

4.0 Progress report for Particulates (PM₁₀)

4.1 The national perspective

There are a wide range of emission sources which contribute to PM₁₀ concentrations in the UK. Sources of particles can be divided into three main categories:

- **Primary particles**

Derived directly from combustion sources including road traffic, power generation and industrial processes.

- **Secondary particles**

Formed by chemical reactions in the atmosphere. These comprise principally of sulphates and nitrates.

- **Coarse particles**

Comprised of emissions from a wide range of sources including re-suspended dust from road traffic, construction works, mineral extraction processes, wind blown dusts and soils, sea salt and biological particles.

The expected reduction in particle emissions in future years is different for each category of particle. For example, primary particle emissions from road transport will be governed by new legislation on vehicle emission standards whilst emissions of secondary particles will be largely governed by controls on industrial emissions of sulphur dioxide and oxides of nitrogen. Emissions of coarse particles are largely uncontrollable and are not expected to decline significantly in future years.

4.2 The local perspective

In the First Stage Review and Assessment of Air Quality in York PM₁₀ was assessed against the following objective:

'The annual 99th percentile of daily maximum running 24 hour averages not to exceed 50µg/m³ by the end of 2005.'

The First Stage Review and Assessment of Air Quality in York concluded that this objective was unlikely to be met in York and that the authority should proceed to a detailed assessment for this pollutant.

Prior to the Second and Third Stage Review and Assessment of Air Quality in York being undertaken, the air quality objectives for PM₁₀ were revised. These revised objectives were used for the purpose of the Second and Third Stage Review and Assessment of Air Quality in York and were as follows:

‘A 24 hour mean objective for PM₁₀ of 50µg/m³, not to be exceeded more than 35 times a year, to be achieved by the end of 2004.’

‘An annual mean of 40µg/m³ to be achieved by the end of 2004.’

The Second and Third Stage Review and Assessment of Air Quality in York concluded that these revised objectives would be met in York without the need for further action at a local level.

The update and screening assessment for PM₁₀ concluded that no further detailed assessments of PM₁₀ emissions from industry or traffic were needed. However, it was concluded that there was a need to undertake further investigation into PM₁₀ concentrations in villages where there is still a high proportion of domestic solid fuel burning. This work was fully documented in City of York Council’s Detailed Assessment report submitted to DEFRA in April 2004. In summary, this report concluded that domestic solid fuel burning did not pose a significant problem with regard to the national air quality objectives. Despite the high levels of domestic fuel burning at the time of monitoring, PM₁₀ concentrations were not regarded as a threat to air quality in the village. The monitoring results from real-time monitoring stations within the city are fully reported in this chapter of the report.

DEFRA recognise that there is a difference between PM₁₀ concentrations recorded with a TEOM instrument and those measured using the gravimetric reference method. This difference arises due to the loss of some volatile material as it passes through the heated TEOM inlet. Because of this, DEFRA recommend that a correction factor of 1.3 be applied to TEOM data prior to comparison with the air quality objectives. As such, all TEOM data presented in this chapter of the report has been corrected to provide gravimetrically equivalent PM₁₀ concentrations.

4.3 Assessment of PM₁₀ data for the area outside the AQMA

4.3.1 PM₁₀ monitoring results from real-time monitoring stations outside the AQMA

City of York Council has undertaken real time air pollution monitoring of PM₁₀ at three locations outside the AQMA. These are:

- Clifton Moor (roadside monitoring site)
- Rawcliffe (roadside monitoring site)
- Bootham (urban background site)

