



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

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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



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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
30/10/2020	Colour	Clear	Clear
	Turbidity	0.84	3.72
29/10/2020	Colour	Clear	Clear
	Turbidity	12.83	13.44
28/10/2020	Colour	Clear	Clear
	Turbidity	14.25	4.00
27/10/2020	Colour	Clear	Clear
	Turbidity	21.18	8.85
26/10/2020	Colour	Clear	Clear
	Turbidity	0.17	0.08
23/10/2020	Colour	Clear	Clear
	Turbidity	0.03	1.53
22/10/2020	Colour	Clear	Clear
	Turbidity	2.78	1.06
21/10/2020	Colour	Clear	Clear
	Turbidity	2.74	3.37
20/10/2020	Colour	Clear	Clear
	Turbidity	4.54	4.33
19/10/2020	Colour	Clear	Clear
	Turbidity	4.42	3.91
16/10/2020	Colour	Clear	Clear
	Turbidity	2.23	3.87
15/10/2020	Colour	Clear	Clear
	Turbidity	4.99	3.59
14/10/2020	Colour	Clear	Clear
	Turbidity	3.09	4.17
13/10/2020	Colour	Clear	Clear
	Turbidity	0.19	6.23
12/10/2020	Colour	Clear	Clear
	Turbidity	3.03	4.90
09/10/2020	Colour	Clear	Clear
	Turbidity	3.07	2.81
08/10/2020	Colour	Clear	Clear
	Turbidity	16.64	5.62
07/10/2020	Colour	Clear	Clear
	Turbidity	4.38	3.67



02/10/2020	Colour	Clear	Clear
	Turbidity	6.07	6.91
01/10/2020	Colour	Clear	Clear
	Turbidity	5.41	6.07
CEMP Compliance Limit	<i>Turbidity</i>	5	5
SEMP Amber Alert Level	<i>Turbidity</i>	15	15
EPL Special Frequency 2 Trigger Value	<i>Turbidity</i>	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 six times during the month;
 - 1st and 2nd October due to mean tide and waves breaking near to shore, stirring up sediment.
 - 8th October due to large, choppy surf breaking close to shore,
 - 27th to 29th October due to beach nourishment works being conducted directly adjacent to the beach and significant rainfall.
- Turbidity at MP9 exceeded the 5 NTU compliance limit six times during the month;
 - 1st and 2nd October due to mean tide and waves breaking near to shore, stirring up sediment.
 - 8th October due to large, choppy surf breaking close to shore,
 - 13th October due to large waves
 - 27th October due to rainfall and large swell,
 - 29th October due to rainfall and large swell,
- There were two Amber Alerts recorded at MP8 during October 2020.
 - 8th October due to large, choppy surf breaking close to shore,
 - 27th October due to beach nourishment works being conducted directly adjacent to the beach and significant rainfall.
- There were no Amber Alerts recorded at MP9 during October 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)
30/10/2020	MP10	Not Visible	7.74	4.19	Clear	4
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
29/10/2020	MP10	Not Visible	7.74	4.13	Clear	2
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
28/10/2020	MP10	Not Visible	7.92	0.00	Clear	1
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
27/10/2020	MP10	Not Visible	7.84	3.08	Clear	3
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
26/10/2020	MP10	Not Visible	7.92	20.5	Clear	11
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
20/10/2020	MP10	No water flowing				
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
19/10/2020	MP10	No water flowing				
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
8/10/2020	MP10	No water flowing				
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				



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Date	Monitoring Point	Oil and Grease	pH	Turbidity (NTU)	Colour	Total Suspended Solids (mg/L)
20/10/2020	MP10	Not Visible	7.51	12.1	Clear	7
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
19/10/2020	MP10	Not Visible	7.54	10.36	Clear	6
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
16/10/2020	MP10	No water flowing				
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
15/10/2020	MP10	No water flowing				
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
14/10/2020	MP10	No water flowing				
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
13/10/2020	MP10	No water flowing				
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
12/10/2020	MP10	No water flowing				
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
09/10/2020	MP10	No water flowing				
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
08/10/2020	MP10	Not Visible	7.97	11.26	Clear	12
	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)
07/10/2020	MP10	Not Visible	7.35	1.70	Clear	11
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
02/10/2020	MP10	Not Visible	7.55	12.77	Clear	4
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				
01/10/2020	MP10	Not Visible	7.80	2.22	Clear	3
	MP11	No water flowing				
	MP14	No water flowing				
	MP21	No water flowing				

