Monthly Air Quality Monitoring – March 2020
Bass Point Quarry

Licensee
HANSON CONSTRUCTION MATERIALS PTY LTD
LOCKED BAG 5260
PARRAMATTA NSW 2124

Premises Details
HANSON CONSTRUCTION MATERIALS PTY LTD
BOOLLWARROO PARADE
SHELLHARBOUR
NSW 2529
LOT 16 DP 627783, LOT 78 DP 751290, LOT 22 DP 1010797

Project Approval: Ref 08_0143, January 28, 2014
Environmental Protection Licence (EPL) No: 2193*

* Listed in the EPA Public Register

Report Author: Chelsea Flood (Compliance Officer)
Date issued: 06.05.2020

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Figures

Tables

1. Air quality monitoring requirements

As per the Project Approval and Air Quality Management Plan (AQMP), the quarry is required to report on the following:

1.1. Particulate Matter

The quarry monitors two PM_{10} samplers (**Table 1**, **Figure 1**) and will gather representative data, to compare the results against the following tables:

Table 4: Long-Term Impact Assessment Criteria for Particulate Matter

Pollutant	***Averaging period***	***[d] Criterion***
Total suspended particulates (TSP)	Annual	[a] 90 µg/m^3
Particulate matter < 10 µm (PM_{10})	Annual	[a] 30 µg/m^3

Table 5: Short Term Impact Assessment Criteria for Particulate Matter

Pollutant	***Averaging period***	***[d] Criterion***
Particulate matter < 10 µm (PM_{10})	24 hour	[a] 50 µg/m^3

1.2. Dust Deposition Gauges

The quarry monitors two Dust Deposition Gauges (DDGs) (**Table 1**, **Figure 1**) and will compare the results against the following table:

Table 6: Long-Term Impact Assessment Criteria for Deposited Dust

Pollutant	***Averaging period***	***Maximum increase in deposited dust level***	***Maximum total deposited dust level***
[c] Deposited dust	Annual	[b] 2 g/m^2/month	[a] 4 g/m^2/month

1.3. Representative Meteorological Data

The quarry will gather representative meteorological data for the respective month including temperature, rainfall, wind speed and direction.

2. Air quality monitoring program

The Air Quality Management Plan was prepared by SLR Global Environmental solutions and details the assessment criteria, monitoring locations and procedures, and the compliance checking procedures for the subsequent reporting in accordance with the Department of Planning, Industry and Environment (DPIE) and the NSW Environment Protection Authority (EPA) requirements.

All monitoring locations conform to the requirements of *AS 3580.1.1:2016*, subject to local site constraints. Monitoring activities are outlined in **Table 1**, with site monitoring points shown in **Figure 1**. Note that Site No. PM10-1 is used as a management tool and not for compliance purposes, and as such, is not used to establish compliance monitoring for PM_{10}. In addition, though not part of the Bass Point Quarry air quality monitoring program, regional background data for 24 hour PM_{10} concentration is sourced from the Office of Environment and Heritage (OEH) Albion Park South Air Quality Monitoring Station (AQMS) as per the AQMP.

Table 1: Summary of the air quality monitoring program at Bass Point Quarry. Sites that are not monitored for compliance purposes (e.g. used as management tools only) are shaded pale grey.

Site No.	Location	Parameter	Instrument	Sampling frequency	Reporting frequency
DDG-1	Western Boundary	Dust Deposition	Dust Deposition Gauge (DDG)	30 days (± 2 days)	Monthly
DDG-2	West, on the amenity bund	Dust Deposition	Dust Deposition Gauge (DDG)	30 days (± 2 days)	Monthly
Automatic Weather Station	Kiama (Bombo Headland)	Meteorological Parameters	Automatic Weather Station (AWS)	Continuous	Monthly
PM10-1	West of the Main Site Office	PM_{10}	Beta Attenuation Monitor (BAM)	Continuous	Monthly
PM10-2	West, on the amenity bund	PM_{10}	Low Volume Air Sampler (LVAS)	1 in 6 day sampling	Monthly

Figure 1: Monitoring locations at the Bass Point Quarry. Air quality monitoring locations have been acronymised as follows: DDG1 – Dust Deposition Gauge 1; DDG2 – Dust Deposition Gauge 2; PM10-1 – Continuous PM_{10} Monitor; PM10-2 – Low Volume PM_{10} Sampler.

3. Monthly results

3.1. Particulate Matter – Particulate Matter < 10 µm (PM_{10})

The PM10-2 (LVAS) monitoring site is located on the site boundary (as per the AQMP). An exceedance of the 24 hour or annual average criteria at this monitoring point therefore does not necessarily mean that there has been an exceedance of the assessment criteria outlined in Project Approval 08_0143 Schedule 3 (which apply at any residence on privately-owned land). PM10-2 was relocated offsite in February 2020 to undertake a detailed investigation, however, the unit malfunctioned and was sent for repairs. The unit was being still under repair for the month of March 2020 and there is no data available.

The 24 hour average PM_{10} reading at Albion Park South AQMS was below the 50 µg/m^3 criterion for all sampling dates during March 2020 (**Figure 2**, **Table 2**) and was hence compliant.

