

AVENUE COKING WORKS AIR QUALITY AND ODOUR MONITORING PROGRAMME Summary of Results: December 2008

1.0 Introduction

This summary presents the results of the monitoring programme for December 2008, and an assessment of these results.

Air quality results are evaluated by comparison with the assessment criteria that were developed in the Jacobs report 'The Avenue Air Quality Management Programme Strategy Document' Issue 1, June 2002, and reviewed in 2006. Odour results are evaluated by comparison with the assessment criteria described in Environment Agency and VDI technical guidance documents.

1.1 Alterations, Downtime and Technical Difficulties

During December 2008, the following amendments to the scope of routine fixed monitoring occurred due to equipment downtime:

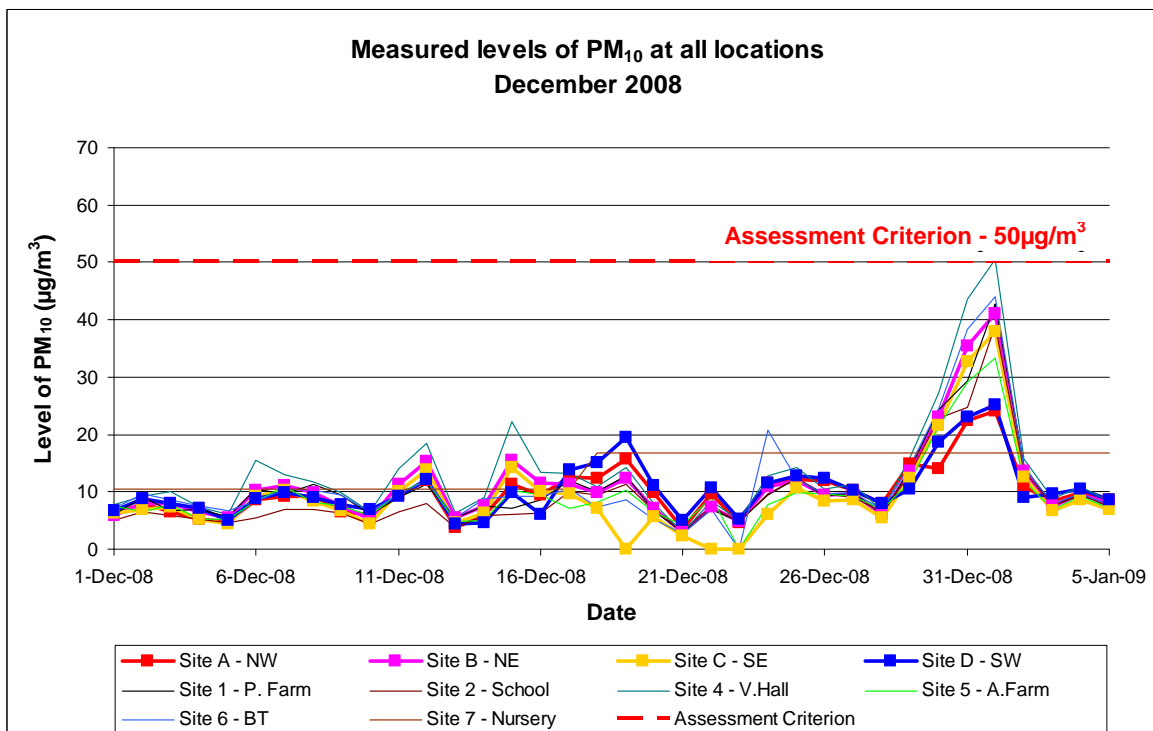
- A local power failure resulted in the loss of PM₁₀ and therefore metals data from the APM unit from 18 to 24 December at station C, and 22 to 24 December at stations 5 and 6.

1.2 Results from Routine Air Monitoring

Of the substances monitored as part of the Avenue programme, statutory limits exist for benzene, PM₁₀, PM_{2.5}, NO₂ and SO₂. Graphs depicting monthly levels of these determinands against applicable assessment criteria are presented with the results, with the exception of benzene, as results for benzene are frequently below limits of detection (LODs). Although a statutory limit does not currently exist for deposited dust, a graph has also been prepared as this has been recognised as a potential issue at and around the Avenue site.

