

CBased Environmental Pty Limited ABN 62 611 924 264



Calga Quarry

Environmental Monitoring

Dust Deposition, Surface Water, Groundwater and Meteorological Data

September 2020

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Environmental Scientist Date: 22 October 2020

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Executive Summary

CBased Environmental is contracted by Hanson Quarry Products to conduct environmental monitoring at the Calga Sand Quarry.

The monitoring includes:

- Dust deposition;
- Surface water; and
- A meteorological data.

This report was prepared by CBased Environmental and includes the following results for September 2020:

- Dust deposition;
- Surface water quality; and
- Meteorological parameters.

The September 2020 dust deposition results for insoluble solids showed:

- Increased levels when compared to August 2020;
- · No excessively contaminated dust gauges; and
- Rolling annual averages below the Air Quality Management Plan criteria of 3.7g/m².month.

Monthly surface water samples were collected at sites A, C1, C2, D and F. Site B was not flowing at the time of collection. The samples were collected and analysed for a monthly sampling event. Results show pH within the slightly acidic range, low electrical conductivity, low total dissolved solids and low total suspended solids. Oil and grease was not detected at sites A, C1, D, and F in September 2020.

The Calga Quarry weather station data recovery in September 2020 was approximately 97%. A summary of rainfall comparison is provided below.

Location	Rainfall (mm)
Calga Quarry	35.4mm
BOM Peats Ridge*	NA
BOM Gosford*	50.2mm
BOM Peats Ridge long-term mean for September*	69.1mm

Notes: NA = Not Available

*Data sourced from Bureau of Meteorology (BOM) website: www.bom.gov.au BOM stations report rainfall at 9am

Calga Quarry station reports rainfall at midnight.

1.0 Sampling Programme

Hanson Calga Quarry conducts environmental monitoring in accordance to Development Consent, OEH (EPA) licence and Environmental Management Plans. CBased Environmental are contracted to undertake dust deposition gauge, surface water, groundwater and meteorological monitoring for the project. CBased Environmental commenced monitoring from the April 2006 monitoring period.

Dust deposition gauges are operated to the Australian Standard AS3580.10.1 "Methods for sampling and analysis of ambient air method. Determination of particulates- deposited matter- gravimetric method". Sampling is undertaken every 30 +/- 2 days and each gauge is analysed for insoluble solids and ash residue. The results are reported as g/m².month.

Six (6) dust deposition gauges are monitored as follows:

- CD1 installed 1 May 2006. Gauges air quality impacts to the east of site operations;
- CD2c located on a rehabilitated section of land between the extraction area and adjacent resident. Gauges air quality impacts to the north of site operations. Replaces former gauges CD2a and CD2b;
- CD3 installed prior to May 2006. Gauges air quality impacts to the south of site operations;
- CD4 installed 3 October 2006. Gauges air quality impacts to the south of site operations;
- CD5 installed 14 December 2006. Gauges air quality impacts to the south of site operations; and
- CD6 installed 14 December 2006. Gauges air quality impacts to the south of the operations.

Dust gauge CD2a was discontinued at the start of August 2006 due to quarry operations "mining out" the site of the gauge. The replacement gauge, CD2b, was located in a position adjacent to the boundary between B. Kashouli and F. & J. Gazzana in conformance with the Air Quality Management Plan. CD2b was discontinued at the end of January 2010 due to contamination of the gauge by non-quarry related vehicle movements on a track adjacent to the gauge. CD2b was replacement by dust gauge CD2c.

Surface water is sampled in accordance with Australian Standards:

- AS5667.1 "Guidance on the design of sample programs, sampling techniques and the preservation and handling of samples";
- AS5667.6 "Water quality sampling—guidance on sampling of rivers and streams"; and
- AS5667.4 "Water quality sampling—guidance on sampling from lakes, natural and man-made".

Surface water monitoring sites include local streams and dams. Laboratory analysis includes pH, electrical conductivity, total suspended solids, total dissolved solids and total oil and grease. Monitoring is conducted monthly at Sites A and F (dams) and

when Sites B, C and D are flowing. Additional samples are collected when daily rainfall exceeds 50mm.

Groundwater is sampled in accordance with Australian Standards:

- AS5667.1 "Guidance on the design of sample programs, sampling techniques and the preservation and handling of samples"; and
- AS5667.11 "Water quality sampling—guidance on sampling of ground waters".

Groundwater monitoring sites are sampled bi-monthly for depth and water quality. Groundwater monitoring loggers continuously record water levels in a selection of bores.

Meteorological monitoring is conducted at the quarry and displayed on the site computer with a real-time display. Metrological parameters are measured according to Australian Standard AS3580.14 "Methods for sampling and analysis of ambient air. Meteorological monitoring for ambient air quality monitoring applications"

The weather station has the following sensor configuration:

- Air temperature;
- Humidity;
- Rainfall:
- Atmospheric pressure;
- Evaporation;
- Solar radiation;
- Wind speed; and
- Wind direction.

CBased Environmental continued to operate the monitoring equipment and utilise site collections at their existing locations.

The locations of monitoring points are provided in Figure 1.

