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BOW FARM GAS RISK ASSESSMENT TO SUPPORT A DEPOSIT OF WASTE FOR RECOVERY ENVIRONMENTAL PERMIT APPLICATION

For

MORETON C CULLIMORE (GRAVELS) LIMITED

November 2025

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Report Title: **Bow Farm Gas Risk Assessment to Support a Deposit of Waste for Recovery Environmental Permit Application**

Client: **Moreton C Cullimore (Gravels) Limited**

Job: BOWFEPR
Report Number: 251040
Version: v.01
Issue Status: Issued to Client
Prepared by: Edward Betteridge
Issue Date: 20th November 2025

Issue History:

Issue No	Date	Description	Admin Review	Technical Review	Approver
v.01	20.11.25	Issued to Client	CL	SJ	SJ

Approver Signature:

This document is based on GWP report template v.1.09 and Normal template v3.10 17/04/19

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1. INTRODUCTION

1.1 Report Context

The works approved by Planning Permission 19/000048/CM (Worcestershire County Council) and Planning Permission 19/0081/TWMAJM (Gloucestershire County Council) provide for, *inter alia*, site restoration using imported inert fill material at Bow Farm, Ripple, Worcestershire (the site).

Planning Permission 19/0081/TWMAJM was approved by Gloucestershire County Council through the successful appeal (Appeal Ref. APP/T1600/W/23/3324695) by the applicant following initial refusal of Planning Permission 19/0081/TWMAJM.

Completion of the approved site restoration scheme, involving the restoration of the mineral extraction areas requires 1.4Mm^3 (approximately 2.45Mt using a standard conversion factor of 1.75t/m^3) of imported inert fill material within Phases 1 to 9 of the excavation area in the main site area.

The approved site restoration scheme also provides for excavation and low-level restoration of Flexible Working Areas A and B in the west of the site. Flexible Working Areas A and B will only be excavated seasonally during non-high flow periods of the River Severn, located *c.* 25m to the west of the site at its closest approach. Restoration of Flexible Working Areas A and B will be to wetlands and water features using only site derived mineral waste (silts and clays) and will have a final landform below pre-extraction ground levels. No imported inert fill material will be placed in Flexible Working Areas A and B.

An application is being made for a Bespoke Environmental Permit (use of waste in a deposit for recovery activity). The applicant is Moreton C Cullimore (Gravels) Limited.

The EPR Permit application is submitted on the basis that the permanent deposit of imported inert fill material within excavation area Phases 1 to 9 at the site to achieve the approved restoration scheme is a deposit for recovery activity and not a waste disposal activity.

This report presents a Gas Risk Assessment (GRA) and has been prepared to support an EPR Permit application to provide for the permanent deposit of imported inert fill material at the site as a deposit for recovery activity to achieve the approved restoration landform.

1.1.1 Operator of the Proposed Development

Moreton C Cullimore (Gravels) Limited, Netherhills, Whitminster, Gloucestershire, GL2 7PD.

1.1.2 Agent who Completed this Report

GWP Consultants LLP, Upton House, Market Street, Charlbury, Oxfordshire, OX7 3PJ.

1.1.3 Outline of the Proposed Development

The EPR Permit application is to provide for site restoration of excavation area Phases 1 to 9 using imported inert fill material as a deposit for recovery operation at the Bow Farm site.

The inert fill capacity to be provided for by the EPR Permit is *c.* 1.4Mm^3.

Drawing No. BOWFEPR2511-1 shows the site location and Drawing No. BOWFEPR2511-2 shows the different areas of the site, including the excavation area Phases 1 to 9 where imported inert fill material will be placed under the EPR Permit. Drawing No. BOWFEPR2511-3 shows the EPR Permit application area within the context of the site approved under the Planning Permissions.

A site plan is presented as Drawing No. BOWFEPR2511-4.

Details of the site setting and development design are presented in the Environmental Setting and Site Design (ESSD) report prepared by GWP Consultants LLP (GWP Report No. 251039) which accompanies the EPR Permit application (Appendix Gii of the Permit application documentation) and which should be read in conjunction with this report.

1.2 Conceptual Model – Sources

The EPR Permit application is submitted on the basis that the permanent deposit of imported inert fill material within excavation area Phases 1 to 9 at the site to achieve the approved restoration scheme is a deposit for recovery activity and not a waste disposal activity.

Notwithstanding the fact that the activity will be a deposit for recovery activity and not a landfill activity, the site will receive Landfill Directive compliant inert waste only.

The waste types provided for by the EPR Permit application are listed below in Table 1. These wastes are, by definition, of insignificant ecotoxicity and are not subject to bio-degradation and consequently they do not have the potential to generate gas.

Given the inert nature of the waste and strict Waste Acceptance Procedures and Protocols which will be put in place, there is no potential source of any significant quantities of gas from the proposed site restoration area. Therefore, there is no potential for gas generation and no requirement for gas management or monitoring.

