

Monthly Air Quality Monitoring – November 2019
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)
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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). Three samples were collected from PM₁₀-2 during November 2019, as the LVAS unit malfunctioned on 22.11.2019 and no further samples could be collected after this date. Two of the three samples were above the 24 hour average PM₁₀ criterion of 50 µg/m³ (05.11.2019 and 11.11.2019; **Figure 2**). Prevailing wind direction on both of these sampling dates suggests that the dust may be attributable to a source external to the quarry. The other sample collected at PM₁₀-2 during November 2019 was below the 24 hour average PM₁₀ criterion of 50 µg/m³ and was therefore compliant.

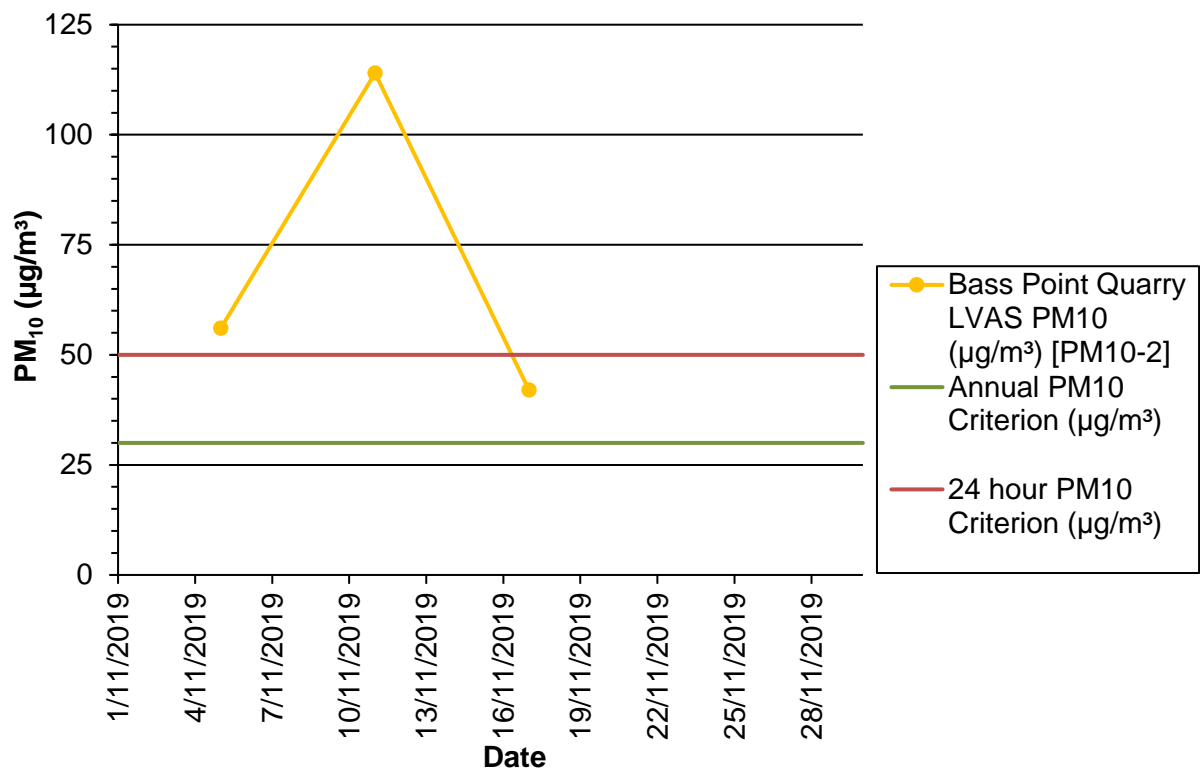


Figure 2: Twenty-four hour PM₁₀ concentration (µg/m³) as measured at PM₁₀-2 during November 2019, compared to the annual criterion and 24 hour criterion (µg/m³).

Twenty-four hour average PM₁₀ data from the OEH Albion Park South AQMS was only available for 13 dates in November 2019 – the cause for this lack of data is unknown. 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 11 of the sampling dates during November 2019 (**Figure 3, Table 2**). The 24 hour average PM₁₀ reading was above the 50 µg/m³ criterion on two occasions (02.11.2019 and 11.11.2019). It is speculated that the results on these two 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.

