

Monthly Air Quality Monitoring – October 2019
Bass Point Quarry

Licensee

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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](#)



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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 PM₁₀ 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

<i>Pollutant</i>	<i>Averaging period</i>	<i>^d Criterion</i>
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

<i>Pollutant</i>	<i>Averaging period</i>	<i>^d Criterion</i>
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

<i>Pollutant</i>	<i>Averaging period</i>	<i>Maximum increase in deposited dust level</i>	<i>Maximum total deposited dust level</i>
^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 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 PM₁₀. In addition, though not part of the Bass Point Quarry air quality monitoring program, regional background data for 24 hour PM₁₀ 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 PM₁₀ Monitor; PM10-2 – Low Volume PM₁₀ Sampler.

3. Monthly results

3.1. Particulate Matter – Particulate Matter < 10 µm (PM₁₀)

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). Two of the five samples collected at PM₁₀-2 during October 2019 were above the 24 hour average PM₁₀ criterion of 50 µg/m³ (24.10.2019 and 30.10.2019; **Figure 2**). Prevailing wind direction on both of these sampling dates suggest that the dust may be attributable to a source external to the quarry. However, it should be noted that there was visible smoke pollution on both of these sampling dates, due to the bushfires in Queensland and northern NSW. There was also an exceedance at the OEH Albion Park South AQMS on the last sampling date (30.10.2019). It is speculated that the results for 30.10.2019 may have been affected by what constitutes an extraordinary or exceptional event as per the Ambient Air Quality National Environment Protection Measure (AAQ NEPM); this will not be confirmed until the OEH release their annual air quality statement in mid-January 2020. The other three samples collected at PM₁₀-2 during October 2019 were below the 24 hour average PM₁₀ criterion of 50 µg/m³ and were therefore compliant.

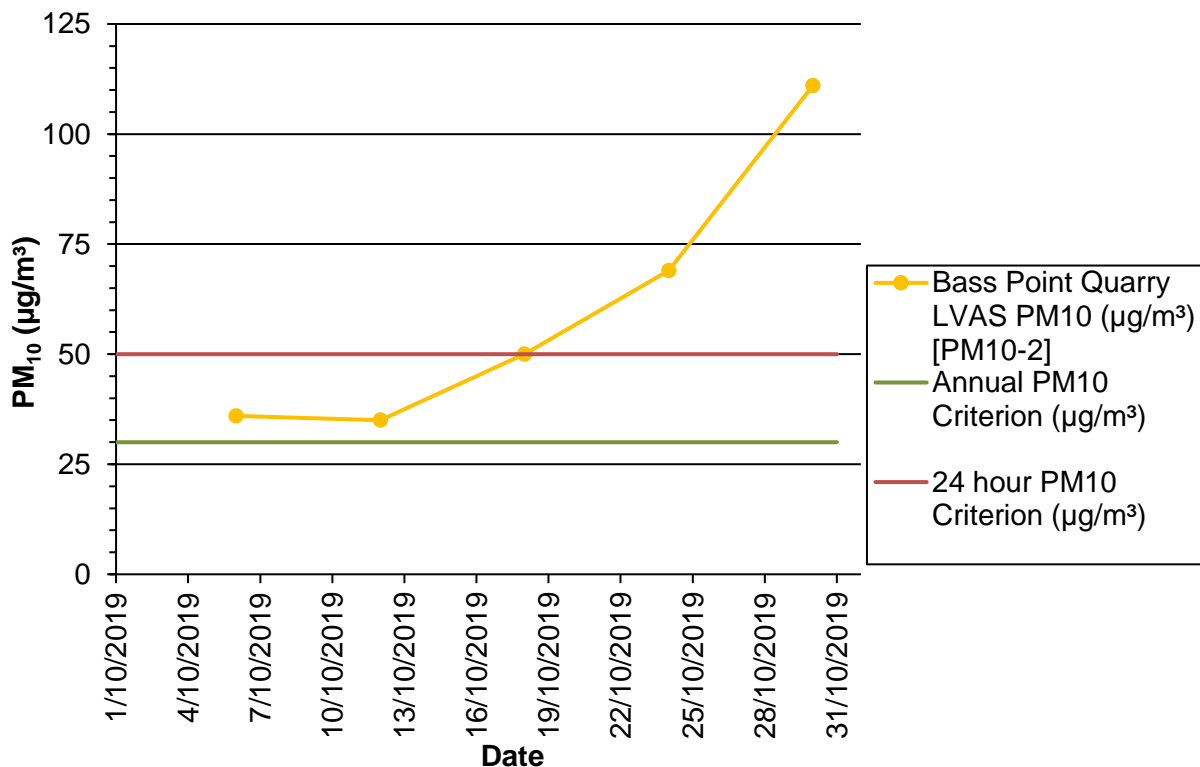


Figure 2: Twenty-four hour PM₁₀ concentration (µg/m³) as measured at PM₁₀-2 during October 2019, compared to the annual criterion and 24 hour criterion (µg/m³).

The 24 hour average PM₁₀ reading from the OEH Albion Park South AQMS was below the 50 µg/m³ criterion – and hence was compliant – for 26 days during October 2019 (**Figure 3, Table 2**). The 24 hour average PM₁₀ reading was above the 50 µg/m³ criterion on four occasions (25.10.2019, 26.10.2019, 30.10.2019, 31.10.2019). It is speculated that the results on these four dates have been affected by what constitutes an extraordinary or exceptional event as per the Ambient Air Quality National Environment Protection Measure (AAQ NEPM); this will not be confirmed until the OEH release their annual air quality statement in mid-January 2020. No data was recorded on one occasion (15.10.2019).

