Upton House
Market Street
Charlbury
Oxfordshire, OX7 3PJ
United Kingdom
tel +44 (0)1608 810374
fax +44 (0)1608 810093
e-mail info@gwp.uk.com
www.gwp.uk.com

WROXTON FIELDS QUARRY ENVIRONMENTAL RISK ASSESSMENT REPORT TO SUPPORT ENVIRONMENTAL PERMIT APPLICATION - LANDFILL FOR INERT WASTE

For

EARTHLINE LIMITED

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GWP Consultants LLP
Registered No. OC326183
Registered Office: Upton House, Market Street, Charlbury, Oxfordshire, OX7 3PJ, UK

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WROXTON FIELDS QUARRY ENVIRONMENTAL RISK ASSESSMENT REPORT TO SUPPORT ENVIRONMENTAL PERMIT APPLICATION - LANDFILL FOR INERT WASTE

1. INTRODUCTION

Wroxton Fields Quarry (the site) currently operates under extant Planning Permission 19/00407/CM which provides for mineral extraction (limestone and ironstone) and low-level restoration of the excavation void with indigenous material (overburden soils and crushing/screening fines) and suitably selected imported inert waste.

The site is operated by Earthline Limited (Earthline).

This report presents an Environmental Risk Assessment (ERA) and has been prepared in support of a Bespoke Environmental Permit application to provide for site restoration to original levels in Phases 5a, 5b, 6a and 6b for agricultural use using indigenous material (overburden soils and crushing/screening fines) and imported inert waste.

This ERA provides an assessment of the risks to the environment and human health from emissions that may be associated with the deposit for recovery activity at the site.

The objective of the assessment is to identify any significant risks, to demonstrate that the risk of environmental impact or harm is acceptably low and to identity mitigation measures which will need to be implemented in order to manage the risks at acceptable levels.

2. PROPOSED DEVELOPMENT

The EPR Permit application is to provide for site restoration to original levels in Phases 5a, 5b, 6a and 6b for agricultural use using indigenous material (overburden soils and crushing/screening fines) and imported inert waste at Wroxton Fields Quarry.

The inert landfill capacity to be provided for by the EPR Permit is *c.* 540,000m^3, based on a tonnage of 1.0Mt and a conversion factor of 1.85t/m^3. The rate of inert waste importation will be *c.* 110,000t – 150,000t depending on market conditions.

3. SITE SETTING

3.1 Site Location

The application site is located at Wroxton Fields Quarry, Stratford Road A422, Wroxton Heath, Banbury, Oxfordshire, OX15 6EZ (National Grid Reference SP 40820 41440).

Drawing No. ELWROX2207-1 shows the site location and Drawing No. ELWROX2207-2 shows the EPR Permit application area. Drawing No. ELWROX2207-3 shows the location of Phases 5a, 5b, 6a and 6b.

The EPR Permit application area is *c.* 21.9ha.

Wroxton Fields Quarry is located *c.* 100m southwest of the village of Wroxton and *c.* 1.3km east of the village of Balscote. The town of Banbury is located *c.* 2km to the east of the application area.

The original ground surface within the immediate vicinity of the current working area is relatively flat lying, although the ground falls away into the valley feature of Padsdon Bottom to the southwest of the workings. Original ground surface levels typically range between *c.* 150 to 155mAOD.

The quarry is excavated in Jurassic strata belonging to the Marlstone Rock Formation (ferruginous limestone and ironstone).

The current quarry excavation area is worked to a floor level of *c.* 148mAOD and the maximum depth of the excavation is currently *c.* 6m relative to land within 30m of the excavation perimeter.

The site is accessed from a single track road off the A422 (Stratford Road) located to the west.

3.2 Geological Setting

The geological setting of the site has been determined based on a review of published information, site investigation information and observations made in the existing quarry excavation.

The general geological setting of the site is shown on Drawing No. ELWROX2207-13.

The quarry is excavated in Jurassic strata belonging to the Marlstone Rock Formation.

More specifically, within the vicinity of the site the strata comprise:

- Overburden – silty, sandy clays and the weathered upper part of the Marlstone Rock Formation (0.0m to *c.* 1.5m thick locally); overlying
- Marlstone Rock Formation – reddish brown fossiliferous, sandy ferruginous limestones associated with oolites, calcareous mudstones and brown calcareous sandstones (*c.* 8-10m thick locally); overlying
- Dyrham Formation (interbedded siltstone and mudstone)– interbedded silts and sandy clays, shales, mudstones with subordinate beds of limestone and sandstone (greater than 30m thick – not worked).