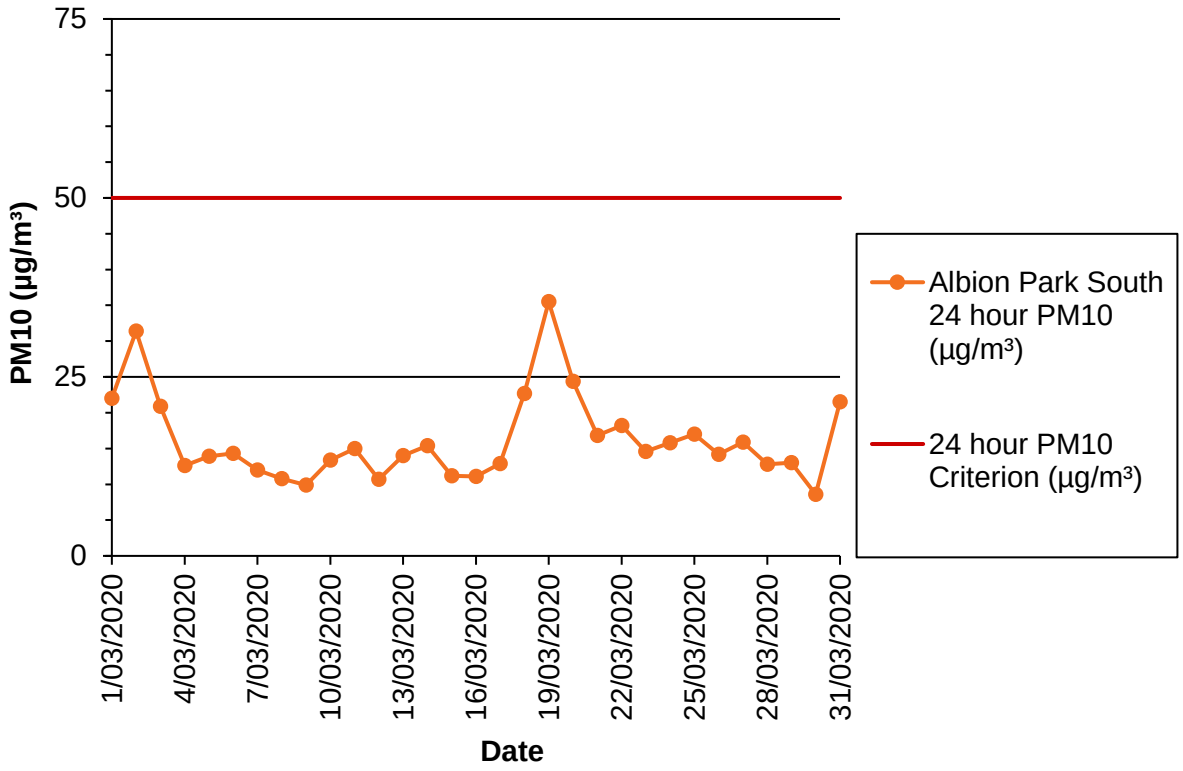


Figure 2: Twenty-four hour PM_{10} concentration (µg/m^3) as measured at Albion Park South AQMS during March 2020, compared to the annual criterion and 24 hour criterion (µg/m^3).

Hanson are required to report on the annual average 24 hour PM_{10} concentration for the identified periods: (i) calendar year, as part of the Environmental Management Annual Review, and; (ii) 15th June to 14th June, as part of the EPL Annual Return. Annual average PM_{10} data is therefore not required as part of the March 2020 monthly report. However, as a management tool, Hanson have begun calculating the rolling annual average 24 hour PM_{10} for the monthly air quality reports.

The rolling annual average 24 hour PM_{10} for the PM10-2 site, as calculated using data up to and including March 2020, was 72.7 µg/m^3. This is above the annual PM_{10}

criterion of 30 µg/m^3. As such, Hanson will be undertaking a more detailed investigation into the PM_{10} levels experienced at a relevant nearby residence or receiver, as is required under the site AQMP. This investigation is pending the repair and return of the PM10-2 unit.

The rolling annual average 24 hour PM_{10} from the OEH Albion Park South AQMS, as calculated using data the 12 months up to and including March 2020, was 20.8 µg/m^3. This is slightly more than two-thirds of the 30 µg/m^3 annual limit as outlined in the Project Approval 08_0143.

As per the AQMP, the PM10-1 (E-BAM) monitoring site is located on-site and is significantly closer to the quarrying activities than the nearest sensitive receptors. An exceedance of the PM_{10} criterion recorded at this location (**Figure 3**, **Table 2**) therefore does not represent non-compliance with the criteria outlined in Project Approval 08_0143 Schedule 3 (which apply at any residence on privately-owned land). In addition, PM10-1 is used as a management tool and not for compliance purposes, and as such, is not used to establish compliance monitoring for PM_{10}.

