COASTWIDE CIVIL

SHELL COVE BOATHARBOUR
STAGE 2 AND BREAKWATERS
MONTHLY MONITORING SUMMARY
April 2019

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APPROVED COMPANY ISO 9001 Quality Management Systems QMS Certification Services
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
20	Beach Zone Rectangular Pond – Discharge into near shore zone	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, 20,21	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, 9 and 20:

Station no.	Location	Testing Required
8	Surf zone, 100m south of groyne	Colour, Turbidity
9	Surf zone 100m north of breakwater	Colour, Turbidity
20	Beach zone rectangular pond	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, 9 and 20 to initiate monitoring at monitoring points 10, 11, 14, 20 and 21 as per special frequency 2.

Station no.	Testing Requirement	Compliance Criteria	Frequency
8,9,20	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)
24	Landscape Mound – west of Quarry Haul Road	Oil and Grease, Suspended Solids, Acidity, Turbidity

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, 24	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 6.5 – 8.5 pH (MP24)	
	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	Nearest residence on Marina 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	Nearest residence on Marina 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	Nearest residence on Marina Drive

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	Nearest residence on Marina Drive

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, 9 and 20

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	Point 8	Point 9	Point 20
30/04/2019	*Colour*	Clear	Clear	Clear
	Turbidity	3.72	**8.09**	8.22
29/04/2019	*Colour*	Clear	Clear	Clear
	Turbidity	0.15	2.89	10.04
24/04/2019	*Colour*	Clear	Clear	Clear
	Turbidity	3.84	4.36	16.31
23/04/2019	*Colour*	Clear	Clear	Clear
	Turbidity	**9.34**	**6.98**	19.14
18/04/2019	*Colour*	Clear	Clear	Clear
	Turbidity	**12.05**	**13.43**	20.13
17/04/2019	*Colour*	Clear	Clear	Clear
	Turbidity	**5.00**	3.91	21
16/04/2019	*Colour*	Clear	Clear	Clear
	Turbidity	4.53	2.69	35.8
15/04/2019	Colour	Clear	Clear	Clear
	Turbidity	3.38	**5.26**	26.88
12/04/2019	*Colour*	Clear	Clear	No water flowing
	Turbidity	1.90	0.45	
11/04/2019	*Colour*	Clear	Clear	
	Turbidity	**6.57**	**5.59**	
10/04/2019	*Colour*	Clear	Clear	Not Clear
	Turbidity	**5.83**	3.07	70
09/04/2019	*Colour*	Clear	Clear	Not Clear
	Turbidity	4.91	3.27	44.53
CEMP Compliance Limit	*Turbidity*	**5**	**5**	
SEMP Amber Alert Level	*Turbidity*	**15**	**15**	

Date	Pollutant	Point 8	Point 9	Point 20
08/04/2019	*Colour*	**Clear**	**Clear**	Not Clear
	Turbidity	**14.36**	**14.78**	46.75
05/04/2019	*Colour*	**Clear**	**Clear**	Not Clear
	Turbidity	**6.15**	**7.33**	41.39
04/04/2019	*Colour*	**Clear**	**Clear**	Not Clear
	Turbidity	**11.43**	3.56	125
03/04/2019	*Colour*	**Clear**	**Clear**	Not Clear
	Turbidity	**6.02**	**14.61**	62
02/04/2019	*Colour*	Clear	Clear	Not Clear
	Turbidity	**5.39**	**5.48**	164
01/04/2019	*Colour*	Clear	Clear	No water flowing
	Turbidity	3.45	3.99	
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, a red and 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.
- While turbidity at MP8 and MP9 regularly exceeded the 5 NTU compliance limit, exceedances were typically minor and likely due to wave action. Discolouration was not observed in the water at these locations.
- There were no Amber Alerts recorded during April 2019.
- There were several spikes in turbidity at MP20 this month:
    - This month, work was carried out between the breakwater and groyne in close proximity to MP20. This contributed to elevated turbidity recorded early in the month.
    - Heavy rainfall of 29mm over a 24-hour period contributed to the elevated reading on the 04/04/2019.
    - On days where turbidity was elevated at MP20, there was no significant elevation in turbidity at MP8 or MP9, nor was visual discolouration observed in the ocean at these points.
    - After 10/05/2019, turbidity at MP20 remained low, with levels similar to previous months.