There are 2 No. major sets of typically closely to medium spaced joints observed in the Marlstone Rock Bed faces at the site:

- Joint Set 1: subvertical generally dipping 75-85° to the southwest;
- Joint Set 2: subvertical generally dipping 75-85° to the northwest or north northwest.

The joints are generally slightly irregular to slightly stepped and rough with local discolouration. The joints are typically tight, but may locally be open up to *c.* 10mm and infilled with weathered clayey material. Joints are typically persistent over 3m, but more persistent joints are observed (through full height of the exposed faces) at *c.* 2-3m spacings.

The rock mass is also intersected by randomly orientated secondary joints which give the unweathered rock mass a very blocky appearance. The upper *c.* 1.5m of the rock mass is somewhat weathered giving rise to a more flaggy or rubbly appearance.

3.3 Hydrogeological Setting

The Marlstone Rock Formation strata which underlies the site and the surrounding area is classified by the Environment Agency as a 'Secondary A' aquifer, defined as 'permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of baseflow to rivers'.

The site is not located in a designated superficial aquifer (unproductive).

The site is not located within a groundwater source protection zone.

Groundwater is present in the lower part of the Marlstone Rock Formation and the underlying Dyrham Formation (interbedded siltstone and mudstone). The quarry is not excavated below the base of the Marlstone Rock Formation *i.e.* no excavation into the underlying Dyrham Formation (interbedded siltstone and mudstone). Typically, 2-3m of Marlstone Rock Formation is left in *situ* and groundwater is not intercepted. This working depth preserves an aquifer unit (the lower part of the Marlstone Rock Formation and the underlying Dyrham Formation (interbedded siltstone and mudstone)) beneath the site and, in doing so, allows continued groundwater flow during quarry development and following the completion of site restoration infilling to support local water features.

Water collecting within the excavation is managed within the water settlement/storage lagoon system located within the quarry area and is used for aggregate washing and dust suppression purposes *etc.* No water is discharged from the site. The water management system allows excavation and restoration infilling to be undertaken efficiently in dry conditions.

Groundwater flow is generally to the south and discharge into the Shutford Stream, located *c.* 1.2km southwest of the site, is inferred.

A more detailed description of the hydrogeological setting is provided in the HRA report (GWP Report No. 210525) which accompanies the EPR Permit variation application (Appendix Hiv)).

3.4 Hydrological Setting

The excavation and proposed infilling area is located at a surface water catchment divide between the Shutford Stream (a tributary of the Sor Brook) covering the west of the site and the Sor Brook itself covering the east of the site. The Shutford Stream is located *c.* 1.2km to the southwest of the site (Phases 5a, 5b, 6a and 6b areas) at its closest approach and flows in a southeasterly direction.

A valley feature exists to the south of the site (Padsdon Bottom) which issues a series of springs (Padsdon Springs) that join the Shutford Stream southwest of the site.

There are a number of surface waterbodies located within and surrounding the existing quarry area.

- A series of ponds, the closest located *c.* 550m east of the site, near Wroxton College. The ponds are likely to be man-made.
- The water settlement/storage lagoon system located within the main active quarry area.

The closest springs (Padsdon Springs) are located just to the southwest of the site (*c.* 200m) within Padsdon Bottom, which join Shutford Stream downstream of the site.

The site is located within fluvial flood risk Flood Zone 1 (annual exceedance probability for river flooding is equal to or less than 0.1% (*i.e.* less than 1 in 1000 years)) and mostly within a very low pluvial flood risk zone.

A more detailed description of the hydrological setting is provided in the HRA report (GWP Report No. 210525) which accompanies the EPR Permit variation application (Appendix Hiv)).

3.5 Wind Rose

A wind rose for Little Rissington, the nearest available reporting wind monitoring station to the site, is presented in Figure 1. The Little Rissington station is located *c.* 30km to the southeast of the site. The predominant wind direction is from the southwest (national prevailing wind direction).

