Monthly Air Quality Monitoring – June 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: 11.08.2020

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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).

Four samples were collected during June 2020 (**Figure 2**, **Table 2**). An issue with sampling equipment prevented a fifth sample from being collected. All four samples were below the 24 hour average PM_{10} criterion of 50 µg/m^3 and were hence compliant. Note that two of the samples (24/06/2020 and 30/06/2020) were below the limit of reporting (LOR) for the laboratory, i.e. smaller that the laboratory is permitted to report. In those cases, the limit of reporting has been graphed.

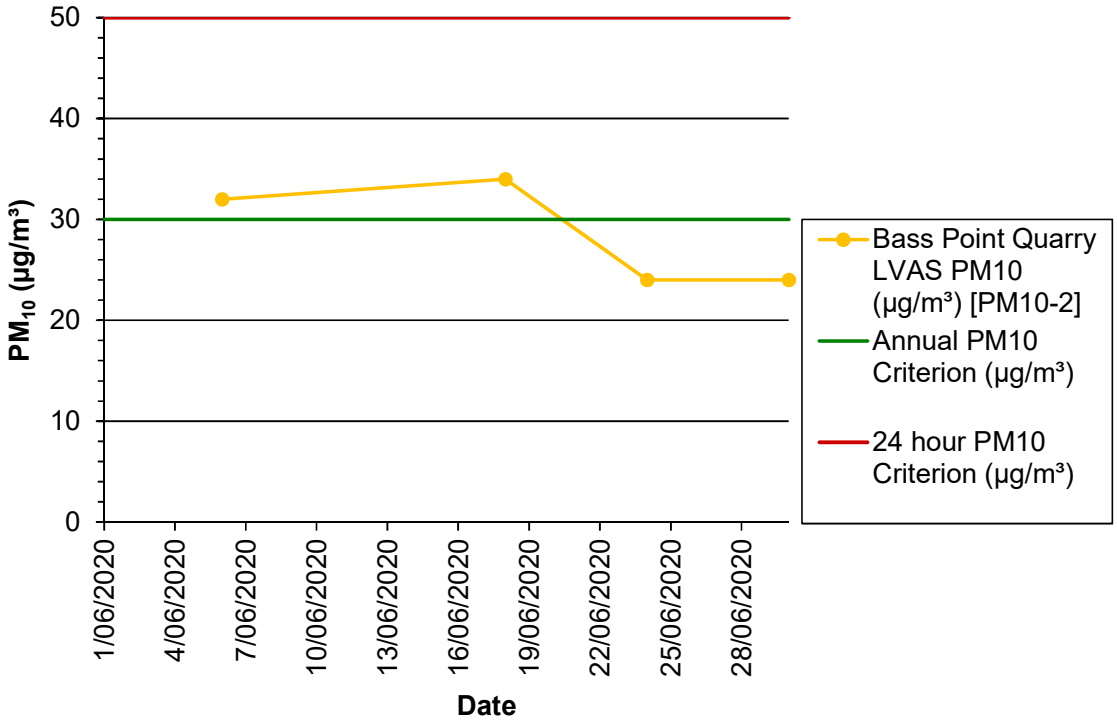


Figure 2: Twenty-four hour PM_{10} concentration (µg/m^3) as measured at PM10-2 during June 2020, compared to the annual criterion and 24 hour criterion (µg/m^3).