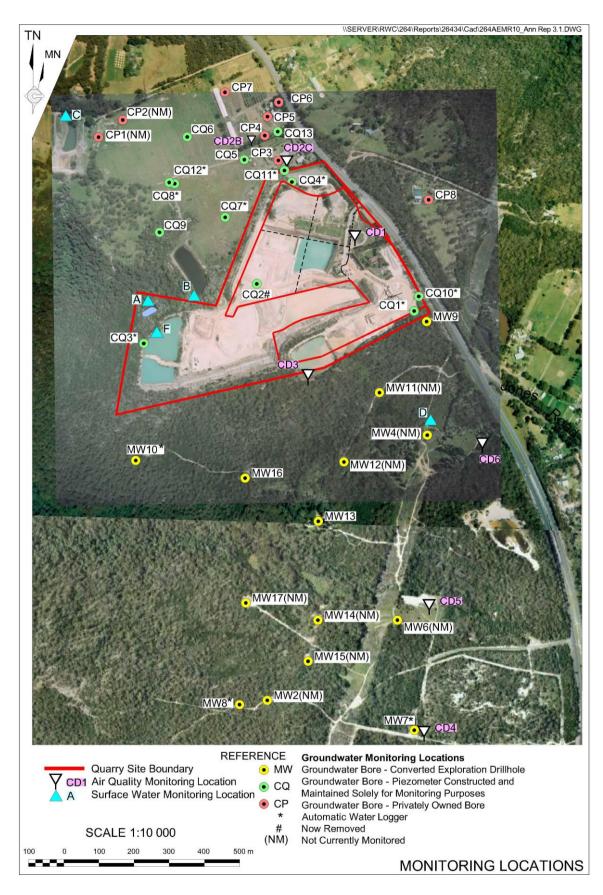


Figure 1: Hanson Calga Quarry Environmental Monitoring Locations

2.0 Results

2.1 Dust Deposition

The results for September 2020 and the project 12-month rolling average are provided **Table 1**.

Dust deposition charts for all dust gauge sites appear in **Figure 2** below. The field sheet, chain of custody documentation and laboratory analysis certificates are provided in **Appendix 1**.

Table 1: Dust Deposition Results: 1 September 2020 – 1 October 2020 (30 days)

Site	Monthly Insoluble Solids	Monthly Ash Residue	Monthly Combustible Matter	Monthly Ash Residue/ Insoluble Solids %	Rolling Annual Average Insoluble Solids
CD1	1.8	1.4	0.4	78	2.1
CD2c	1.1	0.7	0.4	64	1.6
CD3	1.5	1.1	0.4	73	1.7
CD4	1.5	0.8	0.7	53	1.5
CD5	0.3	0.2	0.1	67	1.5
CD6	0.6	0.3	0.3	50	1.3

Notes:

Units in g/m².month unless indicated

Insoluble solid results marked with an * indicate an excessively contaminated gauge. Contamination can include bird droppings, vegetation (such as plant matter, algae, pollen and seeds) and insects

Results in **bold** indicate insoluble solids levels above 3.7g/m².month; the Development Consent's annual average amenity criteria at residential locations

The current rolling annual average is calculated from October 2019 to September 2020

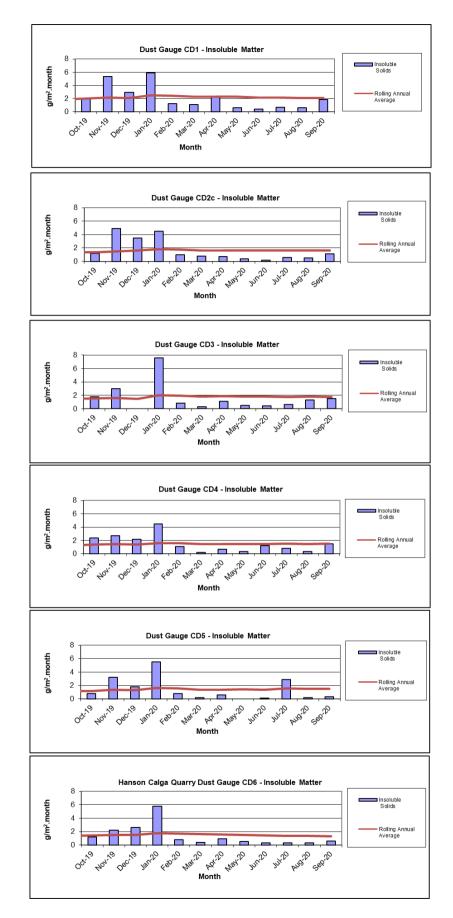


Figure 2: Summary Monthly/Annual Dust Deposition Results for Insoluble Solids

2.2 Surface Water (Monthly)

Monthly surface water monitoring was conducted on 1 September 2020 and results are provided in **Table 2**. The field sheet, chain of custody documentation and laboratory analysis certificates are provided in **Appendix 1**.

Samples were collected at sites A, C1, C2, D and F. Site B was not flowing at the time of collection.

Table 2: Monthly Surface Water Monitoring Results – September 2020

Tubic L.		iting Carrac			9	<u> </u>	111001 2020	
Site	Observed Flow Rate* (visual)	Water Colour* (visual)	Turbidity* (visual)	рН	EC (μS/cm)	TDS (mg/L)	TSS (mg/L)	Oil and Grease (mg/L)
Α	Dam	Clear	Clear	6.01	99	55	<5	<5
В				Not flo	wing			
C1	Dam	Clear	Clear	6.58	88	50	10	<5
C2	Steady	Clear	Clear	6.22	114	58	9	<5
D	Still	Clear	Clear	5.27	88	56	<5	<5
F	Dam	Clear	Clear	5.63	94	56	26	<5

^{*} Indicates field measurements. All other results are laboratory analysed

2.2.1 Non-Routine Surface Water Sampling

Non-routine surface water sampling was completed on 14 September 2020 for 'Hanson Calga Quarry, Site Water Discharge Dam 1(A)' for sample 'Discharge Dam 1 (A) 14/092020 (Test prior to release)'. The chain of custody documentation and laboratory analysis certificates are provided in **Appendix 1**.

