

# SEPA Monitoring Report for : 14 June 2019 flaring event at the Mossmorran Complex



## Summary

This report provides more information about the monitoring SEPA carried out in response to flaring at the Mossmorran Complex during 14 June 2019.

- Particulate matter results gave no cause for concern and were well below the UK 24 hour air quality standard for PM10.
- Benzene levels did not give rise to any concerns and were below the level of detection of the equipment.

## Particulate matter

Particulate matter is made up of a number of components, including chemical substances, and soil and dust particles and comes from both human-made and natural sources. It consists of substances, which are released directly from the source into the atmosphere, and secondary components, which are formed in the atmosphere by chemical reactions.

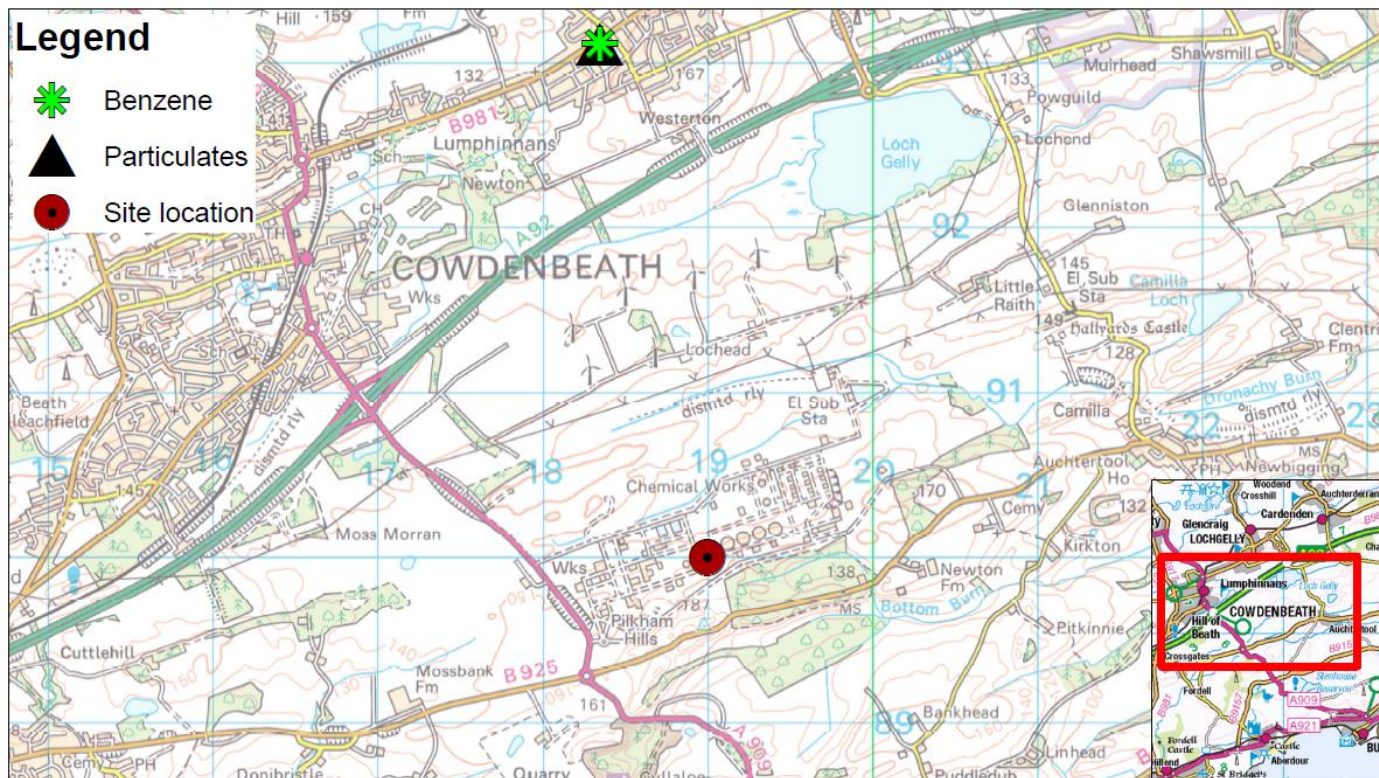
Particulate matter is not made up of one type of substance, it is a classification of particles by size. It is measured in micrometres ( $\mu\text{m}$ ). A human hair is approximately 100  $\mu\text{m}$  wide.