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

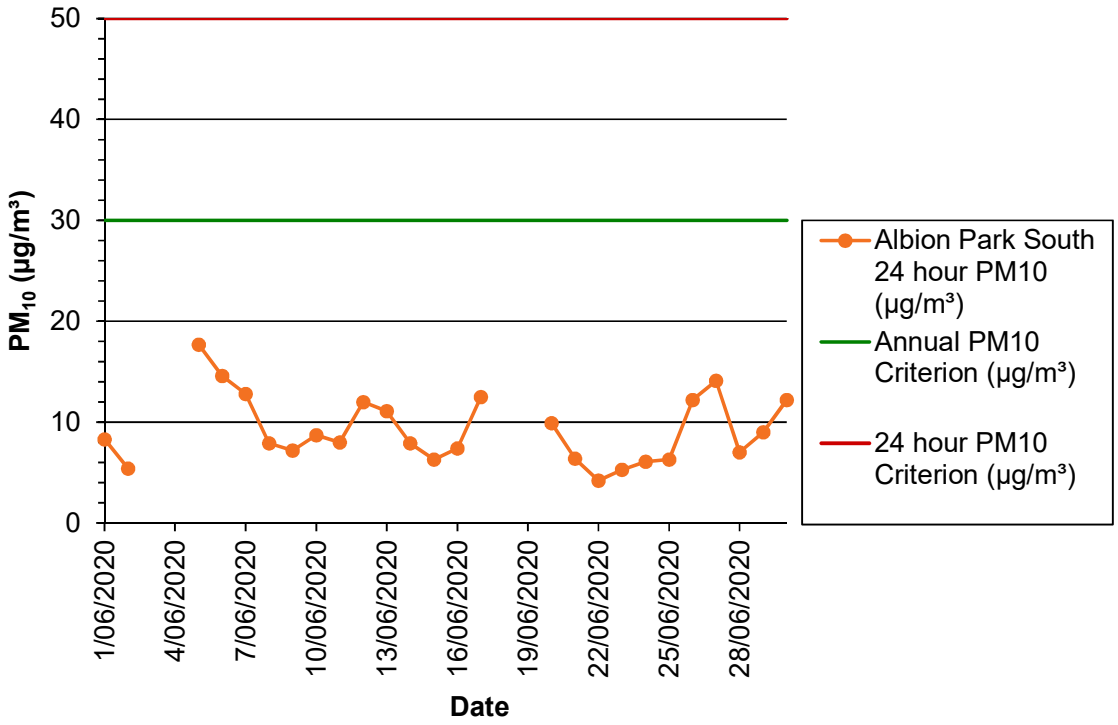


Figure 3: Twenty-four hour PM_{10} concentration (µg/m^3) as measured at Albion Park South AQMS during June 2020, compared to the annual criterion and 24 hour criterion (µg/m^3).

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. Annual average PM_{10} data is therefore not required as part of the June 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 June 2020, was 57.5 µg/m^3. This is above the annual PM_{10} criterion of 30 µg/m^3. Hanson are undertaking a more detailed investigation into the PM_{10} levels experienced at a relevant nearby residence/receiver, as is required under the site AQMP.

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 June 2020, was 20.6 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 4**, **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}.

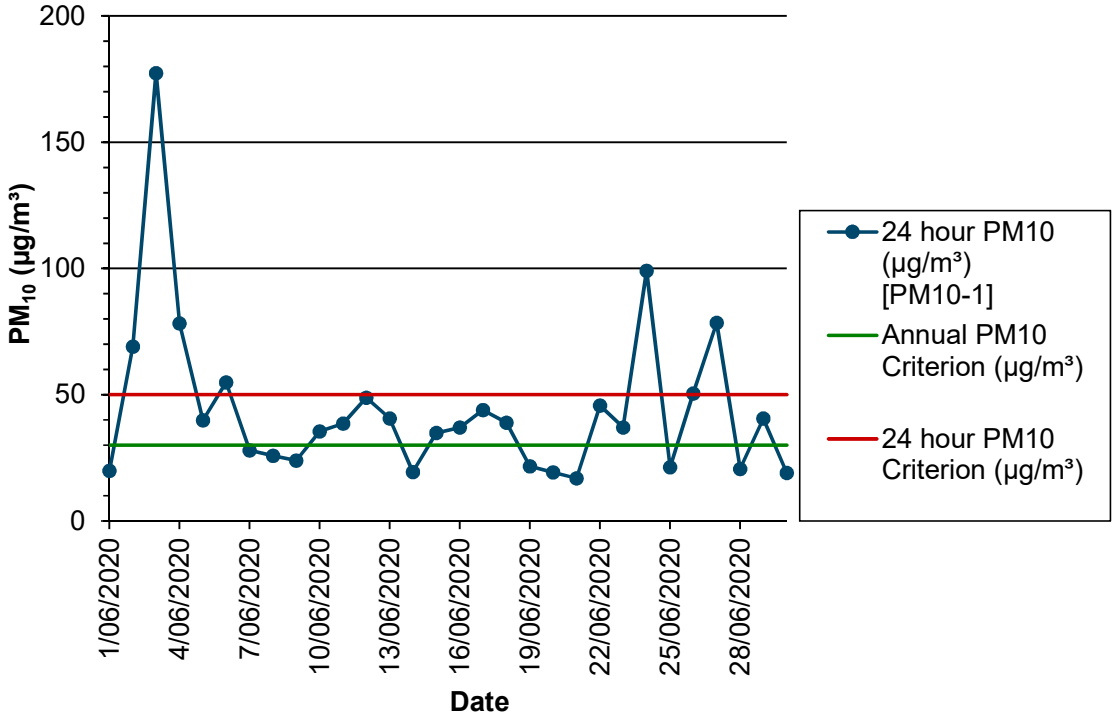


Figure 4: Twenty-four hour PM_{10} concentration (µg/m^3) as measured at PM10-1 during June 2020, compared to the annual PM_{10} criterion and 24 hour PM_{10} criterion (µg/m^3).