EC = Electrical conductivity

TDS = Total dissolved solids

TSS = Total suspended solids

2.3 Meteorological Data

The Calga Quarry weather station data recovery for September 2020 was approximately 97%. Insufficient data on 30 September due to missing data from 9.30am onwards due to a power outage onsite.

The weather station data follows and includes:

- Monthly rainfall comparison between quarry data and BOM data. Refer to Table 3;
- Monthly data summary. Refer to Table 4;
- Weather charts of air temperature, humidity, heat index and wind chill, atmospheric pressure, solar radiation, evapotranspiration, rain, wind speed and data reception. Refer to Figures 6 – 9; and
- Wind rose (frequency distribution diagram of wind speed and direction). Refer to Figure 10.

A summary of rainfall comparison is provided in **Table 3**.

Table 3: Comparison of Local Rainfall – September 2020

Location	Rainfall (mm)
Calga Quarry	35.4mm
BOM Peats Ridge*	NA
BOM Gosford*	50.2mm
BOM Peats Ridge long-term mean for September*	69.1mm

Notes: NA = Not Available

*Data sourced from Bureau of Meteorology (BOM) website: www.bom.gov.au

BOM stations report rainfall at 9am

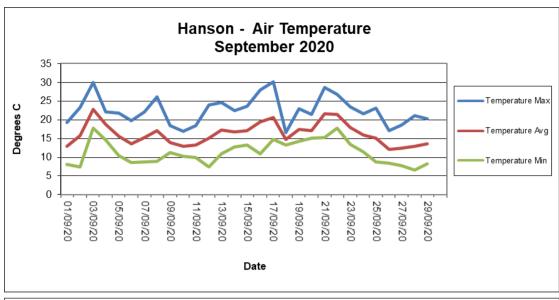
Calga Quarry station reports rainfall at midnight.

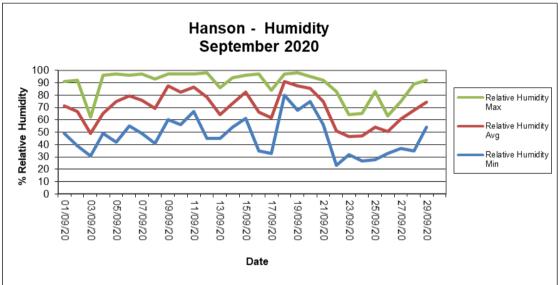
An annual calibration was undertaken on the weather station during April 2020 and is next due in March 2021. Please refer to **Appendix 1**.

