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Odour Risk Assessment

v0.1

Environmental and sustainability solutions provided to

Enva Scotland Ltd



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1.0 INTRODUCTION

This odour risk assessment has been applied to the management and operation of the Eva UK Ltd (hereon referred to as 'Enva') liming facility (including odour control, containment, and site management) and, along with the technical criteria for lime stabilisation and pathogen reduction which are derived from [The Sludge \(Use in Agriculture\) Regulations 1989](#) and the [Department of the Environment](#) Code of Practice for the Agricultural Use of Sewage Sludge guidance, which remain the sector-specific standards for sewage sludge treatment.

This odour risk assessment has been produced by WRM to support Enva's permit application and forms part of the Odour Management Plan (OMP) included within the wider Environmental Management System (EMS) for the site.

This OMP demonstrates how the sludge liming operation complies with the Environment Agency (EA) Appropriate Measures (AM) and aligns with the principles set out in the [Odour management: comply with your environmental permit - Guidance - GOV.UK](#), with specific reference to prevention of odour at source, proportionate control, and risk-based management.

1.1 Regulatory context and scope

The sludge liming activity assessed within this odour risk assessment is a sector-specific treatment process with the treatment outcome parameters governed primarily by [The Sludge \(Use in Agriculture\) Regulations 1989](#) Sludge (Use in Agriculture) Regulations (SUiAR) and the associated DEFRA Code of Practice. These instruments define the intended treatment outcomes, operational benchmarks, and verification requirements for sludge stabilisation, including pH elevation and minimum residence times.

The EA odour guidance and Appropriate Measures have been applied in a risk-based and proportionate manner, taking account of the nature of the activity, the characteristics of the material handled, and the inherent odour control benefits of the liming process itself. Controls and management measures have therefore been selected to align with the correct regulatory

framework for sludge treatment, rather than by reference to unrelated waste treatment sectors.

1.2 Management systems and operator competence

The sludge liming process is operated under a documented process control plan that defines:

- lime dosing rates;
- target pH values;
- mixing methodology and minimum residence times.

This approach aligns with the EA odour guidance principle that odour risk should be managed primarily through effective operational control at source.

Staff involved in the process receive training appropriate to the activity and odour risk profile, including:

- safe handling of lime and COSHH requirements;
- pH monitoring and record keeping;
- regulatory compliance under the Sludge Regulations.

Defined responsibilities and competency assurance provide confidence that the process is consistently operated within parameters that minimise odour generation.

1.3 Waste acceptance and characterisation

Waste acceptance procedures are designed to ensure that only sewage sludge suitable for treatment under the Sludge Regulations is received on site.

Acceptance criteria include:

- confirmation of waste origin;
- dry solids content;
- contaminant concentrations assessed against relevant regulatory thresholds.

Waste characterisation is undertaken prior to treatment to inform odour risk management and process control.

Post-treatment verification is carried out where required to confirm compliance.

1.4 Storage, containment, and emission control

Sludge and lime handling activities take place on engineered, impermeable surfaces with appropriate runoff capture. Liquors are retained within the sludge matrix preventing uncontrolled releases.

The addition of lime inherently reduces longer term odour potential by:

- rapidly increasing pH;
- inhibiting biological activity responsible for odour generation.

This represents a primary odour prevention measure, consistent with EA guidance that prioritises prevention over abatement where practicable. Given the stabilising effect of the liming process, odour risk during post-treatment storage and handling is assessed as low to moderate and is managed through good containment and operational discipline rather than dedicated abatement infrastructure.

1.5 Treatment effectiveness and process monitoring

Treatment effectiveness is assessed against the benchmarks set out in the DEFRA Code of Practice which are specifically designed to control pathogens. Liming controls biological activity a consequence of this is odour generation potential.

Process monitoring focuses on:

- pH achievement and maintenance;
- residence time;
- operational observations during mixing and handling.

Monitoring records provide assurance that the treatment process consistently achieves its intended outcome and that odour risk remains controlled. No additional treatment standards or performance criteria are applied beyond those relevant to sludge stabilisation.

