

Carbrooke Quarry Eastern Extension

Environmental Permit Application

Environmental Setting and Site Design

Mick George Limited

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DRAWINGS

MGL/B032575/PER/01 – Environmental Permit Boundary and Site Plan

C27A/1/21/02 - Restoration Phasing Plan

C27A/1/21/08 – Phasing Plan

C27A/1/21/07 – Cross Sections

1.0 INTRODUCTION

1.1 REPORT CONTEXT

- 1.1.1 This document has been prepared by Tetra Tech on behalf of the Operator, Mick George Limited (Mick George) to support an environmental permit application for Carbrooke Quarry Eastern Extension (the site), Land off Mill Lane, Carbrooke, Norfolk, IP25 6TD.
- 1.1.2 Mick George are seeking to gain a bespoke waste disposal permit for the permanent deposit of inert waste at the site. This activity would facilitate the infilling and restoration of the quarry void that will be created following mineral extraction activities at the site.
- 1.1.3 This document corresponds to Question 1, Appendix 4 of Part B4 of the Environmental Permit application forms, which requires the provision of an Environmental Setting and Site Design (ESSD) report. According to the Environment Agency's (EA) 'Landfill operators: environmental permits' guidance, an ESSD document is required for an application that comprises a landfill for inert waste or a deposit for recovery operation.
- 1.1.4 The aim of this report is to describe the regulated facility in relation to the environmental setting, identifying the source terms, pathways and receptors that will be used as the basis for the Environmental Risk Assessment for this permit application.
- 1.1.5 This document has been prepared based on the ESSD report guide that's provided in the EA's 'Landfill operators: environmental permits' guidance (updated April 2021).

2.0 SITE DETAILS

2.1 SITE LOCATION

- 2.1.1 The site is located approximately 580m south of the village of Carbrooke, 1km north of the village of Griston and 1.2km east of the town of Watton. The site is centred at the approximate National grid Reference (NGR) TF 95215 01069.
- 2.1.2 Access to the site can be gained via the existing site entrance located off Mill Lane. The site sits within an area of agricultural land with quarrying operations in the immediate vicinity. The site is bounded by arable farmland to the north which extends to the east of the site beyond Cuckoo Lane located along the eastern boundary of the site.
- 2.1.3 The B1108 (Norwich Road) bounds the site to the south along with an area of deciduous woodland and farming infrastructure. Approximately 1km southwest of the site is the former RAF Watton site. To the west of the site is Mill Lane beyond which is land occupied by quarrying and aggregate operations.

2.2 SITE CLASSIFICATION

- 2.2.1 The regulated facility is an inert landfill.

2.3 APPLICATION BOUNDARY AND SITE SECURITY

- 2.3.1 The proposed application boundary is shown on Drawing Number MGL/B032575/PER/01.
- 2.3.2 As part of the mineral extraction and restoration operations, security fencing will be established around areas of the site that will be close to public access areas to prevent unauthorised access. Site gates and any perimeter fencing will be inspected on a daily basis. Any identified damage to the fence or gates that could compromise the site security will be recorded and temporarily repaired as necessary before the end of that working day. Permanent repair or replacement will be undertaken as soon as practicable.

3.0 SOURCE TERM CHARACTERISATION

3.1 HISTORICAL ACTIVITY

Planning History

- 3.1.1 Planning Permission was granted by Norfolk County Council for the 'Extraction of sand and gravel working with continued processing, stockpiling, weighing and sale of mineral' on 9th August 2007 (Ref C/3/2007/3006). An application was later submitted in 2018 to vary condition 2 of the original application to extend the operations for a further 8 years until 9th August 2027.
- 3.1.2 Planning permission for the site was originally granted by Norfolk County Council (NCC) in 2007 which authorised the 'extraction of sand and gravel with continued processing, stockpiling, weighing and sale of mineral'. In August 2018, planning permission (ref. C/3/2018/3004) was granted by NCC to vary Condition 2 of planning permission C/3/2007/3006 to extend operations from 2019 to 2027.
- 3.1.3 In April 2022, a planning application (ref. FUL/2022/0011) was submitted to NCC for the 'restoration of quarry to agriculture with enhanced landscaping using inert materials and use of existing Summer Lane access for mineral relates HGV movements'.

3.2 PROPOSED DEVELOPMENT

- 3.2.1 The proposed development involved the extraction with progressive restoration of the site through the importation of inert material. The proposed development would be restored in accordance with the restoration proposals details in Drawing Number C27A/1/21/02.

Proposed Operational Phasing

- 3.2.2 The phasing plans for the site are detailed on Drawing Number C27A/1/21/08. Works would comprise the stripping of topsoil and subsoil from each phase prior to excavation. Any topsoil and subsoil that's stripped away from any working phase will stockpiled separately on site prior to use as part of the restoration works.
- 3.2.3 Once a phase has been stripped of topsoil and subsoil, the proposed works will comprise mineral extraction with progressive infilling with inert waste and restoration with either soils from another phase that is being stripped or from the soil stockpiles that are situated on site.