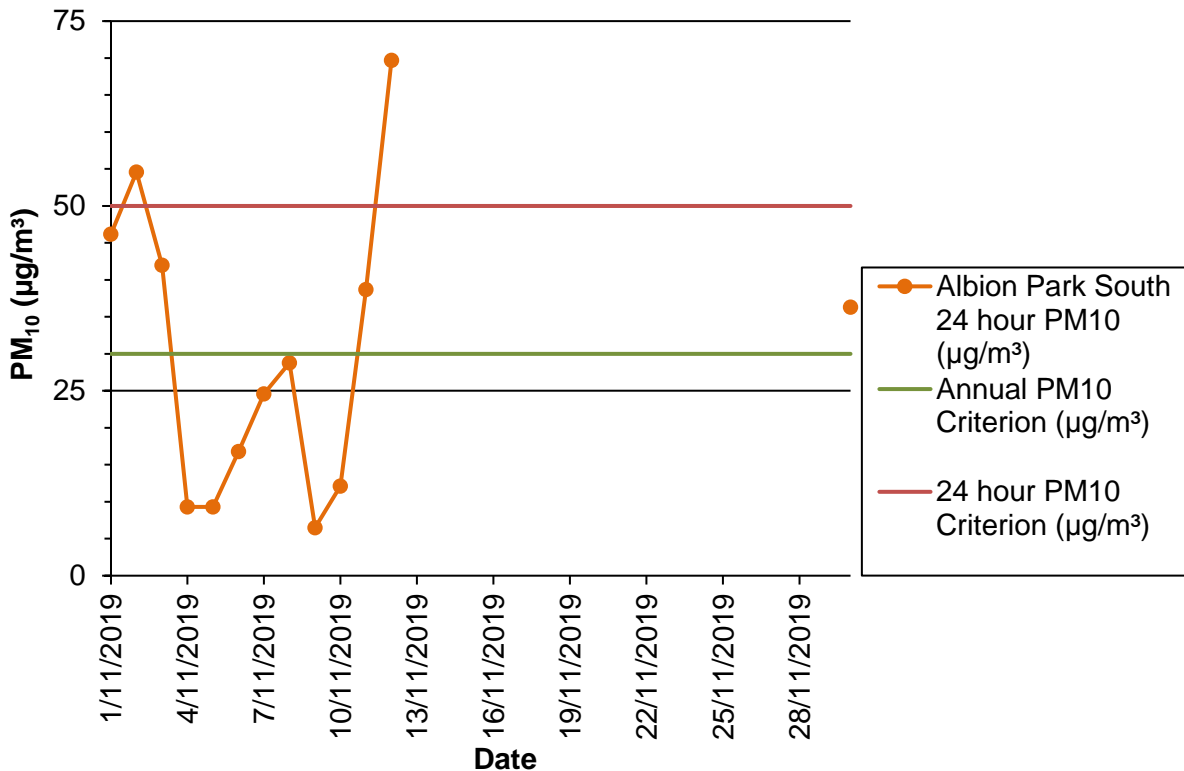


Figure 3: Twenty-four hour PM₁₀ concentration (µg/m³) as measured at Albion Park South AQMS during November 2019, compared to the annual criterion and 24 hour criterion (µg/m³).

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 November 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 November 2019, was 61.2 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 (pending repair of the malfunctioned LVAS unit).

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 November 2019, was 18.4 µg/m³. This is less than two-thirds of the 30 µg/m³ 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.

