

Thermal Oxidiser Supporting Technical Note - PPC-A-1000175 Permit Variation

Permit Variation – Thermal Oxidiser Installation and Start-up Management

1. Introduction

This technical note has been prepared in support of an application to vary the site permit following the installation and commissioning of a thermal oxidiser for the abatement of odorous emissions.

The purpose of the variation is to ensure that the permit conditions accurately reflect the design, operation, and management controls of the thermal oxidiser, including start-up and shutdown activities, while ensuring continued protection of human health and the environment.

2. Background and Purpose of the Thermal Oxidiser

A thermal oxidiser has been installed on site to treat odorous exhaust gases prior to atmospheric discharge. The oxidiser represents Best Available Techniques (BAT) for odour control for waste treatment and is designed to operate at elevated temperatures sufficient to ensure complete oxidation of odorous compounds.

Odour monitoring and dispersion modelling undertaken following installation demonstrate that the oxidiser is effective in reducing odour impacts under normal operating conditions.

3. Normal Operation and Emission Performance

Once the thermal oxidiser has reached its minimum operating temperature, combustion is stable and emissions from the stack are clean, with no visible smoke. Under steady-state operation the oxidiser performs as designed, ensuring effective odour destruction and compliance with relevant permit conditions.

4. Start-up and Shutdown Characteristics

During cold start-up, a short ignition phase is required during which the combustion chamber and burner are brought up to operating temperature. The equipment supplier, Comtherm, have confirmed that, during this initial ignition phase, there may be a brief and transient visible plume from the flue, which clears once stable combustion conditions are established and the chamber reaches its operating temperature.

A copy of the supplier's correspondence confirming this characteristic of the equipment is enclosed.

Once operating temperature is achieved:

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- The oxidiser burns cleanly.
- No visible emissions are expected under normal running conditions.
- Odorous process gases are treated effectively.

5. Management of Start-up and Shutdown Emissions

The operator recognises SEPA's position that visible black smoke is not an acceptable routine emission and that emissions during start-up and shutdown must be prevented or minimised.

Accordingly, the following controls are in place:

Controlled Start-up Procedure: Start-up and shutdown activities are undertaken in accordance with manufacturer guidance governing start-up and shutdown management procedure.

Minimisation of Duration: Start-up and shutdown periods are kept as short as practicable and are infrequent, occurring primarily following maintenance or planned stoppages.

Preventative Maintenance: A planned servicing and maintenance regime is implemented to ensure optimal burner performance and minimise the likelihood or duration of any transient visible emissions. This is referenced in the Environmentally Critical items Maintenance checklist submitted to SEPA annually.

Incident Management: Any visible emissions persisting beyond the expected brief ignition period are treated as an abnormal event, investigated, recorded, and corrective actions implemented as appropriate.

6. Permit Variation Approach

This application does not seek to permit black smoke or visible emissions as normal operation, nor to rely on an "other than normal operating conditions" derogation.

Instead, the operator seeks to ensure that the permit:

Reflects the practical operation of thermal oxidiser technology;

Clearly constrains start-up and shutdown activities;

Requires appropriate technical and management controls; and

Reinforces the expectation of clean combustion during normal operation.

The proposed approach provides regulatory clarity while ensuring continued environmental protection and operational control.

7. Conclusion

The thermal oxidiser has significantly improved odour control at the site and performs to specification once operating temperature is achieved. Short-duration transient effects during cold start-up are unavoidable due to the physics of combustion, but these are tightly managed, infrequent, and minimised through design and operational controls.

The proposed permit variation will ensure that emissions are appropriately controlled, that abnormal conditions are not normalised, and that the permit accurately reflects best practice operation of thermal oxidiser technology.