

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

1.0 Introduction

This summary presents the results of the monitoring programme for October 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 October 2008, the following amendments to the scope of routine fixed monitoring occurred due to equipment downtime:

- equipment failure at station B resulted in the loss of PM₁₀ and metals data from the APM unit for the whole of the second period (18 October to 10 November)
- equipment failure at station 4 resulted in the loss of PM₁₀ data from the APM unit from 12 to 17 October
- power failure at station 6 resulted in the loss of PM₁₀ data from the APM unit from 28 October to 10 November.

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.

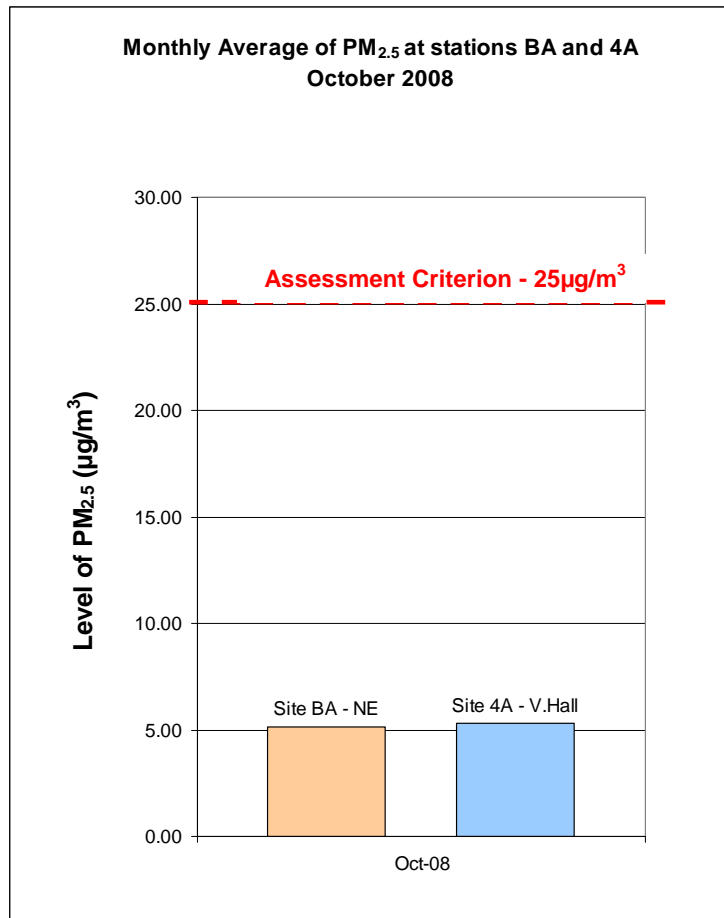
1.2.1 PM₁₀ Levels

The assessment level of 50µg/m³ was not exceeded during the month, with the highest result being 27.72µg/m³ at station 4 on 6 November.



