



TSP EXCEEDANCE REPORT

MONITORING PERIOD

**28TH DECEMBER 2010
1ST AND 2ND OF JANUARY 2011**

Revision	Prepared	Reviewed	Approved	Date	Description
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2		A. Leonard		18/1/2011	

CONTENTS

**FRONT PAGE
CONTENTS**

	Page No.
TABLE	1
1. INTRODUCTION	2
2. INVESTIGATION	2
2.1 Date and time of the exceedance	2
2.2 Port Activities	4
2.3 Meteorological Activities	5
2.4 Reason for exceedance	6
3. CONCLUSIONS	9
Appendix A MPL Laboratory Report	10
Appendix B Daily Wind Roses	13

FIGURE

Figure 1: Location of HVAS monitoring sites 1 to 4, HVAS monitoring site 5, E-Sampler 7 meteorological station, Esperance Port, relative to E-Samplers 5, 6 and 8, TEOM/HVAS monitoring sites 1 to 4 and HVAS monitoring site 5..... 3

Figure 2: Wind rose for the monitoring period 1400 hrs 27/11/2010 to 1500 hrs 29/11/2010. Raw data source: EP7 monitoring station, Berth 3. 5

TABLE

Table 1: Emission Concentration Targets from DEC Licence Number L5099/1974/12 issued to EPSL on 6 January 2009 2

1. INTRODUCTION

On the 11th of January 2011, the Esperance Port Sea and Land (ESPL) ‘became aware’ of laboratory results from MPL Laboratories detailing dust (TSP) exceedences (refer to Table 1).

Table 1: Emission Concentration Targets from DEC Licence Number L5099/1974/12 issued to EPSL on 6 January 2009.

Emission	Ambient concentration target
Nickel in air	0.14 µg/m ³
Dust as PM ₁₀	50 µg/m ³
Dust as TSP	90 µg/m ³

These exceedences came as no surprise since during these days large amounts of foreshore sand were mobilised and complaints of cars being sand blasted were received from guests staying in motels along the Esperance foreshore.

2. INVESTIGATION

2.1 Date and time of the exceedance

The recorded TSP concentration exceeded the emission concentration target (**Table 1**) according to the Licence L5099/1974/12 within two exceedance periods, “**Exceedance Periods A and B**” as detailed:

Exceedance Period A (One sampling period from 1154 28/12/2010 to 1246 29/12/2010)

- 100 µg TSP/m³ at site 1

Exceedance Period B (Two consecutive sampling periods between 1322 1/1/2011 to 1203 3/1/2011).

- 95 µg TSP/m³ at site 1 (1322 1/1/2011 to 1220 2/1/2011)
- 240 µg TSP/m³ at site 1 (1221 2/1/2011 to 1203 3/1/2011)
- 120 µg TSP/m³ at site 4 (1221 2/1/2011 to 1203 3/1/2011)



Figure 1: Map of Air Quality Monitoring Stations

2.2 Port Activities

The following shipping activities were occurring at the Port during:

2.2.1 Exceedance period A (1154 28/12/2010 to 1246 29/12/2010):

- Marine Vessel (MV) Konkar Theo was alongside Berth 2 unloading fertilizer between 0534 hours on the 27th to 1700 hours on the 29th of December 2010
- Marine Vessel (MV) Sea Swift was alongside Berth 1 loading wheat between 0645 hours on the 28th to 1745 hours on the 29th of December 2010
- Marine Vessel (MV) Kalliopi L was alongside Berth 3 loading iron ore lump between 1850 hours on the 28th to 0555 hours on the 30th of December 2010

Other activities include:

- 26,501 tonnes of iron ore averaged across 3 trains delivered to the Port.

2.2.2 Exceedance period B (1322 1/1/2011 to 1203 3/1/2011):

- Marine Vessel (MV) Hebei Legend was alongside Berth 3 loading with iron between 1734 hours 31st of December 2010 to 2232 hours 3rd of January 2011.
- Marine Vessel (MV) Weaver Arrow was alongside Berth 2 unloading Fertiliser between 1100 hours on the 2nd to 0042 hours on the 4th of January 2011.

Other activities include:

- 44,697 tonnes of iron ore averaged across 5 trains delivered to the Port.