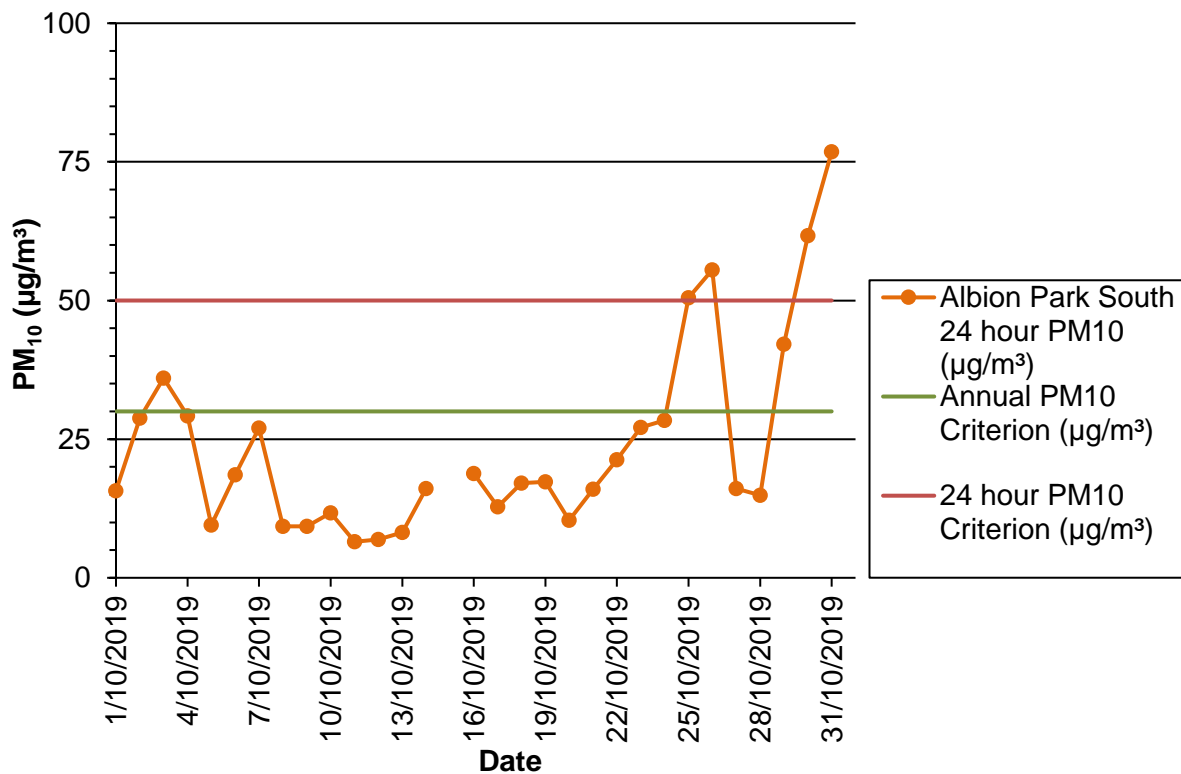


Figure 3: Twenty-four hour PM₁₀ concentration (µg/m³) as measured at Albion Park South AQMS during October 2019, compared to the annual criterion and 24 hour criterion (µg/m³).

Hanson are required to report on the annual average 24 hour PM₁₀ 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 PM₁₀ data is therefore not required as part of the October 2019 monthly report. However, as a management tool, Hanson have begun calculating the rolling annual average 24 hour PM₁₀ for the monthly air quality reports.

The rolling annual average 24 hour PM₁₀ for the PM10-2 site, as calculated using data up to and including October 2019, was 57.0 µg/m³. This is above the annual PM₁₀ criterion of 30 µg/m³. As such, Hanson will be undertaking a more detailed investigation into the PM₁₀ levels experienced at a relevant nearby residence or receiver, as is required under the site AQMP.

The rolling annual average 24 hour PM₁₀ from the OEH Albion Park South AQMS, as calculated using data the 12 months up to and including October 2019, was 18.1

$\mu\text{g}/\text{m}^3$. This is less than two-thirds of the $30 \mu\text{g}/\text{m}^3$ annual limit as outlined in the Project Approval 08_0143.

As per the AQMP, the PM10-1 (BAM) monitoring site is located on-site and is significantly closer to the quarrying activities than the nearest sensitive receptors. An exceedance of the PM₁₀ 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 PM₁₀.