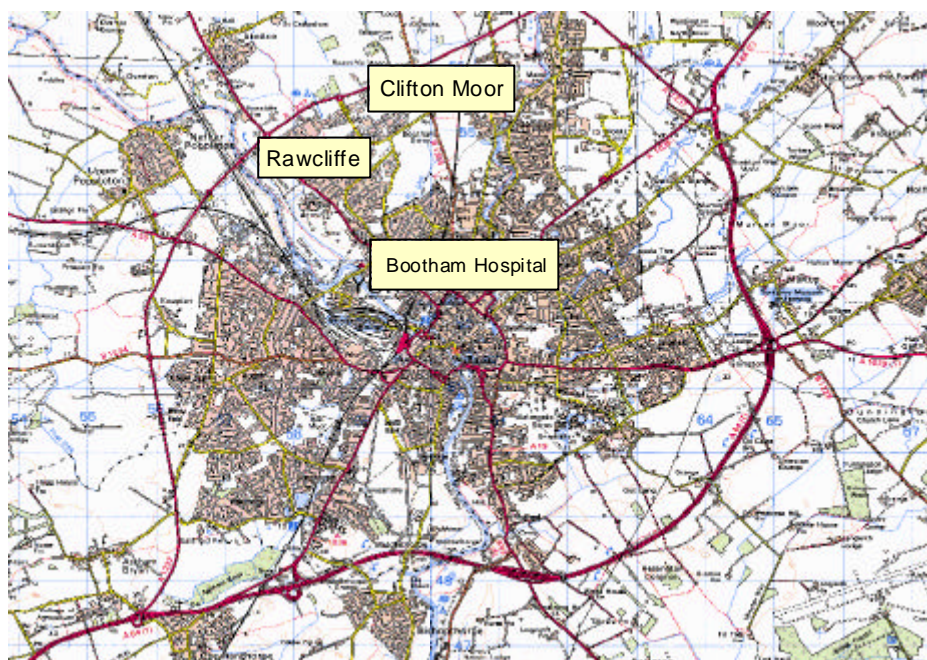
The location of these monitoring sites are shown on Figure 46. All three sites use TEOMs to monitor PM₁₀ concentrations.

The results of the PM₁₀ monitoring undertaken at these sites are shown in Table 10. Full information about the air pollution station locations, data management procedures and other QA/QC procedures for the real time air

pollution stations have been previously documented as part of the Second and Third Stage Review and Assessment of Air Quality in York.¹

In October 2000 the air pollution station previously located at Clifton Moor was moved to the present location at Rawcliffe. As a result of this move the data sets for these two sites between 01/04/00 and 31/03/01 are incomplete.

Figure 46 : Locations outside the AQMA where real time monitoring of PM₁₀ has been undertaken.



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¹ CITY OF YORK COUNCIL Second and Third Stage Review and Assessment of Air Quality in York – Technical Annex 2: Air Quality Monitoring in York Feb 2001

Table 10 : Summary of real time PM10 monitoring results for locations outside the AQMA

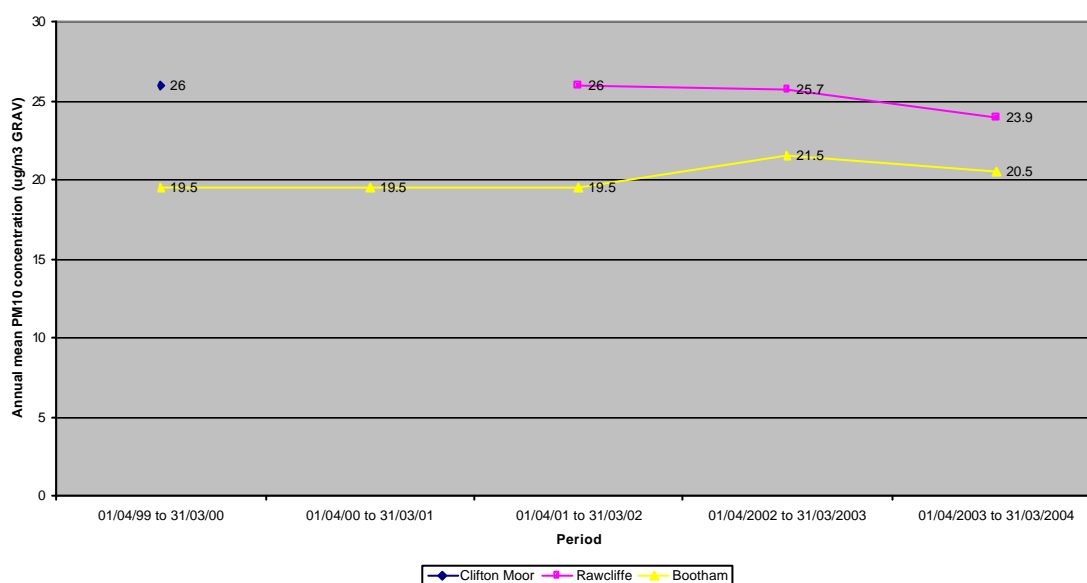
Parameter	Station	01/04/99 to 31/03/00	01/04/00 to 31/03/01	01/04/01 to 31/03/02	01/04/02 to 31/03/03	01/04/03 to 31/03/04
Number of exceedances of 50 $\mu\text{g}/\text{m}^3$ (GRAV) 24 hour objective	Clifton Moor	11	-	-	-	-
	Rawcliffe	-	-	9	17	9
	Bootham	4	1	1	7	7
Annual mean concentration $\mu\text{g}/\text{m}^3$ (GRAV)	Clifton Moor	26	-	-	-	-
	Rawcliffe	-	-	26.0	25.7	23.9
	Bootham	19.5	19.5	19.5	21.5	20.5
90 th percentile of daily averages $\mu\text{g}/\text{m}^3$ (GRAV)	Clifton Moor	44.2	-	-	-	-
	Rawcliffe	-	-	40.3	43.4	38.5
	Bootham	33.8	31.2	29.9	38.8	34.7
Percentage data capture	Clifton Moor	94%	-	-	-	-
	Rawcliffe	-	-	96%	77%	97%
	Bootham	95%	90%	84%	90%	94%