2.3 Meteorological Activities

2.3.1 Exceedance period A (1154 28/12/2010 to 1246 29/12/2010):

The prevailing wind directions during the exceedance period as shown in **(Figure 2)** was from the SE 48%, SSE 28%, ESE 21% and E 5%. The highest hourly wind speed average for the period was 10.6 m/s blowing from an easterly direction between 1000 and 1100 hours on the 28th of December 2010, described as a fresh wind in the 'Beaufort Wind Force Scale' (BOM 2010). For the exceedance period the average wind speed was 7.3 m/s (26.3 km/hr).

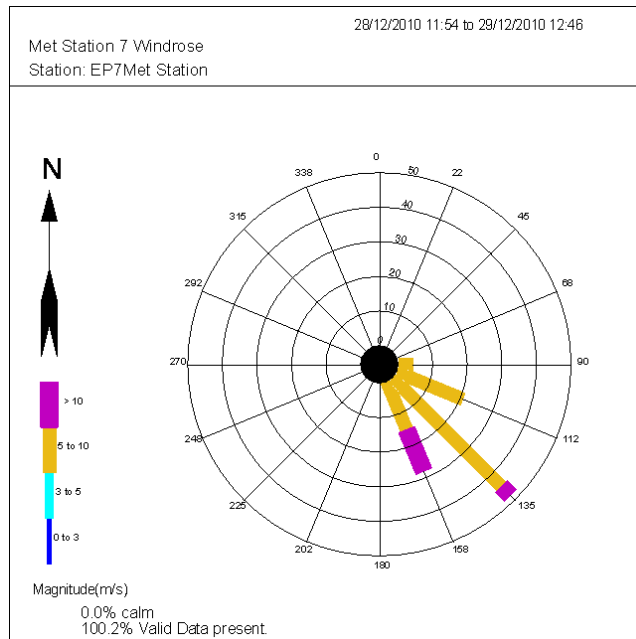


Figure 2: Exceedance Period A, Wind rose for the monitoring period 1154 hrs 28/12/2010 to 1246 hrs 29/12/2010.

2.3.2 Exceedance Period B (1322 1/1/2011 to 1203 3/1/2011):

The prevailing wind directions during the exceedance period as shown in **(Figure 3)** was from the E 32% and ESE 30% from the wind arc NE to SE. The highest hourly wind speed average for the period was 14.6 m/s blowing from an ESE direction between 1600 and 1800 hours on the 2nd of January 2011, described as a near gale in the 'Beaufort Wind Force Scale' (BOM 2010). For the exceedance period the average wind speed was 9.0 m/s (32.4 km/hr).

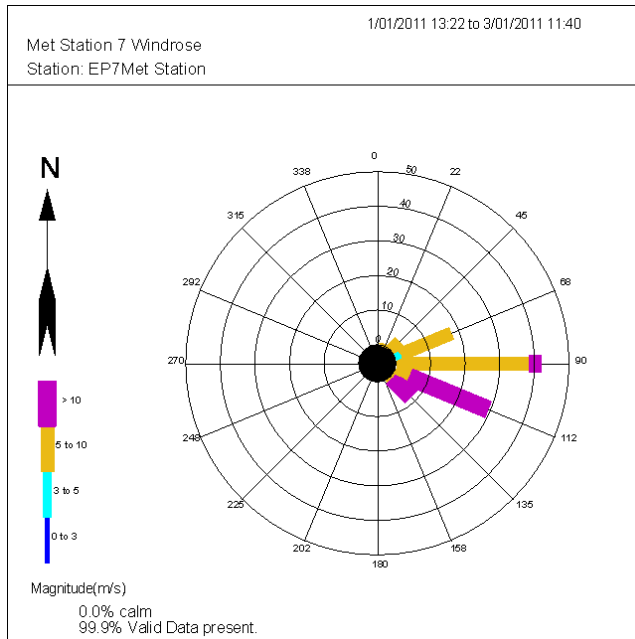


Figure 3: Exceedance Period B, Wind rose for the monitoring period 1322 1/1/2011 to 1203 3/1/2011.