1.2.1 PM₁₀ Levels

The assessment criterion level of 50µg/m³ was exceeded at station 4 on 1 January, with the result being 50.44µg/m³. Marginal results (between 40 and 50µg/m³) were also recorded at station 4 on 31 December (43.62µg/m³), and at stations 1 and 6 on 1 January (42.66 and 44.08µg/m³ respectively).



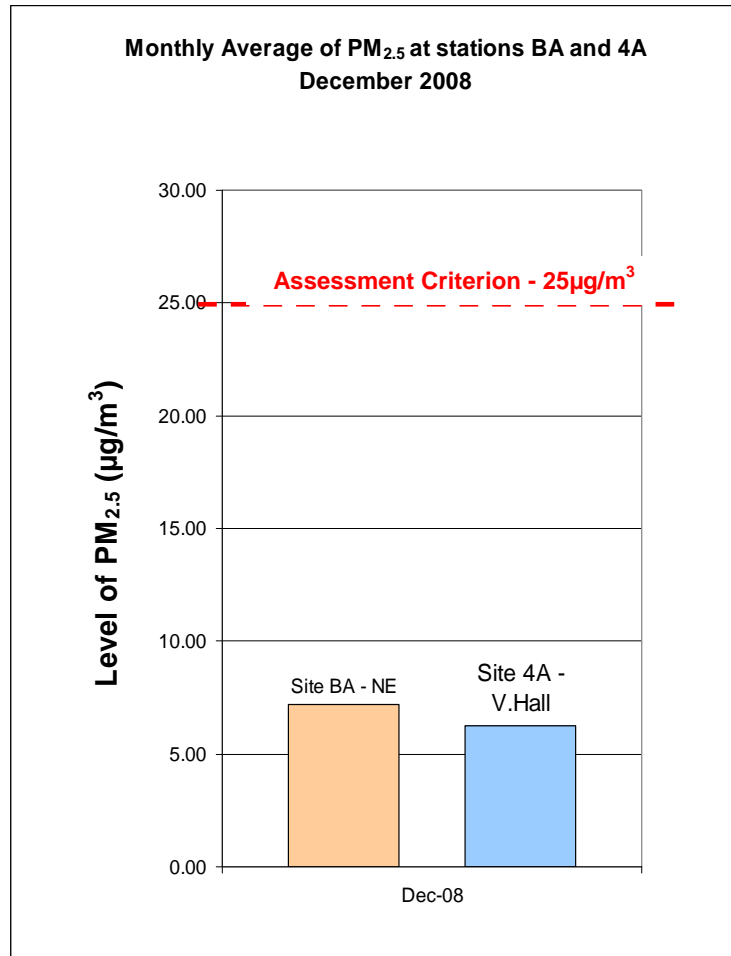
The exceedance of the PM₁₀ assessment criterion at station 4 on 1 January coincided with the highest levels of the month at most on and off-site stations. An analysis of Chesterfield Borough Council monitoring data shows that this trend in particulate levels was generally consistent with hourly PM₁₀ readings from Queen's Park and Chatsworth Road stations.

In addition, data from the Sheffield city centre Automatic Urban and Rural Network (AURN) monitoring station, held in the UK National Air Quality Archive on the NETCEN website (<http://www.airquality.co.uk/archive>), indicate that the trends were repeated in Sheffield city centre.

The above information suggests that the exceedance recorded on 1 January at station 4 was due to more general area-wide or regional phenomena, rather than being due to fugitive particulates generated from any specific activities at the Avenue site. The most likely source of high particulate levels is considered to be the New Year firework celebrations that are known to have occurred during this period.