Table 2: Monitoring results for Particulate Matter – PM_{10} monitoring during June 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} ($\mu g/m^3$) [PM10-1]	24 hour PM_{10} ($\mu g/m^3$) [PM10-2]	24 hour PM_{10} ($\mu g/m^3$) [Albion Park South]	24 hour PM_{10} Criterion ($\mu g/m^3$)	Mean Wind Speed (m/s)	Mode Wind Direction (°)	Mean Atm. Temp. (°C)	Mean Relative Humidity (%)	Mean Bar. Pressure (mmHg)	Comments
1/06/2020	20		8.3	50	3.1	W	15.2	57	755	
2/06/2020	69		5.4	50	3.0	WSW	11.7	60	758	
3/06/2020	177			50	3.8	SSW	14.4	54	764	
4/06/2020	78			50	3.3	SSW	13.3	56	771	
5/06/2020	40		17.7	50	1.8	SSW	13.2	65	769	
6/06/2020	55	32	14.6	50	1.9	SW	13.8	69	766	
7/06/2020	28		12.8	50	2.9	SSW	13.4	75	765	
8/06/2020	26		7.9	50	4.1	SSW	13.8	71	769	
9/06/2020	24		7.2	50	2.5	SSW	14.9	86	771	
10/06/2020	35		8.7	50	2.1	N	14.9	95	769	
11/06/2020	39		8.0	50	2.4	SSW	15.6	83	765	
12/06/2020	49		12.0	50	2.7	S	15.2	82	766	Issue with PM10-2 sampling equipment, sampling not undertaken.
13/06/2020	41		11.1	50	2.5	N	16.1	89	763	
14/06/2020	19		7.9	50	3.4	W	15.9	68	759	
15/06/2020	35		6.3	50	2.0	W	15.7	55	763	
16/06/2020	37		7.4	50	2.2	WSW	17.2	53	764	
17/06/2020	44		12.5	50	3.2	SW	14.3	75	771	
18/06/2020	39	34		50	1.7	SSW	14.4	70	775	
19/06/2020	22			50	3.1	W	14.3	79	770	
20/06/2020	19		9.9	50	2.6	WNW	15.7	72	764	
21/06/2020	17		6.4	50	1.9	NW	13.8	67	757	
22/06/2020	46		4.2	50	2.1	W	11.8	60	754	
23/06/2020	37		5.3	50	2.7	WSW	12.3	54	756	
24/06/2020	99	*<24*	6.1	50	3.7	W	13.9	64	758	
25/06/2020	21		6.3	50	2.1	WSW	14.1	61	761	
26/06/2020	50		12.2	50	2.1	SW	14.0	57	765	
27/06/2020	79		14.1	50	2.6	SSW	13.1	64	768	
28/06/2020	21		7.0	50	2.7	SSW	12.5	71	768	
29/06/2020	41		9.0	50	1.8	SSW	13.2	82	768	
30/06/2020	19	*<24*	12.2	50	2.5	SSW	13.8	77	765	

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 June 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 June 2020 (**Table 3**). The rolling annual average TSP is therefore 56.8 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 June 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
20.6 µg/m^3	36.2%	56.8 µg/m^3	90 µg/m^3

