

## **ESPERANCE PORTS SEA AND LAND**

### **PM10 EMISSION CONCENTRATION TARGET EXCEEDANCE REPORT TO DEC**

**MONITORING PERIOD MIDDAY 7<sup>TH</sup> FEBRUARY  
2011 TO MIDDAY 8<sup>TH</sup> FEBRUARY 2011**

<b>Revision</b>	<b>Prepared</b>	<b>Reviewed</b>	<b>Approved</b>	<b>Date</b>	<b>Description</b>
1	C Magana	A. Leonard		17/02/2011	First Draft for Review

---

## CONTENTS

### FRONT PAGE CONTENTS

	<b>Page No.</b>
1. PURPOSE .....	3
2. INVESTIGATION .....	4
2.1 Date, time and location of exceedance.....	4
2.2 Port Activities .....	6
2.3 Meteorological Activities .....	6
2.4 PM <sub>10</sub> Dust Levels (24hour period).....	7
3. CONCLUSIONS.....	9
3.1 Corrective Action .....	9

## 1. PURPOSE

A daily check undertaken by Esperance Port Sea and Land (ESPL) indicated PM<sub>10</sub> concentrations in excess of ambient concentration targets (stipulated by L5099/1974/12). The targets are replicated in **Table 1** below. This was recorded at Site 2 for the ***monitoring period of 1200hrs 7<sup>th</sup> February 2011 to 1200hrs on 8<sup>th</sup> of February 2011.***

EPSSL checked the PM<sub>10</sub> daily averages for the period midday 7<sup>th</sup> of February 2011 to midday of 8<sup>th</sup> of February 2011 and became aware of the exceedance at site 2 on the 10<sup>th</sup> of February 2011. This report is being submitted to DEC (on 21<sup>st</sup> of February 2011) within the seven working days following becoming aware of the exceedance, which is consistent with the latest amended Licence requirement of Condition 7 of Licence L5099/1974/12.

**Table 1:** Emission Concentration Targets from DEC Licence Number L5099/1974/12

<b>Emission</b>	<b>Ambient concentration target</b>
Nickel in air	0.14 µg/m <sup>3</sup>
Dust as PM <sub>10</sub>	50 µg/m <sup>3</sup>
Dust as TSP	90 µg/m <sup>3</sup>
Silica in air	5 µg/m <sup>3</sup>

## 2. INVESTIGATION

### 2.1 Date, time and location of exceedance

The recorded PM<sub>10</sub> concentration above the emission concentration target (**Table 1**) according to the Licence L5099/1974/12 for the monitoring period of **1200 hours 7<sup>th</sup> February 2011 to 1200 hours 8<sup>th</sup> February 2011** at:

- Site 2: 50.8 µg/m<sup>3</sup>

Site 2 location is downwind of berths 1 and 2 in an ESE wind, but downwind of berth 3 in an Easterly wind (**Figure 1**).



Disclaimer: This map consists of shape files generated by EPSL (2011) and Landgate (2010). This map is not to be used for navigational purposes. Positional accuracy should be considered as approximate.



Title: Location of HVAS/TEOM monitoring sites 1 to 4, HVAS community monitoring site 5, E-Sampler 5 to 8 (EP5-EP8) and EP7 - Meteorological station

Scale: 1:10,000



Date: 5 January 2011

Map no.

Figure 1: Location of air quality monitoring stations.

