



**AIR QUALITY MONITORING MONTHLY
MONITORING REPORT
JULY 2017**

**CARNWATH ROAD RIVERSIDE
(CARRR)**

TIDEWAY

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1 Introduction

1.1 Monitoring Period

- 1.1.1 This report covers data captured by the air quality monitors at Carnwath Road Riverside (CARRR) during July 2017.

1.2 Monitoring Methods

- 1.2.1 Monitoring is undertaken using Osiris instruments to measure concentrations of particulate matter, accompanied by a continuous monitoring unit (CMU) that contains equipment to measure particulate matter and nitrogen dioxide (NO₂).

Osiris Instruments

- 1.2.2 The Osiris instruments measure concentrations of Total Suspended Particles (TSP); particulate matter less than 10 micrometres in aerodynamic diameter, which is known as 'PM₁₀'.

- 1.2.3 The monitoring is continuous, operating 24 hours a day, 7 days a week.

- 1.2.4 Where data capture is less than 90%, an explanation of the reason for the low data capture is provided.

- 1.2.5 Further details of the Osiris monitoring method are described in Appendix A.

Continuous Monitoring Unit (CMU)

- 1.2.6 In addition to the Osiris instruments, air quality monitoring is undertaken using a continuous monitoring unit (CMU) located on the corner of Philpot Square.

- 1.2.7 This CMU contains two monitors; a TEOM-FDMS monitor to measure PM₁₀ concentrations, and a Thermo-42i chemiluminescent analyser to measure nitrogen dioxide concentrations.

1.3 Monitoring Locations

- 1.3.1 There are four Osiris monitors installed at CARRR and one CMU installed on the corner of Philpot Square, the locations of which are shown in Appendix B.

- 1.3.2 The locations have been agreed with the local planning authority, the London Borough of Hammersmith and Fulham (LBHF).

2 Osiris Monitoring Results

2.1 Results Summary

2.1.1 The measured concentrations recorded by the Osiris instruments located at Carnwath Road are shown in the Table 1 and Figures 1, 2, 3 and 4 below.

Table 1: Osiris Unit Air Quality Monitoring Results: July 2017

Osiris Monitor ID	Average PM ₁₀ Concentration (µg/m ³)	Data Capture (%)	Number of Exceedances of the 15-Minute PM ₁₀ Alert Level of 250 µg/m ³ .
CARRR/AA/1	10.8	100	0
CARRR/AA/2	11.8	100	1
CARRR/AA/3	10.8	79.4	0
CARRR/AA/4	11	100	4

Data capture at CARRR/AA/3 was low due to technical issues with the monitor.