4.3.2 Trends in PM₁₀ concentrations outside the AQMA

Annual average PM₁₀ results from real time monitoring stations outside the AQMA have been plotted between 1/4/99 and 31/3/04. Figure 47 below illustrates the trends in PM₁₀ concentrations (N.B. concentrations of PM₁₀ are provided as gravimetric equivalents).

Annual average concentrations of PM₁₀ at all sites indicate no breaches of the annual mean objective of 40ug/m³. The 50 µg/m³ (GRAV) 24 hour objective is also achieved at all monitoring locations outside the AQMA (see Table 10).

Figure 47 : Graph to show trend in annual average PM₁₀ concentrations from real time monitoring stations outside the AQMA



4.4 Assessment of PM₁₀ data for the area inside the AQMA

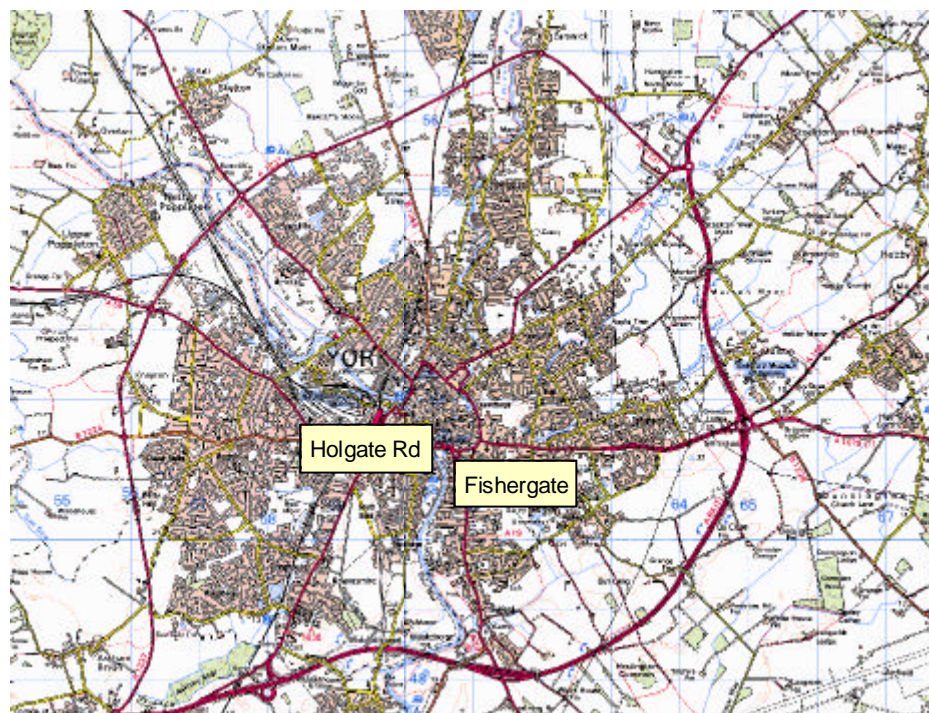
4.4.1 PM₁₀ monitoring results from real-time monitoring stations inside the AQMA

Currently there are two real time monitoring site located in the AQMA. These are the Fishergate and Holgate Road sites. The locations of both of these sites is shown on Figure 48 below. Both the Fishergate site and the new Holgate Road site use TEOMs to monitor PM₁₀ concentrations.

Currently data is only available from the Fishergate site. The results of the PM₁₀ monitoring undertaken at this site is shown in Table 11. Full information about the air pollution station location, data management procedures and other QA/QC procedures for the real time air pollution station have been previously documented as part of the Second and Third Stage Review and

Assessment of Air Quality in York² and the Interim Fourth Stage Review and Assessment of Air Quality in York³.