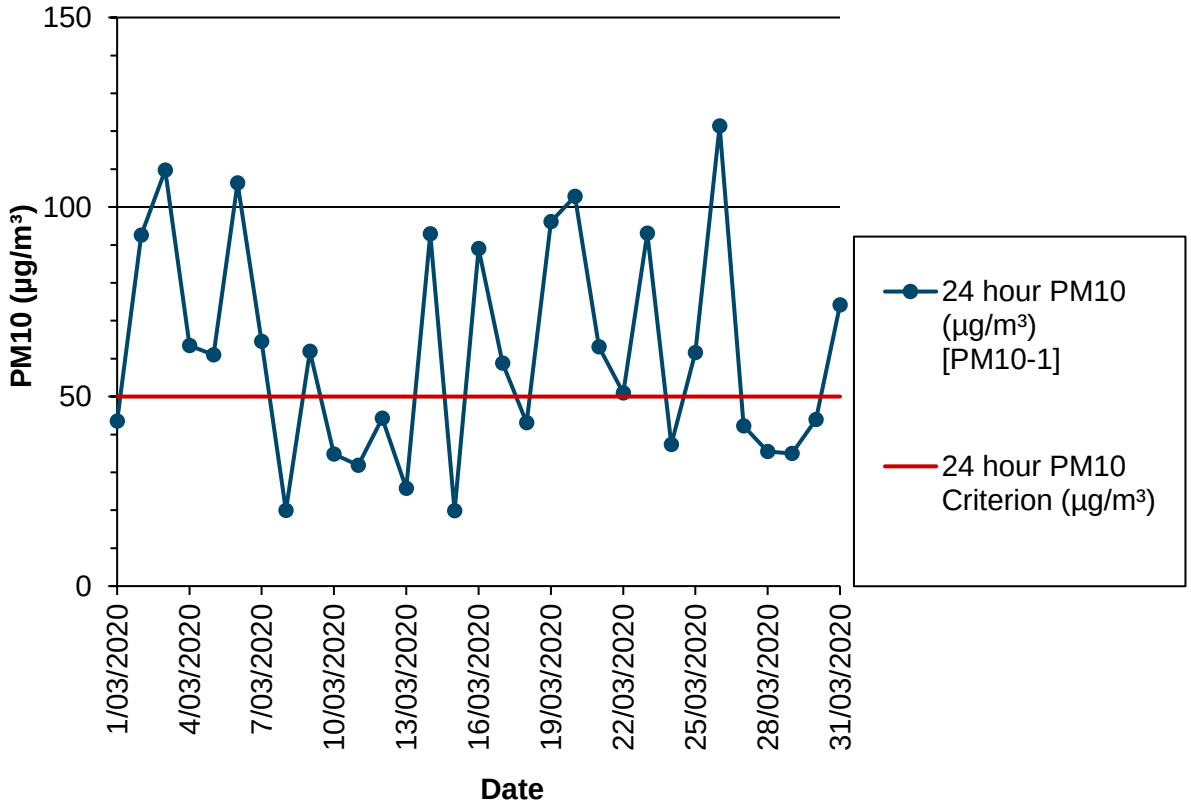


Figure 3: Twenty-four hour PM_{10} concentration (µg/m^3) as measured at PM10-1 during March 2020, compared to the annual PM_{10} criterion and 24 hour PM_{10} criterion (µg/m^3).

Table 2: Monitoring results for Particulate Matter – PM_{10} monitoring during March 2020. Prevailing wind conditions and climate data were measured at PM10-1. Apparent exceedances of the 24 hour PM_{10} criteria are shaded red. Note that as previously discussed, PM10-1 is not used for compliance monitoring; exceedances of the 24 hour PM_{10} criteria at this monitoring location are shaded orange.

Date	24 hour PM_{10} (µg/m³) [PM10-1]	24 hour PM_{10} (µg/m³) [PM10-2]	24 hour PM_{10} (µg/m³) [Albion Park South]	24 hour PM_{10} Criterion (µg/m³)	Mean Wind Speed (m/s)	Mode Wind Direction (°)	Mean Atm. Temp. (°C)	Mean Relative Humidity (%)	Mean Bar. Pressure (mmHg)	Comments
1/03/2020	44		22	50	4.1	N	22.8	84	756	PM10-2 malfunctioned in February 2020.
2/03/2020	93		31	50	2.5	SE	23.9	65	756	
3/03/2020	110		21	50	2.2	S	19.5	77	763	
4/03/2020	63		13	50	3.9	N	20.5	94	761	
5/03/2020	61		14	50	6.4	N	21.6	96	755	
6/03/2020	106		14	50	2.3	SSW	21.9	86	755	
7/03/2020	65		12	50	3.2	SSW	20.1	78	762	
8/03/2020	20		11	50	2.7	SSW	19.3	77	763	
9/03/2020	62		10	50	2.4	SSW	18.5	79	764	
10/03/2020	35		13	50	1.7	SSW	19.6	75	764	
11/03/2020	32		15	50	1.8	NNE	20.9	70	765	
12/03/2020	44		11	50	2.2	NNE	20.9	71	766	
13/03/2020	26		14	50	4.2	W	20.5	70	761	
14/03/2020	93		15	50	5.0	SSW	16.8	74	761	
15/03/2020	20		11	50	4.0	SSW	16.8	69	765	
16/03/2020	89		11	50	3.8	SSW	18.9	73	767	
17/03/2020	59		13	50	2.3	SW	19.7	72	768	
18/03/2020	43		23	50	3.7	N	19.7	78	766	
19/03/2020	96		36	50	1.4	NNE	22.3	74	762	
20/03/2020	103		24	50	3.1	NW	25.7	61	758	
21/03/2020	63		17	50	1.8	SW	20.3	74	762	
22/03/2020	51		18	50	2.7	ESE	21.3	73	762	
23/03/2020	93		15	50	3.1	S	19.5	65	766	
24/03/2020	37		16	50	2.9	SSW	19.6	78	765	
25/03/2020	62		17	50	3.2	SSE	20.3	81	762	
26/03/2020	121		14	50	3.8	S	19.3	71	766	
27/03/2020	42		16	50	1.7	E	20.0	67	767	
28/03/2020	35		13	50	2.2	SSW	19.6	78	766	
29/03/2020	35		13	50	4.4	N	20.5	90	761	
30/03/2020	44		9	50	2.0	NNW	23.0	71	757	
31/03/2020	74		22	50	2.0	E	22.1	81	760	

3.2. Particulate Matter – Total Suspended Particles (TSP)

Total Suspended Particles (TSP) is not currently monitored in the vicinity of the Bass Point Quarry. The SLR Global Environmental Solutions (formerly Heggies Pty Ltd) prepared report *Bass Point Quarry Expansion – Air Quality Impact Assessment* (2010) determined that the approximate PM_{10} to TSP ratio is 36.2% for the Illawarra region.

