

ESPERANCE PORTS SEA AND LAND

PM10 EMISSION CONCENTRATION TARGET EXCEEDANCE REPORT TO DEC

**MONITORING PERIOD MIDDAY 28TH JANUARY
2011 TO MIDDAY 29TH JANUARY 2011**

Revision	Prepared	Reviewed	Approved	Date	Description
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2	C Magana	A Leonard	A Leonard	10/2/2011	Final

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1. PURPOSE

A daily check undertaken by the Esperance Port Sea and Land (ESPL) indicated PM₁₀ concentrations in excess of ambient concentration targets (stipulated by L5099/1974/12). The targets are replicated in **Table 1** below. This was recorded at the all four sites for the *monitoring period of 1200hrs 28th of January 2011 to 1200hrs on 29th of January 2011.*

EPSSL checked the PM₁₀ daily averages for the period midday 28th of January 2011 to midday of 29th of January 2011 and became aware of the exceedance at site 1, 2, 3 and 4 on the 2nd of February 2011. This report is being submitted to DEC (on 11th 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 of

Table 1: Emission Concentration Targets from DEC Licence Number L5099/1974/12 issued to EPSSL 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

2. INVESTIGATION

2.1 Date, time and location of exceedance

The recorded PM₁₀ concentration above the emission concentration target (**Table 1**) according to the Licence L5099/1974/12 for the monitoring period of **1200 hours 28th January 2011 to 1200 hours 29th January** is as follows:

- Site 1: 63.0 µg/m³
- Site 2: 57.0 µg/m³
- Site 3: 53.0µg/m³
- Site 4: 53.0 µg/m³

Site 1 location is downwind of berths 1 and 2 in a SE wind, but downwind of berth 3 in an Easterly wind. Site 2 location is downwind of berths 1 and 2 in an ESE wind, but downwind of berth 3 in an Easterly wind. Site 3 location is downwind of berths 1, 2 and 3 in an ENE wind. Site 4 location is downwind of berths 1, 2 and 3 in a NE 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:

- Clipper Kiku was along side Berth 1 being loaded with wheat between 0031 hours 28th of January 2011 to 1557 hours 29th of January 2011.
- 34,362 tonnes of iron ore averaged across 4 trains
- 124 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 W to ESE (**Figure 2**). The maximum hourly average wind speed of 7.8 m/s (28.1km/hr) was recorded from the SSE at 1200 on the 28th of January. The 'Beaufort Wind Force Scale' is a measure of understanding wind speeds in descriptive terminology. A wind speed of 7.8 m/s is described as a 'moderate winds' (BOM, 2010).

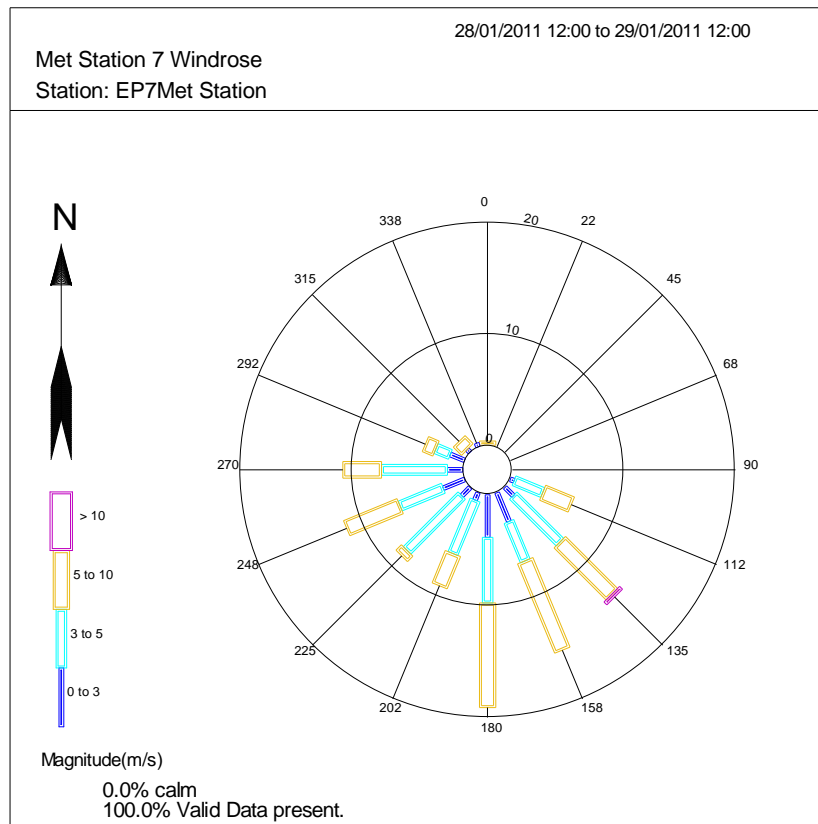


Figure 2 Windrose for the monitoring period 1200 hrs 28/01/2011 to 1200 hrs 29/01/2011. Raw data source: EP7 monitoring station, Berth 3.