2.4 Reason for exceedance

2.4.1 Exceedance period A (1154 28/12/2010 to 1246 29/12/2010):

The exceedance at Site 1 on the 28th of December was caused by the fresh winds from the SE to SSE wind arch (for 76% of the period) mobilising and carrying dust from unsealed surfaces (including the beach and unsealed roads), and potentially grain dust from loading operations on berth 1. During the grain loading **Figure 5** shows the winds were blowing between 113 (ESE) to 150 degrees (SSE). This places both berth 1 and the foreshore upwind of site 1 (**Figure 1**). The Ports real time TSP sampler at EP5 was also downwind of berth 1 and its measurements are correlated against the loading times of the MV Sea Swift in **Figure 4**. Also correlated are the measurements at EP6, which is not downwind of berth 1, it is downwind of unsealed areas in the CBH lease area and the Port. **Figure 4** illustrates that both EP5 and EP6 have peaks in TSP levels during the first loading period. This indicates that dust mobilised from unsealed surfaces is likely to be the major source of TSP. However, in the second period, TSP levels at EP5 were two fold higher than EP6; indicating grain loading was a major source of the dust during this period. Iron ore (Fe 1% of total TSP) and nickel concentrates (Nickel 0.01% of total TSP) did not contribute significantly to TSP exceedance at Site 1.

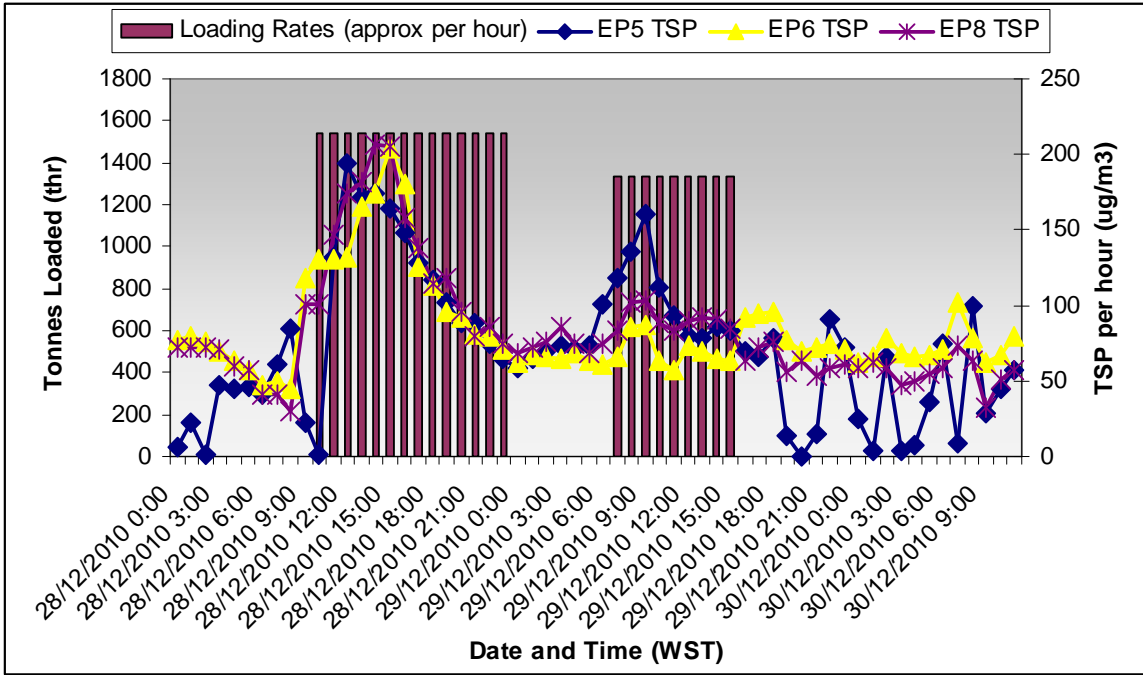


Figure 4: Graph of TSP (ug/m3), Tonnes loaded (tph) and wind speed (m/s) graphed over time (hourly averages) data from E-Samplers 5, 6 and 8.

