

# Holcim Dunloe Sand Quarry Quarterly Environmental Report

## October to December 2017

### 1. Introduction

Dunloe Sand Quarry is located on Mooball Rd, Pottsville. The development application number 06-0030 was approved by the NSW Minister for Planning in November 2008, subject to the conditions listed in the project approval document. Schedule 5, condition number 11 states:

*During the project, the Proponent shall:*

- (a) make a summary of monitoring results required under this approval publicly available at the Proponent's regional office; and*
- (b) update these results regularly (at least every 3 months), to the satisfaction of the Director-General.*

This report is available on the proponent's website in satisfaction of this clause.

Sampling is undertaken at Dunloe Sands every 28 days. Since November is 31 day month, the scheduled monitoring has occurred twice during November 2017.

### 2. Water Quality

#### 2.1. Surface Water – Dredge Pond

The following tables contain the monthly and quarterly results for the Dredge Pond, along with the Water Quality Objectives (WQO) documented in Schedule 3, condition 9.

**Table 1. Monthly Surface Water Results**

Reference	Site	Date	pH	Electrical Conductivity	Dissolved Oxygen	Turbidity	Oil & Grease
Units			pH Units	µS/cm	mg/L	NTU	mg/L
WQO			6.5 - 8.5	3000	>6	5 - 20	10
4840/1	SW1	4/10/2017	4.3	229	8.6	1.6	<5
4956/1	SW1	1/11/2017	4.1	271	8.0	2.9	<5
5097/1	SW1	29/11/2017	4.3	303	7.6	4.0	<5
5191/1	SW1	28/12/2017	4.1	339	7.8	0.9	<5

**Table 2. Monthly Surface Water Algae Tests**

Reference	Site	Date	Blue Green Algae Cyanophytes	Total Algae Count
Units			cells/ml	cells/ml
WQO			<50,000	
4840/1	SW1	4/10/2017	<5	128,000
4956/1	SW1	1/11/2017	<5	38,600
5097/1	SW1	29/11/2017	<5	8,150
5191/1	SW1	28/12/2017	<5	1,890

**Table 3. Quarterly Surface Water Results**

	Units	WQO	SW1
Reference			5191/1
Date			28/12/2017
Aluminium	mg/L	0.5	0.6
Arsenic	mg/L		<0.001
Dissolved Iron	mg/L	20	0.12
Dissolved Manganese	mg/L		0.23
Chloride	mg/L	1000	16
Sulphate	mg/L	800	84
Total Alkalinity as CaCO <sub>3</sub>	mg/L	400	<5
Magnesium	mg/L	100	3.7
Sodium	mg/L	500	11
Potassium	mg/L	40	3
Ammonia	mg/L	20	<0.005
Total Nitrogen	mg/L		<0.1
Total Phosphorus	mg/L		<0.05
Chlorophyll a	mg/m <sup>3</sup>	2 - 10	<1
Faecal Coliforms	CFU/100mL	<1000	<1
Enterococci	CFU/100mL	<230	~2

## 2.2. Surface Water – Local Creeks

The following table contains the quarterly results for the creeks from the surrounding environment.

**Table 4. Waters from the Surrounding Environment – Quarterly Results**

Description	Units	South Creek	North Creek
Reference		5192/1	5192/2
Date		28/12/2017	28/12/2017
pH	pH Units	6.7	6.8
Electrical Conductivity	µS/cm	14130	11000
Dissolved Oxygen	mg/L	5.3	6.1
Total Suspended Solids	mg/L	11	15
Total Nitrogen	mg/L	0.6	0.6
Total Phosphorus	mg/L	<0.05	<0.05

### 2.3. Groundwaters

The following tables contain the monthly and quarterly results for the monitoring bores, along with the Water Quality Objectives (WQO) documented in Schedule 3, condition 9.

**Table 5. Groundwater Monthly Results**

Reference	Site	Date	Depth to Water from top of cap	pH	Electrical Conductivity
Units			m	pH Units	µS/cm
WQO				6.5 - 8.5	3000
4839/1	DLP1	4/10/2017	1.91	4.3	123
4955/1	DLP1	1/11/2017	1.92	4.4	121
5096/1	DLP1	29/11/2017	1.93	4.5	129
5190/1	DLP1	28/12/2017	1.94	4.5	130
4839/2	DLP3	4/10/2017	1.54	6.0	7,530
4955/2	DLP3	1/11/2017	1.64	5.9	7,970
5096/2	DLP3	29/11/2017	1.65	5.9	7,680
5190/2	DLP3	28/12/2017	1.66	6.0	7,570
4839/3	DLP5	4/10/2017	1.61	5.3	188
4955/3	DLP5	1/11/2017	1.72	5.3	197
5096/3	DLP5	29/11/2017	1.74	5.0	480
5190/3	DLP5	28/12/2017	1.74	4.5	2,200
4839/4	DLP6	4/10/2017	1.81	3.9	1,030
4955/4	DLP6	1/11/2017	1.81	3.9	1,000
5096/4	DLP6	29/11/2017	1.81	3.9	919
5190/4	DLP6	28/12/2017	1.97	3.9	822
4839/5	DLP7	4/10/2017	1.69	7.0	3,450
4955/5	DLP7	1/11/2017	1.72	6.9	3,440
5096/5	DLP7	29/11/2017	1.77	6.8	3,440
5190/5	DLP7	28/12/2017	1.78	6.9	3,410