Comments on Results

- Inbound streams:
 - MP10 was flowing 11 times in the month of October.
 - MP11, MP14 and MP21 did not flow in the month of October.
- Notable Rainfall Events: There were no significant rain events during the month of October.
 - 18mm of rain fell on 19th October.
 - 56mm of rain fell on 26th October.
 - 25mm of rain fell between 27th and 30th October



3.3. Storage Pond – Monitoring Points 22 and 23

Test Results

Test frequency: Daily during discharge.

MP22							
Date	Pollutant						
	Oil and Grease	pH*	Total Suspended Solids (mg/L)	Turbidity* (NTU)	Biochemical Oxygen Demand (BOD) (mg/L)	Nitrate (mg/L)	Nitrogen (Ammonia) (mg/L)
30/10/2020	Not Visible	7.54	4	11.78	<1.0	2.06	0.032
29/10/2020	Not Visible	7.82	16	21.33	1.1	0.861	0.070
28/10/2020	Not Visible	7.58	4	8.27	<1.0	1.89	0.117
27/10/2020	Not Visible	7.68	5	14.44	<1.0	1.25	0.092
23/10/2020	Not Visible	8.27	8	10.12	1.4	<0.005	0.040
22/10/2020	Not Visible	8.33	12	25.84	4.5	<0.005	0.024
21/10/2020	Not Visible	8.30	12	19.22	1.1	<0.005	0.072
20/10/2020	Not Visible	7.88	10	30.31	1.4	0.037	0.130
19/10/2020	Not Visible	7.96	9	22.65	1.0	0.239	0.104
16/10/2020	Not Visible	8.07	25	17.34	3.3	0.009	0.009
15/10/2020	Not Visible	8.29	12	13.84	2.5	0.006	0.016
14/10/2020	Not Visible	8.21	8	15.44	1.5	0.008	0.062
13/10/2020	Not Visible	6.82	29	29.72	<1.0	0.074	0.102
12/10/2020	Not Visible	7.82	7	22.82	1.1	0.023	0.110
09/10/2020	Not Visible	6.83	24	21.87	<1.0	0.157	0.096
08/10/2020	Not Visible	7.05	46	21.83	1.0	0.102	0.090
07/10/2020	Not Visible	6.98	13	19.69	<1.0	0.165	0.199
02/10/2020	Not Visible	6.87	22	10.20	<1.0	0.102	0.110
01/10/2020	Not Visible	6.86	36	25.98	<1.0	0.054	0.120
EPA Discharge Criteria		4.0 – 8.5	50	-	-	-	-