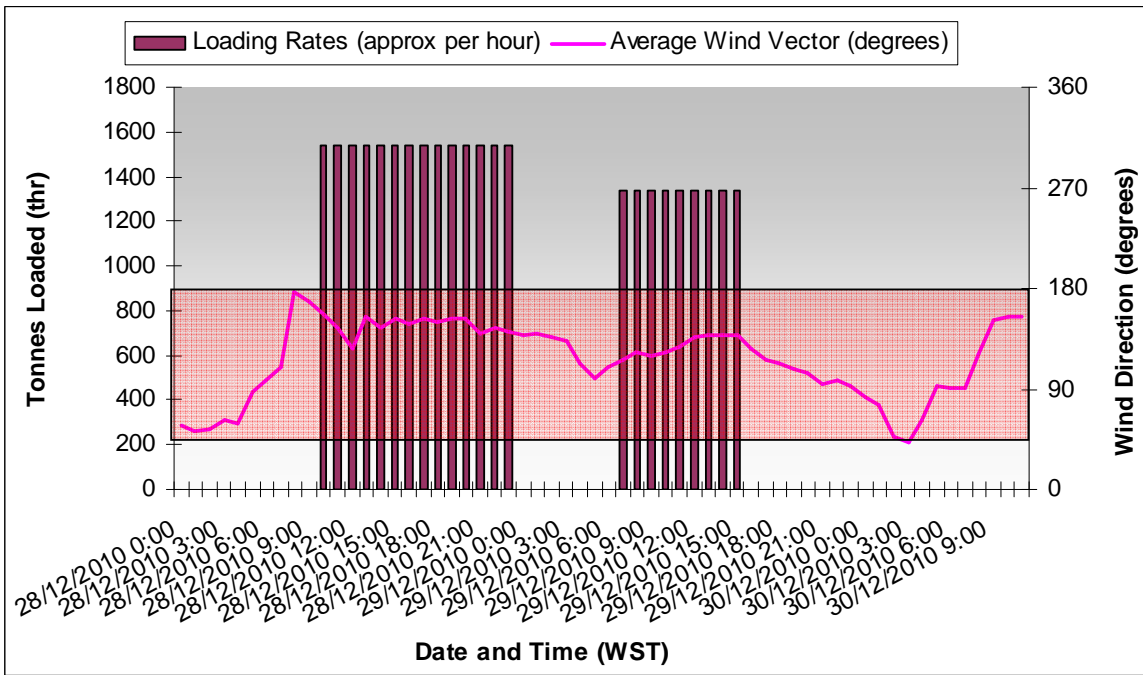


Figure 5: Wind direction and tonnes loaded per hour during the monitoring period for MV Sea Swift between 1154 28/12/2010 to 1246 29/12/2010.

2.4.2 Exceedance period B (1322 1/1/2011 to 1203 3/1/2011):

These exceedance periods are discussed together since they are consecutive sampling periods and had similar meteorological conditions.

The exceedance at Site 1 for the 1st and 2nd of January was caused by near gale winds from the E and SE wind arc (71% of the period) mobilising dust and beach sand from the direction of the beach and possibly from unsealed surfaces in the Port (including areas as far as Berth 3 and in between Berth 1). The winds experienced were near gale winds with 33% being above 10m/s for the period. During this time there was a ship MV Hebei Legend along side Berth 3 loading iron ore. Iron ore and nickel concentrates did not contribute significantly to TSP exceedance at Site 1:

- Fe varied only from 1.3% to 1.7% of total TSP
- Nickel varied only from 0.003% to 0.01% of total TSP and, no bulk nickel concentrate ship loading occurred TSP.

Therefore site 1 exceedences are attributed to the close vicinity of the Esperance Port Beach.

The exceedance at Site 4 on the 2nd of January was caused by near gale winds from the E and SE wind arc (71% of the period) mobilising dust from the Port. Areas included are Berth 2, CBH, Summit and Iron ore sheds 3 & 4. The strength of near gale winds (35% of the time) was strong enough that even with the Ports dust suppression measures dust was mobilised (Refer to **Appendix B**). The Port is not aware of any unusual activity from CBH or Summit and is not aware of any dust management program from unsealed surfaces on these premises. During this period EPSL was wetting the unsealed roads in preparation for road grading and followed by application of several maintenance coats of dust suppression product. Therefore the dust exceedance was caused by the near gale wins blowing across the south east of the Port during the road maintenance that started on the 1st and finished on the 3rd of December 2010.

Iron ore and nickel concentrates did not contribute significantly to TSP exceedance at Site 4:

- Fe was 4.3% of total TSP
- Nickel was 0.03% of total TSP and, no bulk nickel concentrate ship loading occurred TSP.

3. CONCLUSIONS

The TSP exceedance in the first period (1154 28/12/2010 to 1246 29/12/2010) at site 1 was due to fresh winds mobilising dust and sand. The upwind sources of the dust are likely to be the Esperance Port beach, unsealed areas and dust emissions from berth 1 grain loading. The contribution of these sources to the overall dust is unknown.

The TSP exceedences during the second period (1322 1/1/2011 to 1203 3/1/2011) at site 1 was due to near gale winds mobilising dust and sand from the beach and unsealed areas the Port adjacent to berth 3.