3.2. Surface Water: Inbound flow– Monitoring Points 10, 11, 14, 21 and Outbound Flow – Monitoring Point 20

Test Results

Test frequency: Special Frequency 2 (Weekly, or daily when turbidity at MP8, 9 or 20 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)
30/04/2019	MP10	No water flowing				
	MP11	No water flowing				
	MP14	No water flowing				
	MP20	Not Visible	8.22	20.03	Clear	20
	MP21	No water flowing				
29/04/2019	MP10	No water flowing				
	MP11	No water flowing				
	MP14	No water flowing				
	MP20	Not Visible	8.19	10.04	Clear	7
	MP21	No water flowing				
24/04/2019	MP10	No water flowing				
	MP11	No water flowing				
	MP14	No water flowing				
	MP20	Not Visible	8.28	16.31	Clear	7
	MP21	No water flowing				
23/04/2019	MP10	No water flowing				
	MP11	No water flowing				
	MP14	No water flowing				
	MP20	Not Visible	8.24	19.14	Clear	16
	MP21	No water flowing				
18/04/2019	MP10	No water flowing				
	MP11	No water flowing				
	MP14	No water flowing				
	MP20	Not Visible	8.23	20.13	Clear	20
	MP21	No water flowing				

Date	Monitoring Point	Oil and Grease	pH	Turbidity (NTU)	Colour	Total Suspended Solids (mg/L)
17/04/2019	MP10	No water flowing				
	MP11	No water flowing				
	MP14	No water flowing				
	MP20	Not Visible	8.20	21	Clear	11
	MP21	No water flowing				
16/04/2019	MP10	No water flowing				
	MP11	No water flowing				
	MP14	No water flowing				
	MP20	Not Visible	7.72	35.80	Clear	44
	MP21	No water flowing				
15/04/2019	MP10	No water flowing				
	MP11	No water flowing				
	MP14	No water flowing				
	MP20	Not Visible	8.17	26.88	Clear	189
	MP21	No water flowing				
12/04/2019	MP10	No water flowing				
	MP11	No water flowing				
	MP14	No water flowing				
	MP20	No water flowing				
	MP21	No water flowing				
11/04/2019	MP10	No water flowing				
	MP11	No water flowing				
	MP14	No water flowing				
	MP20	No water flowing				
	MP21	No water flowing				
10/04/2019	MP10	Not Visible	7.20	9.08	Clear	15
	MP11	No water flowing				
	MP14	No water flowing				
	MP20	Not Visible	7.55	70	Not Clear	52
	MP21					
9/04/2019	MP10	Not Visible	7.52	59	Not Clear	64
	MP11	No water flowing				
	MP14	No water flowing				
	MP20	Not Visible	8.15	44.53	Not Clear	22
	MP21	No water flowing				

Date	Monitoring Point	Oil and Grease	pH	Turbidity (NTU)	Colour	Total Suspended Solids (mg/L)
08/04/2019	MP10	Not Visible	7.45	17.41	Clear	15
	MP11	No water flowing				
	MP14	No water flowing				
	MP20	Not Visible	8.28	46.75	Not clear	70
	MP21	No water flowing				
05/04/2019	MP10	Not Visible	7.26	7.07	Clear	7
	MP11	No water flowing				
	MP14	No water flowing				
	MP20	Not Visible	7.16	41.39	Not clear	66
	MP21	No water flowing				
4/04/2019	MP10	No water flowing				
	MP11	No water flowing				
	MP14	No water flowing				
	MP20	Not Visible	8.24	125	Not clear	147
	MP21	No water flowing				
3/04/2019	MP10	No water flowing				
	MP11	No water flowing				
	MP14	No water flowing				
	MP20	Not Visible	8.27	62	Not clear	144
	MP21	No water flowing				
2/04/2019	MP10	No water flowing				
	MP11	No water flowing				
	MP14	No water flowing				
	MP20	Not Visible	8.3	164	Not clear	271
	MP21	No water flowing				
1/04/2019	MP10	No water flowing				
	MP11	No water flowing				
	MP14	No water flowing				
	MP20	No water flowing				
	MP21	No water flowing				

