

Comments to Wyre District Council regarding the monitoring data undertaken at Lawrence Recycling (5 July – 9 July) 2013

Turnkey Osiris output data

Public Health England (PHE) has received monitoring data covering the period 5 July – 9 July 2013 from Whittles Bus depot and the Council Offices located close to the Lawrence site which continues to smoulder. The purpose of this monitoring was to support decision making processes around the management of the recovery phase of the fire and inform the potential public health impact associated with these decisions. The data has been received in the form of an excel spreadsheet from Ricardo-AEA containing standalone raw data.

As this is the recovery phase of an incident rather than the acute phase we would have expected the data to be presented to us in a form suitable for interpretation. During the acute incident phase of an incident there are many factors associated with the monitoring which are recorded internally within PHE which enable the interpretation of the data and help to understand discrepancies and inconsistencies. As such we require similar information during any subsequent monitoring in the recovery phase in order for PHE to be able to interpret the public health risks in a robust manner. To enable us to provide interpretation we require the following information:

- Confirmation that the particulate matter raw dataset presented has been ratified by Ricardo-AEA (i.e. quality assured)
- Observations of events which could cause interference in the monitoring for results e.g. the potential for a bus starting up impacting on results is not something which can be investigated by us after receipt of the data.
- Details of the precise monitoring locations, usually via a GIS map. Typically during an acute phase of an incident we ensure that the monitoring equipment is located in areas which have minimal impact from other sources of air pollution, this enables us to assess accurately the levels which are attributable to the fire. We have concerns that the location of the monitoring equipment at the bus depot may not enable PHE to accurately interpret the data as there are likely to be impacts on the monitoring data from other sources of air pollution e.g. bus exhaust emissions.
- Details of the monitoring undertaken e.g. equipment used, calibration certificates.
- Meteorological conditions during the sampling period
- Observations from the scene, allowing correlation results and visual observations of the plume throughout the monitoring periods.

Monitoring locations

Further detail about the monitoring location would support our risk assessment i.e. a GIS map illustrating the location of the Osiris equipment, and the distance from the site boundary.

Public Health England (PHE) has received monitoring data for 5 July – 9 July from Whittles Bus depot and the Council Offices. The monitoring equipment is reported to have been located at Whittles Coaches in the yard between the coach offices and Lawrence's site on the boundary with Severn Trent Water treatment site, and at the WFDC building.

Council offices:

6 July 24 hour average PM₁₀: 25 µg/m³

7 July 24 hour average PM₁₀: 23 µg/m³

8 July 24 hour average PM₁₀: 126 µg/m³

9 July average PM₁₀: 67 µg/m³ (based on an incomplete 24 hour dataset)

Whittles Coaches

6 July 24 hour average PM₁₀: 211 µg/m³

7 July 24 hour average PM₁₀: 19 µg/m³

8 July 24 hour average PM₁₀: 20 µg/m³

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9 July average PM₁₀: 89 µg/m³ (based on an incomplete 24 hour dataset)

Our comments are based on the 24 hour periods of 6 July, 7 July and 8 July for which we have 24 hour uninterrupted period of monitoring data.

From the data provided 24 hour average particulate matter (PM₁₀) levels are averaging below 150 µg/m³ at the Council offices on 6, 7 and 8 July, and Whittles Coaches 7 and 8 July. The WHO interim target value of 150 µg/m³ as a 24 hour average is a level which considers the presence of sensitive individuals in the local area, and is used to inform sheltering decisions. Potential actions at this level may include the provision of sheltering advice and the closure of schools, nurseries, day-care centres and other similar facilities. PHE consider these during the review of sensitive receptors during the acute phase of the incident response. The 24 hour PM₁₀ average exceeds 150 µg/m³ at Whittles Coaches on 6 July. Levels exceeding 300 µg/m³ as an 8 hour average define a point at which 'shelter versus evacuation' discussions should take place. We note the levels of 211 µg/m³ are stated to result from an activity on site such as a bus starting up, however as is associated with a period of elevated PM₁₀ it cannot be deduced that these levels did not result from the fire without further investigation.