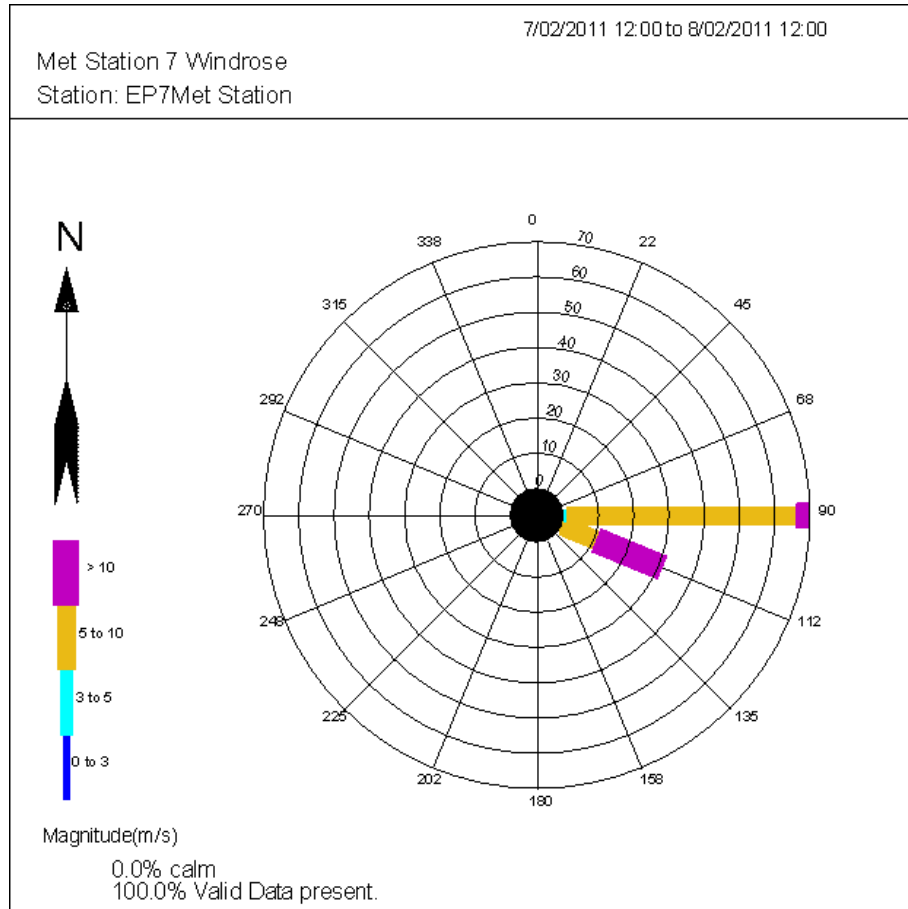
## 2.2 Port Activities

The following Port activities occurred during the monitoring period:

- GCL Argentina was along side Berth 3 being loaded with iron ore between 0812 hours 7<sup>th</sup> of February 2011 to 1218 hours 8<sup>th</sup> of February 2011.
- 26,093 tonnes of iron ore averaged across 3 trains
- 120 tonnes of nickel concentrate across 2 trucks

## 2.3 Meteorological Activities

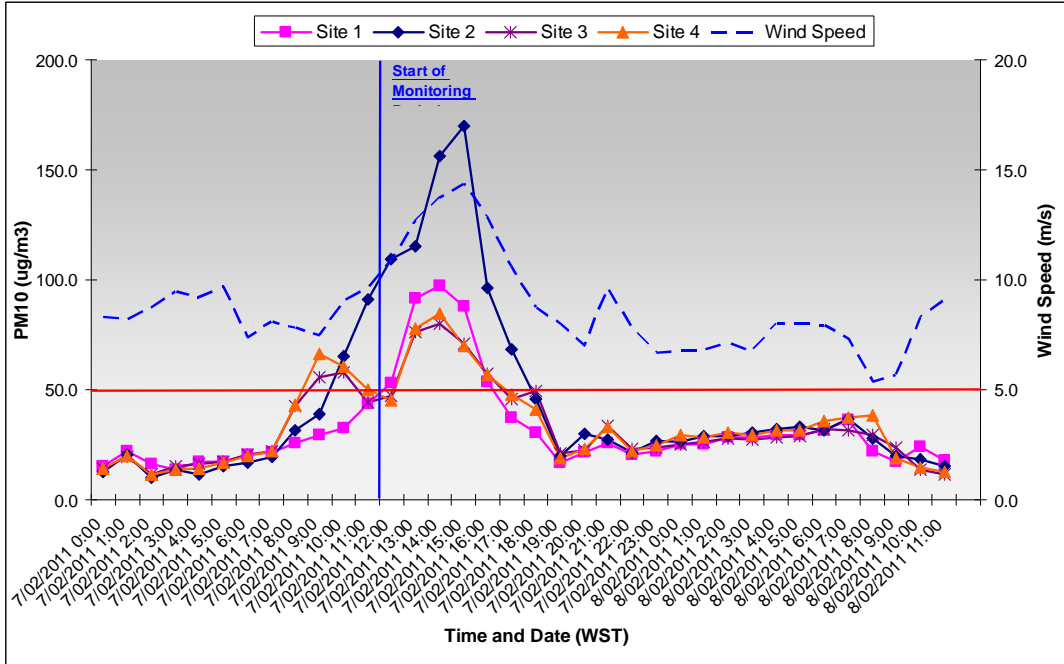
The wind directions for the 24 hour period are in the wind arc from E (69%) to ESE (31%) (**Figure 2**). The maximum hourly average wind speed of 14.4 m/s (51.8 km/hr) was recorded from the ESE at 1500 on the 7<sup>th</sup> of February. The 'Beaufort Wind Force Scale' is a measure of understanding wind speeds in descriptive terminology. A wind speed of 14.4 m/s is described as a 'near gale winds' (BOM, 2011).