Comments on Results

- Southern channel opening (MP20):
    - Channel was open to the ocean on 8 out of 18 days this month and was otherwise closed to the ocean.
- See section 3.1 for commentary regarding results at MP20.
- Inbound streams:
    - MP10 flowed on 4 occasions this month. On the 9th the NTU levels were elevated compared to normal readings for this flow. NTU levels returned normal the next day. The cause of the elevation was unknown, nothing unusual was observed on site or upstream which may have impacted upon water quality at this point.
    - MP11 did not flow this month.
    - MP14 did not flow this month.
    - Despite heavy rainfall recorded on the 4th April, there was an insufficient amount of water flowing to take a sample at either MP11 or MP14 at the times of inspection.
- Notable Rainfall Events:
    - 61.5 mm of total rainfall was recorded on site during the month.
    - 29mm rainfall was recorded as the highest daily total on the 4th April.
    - 19mm rainfall was also recorded on the 23rd April.

3.3. Storage Pond – Monitoring Points 22, 23 and 24

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)
30/04/2019	Not Visible	7.94	Next Report	20.03	Next Report	Next Report	Next Report
29/04/2019	Not Visible	7.94	Next Report	20.98	Next Report	Next Report	Next Report
18/04/2019	Not Visible	7.47	18	19.82	2.3	0.148	0.068
16/04/2019	Not Visible	8.08	16	27.43	<1	0.033	0.036
15/04/2019	Not Visible	8.23	27	31.78	1.5	0.005	0.063
10/04/2019	Not Visible	7.33	18	31.76	<1	1.65	0.054
9/04/2019	Not Visible	7.33	11	28.34	<1	0.096	0.055
8/04/2019	Not Visible	7.81	10	29.44	<1	0.091	0.056
6/04/2019	Not Visible	7.94	18	23.97	1	0.09	0.061
5/04/2019	Not Visible	7.35	7	24.72	1.4	0.201	0.058
3/04/2019	Not Visible	7.34	25	27.12	2.4	0.229	0.074
1/04/2019	Not Visible	7.5	18	26.02	1.1	0.275	0.077
EPA Discharge Criteria		**4.0 – 8.5**	**50**	-	-	-	-

**Tests undertaken on site by Coastwide Civil*

Remarks – MP22

- Nitrate levels were elevated on 10/04/2019 compared to typical site levels. Nitrates returned to typical levels by the next day. The cause of the elevation was unknown, nothing unusual was observed on site which may have impacted upon water quality at this point.
- Discharge was undertaken on the above listed days. All site based monitoring and received lab testing results are compliant with discharge criteria.
- Sample results that haven't returned from the lab will be include in the next monthly report.

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)
5/04/2019	Not Visible	8.01	16	28.09	<1	0.252	0.063
EPA Discharge Criteria		**4.0 – 8.5**	**50**	-	-	-	-

Remarks – MP23

- Discharge was undertaken on the above listed day. All site based monitoring and received lab testing results are compliant with discharge criteria.

MP24							
	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)
EPA Discharge Criteria		**4.0 – 8.5**	**50**	-	-	-	-

Remarks – MP24

- No Discharge was undertaken during the month.