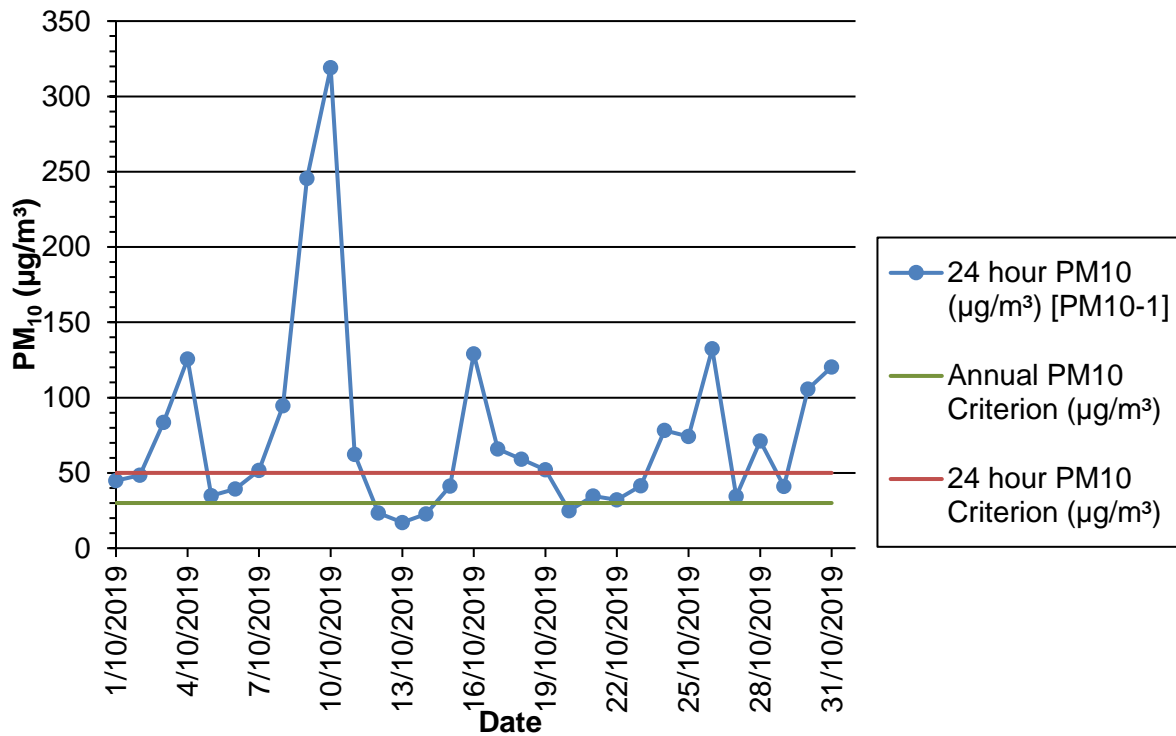


Figure 4: Twenty-four hour PM₁₀ concentration ($\mu\text{g}/\text{m}^3$) as measured at PM10-1 during October 2019, compared to the annual PM₁₀ criterion and 24 hour PM₁₀ criterion ($\mu\text{g}/\text{m}^3$).

Table 2: Monitoring results for Particulate Matter – PM₁₀ monitoring during October 2019. Prevailing wind conditions and climate data were measured at PM10-1. Apparent exceedances of the 24 hour PM₁₀ criteria are shaded red. Note that as previously discussed, PM10-1 is not used for compliance monitoring; exceedances of the 24 hour PM₁₀ criteria at this monitoring location are shaded orange.

Date	24 hour PM ₁₀ (µg/m ³) [PM10-1]	24 hour PM ₁₀ (µg/m ³) [PM10-2]	24 hour PM ₁₀ (µg/m ³) [Albion Park South]	24 hour PM ₁₀ Criterion (µg/m ³)	Mean Wind Speed (m/s)	Mode Wind Direction (°)	Mean Atm. Temp. (°C)	Mean Relative Humidity (%)	Mean Bar. Pressure (mmHg)	Comments
1/10/2019	45	-	15.7	50	3.7	NNE	16.1	72	770	
2/10/2019	48	-	28.8	50	2.9	N	17.3	79	768	
3/10/2019	84	-	36.0	50	2.3	NNW	18.6	75	764	
4/10/2019	126	-	29.2	50	3.0	NW	20.8	58	761	
5/10/2019	35	-	9.5	50	2.5	SSW	16.2	84	765	
6/10/2019	39	36	18.6	50	7.3	NNW	17.9	83	759	
7/10/2019	52	-	27.0	50	2.7	NE	18.9	78	756	
8/10/2019	95	-	9.3	50	3.0	SW	15.7	79	757	
9/10/2019	246	-	9.3	50	4.8	SSW	14.5	56	764	
10/10/2019	319	-	11.7	50	3.3	SSW	15.3	63	765	
11/10/2019	62	-	6.5	50	2.4	SSW	14.5	79	762	
12/10/2019	23	35	6.9	50	2.7	SSW	13.0	84	762	
13/10/2019	17	-	8.2	50	2.2	SW	14.9	70	763	
14/10/2019	23	-	16.1	50	3.7	N	16.2	77	760	
15/10/2019	41	-	-	50	3.6	N	18.3	87	757	
16/10/2019	129	-	18.8	50	3.2	S	19.3	76	756	
17/10/2019	66	-	12.8	50	3.9	W	19.3	55	754	
18/10/2019	59	50	17.1	50	3.3	WSW	17.0	50	759	
19/10/2019	52	-	17.3	50	3.9	W	19.8	46	758	
20/10/2019	25	-	10.4	50	2.0	WSW	16.0	52	764	
21/10/2019	35	-	16.0	50	1.7	SSW	17.2	64	767	
22/10/2019	32	-	21.3	50	2.1	N	17.5	77	766	Observation of bushfire smoke from this date onwards
23/10/2019	41	-	27.1	50	4.0	N	18.4	85	764	
24/10/2019	78	69	28.4	50	1.9	NNW	19.4	87	761	Wind direction suggests an external dust source
25/10/2019	74	-	50.5	50	2.6	N	23.1	62	755	Suspected extraordinary event – NSW bushfires
26/10/2019	132	-	55.5	50	4.3	W	23.6	37	751	Suspected extraordinary event – NSW bushfires
27/10/2019	35	-	16.1	50	2.2	NNE	17.5	46	759	
28/10/2019	71	-	14.9	50	2.2	SSW	17.7	68	764	
29/10/2019	41	-	42.1	50	4.3	N	18.1	79	764	
30/10/2019	106	111	61.7	50	2.2	N	19.6	84	761	Wind direction suggests an external dust source Suspected extraordinary event – NSW bushfires
31/10/2019	120	-	76.8	50	3.4	N	19.8	88	760	Suspected extraordinary event – NSW bushfires

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 PM₁₀ 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 October 2019 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 PM₁₀ data (as per the AQMP) for October 2019 (**Table 3**). The rolling annual average TSP is therefore 49.9 µg/m³; just over half of the annual TSP criterion of 90 µg/m³ identified in Project Approval 08_0143 Schedule 3.

Table 3: Calculation of Rolling Annual Average TSP (µg/m³) for the month of October 2019.

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
18.1 µg/m ³	36.2%	49.9 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 October 2019 indicate that dust deposition at DDG-1 was less than the annual criterion of 4 g/m².month identified in Project Approval 08_0143 Schedule 3 and EPL-2193 (**Table 4, Figure 5(a), Figure 5(b)**). Dust deposition at DDG-2 was far greater than the annual criterion. It is believed that this is due to the close proximity to the haul route being used for the Shell Cove Marina construction. Impromptu visual inspection of DDG-2 during the sampling period revealed unusual deposition, and it is therefore suspected that the sampling apparatus may have also been tampered with – the sampling apparatus will be closely monitored for further evidence of tampering.