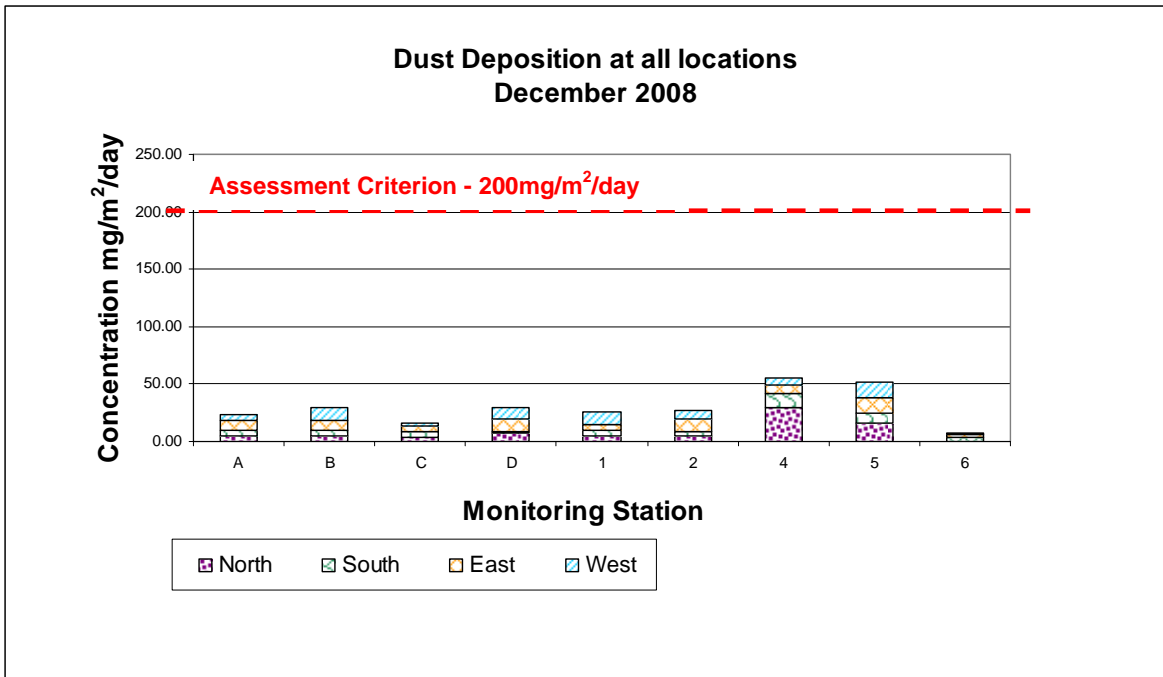
1.2.2 PM_{2.5} Levels

The assessment level of 25µg/m³ was not exceeded at on-site station B or off-site station 4 during the month, with the monthly mean result being 7.22µg/m³ for station B, and 6.26µg/m³ for station 4.