Table 4: Summary of Monthly Meteorological Data – September 2020

Date	Temperature Min	Temperature Avg	Temperature Max	Relative Humidity Min	Humidity Avg	Relative Humidity Max	Rain	Evapotrans piration	Wind Speed Min	Wind Speed Avg	Wind Speed Max	Wind Chill Min	Heat Index Max	Atmospheric Pressure Min			Solar Radiation Min	Solar Radiation Avg	Solar Radiation Max	Data Min	Data Avg	Data Max
1/09/2020	8.1	12.9	19.2	49.0	71.3	91.0	0.0	2.9	0.0	1.6	7.6	8.2	18.5	1018.1	1019.9	1022.2	0.0	171.3	926.0	59.6	87.8	100.0
2/09/2020	7.4	15.7	23.3	39.0	66.7	92.0	0.0	3.1	0.0	1.3	9.4	7.4	22.7	1013.3	1016.4	1018.9	0.0	164.1	704.0	74.1	89.8	99.4
3/09/2020	17.8	22.8	30.0	31.0	49.1	62.0	0.0	5.6	0.4	3.1	11.6	17.9	29.6	1010.0	1012.4	1014.7	0.0	213.1	834.0	57.4	84.1	99.7
4/09/2020	14.6	18.8	22.1	49.0	65.2	96.0	9.0	1.8	0.0	1.9	11.6	13.8	21.3	1010.3	1012.0	1014.8	0.0	34.4	198.0	42.6	81.7	92.7
5/09/2020	10.5	15.6	21.8	42.0	74.9	97.0	0.4	3.7	0.0	1.3	8.0	10.6	20.8	1010.6	1014.5	1020.9	0.0	219.1	796.0	44.8	73.6	91.2
6/09/2020	8.6	13.7	19.7	55.0	79.5	96.0	0.0	2.4	0.0	1.4	8.0	8.6	19.1	1021.1	1024.4	1027.0	0.0	138.5	760.0	78.2	88.4	93.1
7/09/2020	8.8	15.3	22.2	49.0	75.9	97.0	0.2	4.0	0.0	2.4	8.9	8.9	21.7	1025.9	1027.3	1028.9	0.0	222.4	795.0	52.7	81.0	92.4
8/09/2020	8.9	17.1	26.2	41.0	69.1	93.0	0.0	3.7	0.0	1.1	5.8	8.9	25.8	1021.1	1024.3	1027.4	0.0	212.9	813.0	61.5	81.5	90.2
9/09/2020	11.3	13.9	18.4	60.0	87.6	97.0	9.6	0.9	0.0	1.3	10.3	11.3	18.0	1019.9	1023.4	1025.1	0.0	43.3	291.0	52.4	75.5	89.3
10/09/2020	10.3	13.0	16.9	56.0	82.2	97.0	1.8	2.4	0.0	1.3	9.4	10.1	16.1	1023.0	1025.1	1027.1	0.0	148.9	974.0	62.5	76.7	89.3
11/09/2020	9.9	13.3	18.4	67.0	86.6	97.0	0.8	1.9	0.0	1.0	6.3	9.9	18.1	1025.5	1027.0	1029.1	0.0	128.2	675.0	53.3	79.4	90.9
12/09/2020	7.4	15.0	24.0	45.0	78.6	98.0	0.6	3.7	0.0	1.3	6.7	7.4	23.8	1020.1	1023.3	1026.7	0.0	234.1	827.0	75.7	83.2	91.2
13/09/2020	10.9	17.3	24.7	45.0	64.1	86.0	0.0	3.4	0.0	1.5	8.5	11.0	24.4	1017.4	1019.5	1021.4	0.0	163.2	1001.0	76.0	82.0	87.4
14/09/2020	12.7	16.8	22.4	54.0	73.1	94.0	0.0	4.0	0.0	1.3	8.0	12.8	22.3	1018.7	1021.1	1024.1	0.0	235.6	825.0	72.9	83.0	96.2
15/09/2020	13.2	17.2	23.7	61.0	82.3	96.0	0.0	2.9	0.0	2.2	9.4	13.2	24.1	1021.6	1023.7	1026.1	0.0	150.5	961.0	73.5	88.8	100.0
16/09/2020	11.0	19.4	27.9	35.0	66.3	97.0	0.2	4.5	0.0	1.3	8.5	11.1	27.2	1015.0	1018.9	1022.9	0.0	236.5	856.0	70.0	87.0	98.4
17/09/2020	14.7	20.6	30.2	33.0	61.7	84.0	0.0	4.8	0.0	2.1	12.5	14.4	29.7	1015.8	1019.4	1026.5	0.0	229.1	840.0	55.8	82.8	91.5
18/09/2020	13.3	14.8	16.6	80.0	91.2	97.0	1.4	0.7	0.0	0.6	7.2	13.3	16.6	1025.5	1026.9	1029.0	0.0	46.5	244.0	71.6	91.1	100.0
19/09/2020	14.3	17.5	22.9	68.0	87.4	98.0	0.4	2.7	0.0	2.3	9.4	14.3	23.4	1015.2	1020.7	1025.9	0.0	141.8	713.0	90.2	99.3	100.0
20/09/2020	15.1	17.1	21.5	75.0	85.6	95.0	9.4	1.9	0.0	1.9	8.9	14.6	21.8	1007.8	1011.3	1015.0	0.0	94.9	814.0	94.0	98.2	100.0
21/09/2020	15.3	21.6	28.7	56.0	74.8	92.0	0.0	3.5	0.0	1.8	13.4	15.3	29.6	1002.6	1006.5	1009.9	0.0	182.0	918.0	88.3	95.0	99.7
22/09/2020	17.7	21.5	26.8	23.0	51.3	83.0	0.0	6.5	0.9	3.5	12.1	17.8	25.3	1002.6	1006.0	1009.0	0.0	256.0	885.0	85.2	94.6	100.0
23/09/2020	13.4	17.9	23.4	32.0	46.6	64.0	0.0	6.0	0.4	3.3	11.6	13.4	22.5	1006.2	1008.8	1011.3	0.0	245.7	875.0	77.0	93.5	100.0
24/09/2020	11.4	16.0	21.6	27.0	47.1	65.0	0.0	5.8	0.0	3.1	13.0	9.9	19.6	1007.7	1009.7	1011.1	0.0	263.2	890.0	78.9	89.7	96.8
25/09/2020	8.7	15.1	23.1	28.0	54.1	83.0	1.4	5.3	0.0	3.9	21.5	5.7	21.9	995.3	1003.0	1009.4	0.0	219.4	1014.0	83.9	90.6	98.7
26/09/2020	8.5	12.0	17.1	33.0	50.6	63.0	0.2	6.4	1.3	6.0	15.6	5.4	15.1	1002.6	1007.9	1014.4	0.0	268.8	902.0	84.5	90.9	99.4
27/09/2020	7.8	12.4	18.6	37.0	60.7	75.0	0.0	4.2	0.0	2.0	9.4	6.7	16.5	1014.1	1018.7	1023.5	0.0	232.5	1071.0	86.4	94.1	100.0
28/09/2020	6.6	12.9	21.1	35.0	67.6	89.0	0.0	3.7	0.0	1.2	8.0	6.6	19.3	1020.7	1022.9	1025.1	0.0	217.9	972.0	78.2	92.0	99.4
29/09/2020	8.2	13.5	20.2	54.0	74.4	92.0	0.0	3.1	0.0	1.6	7.6	8.3	19.6	1019.0	1021.9	1024.8	0.0	174.3	886.0	76.7	87.3	95.3
30/09/2020																						
Monthly	6.6	16.2	30.2	23	70	98	35.4	105.6	0.0	2.0	21.5	5.4	29.7	995.3	1017.8	1029.1	0.0	182.3	1071.0	42.6	87.0	100.0
Unit		grees Celcius (°	C)	_	ge Relative		mm	mm	Metres	per secon	d (m/s)	°C	°C	He	ector Pascals (h	Pa)	Watts pe	r square metr	re (W/m²)	F	Percentage (%)

Missing data from 30/09/20 9.30am onwards due to a power outage onsite resulting in insufficient data





