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Re: Hydrogen sulphide monitoring assessment

Dear Stephen,

Following our discussion relating to the practical issue of monitoring ambient sulphide concentrations near the Aylesbury site, we have completed the first phase of this monitoring exercise and this letter summarises what the finding were.

1 Monitoring approach

During phase 1, we set up a Jerome J605 Gold film hydrogen sulphide analyser on the property located to the north of the site. Figure 1.

The Jerome J605 has an H_2S detection range from 3ppb to 10,000ppb and has an accuracy of +/- 1ppb at 5ppb. Measurements below 3ppb are recorded at 0ppb.

The odour threshold for H_2S of 0.5ppb.

The Jerome J605 is promoted as a hydrogen sulphide monitor but will react to the presence of reduced sulphide compounds, chlorine, ammonia and nitrogen dioxide.

The Jerome J605 was set up with an autosample interval of 5 minutes, i.e. a sample was tested every 5 minutes from 15:00 hours on 21 January until 10:00 hours on 28 January.

To avoid overloading the internal memory data was retrieved twice during this period.

2 Weather conditions

Monitoring ambient concentration at distance from a source is dependent on the wind speeds and direction during the monitoring campaign.

Figure 2 presents the wind rose for meteorological data measured at Heathrow Airport for this period. That data set should be representative of the condition in Aylesbury. The wind rose shows that during this monitoring period the predominant wind direction was from a general west to south direction - accounting for 80% of this period.

Wind blowing from 150°, 180° and 210° would more likely that not carry reduced sulphur compounds from the Olleco site to the monitoring location if these were emitted from the site.

3 Hydrogen sulphide measurement

During the monitoring period a total of 1877 measurements were made, of these 1829 were registered as '0' ppb (less than 3ppb). The 48 samples registering above '0'ppb was in the range 3 to 4 ppb. These values were recorded:

- Between 22:00 on 23rd January and 00:00 on 24th January; and
- Between 09:45 and 12:25 on 24th January

Figure 3 presents a pollution rose in two formats for the measured values above '0' ppb. Based on the values greater than 3ppb, the pollution rose indicates a pollution source located to the north through to south west of the monitoring location. A south westerly direction may indicate a source close to the Olleco site, the remaining sectors could indicate a source other than on the Olleco site. However, inspection of the wind speed conditions during these two periods showed that the wind speed was low (ca. 1 m/s). Under such conditions a plume may meander as it moves away from the source.

Based on the odour threshold for H_2S of 0.5ppb, a very low intensity odour may have barely been detectable during these two events. At this level the measurements more likely than not sit within the noise of the instrument.

4 Closing

The campaign shows that this type of monitoring is feasible, however on this occasion the Jerome sited at this location was only able detect a barely measurable quantity of reduced sulphide during this period.

If you have any questions about this letter report, please do not hesitate to contact me.

Yours sincerely

[redacted]