*Tests undertaken on site by Coastwide Civil



Remarks – MP22

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

MP23							
Date	Pollutant						
	Oil and Grease	pH*	Total Suspended Solids (mg/L)	Turbidity* (NTU)	Biochemical Oxygen Demand (BOD) (mg/L)	Nitrate (mg/L)	Nitrogen (Ammonia) (mg/L)
30/10/2020	Not Visible	8.16	13	23.31	<1	0.102	0.085
29/10/2020	Not Visible	7.89	12	11.53	<1	0.096	0.076
28/10/2020	Not Visible	7.77	49	20.58	<1	0.134	0.060
27/10/2020	Not Visible	7.98	53	17.06	<1	0.125	0.054
23/10/2020	Not Visible	7.76	23	18.46	0.4	0.118	0.092
22/10/2020	Not Visible	7.82	55	31.31	0.5	0.079	0.078
21/10/2020	Not Visible	8.00	60	23.69	0.4	0.065	0.079
20/10/2020	Not Visible	8.14	24	20.15	<1	<0.005	0.015
19/10/2020	Not Visible	7.97	41	20.97	<1	<0.005	0.008
16/10/2020	Not Visible	8.06	63	23.67	<1	<0.005	0.023
15/10/2020	Not Visible	7.48	35	22.97	<1	0.105	0.080
14/10/2020	Not Visible	7.68	38	31.58	<1	0.073	0.045
13/10/2020	Not Visible	7.20	17	25.52	<1	0.082	0.034
08/10/2020	Not Visible	7.42	29	26.82	<1	0.078	0.135
07/10/2020	Not Visible	7.61	15	22.79	<1	0.065	0.116
02/10/2020	Not Visible	7.61	13	20.44	<1	0.093	0.226
01/10/2020	Not Visible	7.75	21	27.33	<1	0.104	0.141
EPA Discharge Criteria		4.0 – 8.5	50	-	-	-	-

*Tests undertaken on site by Coastwide Civil



Remarks – MP23

- Discharge was undertaken on the above listed days. All site based monitoring are compliant with discharge criteria, however there was one exceedances on lab testing results.
 - 16th October testing was compliant when tested for turbidity, however lab tests showed TSS of 63 mg/L.
 - 21st October testing was compliant when tested for turbidity, however lab tests showed TSS of 60 mg/L.
 - 22nd October testing was compliant when tested for turbidity, however lab tests showed TSS of 55 mg/L.
 - 27th October testing was compliant when tested for turbidity, however lab tests showed TSS of 53 mg/L.

In September and October there has been an increase in samples that pass a field test then fail the laboratory test. It is believed that these samples may contain sand. Sand settles out prior to the field test, however will still be present on the laboratory test.



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
29/10/2020	MP17	12:30 – 12:45	L_{A10} = 57.2 L_{A90} = 47.0 L_{Aeq} = 48.8 L_{max} = 71.2 L_{min} = 45.0	Dogs – 68.6, 57.9, 58.0, 58.2 Birds – 65.4, 64.8, 61.8, 61.6, 52.2, 48.3, 54.0, 52.4, 53.4, 51.8, 50.7, 53.9 Ocean – 50.6, 51.6, 52.0, 51.6, 55.1, 52.2, 54.0 Dominant source of noise was birds and the ocean. CWC inaudible. L_{Aeq} = L_{A90} – 10dB	37.0	51.0
	MP18	12:10 – 12:25	L_{A10} = 54.4 L_{A90} = 44.3 L_{Aeq} = 45.7 L_{max} = 70.6 L_{min} = 42.0	Birds – 57.0, 57.3, 54.5, 53.2, 51.0, 46.5, 55.7, 55.5, 58.3, 57.0 Helicopter – 52.1, 50.7, 49.7, 52.0, 48.7 Walker – 50.0, 49.7 Dominant source of noise was birds. CWC inaudible. L_{Aeq} = L_{A90} – 10dB	34.3	46.0
	MP19	11:50 – 12:05	L_{A10} = 58.9 L_{A90} = 47.8 L_{Aeq} = 53.3 L_{max} = 77.3 L_{min} = 46.0	Car – 68.7, 66.0, 61.4, 61.5, 77.0, 79.6, 64.9 Construction Work – 47.7, 55.5, 53.8, 57.0 Dominant source of noise was domestic construction work. CWC inaudible. L_{Aeq} = L_{A90} – 10dB	37.8	43.0