Hanson are required to report on the annual average TSP concentration for the calendar year, as part of the Environmental Management Annual Review. This annual average TSP data is therefore not required as part of the March 2020 monthly report. However, as a management tool, Hanson have begun calculating the rolling annual average TSP for the monthly air quality reports. In the absence of TSP readings, the 36.2% ratio has been applied to the Albion Park South AQMS rolling annual average 24 hour PM_{10} data (as per the AQMP) for March 2020 (**Table 3**). The rolling annual average TSP is therefore 57.5 µg/m^3; over half of the annual TSP criterion of 90 µg/m^3 identified in Project Approval 08_0143 Schedule 3.

Table 3: Calculation of Rolling Annual Average TSP (µg/m^3) for the month of Mach 2020.

Rolling annual average 24 hour PM_{10} (µg/m^3) [Albion Park South]	PM_{10} to TSP ratio	Calculated rolling annual average TSP	Annual TSP criterion
20.8 µg/m^3	36.2%	57.5 µg/m^3	90 µg/m^3

3.3. Dust Deposition Gauges

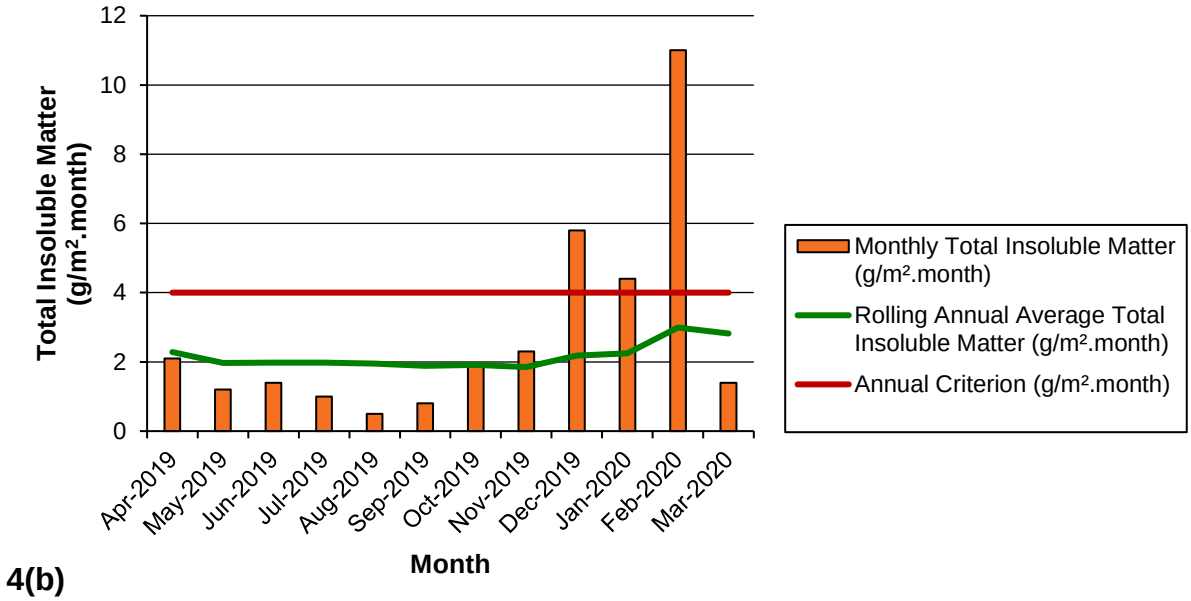
Monthly analyses of deposited dust samples collected at DDG-1 and DDG-2 are completed by NATA-accredited laboratory ALS Environmental. Monitoring results for the month of March 2020 indicate that dust deposition at DDG-1 was less than the annual criterion of 4 g/m^2.month identified in Project Approval 08_0143 Schedule 3 and EPL-2193 (**Table 4**, **Figure 4(a)**). Dust deposition at DDG-2 was greater than the annual criterion (**Table 4**, **Figure 4(b)**).

Wind direction analysis suggests that sources external to the site may be at least partially attributable to the elevated results at DDG-2. South-south-west winds had the highest relative prevalence in March 2020, followed by north winds. The location of DDG-2 at the north-western site boundary means that the dust gauge may have had considerable exposure to to dust sources not associated with the site during the north winds. In addition, DDG-2 is located in close proximity to earthworks and the associated haulage route for the Shell Cove Boat Harbour Redevelopment project, which may have impacted the results.

Table 4: Monthly Total Insoluble Matter (g/m^2.month) measured at the two Bass Point Quarry Dust Deposition Gauges (DDGs) during the period 12/02/2020 to 13/03/2020 (i.e. March 2020), and calculated rolling annual average Total Insoluble Matter (g/m^2.month).

Site	Monthly Total Insoluble Matter (g/m^2.month)	Rolling Annual Average Total Insoluble Matter (g/m^2.month)	Comments
DDG-1	1.4	2.8	
DDG-2	5.0	9.8	Results likely affected by Boat Harbour construction and external sources

4(a)