Larger particles are generally filtered in the nose and throat, but particulate matter smaller than about 10 micrometres ( $\mu\text{m}$ ) can be inhaled, which is why these are the ones measured for air quality monitoring.

- PM10 means the particles are 10 $\mu\text{m}$  or smaller. The measurement of this figure includes PM2.5.
- PM2.5 means the particles are 2.5  $\mu\text{m}$  or smaller.

Particulate levels can vary for a variety of reasons, such as rush hour traffic, building work, elevated pollen levels and emissions from industrial activities. Changes in wind direction can also have an impact on the measurements at a monitoring site.

## Overview of event monitoring



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The table below shows the details of what was monitored at location 1.

Location	Species Monitored	Duration
1	Particulates	14:57 – 20:54
1	Benzene	14:35, 17:05, 19:00, 20:30

## Air quality monitoring

SEPA activated a full operational response, including multi-agency co-ordination, regulatory and air quality monitoring. Reflecting scientific best practice on incident wind patterns, air quality monitoring was deployed at Lochgelly Fire Station. The location was downwind of the site, provided access to mains power and security of the equipment. In conjunction with partners, it was agreed that monitoring would continue after the facility had returned to normal operation. This was to ensure that monitoring data would be available should further flaring have occurred. Monitoring was conducted for PM10, PM2.5 and benzene.

## Benzene monitoring

Following public concern about benzene, SEPA scientists were deployed to measure levels of this particular compound.

The most appropriate way to do this at low levels is to deploy diffusion tubes for a fortnight. This provides a value that can be compared against the annual air quality standard. However, given the duration of the most recent flaring event, diffusion tube monitoring would not provide the information required by the public. To address this, SEPA scientists deployed alternative equipment in an attempt to assess levels at the time of flaring in this case Dräger tubes. They work by pumping a known volume of air through the Dräger tube and if the pollutant being tested for is present the reactive material held within the tube changes colour and the concentration of the pollutant can be determined.

## Noise and vibration monitoring

Also reflecting scientific best practice, noise monitoring is conducted against a set of standards. These standards focus on evening and overnight noise monitoring which ensures results are not affected by background noise interference and reflect the time of likely greatest impact.