Table 4: Monthly Total Insoluble Matter ($\text{g/m}^2\cdot\text{month}$) measured at the two Bass Point Quarry Dust Deposition Gauges (DDGs) during the period 13/09/2019 to 15/10/2019 (i.e. October 2019), and calculated rolling annual average Total Insoluble Matter ($\text{g/m}^2\cdot\text{month}$).

Site	Monthly Total Insoluble Matter ($\text{g/m}^2\cdot\text{month}$)	Rolling Annual Average Total Insoluble Matter ($\text{g/m}^2\cdot\text{month}$)	Comments
DDG-1	1.9	1.9	
DDG-2	27.3	9.7	Results likely affected by Marina construction.

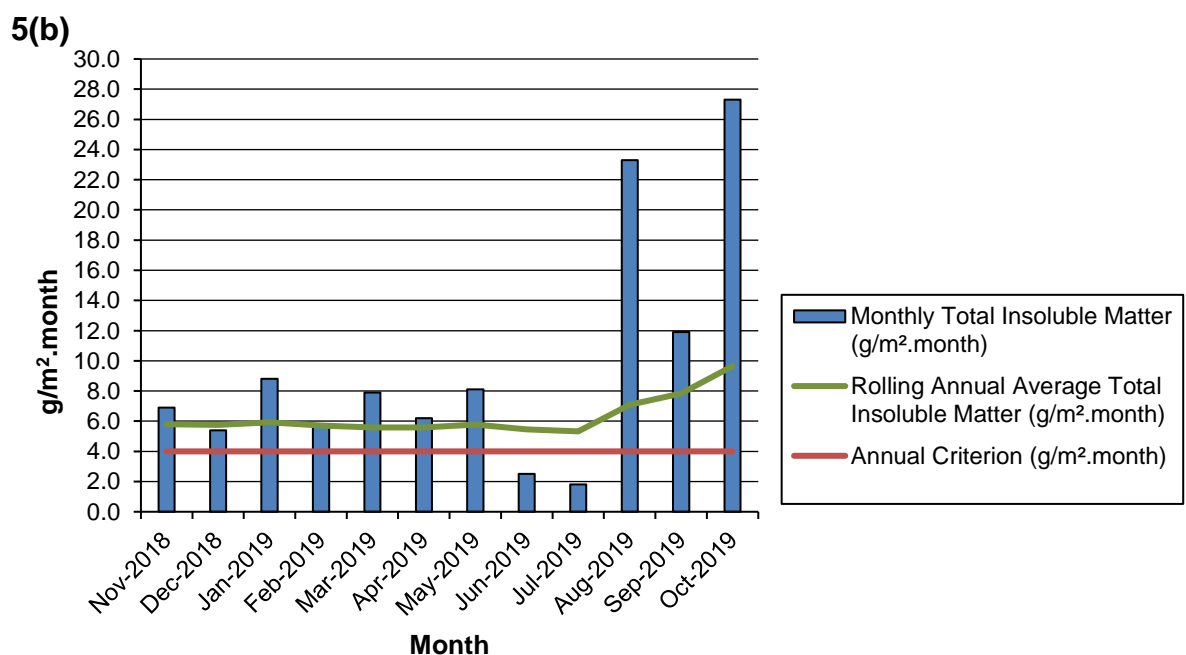
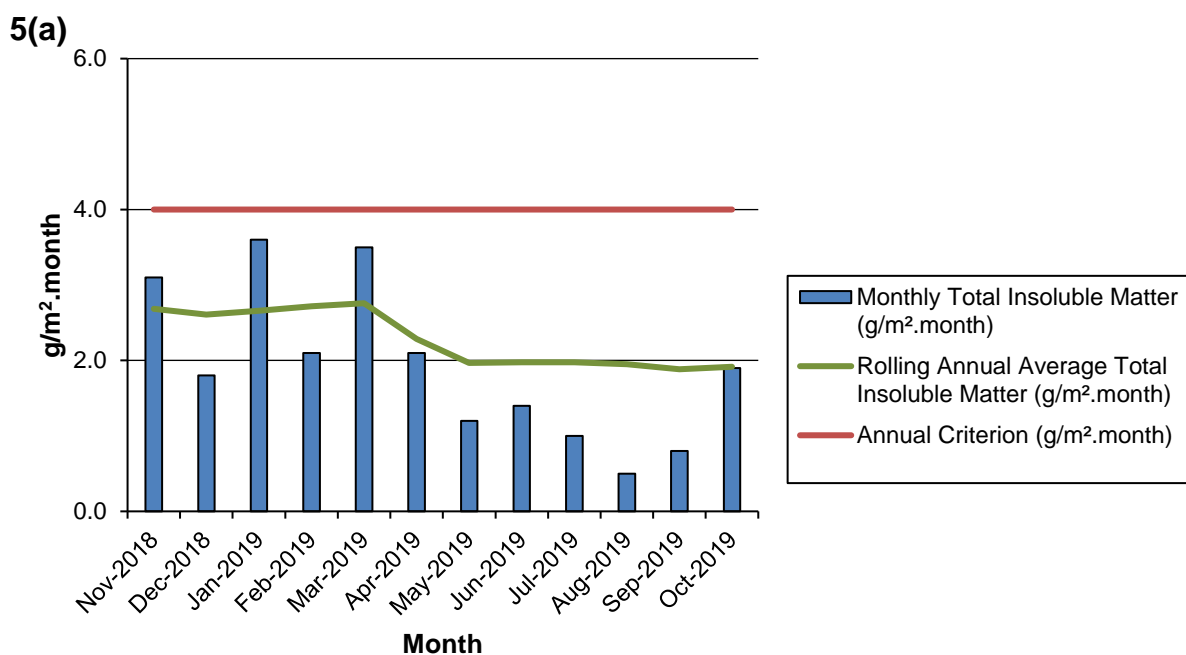


Figure 5: Total Insoluble Matter, rolling annual average, and annual criterion ($\text{g/m}^2\cdot\text{month}$) for the Bass Point Quarry as measured at **(a)** DDG-1, and; **(b)** DDG-2; during the 12-month period to October 2019.