Permitted Waste Types and Quantities

- 3.2.4 Wastes accepted at the site will be strictly inert as classified under the Landfill Directive (1999/31/EC) and Council Decision (2003/33/EC) of 19 December 2002 'establishing criteria and procedures for the acceptance of waste landfills'.
- 3.2.5 Details regarding the proposed waste types including restrictions are provided in the Operating Techniques (Appendix B of the Environmental Permit Application).
- 3.2.6 A volume of 200,000m³ of imported material (or 300,000 tonnes using a conversion factor of 1.5m³/tonne) is required to restore the site and it is proposed that up to 50,000 tonnes of material would be brought to the site each year over a course of 6 years.

Landform and After Use

- 3.2.7 As detailed on the restoration scheme (Drawing Number C27A/1/21/02) the site will be restored to agricultural land with natural landscaping.
- 3.2.8 Cross sections of the restoration are provided on Drawing Number C27A/1/21/07.

4.0 PATHWAY AND RECEPTOR TERM CHARACTERISATION

4.1 GEOLOGY

4.1.1 Using the British Geological Survey (BGS) Geology of Britain Viewer, the bedrock geology comprises chalk of the Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation and Culver Chalk Formation. These deposits formed up to 72 to 94 million years ago in the Cretaceous Period in a local environment previously dominated by warm chalk seas. With regards to superficial deposits, the BGS website indicates that the site overlies sand and gravel of the Lowestoft Formation. These superficial deposits were formed approximately 2 million years ago in the Quaternary Period.

4.2 HYDROLOGY

4.2.1 According to the Flood Map for Planning Service (FMPS), the site is not located in a Flood Risk Zone, and therefore has a low probability of flooding.

4.2.2 The application site is positioned between the Blackwater River some 3.8km to the north-east and the River Wissey some 12km to the west of the site. The nearest statutory "Main River" is a drain located 985m to the east of the site. This watercourse is sourced from the Scoulton Mere SSSI positioned ~2.7km to the east of the site. Surface water within the vicinity of the site is managed via a network of drains which flow from east to west towards Watton and the River Wissey.

4.2.3 The closest surface water features include a pond to the west of the site and within the western part of the Carbrooke Quarry created by former mineral workings

4.3 HYDROGEOLOGY

4.3.1 With reference to the Multi Agency Geographic Information for the Countryside's (MAGIC) website under the Groundwater Vulnerability Map, the site is situated within an area of medium vulnerability. The site is located within a Drinking Water Safeguard Zone for surface water, at risk from Pesticide (Metaldehyde).

4.3.2 In terms of aquifers, the MAGIC website shows the site overlies a Principal Bedrock aquifer. Principal strata are defined by layers of strategically important rock units that have high permeability and water storage capacity.

4.3.3 In terms of superficial aquifers, the site is both a Secondary A superficial drift aquifer and a secondary (undifferentiated). A Secondary A is defined by the EA as "*permeable layers capable of supporting water*

supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers". Meanwhile, a Secondary (undifferentiated) is defined as "assigned where it has not been possible to attribute either category A or B to a rock type".

4.4 AMENITY

4.4.1 All receptors that may be affected by this proposal are identified in the Environmental Risk Assessment (ERA) that has been prepared as part of this Environmental Permit Application. A copy of the ERA is provided as Appendix D of the Environmental Permit Application.

4.5 COMPLIANCE POINTS

4.5.1 The risk of impact on groundwater and surface water and the selection of relevant compliance points is detailed in the Hydrogeological Risk Assessment (HRA) (Appendix E of the Environmental Permit Application).

5.0 POLLUTION CONTROL MEASURES

5.1 SITE ENGINEERING

Basal Engineering

- 5.1.1 A geological barrier is a fundamental requirement for all landfills according to the Landfill Directive and must provide sufficient attenuation to prevent a risk to soil and groundwater. The geological barrier shall have a minimum thickness of 1m and a permeability of no greater than 1×10^{-7} m/s or equivalent.
- 5.1.2 Prior to the commencement of landfilling, a geological barrier will be engineered using imported materials. The geological barrier will be constructed in compliance with the Environmental Permitting Regulations and will have a hydraulic conductivity of less than 1m at 1×10^{-7} m/s or its direct equivalent of 0.5m at 1×10^{-8} m/s.

Side Slope Engineering

- 5.1.3 A clay side slope liner will be constructed from suitable waste materials against a suitable 1 in 2.5 subgrade slope. The liner will have a horizontal crest width of 2m from the edge of the formation and be constructed at a slope of 1 in 3. The engineered clay liner will have a thickness of 0.5m perpendicular to the side slope with a hydraulic conductivity of 0.5×10^{-8} m/s or the equivalent.
- 5.1.4 The clay barriers will be engineered as soon as possible after extraction commences. However, they cannot be constructed until the base of the gravel is reached with the result that there could be short-term drawdown effects on adjoining areas.
- 5.1.5 The proposed construction of the clay liner would be to the specification detailed in the Construction Quality Assurance (CQA) Plan that will be submitted to the Agency for approval prior to engineering taking place. See the HRA for further details (Appendix E of the Environmental Permit Application).