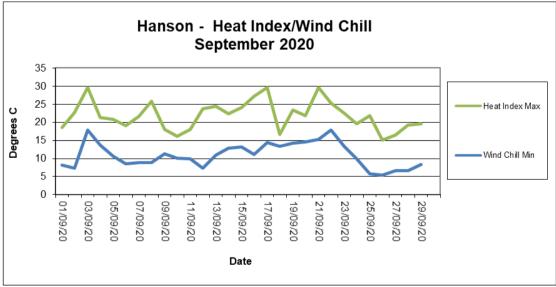


Figure 7 Summary of Monthly Temperature, Humidity and Heat Index Results

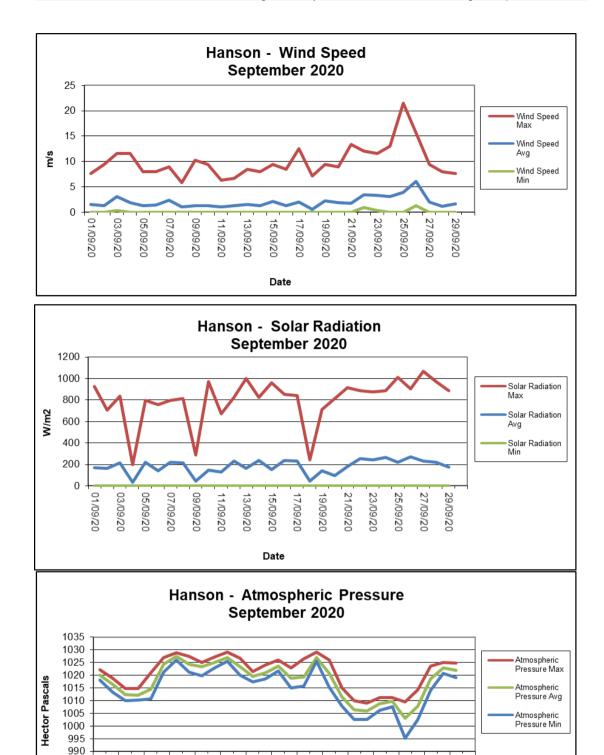


Figure 8 Summary of Monthly Wind Speed, Solar Radiation and Atmospheric Pressure Results

19/09/20 17/09/20 21/09/20

23/09/20

15/09/20

Date

13/09/20

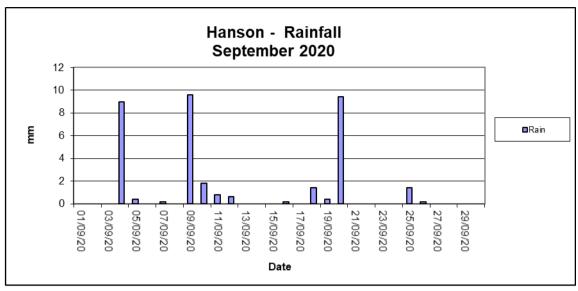
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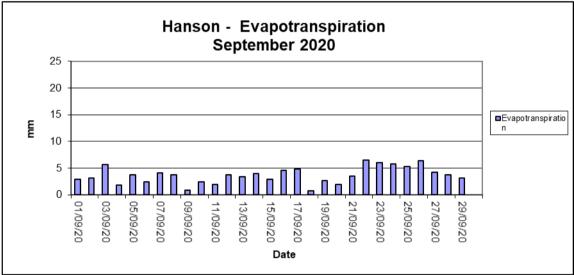
09/09/20

29/09/20 27/09/20

25/09/20

07/09/20 05/09/20 03/09/20 01/09/20





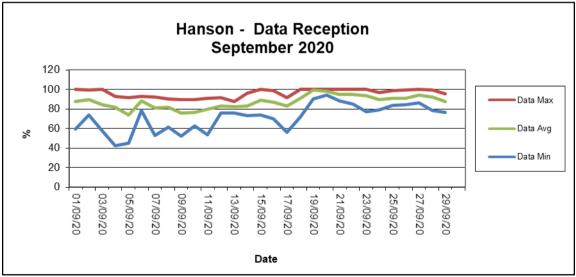


Figure 9 Summary of Monthly Rainfall, Evapotranspiration and Data Reception Results

Frequency plot of the average wind speed and average direction over each 15-minute sampling period. Wind is considered to be calm when at less than a 15-minute average of 1m/s.

Hanson - Windrose

00:15 1 September 2020 to 23:45, 29 September 2020

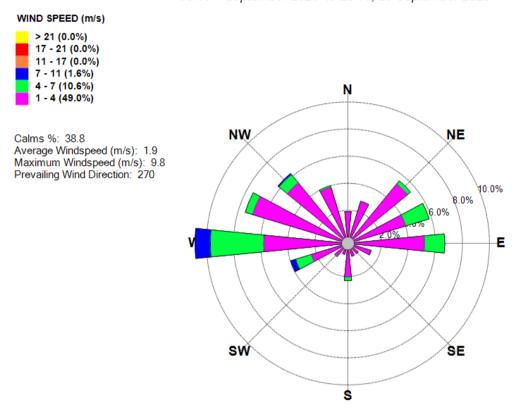


Figure 10: *Monthly Windrose Plot – September 2020*

The predominant wind for September was from the West, with most frequent, strongest winds from the West. The maximum wind speed was 9.8 m/s from the West. Insufficient data for 30 September due to missing data from 9.30am onwards due to a power outage onsite.