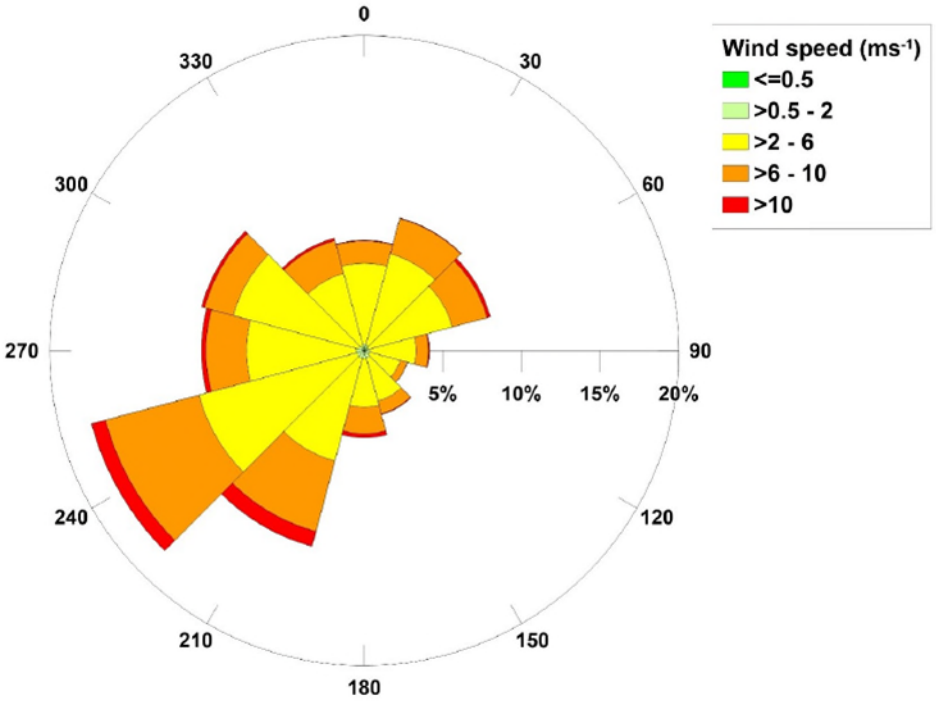

Figure 1 – 5-year average wind rose, Little Rissington 2014 – 2018

4. ENVIRONMENTAL RISK ASSESSMENT

4.1 Overview of Methodology

This ERA presents an assessment of the environmental risks posed by the proposed inert landfill activity.

The ERA has been completed in accordance with the Environment Agency (EA) Technical Guidance *'Risk Assessments for your Environmental Permit'* .

The objective of the assessment is to identify any significant risks, to demonstrate that the risk of environmental impact or harm is acceptably low and to identity mitigation measures which will need to be implemented in order to manage the risks at acceptable levels.

The ERA follows the steps under the *'How to do a risk assessment'* section of the EA guidance, as follows:

1. Identify and consider risks for your site, and the sources of the risks;
2. Identify the receptors (people, animals, property and anything else that could be affected by the hazard) at risk from your site;
3. Identify the possible pathways from the sources of the risks to the receptors;
4. Assess risks relevant to your specific activity and check they are acceptable and can be screened out;
5. State what you will do to control risks if they are too high;
6. Submit your risk assessment as part of your permit application.

4.2 Consideration of Risks

Step 1 considers the potential risks to the environment from the proposed development. The risk assessment must identify whether any of the following risks could occur and what the environmental impact could be:

- any discharge, for example sewage or trade effluent to surface or groundwater;
- accidents;
- odour (not for standalone water discharge and groundwater activities);
- noise and vibration (not for standalone water discharge and groundwater activities);
- uncontrolled or unintended ('fugitive') emissions, for which risks include dust, litter, pests and pollutants that should not be in the discharge;
- visible emissions, *e.g.* smoke or visible plumes;
- release of bioaerosols, for example from shredding, screening and turning, or from stack or open point source release such as a biofilter.

In addition, the EA guidance identifies risks from specific activities for which additional risk assessments must be completed depending on the activity being carried out and where substances are released or discharged into the environment.

Additional risk assessments have been prepared and submitted by GWP comprising:

- Hydrogeological Risk Assessment (GWP Report No. 210525 v.01 – Appendix Hiv of the EPR Permit application);
- Landfill Gas Risk Assessment (GWP Report No. 210523 v.01 – Appendix Hv of the EPR Permit application);
- Stability Risk Assessment (GWP Report No. 210524 v.01 – Appendix Hvi of the EPR Permit application).

Potential risks can be screened out if they are not relevant for the site or by carrying out tests to check whether they are within acceptable limits or environmental standards. If they are, any further assessment of the pollutant is not necessary because the risk to the environment is insignificant.

4.3 Receptors

Step 2 of the risk assessment methodology outlined in Section 4.1 considers the receptors that could be at risk from the inert landfill activities at the site.

The following distances from the Environmental Permit application boundary have been used to identify potential receptors:

- 1km radius – European ecological important sites including RAMSAR sites, Special Areas of Conservation, Local Wildlife Sites and Special Protection Areas;
- 1km radius – potentially sensitive receptors of ecological importance and sites of cultural and natural heritage. These include National Nature Reserves, Local Nature Reserves, Sites of Special Scientific Interest and Scheduled Monuments;
- 500m radius – all other potentially sensitive receptors e.g. residential, commercial, industrial, agricultural and surface water receptors.