The TSP exceedences during the second period (1221 2/1/2011 to 1203 3/1/2011) at site 4 were due to near gale winds mobilising dust from unsealed surfaces within the Port, and the lease areas of CBH and Summit.

EPSL already has a dust management strategy based on application of a dust binding agent on its unsealed areas. EPSL will endeavour to pursue lessees (CBH and Summit) to request that a similar dust management strategy be implemented on non-sealed surfaces by CBH and Summit, the occupiers of their respective lease areas.

APPENDIX A MPL LABORATORY REPORT



Part of the EnviroLab Group



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 www.envirolabservices.com.au
 EnviroLab Services (WA) Pty Ltd ABN 53 140 099 207

CERTIFICATE OF ANALYSIS 108099

Client:

Esperance Ports - Sea and Land

PO Box 35

Esperance

WA 6460

Attention: C Magana

Sample log in details:

Your Reference:

Dust Analysis

No. of samples:

18 High Volume Filters

Date samples received:

4/01/11

Date completed instructions received:

4/01/11

Location:

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by:

11/01/11

Date of Preliminary Report:

Not issued

Issue Date:

10/01/11

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Tests not covered by NATA are denoted with *.

Results Approved By:


 Dr Monika Berger
 Supervisor - Micro, Asbestos, Dust

Client Reference: Dust Analysis

Metals in High Volume Filters							
Our Reference:	UNITS	PQL	108099-1	108099-2	108099-3	108099-4	108099-5
Your Reference	--	--	EAP 332	EAP 333	EAP 334	EAP 335	EAP 336
Location	--	--	Site 4	Site 3	Site 2	Site 1	Site 5
Date Sampled			26/12/10	26/12/10	26/12/10	26/12/10	26/12/10
Dust	mg/liter	0.1	98	83	75	98	49
Dust in Air	µg/m ³	0.1	62	52	48	61	31
Iron	µg/liter	20	3,000	2,800	2,200	1,400	330
Iron in Air	µg/m ³	0.01	1.9	1.7	1.4	0.90	0.21
Nickel	µg/liter	5	24	23	19	9.0	<5.0
Nickel in Air	µg/m ³	0.002	0.020	0.010	0.010	0.010	<0.002
Lead	µg/liter	5	<5.0	<5.0	<5.0	<5.0	<5.0
Lead in Air	µg/m ³	0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Lithium	µg/liter	5	<5.0	<5.0	<5.0	<5.0	<5.0
Lithium in Air	µg/m ³	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Sulfur	µg/liter	50	4,500	5,400	4,500	3,600	1,200
Sulfur in Air	µg/m ³	0.03	2.8	3.4	2.9	2.3	0.74

Metals in High Volume Filters							
Our Reference:	UNITS	PQL	108099-6	108099-7	108099-8	108099-9	108099-10
Your Reference	--	--	EAP 337	EAP 338	EAP 339	EAP 340	EAP 341
Location	--	--	Blank	Site 4	Site 3	Site 2	Site 1
Date Sampled				27/12/10	27/12/10	27/12/10	27/12/10
Dust	mg/liter	0.1	68	98	81	90	110
Dust in Air	µg/m ³	0.1	[NA]	66	55	60	73
Iron	µg/liter	20	120	2,200	1,600	2,100	1,700
Iron in Air	µg/m ³	0.01	[NA]	1.5	1.1	1.4	1.2
Nickel	µg/liter	5	<5.0	20	15	19	12
Nickel in Air	µg/m ³	0.002	[NA]	0.010	0.010	0.010	0.010
Lead	µg/liter	5	<5.0	<5.0	<5.0	<5.0	<5.0
Lead in Air	µg/m ³	0.003	[NA]	<0.003	<0.003	<0.003	<0.003
Lithium	µg/liter	5	<5.0	<5.0	<5.0	<5.0	<5.0
Lithium in Air	µg/m ³	0.002	[NA]	<0.002	<0.002	<0.002	<0.002
Sulfur	µg/liter	50	520	5,000	4,700	3,700	4,100
Sulfur in Air	µg/m ³	0.03	[NA]	3.4	3.2	2.5	2.7