1.6 Proportionality and regulatory consistency

The odour risk associated with sludge liming is mitigated primarily through:

- material selection and acceptance controls;
- inherent odour suppression via pH elevation;
- controlled handling and storage;

- operator competence and process oversight.

This approach reflects the EA odour guidance emphasis on proportionality, prevention at source, and sector-appropriate measures.

Controls have been selected to match the scale and risk profile of the activity and the nature of surrounding receptors, as identified in Sections 2 and 3 of this assessment.

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2.0 ODOUR RISK ASSESSMENT

2.1 Purpose and scope

This odour risk assessment identifies and evaluates the potential for odour pollution arising from site activities under normal, abnormal, and foreseeable operating conditions. The assessment follows the Source–Pathway–Receptor (SPR) model and informs the selection of Appropriate Measures (AM) and Best Available Techniques (BAT).

The assessment considers:

- the nature and odour potential of materials handled;
- the site layout and process design;
- operational controls and containment measures;
- meteorological influences;
- proximity and sensitivity of receptors;
- abnormal and emergency scenarios.

The outcome of this assessment is used to:

- prioritise odour risks;
- determine proportionate control measures;
- define monitoring, trigger levels, and corrective actions.

2.2 Risk assessment methodology

Risk scoring approach

Each odorous activity is assessed qualitatively using the following criteria:

- Odour source strength (Low / Medium / High)
- Pathway effectiveness (Highly controlled / Partially controlled / Open)
- Receptor sensitivity (Low / Medium / High)
- Overall odour risk (Low / Medium / High)

Risk is assessed before and after application of control measures, demonstrating how BAT reduces the likelihood of off-site odour impact.

Table 2-1:Odour risk assessment (normal operations)

Activity / source	Odour source strength	Pathway (how odour could travel)	Receptors at risk	Inherent risk (pre-control)	Control measures / BAT	Residual risk (post-control)
Delivery of untreated biosolids (trailers)	Medium	Fugitive emissions during unloading; wind dispersion	Nearest industrial / commercial receptors; transient exposure	Medium	Sealed trailers; controlled unloading; minimised exposure time; staff supervision	Low
Temporary storage of untreated biosolids	Medium	Surface exposure; wind transport	Site staff; nearest receptors under adverse weather	Medium	Storage duration limits; covering where required; rapid progression to treatment	Low
Liming and mixing process	High (short duration)	Fugitive emissions during active mixing	Site staff; nearest receptors downwind	Medium–High	Controlled lime dosing; mechanical mixing; partial enclosure; pH verification	Low
Treated material stockpiling	Low	Minimal volatilisation due to alkaline stabilisation	Nearest receptors	Low	Maintenance of elevated pH; stock rotation; covering if required	Low
Loading of treated material	Low	Short-term exposure during handling	Site boundary receptors	Low	Sealed outbound vehicles; minimised handling time	Low
Mobile plant movements	Low	Minor disturbance of materials	On-site staff	Low	Good housekeeping; trained operators	Low

Table 2-2: Odour risk assessment (abnormal events)

Abnormal event	Odour risk pathway	Potential impact	Risk rating	Mitigation / recovery measures	Residual risk
Inability to remove treated material	Increased storage duration; secondary disturbance	Potential increase in odour risk	Medium	Intake restriction; prioritised removal; enhanced monitoring	Low
Equipment failure (liming / mixing)	Untreated material retained on site	Elevated odour potential	Medium–High	Suspension of acceptance; isolation; rapid repair	Low
Power failure	Loss of processing capability	Short-term odour risk	Medium	Secure materials; suspend operations; resume only once controls restored	Low
Adverse meteorology (low wind / inversion)	Reduced dispersion	Increased receptor exposure	Medium	Operational curtailment; scheduling; increased monitoring	Low
Receipt of unusually odorous waste	Higher source strength	Elevated off-site odour risk	Medium	Rejection or immediate treatment	Low
Short staffing	Reduced operational control	Increased risk of errors	Medium	Minimum staffing thresholds; suspend high-risk activities	Low

2.3 Receptor sensitivity evaluation

Receptors have been identified and categorised in Table 2 and illustrated in Figure 1 (*see EPR-CO2_Odour_Management_Plan*). Receptor sensitivity has been assessed with regard to:

- duration of exposure;
- frequency of presence;
- land use type (residential, commercial, industrial);
- reasonable expectation of odour-free conditions.