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
23/04/2019	MP17	9:45 am – 10:00am	L_{A10} = 52.4 L_{A90} = 39.9 **L_{Aeq} = 51.9** L_{max} = 70.5 L_{min} = 31.5	Non-CWC Vehicles: 9 Av: 60.1 Bird Av: 49.2 CWC site noise was inaudible. Dominant noises were birds and non-CWC vehicles. Site contribution L_{Aeq} = L_{A90} – 10dB	**29.9**	**51.0**
	MP18	9:15am – 9:30am	L_{A10} = 46 L_{A90} = 35 **L_{Aeq} = 46** L_{max} = 74.3 L_{min} = 32	Non-CWC Vehicles: 4 Av: 50 Birds Av: 54.9 CWC noise was inaudible. Birds were the dominant noise. Site contribution L_{Aeq} = L_{A90} – 10dB	**25**	**46.0**
	MP19	8:45am – 9:00am	L_{A10} = 58.7 L_{A90} = 41.3 **L_{Aeq} = 56.9** L_{max} = 75.6 L_{min} = 36.9	Non-CWC construction Av: 59.4 Non-CWC Vehicles: 18 Av: 59.6 CWC noise was inaudible. Dominant noises were Non-CWC Vehicles and construction. Site contribution L_{Aeq} = L_{A90} – 10dB	**31.3**	**43.0**

Date	Location	Time	Measured Noise Levels	Observed Noise Sources and notes (sound levels in dB)	Estimated L_{Aeq} Contribution	CEMP Trigger Value
17/04/2019	MP17	2:25pm– 2:40pm	L_{A10} = 55.7 L_{A90} = 49.3 **L_{Aeq} = 56.3** L_{max} = 84.8 L_{min} = 46.6	Vehicles: 7 No. Av: 65.8 Bird Av: 61 CWC Site Av: 54.8 CWC noise was not as loud as spikes from Non-CWC Vehicles and birds but was audible. Site contribution L_{Aeq} = L_{Aeq} – 6dB	**50.3**	**51.0**
	MP18	2:45pm – 3pm	L_{A10} = 60.9 L_{A90} = 52.4 **L_{Aeq} = 58** L_{max} = 70.4 L_{min} = 39	Birds Av: 58.6 CWC Av: 62.1 Site noise was the dominant noise during testing. CWC are working along the boundary fence at testing spot. Site contribution L_{Aeq} = L_{Aeq}	58	**46.0**
	MP19	3:05pm – 3:20pm	L_{A10} = 60.2 **L_{A90} = 48.7** L_{Aeq} = 58.2 L_{max} = 78 L_{min} = 44.6	Non CWC Vehicles: 30 Av: 62.1 Dominant noise was Non-CWC vehicles. CWC noise was inaudible. Site contribution L_{Aeq} = L_{A90} – 10dB	**38.7**	**43.0**

Date	Location	Time	Measured Noise Levels	Observed Noise Sources and notes (sound levels in dB)	Estimated L_{Aeq} Contribution	CEMP Trigger Value
11/04/2019	MP17	1:35pm – 1:50pm	L_{A10} = 63.5 L_{A90} = 52.8 **L_{Aeq} = 61** L_{max} = 79.2 L_{min} = 38.3	CWC Av: 62 Non-CWC Vehicles: 2 Av: 64.4 Birds Av: 63.7 People walking past: 79.2 CWC was the dominant noise working right on the fence line of site. Site contribution L_{Aeq} = L_{Aeq}	61	**51.0**
	MP18	2:00pm – 2:15pm	L_{A10} = 62 L_{A90} = 54.5 **L_{Aeq} = 59.4** L_{max} = 71.2 L_{min} = 43.5	Birds Av: 61.6 Non-CWC Vehicles: 15 Av: 62.2 Non-CWC Construction Av:57.9 CWC Av: 60.8 CWC was the dominant noise working right on the fence line of site. Site contribution L_{Aeq} = L_{Aeq}	59.4	**46.0**
	MP19	1:10pm – 1:25pm	L_{A10} = 55 **L_{A90} = 40.9** L_{Aeq} = 52 L_{max} = 69.8 L_{min} = 31.2	Non CWC construction Av: 48.4 Birds Av: 46.1 Vehicles: 29 No. Av: 57.4 Vehicles and Non CWC construction were the dominant noise. CWC noise was inaudible. Site contribution L_{Aeq} = L_{A90} – 10dB	**30.9**	**43.0**