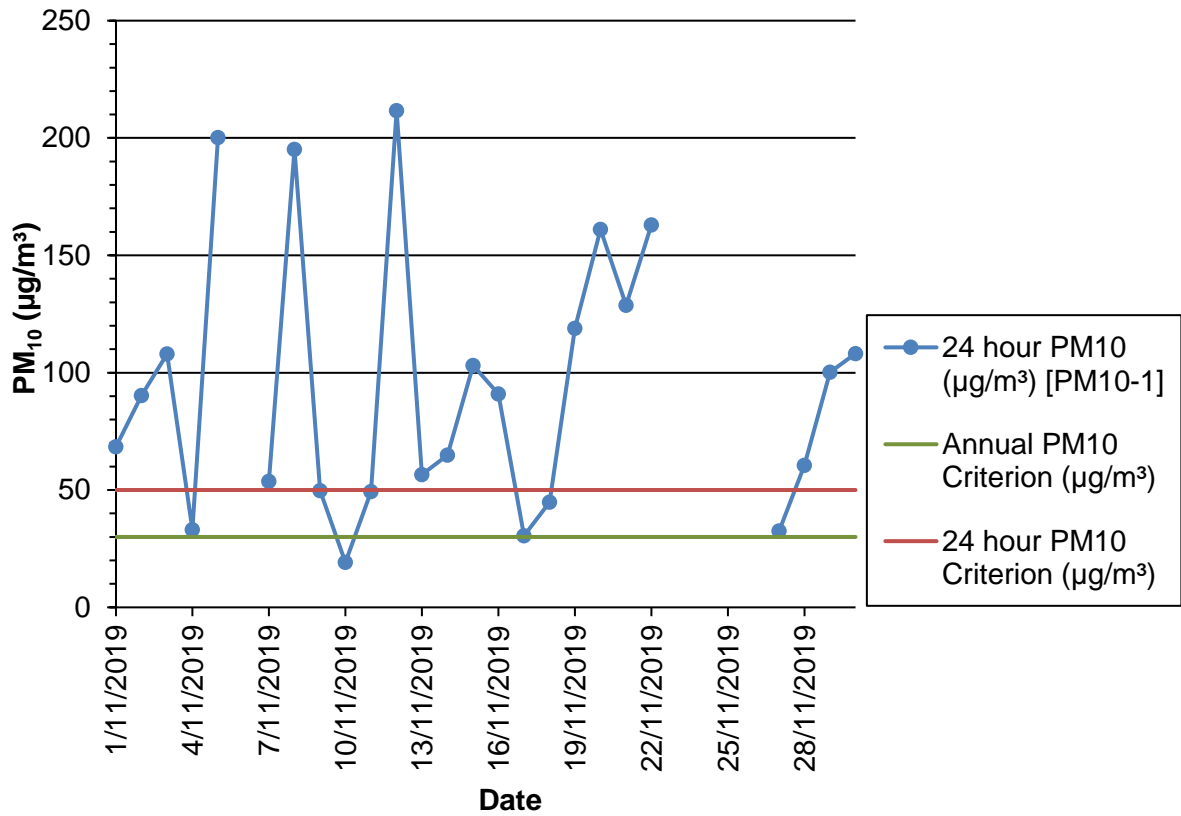


Figure 4: Twenty-four hour PM₁₀ concentration (µg/m³) as measured at PM10-1 during November 2019, compared to the annual PM₁₀ criterion and 24 hour PM₁₀ criterion (µg/m³).

Table 2: Monitoring results for Particulate Matter – PM₁₀ monitoring during November 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
1/11/2019	68		46	50	5.5	N	19.6	86.1	760	Observation of bushfire smoke from this date onwards
2/11/2019	90		55	50	6.4	N	19.2	88.2	758	Suspected exceptional event – NSW bushfires
3/11/2019	108		42	50	2.3	N	18.7	90.5	757	
4/11/2019	33		9	50	2.1	N	18.7	83.4	757	
5/11/2019	200	56	9	50	3.9	SSW	15.8	69.3	759	Wind direction suggests an external dust source
6/11/2019			17	50	2.9	W	18.9	58.1	755	
7/11/2019	54		25	50	3.9	W	23.4	45.1	751	
8/11/2019	195		29	50	3.4	W	21.4	43.0	750	
9/11/2019	50		7	50	2.5	WSW	15.0	45.2	756	
10/11/2019	19		12	50	2.9	W	18.3	46.9	757	
11/11/2019	49	114	39	50	4.1	N	18.2	76.9	758	Wind direction suggests an external dust source
12/11/2019	212		70	50	3.9	N	22.7	57.1	752	Suspected exceptional event – NSW bushfires
13/11/2019	57			50	3.4	WSW	17.5	47.3	757	
14/11/2019	65			50	3.2	N	19.7	47.8	757	
15/11/2019	103			50	3.0	W	22.7	47.3	754	
16/11/2019	91			50	2.1	ENE	17.7	74.2	759	
17/11/2019	31	42		50	2.3	ESE	17.4	75.5	761	
18/11/2019	45			50	4.4	N	18.4	76.0	760	
19/11/2019	119			50	3.2	S	21.9	61.9	756	
20/11/2019	161			50	2.5	NNE	19.5	70.3	761	
21/11/2019	129			50	5.7	N	20.4	82.9	757	
22/11/2019	163			50	3.9	SE	19.7	91.8	754	LVAS unit (PM10-2) malfunctioned
23/11/2019				50	2.6	SSE	19.7	77.3	759	E-BAM (PM10-1) unit malfunctioned
24/11/2019				50	2.5	SSW	19.4	72.8	761	
25/11/2019				50	3.7	NNW	20.9	80.9	755	
26/11/2019				50	4.8	N	23.3	54.8	750	
27/11/2019	33			50	4.3	SSW	19.0	61.3	759	E-BAM (PM10-1) unit repaired
28/11/2019	61			50	3.8	N	19.5	76.0	760	
29/11/2019	100			50	3.8	N	21.4	85.7	757	
30/11/2019	108		36	50	3.7	S	20.1	77.6	754	

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 November 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 November 2019 (**Table 3**). The rolling annual average TSP is therefore 50.9 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 November 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
18.4 µg/m ³	36.2%	50.9 µg/m ³	90 µg/m ³