The assessment recognises that distance alone does not determine risk and that meteorology, operational timing, and containment effectiveness are critical factors in determining potential odour impact.

2.4 Risk management and control hierarchy

The risk assessment demonstrates that odour management is achieved primarily through:

- Prevention at source (rapid stabilisation via liming);
- Operational control (waste acceptance, storage limits);
- Containment and exposure minimisation;
- Monitoring and responsive management.

End-of-pipe abatement is not relied upon as the primary control, consistent with EA BAT principles for this sector.

2.5 Monitoring, triggers, and review

Odour risks identified in this assessment are managed through:

- proactive and reactive odour monitoring (Section 5);
- defined trigger levels and corrective actions (Section 4);
- complaint investigation and review procedures (Section 5);
- abnormal event planning and recovery measures (Section 6).

This risk assessment is:

- reviewed at least annually;
- updated following substantiated odour complaints;
- reviewed after abnormal events;
- amended where operational or receptor changes occur.

2.6 Risk assessment conclusion

Based on the assessment above and taking account of the control measures and BAT implemented, the Operator considers that the risk of odour pollution beyond the site boundary is low during normal operations and effectively managed during abnormal conditions.

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3.0 ASSESSMENT

Table 3-1:Odour risk assessment (sludge liming)

Activity / source	Odour source strength	Pathway	Receptors at risk	Inherent risk (pre-control)	Control Measures / BAT	Residual risk	Reference / justification
Delivery of untreated sludge (trailers)	Medium	Fugitive emissions during unloading. (wind dispersion)	Nearest industrial/commercial receptors	Medium	Sealed trailers, controlled unloading, minimised exposure time, staff supervision	Low	EA Odour Guidance: prevention at source; AM 2.1: waste acceptance and tracking; operational controls under Sludge Regulations
Temporary storage of untreated sludge	Medium	Surface exposure; (wind transport)	Site staff; nearest receptors downwind	Medium	Storage duration limits, containment on engineered pads, rapid progression to liming, runoff control	Low	AM 3.1: storage, containment, surfaces; EA guidance: containment prevents off-site odour
Liming and mixing process	High (short duration)	Fugitive emissions during active mixing	Site staff; nearest receptors downwind	Medium–High	Lime dosing under documented process plan, target pH, controlled mixing, minimum residence time; operator competence training	Low	AM 4.1: treatment and process control; EA guidance: prevention at source; DEFRA Code of Practice / Sludge Regulations define BAT
Treated sludge stockpiling	Low	Minimal volatilisation due to elevated pH	Site boundary receptors	Low	Maintain elevated pH, stock rotation, covering if required	Low	EA guidance: containment and minimisation; AM 3.1: surfaces and storage; inherent odour suppression by liming