Date	Location	Time	Measured Noise Levels	Observed Noise Sources and notes (sound levels in dB)	Estimated L_{Aeq} Contribution	CEMP Trigger Value
3/04/2019	MP17	12:10pm – 12:25pm	L_{A10} = 58.3 L_{A90} = 50.4 **L_{Aeq} = 55.4** L_{max} = 68.5 L_{min} = 41.4	Non-CWC Vehicles: 3 No. Av: 55.2 CWC Av: 57.7 CWC site noise was the dominant noise source. Site contribution L_{Aeq} = L_{Aeq}	55.4	**51.0**
	MP18	11:50am – 12:05pm	L_{A10} = 54.5 **L_{A90} = 49.3** L_{Aeq} = 53.1 L_{max} = 77.7 L_{min} = 47	Birds Av: 51.2 Non-CWC Vehicles: 3 Av: 54.6 Mower Av: 52.6 CWC noise was inaudible. Mowing at adjacent field was dominant noise. Site contribution L_{Aeq} = L_{A90} – 10dB	**39.3**	**46.0**
	MP19	11:30am – 11:45pm	L_{A10} = 58.3 **L_{A90} = 46.5** L_{Aeq} = 57.9 L_{max} = 77.9 L_{min} = 44.0	Non CWC construction Av: 63.2 Vehicles: 13 No. Av: 64 Vehicles and Non CWC construction were the dominant noise. CWC where inaudible. Site contribution L_{Aeq} = L_{A90} – 10dB	**36.5**	**43.0**

Comments on Results

- At MP17, weekly L_{Aeq} levels exceeded the trigger value on 3/04/19 and 11/04/19.
- At MP18, weekly L_{Aeq} levels exceeded the trigger value on 11/04/19 and 17/04/19.
- At MP19, weekly L_{Aeq} levels did not exceed the trigger value.
- Consultation with the community about the project has been ongoing. A community newsletter is being distributed when required, explaining new and current works on site. The newsletter contains contact information to allow any residents to communicate concerns about noise levels.
- No complaints have been received in this month about noise levels.

4.2. Air Quality

Test Results
Test frequency: Monthly

Date	Pollutant	Point 1	Point 2	Point 3
28/03/19 - 23/04/19	*Ash Content (g/m^2/ month)*	Awaiting results	Awaiting results	Awaiting results
	Combustible Matter (g/m^2/ month)			
	Total dust (g/m^2/ month)			
SEMP Compliance Limit	***Total dust (g/m^2/ month)***	**4.0**	**4.0**	**4.0**

Comments on Results

- Samples have been to the lab for testing, results and comments will be included in the next monthly report.

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

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: Not to Scale

DRAWN BY: B.Cardillo

DESIGNED BY:

CHECKED BY: C. Runciman

REVIEWED BY:

PROJECT: Shell Cove Boat Harbour Stage 2

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: 30/04/2019

Site Map

Rev No. 1

Sheet 1 of 1

Appendix B
– Lab Testing Results

RESULTS OF WATER ANALYSIS

6 samples supplied by Coastwide Civil Pty Ltd on 11th April, 2019. Lab Job No.I0685
Samples submitted by Lachlan Payne. Your Job: Shell Cove Boat Harbour
19 Croome Lane ALBION PARK NSW 2527

Parameter	Methods reference	Sample 1 MP22 29/3/19	Sample 2 MP22 1/4/19	Sample 3 MP22 3/4/19	Sample 4 MP22 5/4/19	Sample 5 MP23 5/4/19	Sample 6 MP22 6/4/19
	Job No.	*I0685/1*	*I0685/2*	*I0685/3*	*I0685/4*	*I0685/5*	*I0685/6*
Total Suspended Solids (mg/L)	GFC equiv. filter - APHA 2540-D	17	18	25	7	16	18
Biochemical Oxygen Demand$_5$ (mg/L O_2)	APHA 5210-B	1	1.1	2.4	1.4	<1	1
Nitrate (mg/L N)	APHA 4500 NO_3^--F	0.282	0.275	0.229	0.201	0.252	0.090
Ammonia (mg/L N)	APHA 4500 NH_3-H	0.123	0.077	0.074	0.058	0.063	0.061