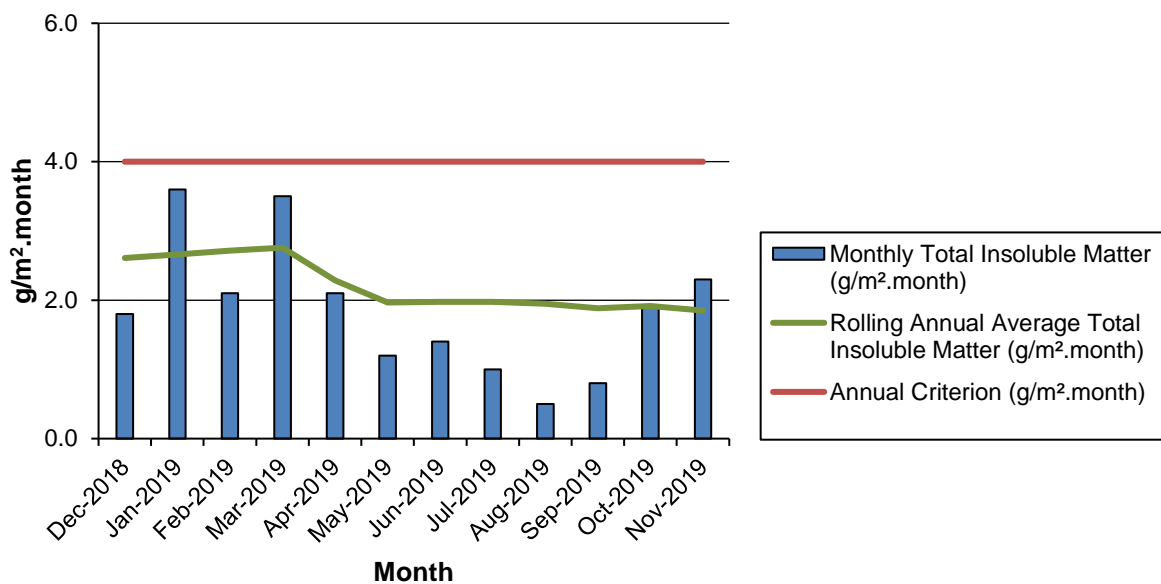
3.3. Dust Deposition Gauges

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 November 2019 indicate that dust deposition at DDG-1 and DDG-2 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)**).

Table 4: Monthly Total Insoluble Matter ($\text{g}/\text{m}^2\cdot\text{month}$) measured at the two Bass Point Quarry Dust Deposition Gauges (DDGs) during the period 15/10/2019 to 14/11/2019 (i.e. November 2019), and calculated rolling annual average Total Insoluble Matter ($\text{g}/\text{m}^2\cdot\text{month}$).

Site	Monthly Total Insoluble Matter ($\text{g}/\text{m}^2\cdot\text{month}$)	Rolling Annual Average Total Insoluble Matter ($\text{g}/\text{m}^2\cdot\text{month}$)	Comments
DDG-1	2.3	1.9	
DDG-2	3.6	9.4	Results likely affected by Marina construction

5(a)



5(b)

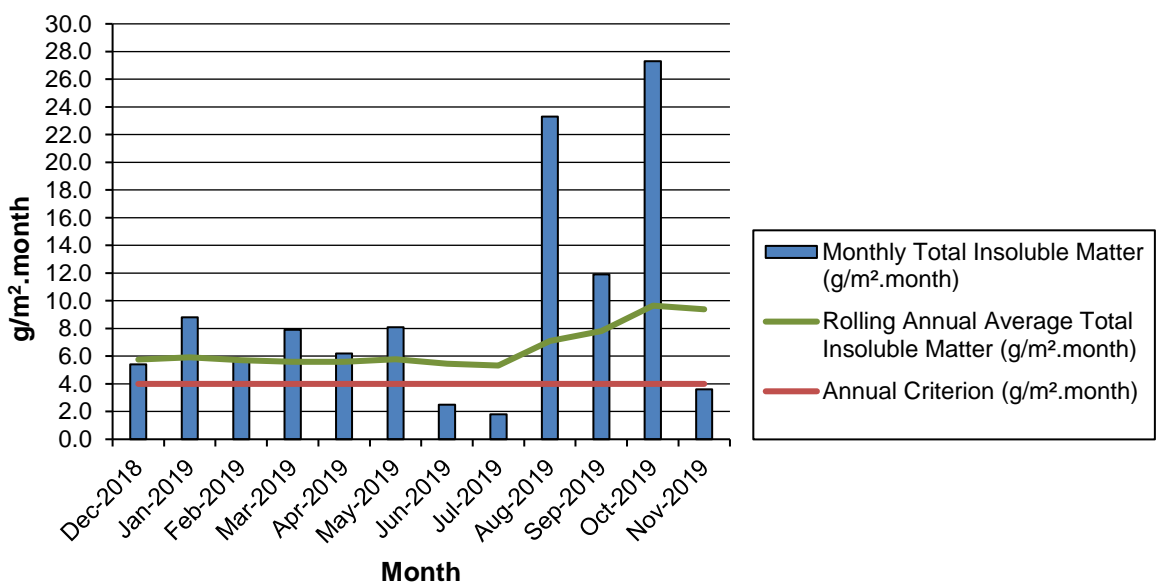


Figure 5: Total Insoluble Matter, rolling annual average, and annual criterion ($\text{g}/\text{m}^2\cdot\text{month}$) for the Bass Point Quarry as measured at (a) DDG-1, and; (b) DDG-2; during the 12-month period to November 2019.