There is variability over the sampling period due to the transient nature of the plume, resulting in transient spikes of high particulate concentrations of short duration. Many fires generate local concentrations of particles measured as 24-hour average PM₁₀ values of greater than 50 µg/m³ and above 100 µg/m³. Fires are often associated with extremely high, but short lived, peaks of PM₁₀, often reaching levels above 1000 µg/m³ in close proximity to the fire, usually for periods of less than 1 hour.

The 24 hour average levels recorded during the monitoring period do not exceed the WHO interim target of 150 µg m⁻³ as a 24 hour average. However, this conclusion is based on the monitoring undertaken at the Whittles Coaches and the Council Offices, and the assumption that these are typical levels. A caveat therefore must be added that particulate matter (PM₁₀) levels at locations around the site of the fire will vary dependent on a number of factors including meteorological conditions, activities at the scene, conditions of the fire (e.g. temperature of the fire, material involved in the fire, oxygen content, etc), local topography, distance from the plume etc.

At the levels being reported short term health effects are likely in sensitive individuals within the population and may be experienced within the general population. Sheltering will offer a

degree of protection. This is based on the assumption premise are ventilated when the smoke is moving away from the properties.

PHE advice

There is potential for symptoms in sensitive individuals at these levels. Smoke from any source may contain substances that can irritate the lining of the air passages, eyes and the skin. Respiratory symptoms can include coughing and wheezing, breathlessness, sputum (phlegm) production and chest pain. People with asthma and other respiratory conditions may be particularly susceptible to the smoke and should carry and use their medication (such as their inhalers) as usual. If symptoms occur, people should seek medical advice or call NHS Direct 0845 4647.

Subsequently, PHE reinforce its previous advice that workers should reduce their exposure to the plume as much as is practicable, and ventilate their workplace whenever the smoke is moving away from their premise. If companies have any concerns these should be directed to their local Health and Safety Executive Office who will be able to provide support regarding consideration of the need for PPE.

Further weather predictions could be requested to support this advice in terms of plume direction, however it should be noted the plume is transient in nature.

GasMet data

The GasMet (Friday 5 July) data indicates elevated levels of acrolein. While the chemical composition of emissions from various combustion processes have been extensively studied, in general the GasMet (used also by the Environment Agency's Air Quality Cell) monitoring equipment cannot adequately quantify them all with suitable signal to noise ratio or with suitable specificity. It is expected that, with the changes in wind direction, levels of substances in the plume should rise and fall at the monitoring locations and this is readily observed in the monitoring picture for particulate matter. Osiris particulate data has good signal to noise ratio levels, across the spectrum from normal air quality levels through to hazardous levels of particulate matter. However, GasMet data has had issues with correlation of data outputs from Osiris.

In addition to not showing correlation with plume variability, (as typically inferred from PM₁₀ levels), it is not uncommon for GasMet to report components with signal levels of ten times above the limit of detection; these for some species are exceeding the AEGL 2 (Acute Exposure Guideline Levels – for the public) and STEL (Short Term Exposure Limit – for the workplace) values and sometimes AEGL 3 levels at which levels serious acute, possibly life threatening health effects would be expected. Clearly this appears erroneous, as no significant adverse health effects have been reported. Acrolein and phosphine results are typical examples, of unreliable data capture.

Due to the unreliability issues associated with the GasMet data we have recommended diffusion tubes are used to support our risk assessment, and identify the levels of irritant gases in the area reported to be impacted by the plume (e.g. acrolein, formaldehyde, phosgene, hydrogen chloride, hydrogen cyanide, isocyanates). These will be deployed for a period of 2 weeks. We have also received confirmation from Wyre Forest District Council that sampling for dioxins is currently underway, using a different sampling technique.