

Portland
energy recovery
facility

Environmental statement
Second addendum
Appendices

Powerfuel Ltd

Portland Energy Recovery Facility

PM2.5 Clarification Response

1 Background

Dorset Council has submitted a Regulation 25 request for further information in relation to section 2 of the Environment Act 2021. Dorset Council has stated that:

“In light of the passing into law of the Environment Act 2021 and the requirement for the UK Government to set an air quality target for PM_{2.5}, which is lower than that currently in UK legislation. Please provide additional information on the impact of PM_{2.5}s from the proposed development”

A similar question was raised by Hampshire County Council on the planning application for the Alton Energy Recovery Facility. The response included monitoring data from the Four Ashes Energy Recovery Facility (ERF) in Staffordshire, operated by Veolia. This technical note has drawn upon the monitoring data presented to Hampshire County Council.

2 The Environment Act

The Environment Act gained Royal Assent on 9 November 2021. This will deliver key aspects of the Clean Air Strategy. The Act as approved by Parliament introduces a legally binding duty on the government to reduce the annual average level of PM_{2.5} in ambient air. Although the Act does not stipulate the level, it does state that the Secretary of State must set regulations to set the target for annual average levels of PM_{2.5}.

- The current level set in UK legislation (the AQAL) is 20 µg/m³.
- The recommended guideline value within the World Health Organisation (WHO) 2005 for PM_{2.5} was 10 µg/m³. This was the recommendation in place during the various committee stages of the Bill.
- An updated recommendation was published by the WHO in September 2021 which recommended a guideline value for PM_{2.5} of 5 µg/m³

Therefore, it is possible that the Secretary of State will set targets at either of the WHO recommendations or set an independently determined target.

At the point of maximum impact of emissions from the stacks of the Portland ERF, the predicted contribution to ground level concentrations of PM_{2.5} is 0.05 µg/m³. This occurs at sea. The maximum predicted contribution on land is 0.03 µg/m³. This assumes that the plant operates at the emission limit for total dust, and all this dust is in the PM_{2.5} fraction. In reality the plant will operate below the emission limit value and most of the dust emitted will be larger than PM_{2.5}.

The following table sets out the predicted ground level concentrations of PM_{2.5} assuming continual operation of the plant at the emission limit for total dust, and assuming that all this dust is in the

PM_{2.5} fraction. The ground level concentration has been compared to (a) the existing AQAL, which remains the appropriate assessment level; (b) the WHO 2005 guideline value, which was appropriate at the time of submission of the application; and (c) the more recent WHO 2021 guideline value.

Table 1: Effect of Reduced AQAL

Standard	AQAL (µg/m ³)	Point of Maximum Impact		Maximum Impact on Land	
		Concentration (µg/m ³)	As % standard	Concentration (µg/m ³)	As % standard
AQAL	20	0.05	0.23%	0.03	0.16%
WHO 2005 Guideline	10		0.46%		0.32%
WHO 2021 Guideline	5		0.92%		0.64%

As shown, the maximum impact would be 0.46% of the WHO 2005 guideline, and 0.92% of the recently published WHO 2021 guideline. This would occur at sea. The maximum impact on land would be 0.32% of the WHO 2005 guideline, and 0.64% of the recently published WHO 2021 guideline.

This conservatively assumes that the plant continually operates at the emission limit for total dust and that all the dust emitted consists of that in the PM_{2.5} fraction. This is an overestimate as the plant would be offline for periods of maintenance, would operate below the emission limit and not all the dust would be in the PM_{2.5} fraction.

Based on the assessment criteria applied for planning from the Institute of Air Quality Management (IAQM), the impact can be described as negligible irrespective of baseline concentrations if the annual mean process contribution is less than 0.5% of the AQAL. If the level of PM_{2.5} in the exhaust gases remains below 3.9 mg/Nm³ (or 78% of the emission limit value), the maximum process contribution would remain less than 0.5% of the WHO 2021 guideline value at the point of maximum impact on land and the impact would still be described as negligible irrespective of baseline concentrations.

3 Monitoring of PM_{2.5} from a Comparable Facility

Historically there has been limited information on the speciation of the fractions of particulate matter (PM) from energy from waste plants owing to the low concentrations of PM in the exhaust gases. To enable the Environment Agency (EA) to obtain data on this, the EA has previously included conditions in Environmental Permits to include for periodic monitoring for the speciation of PM in the exhaust gases into the PM₁₀ and PM_{2.5} fractions. The results of the monitoring are required to be reported to the EA as a condition of the Environmental Permit and are publicly available; the results were also reported to Hampshire CC in response to a Regulation 25 request for the Alton ERF.

The Four Ashes ERF uses the same combustion and abatement technologies as proposed for the Portland ERF. It is a two-line plant with a capacity of 340,000 tonnes per annum, so each line processes a similar quantity of waste as proposed at the Portland ERF; it is therefore considered to be a comparable plant.

Monitoring for the speciation of the PM fractions at the Four Ashes ERF was carried out in 2014. The monitoring results are summarised in Table 2. For reference purposes, the monitoring report submitted to the Environment Agency is provided in Appendix A.

Table 2: Monitoring data for the speciation of PM – Four Ashes ERF

Line	PM ₁₀ (mg/Nm ³)	PM _{2.5} (mg/Nm ³)	% PM _{2.5}
A1	0.068	0.017	26%
A2	0.043	0.037	85%
Average	0.055	0.027	49%
Max	0.068	0.037	
As % of proposed ELV at Portland	1.4%	0.8%	

Source: Data submitted to Environment Agency to discharge improvement condition 2 - permit ref: EPR/HP3431HK

The monitoring presented in Table 2 shows that the level of emission of PM_{2.5} from the Four Ashes ERF was very low. It also shows that, on average, the PM_{2.5} fraction was about 50% of the total particulate emissions.

As set out above, if the level of PM_{2.5} in the exhaust gases remains below 78% of the emission limit value (ELV) (3.9 mg/Nm³) the maximum process contribution would remain less than 0.5% of the WHO 2021 guideline value at the point of maximum impact on land and the impact would be described as negligible irrespective of baseline concentrations.

- If the emissions of PM_{2.5} from the Portland ERF are the same as the maximum monitored concentration at the Four Ashes ERF, the emissions will be only 0.8% of the ELV proposed for the Portland ERF of 5 mg/Nm³.
- Alternatively, if the emissions of particulate matter from the Portland ERF are at the ELV and the PM_{2.5} fraction is the same as the average from Four Ashes ERF, then the PM_{2.5} concentration would be 49% of the ELV.

In either case, the environmental impacts of PM_{2.5} from the Portland ERF would be described as 'negligible', even at the modelled point of maximum impact, irrespective of baseline concentrations.

4 Conclusion

Therefore, there would be no changes to the conclusions of the ES if the government decided to introduce a target value for PM_{2.5} at the level in the latest WHO Guidelines.

Yours sincerely

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A Monitoring report for the speciation of PM for the Four Ashes ERF