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*

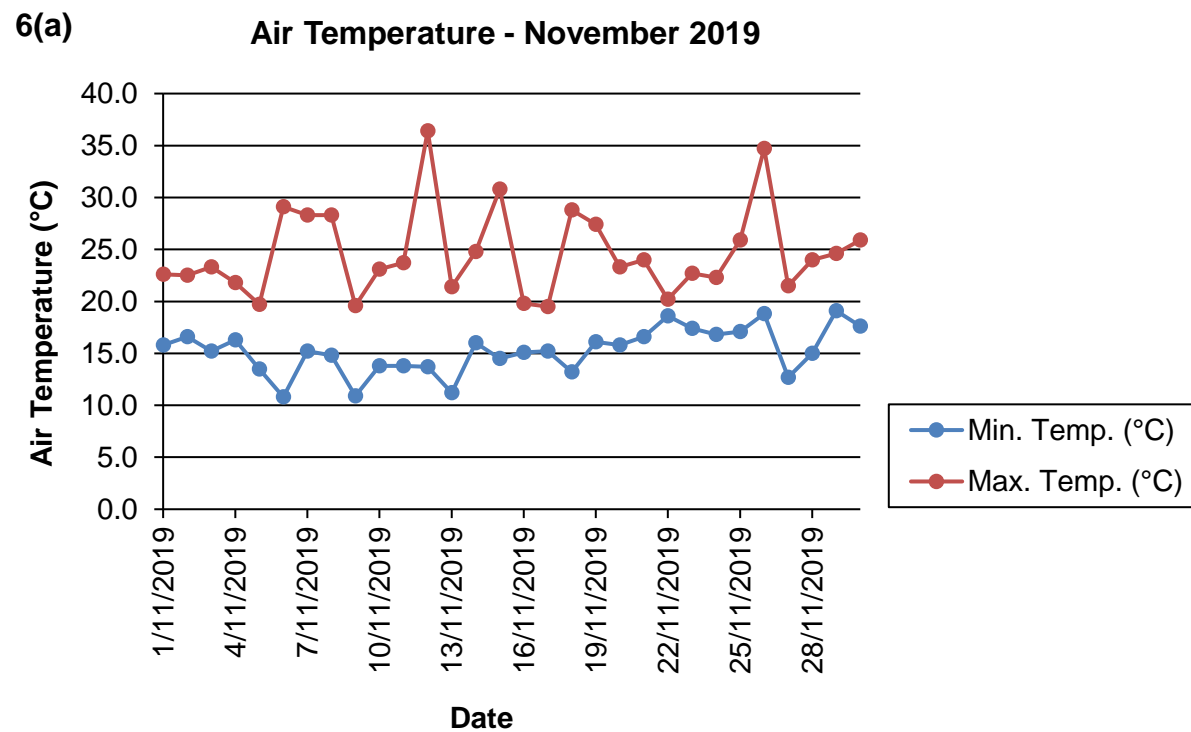
Table 5: Summary of representative meteorological data sourced from the BOM Kiama (Bombo Headland) AWS.

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)
1/11/2019	15.8	22.6	4.5	0.0	70	87	N	52	18:34	5.37	27.06
2/11/2019	16.6	22.5	4.2	0.0	69	88	N	54	15:04	5.75	23.11
3/11/2019	15.2	23.3	2.9	0.0	66	88	NW	48	16:20	2.55	12.82
4/11/2019	16.3	21.8	4.2	10.0	68	86	SE	30	6:59	2.86	24.80
5/11/2019	13.5	19.7	4.3	0.0	57	77	S	50	8:36	6.19	20.50
6/11/2019	10.8	29.1	6.7	0.0	18	82	W	39	14:48	3.36	28.55
7/11/2019	15.2	28.3	7.2	0.0	19	78	WSW	59	11:09	4.33	28.66
8/11/2019	14.8	28.3	8.1	0.0	17	74	WSW	67	15:32	5.89	28.72
9/11/2019	10.9	19.6	5.3	0.4	32	70	S	46	8:12	4.77	25.89
10/11/2019	13.8	23.1	5.7	0.0	32	74	WSW	52	23:33	4.66	24.55
11/11/2019	13.8	23.7	5.1	0.0	60	80	N	37	18:12	4.03	28.81
12/11/2019	13.7	36.4	11.3	0.0	7	82	S	72	17:41	7.28	24.96
13/11/2019	11.2	21.4	5.8	0.0	25	77	WSW	48	22:16	4.29	29.45
14/11/2019	16.0	24.8	6.3	0.0	26	79	SW	46	23:11	3.81	29.53
15/11/2019	14.5	30.8	7.8	0.0	11	79	S	61	19:26	4.50	25.73
16/11/2019	15.1	19.8	3.2	2.8	62	84	S	35	23:04	3.32	15.11
17/11/2019	15.2	19.5	2.9	0.8	65	85	SE	41	11:01	4.78	11.71
18/11/2019	13.2	28.8	5.7	1.6	60	82	NNE	44	12:14	3.97	28.87
19/11/2019	16.1	27.4	7.8	0.0	19	78	S	69	16:14	5.62	30.00
20/11/2019	15.8	23.3	4.8	0.0	55	77	S	39	23:11	3.38	24.39
21/11/2019	16.6	24.0	5.2	0.0	64	89	NNE	46	10:13	5.44	28.95
22/11/2019	18.6	20.2	3.9	0.0	65	89	S	67	7:22	7.13	19.49
23/11/2019	17.4	22.7	4.1	0.0	70	84	SSE	35	22:24	4.74	20.45
24/11/2019	16.8	22.3	3.6	0.0	60	79	SSW	31	1:14	3.49	14.71
25/11/2019	17.1	25.9	4.2	0.0	60	83	N	57	16:48	3.59	18.20
26/11/2019	18.8	34.7	9.1	10.8	15	83	WSW	76	15:37	6.28	21.71
27/11/2019	12.7	21.5	5.7	0.4	33	70	SSW	26	2:44	3.09	30.66
28/11/2019	15.0	24.0	5.6	0.0	56	80	N	41	20:23	4.38	30.04
29/11/2019	19.1	24.6	4.7	0.0	69	89	N	31	15:53	3.68	25.24
30/11/2019	17.6	25.9	6.3	0.0	34	91	S	65	8:38	8.01	20.68