Date	Location	Time	Measured Noise Levels	Observed Noise Sources and notes (sound levels in dB)	Estimated L_{Aeq} Contribution	CEMP Trigger Value
21/10/2020	MP17	11:45 – 12:00	L_{A10} = 57.2 L_{A90} = 46.1 L_{Aeq} = 51.4 L_{max} = 72.7 L_{min} = 40.1	Birds – 56.4, 60.8, 58.4, 54.7, 60.4, 61.1, 57.3 Human – 54.7, 55.6 Cars – 70.1, 72.7, 68.9, 69.6, 70.4 Dominant source of noise was birds. CWC inaudible. L_{Aeq} = L_{A90} – 10dB	36.1	51.0
	MP18	12:05 – 12:20	L_{A10} = 59.6 L_{A90} = 47.8 L_{Aeq} = 50.6 L_{max} = 72.4 L_{min} = 38.4	Birds – 58.2, 56.7, 60.4, 59.1, 57.4, 60.7 Car – 71.5, 70.4, 72.0 Birds were dominant source of noise for the duration of the test. CWC was only sometimes audible. L_{Aeq} = L_{Aeq} – 6dB	44.6	46.0
	MP19	12:30 – 12:45	L_{A10} = 59.4 L_{A90} = 50.1 L_{Aeq} = 54.7 L_{max} = 77.1 L_{min} = 46.4	Car – 71.4, 68.7, 61.7 Construction Work – 55.5, 57.0, 54.6, 56.1, 54.7, 57.1 Non-CWC construction noise was dominant for the duration of the test. CWC was only sometime audible. L_{Aeq} = L_{Aeq} – 6dB	48.7	43.0



Coastwide Civil
Shell Cove Boat Harbour, Stage 2 and Breakwaters
 Monthly Environmental Monitoring Report
 October 2020

Date	Location	Time	Measured Noise Levels	Observed Noise Sources and notes (sound levels in dB)	Estimated L_{Aeq} Contribution	CEMP Trigger Value
14/10/2020	MP17	11:40 – 11:55	L_{A10} = 66.4 L_{A90} = 49.9 L_{Aeq} = 57.4 L_{max} = 70.4 L_{min} = 46.4	Dog – 51.7, 58.2, 53.4 Ocean – 51.0, 50.8 Cars – 57.1, 56.4, 51.6, 64.4, 65.7, 61.7 Birds – 58.4, 60.7, 59.6 Dominant source of noise was birds and cars. CWC inaudible. L_{Aeq} = L_{A90} – 10dB	39.9	51.0
	MP18	11:15 – 11:30	L_{A10} = 59.8 L_{A90} = 47.4 L_{Aeq} = 50.1 L_{max} = 70.7 L_{min} = 45.0	Birds – 50.7, 54.1, 51.1, 50.9, 53.6, 52.1, 50.9, 50.3, 51.1, 50.4 Cars – 51.1, 52.3, 50.7 Birds were dominant source of noise for the duration of the test. CWC was only sometimes audible. L_{Aeq} = L_{Aeq} – 6dB	44.1	46.0
	MP19	10:50 – 11:05	L_{A10} = 62.0 L_{A90} = 51.7 L_{Aeq} = 56.2 L_{max} = 74.7 L_{min} = 50.1	Cars – 61.1, 61.7, 58.4, 59.4, 60.2, 71.1, 70.4 Construction Work – 50.7, 52.1, 52.4, 50.9, 51.7, 60.4, 57.7, 54.9 Cars and Non-CWC Construction were dominant sources of noise for the duration of the test. CWC was only sometimes audible. L_{Aeq} = L_{Aeq} – 6dB	50.2	43.0