Nigel Gibson
Principal Consultant

Figure 1: Photographs of the monitor location

Figure 2: wind rose for monitoring period

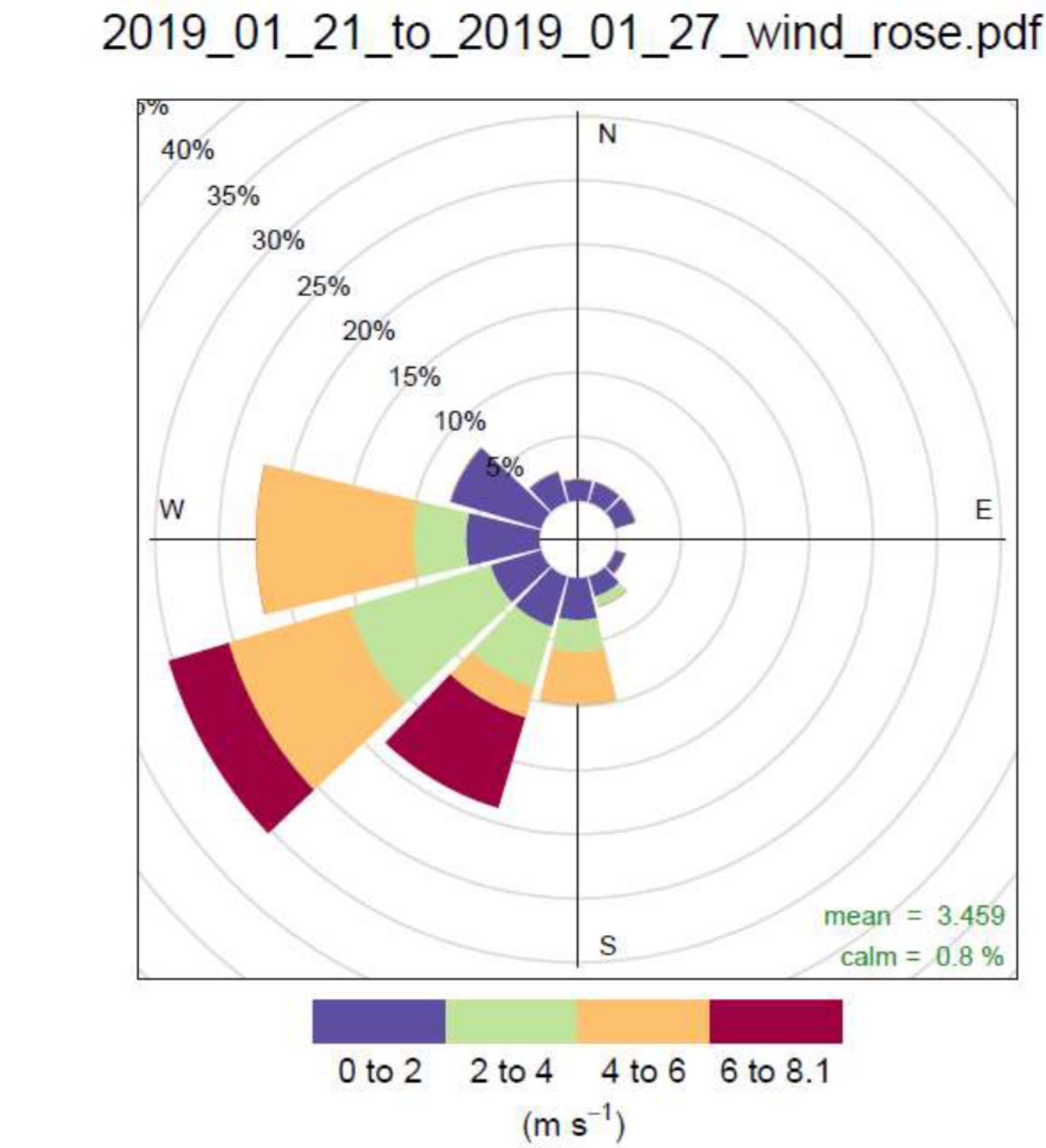