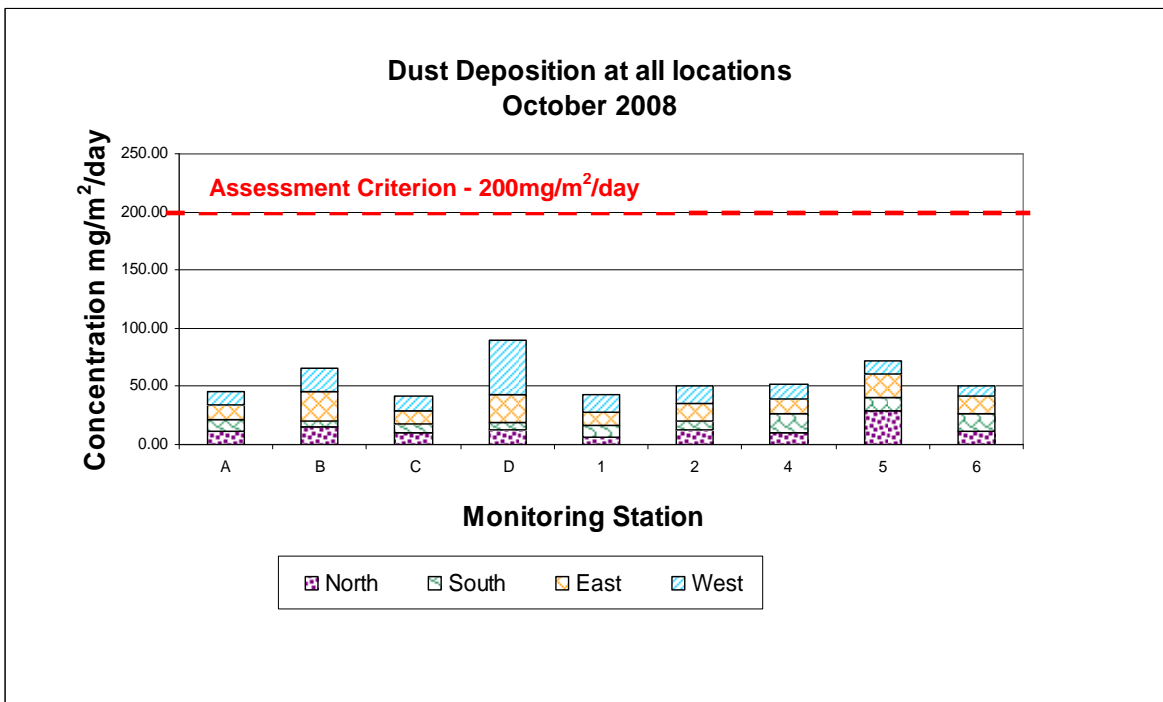
1.2.2 PM_{2.5} Levels

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 5.12µg/m³ for station B, and 5.29µg/m³ for station 4.



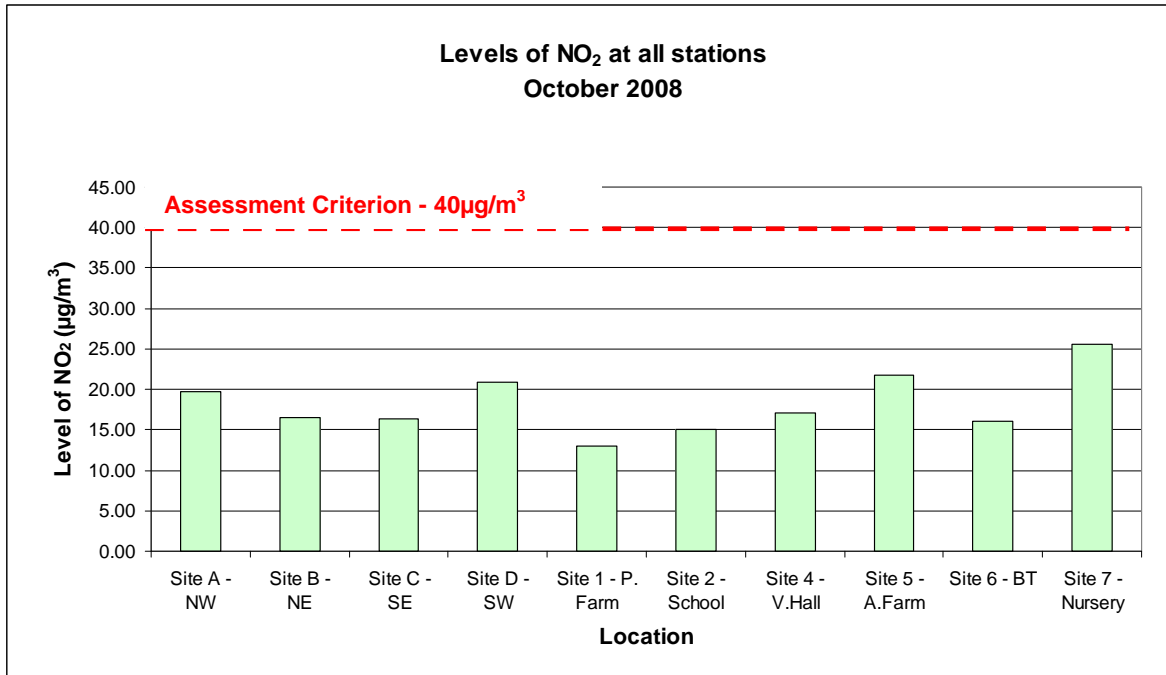
1.2.3 Deposited Dust

The assessment criterion level of 200mg/m²/day was not exceeded during the month, with the highest result being 90mg/m²/day recorded at station D.