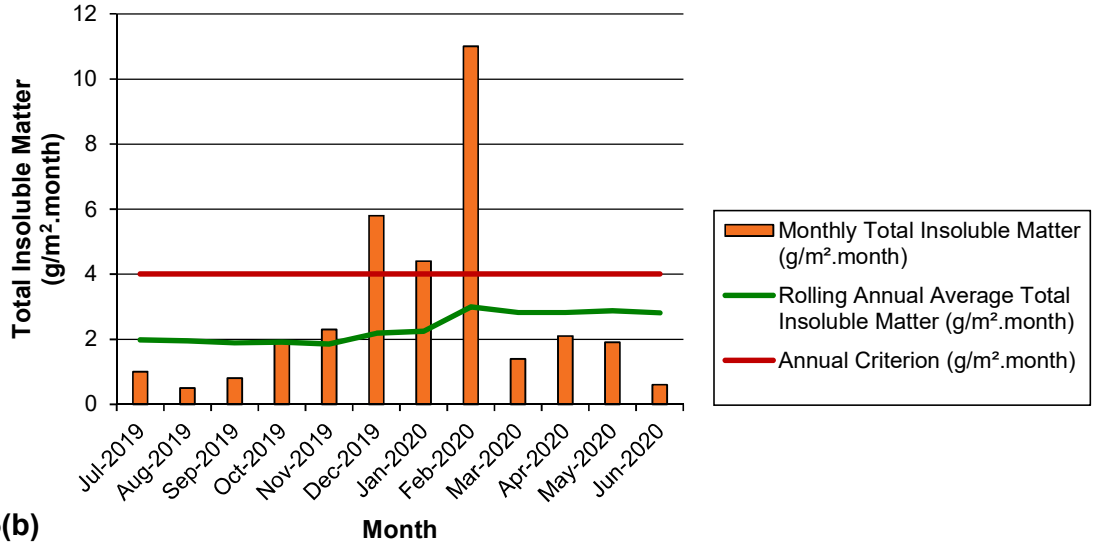
3.3. Dust Deposition Gauges

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 June 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 5(a)**). Dust deposition at DDG-2 was greater than the annual criterion of 4 g/m^2.month (**Table 4**, **Figure 5(b)**). The prevailing wind direction (**Figure 5(d)**) was southwest and south-southwest, which suggests that this high monitoring result at DDG-2 may be associated with the site (although not definitively). It is speculated that this result may be associated with ongoing earthworks associated with boat-harbour construction (i.e. not associated with the site), specifically, construction of a large earthen mound in close proximity to DDG-2.

Table 4: Monthly Total Insoluble Matter (g/m^2.month) measured at the two Bass Point Quarry Dust Deposition Gauges (DDGs) during the period 15/05/2020 to 15/06/2020 (i.e. June 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	0.6	2.8	
DDG-2	9.3	9.6	

5(a)



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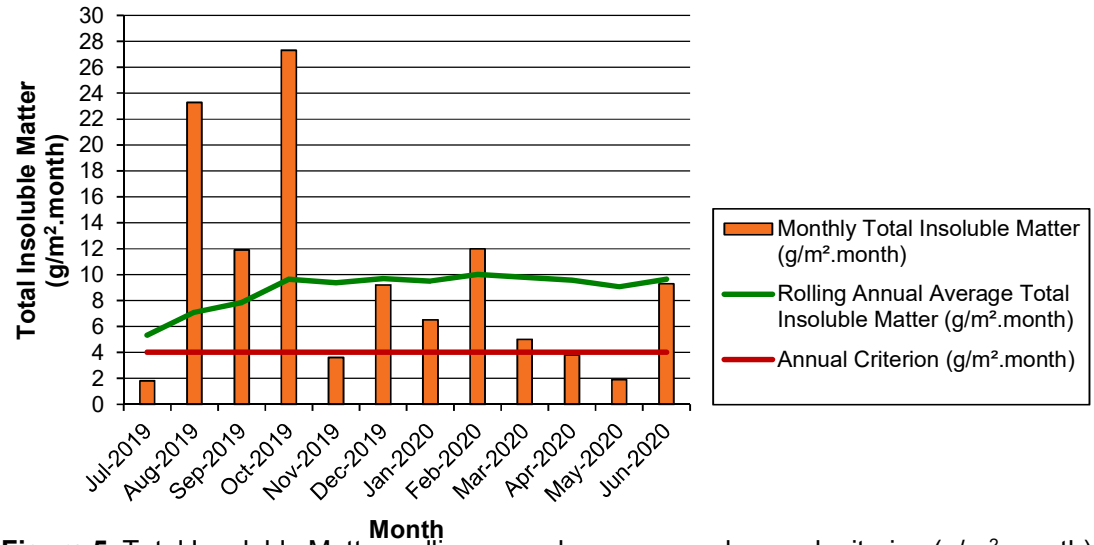


Figure 5: Total Insoluble Matter, rolling annual average, and annual criterion (g/m^2.month) for the Bass Point Quarry as measured at **(a)** DDG-1, and; **(b)** DDG-2; during the 12-month period to June 2020.