Appendix 1

Field Sheets
Chain of Custody Documentation
Laboratory Analysis Certificates



DEPOSITIONAL DUST MONITORING

Client: Hanson Calga Quarry

Date Installed: 1 9 20

Date Collected: 1 - 10 - 20

Sampled By: Lelsa King

Site	Time	Water	Insolut	ole Material (🗸 =		nod etc)	Water	Water	Stand Level	Funnel Level	New Funnel	Comments	
	Collected	Level (mL)	Insects	Bird droppings	Vegetation	Dust	Turbidity	The same of the sa	(Y/N)	(Y/N)	Diameter (mm)		1
CD1	10.55	200	1,			/	ØST.	O Bn Gn Gy	Y	4			
CD2C	11.05	200			/	/	Ø S T	O Bn Gn Gy		4			
CD3	10.45	800	/		11		© S T	O Bn Gn Gy	41	4		Trees Very	(ase
CD4	11.15	860	141			/		O Bn Gn Gy		4		J	
CD5	11.25	800					⊘ s ⊤	Bn Gn Gy	7	·Y			
CD6	11-35	800	/		6	~	Øsт	O Bn Gn Gy	V	7			1
									7				
	8											2	1
													1
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										10			1
													1
													1
													1
	1												1

Turbidity: C=Clear, S= Slight, T=Turbid (CIRCLE)

Colour: C=Colourless, O=Orange, Bn=Brown, Gn=Green, Gy = Grey (CIRCLE)

Report broken funnels and replacement diameters

Signed:

CHAIN OF CUSTO	DY DO	CUN	/IEN	TAT	TION																						Australian Laboratory	Service
CLIENT: CBased Environmental Pty L	td										BATC	HNO.					TANK T			and the second			A Co			13 3	Pty Ltd	
POSTAL ADDRESS: 47 Boomerang S	t CESSNOCK	NSW 232	25					SAME	LERS	S:			Re	sa	(Zi,	رم ا											
SEND REPORT TO: monitoringresults@cbased.com.au		SEND IN renae.m			counts@cbased.com.au, om.au			PHON	IE: 02	6571	3334			E-MA	NL: mo	nitorir	gresult	s@cba	sed.co	m.au								
DATA NEEDED BY: 7 working days		REPOR	TNEEDE	D BY:	7 working days			REPO	RTF	ORM	AT: I	HARD:	Yes	F	AX:		DISK:	BU	JLLET	N BOA	RD:		E-N	AIL:	Yes			
PROJECT ID: Hanson Calga Dusts	QUOTE NO.:	SYBQ 40	3-18	2010				QC LE	VEL:		QCS	31:			QCS2	:	- 1	QCS3:	Yes			Q	CS4:					
P.O. NO.:	COMMENTS/	SPECIAL	HANDLI	NG/ST	ORAGE OR DIPOSAL:													ANA	LYSIS	REQU	IRED							
FOR LAB USE ONLY COOLER SEAL								Soldis	ane	ole Matt																		
Yes No,	Total unless s	pecified		2				aple	esic	stak				- 1								- 1				- 1		
Broken, Intact							8.	Insoluable	Ash Residue	Combustable				- 1				1										
COOLER TEMP: deg.C					·			≗	As	కి	_																NOTES	
SAMP	LE DATA				*CONTAINER I	DATA					_				\perp	\perp	_											
SAMPLE ID	MATRIX		ON DA			NO.									_													
CD1	Dust	(.9.	201-	10-2	9			х	х	х																		
CD2c	Dust			1				х	x	x																		
CD3	Dust							х	х	х																		
CD4	Dust							х	Х	х	_		$ \bot $	_	_													
CD5	Dust			-				Х	Х	х	_			_	_					_	_	_						
CD6	Dust			<u> </u>	ļ			Х	Х	Х	-	_	_	_	_	_	_	-										
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*Container Type and Preservative Cod VC = Hydrochloric Acid Preserved Vial O = Other.		100			10																i;							

AUSTRALIAN LABORATORY SERVICES P/L

Environmental Division Newcastle Work Order Reference EN2006619



Telephone : +61 2 4014 2500



CERTIFICATE OF ANALYSIS

Work Order : EN2006619

Client : CBASED ENVIRONMENTAL PTY LTD

Contact : All Deliverables

Address : Unit 3 2 Enterprise Cres

Singleton NSW 2330

Telephone : +61 02 6571 3334
Project : Hanson Calga Dusts

Order number : ---C-O-C number : ----

Sampler : Leesa King

Site

Quote number : SYBQ/403/18 - COMPASS

No. of samples received : 6
No. of samples analysed : 6

Page : 1 of 4

Laboratory : Environmental Division Newcastle

Contact :

Address : 5/585 Maitland Road Mayfield West NSW Australia 2304

Telephone : +61 2 4014 2500
Date Samples Received : 01-Oct-2020 15:42

Date Analysis Commenced : 02-Oct-2020

Issue Date : 14-Oct-2020 10:38



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

Page : 2 of 4
Work Order : EN2006619

Client : CBASED ENVIRONMENTAL PTY LTD

Project : Hanson Calga Dusts



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.

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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

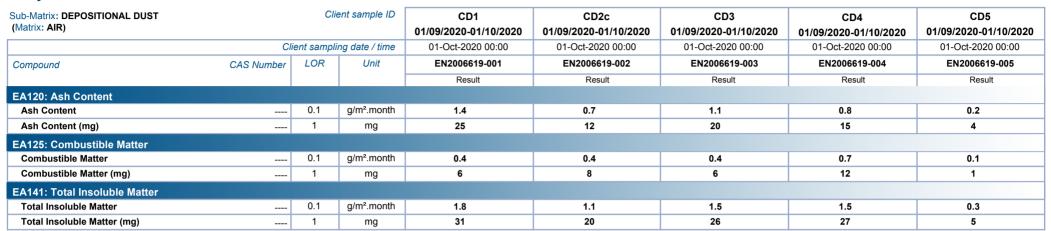
- ^ = This result is computed from individual analyte detections at or above the level of reporting
- ø = ALS is not NATA accredited for these tests.
- ~ = Indicates an estimated value.
- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in g/m².mth as sampling data was provided by the client.