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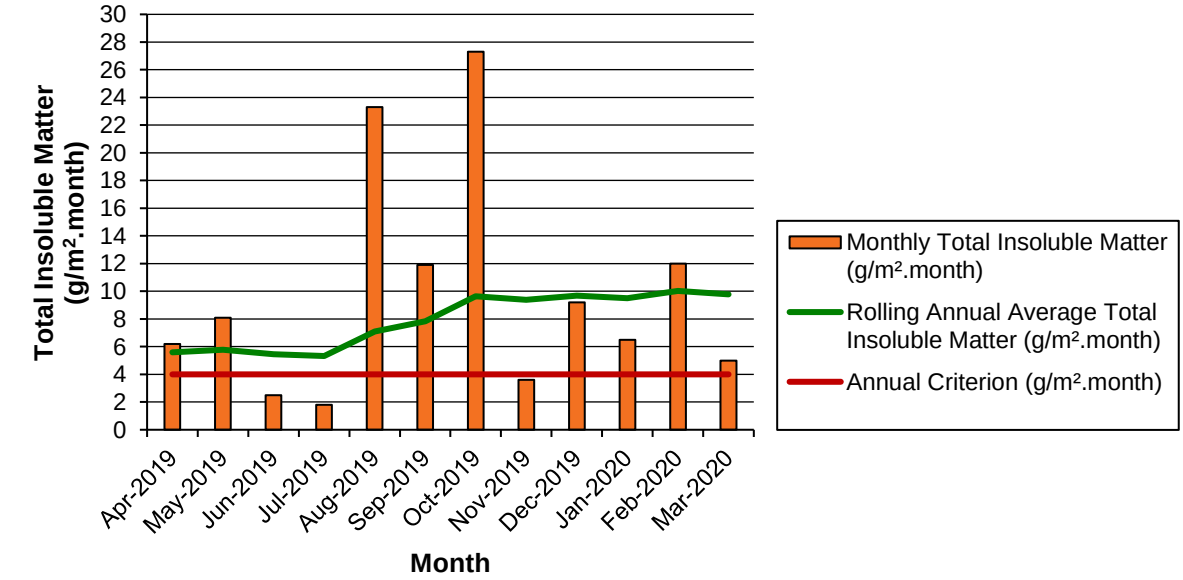


Figure 4: Total Insoluble Matter, rolling annual average, and annual criterion (g/m^2.month) for the Bass Point Quarry as measured at **(a)** DDG-1, and; **(b)** DDG-2; during the 12-month period to March 2020.

4. Representative Meteorological Data

Representative meteorological data has been sourced from the Bureau of Meteorology's (BOM) Kiama (Bombo Headland) Automatic Weather Station (AWS), as per the AQMP.

4.1. Monthly Meteorological Data Summary

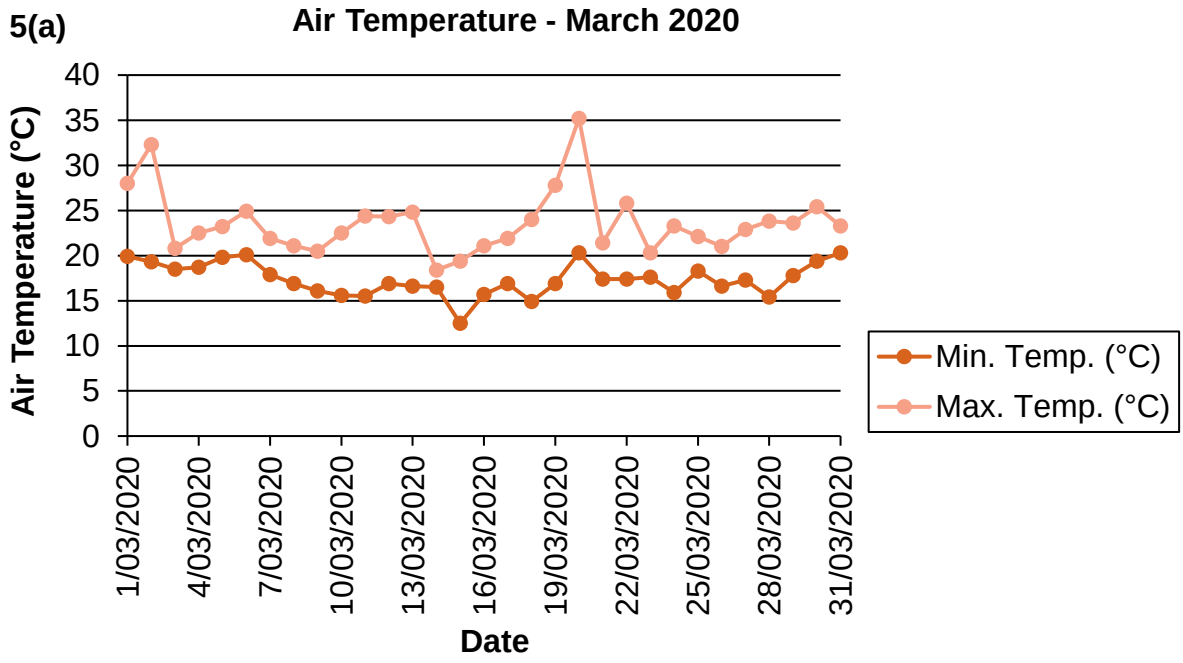
Table 5: Summary of representative meteorological data sourced from the BOM Kiama (Bombo Headland) AWS.

