1 Purpose & Scope

1.1 Purpose

To reduce the potential for odorous emissions and air pollution from the Thermal oxidizer to impact the local environment beyond the environmental installation boundary permit QP3331QP .

This work instruction (WI) identify the thermal oxidizer system works and describes the operating.

1.2 Scope

Air emissions from the Thermal oxidizer A13

2 Responsibility

- Extraction operators
- Extraction Engineers
- Extraction Manager
- Environmental Manager

3 Terms and Definitions

Write down abbreviations, ADM terms, technical terminology and their definition that need explaining.

Term	Definition
EA	Environment Agency
TO	Thermal Oxidiser
DTDC	Desolventizer Toaster Dryer Cooler
D3	Computer Software used to control process
LEL	Lower Explosion Limit – concentration of a substance when it starts to become explosive
H2S	Hydrogen Sulphide
ATEX	Atmosphere Explosible
WI	Work Instructions
PT	Policy Tech
Work Instruction	A document describing a task, step by step. Usually applicable to a single function.

4 Work Instructions

ADM uses a Thermal oxidier (TO) to abate the waste gases from the mineral oil extraction system. The TO is fuelled using a 630kW natural gas-fired burner and combusted gases are emitted through air emission point A13.

For safety reasons, due to the flammable nature of hexane, Lower Explosive Limit (LEL) detectors are installed to detect dangerous concentrations of this flammable material between the MOS and the TO (applies to old and new TO).

When this equipment detects values above the safe limits, the flow of the MOS exhaust gases bypass the TO to emission point A14 (located in the extraction plant) from where it enters the atmosphere unabated. This bypass also occurs when an operational problem is detected in the TO (e.g. if the natural gas feed is interrupted or if overpressure is detected (again this applies to the old and new TO).

4.1 Point source emissions to Air *(ref. table 2.2.1 , EP QP3331PQ)*

Emission point number	Description	Source	Location	Abatement
A13	Thermal oxidizer	Extraction waste air removal via absorption	Penthouse roof	Mineral oil Absorption and thermal oxidizer
A14	DTDC	Drying & cooling decks and A13 Thermal Oxidizer on bypass	Extraction	

4.2 Control Parameters

The thermal oxidizer is located in the ATEX zone (Atmosphere Explosible) which classified as hazardous area. The LEL (Lower Explosion Limit) detectors are the fixed gas detection system that used for detecting hexane solvent vapour. There are three LEL detectors as below :

- LEL # 01 Limit <75%
- LEL # 02 Limit <75%
- LEL # 03 Limit <75%

4.3 Bypass Thermal oxidizer

Combustion temperatures within the TO are around 750-850˚C. The waste gas feed to the TO is quite variable in terms of composition of the odorous compounds as is the destruction efficiency of the TO. The primary odour nuisance is H_2S .

The current TO requires to function in bypass in the event of the following scenarios:

- When hexane, Lower Explosive Limit (LEL) equipment detects values above the safe limits (>75%, interlocks on the TO divert the flow of the mineral waste gases from A13 to A14 to the atmosphere (unabated).

- Plant upset – If a problem is detected in the TO as a result of plant upset (e.g. if the natural gas feed is interrupted, if overpressure is detected or if temperatures are too high), the flow of the mineral waste gases is bypassed via A14 (located in the extraction plant) directly (unabated) to the atmosphere.

  These types of bypass do not occur for long durations ,as the system stabilizes and can be restarted.
- TO failure – In the event of a failure of the TO, the flow of the mineral waste gases (unabated) is diverted to atmosphere directly (unabated) via A14.
- Bypasses or possible failures of the Thermal Oxidiser.

In the event of TO bypass ; The Incident should be reported to the Shift Superintendent or line manager without delay.

The TZ2_HS-CHL Near Miss Form to Erith Incident & Near Miss Group (this is the preferred option), or a hard copy can be given to the Shift Superintendent or any Production Team member. The environmental Manager shall be informed. Then He/she must report to the Environmental Incident hotline (0800 80 70 60, permit QP3331PQ) within 24 hr. The Notification of abnormal emissions, Part A schedule 1 must be submitted to the Environment Agency within 24 hours. Following with the Part B ; full investigation.

5 Required Training

- Extraction Operators
- Extraction Engineers
- Extraction Manager

6 Applicable/Referenced Documents

Further guidance on what should be reported is included in the following internal procedure :

TZ2_ENV_WI_Immediate Reporting of Environmental Incidents

TZ2_EHS_CHL_Near Miss and Incident Reporting form is used to report both incidents/deviations and near misses

7 Document Control

Document Approvers:	DAVID HOLLOWAY
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