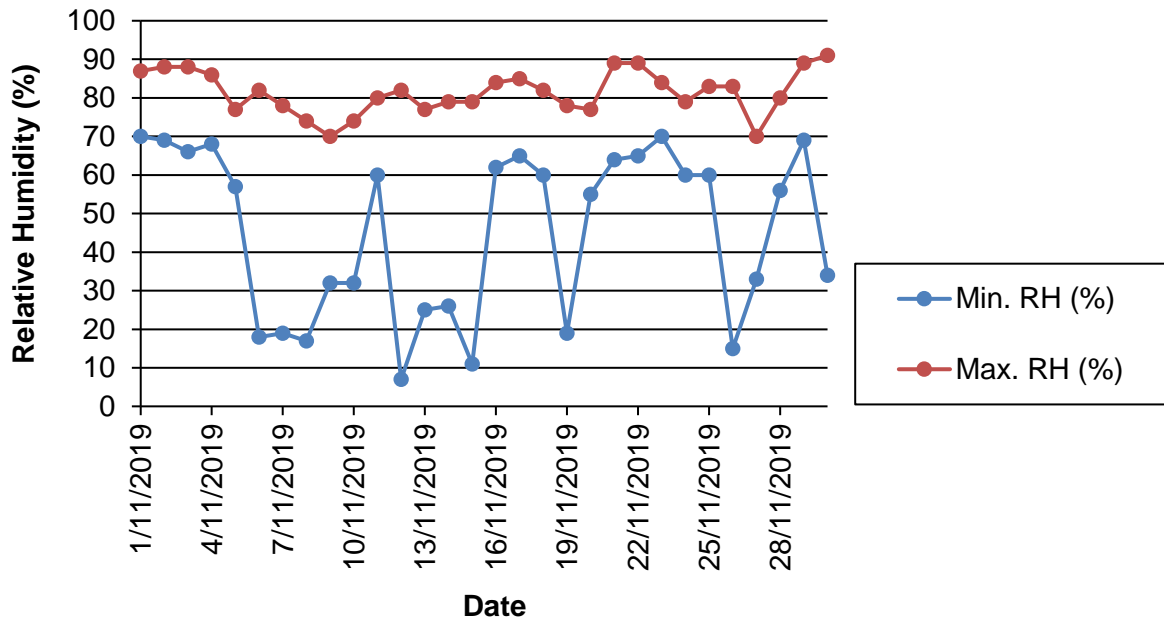
Monthly	Min. Temp. (°C)	Max. Temp. (°C)	Evapo-Transp. (mm)	Rainfall (mm)	Min. RH (%)	Max. RH (%)	Direction of maximum wind gust	Speed of maximum wind gust (km/h)	Time of maximum wind gust	Average 10 m Wind Speed (m/sec)	Solar Radiation (MJ/sq m)
Mean	15.2	24.7	5.5	0.9	45	81	-	49	-	4.68	24.11
Lowest	10.8	19.5	2.9	0.0	7	70	SSW	26	2:44	2.55	11.71
Highest	19.1	36.4	11.3	10.8	70	91	WSW	76	15:37	8.01	30.66
Total	-	-	166.2	26.8	-	-	-	-	-	-	-

4.2. Monthly Weather Charts

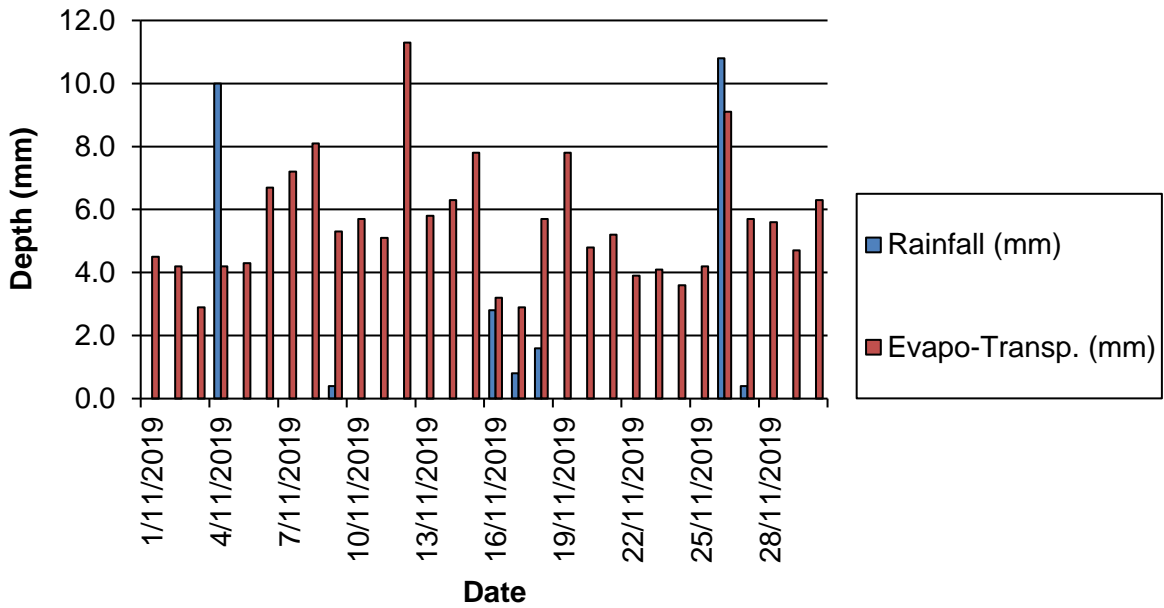
Figure 6: Summary of representative meteorological data sourced from the BOM Kiama (Bombo Headland) AWS for (a) Air Temperature; (b) Relative Humidity; and, (c) Rainfall and Evapo-Transpiration. Wind rose for data sourced from PM10-1 for (d) Wind Speed and Direction.