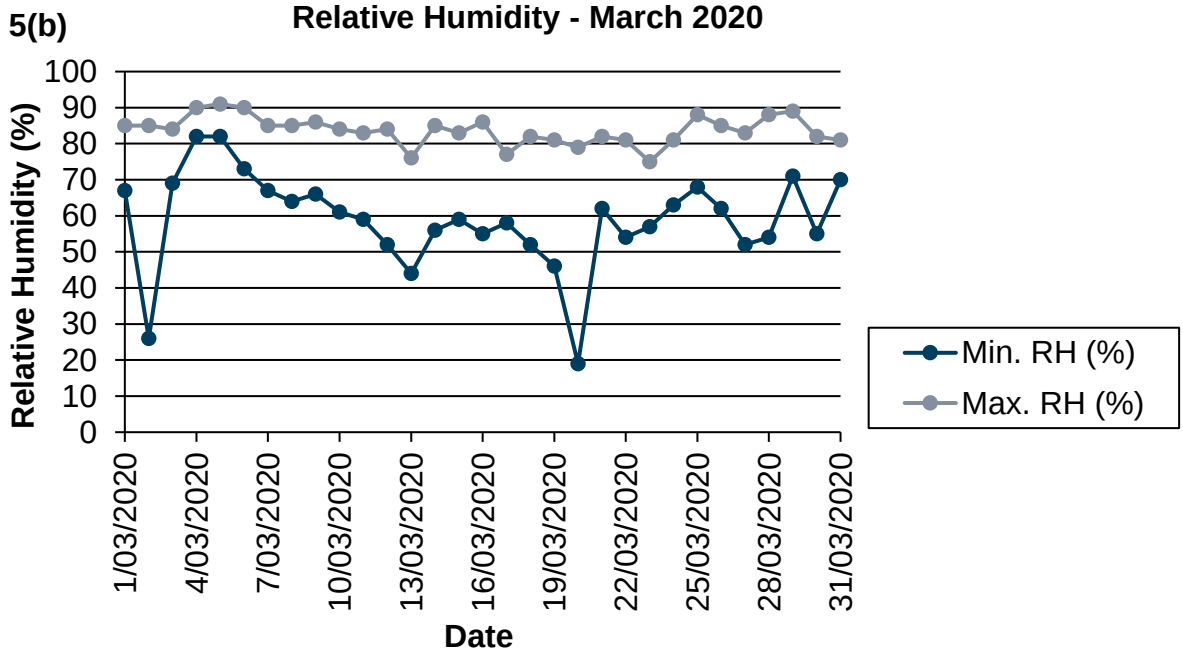
Date	Min. Temp. (°C)	Max. Temp. (°C)	Evapo-Transp. (mm)	Rainfall (mm)	Min. RH (%)	Max. RH (%)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	Time of maximum wind gust	Average 10 m Wind Speed (m/sec)	Solar Radiation (MJ/sq m)
1/03/2020	19.9	28.0	4.9	0.0	67	85	N	41	15:31	3.97	24.58
2/03/2020	19.3	32.3	7.2	0.0	26	85	SSE	70	13:40	5.36	21.84
3/03/2020	18.5	20.8	2.2	0.0	69	84	S	31	10:41	4.08	5.22
4/03/2020	18.7	22.5	1.5	8.8	82	90	NNE	44	9:13	4.10	3.17
5/03/2020	19.8	23.2	1.6	9.2	82	91	N	50	12:38	5.67	2.59
6/03/2020	20.1	24.9	3.0	13.2	73	90	SSE	44	17:42	4.66	12.47
7/03/2020	17.9	21.9	3.9	1.2	67	85	S	52	14:53	6.33	19.70
8/03/2020	16.9	21.1	3.7	3.0	64	85	SSW	46	8:58	5.92	18.32
9/03/2020	16.1	20.5	3.3	0.0	66	86	SSE	41	10:57	4.70	16.32
10/03/2020	15.6	22.5	3.8	2.0	61	84	SSE	28	23:23	2.70	21.69
11/03/2020	15.5	24.4	4.0	0.0	59	83	NNE	22	19:39	2.29	22.59
12/03/2020	16.9	24.3	4.2	1.4	52	84	NNE	26	10:55	3.14	21.34
13/03/2020	16.6	24.8	5.1	0.2	44	76	N	46	18:00	4.62	22.36
14/03/2020	16.5	18.4	3.0	0.8	56	85	S	76	4:03	9.90	1.56
15/03/2020	12.5	19.4	3.5	8.4	59	83	S	52	13:04	7.45	14.52
16/03/2020	15.7	21.1	4.0	3.2	55	86	SSW	48	7:58	7.63	16.70
17/03/2020	16.9	21.9	3.9	1.0	58	77	SSE	37	10:05	4.01	19.63
18/03/2020	14.9	24.0	4.2	0.2	52	82	N	39	14:42	3.51	21.44
19/03/2020	16.9	27.8	4.2	0.0	46	81	N	24	17:58	2.03	21.11
20/03/2020	20.3	35.2	8.0	0.0	19	79	S	63	18:20	5.52	20.96
21/03/2020	17.4	21.4	3.4	0.0	62	82	SSE	35	11:56	3.61	17.23
22/03/2020	17.4	25.8	4.6	0.0	54	81	SSE	54	21:51	5.26	20.02
23/03/2020	17.6	20.3	4.3	3.2	57	75	SSE	57	23:52	6.58	19.53
24/03/2020	15.9	23.3	3.3	0.2	63	81	N	39	15:15	2.95	16.66
25/03/2020	18.3	22.1	2.6	0.0	68	88	SSW	43	22:55	5.40	8.41
26/03/2020	16.6	21.0	3.7	7.4	62	85	S	56	2:01	7.45	18.01
27/03/2020	17.3	22.9	3.4	0.6	52	83	ESE	33	0:11	2.73	16.71
28/03/2020	15.4	23.8	3.4	1.2	54	88	N	43	18:57	2.55	18.20
29/03/2020	17.8	23.6	3.0	11.0	71	89	NNE	44	14:34	4.23	15.54
30/03/2020	19.4	25.4	2.5	0.0	55	82	WSW	26	13:44	1.67	9.76
31/03/2020	20.3	23.3	3.3	0.2	70	81	SSW	43	0:03	4.21	15.70

Monthly	Min. Temp. (°C)	Max. Temp. (°C)	Evapo-Transp. (mm)	Rainfall (mm)	Min. RH (%)	Max. RH (%)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	Time of maximum wind gust	Average 10 m Wind Speed (m/sec)	Solar Radiation (MJ/sq m)
Mean	17.4	23.6	3.8	2.5	59	84	-	44	-	4.65	16.25
Lowest	12.5	18.4	1.5	0.0	19	75	NNE	22	19:39	1.67	1.56
Highest	20.3	35.2	8.0	13.2	82	91	S	76	4:03	9.90	24.58
Total	-	-	116.7	76.4	-	-	-	-	-	-	-