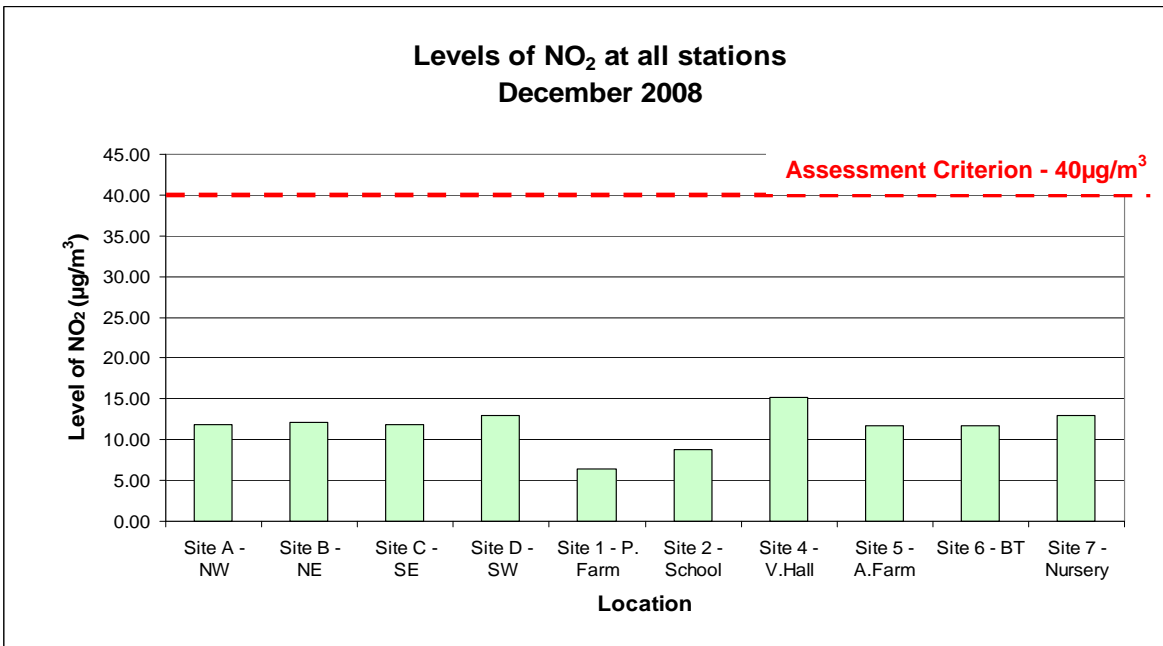
1.2.3 Deposited Dust

The assessment criterion level of 200mg/m²/day was not exceeded during the month, with the highest result being 56mg/m²/day recorded at station 4.



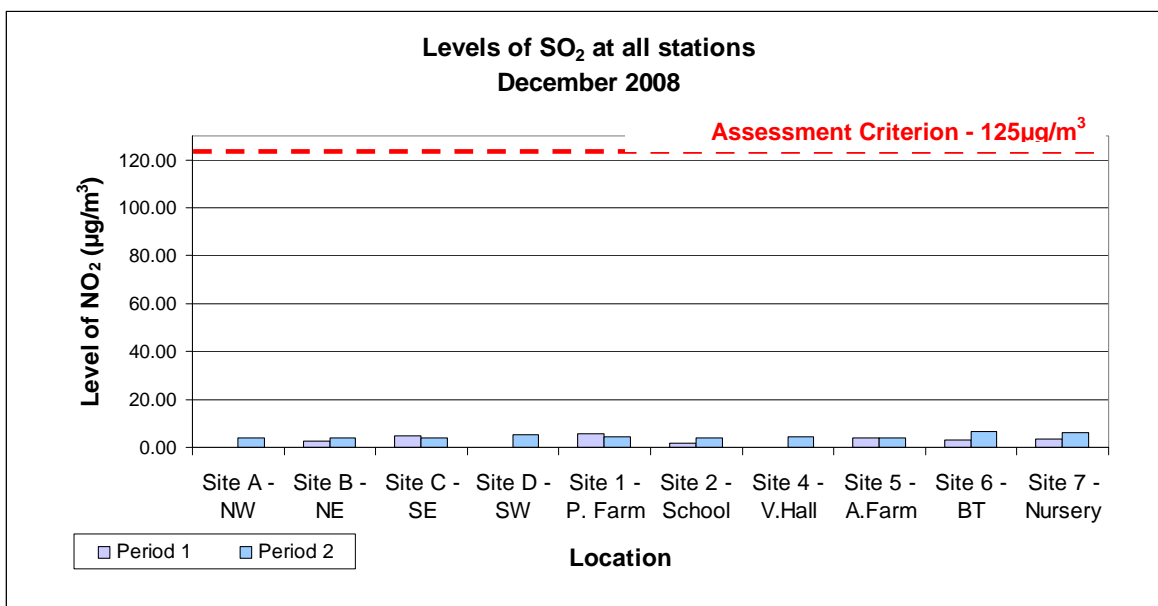
1.2.4 Nitrogen Dioxide

The assessment criteria level developed for NO₂ is 40µg/m³. No stations recorded NO₂ in exceedance of this level, with the highest NO₂ result being 15.15µg/m³, recorded at station 4.