Figure 1 Graph of 15-min PM₁₀ Concentrations at CARRR/AA/1: July 2017

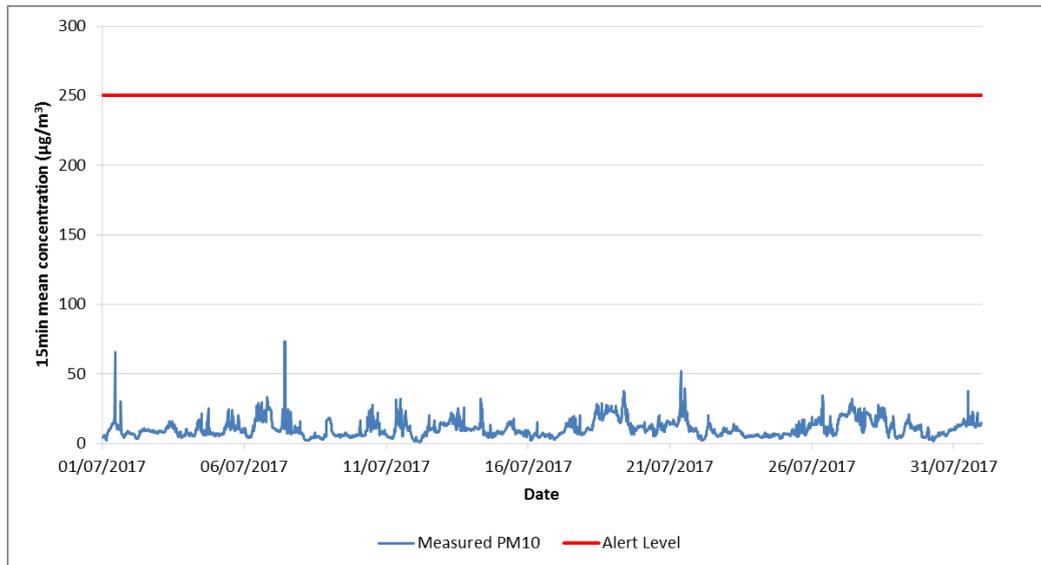


Figure 2 Graph of 15-min PM₁₀ Concentrations at CARRR/AA/2: July 2017

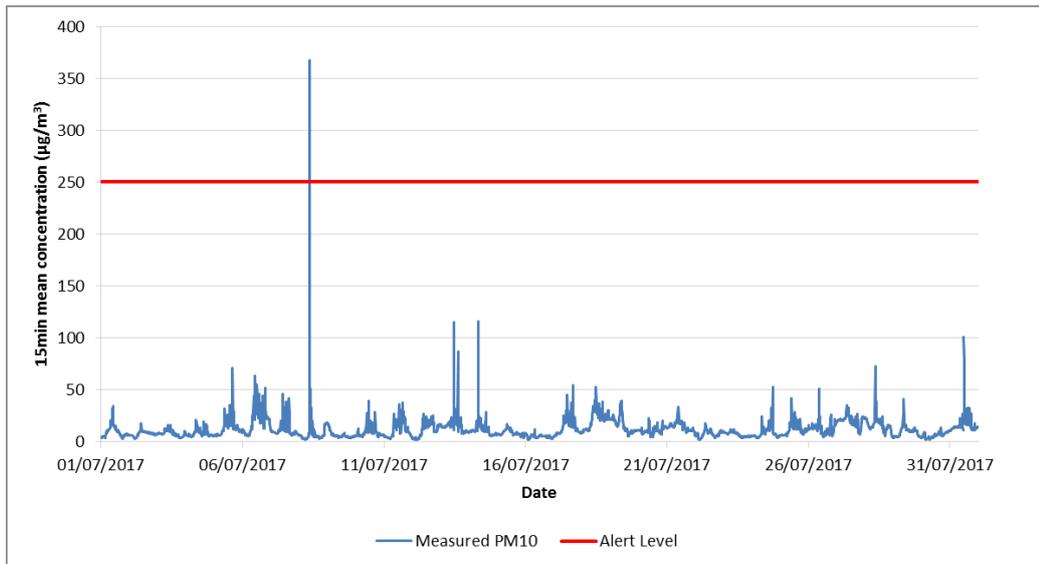


Figure 3 Graph of 15-min PM₁₀ Concentrations at CARRR/AA/3: July 2017

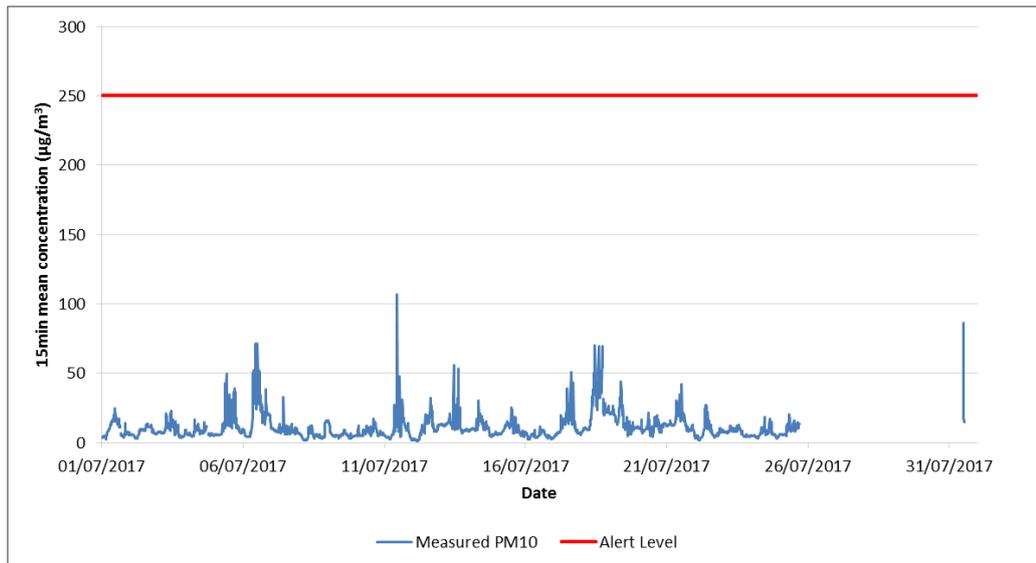
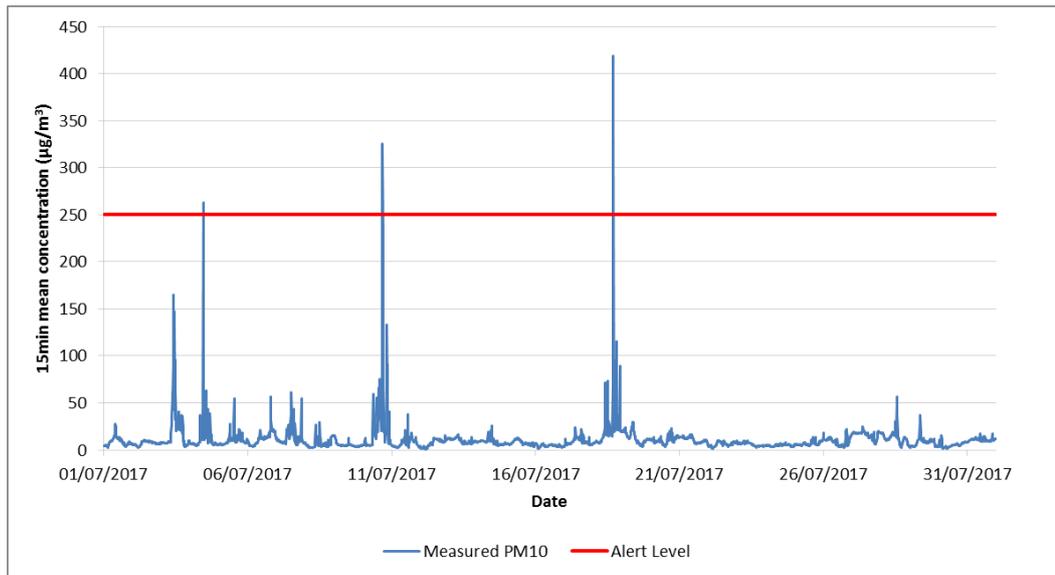


Figure 4 Graph of 15-min PM₁₀ Concentrations at CARRR/AA/4: July 2017



2.2 Results Discussion

2.2.1 The key observations in relation to the measured concentrations of PM₁₀ are summarised below:

2.2.2 PM₁₀:

- Data capture for the month was 100% at sites CARRR/AA/1, CARRR/AA/2 and CARRR/AA/4. Data capture was 79.4% at CARRR/AA/3;
- There was one exceedance of the 15-minute PM₁₀ alert level of 250 µg/m³ at CARRR/AA/2, and four exceedances at CARRR/AA/4.

2.3 Alert Level Exceedances

2.3.1 There was one exceedance of the 15-minute PM₁₀ alert level of 250 µg/m³, recorded at Osiris monitor CARRR/AA/2, and four exceedances at monitor CARRR/AA/4. A summary of these occurrences is shown in Table 3 below.

Table 2: PM₁₀ Alert Level Exceedance Details

Alert ID	Osiris Monitor Location	Date	Time	PM ₁₀ Conc. (µg/m ³)	Source of dust
CARRR/AA/2_W27_1	CARRR/AA/2	08/07/2017	08:45	367.6	The substation on the northern boundary was being removed at the time of the exceedance. Additional damping down was implemented to reduce dust levels.
CARRR/AA/4_W27_1	CARRR/AA/4	04/07/2017	11:00	262.6	Works taking place consisted of steel fixing, coring and installation of shutter pans in preparation for a concrete pour.