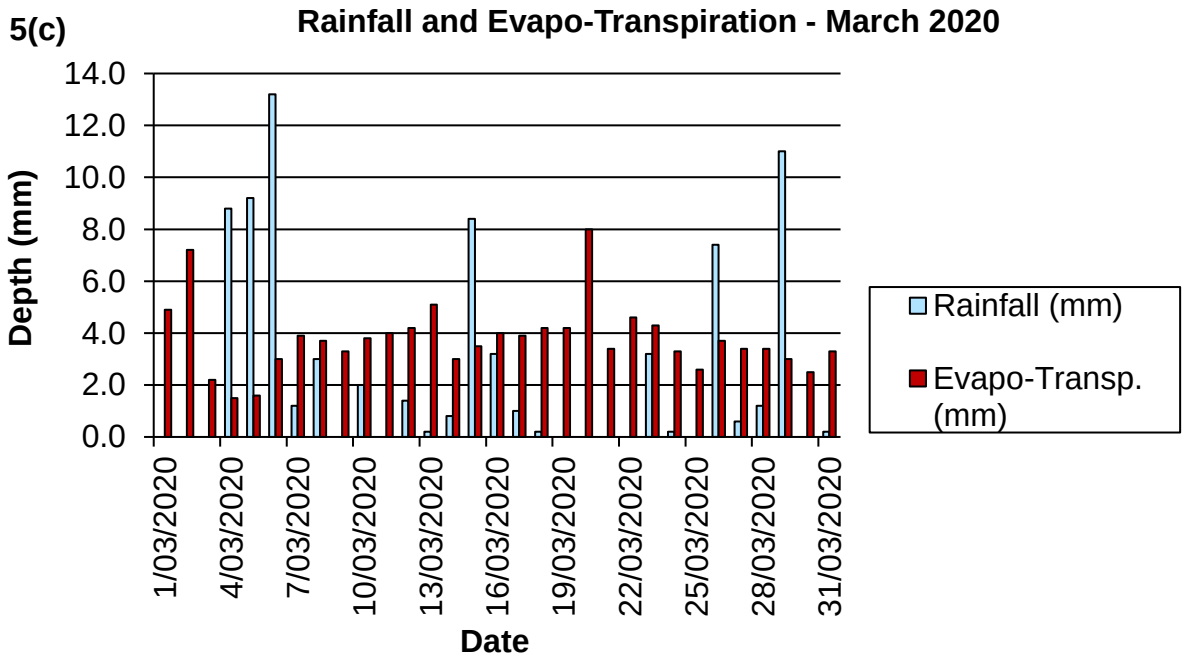
4.2. Monthly Weather Charts

Figure 5: Summary of representative meteorological data sourced from the BOM Kiama (Bombo Headland) AWS for **(a)** Air Temperature; **(b)** Relative Humidity; **(c)** Rainfall and Evapo-Transpiration; and, **(d)** Wind Speed and Direction. Note that wind speed and direction data was sourced from PM10-1.

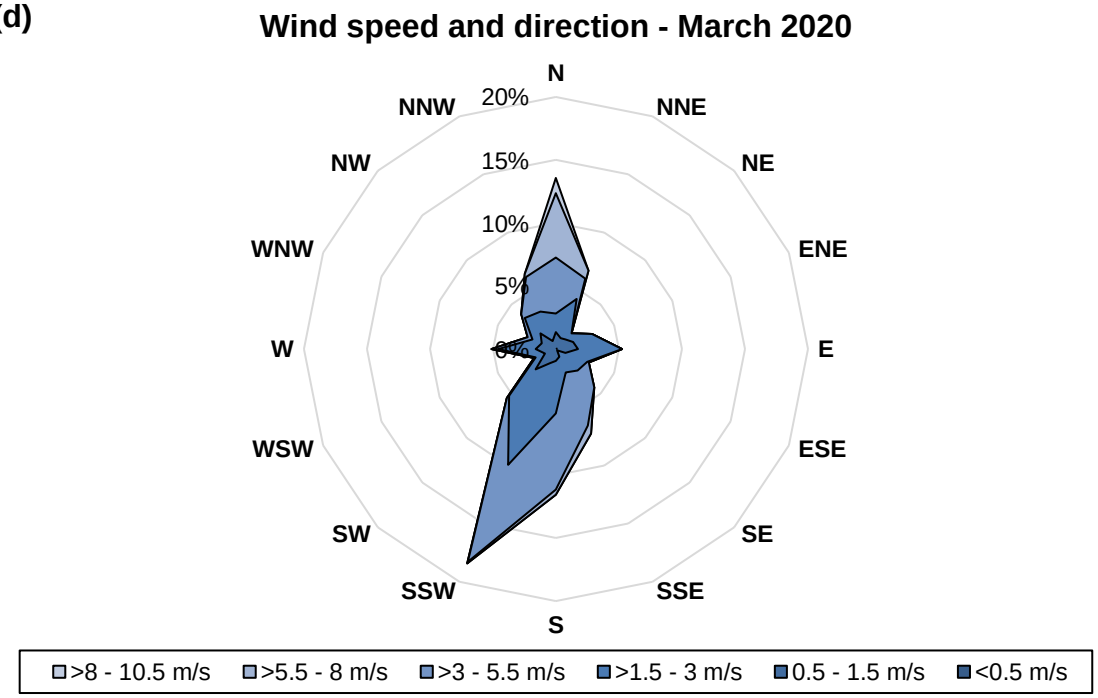




5(c)