Client Reference: Dust Analysis

Metals in High Volume Filters							
Our Reference:	UNITS	PQL	108099-11	108099-12	108099-13	108099-14	108099-15
Your Reference	--	--	EAP342	EAP343	EAP344	EAP345	EAP346
Location	--	--	Site 5	Blank	Site 4	Site 3	Site 2
Date Sampled			27/12/10		28/12/10	28/12/10	28/12/10
Dust	mg/Filter	0.1	64	7.0	67	64	110
Dust in Air	µg/m ³	0.1	43	[NA]	42	40	66
Iron	µg/Filter	20	610	130	[NA]	[NA]	[NA]
Iron in Air	µg/m ³	0.01	0.41	[NA]	[NA]	[NA]	[NA]
Nickel	µg/Filter	5	<5.0	<5.0	[NA]	[NA]	[NA]
Nickel in Air	µg/m ³	0.002	<0.002	[NA]	[NA]	[NA]	[NA]
Lead	µg/Filter	5	<5.0	<5.0	[NA]	[NA]	[NA]
Lead in Air	µg/m ³	0.003	<0.003	[NA]	[NA]	[NA]	[NA]
Lithium	µg/Filter	5	<5.0	<5.0	[NA]	[NA]	[NA]
Lithium in Air	µg/m ³	0.002	<0.002	[NA]	[NA]	[NA]	[NA]
Sulfur	µg/Filter	50	1,600	560	[NA]	[NA]	[NA]
Sulfur in Air	µg/m ³	0.03	1.1	[NA]	[NA]	[NA]	[NA]

Metals in High Volume Filters						
Our Reference:	UNITS	PQL	108099-16	108099-17	108099-18	108099-19
Your Reference	--	--	EAP347	EAP348	EAP349	Lab Blank
Location	--	--	Site 1	Site 5	Blank	
Date Sampled			28/12/10	28/12/10		
Dust	mg/Filter	0.1	160	94	6.8	[NA]
Dust in Air	µg/m ³	0.1	100	58	[NA]	[NA]
Iron	µg/Filter	20	1,600	[NA]	[NA]	130
Iron in Air	µg/m ³	0.01	1.0	[NA]	[NA]	[NA]
Nickel	µg/Filter	5	20	[NA]	[NA]	<5.0
Nickel in Air	µg/m ³	0.002	0.010	[NA]	[NA]	[NA]
Lead	µg/Filter	5	<5.0	[NA]	[NA]	<5.0
Lead in Air	µg/m ³	0.003	<0.003	[NA]	[NA]	[NA]
Lithium	µg/Filter	5	<5.0	[NA]	[NA]	<5.0
Lithium in Air	µg/m ³	0.002	<0.002	[NA]	[NA]	[NA]
Sulfur	µg/Filter	50	7,400	[NA]	[NA]	700
Sulfur in Air	µg/m ³	0.03	4.6	[NA]	[NA]	[NA]



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 EnviroLab Services (WA) Pty Ltd ABN 53 140 099 207

CERTIFICATE OF ANALYSIS 108115

Client:

Esperance Ports - Sea and Land
 PO Box 35
 Esperance
 WA 6450

Attention: C Magana

Sample log in details:

Your Reference:

No. of samples:

Date samples received:

Date completed instructions received:

Location:

Dust Analysis

18 High Volume Filters

5/01/11

5/01/11

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by:

Date of Preliminary Report:

Issue Date:

12/01/11

Not issued

10/01/11

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Results Approved By:


 Dr Monika Berger
 Supervisor - Micro, Asbestos, Dust

Client Reference: Dust Analysis

Metals in High Volume Filters							
Our Reference:	UNITS	PQL	108115-1	108115-2	108115-3	108115-4	108115-5
Your Reference	--	--	EAP368	EAP369	EAP370	EAP371	EAP372
Location	--	--	Site 4	Site 3	Site 2	Site 1	Site 5
Date Sampled			1.01/11	1.01/11	1.01/11	1.01/11	1.01/11
Dust	mg/filter	0.1	65	60	66	140	48
Dust in Air	µg/m ³	0.1	44	40	44	95	32
Iron	µg/filter	20	2,300	1,600	2,600	2,400	580
Iron in Air	µg/m ³	0.01	1.5	1.1	1.8	1.6	0.39
Nickel	µg/filter	5	9.0	10	16	10	<5.0
Nickel in Air	µg/m ³	0.002	0.010	0.010	0.010	0.010	<0.002
Lead	µg/filter	5	<5.0	<5.0	<5.0	<5.0	<5.0
Lead in Air	µg/m ³	0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Lithium	µg/filter	5	<5.0	<5.0	<5.0	<5.0	<5.0
Lithium in Air	µg/m ³	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Sulfur	µg/filter	50	2,000	3,500	2,500	3,600	2,600
Sulfur in Air	µg/m ³	0.03	1.4	2.3	1.7	2.4	1.7