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

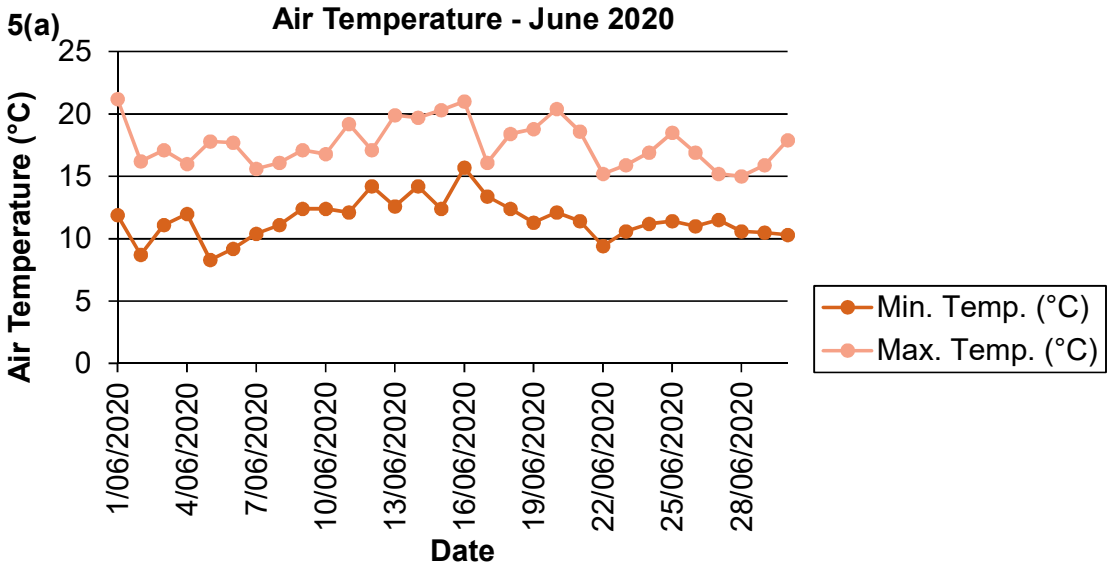
Table 5: Summary of representative meteorological data sourced from the BOM Kiama (Bombo Headland) AWS.