Page : 3 of 4
Work Order : EN2006619

Client : CBASED ENVIRONMENTAL PTY LTD

Project : Hanson Calga Dusts

Analytical Results





Page : 4 of 4
Work Order : EN2006619

Client : CBASED ENVIRONMENTAL PTY LTD

0.1

1

g/m².month

mg

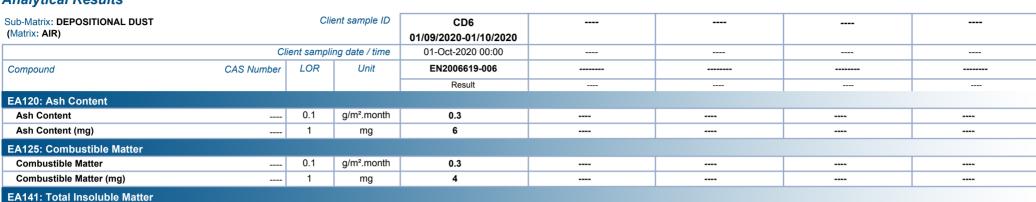
0.6 10

Project : Hanson Calga Dusts

Analytical Results

Total Insoluble Matter

Total Insoluble Matter (mg)





CBASED ENVIRONMENTAL PTY LIMITED



Date: 1, 9.20

Client:

Hanson Calga

Project:

SURFACE WATERS

Site	Flow Rate	Odour	Sampling Time	Bottles	Water Turbidity	Water Colour	Comments
A	DAM	N	11:20	1x 250ml GP, 1x 500mL GP, 1x PG	O ST	Ø LO O B G	
В	-		11:05 -	1x 250ml GP, 1x 500ml GP, 1x PG	CST	GLOOBG	NOT FLOWING
C1	Dam	N	13:00	1x 250ml GP, 1x 500mL GP, 1x PG	(C)ST	C)LO O B G	
C2	STEADY	N,	13:05	1x 250ml GP, 1x 500mL GP, 1x PG	CS T	⊘ LO O B G	
D	STILL	N	12115	1x 250ml GP, 1x 500mL GP, 1x PG	⊘ ST	⊘ LO O B G	
F	DAM	N	11:15	1x 250ml GP, 1x 500mL GP, 1x PG	ØST	⊘ LO O B G	3
						9	

Turbidity: C=Clear, S= Slight, T=Turbid (CIRCLE)

Colour: C=Clear, LO=Light Orange, O=Orange, B=Brown, G=Green (CIRCLE)

Sampled by: ALEX ShiTA
MADDIE BROWN.

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SAMPLE ID	MATRIX	DATE		TYPE & PRESERVATIVE	NO.							_	╄.		1	-				1		+	
Α	Water	1.9.20	11:20	1x 250mlGP,1x 500mLGP,1xPG		х	х	Х	х	х													
-B	Water			1x 250mlGP, 1x 500mLGP, 1xPG				X														\perp	
C1	Water			1x 250mIGP,1x 500mLGP,1xPG		х	Х	Х	Х	Х					_	-						+	
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D	Water	1.9.20	12:13	1x 250mIGP,1x 500mLGP,1xPG		х	х	х		х		_	_		_	-			_			+	
F	Water	1.9.20	11:12	1x 250mlGP,1x 500mLGP,1xPG		х	Х	х	Х	х	_	-	-		-	+		_	+-	-	-	+	
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AUSTRALIAN LABORATORY SERVICES P/L

O = Other.

Environmental Division
Sydney
Work Order Reference
ES2030679



Lelephone: +61-2-8784 8555



CERTIFICATE OF ANALYSIS

Work Order : ES2030679

: CBASED ENVIRONMENTAL PTY LTD

Contact : All Deliverables

Address : Unit 3 2 Enterprise Cres

Singleton NSW 2330

Telephone : +61 02 6571 3334
Project : Hanson Quarry SW

 Order number
 : ---

 C-O-C number
 : ---

 Sampler
 : ---

 Site
 ...

Quote number : SYBQ/403/18 - COMPASS

No. of samples received : 5
No. of samples analysed : 5

Page : 1 of 2

Laboratory : Environmental Division Sydney

Contact : Customer Services ES

Address : 277-289 Woodpark Road Smithfield NSW Australia 2164

Telephone : +61-2-8784 8555

Date Samples Received : 01-Sep-2020 14:50

Date Analysis Commenced : 01-Sep-2020

Issue Date : 07-Sep-2020 14:55



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

Client

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

Ankit Joshi Inorganic Chemist Sydney Inorganics, Smithfield, NSW Neil Martin Sydney Inorganics, Smithfield, NSW Chemistry, Newcastle West, NSW

Page : 2 of 2 Work Order : ES2030679

Client : CBASED ENVIRONMENTAL PTY LTD

Project : Hanson Quarry SW

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.