Metals in High Volume Filters							
Our Reference:	UNITS	PQL	108115-6	108115-7	108115-8	108115-9	108115-10
Your Reference	--	--	EAP373	EAP374	EAP375	EAP376	EAP377
Location	--	--	Blank	Site 4	Site 3	Site 2	Site 1
Date Sampled				2.01/11	2.01/11	2.01/11	2.01/11
Dust	mg/filter	0.1	0.60	180	130	130	380
Dust in Air	µg/m ³	0.1	[NA]	120	82	88	240
Iron	µg/filter	20	170	6,600	3,000	3,800	4,600
Iron in Air	µg/m ³	0.01	[NA]	4.3	1.9	2.5	3.0
Nickel	µg/filter	5	<5.0	46	28	40	21
Nickel in Air	µg/m ³	0.002	[NA]	0.030	0.020	0.030	0.010
Lead	µg/filter	5	<5.0	7.0	<5.0	9.0	8.0
Lead in Air	µg/m ³	0.003	[NA]	<0.003	<0.003	0.010	0.010
Lithium	µg/filter	5	<5.0	7.0	<5.0	<5.0	6.0
Lithium in Air	µg/m ³	0.002	[NA]	<0.002	<0.002	<0.002	<0.002
Sulfur	µg/filter	50	760	7,900	8,100	6,500	3,900
Sulfur in Air	µg/m ³	0.03	[NA]	5.1	5.2	4.2	2.5

MPL Reference: 108115
Revision No: R 00

Page 2 of 5

MPL Reference: 108115
Revision No: R 00

Page 3 of 5

Client Reference: Dust Analysis

Metals in High Volume Filters							
Our Reference:	UNITS	PQL	108115-11	108115-12	108115-13	108115-14	108115-15
Your Reference	--	--	EAP378	EAP379	EAP380	EAP381	EAP382
Location	--	--	Site 5	Blank	Site 4	Site 3	Site 2
Date Sampled			2.01/11		3.01/11	3.01/11	3.01/11
Dust	mg/filter	0.1	80	3.9	49	59	88
Dust in Air	µg/m ³	0.1	52	[NA]	31	38	44
Iron	µg/filter	20	620	180	[NA]	[NA]	[NA]
Iron in Air	µg/m ³	0.01	0.40	[NA]	[NA]	[NA]	[NA]
Nickel	µg/filter	5	<5.0	<5.0	[NA]	[NA]	[NA]
Nickel in Air	µg/m ³	0.002	<0.002	<0.002	[NA]	[NA]	[NA]
Lead	µg/filter	5	<5.0	<5.0	[NA]	[NA]	[NA]
Lead in Air	µg/m ³	0.003	<0.003	[NA]	[NA]	[NA]	[NA]
Lithium	µg/filter	5	<5.0	<5.0	[NA]	[NA]	[NA]
Lithium in Air	µg/m ³	0.002	<0.002	[NA]	[NA]	[NA]	[NA]
Sulfur	µg/filter	50	2,000	760	[NA]	[NA]	[NA]
Sulfur in Air	µg/m ³	0.03	1.3	[NA]	[NA]	[NA]	[NA]

Metals in High Volume Filters							
Our Reference:	UNITS	PQL	108115-16	108115-17	108115-18	108115-19	
Your Reference	--	--	EAP383	EAP384	EAP385	Lab Blank	
Location	--	--	Site 1	Site 5	Blank		
Date Sampled			3.01/11	3.01/11			
Dust	mg/filter	0.1	98	63	2.5	[NA]	
Dust in Air	µg/m ³	0.1	37	40	[NA]	[NA]	
Iron	µg/filter	20	[NA]	[NA]	[NA]	98	
Nickel	µg/filter	5	[NA]	[NA]	[NA]	<5.0	
Lead	µg/filter	5	[NA]	[NA]	[NA]	<5.0	
Lithium	µg/filter	5	[NA]	[NA]	[NA]	<5.0	
Sulfur	µg/filter	50	[NA]	[NA]	[NA]	400	

APPENDIX B DAILY WIND ROSES