Date	Location	Time	Measured Noise Levels	Observed Noise Sources and notes (sound levels in dB)	Estimated L_{Aeq} Contribution	CEMP Trigger Value
07/10/2020	MP17	10:30 – 10:45	L_{A10} = 58.1 L_{A90} = 47.4 L_{Aeq} = 53.4 L_{max} = 68.8 L_{min} = 38.4	Human Activity – 58.2, 60.1, 59.4 Car – 64.4, 64.8, 59.8, 61.7, 63.2 Birds – 59.7, 57.1, 60.4, 60.1, 58.4 Ocean – 52.0, 51.4 No true dominant source of noise for the duration of the test. CWC was only sometimes audible. L_{Aeq} = L_{Aeq} – 6dB	47.4	51.0
	MP18	10:55 – 11:10	L_{A10} = 59.9 L_{A90} = 42.7 L_{Aeq} = 51.7 L_{max} = 71.4 L_{min} = 40.1	Cars – 58.4, 56.1 Truck – 71.1, 71.6, 70.4 Birds – 59.1, 71.1, 64.8, 62.8, 63.3, 62.7, 58.7 Birds were dominant source of noise for the duration of the test. CWC was only sometimes audible. L_{Aeq} = L_{Aeq} – 6dB	45.7	46.0
	MP19	11:20 – 11:35	L_{A10} = 61.7 L_{A90} = 51.4 L_{Aeq} = 55.7 L_{max} = 73.1 L_{min} = 50.8	Cars – 70.4, 68.9, 66.4 Truck – 71.4, 72.2 Human Activity – 59.2, 60.4, 60.1 Construction Work – 58.4, 60.1, 59.2, 58.6, 61.1, 62.7 Construction Work was the dominant source, impossible to tell whether CWC or other construction was dominant. L_{Aeq} = L_{Aeq} – 3dB	52.7	43.0

Comments on Results

- At MP17, weekly L_{Aeq} levels did not exceed the trigger value during the month of October.
- At MP18, weekly L_{Aeq} levels did not exceed the trigger value during the month of October.
- At MP19, weekly L_{Aeq} levels exceeded the trigger value during three of the four tests in the month of October, the average estimated contribution over the three tests was 50.5dB. 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
01/10/2020 – 02/11/2020	<i>Ash Content (g/m²/ month)</i>	1.0	1.6	3.5
	<i>Combustible Matter (g/m²/ month)</i>	0.4	0.9	0.7
	<i>Total dust (g/m²/ month)</i>	1.4	2.5	4.2
SEMP Compliance Limit	<i>Total dust (g/m²/ month)</i>	4.0	4.0	4.0

Comments on Results

- Dust levels at MP1 and MP2 were compliant with SEMP limit for the month of October.
- Dust levels at MP3 were not compliant with SEMP limit for the month of October.
- Excavation works, by a third party, were conducted within metres of the dust deposition gauge at MP3 and it is assumed that these excavation works may have contributed to an unexpected exceedance at this monitoring point.

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 October 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



<div>The information contained within this drawing is protected by copyright. It has been created specifically for the client named on this drawing. It's intended purpose is to denote actual survey data collected by Coastwide Civil during the execution of our works. Coastwide Civil accepts no warranty or liability arising from the use of this drawing with the exception of the purpose of which it was intended. You may not reproduce, disseminate any part of the drawing without the written permission of Coastwide Civil.</div> <div>CLIENT:</div>				<div>SCALE</div> <div>DRAWN BY:</div> <div>DESIGNED BY:</div> <div>CHECKED BY:</div> <div>REVIEWED BY:</div>		<div>PROJECT:</div> <div>COASTWIDE CIVIL Civil, Marine & Earthworks Contractors 19 Croome Lane, Albion Park, 2527 Phone: (02) 4256 1499 email: info@coastwidecivil.com.au</div> <div> COASTWIDE CIVIL</div>		<div>DWG/FILE No.</div>		<div>Date:</div>		<div>Rev No.</div>	
<div>2</div>													
<div>1</div>													
<div>No.</div>		<div>Amendment Description</div>		<div>Initials</div>		<div>Date</div>							
<div>A3 original</div>		<div>This sheet may be prepared using colour and may be incomplete if copied</div>		<div>Co-ordinate System:</div>		<div>Height Datum: A.H.D.</div>							



Appendix B
– Lab Testing Results

RESULTS OF WATER ANALYSIS

4 samples supplied by Coastwide Civil Pty Ltd on 13/10/2020. Lab Job No. J9356.