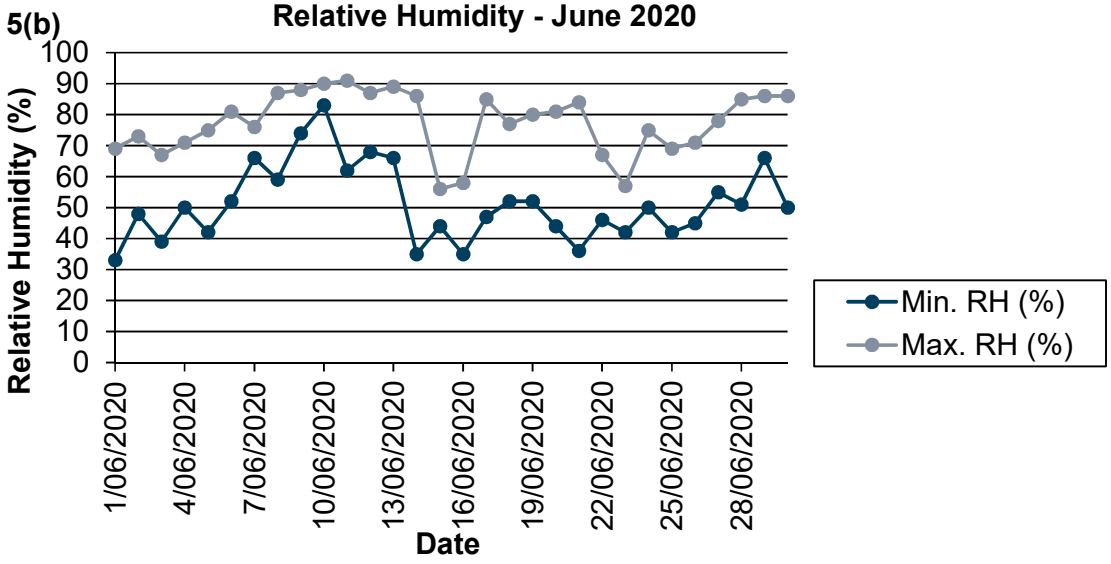
Date	Min. Temp. (°C)	Max. Temp. (°C)	Evapo-Transp. (mm)	Rainfall (mm)	Min. RH (%)	Max. RH (%)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	Time of maximum wind gust	Average 10 m Wind Speed (m/sec)	Solar Radiation (MJ/sq m)
1/06/2020	11.9	21.2	3.0	0.0	33	69	WSW	52	20:30	3.75	8.56
2/06/2020	8.7	16.2	2.8	1.0	48	73	W	57	0:01	6.63	8.90
3/06/2020	11.1	17.1	3.5	0.0	39	67	WSW	61	1:46	7.30	10.88
4/06/2020	12.0	16.0	2.5	0.0	50	71	SSW	44	5:03	5.32	10.26
5/06/2020	8.3	17.8	1.7	0.0	42	75	S	22	22:40	2.23	10.81
6/06/2020	9.2	17.7	1.6	0.0	52	81	SSE	19	11:06	2.43	10.74
7/06/2020	10.4	15.6	1.9	0.0	66	76	S	41	11:40	5.46	6.60
8/06/2020	11.1	16.1	2.2	0.0	59	87	S	50	9:45	7.37	9.93
9/06/2020	12.4	17.1	1.4	5.8	74	88	S	37	3:30	3.90	10.65
10/06/2020	12.4	16.8	0.9	0.2	83	90	N	31	16:39	1.81	4.56
11/06/2020	12.1	19.2	1.8	6.6	62	91	S	48	13:48	4.03	10.63
12/06/2020	14.2	17.1	1.8	1.2	68	87	SSW	44	5:06	5.36	8.00
13/06/2020	12.6	19.9	1.4	3.0	66	89	N	26	11:06	2.12	9.83
14/06/2020	14.2	19.7	2.4	3.8	35	86	W	54	13:05	3.72	9.74
15/06/2020	12.4	20.3	3.6	0.0	44	56	WNW	63	1:46	6.23	10.57
16/06/2020	15.7	21.0	3.6	0.0	35	58	WSW	48	3:28	5.01	10.55
17/06/2020	13.4	16.1	2.4	0.0	47	85	SSE	46	12:50	5.80	5.24
18/06/2020	12.4	18.4	1.6	6.0	52	77	S	24	5:16	2.18	8.92
19/06/2020	11.3	18.8	2.0	0.0	52	80	N	31	15:53	3.62	10.55
20/06/2020	12.1	20.4	2.0	0.0	44	81	NW	24	23:32	2.84	10.50
21/06/2020	11.4	18.6	2.0	5.4	36	84	N	28	13:34	2.84	7.67
22/06/2020	9.4	15.2	2.3	0.2	46	67	WSW	48	23:50	4.41	9.89
23/06/2020	10.6	15.9	3.1	0.0	42	57	WSW	50	21:08	6.07	10.56
24/06/2020	11.2	16.9	2.8	0.0	50	75	SSW	65	13:03	6.88	8.84
25/06/2020	11.4	18.5	2.8	0.0	42	69	WSW	46	8:58	4.82	10.61
26/06/2020	11.0	16.9	2.1	0.0	45	71	S	37	23:45	3.34	10.61
27/06/2020	11.5	15.2	2.0	0.0	55	78	S	41	8:43	4.53	10.56
28/06/2020	10.6	15.0	2.0	0.0	51	85	S	39	10:31	4.80	8.03
29/06/2020	10.5	15.9	1.4	1.8	66	86	SSE	26	13:10	2.79	10.42
30/06/2020	10.3	17.9	1.8	0.6	50	86	NNE	31	14:19	2.98	10.44

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	11.5	17.6	2.2	1.2	51	78	-	41	-	4.35	9.47
Lowest	8.3	15.0	0.9	0.0	33	56	SSE	19	11:06	1.81	4.56
Highest	15.7	21.2	3.6	6.6	83	91	SSW	65	13:03	7.37	10.88
Total	-	-	66.4	35.6	-	-	-	-	-	-	-