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*

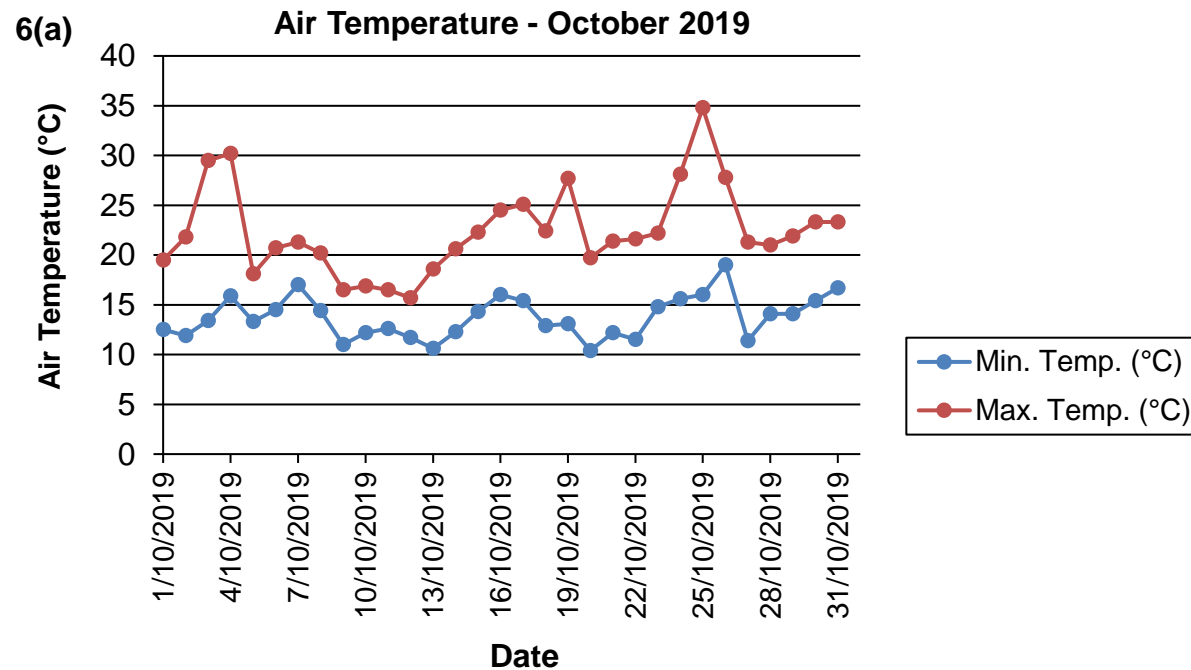
Table 5: Summary of representative meteorological data sourced from the BOM Kiama (Bombo Headland) AWS.