1.2.5 Sulphur Dioxide

The assessment criteria levels developed for SO₂ is 125µg/m³. No stations recorded SO₂ in exceedance of this level, with the highest SO₂ level being 6.74µg/m³ at station 6 in the second monitoring period.



1.2.6 BTEX Compounds

The assessment criteria limits for benzene and toluene are 5µg/m³ and 1.9mg/m³ per fortnight, respectively. No stations recorded levels of benzene above the LOD during the month. The highest level of toluene was recorded at station 1 during the first period at 0.015mg/m³.

1.2.7 Metals

The only metal currently falling under the control of the UK Air Quality Strategy is lead, at a maximum concentration 0.5µg/m³ (annual mean). The highest level of lead was 0.02µg/m³, recorded at station 7 during the first monitoring period.

All other metals were below the assessment criteria developed for the site, and in many cases below LODs.

1.2.8 Cyanide

No National Air Quality Standard has been developed for cyanide; the assessment criteria suggested for the Avenue is a maximum concentration of 50µg/m³ per fortnight. The highest level of cyanide was recorded at 0.1µg/m³ at stations D and 7 during the second monitoring period.

1.2.9 Phenol(s)

The assessment criteria limits for phenol and cresol are 48µg/m³ and 220µg/m³ per fortnight, respectively. The reporting of phenols is subject to a LOD of 0.2µg/m³ and no results were reported above this level.

1.2.10 PAHs

The maximum allowable fortnightly concentration of Coal Tar Pitch Volatiles is 0.48µg/m³, whilst for naphthalene the figure is 126µg/m³. None of the on or off-site stations recorded concentrations in exceedance of these criteria during December 2008. The highest concentration of total coal tar pitch volatiles was 0.02153µg/m³, recorded at station 4 during the first monitoring period, whilst the highest naphthalene result was 0.00055µg/m³, recorded at station A during the second period.

1.2.11 Quality Control Samples

As part of the routine monitoring programme, quality control samples are submitted in the form of duplicates for all sample media and blanks for phenols, cyanide, metals, PAHs and BTEX. This is to ensure that results generated are accurate and, essentially, reliable. The outcomes for December 2008 are as follows:

Media Blanks

The analysis of media blanks indicated no problems with the contamination of media used for the collection of samples during December 2008.

Duplicates

Duplicate PM₁₀ samples taken at station A correlated well with original data during the month, with duplicate results ranging between 71% and 175% of original results.

Duplicate PAH results from station 1 correlated well with original data during the first period, but less well during the second. Duplicate results during the second period for naphthalene and fluorene were 443% and 363% of the original results respectively.

No duplicate results for phenol and cyanide samples, taken at station 1, were reported above the limit of detection (LOD) during both monitoring periods, and as a result the duplicate results correlated exactly with original results.

Duplicate BTEX results recorded at station 6 correlated well with original results during both monitoring periods, with the exception of total VOCs in the second period, when the duplicate result was 16% of the original.

Duplicate results for metals, NO₂ and SO₂ taken from stations A and B correlated well with original results during both monitoring periods.

1.3 Results from Targeted Air Monitoring

Targeted monitoring is undertaken around specific site activities considered to have the potential to liberate airborne contaminants and also to monitor ambient conditions when no works are taking place. Due to the lack of potential for site activities to generate or liberate significant amounts of contaminative materials, targeted monitoring was not required during the month.

Results from Odour Monitoring

1.4.1 Odour Diaries

Background monitoring using odour diaries was suspended at the end of October 2008 following an 18 month period of monitoring; it was considered that a sufficient level of background data have been collected during this period. The odour diary programme is scheduled to resume prior to the remediation phase.

1.4.2 Sensory Field Odour Surveys

A 'diesel' odour was recorded at station 1 on 12 December at odour annoyance impact *very high*.

The wind was not from the direction of the Avenue at the time of this record, plus station 1 is located approximately 2.6km from the site. It is thus considered that the odours arising are likely to be due to conditions or activities local to station 1 rather than activities or conditions at the Avenue site.

1.4.3 Complaints

No odour-related complaints were received during December 2008.