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

19 Croome Lane ALBION PARK NSW 2527

Parameter	Methods reference	Sample 1 MP10 01/10/20	Sample 2 MP10 02/10/20	Sample 3 MP10 07/10/20	Sample 4 MP10 08/10/20
	Job No.	J9356/1	J9356/2	J9356/3	J9356/4
Total Suspended Solids (mg/L)	GFC equiv. filter - APHA 2540-D	3	4	11	12

Notes:

- 1 mg/L (milligram per litre) = 1 ppm (part per million) = 1000 µg/L (micrograms per litre) = 1000 ppb (part per billion).
- Analysis performed according to APHA (2017) 'Standard Methods for the Examination of Water & Wastewater', 23rd Edition, except where stated otherwise.
- Analysis conducted between sample arrival date and reporting date.
- ** NATA accreditation does not cover the performance of this service.
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- Results relate only to the samples tested.
- This report was issued on 19/10/2020.



WORLD RECOGNISED
ACCREDITATION

Accreditation No. 14960
Accredited for compliance
with ISO/IEC 17025 - Testing

checked:
Graham Lancaster
Laboratory Manager

RESULTS OF WATER ANALYSIS

9 samples supplied by Coastwide Civil Pty Ltd on 13/10/2020. Lab Job No. J9357.

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

19 Croome Lane ALBION PARK NSW 2527

Parameter	Methods reference	Sample 1 MP22 01/10/20	Sample 2 MP23 01/10/20	Sample 3 MP22 02/10/20	Sample 4 MP23 02/10/20	Sample 5 MP22 07/10/20	Sample 6 MP23 07/10/20	Sample 7 MP22 08/10/20	Sample 8 MP23 08/10/20	Sample 9 MP22 09/10/20
	Job No.	J9357/1	J9357/2	J9357/3	J9357/4	J9357/5	J9357/6	J9357/7	J9357/8	J9357/9
Total Suspended Solids (mg/L)	GFC equiv. filter - APHA 2540-D	36	21	22	13	13	15	46	29	24
Biochemical Oxygen Demand ₅ (mg/L O ₂)	APHA 5210-B	<1	<1	<1	<1	<1	<1	1	<1	<1
Nitrate (mg/L N)	APHA 4500 NO ₃ ⁻ -F	0.054	0.104	0.102	0.093	0.165	0.065	0.102	0.078	0.157
Ammonia (mg/L N)	APHA 4500 NH ₃ -H	0.120	0.141	0.110	0.226	0.199	0.116	0.090	0.135	0.096

Notes:

- 1 mg/L (milligram per litre) = 1 ppm (part per million) = 1000 µg/L (micrograms per litre) = 1000 ppb (part per billion).
- Analysis performed according to APHA (2017) 'Standard Methods for the Examination of Water & Wastewater', 23rd Edition, except where stated otherwise.
- Analysis conducted between sample arrival date and reporting date.
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- Results relate only to the samples tested.
- This report was issued on 20/10/2020.



RESULTS OF WATER ANALYSIS

2 samples supplied by Coastwide Civil Pty Ltd on 26/10/2020. Lab Job No. J9866.

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

19 Croome Lane ALBION PARK NSW 2527

Parameter	Methods reference	Sample 1 MP10 19/10/20	Sample 2 MP10 20/10/20
	Job No.	J9866/1	J9866/2
Total Suspended Solids (mg/L)	GFC equiv. filter - APHA 2540-D	6	3

Notes:

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

13 samples supplied by Coastwide Civil Pty Ltd on 26/10/2020. Lab Job No. J9867.

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/ JOB NO.	GFC equiv. filter - APHA 2540-D	APHA 5210-B	APHA 4500 NO ₃ ⁻ -F	APHA 4500 NH ₃ -H
MP22 12/10/2020	J9867/1	7	1.1	0.023	0.110
MP22 13/10/2020	J9867/2	29	<1	0.074	0.102
MP23 13/10/2020	J9867/3	17	<1	0.082	0.034
MP22 14/10/2020	J9867/4	8	1.5	0.008	0.062
MP23 14/10/2020	J9867/5	38	<1	0.073	0.045
MP22 15/10/2020	J9867/6	12	2.5	0.006	0.016
MP23 15/10/2020	J9867/7	35	<1	0.105	0.080
MP22 16/10/2020	J9867/8	25	3.3	0.009	0.009
MP23 16/10/2020	J9867/9	63	<1	<0.005	0.023
MP22 19/10/2020	J9867/10	9	1.0	0.239	0.104
MP23 19/10/2020	J9867/11	41	<1	<0.005	0.008
MP22 20/10/2020	J9867/12	10	1.4	0.037	0.130
MP23 20/10/2020	J9867/13	24	<1	<0.005	0.015