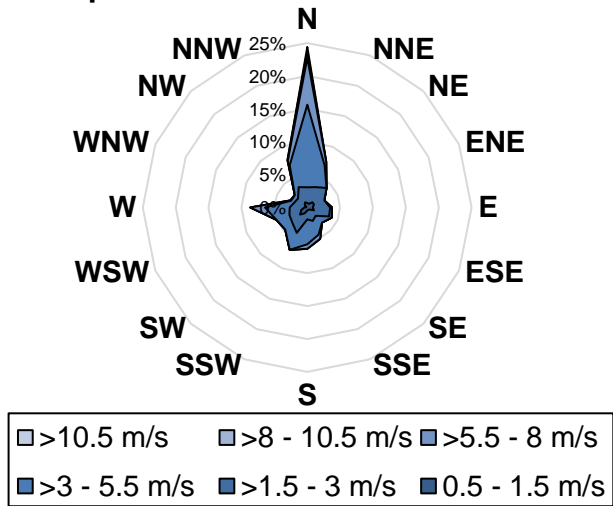
6(b) Relative Humidity - November 2019



6(c) Rainfall and Evapo-Transpiration - November 2019



6(d) Wind Speed and Direction - November 2019



Appendix 1
Chain of Custody & Laboratory Certificates



CHAIN OF CUSTODY

ALS Laboratory: please tick →

Sydney: 277 Woodpark Rd, Smithfield NSW 2176
Ph: 02 8764 8655 E: samples.sydney@alsenviro.com
 Newcastle: 5 Rosegum Rd, Warabrook NSW 2304
Ph: 02 4868 9433 E: samples.newcastle@alsenviro.com

Brisbane: 32 Sharnl St, Stafford QLD 4053
Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com
 Townsville: 14-15 Drama Ct, Bohle QLD 4813
Ph: 07 4796 0990 E: townsville.environmental@alsenviro.com

Melbourne: 2-4 Westall Rd, Springvale VIC 3171
Ph: 03 8549 9000 E: samples.melbourne@alsenviro.com
 Adelaide: 2-1 Burma Rd, Pooraka SA 5095
Ph: 08 8350 0690 E: adelaide@alsenviro.com

Perth: 10 Hod Way, Malaga WA 6090
Ph: 08 9209 7665 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: <input type="checkbox"/> Standard TAT (List due date): (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)		<input type="checkbox"/> Non Standard or urgent TAT (List due date):		EPR LABORATORY USE ONLY (Circle)	
OFFICE: Boolwarroo Pde Shellharbour NSW 2529		ALS QUOTE NO.: WL043/11		COC SEQUENCE NUMBER (Circle)		COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7	
PROJECT: Bass Point Dust Monitoring		ORDER NUMBER:		PROJECT MANAGER: Steve Butcher		CONTACT PH: 02 4295 1352	
SAMPLER:		SAMPLER MOBILE:		RELINQUISHED BY: Robert		RECEIVED BY:	
COC emailed to ALS? (YES / NO)		EDD FORMAT (or default):		DATE/TIME: 14.11.19 15:25		DATE/TIME:	
Email Reports to: steve.butcher@hanson.com.au		Email Invoice to: steve.butcher@hanson.com.au		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	14.11.19 12:30	AIR	AG	1	✓						
	DDG 2	10:40	AIR	AG	1	✓						
	DDG 3	11:40	AIR	AG	1	✓						
TOTAL					3							

Environmental Division
Wollongong
Work Order Reference
EW1904956



Telephone: 02 4295 2114

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 Specialisation 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	: EW1904956	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	: 14-Nov-2019 15:04
Order number	: ---	Date Analysis Commenced	: 18-Nov-2019
C-O-C number	: ---	Issue Date	: 20-Nov-2019 15:01
Sampler	: Robert DaLio		
Site	: ---		
Quote number	: WL/043/11 Bass Point Dust Monitoring		
No. of samples received	: 3		
No. of samples analysed	: 3		



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>
Jennifer Targett	Laboratory Technician	Newcastle - Inorganics, Mayfield West, NSW

Page : 2 of 2
 Work Order : EW1904956
 Client : HANSON CONSTRUCTION MATERIALS PTY LTD
 Project : Bass Point Dust Monitoring



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
 @ = 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-EN010 Sampling of Dust Deposition Gauges.