4.4 Receptors – General Risk Assessment

Receptors for which a general risk assessment schedule has been completed are listed in Table 1.

The general risk assessment schedule is provided in Appendix 1. Steps 3, 4 and 5 of the risk assessment methodology outlined in Section 4.1 are covered in the general risk assessment schedule.

Table 1 – Receptors (general risk assessment)

Receptor name	Receptor type	Receptor direction from site	Approximate distance from application boundary
Land use receptors within 500m of the application boundary (Drawing No. ELWROX2207-4)			
Wroxton Quarry	Industrial/Commercial	West	Adjacent
Premier Paws Dog Day Care Centre (Stone Pit Barn)	Industrial/Commercial	West	Adjacent
Laurels Farm	Industrial/Commercial	East	260m
Wroxton Church of England Primary School	Private Commercial	East	120m
Properties within Wroxton village	Residential properties	Northeast	100m (closest)
French's Buildings	Residential property	South	350m
A422/Stratford Road	Local Transport Network	North	Adjacent
Single track road leading to North Newington	Local Transport Network	East	Adjacent
Road network within Wroxton village	Local Transport Network	Northeast	130m (closest)
Drift Lane	Local Transport Network	Northeast	250m
Ironstone Lane	Local Transport Network	Northwest	260m
Single track road leading to Shutford	Local Transport Network	West	300m
Settlement lagoon/balancing pond system (main quarry area to the west of the site)	Surface water feature	West	230m
Padsdon Spring issue	Surface water feature	Southwest	200m
Agricultural land	Open ground	North, south and east	Adjacent
Allotments	Public open land	East	270m
Cultural and heritage receptors within 1km of the application boundary (Drawing No. ELWROX2207-5)			
Castle Bank Enclosure	Scheduled Monument	South	270m
Stone Guide Post	Listed building	Northeast	10m (closest)
Wroxton Abbey	Registered Parks and Gardens	East	20m
Wroxton	Historical Conservation Area	East	Adjacent

4.5 Receptors – Bespoke Risk Assessment

Receptors identified by screening undertaken by GWP for which a bespoke risk assessment schedule has been completed are listed in Table 2.

The bespoke risk assessment schedule is provided in Appendix 2. Steps 3, 4 and 5 of the risk assessment methodology outlined in Section 4.1 are covered in the bespoke risk assessment schedule.

Table 2 – Receptors (bespoke risk assessment)

Receptor name	Receptor type	Receptor direction from site	Approximate distance from site boundary
Ecological receptors within 1km of the application boundary (Drawing No. ELWROX2207-6)			
Priority Habitat Inventory – Deciduous Woodland	Protected Woodland	Within site boundary	Within site boundary
Woodpasture and Parkland BAP Priority Habitat	Protected Woodpasture and Parkland	East	20m
Priority Habitat Inventory – Good Quality Semi-Improved Grassland	Protected Grassland	Southwest	680m
Wroxton and Balscote Mills	Local Wildlife Site (LWS)	Southwest	500m
Horley	LWS	North	1km

4.6 Searches for Other Designated Sites

Further searches completed by GWP have confirmed that none of the following designations are located within 1km of the site:

- Sites of Special Scientific Interest;
- Special Areas of Conservation;
- Special Protection Areas;
- National Nature Reserves;
- Local Nature Reserves;
- Areas of Outstanding Natural Beauty;
- Ramsar sites;
- National Trust Properties;
- World Heritage Sites;
- Registered Battlefields.

5. SUMMARY AND CONCLUSIONS

This Environmental Risk Assessment report presents an assessment of the environmental risks posed by the proposed EPR Permit to provide for site restoration to original levels in Phases 5a, 5b, 6a and 6b for agricultural use using indigenous material (overburden soils and crushing/screening fines) and imported inert waste at the Wroxton Fields Quarry site.

The Environmental Risk Assessment has been completed in accordance with the Environment Agency Technical Guidance *'Risk Assessments for your Environmental Permit'* .

The objective of the assessment is to identify any significant risks, to demonstrate that the risk of environmental impact or harm is acceptably low and to identity mitigation measures which will need to be implemented in order to manage the risks.

Based on the findings of this Environmental Risk Assessment and other risk assessment reports which have been prepared and submitted with the Environmental Permit application, it is considered that the Permit application involving site restoration using indigenous material (overburden soils and crushing/screening fines) and imported inert waste material within Phases 5a, 5b, 6a and 6b at the Wroxton Fields Quarry site will not have a significant detrimental impact on the environment.

GWP CONSULTANTS
MAY 2023

APPENDIX 1

General risk assessment schedule

APPENDIX 2

Bespoke risk assessment schedule