CARRR/AA/4_W28_1	CARRR/AA/4	10/07/2017	16:30	325.2	Works taking place included installation of drain caps & shuttering on the eastern boundary and construction of a crane mat in preparation for the setup of the offices. Works were damped down, however, a small corner of site was noted to be dry and could have contributed to the elevated readings.
CARRR/AA/4_W29_1	CARRR/AA/4	18/07/2017	16:45	419.1	The only works taking place at the time were minor office foundation preparatory works. It was observed that an area near the site perimeter was dusty. Additional damping down took place.
CARRR/AA/4_W29_2	CARRR/AA/4	18/07/2017	17:00	330.2	

2.3.2 On each occasion where the alert level was exceeded, an investigation was carried out to determine the potential source(s) of dust which may be causing the high PM₁₀ levels. A summary of the identified potential sources of dust and the action taken to remediate these sources are provided in Table 2 above.

3 CMU Monitoring Results

3.1 Results Summary

3.1.1 Summary statistics from the CMU on the corner of Philpot Square are shown in Table 4, Figure 4 and Figure 5.

Table 3: Measured PM₁₀ and NO₂ Concentrations – July 2017

Site	Statistic	PM ₁₀	NO ₂
CARRR/CM/1	Period Data Capture (%)	100	98.8
	Period mean (µg/m ³)	15.7	18.1

Figure 5 Graph of 24-hour mean PM₁₀ (µg/m³) at Philpot Square: July 2017

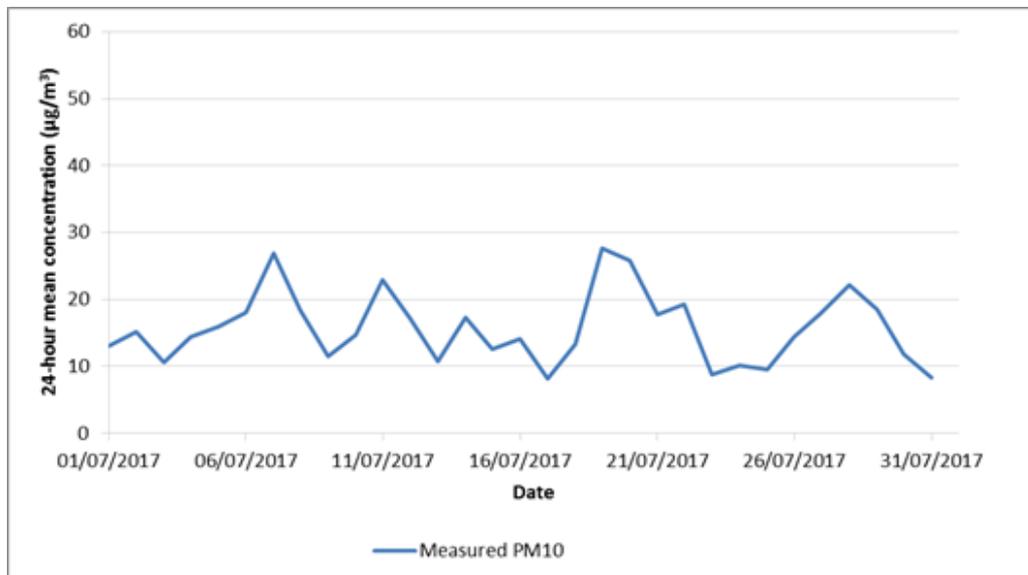
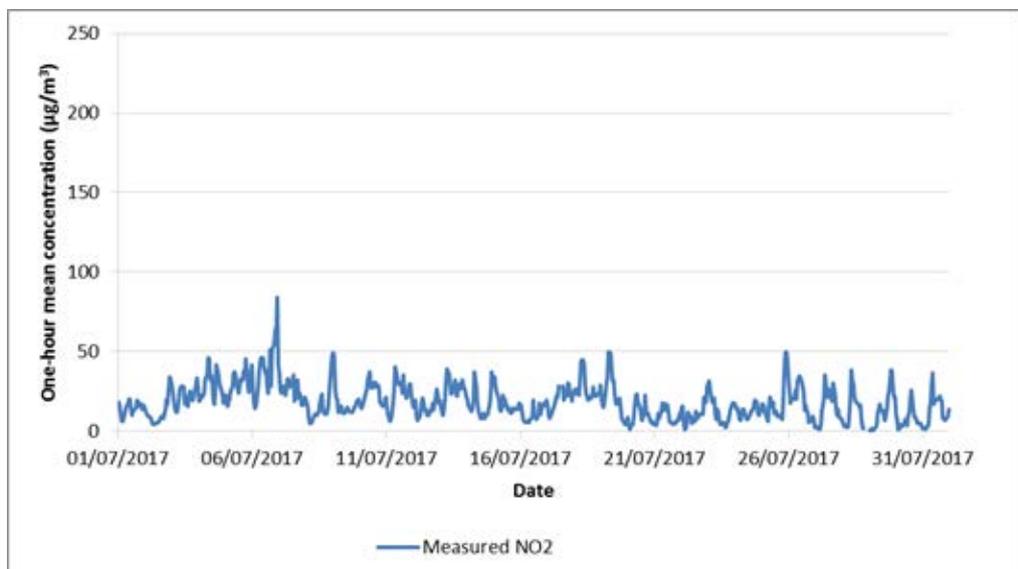