Notes:

- 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
- Metals and salts analysed by Inductively Coupled Plasma - Mass Spectrometry (ICP-MS).
- 1 mg/L (milligram per litre) = 1 ppm (part per million) = 1000 µg/L (micrograms per litre) = 1000 ppb (part per billion).
- For conductivity 1 dS/m = 1 mS/cm = 1000 µS/cm.
- Analysis performed according to APHA (2017) 'Standard Methods for the Examination of Water & Wastewater', 23rd Edition, except where stated otherwise.
- Analysis conducted between sample arrival date and reporting date.
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- Results relate only to the samples tested.
- This report was issued on 03/11/2020.



checked:
Graham Lancaster
Laboratory Manager

RESULTS OF WATER ANALYSIS

7 samples supplied by Coastwide Civil Pty Ltd on 3/11/2020 . Lab Job No. K0164.

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

19 Croome Lane ALBION PARK NSW 2527

Parameter	Methods reference	Sample 1 MP22 21/10/2020	Sample 2 MP23 21/10/2020	Sample 3 MP22 22/10/2020	Sample 4 MP23 22/10/2020	Sample 5 MP22 23/10/2020	Sample 6 MP23 23/10/2020	Sample 7 MP10 26/10/2020
	<i>Job No.</i>	<i>K0164/1</i>	<i>K0164/2</i>	<i>K0164/3</i>	<i>K0164/4</i>	<i>K0164/5</i>	<i>K0164/6</i>	<i>K0164/7</i>
Total Suspended Solids (mg/L)	GFC equiv. filter - APHA 2540-D	12	60	10	55	8	23	11
Biochemical Oxygen Demand ₅ (mg/L O ₂)	APHA 5210-B	1.1	0.4	1.5	0.5	1.4	0.4	0.9
Nitrate (mg/L N)	APHA 4500 NO ₃ -F	<0.005	0.065	<0.005	0.079	<0.005	0.118	0.306
Ammonia (mg/L N)	APHA 4500 NH ₃ -H	0.072	0.079	0.024	0.078	0.040	0.092	0.079

Notes:

- 1 mg/L (milligram per litre) = 1 ppm (part per million) = 1000 µg/L (micrograms per litre) = 1000 ppb (part per billion).
- Analysis performed according to APHA (2017) 'Standard Methods for the Examination of Water & Wastewater', 23rd Edition, except where stated otherwise.
- Analysis conducted between sample arrival date and reporting date.
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- This report was issued on 10/11/2020.



RESULTS OF WATER ANALYSIS

12 samples supplied by Coastwide Civil Pty Ltd on 3/11/2020 . Lab Job No. K0165.
Samples submitted by Cameron Hawke. Your Job: Shell Cove Boat Harbour
19 Croome Lane ALBION PARK NSW 2527

Parameter	Methods reference	Sample 1 MP10 27/10/2020	Sample 2 MP22 27/10/2020	Sample 3 MP23 27/10/2020	Sample 4 MP10 28/10/2020	Sample 5 MP22 28/10/2020	Sample 6 MP23 28/10/2020	Sample 7 MP10 29/10/2020	Sample 8 MP22 29/10/2020	Sample 9 MP23 29/10/2020	Sample 10 MP10 30/10/2020	Sample 11 MP22 30/10/2020	Sample 12 MP23 30/10/2020
	Job No.	K0165/1	K0165/2	K0165/3	K0165/4	K0165/5	K0165/6	K0165/7	K0165/8	K0165/9	K0165/10	K0165/11	K0165/12
Total Suspended Solids (mg/L)	GFC equiv. filter - APHA 2540-D	3	5	53	1	4	49	2	16	12	4	4	13
Biochemical Oxygen Demand ₅ (mg/L O ₂)	APHA 5210-B	..	<1	<1	..	<1	<1	..	1.1	<1	..	<1	<1
Nitrate (mg/L N)	APHA 4500 NO ₃ -F	..	1.25	0.125	..	1.89	0.134	..	0.861	0.096	..	2.06	0.102
Ammonia (mg/L N)	APHA 4500 NH ₃ -H	..	0.092	0.054	..	0.117	0.060	..	0.070	0.076	..	0.032	0.085

- 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 12/11/2020.