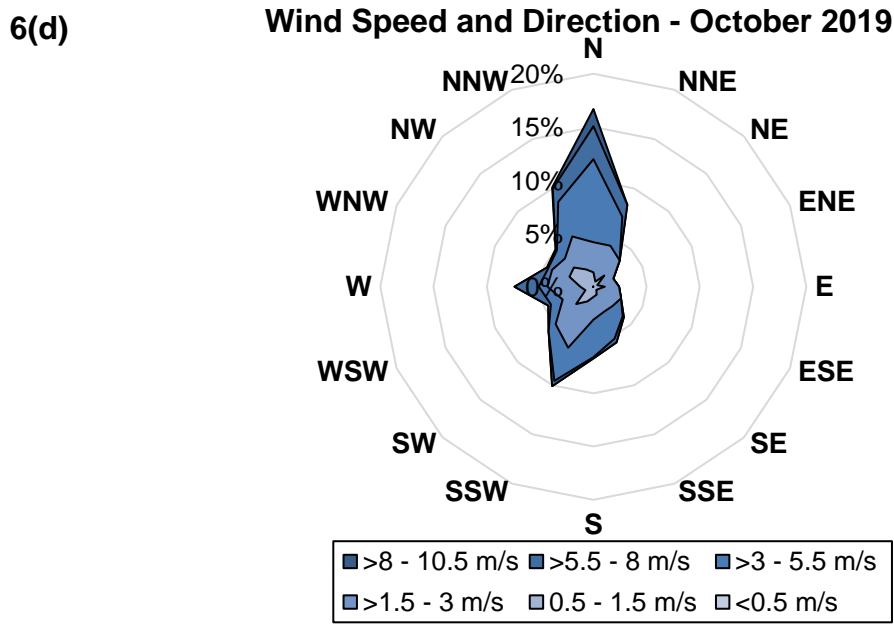
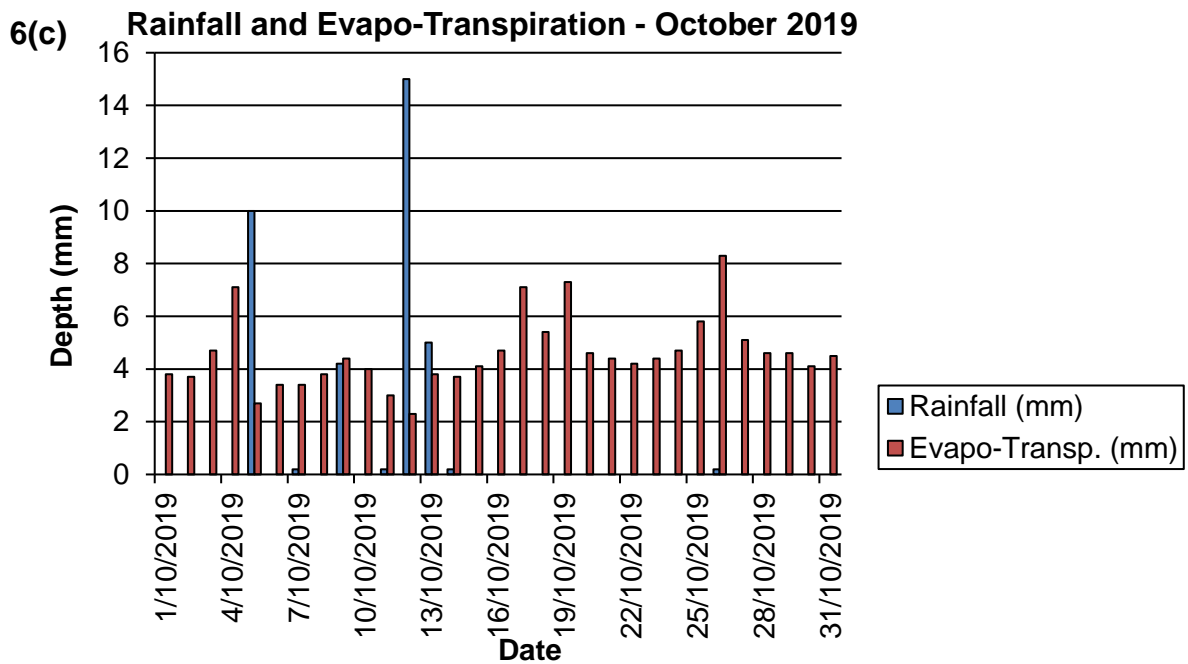
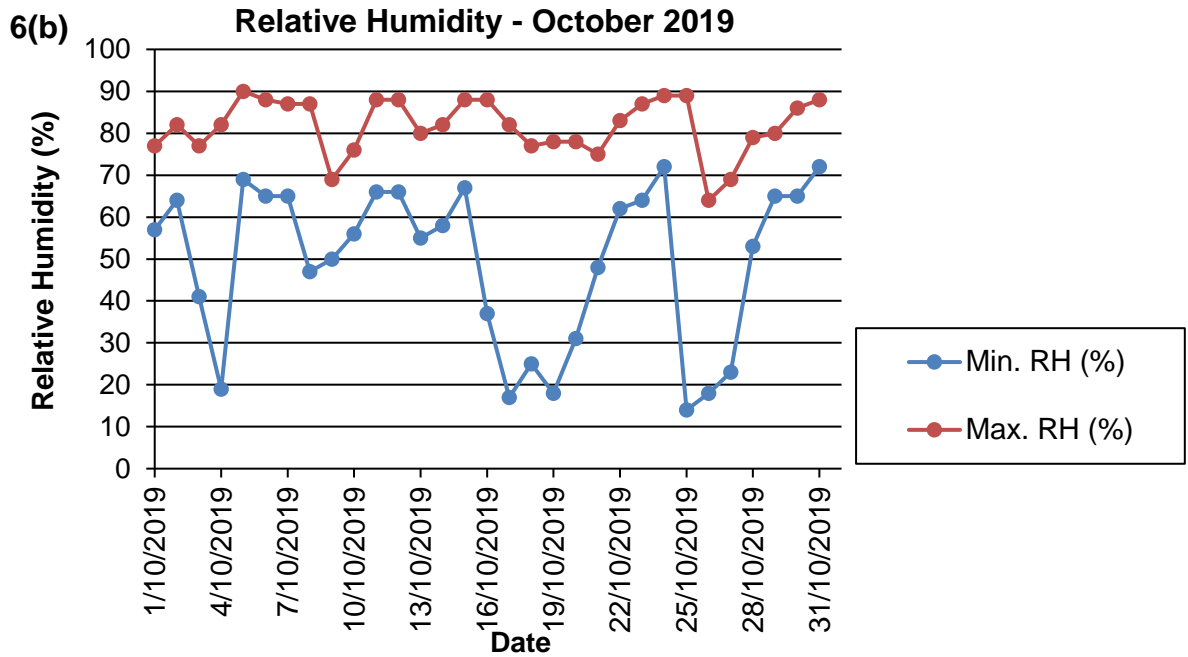
Date	Min. Temp. (°C)	Max. Temp. (°C)	Evapo-Transp. (mm)	Rainfall (mm)	Min. RH (%)	Max. RH (%)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	Time of maximum wind gust	Average 10 m Wind Speed (m/sec)	Solar Radiation (MJ/sq m)
1/10/2019	12.5	19.5	3.8	0	57	77	N	41	16:25	3.56	22.4
2/10/2019	11.9	21.8	3.7	0	64	82	NNE	30	12:12	2.79	22.73
3/10/2019	13.4	29.5	4.7	0	41	77	N	28	17:27	2.1	22.95
4/10/2019	15.9	30.2	7.1	0	19	82	SSE	61	12:09	5.58	21.02
5/10/2019	13.3	18.1	2.7	10	69	90	S	35	6:33	3.83	15.43
6/10/2019	14.5	20.7	3.4	0	65	88	NNE	54	12:20	5.75	17.15
7/10/2019	17.0	21.3	3.4	0.2	65	87	S	48	0:34	4.16	17.18
8/10/2019	14.4	20.2	3.8	0	47	87	S	56	12:52	5.4	15.21
9/10/2019	11.0	16.5	4.4	4.2	50	69	SSE	56	13:25	7.86	22.07
10/10/2019	12.2	16.9	4	0	56	76	SSE	41	13:30	5.7	23.94
11/10/2019	12.6	16.5	3	0.2	66	88	SSE	43	10:03	4.09	19.25
12/10/2019	11.7	15.7	2.3	15	66	88	SSW	39	5:41	4.42	10.12
13/10/2019	10.6	18.6	3.8	5	55	80	N	24	18:33	2.88	23.88
14/10/2019	12.3	20.6	3.7	0.2	58	82	N	31	13:16	3.61	20.02
15/10/2019	14.3	22.3	4.1	0	67	88	N	35	13:29	3.66	24.47
16/10/2019	16.0	24.5	4.7	0	37	88	S	44	2:57	5.24	15.72
17/10/2019	15.4	25.1	7.1	0	17	82	WSW	80	14:07	6.98	25.01
18/10/2019	12.9	22.4	5.4	0	25	77	WSW	67	23:08	3.86	25.67
19/10/2019	13.1	27.7	7.3	0	18	78	W	69	13:44	6.23	22.98
20/10/2019	10.4	19.7	4.6	0	31	78	SSE	31	9:40	3.01	26.02
21/10/2019	12.2	21.4	4.4	0	48	75	NNE	15	9:55	2.09	26.18
22/10/2019	11.5	21.6	4.2	0	62	83	N	30	12:57	2.5	26.35
23/10/2019	14.8	22.2	4.4	0	64	87	NNE	43	10:32	4	26.57
24/10/2019	15.6	28.1	4.7	0	72	89	N	28	17:07	2.5	26.46
25/10/2019	16.0	34.8	5.8	0	14	89	NW	39	10:09	2.73	16.54
26/10/2019	19.0	27.8	8.3	0.2	18	64	WSW	72	15:38	6.67	26.36
27/10/2019	11.4	21.3	5.1	0	23	69	NNE	28	14:08	2.83	27.09
28/10/2019	14.1	21	4.6	0	53	79	SSE	28	8:46	2.89	26.79
29/10/2019	14.1	21.9	4.6	0	65	80	N	41	18:30	4.38	27.25
30/10/2019	15.4	23.3	4.1	0	65	86	N	22	17:43	2.41	22.67
31/10/2019	16.7	23.3	4.5	0	72	88	N	33	21:04	3.8	27