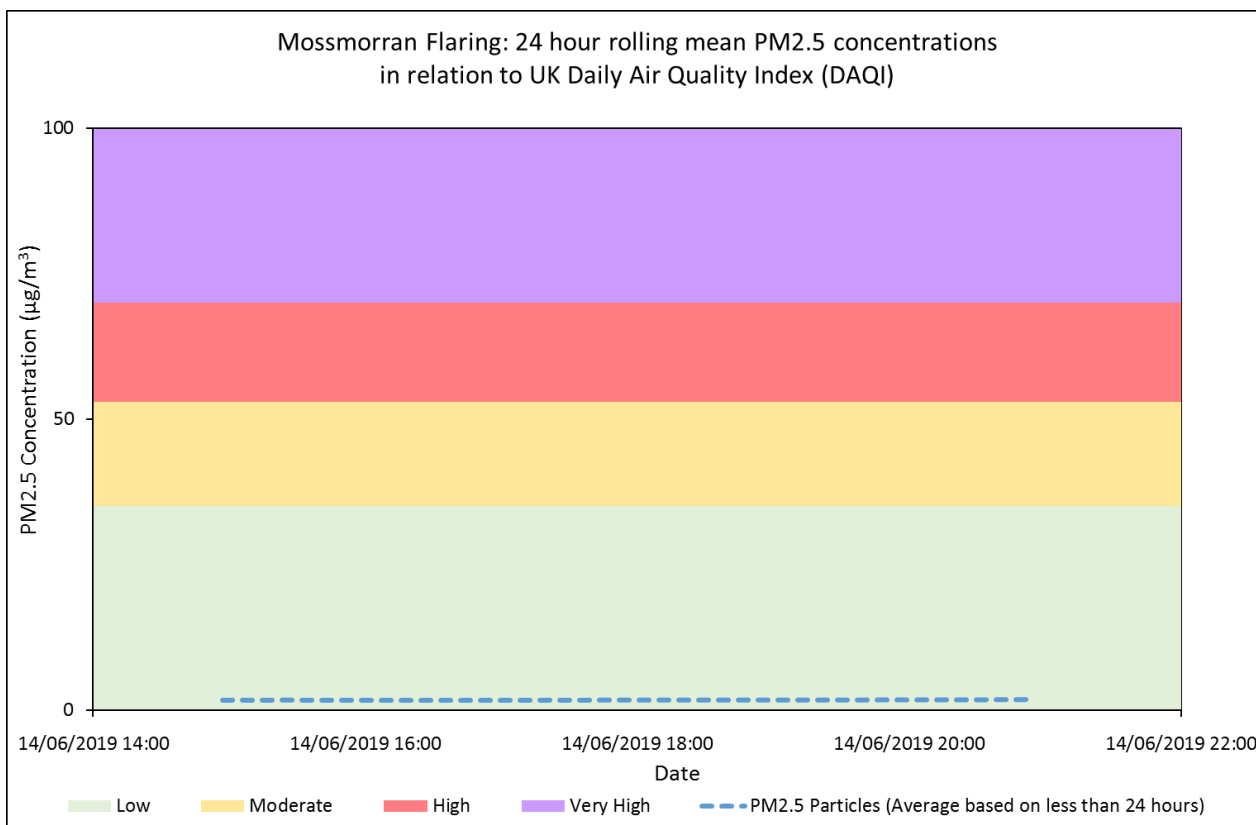
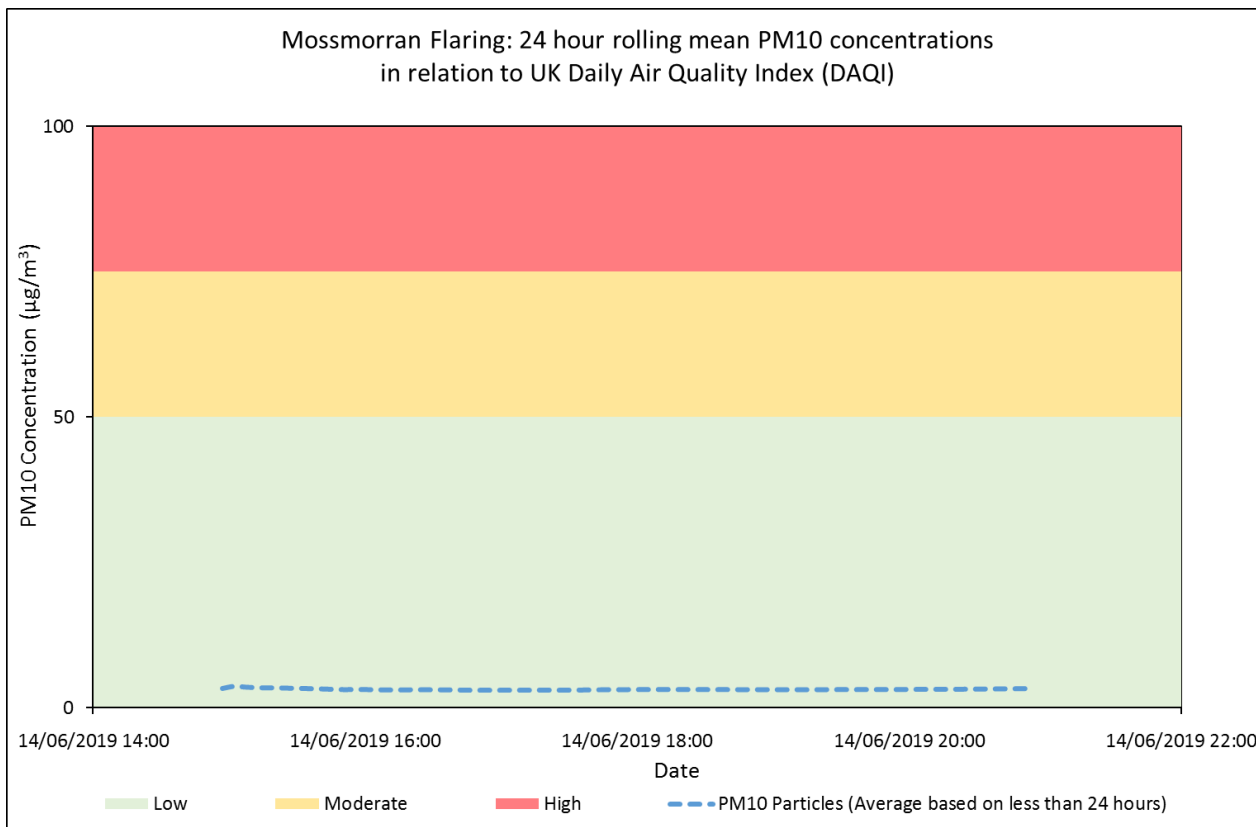
Noise monitoring equipment was deployed on the evening of 14 June 2019. Whilst normal plant operations had resumed, equipment remained deployed to gather data during the facility restart.