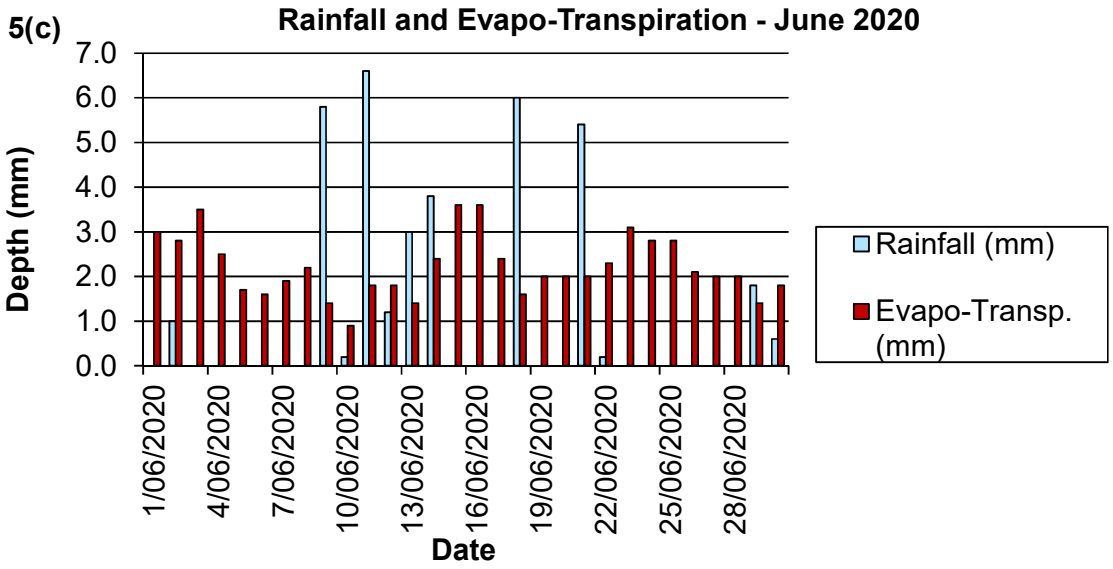
4.2. Monthly Weather Charts

Figure 6: 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.

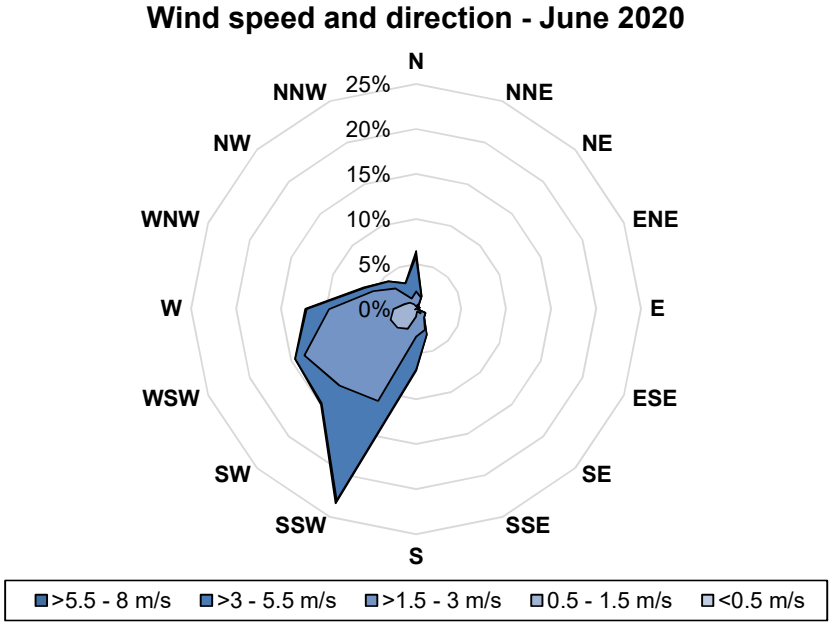




5(c)


Rainfall and Evapo-Transpiration - June 2020
Depth (mm)
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
1/06/2020
4/06/2020
7/06/2020
10/06/2020
13/06/2020
16/06/2020
19/06/2020
22/06/2020
25/06/2020
28/06/2020
Date
Rainfall (mm)
Evapo-Transp. (mm)

5(d)


Wind speed and direction - June 2020
N
NNE
NE
ENE
E
ESE
SE
SSE
S
SSW
SW
WSW
W
WNW
NW
NNW
25%
20%
15%
10%
5%
0%
>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 2175 Ph: 02 8784 8555 E: samples.sydney@alsenviro.com
☐ Newcastle: 5 Rosecum 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: 3-1 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):	**FOR LABORATORY USE ONLY (Circle)**	
OFFICE:	PO Box 4022 Shellharbour NSW 2529		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact:	Yes / No / N/A
PROJECT:	LVAS (PM10)	**ALS QUOTE NO.:**		Free ice/frozen ice bricks present upon receipt:	Yes / No / N/A
ORDER NUMBER:				Random Sample Temperature on Receipt:	°C
PROJECT MANAGER:	Steve Butcher	**CONTACT PH:** 02 4247 3900		Other comment:	
SAMPLER:	Chelsea Flood	**SAMPLER MOBILE:** 0448 290 721			
COC emailed to ALS? (YES / NO)		**EDD FORMAT (or default):**			
Email Reports to (will default to PM if no other addresses are listed): chelsea.flood@hanson.com.au					
Email Invoice to (will default to PM if no other addresses are listed): chelsea.flood@hanson.com.au					

COC SEQUENCE NUMBER (Circle)

COC: 1 2 3 4 5 6 7
OF: 1 2 3 4 5 6 7

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Chelsea Flood	Amelia		
DATE/TIME: 02/07/2020 09:15	DATE/TIME: 2/7/20	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HAN

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	LVAS PM10							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	47-163D9094365	6/06/2020	Filter		1	✓							
	47-163D9094369	18/06/2020	Filter		1	✓							
	47-163D9094357	24/06/2020	Filter		1	✓							
	47-163D9094356	30/06/2020	Filter		1	✓							
				TOTAL	0								

Environmental Division
Wollongong
Work Order Reference
EW2003049

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.