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	13.7	22.4	4.6	1.1	49	82	-	42	-	4.11	22.34
Lowest	10.4	15.7	2.3	0.0	14	64	NNE	15	9:55	2.09	10.12
Highest	19.0	34.8	8.3	15.0	72	90	WSW	80	14:07	7.86	27.25
Total	-	-	141.7	35.0	-	-	-	-	-	-	-

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; and, (c) Rainfall and Evapo-Transpiration. Wind rose for data sourced from PM10-1 for (d) Wind Speed and Direction.





Appendix 1
Chain of Custody & Laboratory Certificates



CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ Sydney: 277 Woodpark Rd, Smithfield NSW 2176
Ph: 02 8734 8555 E: samples.sydney@alsenviro.com

☐ Brisbane: 32 Strand St, Stafford QLD 4053
Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com

☐ Melbourne: 2-4 Wastell Rd, Springvale VIC 3171
Ph: 03 8549 9800 E: samples.melbourne@alsenviro.com

☐ Perth: 10 Hod Way, Malaga WA 6050
Ph: 08 9209 7665 E: samples.perth@alsenviro.com

☐ Newcastle: 5 Rosegum Rd, Warabrook NSW 2304
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☐ Townsville: 14-15 Duarna Ct, Bohle QLD 4818
Ph: 07 4795 0600 E: townsville.environmental@alsenviro.com

☐ Adelaide: 2-1 Burma Rd, Pooraka SA 5095
Ph: 08 8359 0690 E: adelaide@alsenviro.com

☐ Launceston: 27 Wellington St, Launceston TAS 7250
Ph: 03 6331 2159 E: launceston@alsenviro.com

CLIENT: Hanson Construction Materials	TURNAROUND REQUIREMENTS : <input type="checkbox"/> Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)	
OFFICE: Boolwarroo Pde Shellharbour NSW 2529	(Standard TAT may be longer for some tests e.g. Ultra Trace Organics) <input type="checkbox"/> Non Standard or urgent TAT (List due date):		
PROJECT: Bass Point Dust Monitoring	ALS QUOTE NO.: WL/043/11	COC SEQUENCE NUMBER (Circle)	
ORDER NUMBER:		COC: 1 2 3 4 5 6 7	
PROJECT MANAGER: Steve Butcher	CONTACT PH: 02 4295 1352	OF: 1 2 3 4 5 6 7	
SAMPLER:	SAMPLER MOBILE:	RELINQUISHED BY: Robert	RECEIVED BY: [Signature]
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	DATE/TIME: 15/10/19 13:30	DATE/TIME: 15/10/19 13:30
Email Reports to : steve.butcher@hanson.com.au		DATE/TIME:	DATE/TIME:
Email Invoice to : steve.butcher@hanson.com.au			

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	15.10.19 11:30	AIR	AG	1	✓							
	DDG 2	11:20	AIR	AG	1	✓							
	DDG 3	10:20	AIR	AG	1	✓							
					TOTAL	3							

Environmental Division
Wollongong
Work Order Reference
EW1904356



Telephone: 180 42263124

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 Solis; B = Unpreserved Bag.

CERTIFICATE OF ANALYSIS

Work Order : EW1904356 Client : HANSON CONSTRUCTION MATERIALS PTY LTD Contact : MR STEVE BUTCHER Address : BOOLLWARROO PDE SHELLHARBOUR NSW, AUSTRALIA 2529 Telephone : +61 02 4295 1355 Project : Bass Point Dust Monitoring Order number : ---- C-O-C number : ---- Sampler : Robert DaLio Site : ---- Quote number : WL/043/11 Bass Point Dust Monitoring 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 : 15-Oct-2019 14:39 Date Analysis Commenced : 17-Oct-2019 Issue Date : 24-Oct-2019 09:08	  <small>Accreditation No. 825 Accredited for compliance with ISO/IEC 17025 - Testing</small>
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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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Dianne Blane	Laboratory Coordinator (2IC)	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.