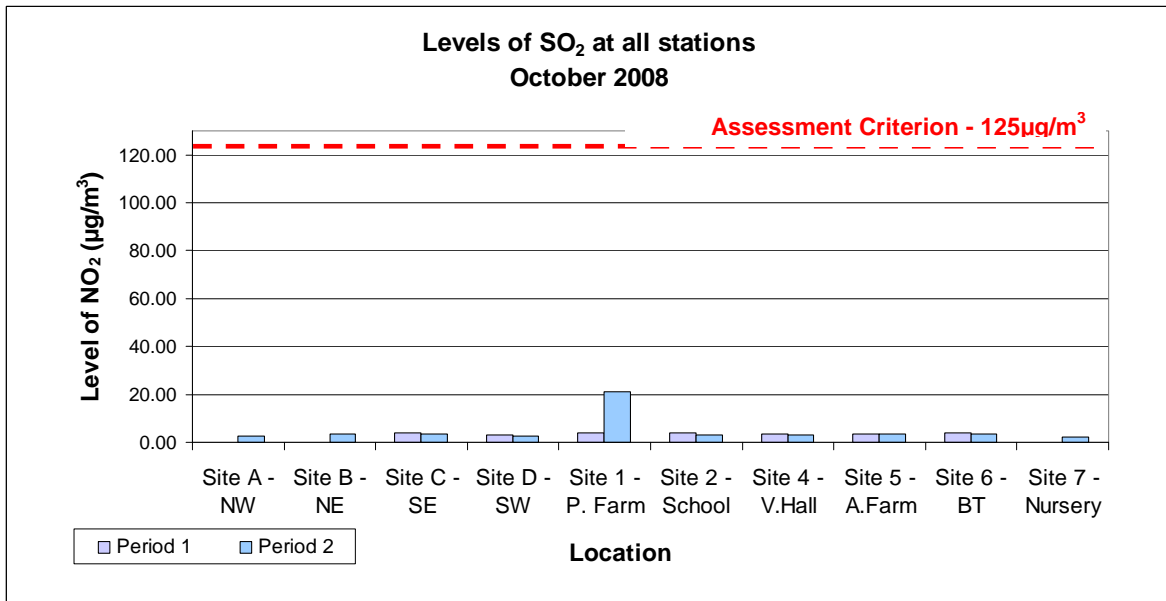
1.2.4 Nitrogen Dioxide

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 25.55µg/m³, recorded at station 7



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 21.12µg/m³ at station 1 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 0.011mg/m³, recorded at station 4 during the second period.

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 recorded at any on-site station was 0.03µg/m³, recorded at station 4 in the second 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 $50\mu\text{g}/\text{m}^3$ per fortnight. The highest level of cyanide recorded was $0.04\mu\text{g}/\text{m}^3$ at station A during the first period

1.2.9 Phenol(s)

The assessment criteria limits for phenol and cresol are $48\mu\text{g}/\text{m}^3$ and $220\mu\text{g}/\text{m}^3$ per fortnight, respectively. The reporting of phenols is subject to a LOD of $0.2\mu\text{g}/\text{m}^3$ and no results were reported above this level.

1.2.10 PAHs

The maximum allowable fortnightly concentration of Coal Tar Pitch Volatiles is $0.48\mu\text{g}/\text{m}^3$, whilst for naphthalene the figure is $126\mu\text{g}/\text{m}^3$. None of the on or off-site stations recorded concentrations in exceedance of these criteria during October 2008. The highest concentration of total coal tar pitch volatiles was $0.01099\mu\text{g}/\text{m}^3$ at station D during the first monitoring period. The highest naphthalene result was $0.00058\mu\text{g}/\text{m}^3$ recorded at station 7 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 October 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 October 2008.

Duplicates

Duplicate PM_{10} samples taken at station A correlated well with original data during the month, with the exception of the duplicate result taken on 7 October, which was 229% of the original. All other duplicate results ranged between 80% and 147% 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, acenaphthene and chrysene were 50%, 329% and 372% of the original results respectively.

Duplicate phenol samples were taken at station 1. No results were reported above the limit of detection (LOD) of $0.2\mu\text{g}/\text{m}^3$ during both monitoring periods, and as a result the duplicate results correlated exactly with original results.

Duplicate cyanide results from station A correlated poorly with original results during both monitoring periods, with the duplicate results being 25% for the first period and 200% for the second.

Duplicate metals results from station A correlated well with original data during both monitoring periods.