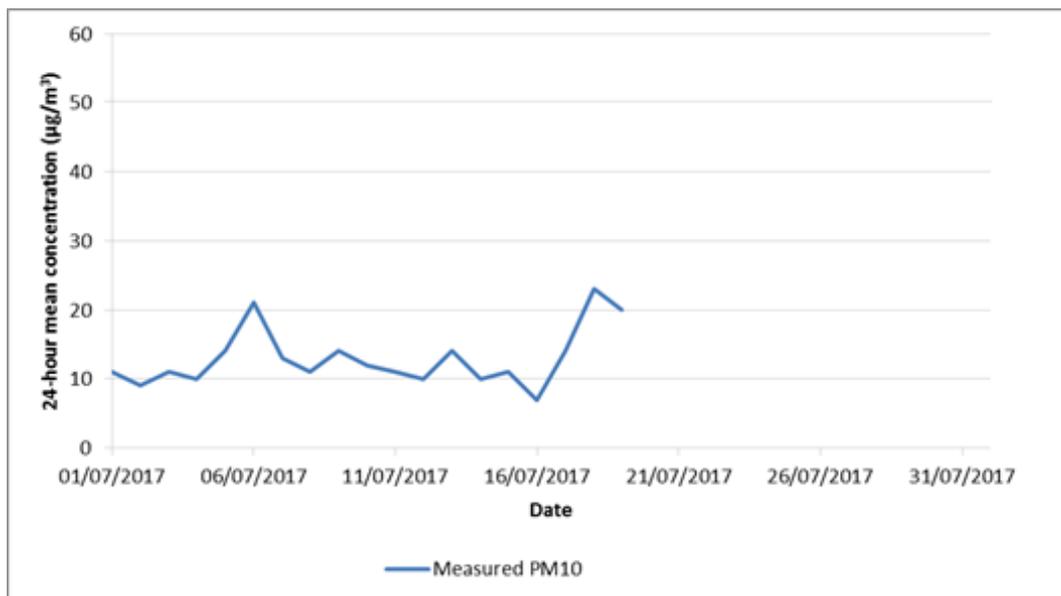
Figure 6 Graph of 1-hour mean NO₂ (µg/m³) at Philpot Square: July 2017