CERTIFICATE OF ANALYSIS

Work Order : **EW2004906**
Client : **COASTWIDE CIVIL**
Contact : CAMERON HAWKE
Address : 19 Croome Lane
 Albion Park 2527

Telephone : ----
 Project : SCBH2
 Order number : ----
 C-O-C number : ----
 Sampler : ----
 Site : ----
 Quote number : ----
 No. of samples received : 3
 No. of samples analysed : 3

Page : 1 of 2
Laboratory : Environmental Division NSW South Coast
Contact : Glenn Davies
Address : 1/19 Ralph Black Dr, North Wollongong 2500
 4/13 Geary Pl, North Nowra 2541
 Australia NSW Australia
 Telephone : 02 42253125
 Date Samples Received : 02-Nov-2020 10:15
 Date Analysis Commenced : 04-Nov-2020
 Issue Date : 11-Nov-2020 16:44



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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	Position	Accreditation Category
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 01/10/2020 - 02/11/2020	MP2 01/10/2020 - 02/11/2020	MP3 01/10/2020 - 02/11/2020	----	----
Client sampling date / time				02-Nov-2020 00:00	02-Nov-2020 00:00	02-Nov-2020 00:00	----	----
Compound	CAS Number	LOR	Unit	EW2004906-001	EW2004906-002	EW2004906-003	-----	-----
				Result	Result	Result	----	----
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	1.0	1.6	3.5	----	----
Ash Content (mg)	----	1	mg	18	31	66	----	----
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	0.4	0.9	0.7	----	----
Combustible Matter (mg)	----	1	mg	9	16	13	----	----
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	1.4	2.5	4.2	----	----
Total Insoluble Matter (mg)	----	1	mg	27	47	79	----	----



Appendix C
– Site Rainfall Measurements

Thursday	1/10/2020	2.0	Tameeka Collins
Friday	2/10/2020	0.0	Tameeka Collins
Saturday	3/10/2020	*	
Sunday	4/10/2020	*	
Monday	5/10/2020	*	
Tuesday	6/10/2020	*	
Wednesday	7/10/2020	2.0	Tameeka Collins
Thursday	8/10/2020	3.0	Tameeka Collins
Friday	9/10/2020	0.0	Cam Hawke
Saturday	10/10/2020	*	
Sunday	11/10/2020	*	
Monday	12/10/2020	0.0	Cam Hawke
Tuesday	13/10/2020	0.0	Cam Hawke
Wednesday	14/10/2020	0.0	Cam Hawke
Thursday	15/10/2020	0.0	Cam Hawke
Friday	16/10/2020	1.0	Cam Hawke
Saturday	17/10/2020	*	
Sunday	18/10/2020	*	
Monday	19/10/2020	18.0	Cam Hawke
Tuesday	20/10/2020	0.0	Cam Hawke
Wednesday	21/10/2020	0.0	Cam Hawke
Thursday	22/10/2020	0.0	Cam Hawke
Friday	23/10/2020	2.0	Cam Hawke
Saturday	24/10/2020	*	
Sunday	25/10/2020	*	
Monday	26/10/2020	56.0	Cam Hawke
Tuesday	27/10/2020	9.0	Cam Hawke
Wednesday	28/10/2020	3.0	Cam Hawke
Thursday	29/10/2020	6.0	Cam Hawke
Friday	30/10/2020	7.0	Cam Hawke
Saturday	31/10/2020	*	