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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.
- EA016: Calculated TDS is determined from Electrical Conductivity using a conversion factor of 0.67.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Clie	ent sample ID	Α	C1	C2	D	F						
	CI	ient sampli	ng date / time	01-Sep-2020 11:20	01-Sep-2020 13:00	01-Sep-2020 13:05	01-Sep-2020 12:15	01-Sep-2020 11:15						
Compound	CAS Number	LOR	Unit	ES2030679-001	ES2030679-002	ES2030679-003	ES2030679-004	ES2030679-005						
				Result	Result	Result	Result	Result						
EA005: pH														
pH Value		0.01	pH Unit	6.01	6.58	6.22	5.27	5.63						
EA010P: Conductivity by PC Titrator														
Electrical Conductivity @ 25°C		1	μS/cm	99	88	114	88	94						
EA015: Total Dissolved Solids dried at	180 ± 5 °C													
Total Dissolved Solids @180°C		10	mg/L	55	50	58	56	56						
EA025: Total Suspended Solids dried a	t 104 ± 2°C													
Suspended Solids (SS)		5	mg/L	<5	10	9	<5	26						
EP020: Oil and Grease (O&G)														
Oil & Grease		5	mg/L	<5	<5	<5	<5	<5						







CUSTODY Emmonmental

ALS Laboratory: clease tick →

CHAIN OF

DADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@afsglobal.com

JBRISBANE 32 Shand Street Stafford OLD 4053 Ph: 07 3243 7222 E: samples.brisbano@alsgloba.com DGLADSTONE 46 Callemonda's Drive Choton Of D 4680 Ph: 07 7471 5800 E: gladstone@alsqlobal.com

□MACKAY 78 Harbour Road Mackay OLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com

DMELSOURNE 2-4 Westall Road Springvale VIC 3171
Ph 03 8549 9600 E: samples melbourne@alsciobal.com ☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee mail@alsolobal.com

DNFWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 DNEWOASTLE 6/685 Marttand Rd Mayrield West NSW 2304
Ph; 02 4014 2500 E; samples.newcastle@alsglobal.com
UNOWRA 4/13 Geary Place North Nowra NSW 2541
Ph; 024423 2063 E; nowra@alsglobal.com DPERTH 10 Hod Way Malaga WA 6090
Ph 98 9209 7655 E: samples.perth@atsglobat.com DSYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph. 02,8784,8555 E. sargples sydney@alsolohal.com Ph: 07 4796 0600 F: townsvite.environmentek@alsolobal.com

⊒WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph; 02 4225 3125 E. portkembla@elsglobal.com

CLIENT:	Hanson Calga Quarry - 151 Peats Ridge	Rd Calga NSW 2250	TURN	AROUND REQUIREMENTS :	☐ Stand	ard TAT (List	due date):			,		FOR	LABORAT	ORY USE C	NLY (Circle)-	
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ALS USE	SAMPLE DE MATRIX: SOLID (S)		1.4 30	CONTAINER INFORM	AATION	estation and the	ANALY Where Me	/SIS REC letals are	QUIRED including required, specify	Total (unfilter	l. Suite Codes ed bottle requ uired).	must be listed ired) or Dissol	f to attract suit	te price) ered bottle	Additional Inform	ation
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below)	(refer to	TOTAL	Hd.	EC	TSS	тоѕ	Oil & Grease				Comments on likely contaminan dilutions, or samples requiring s analysis etc.	
	Discharge Dam 1 (A) 14/092020 (Test prior to release)	14/09/2020 14:00pm	w	1x P, 1x O&G		2	1	1	1	1	1					
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Page von en					4 204 (4)								Tele	phone · + 6	1-2-8784 8555	
Water Conta	alner Codes: P = Unpreserved Plastic: N = Nitric	Preserved Plastic: ORG = Nifri	Preserve	od ORC: SH = Sodium Hv/mxida/Cd Preserver	TOTAL		1	1 AG = Am	1	1	1	eserved Plastic				

V = VOA Vial HCI Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; A = HCI preserved Plastic; HS = HCI preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; A = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.



CERTIFICATE OF ANALYSIS

Work Order : **ES2032354**

: HANSON CONSTRUCTION MATERIALS PTY LTD

Contact : PAUL SLOUGH

Address : 151 Peats Ridge Rd

Calga 2250

Telephone : ----

Client

Project : HANSON CALGA QUARRY, SITE WATER DISCHARGE DAM 1

(A)

Order number : 4502774688

C-O-C number : ---Sampler : ---Site : ----

Quote number : EN/222

No. of samples received : 1

No. of samples analysed : 1

Page : 1 of 2

Laboratory : Environmental Division Sydney

Contact : Customer Services ES

Address : 277-289 Woodpark Road Smithfield NSW Australia 2164

Telephone : +61-2-8784 8555

Date Samples Received : 14-Sep-2020 17:05

Date Analysis Commenced : 14-Sep-2020

Issue Date : 16-Sep-2020 13:53



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

Ankit Joshi Inorganic Chemist Sydney Inorganics, Smithfield, NSW

Page : 2 of 2 Work Order : ES2032354

Client : HANSON CONSTRUCTION MATERIALS PTY LTD

Project : HANSON CALGA QUARRY, SITE WATER DISCHARGE DAM 1 (A)



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.

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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 Results

Sub-Matrix: WATER (Matrix: WATER)		Cli	ent sample ID	Discharge Dam 1 (A) 14/09/2020 (Test prior to release)	 	
	CI	lient sampli	ing date / time	14-Sep-2020 14:00	 	
Compound	CAS Number	LOR	Unit	ES2032354-001	 	
				Result	 	
EA005P: pH by PC Titrator						
pH Value		0.01	pH Unit	7.09	 	
EA010P: Conductivity by PC Titrator						
Electrical Conductivity @ 25°C		1	μS/cm	125	 	
EA015: Total Dissolved Solids dried at 18	0 ± 5 °C					
Total Dissolved Solids @180°C		10	mg/L	63	 	
EA025: Total Suspended Solids dried at 1	104 ± 2°C					
Suspended Solids (SS)		5	mg/L	12	 	
EP020: Oil and Grease (O&G)						
Oil & Grease		5	mg/L	<5	 	