics, Mayfield West, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- **Analytical work for this work order will be conducted at ALS Newcastle.**
- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in g/m².mth as sampling data was provided by the client.

Analytical Results

Sub-Matrix: **DEPOSITIONAL DUST** (Matrix: **AIR**)				Client sample ID	**MP1 1/08/2020 - 1/09/2020**	**MP2 1/08/2020 - 1/09/2020**	**MP3 1/08/2020 - 1/09/2020**	**----**	**----**
				Client sampling date / time	01-Sep-2020 00:00	01-Sep-2020 00:00	01-Sep-2020 00:00	----	----
Compound	CAS Number	LOR	Unit		**EW2004008-001**	**EW2004008-002**	**EW2004008-003**	**--------**	**--------**
					Result	Result	Result	----	----
EA120: Ash Content									
Ash Content	----	0.1	g/m².month		**0.5**	**0.3**	**0.7**	**----**	**----**
Ash Content (mg)	----	1	mg		**9**	**6**	**12**	**----**	**----**
EA125: Combustible Matter									
Combustible Matter	----	0.1	g/m².month		**0.2**	**0.2**	<0.1	**----**	**----**
Combustible Matter (mg)	----	1	mg		**3**	**3**	<1	**----**	**----**
EA141: Total Insoluble Matter									
Total Insoluble Matter	----	0.1	g/m².month		**0.7**	**0.5**	**0.7**	**----**	**----**
Total Insoluble Matter (mg)	----	1	mg		**12**	**9**	**12**	**----**	**----**

Appendix C
– Site Rainfall Measurements

Saturday	1/08/2020	*	
Sunday	2/08/2020	*	
Monday	3/08/2020	**0.0**	Blake Rogers
Tuesday	4/08/2020	**0.0**	Blake Rogers
Wednesday	5/08/2020	**0.0**	Blake Rogers
Thursday	6/08/2020	**0.0**	Blake Rogers
Friday	7/08/2020	**0.5**	Blake Rogers
Saturday	8/08/2020	**93.0**	Cam Hawke
Sunday	9/08/2020	**25.0**	Cam Hawke
Monday	10/08/2020	**54.0**	Cam Hawke
Tuesday	11/08/2020	**5.5**	Blake Rogers
Wednesday	12/08/2020	**0.0**	Blake Rogers
Thursday	13/08/2020	**0.0**	Blake Rogers
Friday	14/08/2020	**0.0**	Blake Rogers
Saturday	15/08/2020	**15.0**	Cam Hawke
Sunday	16/08/2020	**1.5**	Cam Hawke
Monday	17/08/2020	**0.0**	Blake Rogers
Tuesday	18/08/2020	**0.0**	Blake Rogers
Wednesday	19/08/2020	**0.0**	Blake Rogers
Thursday	20/08/2020	**0.0**	Blake Rogers
Friday	21/08/2020	**0.0**	Blake Rogers
Saturday	22/08/2020	**0.0**	Blake Rogers
Sunday	23/08/2020	**0.0**	Blake Rogers
Monday	24/08/2020	**0.0**	Blake Rogers
Tuesday	25/08/2020	**0.0**	Blake Rogers
Wednesday	26/08/2020	**0.0**	Blake Rogers
Thursday	27/08/2020	**0.0**	Blake Rogers
Friday	28/08/2020	**0.0**	Blake Rogers
Saturday	29/08/2020	*	
Sunday	30/08/2020	*	
Monday	31/08/2020	**0.0**	Blake Rogers