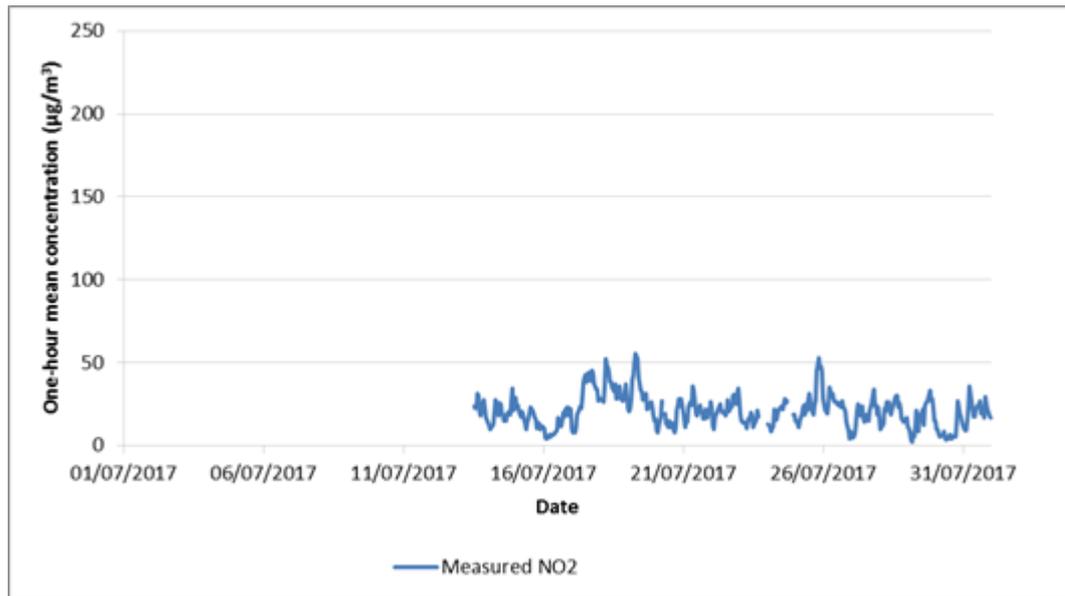
4 Secondary Data

- 4.1.1 Monitoring data for PM₁₀ and nitrogen dioxide are available from the nearby Wandsworth Putney air quality monitoring station. This station is operated by Kings College London as part of the London Air Quality Network (LAQN), which is the major centralised air quality network in London.
- 4.1.2 Results of PM₁₀ monitoring at Wandsworth Putney for July 2017 are shown in Figure 6 below. Results of nitrogen dioxide monitoring are shown in Figure 7.

Figure 7 Graph of 24-hour mean PM₁₀ (µg/m³) at Wandsworth Putney: July 2017



- 4.1.3 The average PM₁₀ concentration at Wandsworth Putney during this period was 12.9 µg/m³, which was lower than the average concentrations at Carnwath Road set out in Table 5. Figure 6 shows a peak in concentration around the 18th July, which reflects trends observed at Carnwath Road. Data capture for the period was low, as data have not been collected at this monitoring location since 20th July. It should be noted, however, that the Wandsworth Putney site uses a more sophisticated monitoring unit and as such the results are only broadly comparable to the Osiris measurements.

Figure 8 Graph of 1-hour mean NO₂ (µg/m³) at Wandsworth Putney: July 2017

- 4.2 The average NO₂ concentration at Wandsworth Putney during this period was 21.1 µg/m³, which was higher than the average concentration at the Philpot Square CMU set out in Table 5. Despite missing data at the start of the month, the NO₂ concentrations plotted in Figure 7 show no discernible trend, which is consistent with the trends observed at the CMU at Philpot Square.