Rainfall and Evapo-Transpiration - March 2020
Depth (mm)
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
1/03/2020
4/03/2020
7/03/2020
10/03/2020
13/03/2020
16/03/2020
19/03/2020
22/03/2020
25/03/2020
28/03/2020
31/03/2020
Date
Rainfall (mm)
Evapo-Transp. (mm)

5(d)


Wind speed and direction - March 2020
N
NNE
NE
ENE
E
ESE
SE
SSE
S
SSW
SW
WSW
W
WNW
NW
NNW
20%
15%
10%
5%
0%
>8 - 10.5 m/s
>5.5 - 8 m/s
>3 - 5.5 m/s
>1.5 - 3 m/s
0.5 - 1.5 m/s
<0.5 m/s

Appendix 1
Chain of Custody & Laboratory Certificates

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ **Sydney** 277 Woodpark Rd, Smithfield NSW 2176 Ph 02 8784 8555 E samples.sydney@alsenviro.com
☐ **Newcastle:** 5 Rosegum Rd, Warabrook NSW 2304 Ph 02 4968 9433 E samples.newcastle@alsenviro.com
☐ **Brisbane:** 32 Shand St, Stafford QLD 4053 Ph 07 3243 7222 E samples.brisbane@alsenviro.com
☐ **Townsville:** 14-15 Desma Ct, Bohle QLD 4818 Ph 07 4796 0600 E: townsville.environmental@alsenviro.com
☐ **Melbourne:** 2-4 Westall Rd, Springvale VIC 3171 Ph 03 8549 9600 E: samples.melbourne@alsenviro.com
☐ **Adelaide:** 2-1 Burma Rd, Pooraka SA 5095 Ph: 08 8359 0890 E adelaide@alsenviro.com
☐ **Perth:** 10 Hod Way, Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsenviro.com
☐ **Launceston:** 27 Wellington St, Launceston TAS 7250 Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT:	Hanson Construction Materials	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☐ Standard TAT (List due date):
OFFICE:	Boollwarroo Pde Shellharbour NSW 2529		☐ Non Standard or urgent TAT (List due date):
PROJECT:	Bass Point Dust Monitoring	**ALS QUOTE NO.:**	WL/043/11
ORDER NUMBER:			
PROJECT MANAGER:	Steve Butcher	**CONTACT PH:**	02 4295 1352
SAMPLER:		**SAMPLER MOBILE:**	
COC emailed to ALS? (YES / NO)		**EDD FORMAT (or default):**	
Email Reports to :	steve.butcher@hanson.com.au		
Email Invoice to :	steve.butcher@hanson.com.au		

COC SEQUENCE NUMBER (Circle)

COC: 1 2 3 4 5 6 7

OF: 1 2 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact?	Yes	No	N/A
Free ice / Frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt		°C	
Other comment:			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE/TIME: 13.3.20 15:10	DATE/TIME: 13/3/20 15:30	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	A04-3 (Total Insoluble Solids, Ash, Combustibles)								Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	DDG 1	13·3·20 12:30	AIR	AG	1	✓								
	DDG 2	11:10	AIR	AG	1	✓								
	DDG 3	11:55	AIR	AG	1	✓								
				TOTAL	3									

Environmental Division
Wollongong
Work Order Reference
EW2001366

Telephone : 02 42253125

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EW2001366**	Page	: 1 of 2
Client	: **HANSON CONSTRUCTION MATERIALS PTY LTD**	Laboratory	: Environmental Division NSW South Coast
Contact	: MR STEVE BUTCHER	Contact	: Glenn Davies
Address	: BOOLLWARROO PDE SHELLHARBOUR NSW, AUSTRALIA 2529	Address	: 1/19 Ralph Black Dr, North Wollongong 2500 4/13 Geary Pl, North Nowra 2541 Australia NSW Australia
Telephone	: +61 02 4295 1355	Telephone	: 02 42253125
Project	: Bass Point Dust Monitoring	Date Samples Received	: 13-Mar-2020 15:46
Order number	: ----	Date Analysis Commenced	: 17-Mar-2020
C-O-C number	: ----	Issue Date	: 23-Mar-2020 16:15
Sampler	: Robert DaLio		
Site	: ----		
Quote number	: WL/043/11 Bass Point Dust Monitoring		
No. of samples received	: 3		
No. of samples analysed	: 3		

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*
Jennifer Targett	Quality Coordinator	Newcastle - Inorganics, Mayfield West, NSW

General Comments

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

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

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

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

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

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

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

- **Analytical 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 is not held for results reported in g/m².mth.
- Sampling completed as per FWI-EN010 Sampling of Dust Depositon Gauges.

Analytical Results

Sub-Matrix: **DEPOSITIONAL DUST** (Matrix: **AIR**)			Client sample ID	DDG 1 12/02/2020 - 13/03/2020	DDG 2 12/02/2020 - 13/03/2020	DDG 3 12/02/2020 - 13/03/2020	----	----
			Client sampling date / time	13-Mar-2020 12:30	13-Mar-2020 11:10	13-Mar-2020 11:55	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**EW2001366-001**	**EW2001366-002**	**EW2001366-003**	--------	--------
				Result	Result	Result	----	----
EA120: Ash Content								
Ash Content	----	0.1	g/m².month	**1.0**	**4.6**	**3.9**	----	----
Ash Content (mg)	----	1	mg	**18**	**82**	**75**	----	----
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m².month	**0.4**	**0.4**	**0.4**	----	----
Combustible Matter (mg)	----	1	mg	**6**	**7**	**8**	----	----
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m².month	**1.4**	**5.0**	**4.3**	----	----
Total Insoluble Matter (mg)	----	1	mg	**24**	**89**	**83**	----	----