**Table 6. Groundwater Quarterly Results**

Site	Units	WQO	DLP1	DLP3	DLP5	DLP6	DLP7
Reference			5190/1	5190/2	5190/3	5190/4	5190/5
Date			28/12/17	28/12/17	28/12/17	28/12/17	28/12/17
Oil & Grease	mg/L	10	<5.0	<5.0	<5.0	<5.0	<5.0
Aluminium	mg/L	0.5	0.53	0.09	2.4	12	0.33
Arsenic	mg/L		<0.001	<0.001	<0.001	0.001	<0.001
Dissolved Iron	mg/L	20	5	13	7.2	150	1.4
Dissolved Manganese	mg/L		0.02	0.62	0.11	0.67	0.063
Chloride	mg/L	1000	21	2,400	640	18	720
Sulphate	mg/L	800	44	190	79	540	250
Total Alkalinity as CaCO <sub>3</sub>	mg/L	400	<5	130	<5	<5	380
Magnesium	mg/L	100	0.6	130	41	8.8	38
Sodium	mg/L	500	12	1,700.00	450	11	930
Potassium	mg/L	40	2.1	53	6.8	8	30
Ammonia	mg/L	20	0.071	2.8	0.24	0.41	2.4
Total Nitrogen	mg/L		0.4	3.8	0.6	1.6	3.6
Total Phosphorus	mg/L		<0.05	0.05	<0.05	0.1	0.1

### 3. Ambient Air Monitoring

#### 3.1. Dust Depositional Gauges

The following table contains the results of the monthly dust deposition results, along with the Long Term Impact Assessment Criteria for Particulate Matter, as documented in Schedule 3, condition 6, table 5. It should be noted that this criteria is relevant to the annual average and not the monthly results.

Reference	Description	Date On	Date Off	Insoluble Solids	Ash	Combustible Matter
Units				g/m <sup>2</sup> /mth	g/m <sup>2</sup> /mth	g/m <sup>2</sup> /mth
<i>Criteria</i>				4		
4841/1	D1 Sugar Shed	6/09/2017	4/10/2017	0.7	0.4	0.3
4954/1	D1 Sugar Shed	4/10/2017	1/11/2017	0.5	0.1	0.4
5094/1	D1 Sugar Shed	1/11/2017	29/11/2017	0.1	<0.1	0.1
5189/1	D1 Sugar Shed	29/11/2017	28/12/2017	0.4	0.1	0.3
	Annual Average			0.4		
4841/2	D2 Black Rocks	6/09/2017	4/10/2017	0.6	0.2	0.4
4954/2	D2 Black Rocks	4/10/2017	1/11/2017	0.3	<0.1	0.3
5094/2	D2 Black Rocks	1/11/2017	29/11/2017	0.2	0.1	0.1
5189/2	D2 Black Rocks	29/11/2017	28/12/2017	0.3	0.2	0.1
	Annual Average			0.3		
4841/3	D3 Windmill	6/09/2017	4/10/2017	2.4	1.8	0.6
4954/3	D3 Windmill	4/10/2017	1/11/2017	0.8	0.6	0.2
5094/3	D3 Windmill	1/11/2017	29/11/2017	0.3	0.3	<0.1
5189/3	D3 Windmill	29/11/2017	28/12/2017	0.2	0.1	0.1
	Annual Average			0.8		
4841/4	D4 Haul Rd	6/09/2017	4/10/2017	0.9	0.4	0.5
4954/4	D4 Haul Rd	4/10/2017	1/11/2017	0.5	0.2	0.3
5094/4	D4 Haul Rd	1/11/2017	29/11/2017	<0.1	<0.1	<0.1
5189/4	D4 Haul Rd	29/11/2017	28/12/2017	0.2	0.1	0.1
	Annual Average			0.4		