## Light

SEPA does not regulate emissions of light from PPC installations.

## Results of particulate monitoring

The graphs below show the measured data over the monitoring period for PM10 particles and PM2.5 particles. These are compared against the relevant UK Daily Air Quality Index. All measurements are within the 'Low' banding. The average values for the period were 3.13  $\mu\text{m}^{-3}$  for PM10 and 1.70  $\mu\text{m}^{-3}$  for PM2.5



Further information on DAQI and bandings are available at the end of this report.

## **Results of benzene monitoring**

Dräger tubes were used to monitor for benzene levels at set times across the deployment period. During this time, the tubes did not identify levels of benzene above the limit of detection of the Dräger tubes.

## **Conclusions**

- The air quality particulate matter results gave no cause for concern and would be classified as low according to the Daily Air Quality Index for PM10 (and PM2.5). Additionally, PM10 levels were below the daily air quality standards of 50 µm-3 (per cubic metre).
- Dräger tube monitoring of benzene did not highlight any concerns with all data below the limit of detection of the Dräger tubes.
- We are continually reviewing our own scientific and regulatory response to elevated flaring events, and are working with partners to improve our response across agencies. Further work with partner agencies around future monitoring is also underway.

## **What does the UK Daily Air Quality Index mean?**

The following information is taken from the Air Quality in Scotland website at [www.scottishairquality.scot/air-quality/daqj](http://www.scottishairquality.scot/air-quality/daqj)

In the UK most air pollution information services use the index and banding system approved by the [Committee on Medical Effects of Air Pollution Episodes](#) (COMEAP).

The overall Daily Air Quality Index (DAQI) looks at five substances, not just PM10 and PM2.5. These tables are included to help put the levels detected by SEPA into context.

**PM10 Particles** - Based on the daily mean concentration for historical data, latest 24 hour running mean (24 hour average) for the current day.

Index	1	2	3	4	5	6	7	8	9	10
Band	Low	Low	Low	Moderate	Moderate	Moderate	High	High	High	Very High
$\mu\text{gm}^{-3}$	0-16	17-33	34-50	51-58	59-66	67-75	76-83	84-91	91-100	101 or more

**PM2.5 Particles** - Based on the daily mean concentration for historical data, latest 24 hour running mean (24 hour average) for the current day.

Index	1	2	3	4	5	6	7	8	9	10
Band	Low	Low	Low	Moderate	Moderate	Moderate	High	High	High	Very High
$\mu\text{gm}^{-3}$	0-11	12-23	24-35	36-41	42-47	48-53	54-58	59-64	65-70	71 or more

Air Pollution Banding	Value	Accompanying health messages for at-risk individuals*	Accompanying health messages for the general population
Low	1-3	Enjoy your usual outdoor activities.	Enjoy your usual outdoor activities.
Moderate	4-6	Adults and children with lung problems, and adults with heart problems, <b>who experience symptoms</b> , should <b>consider reducing</b> strenuous physical activity, particularly outdoors.	Enjoy your usual outdoor activities.
High	7-9	Adults and children with lung problems, and adults with heart problems, should <b>reduce</b> strenuous physical exertion, particularly outdoors, and particularly if they experience symptoms.  People with asthma may find they need to use their reliever inhaler more often. Older people should also <b>reduce</b> physical exertion.	Anyone experiencing discomfort such as sore eyes, cough or sore throat should <b>consider reducing</b> activity, particularly outdoors.
Very High	10	Adults and children with lung problems, adults with heart problems, and older people, should <b>avoid</b> strenuous physical activity.  People with asthma may find they need to use their reliever inhaler more often.	<b>Reduce</b> physical exertion, particularly outdoors, especially if you experience symptoms such as cough or sore throat.

\* Adults and children with heart or lung problems are at greater risk of symptoms. Follow your doctor's usual advice about exercising and managing your condition. It is possible that very sensitive individuals may experience health effects even on Low air pollution days. Anyone experiencing symptoms should follow the guidance provided on the [Defra UK-AIR](#) website.