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Appendix A

A.1 Air Quality Monitoring Methodology - Osiris

- A.1.1 The Osiris air quality monitoring units installed at CARRR measure concentrations of particulate matter with a diameter of less than 10 micrometres, known as PM₁₀.
- A.1.2 The Osiris monitors are operated continuously and work by pumping air through a heated inlet to remove moisture, and past an optical sensor which measures the concentration of PM₁₀ in the sampled air.
- A.1.3 The Osiris monitors are set up to record average PM₁₀ measurements every 15 minutes, which are sent via a mobile connection to an online database which stores the recorded data. Concentrations are recorded in micrograms of PM₁₀ per cubic metre of air (µg/m³).
- A.1.4 One of the Osiris monitors at CARRR is connected to a wind sensor which records local wind speed and direction. This is to help identify possible sources of any high PM₁₀ measurements which are recorded.
- A.1.5 The Osiris monitors are all subject to the following routine checks and maintenance:
- Daily online checks of monitoring data and power connection;
 - Quarterly on-site calibration checks; and
 - Annual monitor servicing.
- A.1.6 It is desirable to achieve over 90% successful data capture on the Osiris monitors. An overall data capture rate of 100% is ideal; however, best practice guidance acknowledges that monitoring methods such as the Osiris can be prone to occasional power losses, communication errors and erroneous readings, which result in data capture lower than 100%. Successful data capture greater than 90% represents a high performance with no devaluation of the monitoring results. Where data capture is less than 90% in any monitoring period, justification as to the reasons for the low data capture are to be provided.

A.2 Alert Levels

- A.2.1 The Osiris monitors are set up so that they send an automated alert message to CARRR site management, environmental managers and air quality specialists if 15-minute PM₁₀ concentrations exceed a set level known as an 'alert level'.
- A.2.2 The purpose of the alert level is to provide a warning of unusually high concentrations of PM₁₀, which may be an indication that dust is being produced by site works, but might also indicate other causes such as regional dust episodes (e.g. Saharan dust clouds) and other local dust and PM₁₀ sources such as road traffic, roadworks and utility works, bonfires, or adjacent construction sites. Dry and windy weather conditions are often the cause of high dust and PM₁₀ levels.

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- A.2.3 When an alert level message is received, it is immediately investigated. If site works are identified as a possible contributory factor in the high PM₁₀ levels, then remedial action is taken. This might include using additional dust mitigation measures, relocating or stopping the dusty activity, or completely stopping works.

A.3 Air Quality Monitoring Methodology - CMU

- A.3.1 The CMU installed at Philpot Square measures concentrations of particulate matter with a diameter of less than 10 micrometres, known as PM₁₀.
- A.3.2 Particulate matter is measured by a TEOM-FDMS analyser which operates by drawing air through a permeation dryer and then into a sensor unit where particulate matter is collected and weighed. Auxiliary air is directed through a purge filter, and then to the sensor unit to provide a 'reference' measurement. This allows the monitor to account for volatile particulates.
- A.3.3 Nitrogen dioxide concentrations are measured by a Thermo 42i chemiluminescent analyser. This operates by converting nitrogen dioxide to nitric oxide and measuring the resulting infrared light emissions to determine concentrations in the airflow.
- A.3.4 The TEOM-FDMS and Thermo 42i chemiluminescent analysers are set up to record average PM₁₀ and nitrogen dioxide measurements every 15 minutes, which are sent via a mobile connection to an online database which stores the recorded data. Concentrations are recorded in micrograms of per cubic metre of air ($\mu\text{g}/\text{m}^3$).

Appendix B

B.1 Air Quality Monitoring Locations

- B.1.1 There are four Osiris monitors installed at CARRR, in the following locations:
- CARRR/AA/1: Osiris monitor fitted to a lamppost on Peterborough Road. An anemometer (wind speed and direction sensor) is attached to this monitor.
 - CARRR/AA/2: Osiris monitor fitted to a lamppost on Carnwath Road.
 - CARRR/AA/3: Osiris monitor fitted to a lamppost on the redirected Thames Path west of the CARRR site.
 - CARRR/AA/4: Osiris monitor fitted to hoarding on the eastern boundary of the work site.
- B.1.2 The figure below shows the locations of the three Osiris monitors at CARRR (CARRR/AA/1, CARRR/AA/2, CARRR/AA/3 and CARRR/AA/4).
- B.1.3 The location of the Continuous Monitoring Unit (CMU) at Philpot Square is shown as CARRR/CM/1.

Figure B.1 Osiris Air Quality Monitor Location Plan