Duplicate BTEX results recorded at station 6 correlated well with original results during both monitoring periods.

The duplicate NO_2 and SO_2 results from station B correlated well with original results.

1.3 Results from Targeted Air Monitoring

Targeted monitoring is undertaken around specific site activities considered to have the potential to generate airborne contaminants and also to monitor ambient conditions when no works are taking place. Targeted monitoring was undertaken from 25 February to 10 November 2008 to monitor for emissions of volatile organic compounds (VOCs) from stockpiled woodchip, generated from tree clearance at the waste tip. The results for the whole of this exercise are presented below.

None of the targeted monitoring yielded results in excess of assessment criteria levels. In most cases the results were also below limits of detection (LOD).

Targeted monitoring results were below LOD during the whole period for benzene, ethyl benzene and o xylenes. This corresponds with results from fixed stations, where results for benzene were also below LOD for the whole period, and only one result was above LOD for ethyl benzene ($0.0065\text{mg}/\text{m}^3$) and o xylenes ($0.0069\text{mg}/\text{m}^3$).

Targeted monitoring results were also below LOD during the whole period for m,p xylenes, while results from fixed stations for m,p xylenes ranged from 0.0066 to 0.0190 mg/m³.

Targeted monitoring results for toluene and total VOCs ranged from 0.0007 to 0.085mg/m³ and 0.0008 to 0.0144mg/m³, respectively, compared to fixed monitoring results ranging from 0.0026 to 0.085mg/m³ and 0.005 to 0.66mg/m³, respectively.

Results from Odour Monitoring

1.4.1 Odour Diaries

There were two records of odour at intensity 4 detected during the month:

- One 'chemical' odour recorded on 21 October at approximately 0.5km north of the Avenue site
- One 'manure' odour recorded on 29 October at approximately 0.1km west of the site.

The chemical odour was not recorded when the wind was not from the direction of the Avenue site, and is therefore not considered to be attributable to the Avenue.

The manure odour recorded on 29 October at approximately 0.1km west of the site was recorded when the wind was from the direction of the Avenue. No site activities occurred at the time that could have generated odours of this nature. In addition, manure odours were recorded within 1km of this area (at stations D and 6) by a trained assessor earlier in the month and the wind direction was not from the Avenue site. The above seems to suggest that the manure odours arising may be due to local activities or conditions, and are not attributable to the Avenue site.

No odours were detected at odour intensities 5 or 6 during the month.

1.4.2 Sensory Field Odour Surveys

Two records of 'medium' odour annoyance impact were recorded during the month:

- An 'agricultural' odour of 'neutral' pleasantness was recorded at off-site station 7 on 22 October
- A 'rubber' odour described as 'unpleasant' was recorded at off-site station 2 on 27 October.

Three records of 'very high' odour annoyance impact were recorded during the month:

- A 'manure' odour described as 'unpleasant' was recorded at off-site station 6 on 15 October
- A 'diesel' odour described as 'unpleasant' was recorded at off-site station 1 on 22 October
- A 'tar' odour described as 'unpleasant' was recorded at on-site station B on 27 October

The wind was not from the direction of the Avenue at the time of the agricultural, rubber, manure, and diesel records and they are therefore not considered to be attributable to the Avenue.

The record of odour at on-site station B, described as 'tar' and 'unpleasant', was recorded when the wind was from a northwesterly direction. This suggests that the 'tar' odour could be due to the lagoons that are located northwest of station B. This is further supported by the assessor's notes from the odour impact assessment log for that day, which states "Site B affected by odour from lagoon".

It is considered that, in the absence of any evidence to the contrary, the tar odour may have arisen from the lagoons situated at the north of the Avenue site, northwest of station B. The odours arising do not seem to have impacted on the surrounding area, with no odours of a similar nature being detected by the assessor at any other station on the same day, no reports by any odour diarists during the month, and no complaints of this nature being received.

1.4.3 Complaints

One odour-related complaint was made during October 2008 whereby one of the odour diarists contacted the Avenue site with concerns relating to 'gas' and 'burning' smells. The complaint was investigated by two members of staff from Jacobs and Bureau Veritas. It was determined that neither of the two odours was attributable to the Avenue site; the gas odour was considered to be due to a gas leak from a nearby pipe, and there were no burning activities at the Avenue site. The odour diarist was subsequently advised and reassured.

No other odour-related complaints were received during October 2008.