### 3.1. Particulate Matter

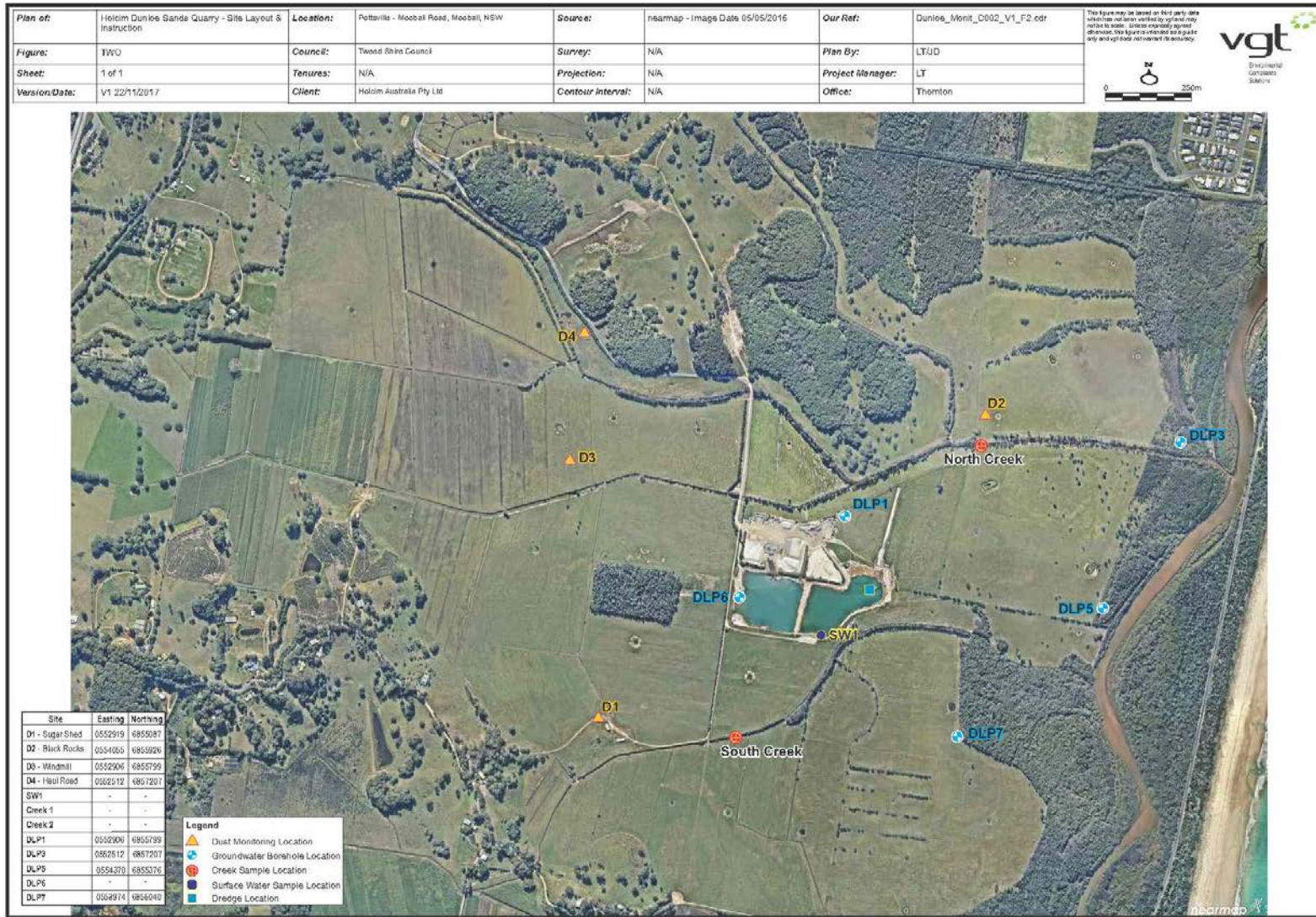
The following table contains the results of Particulate Matter less than 10 µm (PM<sub>10</sub>) as measured by high volume air sampler (HVAS) located near the Dunloe Site Office, along with the Short and Long Term Impact Assessment Criteria for Particulate Matter, as documented in Schedule 3, condition 6, tables 3 and 4. In accordance with the Air Quality Management Plan, Total suspended particulate matter (TSP) is calculated from the PM<sub>10</sub> results multiplied by 2.5.

The HVAS was installed on 1/11/2017 and therefore the Long Term Impact Assessment Criteria (annual average) is not yet reportable.

Reference	Description	Date Sampled	Comments	Particulate Matter <10µm (PM <sub>10</sub> )	Calculated Total Suspended Particulates (TSP)
Units				µg/m <sup>3</sup>	µg/m <sup>3</sup>
Criteria	24 hour average			50	
	Annual average			30	90
5150/1	Office	2/11/2017		32	80
5150/2	Office	8/11/2017		12	30
5150/3	Office	14/11/2017		18	45
5150/4	Office	20 + 26/11/2017	Ran twice	18	45
5259/1	Office	2/12/2017		12	30
5259/2	Office	8/12/2017		15	37.5
5259/3	Office	14/12/2017		13	32.5
5259/4	Office	20 + 26/12/2017	Paper ran twice due to holiday period	15	37.5



## 4. Monitoring Locations



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