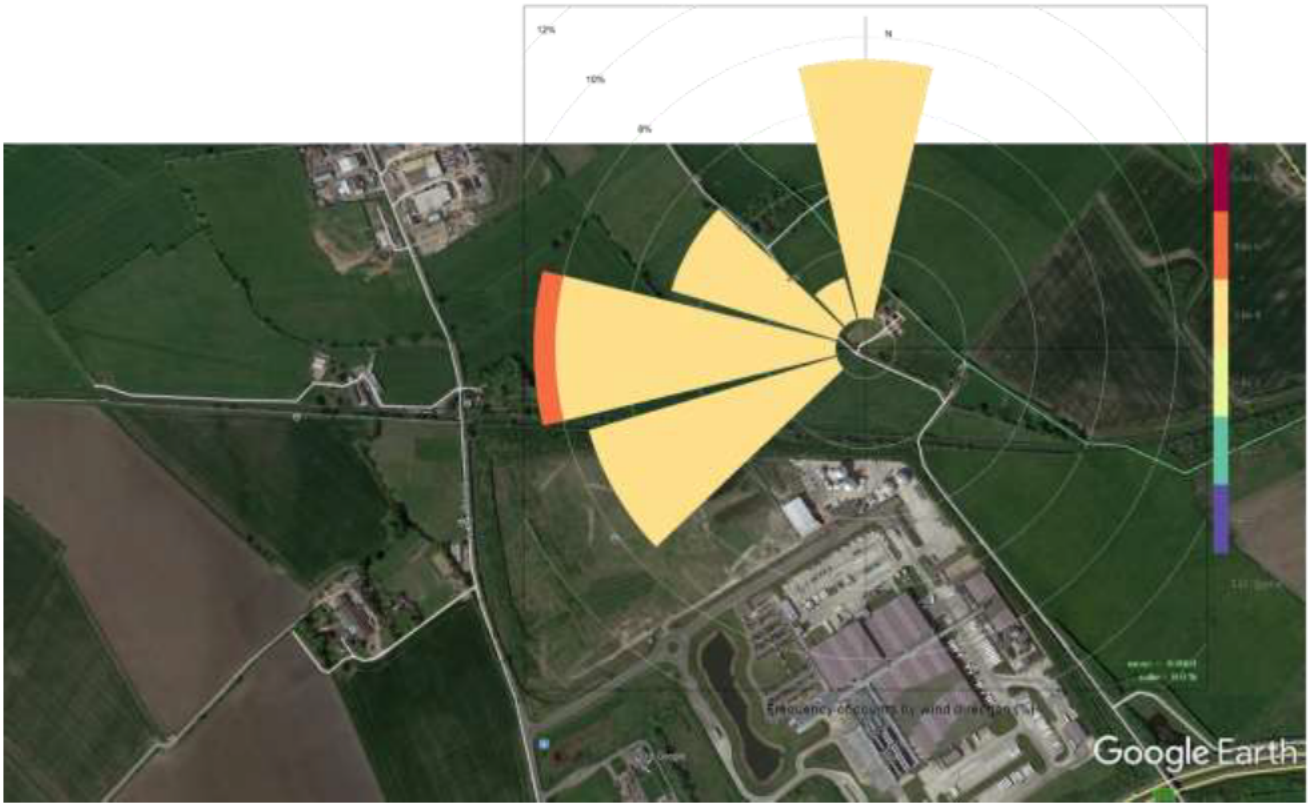
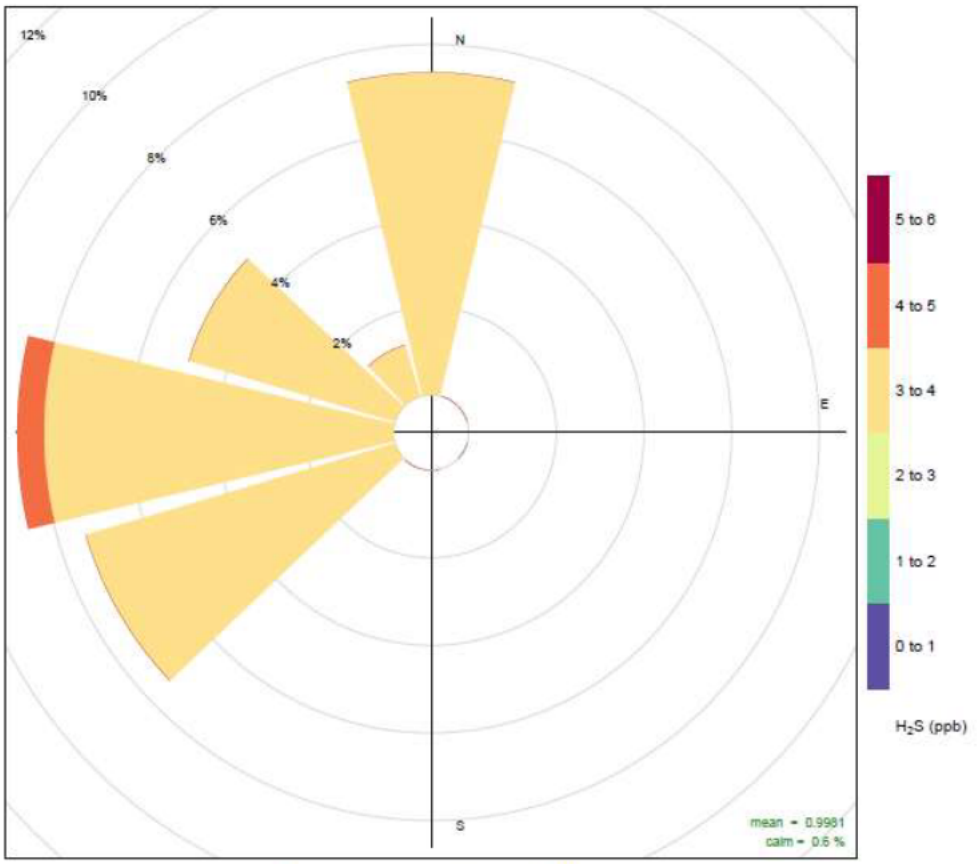


Figure 3: pollution rose





Frequency of counts by wind direction (%)