ENFM 204

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EW2003049**	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	: LVAS	Date Samples Received	: 02-Jul-2020 09:40
Order number	: 4502743561	Date Analysis Commenced	: 10-Jul-2020
C-O-C number	: ----	Issue Date	: 13-Jul-2020 14:44
Sampler	: CHELSEA FLOOD		
Site	: ----		
Quote number	: EN/333		
No. of samples received	: 4		
No. of samples analysed	: 4		

ilac-MRA NATA

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
Zoran Grozdanovski	Laboratory Operator	Newcastle, Mayfield West, NSW

RIGHT SOLUTIONS | RIGHT PARTNER

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.**
- EA143-LV: Reporting of 'Initial' and 'Final' weights to 0.0001mg not covered by scope of NATA accreditation.
- The variation in LOR for µg/m³ results is due to the variation in sample volumes.
- NATA accreditation is not held for results reported in µg/m³. Air volume data was provided by the client.

Analytical Results

Sub-Matrix: **FILTER** (Matrix: **AIR**)			Client sample ID	47-163D9094365 47-163D9094365	47-163D9094369 47-163D9094369	47-163D9094357 47-163D9094357	47-163D9094356 47-163D9094356	----
			Client sampling date / time	06-Jun-2020 00:00	18-Jun-2020 00:00	24-Jun-2020 00:00	30-Jun-2020 00:00	----
Compound	CAS Number	LOR	Unit	EW2003049-001	EW2003049-002	EW2003049-003	EW2003049-004	-------
				Result	Result	Result	Result	---
EA143: Particulates in Air - LVAFs								
^ ø**PM10**	----	14	µg/m³	32	34	<24	<24	----
PM10 (mass per filter)	----	100	µg/filter	132	144	<100	<100	----
EA143: Total Suspended Particulates								
Initial Weight	----	0.0001	mg	164.0020	159.6260	158.9161	160.6291	----
Final Weight	----	0.0001	mg	164.1338	159.7700	158.9748	160.7035	----
Low Volume Air-Sampling Parameters								
ø **Volume**	----	1	L	4130	4160	4070	4120	----

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): ☐ Non Standard or urgent TAT (List due date):
OFFICE:	Boollwarroo Pde Shellharbour NSW 2529		
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 comments:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Robert.	Aneta		
DATE/TIME: 15.6.20 12:50	DATE/TIME: 15-6-20	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.
1	DDG 1	15.6.20 11:00	AIR	AG	1	✓	
2	DDG 2	9:15	AIR	AG	1	✓	
3	DDG 3	10:00	AIR	AG	1	✓	
				TOTAL	3		

Environmental Division Wollongong
Work Order Reference
EW2002738

Telephone : 02 4225 3125

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ENFM 204

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EW2002738**	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	: 15-Jun-2020 13:19
Order number	: ----	Date Analysis Commenced	: 17-Jun-2020
C-O-C number	: ----	Issue Date	: 23-Jun-2020 11:21
Sampler	: Robert DaLio		
Site	: ----		
Quote number	: WL/043/11 Bass Point Dust Monitoring		
No. of samples received	: 3		
No. of samples analysed	: 3		

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

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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*
Joel Mullarvey	Laboratory Technician	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.

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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.

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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 15/05/2020 - 15/06/2020**	**DDG 2 15/05/2020 - 15/06/2020**	**DDG 3 15/05/2020 - 15/06/2020**	----	----
			Client sampling date / time	15-Jun-2020 11:00	15-Jun-2020 09:15	15-Jun-2020 10:00	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**EW2002738-001**	**EW2002738-002**	**EW2002738-003**	--------	--------
				Result	Result	Result	---	---
EA120: Ash Content								
Ash Content	----	0.1	g/m².month	0.3	8.2	1.3	----	----
Ash Content (mg)	----	1	mg	5	150	25	----	----
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m².month	0.3	1.1	0.6	----	----
Combustible Matter (mg)	----	1	mg	6	19	12	----	----
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m².month	0.6	9.3	1.9	----	----
Total Insoluble Matter (mg)	----	1	mg	11	169	37	----	----