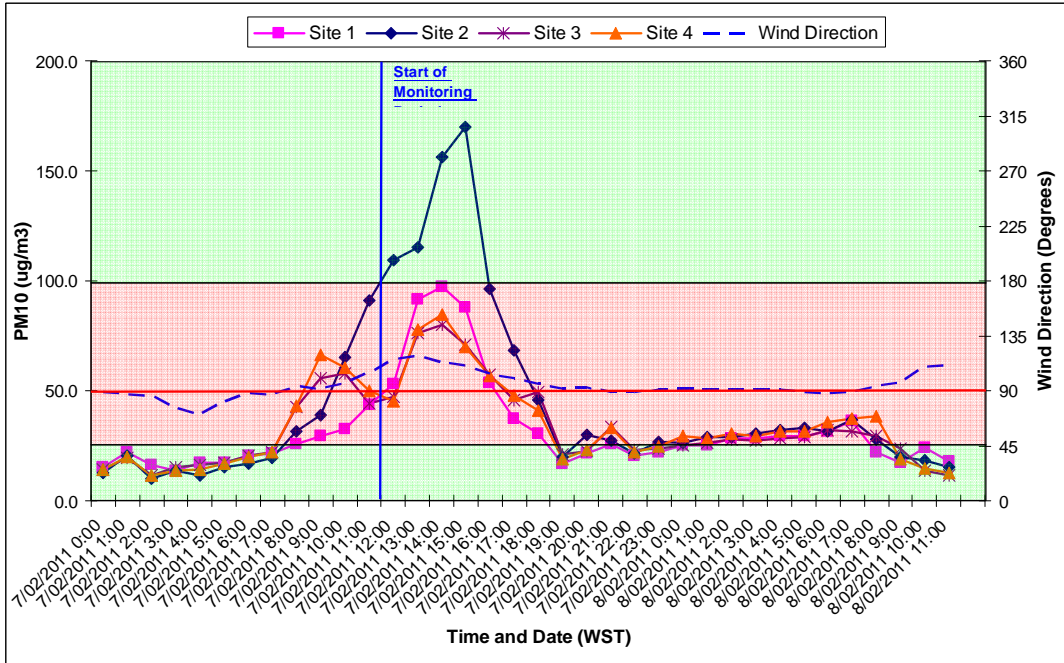
**Figure 2** Wind rose for the monitoring period 1200 hrs 7/02/2011 to 1200 hrs 8/02/2011. Raw data source: EP7 monitoring station, Berth 3.

#### 2.4 PM<sub>10</sub> Dust Levels (24hour period)

The PM<sub>10</sub> exceedance for Site 2 was due to wind speeds increasing to about 14 m/s and shifting to an ESE direction (approximately 125 degrees) (refer to Figure 3). These conditions may have mobilised PM<sub>10</sub> particulates from the unsealed surfaces of Dempster Head, the reclaim area around sheds 3 and 4, and the CBH lease area. **Figure 3** shows a correlation between wind speed and the increase in PM<sub>10</sub> dust at all sites but in particular for Site 2. Site 2 is affected by the dust more than the other sites due to the wind direction being due E and ESE for the duration of the monitoring period as illustrated in **Figure 4**.



**Figure 3** Line graph PM10 dust and wind speed over the monitoring period 12 hours prior and during the 24 hour exceedance period. Note: the exceedance period starts at 1200 hrs 7/02/2011 to 1200 hrs 8/02/2011. Raw data source: TEOM monitoring stations 1, 2, 3 and 4.



**Figure 4** Line graph PM10 dust and wind direction over the monitoring period 12 hours prior and during the 24 hour exceedance period. Note: the exceedance period starts at 1200 hrs 7/02/2011 to 1200 hrs 8/02/2011. Raw data source: TEOM monitoring stations 1, 2, 3 and 4.

### **3. CONCLUSIONS**

The investigation of the respirable dust (PM10) exceedance at sites 2 for the exceedance period (1200hr 7/02/2011 to 1200 8/02/2011) is likely to be due to the combination of near gale winds mobilising PM10 dust from particulates from the unsealed surfaces of Dempster Head, the reclaim area around sheds 3 and 4, and the CBH lease area (**Figure 3 & 4**). During this exceedance period there was one ship being loaded with iron ore at Berth 3. If there is any iron ore dust contribution from this activity, it can not be determined as the PM10 measurement is by means of light scatter and no physical sample taken to enable analysis of iron content.

#### **3.1 Corrective Action**

The event is predominately due to meteorological conditions and the unsealed surfaces. EPSL already implements a dust binding agent on unsealed surfaces. No further action can be practically taken by EPSL to further reduce dust in near gale winds.