Figure 48: Location of real time PM₁₀ monitoring equipment within the AQMA



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² CITY OF YORK COUNCIL Second and Third Stage Review and Assessment of Air Quality in York – Technical Annex 2: Air Quality Monitoring in York Feb 2001

³ CITY OF YORK COUNCIL Interim Fourth Stage Review and Assessment of Air Quality in York Jan 2003

Table 11 : Summary of real time PM10 monitoring results for Fishergate (within the AQMA)

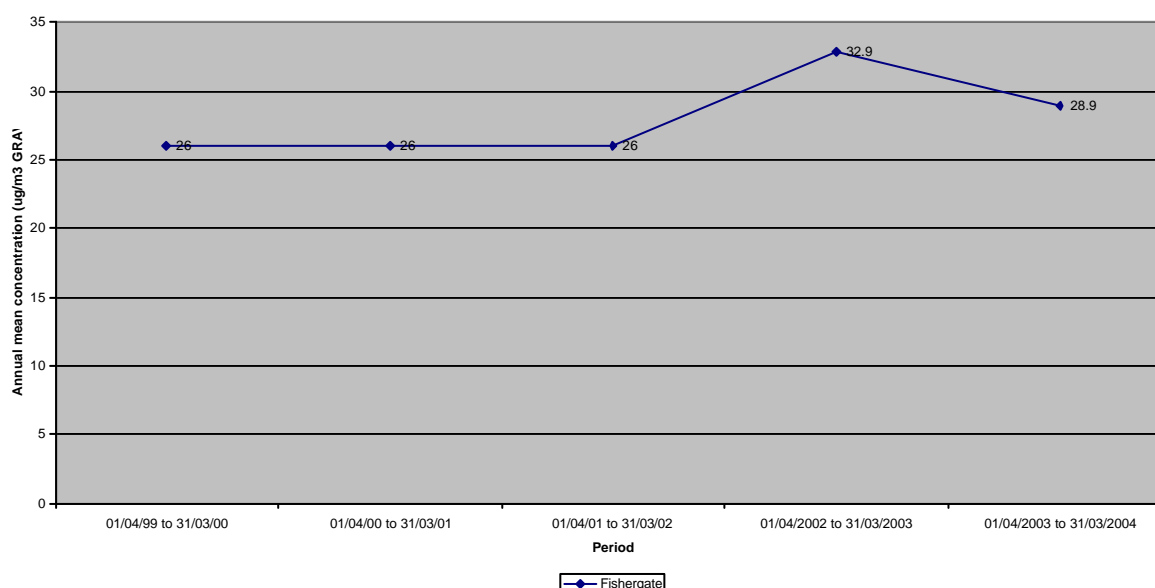
Parameter	01/04/99 to 31/03/00	01/04/00 to 31/03/01	01/04/01 to 31/03/02	01/04/02 to 31/03/03	01/04/03 to 31/03/04
Number of exceedances of 50 $\mu\text{g}/\text{m}^3$ (GRAV) 24 hour objective	11	12	4	47	23
Annual mean concentration $\mu\text{g}/\text{m}^3$ (GRAV)	26	26	26	32.9	28.9
90 th percentile of daily averages $\mu\text{g}/\text{m}^3$ (GRAV)	44.2	42.9	40.3	54.5	46.3
Percentage data capture	97%	94%	91%	82%	92%

4.4.2 Trends in PM₁₀ concentrations within the AQMA

Annual average PM₁₀ results from Fishergate real time monitoring station (within the AQMA) have been plotted between 1/4/99 and 31/3/04. Figure 49 below illustrates the trend in PM₁₀ concentration observed at this site (N.B. concentrations of PM₁₀ are provided as gravimetric equivalents).

Annual average concentrations of PM₁₀ at Fishergate indicate no breaches of the annual mean objective of 40 $\mu\text{g}/\text{m}^3$. The 50 $\mu\text{g}/\text{m}^3$ (GRAV) 24 hour objective is breached during the period 01/04/02 to 31/03/03, with 47 exceedences of the 50 $\mu\text{g}/\text{m}^3$ limit. However, the number of exceedences falls to 23 during the period 01/04/03 to 31/03/04. It is thought that the elevated concentrations of PM₁₀ recorded during 2002/03 were due to an extended period of construction work in the vicinity of the monitoring site at this time.

Figure 49 : Graph to show trend in annual average PM10 concentrations from Fishergate real time monitoring stations



4.5 Conclusions

The recent monitoring data has indicated that there are no current breaches of any of the objectives for PM₁₀. This situation will be re-assessed during the next round of update and screening due for submission to DEFRA in early 2006. The update and screening report will also consider PM₁₀ monitoring data in York in the context of the more stringent proposed PM₁₀ objectives. Monitoring data from the new Holgate Road monitoring site will also be considered in this report if it is available.