- 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-END10 Sampling of Dust Depositon Gauges.

Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Client sample ID

				DDG 1 13/09/2019 - 15/10/2019	DDG 2 13/09/2019 - 15/10/2019	DDG 3 13/09/2019 - 15/10/2019	----	----
Client sampling date / time				15-Oct-2019 11:30	15-Oct-2019 11:20	15-Oct-2019 10:20	----	----
Compound	CAS Number	LOR	Unit	EW1904356-001	EW1904356-002	EW1904356-003	-----	-----
				Result	Result	Result	---	---
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	1.5	20.8	4.4	----	----
Ash Content (mg)	----	1	mg	29	392	90	----	----
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	0.4	6.5	1.8	----	----
Combustible Matter (mg)	----	1	mg	6	123	36	----	----
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	1.9	27.3	6.2	----	----
Total Insoluble Matter (mg)	----	1	mg	35	515	126	----	----



CHAIN OF CUSTODY

ALS Laboratory: please tick →

Sydney: 277 Woodpark Rd, Smithfield NSW 2176
Ph: 02 8774 8555 E: samples_sydney@alsenviro.com

Brisbane: 32 Shand St, Stafford QLD 4053
Ph: 07 3243 7222 E: samples_brisbane@alsenviro.com

Melbourne: 2-4 Westall Rd, Springvale VIC 3171
Ph: 03 8549 9500 E: samples_melbourne@alsenviro.com

Perth: 10 Hord Way, Malaga WA 6090
Ph: 08 9209 7055 E: samples_perth@alsenviro.com

Newcastle: 5 Rosegum Rd, Warabrook NSW 2304
Ph: 02 4968 9433 E: samples_newcastle@alsenviro.com

Townsville: 14-15 Desma Ct, Bohle QLD 4818
Ph: 07 4796 0600 E: townsville_environmental@alsenviro.com

Adelaide: 2-1 Burma Rd, Pooraka SA 5095
Ph: 08 8359 0890 E: adelaide@alsenviro.com

Launceston: 27 Wellington St, Launceston TAS 7250
Ph: 03 6331 2158 E: launceston@alsenviro.com

CLIENT: Hanson Construction Materials		TURNAROUND REQUIREMENTS : <input type="checkbox"/> Standard TAT (List due date):		FOR LABORATORY USE ONLY (Circle)	
OFFICE: PO Box 4022 Shellharbour NSW 2529		(Standard TAT may be longer for some tests e.g., Ultra Trace Organics) <input type="checkbox"/> Non Standard or urgent TAT (List due date):			
PROJECT: LVAS (PM10)		ALS QUOTE NO.:		Custody Seal intact? Yes No N/A	
ORDER NUMBER:				Free ice / frozen ice bricks present upon receipt? Yes No N/A	
PROJECT MANAGER: Steve Butcher		CONTACT PH: 02 4247 3900		Random Sample Temperature on Receipt °C	
SAMPLER: Chelsea Flood		SAMPLER MOBILE: 0448 290 721		Other comment:	
COC emailed to ALS? (YES / NO)		EDD FORMAT (or default):		RELINQUISHED BY:	
Email Reports to (will default to PM if no other addresses are listed): steve.butcher@hanson.com.au		Email Invoice to (will default to PM if no other addresses are listed): steve.butcher@hanson.com.au		RECEIVED BY:	
		DATE/TIME: 01/11/2019 11:30am		DATE/TIME: 1/11/2019 11:30	

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Please provide pre- and post-sampling filter paper weight on the report

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 <i>(refer to codes below)</i>	TOTAL BOTTLES	LVAS PM10						Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	47-125P6498605	6/10/2019	Filter		1	✓						
	47-125P6498606	12/10/2019	Filter		1	✓						
	47-125P6498607	18/10/2019	Filter		1	✓						
	47-125P6498608	24/10/2019	Filter		1	✓						
	47-125P6498630	30/10/2019	Filter		1	✓						
					TOTAL	0						

Environmental Division
Wollongong
Work Order Reference
EW1904733

Telephone : 02 42263125

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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.

CERTIFICATE OF ANALYSIS

Work Order	: EW1904733	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	: 01-Nov-2019 11:52
Order number	: ---	Date Analysis Commenced	: 07-Nov-2019
C-O-C number	: ---	Issue Date	: 08-Nov-2019 10:34
Sampler	: CHELSEA FLOOD		
Site	: ---		
Quote number	: EN/333		
No. of samples received	: 5		
No. of samples analysed	: 5		



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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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Merrin Avery	Supervisor - Inorganic	Newcastle - Inorganics, Mayfield West, NSW
Merrin Avery	Supervisor - Inorganic	Newcastle, 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.

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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.

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.

- NATA accreditation is not held for results reported in µg/m³. Air volume data was provided by the client.
- 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	47-125P6498605	47-125P6498606	47-125P6498607	47-125P6498608	47-125P6498630
Client sampling date / time				06-Oct-2019 00:00	12-Oct-2019 00:00	18-Oct-2019 00:00	24-Oct-2019 00:00	30-Oct-2019 00:00	
Compound	CAS Number	LOR	Unit	EW1904733-001	EW1904733-002	EW1904733-003	EW1904733-004	EW1904733-005	
				Result	Result	Result	Result	Result	
EA143: Particulates in Air - LVAFs									
^ øPM10	----	14	µg/m³	36	35	50	69	111	
PM10 (mass per filter)	----	100	µg/filter	145	145	202	276	445	
EA143: Total Suspended Particulates									
Initial Weight	----	0.0001	mg	140.8874	137.4598	140.2413	137.3102	138.1543	
Final Weight	----	0.0001	mg	141.0321	137.6052	140.4433	137.5867	138.5991	
Low Volume Air-Sampling Parameters									
ø Volume	----	1	L	4020	4110	4040	4000	4000	