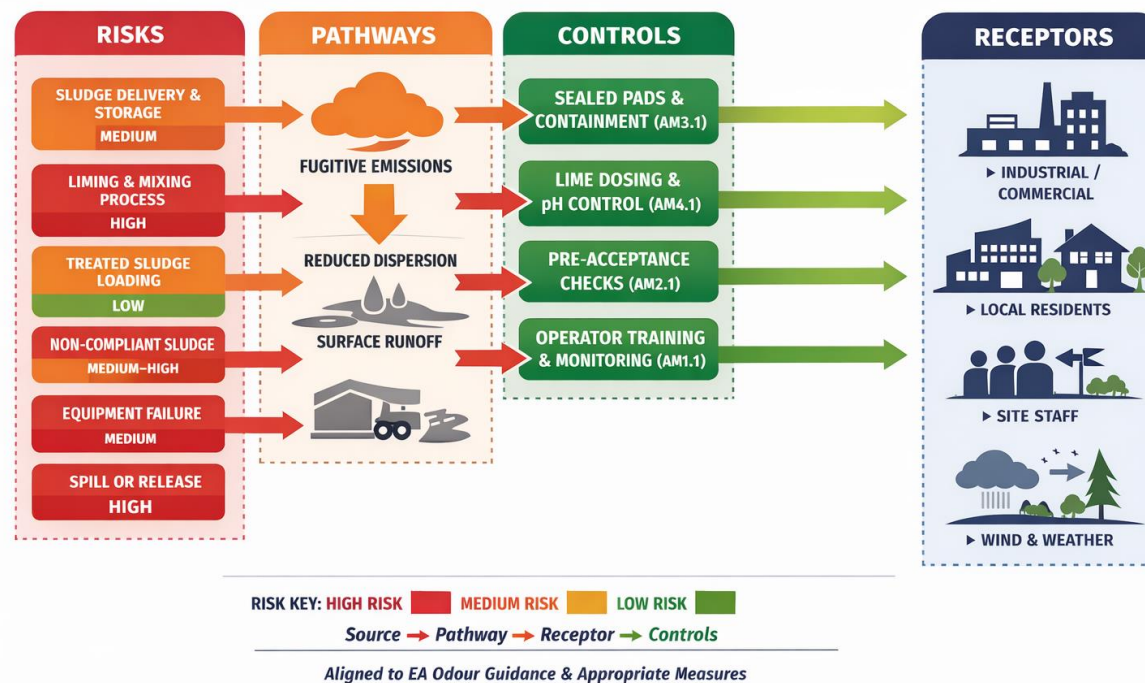
Loading of treated sludge for dispatch	Low	Short-term exposure during handling	Site boundary receptors	Low	Sealed trailers, minimised handling time, staff supervision	Low	AM 7.1: odour management; EA guidance: operational measures to minimise fugitive emissions
Mobile plant movements	Low	Minor disturbance of treated or untreated material	On-site staff	Low	Trained operators, good housekeeping, minimised handling of odorous material	Low	AM 1.1 & 1.2: management and competence; EA guidance: staff competency reduces odour risk
Receipt of non-compliant or unusually odorous sludge	Medium–High	Potential elevated odour emissions	Site boundary receptors	Medium–High	Pre-acceptance checks, waste characterisation, rejection; post-liming verification if required	Low	AM 2.1: pre-acceptance and tracking; EA guidance: odour prevention via material control
Equipment or power failure	Medium	Retention of untreated material; increased exposure time	Site staff; nearest receptors downwind	Medium	Suspension of acceptance, isolation of untreated sludge, rapid repair or restoration of operation, enhanced monitoring	Low	AM 1.2: contingency planning; EA guidance: management of abnormal events; SPR model applied
Adverse meteorology (low wind, inversion, high temperature)	Medium	Reduced dispersion	Sensitive receptors downwind	Medium	Operational curtailment, schedule adjustments, enhanced monitoring during adverse conditions	Low	EA guidance: meteorology considered in odour management; source control preferred over abatement
Short staffing / absence of trained personnel	Medium	Reduced operational control	Site staff; nearest receptors	Medium	Minimum staffing thresholds, suspension of high-risk activities, operator training	Low	AM 1.1: competence; EA guidance: prevention at source relies on trained personnel
Spill or accidental release of untreated sludge	Medium–High	Fugitive emissions via runoff or	On-site staff; nearby receptors	Medium–High	Containment, recovery, lime stabilisation,	Low	AM 3.2: containment and runoff; AM 7.1: odour prevention; EA

surface
exposure

operational procedures
for emergency response

guidance: rapid intervention
reduces off-site odour

ODOUR RISK ASSESSMENT – SLUDGE LIMING



4.0 CONCLUSION

The sludge liming activity:

- fully aligns with the intent and requirements of the EA odour guidance;
- applies Appropriate Measures in a manner that is risk-based and proportionate;
- utilises treatment standards defined by the correct statutory framework.

The sludge liming operation incorporates inherent odour control through its treatment mechanism and is supported by appropriate management systems, containment measures, and monitoring. When assessed against current EA odour guidance and Appropriate Measures, the activity presents a controlled and low residual odour risk, with mitigation measures that are robust, relevant, and proportionate to the sector and site context.