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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Tel. 02 6620 3678, website: scu.edu.au/eal

checked: .....
Graham Lancaster
Laboratory Manager

RESULTS OF WATER ANALYSIS

7 samples supplied by Coastwide Civil Pty Ltd on 11th April, 2019. Lab Job No.I0686
Samples submitted by Lachlan Payne. Your Job: Shell Cove Boat Harbour
19 Croome Lane ALBION PARK NSW 2527

Parameter	Methods reference	Sample 1 MP20 2/4/19	Sample 2 MP20 3/4/19	Sample 3 MP20 4/4/19	Sample 4 MP10 5/4/19	Sample 5 MP20 5/4/19	Sample 6 MP10 8/4/19	Sample 7 MP20 8/4/19
	Job No.	*I0686/1*	*I0686/2*	*I0686/3*	*I0686/4*	*I0686/5*	*I0686/6*	*I0686/7*
Total Suspended Solids (mg/L)	GFC equiv. filter - APHA 2540-D	271	144	147	7	66	15	70

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.
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Graham Lancaster
Laboratory Manager

RESULTS OF WATER ANALYSIS

3 samples supplied by Coastwide Civil Pty Ltd on 18th April, 2019. Lab Job No.I0988
Samples submitted by Bernadette Cardillo. Your Job: MP22 8-10/4/19
19 Croome Lane ALBION PARK NSW 2527

Parameter	Methods reference	Sample 1 MP22 8/4/19	Sample 2 MP22 9/4/19	Sample 3 MP22 10/4/19
	Job No.	*I0988/1*	*I0988/2*	*I0988/3*
Total Suspended Solids (mg/L)	GFC equiv. filter - APHA 2540-D	10	11	18
Biochemical Oxygen Demand$_5$ (mg/L O_2)	APHA 5210-B	<1	<1	<1
Nitrate (mg/L N)	APHA 4500 NO_3^--F	0.091	0.096	1.650
Ammonia (mg/L N)	APHA 4500 NH_3-H	0.056	0.055	0.054

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.
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Laboratory Manager

RESULTS OF WATER ANALYSIS

4 samples supplied by Coastwide Civil Pty Ltd on 18th April, 2019. Lab Job No.I0989

Samples submitted by Bernadette Cardillo. Your Job: MP10 & MP20 9-10/4/19

19 Croome Lane ALBION PARK NSW 2527

Parameter	Methods reference	Sample 1 MP10 9/4/19	Sample 2 MP20 9/4/19	Sample 3 MP10 10/4/19	Sample 4 MP20 10/4/19
	Job No.	*I0989/1*	*I0989/2*	*I0989/3*	*I0989/4*
Total Suspended Solids (mg/L)	GFC equiv. filter - APHA 2540-D	64	22	3	52

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.
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Laboratory Manager

RESULTS OF WATER ANALYSIS

3 samples supplied by Coastwide Civil Pty Ltd on 26th April, 2019. Lab Job No.i1097
Samples submitted by Bernadette Cardillo. Your Job: Shell Cove Boat Harbour
19 Croome Lane ALBION PARK NSW 2527

Parameter	Methods reference	Sample 1 MP22 15/4/19	Sample 2 MP22 16/4/19	Sample 3 MP22 18/4/19
	Job No.	*i1097/1*	*i1097/2*	*i1097/3*
Total Suspended Solids (mg/L)	GFC equiv. filter - APHA 2540-D	27	16	18
Biochemical Oxygen Demand$_5$ (mg/L O_2)	APHA 5210-B	1.5	<1	2.3
Nitrate (mg/L N)	APHA 4500 NO_3^--F	<0.005	0.033	0.148
Ammonia (mg/L N)	APHA 4500 NH_3-H	0.063	0.036	0.068

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.
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Laboratory Manager