Analytical Results

Sub-Matrix: DEPOSITIONAL DUST
 (Matrix: AIR)

Client sample ID

				DDG 1 15/10/2019 - 14/11/2019	DDG 2 15/10/2019 - 14/11/2019	DDG 3 15/10/2019 - 14/11/2019	----	----
Client sampling date / time				14-Nov-2019 12:30	14-Nov-2019 10:40	14-Nov-2019 11:40	----	----
Compound	CAS Number	LOR	Unit	EW1904956-001 Result	EW1904956-002 Result	EW1904956-003 Result	-----	-----
EA120: Ash Content								
Ash Content	----	0.1	g/m ² .month	1.9	3.2	3.9	---	----
Ash Content (mg)	----	1	mg	34	57	74	---	----
EA125: Combustible Matter								
Combustible Matter	----	0.1	g/m ² .month	0.4	0.4	0.2	---	----
Combustible Matter (mg)	----	1	mg	7	7	5	---	----
EA141: Total Insoluble Matter								
Total Insoluble Matter	----	0.1	g/m ² .month	2.3	3.6	4.1	---	----
Total Insoluble Matter (mg)	----	1	mg	41	64	79	---	----



CHAIN OF CUSTODY

ALS Laboratory: please tick →

Sydney: 277 Woodhark Rd. Smithfield NSW 2176
 Ph: 02 8784 8555 E: samples.sydney@alsenviro.com
 Newcastle: 5 Roseglen Rd. Warabrook NSW 2304
 Ph: 02 4968 1433 E: samples.newcastle@alsenviro.com

Brisbane: 32 Skand St. Stafford QLD 4053
 Ph: 07 3243 7222 E: samples.brisbane@alsenviro.com
 Townsville: 14-15 Desma Ct. Belle QLD 4818
 Ph: 07 4796 0600 E: samples.townsville@alsenviro.com

Melbourne: 2-4 Westall Rd. Springvale VIC 3171
 Ph: 03 8540 9600 E: samples.melbourne@alsenviro.com
 Adelaide: 2-1 Birnie Rd. Pooraka SA 5095
 Ph: 08 8358 0800 E: samples.adelaide@alsenviro.com

Perth: 10 Hool Way. Mosley WA 6090
 Ph: 08 9209 7055 E: samples.perth@alsenviro.com
 Launceston: 27 Wellington St. Launceston TAS 7250
 Ph: 03 6331 2158 E: samples.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)		Custody Seal Intact? Yes No N/A	
PROJECT: LVAS (PM10)		ALS QUOTE NO.:		Freeze / frozen ice bricks present upon receipt? Yes No N/A	
ORDER NUMBER:		COC SEQUENCE NUMBER (Circle)		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		RECEIVED BY: Anete	
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		RELINQUISHED BY: Chelsea		RECEIVED BY:	
Email Invoice to (will default to PM if no other addresses are listed): steve.butcher@hanson.com.au		DATE/TIME: 28/11/2019 10:46		DATE/TIME:	

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 (refer to codes below)	TOTAL BOTTLES	LVAS PM10				
1	47-125P6498631	5/11/2019	Filter		1	✓				
2	47-125P6498632	11/11/2019	Filter		1	✓				
3	47-125P6498633	17/11/2019	Filter		1	✓				
					TOTAL	0				



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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	: EW1905188	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	: 28-Nov-2019 12:12
Order number	: ---	Date Analysis Commenced	: 03-Dec-2019
C-O-C number	: ---	Issue Date	: 05-Dec-2019 09:25
Sampler	: ---		
Site	: ---		
Quote number	: EN/333		
No. of samples received	: 3		
No. of samples analysed	: 3		



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>
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.

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.

- 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.

Analytical Results

Sub-Matrix: FILTER (Matrix: AIR)		Client sample ID		47-125P6498631	47-125P6498632	47-125P6498633	----	----
		Client sampling date / time		47-125P6498631	47-125P6498632	47-125P6498633	----	----
Compound	CAS Number	LOR	Unit	05-Nov-2019 00:00	11-Nov-2019 00:00	17-Nov-2019 00:00	----	----
				EW1905188-001	EW1905188-002	EW1905188-003	-----	-----
				Result	Result	Result	---	---
EA143: Particulates in Air - LVAFs								
^ øPM10	----	14	µg/m³	56	114	42	----	----
PM10 (mass per filter)	----	100	µg/filter	225	456	169	----	----
EA143: Total Suspended Particulates								
Initial Weight	----	0.0001	mg	139.3526	138.6372	137.4392	----	----
Final Weight	----	0.0001	mg	139.5775	139.0933	137.6080	----	----
Low Volume Air-Sampling Parameters								
ø Volume	----	1	L	4050	4000	4040	----	----