

Outstanding information required.

1. H1 tool data and air emissions screening

I have reviewed your H1 risk assessment emissions data and although we are satisfied that the emission species characteristics from the existing smaller shredder and its wastes are likely to be reflective of the larger shredder and its wastes, we are not satisfied that the concentrations figures and the amount of emissions adequately reflect the scale of the revised proposal. For us to duly make and determine a permit an appropriate emissions assessment must be provided which reflects the scale of the new operations.

Example options for providing an appropriate assessment could include:

- Basing the emissions on what the treatment/abatement process is designed/expected to achieve e.g. evidence from the manufacturer.
- Assuming operation at a BAT AEL from the waste treatment BREF/BATCs
- Representative monitoring data e.g. from a similar process or site.
- Justified figures for the scale up of emissions to reflect operations.
- Direct monitoring of the proposed plant set up prior to operation.

These approaches would need justification as to why the results are adequately reflective of the proposed operations.

Please submit emissions concentrations/amounts in a revised H1 tool which are reflective of the increased scale of the proposed operations and provide justification and evidence for any projected emissions data sets you use.

A H1 assessment has been undertaken based on the likely emissions from the larger shredder. The following assumptions have been made:

- An accurate building height survey has been undertaken and the effective stack height is 14m (based on stack height of 14m and building height of 11m);
- The total volumetric flow rate has been calculated from the sum of both the VOC abatement system and the bag house. The velocity has been calculated from this total and the stack diameter of 0.9m. This is based on information provided from the manufacturers.
- Emissions operating mode is based on 12 hour a day operation, 5 days a week. 48 weeks a year (32.8% - rounded to 35% to allow some contingency).
- Emissions concentrations are assumed to be the same as the small shredder. This is due to the fact the existing abatement system is 12 years old, and was not designed specifically for the process undertaken. The new abatement system contains a VOC collection system with scrubber and carbon filter; and a separate dust collection system with bag house. Consequently, emission concentrations from the new abatement system should be equivalent, and only the quantity will increase. The manufacturers of each abatement system have quoted that the particulate filter on the bag house is 99% efficient, and VOC emissions post abatement are almost zero.
- Acetaldehyde and diethyl ether have been used as proxy to total VOC for the reasons outlined in the response to Q2.

The H1 assessment concludes that emissions to air are potentially significant for cadmium, nickel, arsenic, manganese and acetaldehyde. However further screening indicates that predicted environmental concentrations are less than 70% the environmental assessment level or the process concentrations are less than 20% of the headroom for those pollutants with short term environmental assessment levels.

Ecobat will during the first 6 months of operation complete emissions testing to validate the findings of the H1 assessments which will also include speciated VOC testing.

2. VOCs and screening

You have provided some results for VOC species, however there is not an appropriate assessment against a relevant environmental standard to determine their potential environmental impact. Previously you have attempted to use the environmental standard for benzene as a worse case surrogate which is an appropriate proxy method outlined in our guidance on grouping air emissions.

[Air emissions risk assessment for your environmental permit - GOV.UK \(www.gov.uk\)](https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit)

This guidance also outlines the option to group emissions as something else (e.g. a different VOC standard as a proxy) if you can justify that instead.

Therefore, in your case if VOC's do not screen out based on the environmental standard for benzene, you can provide justification for using a different VOC environmental standard which is more reflective of the risk associated with the VOCs in your emissions. This new VOC proxy can then be used as the VOC environmental standard in the H1 tool.

Provide a justification for a suitable proxy environmental standard which reflects the properties of your proposed VOC emissions and use this to screen grouped VOC emissions in the H1 assessment tool.

ECL was commissioned by Ecobat Solutions to undertake an emissions monitoring survey looking at both total VOC and speciated VOC. ECL Report P5558/R001 (previously submitted). This report confirms that only a single species was identified during the GC-MS scan for both of the speciated VOC tests undertaken, namely carbonic acid, ethyl-, methyl ester (ethyl methyl carbonate ($C_4H_8O_3$)). Additional acetaldehyde testing was also undertaken in August 2023, the results of which have been included in the previously submitted H1 assessment.

From research, it is known that acetaldehyde is a base chemical for manufacturing other chemicals used for making the batteries. When considering all available air quality standards, the closest match would appear to be diethyl ether which is derived from alcohols. Diethyl ether has a $154,000\mu\text{g}/\text{m}^3$ one hour mean and $12,300\mu\text{g}/\text{m}^3$ annual mean concentration parameters for assessment. This is compared to $9,200\mu\text{g}/\text{m}^3$ one hour mean and $370\mu\text{g}/\text{m}^3$ annual mean for acetaldehyde. Consequently two H1 assessments are provided using both diethyl ether and acetaldehyde as proxies. Both H1s demonstrate that whichever proxy is used, emissions can be considered not significant and no further assessment is required.