2.4 PM₁₀ Dust Levels (24hour period)

The PM₁₀ levels at above 50µg/m³ for all sites are likely to have been caused by wind conditions mobilising PM₁₀ particulates from sources from the west through to the east south east of the Port.

- Site 1 was downwind of various potential PM₁₀ sources and had the highest reading of the four sites of 63µg/m³. For 36% of the time, light to moderate winds from the south east these sources included Esperance Port beach and aerosols from the marine environment, Berth 1 grain loading and unsealed surfaces of the Port. The rest of the time (63%) the winds were blowing from Esperance Town north to east of site 1.
- Site 2 (57 µg/m³) was downwind of potential PM₁₀ sources from the Port and Berth 1 activity for 21% of the monitoring period by light to moderate winds from the east south east. The rest of the time (80%) the winds were blowing from the Esperance Town west to south-south east of site 2.
- Site 3 (53 µg/m³) and 4 (53 µg/m³) were both affected by PM₁₀ mainly from the Esperance Town west to east south east of the sites and a very small contribution from CBH, Port and power station east south east of the monitors for approximately 6% of the period by light to moderate wind conditions.

Overall the light to moderate wind conditions don't appear to have a great potential for PM₁₀ mobilisation but the dry and hot conditions promoted PM₁₀ mobilisation affecting all four monitors on the Ports boundary. It is not possible to differentiate Port contributions to this PM₁₀.

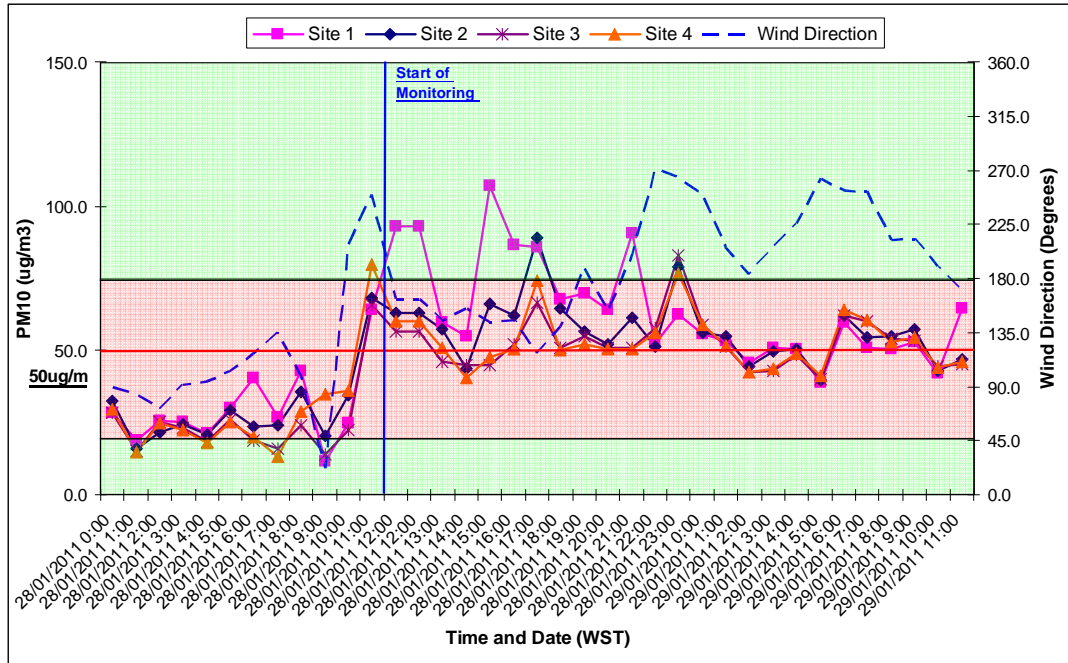


Figure 3 Line graph for the monitoring period 12 hours prior and during the 24 hour exceedance period. Note: the exceedance period starts at 1200 hrs 28/01/2011 to 1200 hrs 29/01/2011. Raw data source: TEOM monitoring stations 1, 2, 3 and 4.

3. CONCLUSIONS

The investigation of the respirable dust (PM10) exceedences at sites 1, 2, 3, 4 for the exceedance period (1200hr 28/01/2011 to 1200 29/01/2011) is likely to be due to the combination of hot, dry conditions and PM10 mobilising from the Esperance Town south to west of the Port (**Figure 3**). The PM10 contribution from the Port cannot be determined but it is not the main contributor to the overall PM10 levels based on wind direction.

3.1 Corrective Action

The event is predominately due to meteorological conditions, and the Port is not the main contributor of the PM10 exceedences.