Table 1 – Waste types

Waste types	
Exclusions Wastes having any of the following characteristics shall not be accepted: - consisting solely or mainly of dusts, powders or loose fibres - hazardous wastes - wastes in liquid form	
EWC Waste Code	**Description**
01	**WASTES RESULTING FROM EXPLORATION, MINING, QUARRYING AND PHYSICAL AND CHEMICAL TREATMENT OF MINERALS**
01 01	**wastes from mineral excavation**
01 01 02	wastes from mineral non-metalliferous excavation
01 04	**wastes from physical and chemical processing of non-metalliferous minerals**
01 04 08	waste gravel and crushed rocks other than those mentioned in 01 04 07
01 04 09	waste sand and clays
17	**CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)**
17 01	**concrete, bricks, tiles and ceramics**
17 01 01	concrete
17 01 02	bricks
17 01 03	tiles and ceramics
17 01 07	mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06
17 05	**soil (including excavated soil from contaminated sites), stones and dredging spoil**
17 05 04	soil and stones other than those mentioned in 17 05 03

2. GAS RISK ASSESSMENT

2.1 The Nature of the Gas Risk Assessment

Environment Agency (EA) guidance proposes a tiered approach to risk assessment whereby the complexity of the assessment reflects the potential risk posed by a particular site, the sensitivity of the site settings and the probability of a risk being realised.

The initial risk screening is based upon the source – pathway – receptor approach. Whilst such an approach is iterative, with regular reviews built into the process, the initial Tier 1 risk screening has not identified a source of gas. This indicates that no further assessment is required as without a

source, the pathway – receptor linkages are academic and the site therefore presents a negligible risk to potential receptors.

However, for completeness, the following potential receptors for gas have been identified:

- site operatives, visitors and passers-by;
- on-site offices;
- residential properties;
- crops in adjacent fields;
- global atmosphere.

Having completed the risk screening, it has been established that there is no source of gas and therefore there is no need to move to more sophisticated forms of analysis. This is in accordance with available EA guidance (LFTGN03 – Guidance on the management of landfill gas). Strict management control and adherence to the waste acceptance criteria and protocols are considered sufficiently robust to ensure that the gas source is demonstrably negligible and will remain negligible.

2.2 Proposed Assessment Scenarios

No further assessment is required as the risk screening completed in accordance with guidance provided by the EA (LFTGN03 – Guidance on the management of landfill gas) has revealed no potential for the generation of significant gas.

2.3 Accidents and their Consequences

The only conceivable accident that would result in a release of gas at this site is the accidental acceptance of biodegradable wastes. Due to the robust Waste Acceptance Procedures which will be employed on site, it is considered highly unlikely that any biodegradable wastes will enter the site in significant quantities.

However, for the purposes of a simulated accident it has been assumed that *c.* 2000t of non-inert waste is accidentally accepted at the site during a single day. If it is conservatively assumed that 10% of this waste was biodegradable waste then the total gas yield can be calculated over a 1 year period from the following equation which assumes that each tonne of waste produces 10m³ of gas (which is an overestimate based on EA Guidance):

$$Q = M \times 10 \times T / 8760 \qquad \text{or} \qquad Q = 200 \times 10 \times 1 / 8760$$

Where:

Q = methane flow in m³/hour

M = annual quantity of biodegradable waste in tonnes

T = time in years

Even if such a set of circumstances were to arise, the gas production is estimated at only 0.228m³/hr and this from an isolated location. This should be compared with a minimum flow for gas flaring of *c.* 50m³/hr. Clearly, any such accident would not be significant in altering the outcome of the screening risk assessment. Consideration of this highly unlikely accident reveals no elevated gas risk to receptors around the site.

2.4 Numerical Modelling

No numerical modelling is required as the risk screening completed in accordance with guidance provided by the EA (LFTGN03 – Guidance on the management of landfill gas) has revealed no potential for the generation of significant gas from the proposed development.

2.5 Risks to the Environment and Human Health

The gas emissions estimated from the site are insignificant. Accordingly, there is no gas risk associated with:

- sub-surface migration;
- atmospheric dispersion and odour;
- atmospheric pollution; or

- human exposure

or to the potential receptors for gas listed in Section 2.1 above.

2.6 Gas Completion Criteria

Risk screening and simple risk assessment has indicated that even if a small amount of biodegradable waste is accidentally accepted at the site, this will not lead to gas emissions which could cause pollution or harm to human health as gas will preferentially migrate to the surface and disperse in the atmosphere.

3. GAS MANAGEMENT PLAN

3.1 Control Measures

No control measures are required as the risk screening completed in accordance with guidance provided by the EA (LFTGN03 – Guidance on the management of landfill gas) has revealed no potential for the generation of significant gas.

3.2 Monitoring

Given the inert nature of the material and strict waste acceptance procedures and protocols, and consistent with the findings of this LGRA, there is no potential source of any significant quantities of gas from the proposed deposit for recovery activity.

No gas monitoring is required and none is proposed as the risk screening completed in accordance with guidance provided by the EA (LFTGN03 – Guidance on the management of landfill gas) has revealed no potential for the generation of significant gas.

4. CONCLUSIONS

Given that the acceptance of inert waste at the site will be strictly controlled using robust waste acceptance criteria and protocols, and consistent with the findings of this LGRA, it is considered that completion of the approved site restoration scheme, involving the restoration of the Phases 1 to 9 mineral extraction area using imported inert material under a deposit for recovery activity at Bow Farm, will not result in any significant or measurable levels of gas being produced.

Given that the acceptance of imported inert waste at the site will be strictly controlled using robust Waste Acceptance Criteria and Protocols, and having regard to the findings of the LGRA, it is considered that completion of the approved site restoration scheme as a deposit for recovery activity, requiring *c.* 1.4Mm^3 (approximately 2.45Mt using a standard conversion factor of 1.75t/m^3) of imported inert fill material will not result in any significant or measurable levels of gas being produced.

GWP CONSULTANTS
NOVEMBER 2025