RESULTS OF WATER ANALYSIS

6 samples supplied by Coastwide Civil Pty Ltd on 26th April, 2019. Lab Job No.I1098
Samples submitted by Bernadette Cardillo. Your Job: Shell Cove Boat Harbour
19 Croome Lane ALBION PARK NSW 2527

Parameter	Methods reference	Sample 1 MP20 15/4/19	Sample 2 MP20 16/4/19	Sample 3 MP20 17/4/19	Sample 4 MP20 18/4/19	Sample 5 MP20 23/4/19	Sample 6 MP20 24/4/19
	Job No.	*I1098/1*	*I1098/2*	*I1098/3*	*I1098/4*	*I1098/5*	*I1098/6*
Total Suspended Solids (mg/L)	GFC equiv. filter - APHA 2540-D	189	44	11	20	16	7

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.
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Laboratory Manager

RESULTS OF WATER ANALYSIS

5 samples supplied by Coastwide Civil Pty Ltd on 6th May, 2019. Lab Job No.i1368

Samples submitted by Lachlan Payne. Your Job: Shell Cove Boat Harbour

19 Croome Lane ALBION PARK NSW 2527

Parameter	Methods reference	Sample 1 MP20 20/04/19 Monday	Sample 2 MP20 30/04/19 Tuesday	Sample 3 MP20 01/05/19 Wednesday	Sample 4 MP20 02/05/19 Thursday	Sample 5 MP20 03/05/119 Friday
	Job No.	*i1368/1*	*i1368/2*	*i1368/3*	*i1368/4*	*i1368/5*
Total Suspended Solids (mg/L)	GFC equiv. filter - APHA 2540-D	7	20	24	33	13

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.
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Laboratory Manager

Appendix C
– Site Rainfall Measurements

Monday	1/04/2019	9:00 AM	**10.0**	Charlie Runciman
Tuesday	2/04/2019	9:00 AM	**0.5**	Lachlan Payne
Wednesday	3/04/2019	9:00 AM	**0.0**	Charlie Runciman
Thursday	4/04/2019	9:00 AM	**29.0**	Bernadette Cardillo
Friday	5/04/2019	9:00 AM	**3.0**	Charlie Runciman
Saturday	6/04/2019	9:00 AM	*	
Sunday	7/04/2019	9:00 AM	*	
Monday	8/04/2019	9:00 AM	**0.0**	Charlie Runciman
Tuesday	9/04/2019	9:00 AM	**0.0**	Charlie Runciman
Wednesday	10/04/2019	9:00 AM	**0.0**	Bernadette Cardillo
Thursday	11/04/2019	9:00 AM	**0.0**	Charlie Runciman
Friday	12/04/2019	9:00 AM	**0.0**	Charlie Runciman
Saturday	13/04/2019	9:00 AM	*	
Sunday	14/04/2019	9:00 AM	*	
Monday	15/04/2019	9:00 AM	**0.0**	Bernadette Cardillo
Tuesday	16/04/2019	9:00 AM	**0.0**	Bernadette Cardillo
Wednesday	17/04/2019	9:00 AM	**0.0**	Charlie Runciman
Thursday	18/04/2019	9:00 AM	**0.0**	Charlie Runciman
Friday	19/04/2019	9:00 AM	*	
Saturday	20/04/2019	9:00 AM	*	
Sunday	21/04/2019	9:00 AM	*	
Monday	22/04/2019	9:00 AM	*	
Tuesday	23/04/2019	9:00 AM	**19.0**	Charlie Runciman
Wednesday	24/04/2019	9:00 AM	**5.0**	Charlie Runciman
Thursday	25/04/2019	9:00 AM	*	
Friday	26/04/2019	9:00 AM	*	
Saturday	27/04/2019	9:00 AM	*	
Sunday	28/04/2019	9:00 AM	*	
Monday	29/04/2019	9:00 AM	**0.0**	Charlie Runciman
Tuesday	30/04/2019	9:00 AM	**0.0**	Bernadette Cardillo