Capping

- 5.1.6 In accordance with the requirements of the Landfill Directive, an engineered cap (clay or plastic) is not required. On completion of filling to final levels, the site will be capped with 1m of restoration soils comprising not less than 0.3m of topsoil.

5.2 RESTORATION

- 5.2.1 As mentioned in Section 3.2.7, the site will be restored to agricultural land with natural landscaping as shown on Drawing Number C27A/1/21/02.
- 5.2.2 Prior to mineral extraction, the soils on site will be stripped to expose the underlying gravel and used to create a series of bunds (as shown on Drawing Number C27A/1/21/08. The soil from these bunds will subsequently be used to facilitate the restoration of the site.
- 5.2.3 With reference to the Environment Agency's guidance notes for the Part B4 application form, an agricultural and ecological benefit statement is only required if the proposed activity involves the deposit of waste to provide a growing medium and/or nutrients to support plant growth. This is characterised in the guidance notes as recovery code R10 'Land treatment resulting in benefit to agriculture or ecological improvement'.
- 5.2.4 In light of the above, the growing medium works will not comprise the use of waste and therefore will not comprise a waste recovery activity. As such, it is considered that an agricultural and ecological benefit statement will not be required to support this application.

5.3 LEACHATE MANAGEMENT AND MONITORING

Leachate Generation

- 5.3.1 Leachate is generated by rainfall infiltrating through areas of open waste and also through areas of restored waste. Due to the inert nature of the waste, it is considered that the generation of leachate is highly unlikely and therefore no leachate management or monitoring is proposed.

5.4 GAS MANAGEMENT AND MONITORING INFRASTRUCTURE

- 5.4.1 A Gas Risk Assessment (GRA) has not been prepared for the infilling of the site, as the Landfill Technical Guidance Note LFTGN03 indicates that new inert landfills do not pose a landfill gas hazard. Nevertheless, a landfill gas screening report has been prepared which has been submitted with the Environmental Permit Application as Appendix G.
- 5.4.2 This report concludes that active gas management is not required for the site but recommends that monitoring is undertaken.
- 5.4.3 Further details regarding the monitoring of landfill gas are provided in the Environmental Management and Monitoring Plan (Appendix H of the Environmental Permit Application)

5.5 GROUNDWATER MANAGEMENT AND MONITORING

- 5.5.1 An HRA has been prepared to assess the potential risk of significant impacts on groundwater quality as a result of the proposed development. A copy of the HRA is provided as Appendix E of the Environmental Permit Application.
- 5.5.2 The HRA concludes that the proposed activity does not pose a potential hazard to groundwater quality and therefore long-term management will not be required. However, the HRA does propose compliance limits for groundwater monitoring.
- 5.5.3 Details regarding groundwater monitoring are provided in the Environmental Management and Monitoring Plan (Appendix H of the Environmental Permit Application).

5.6 SURFACE WATER MANAGEMENT SYSTEM

- 5.6.1 The HRA concludes that the proposed activity does not pose a potential hazard to surface water quality and therefore long-term management will not be required.
- 5.6.2 According to the HRA, a dewatering system will not be implemented. As such, there will not be a discharge point to surface water.
- 5.6.3 In terms of surface water features, the nearest surface water feature to the site is a pond that is located to the west of the site within western part of the Carbrooke Quarry and was created by former mineral workings.
- 5.6.4 According to the EA's Landfill Technical Guidance Note 'Guidance on Monitoring of Landfill Leachate, Groundwater and Surface Water' (LFTGN02), at least one monitoring point is required for each area of ponded water located within the site or within the downgradient catchment area of the site where these are potentially at risk.
- 5.6.5 According to the HRA, the groundwater flow direction can be inferred to be broadly south east to north west. As such, it's considered that the pond is not within the down-gradient catchment area.
- 5.6.6 In light of the above, it's considered that no monitoring is required with regards to surface water.

5.7 AMENITY

- 5.7.1 An ERA (Appendix D of the Environmental Permit Application) has been prepared to consider the potential impact of the proposed extension. The ERA indicates that the proposed changes will have no significant

impacts in terms of odour, noise and vibration, and fugitive emissions. This is based on the control measures that are detailed in the ERA.

5.8 POST CLOSURE CONTROLS

- 5.8.1 The post closure controls will ensure long-term management and monitoring of the regulated facility.
- 5.8.2 The Environmental Management and Monitoring Plan (Appendix H of the Environmental Permit Application) provides details regarding the monitoring schedule of the aftercare phase.
- 5.8.3 The Closure and Aftercare Plan (Appendix J of the Environmental Permit Application) provides details of the measures to be taken upon and after the closure of the landfill to avoid pollution risk.

6.0 MONITORING

- 6.0.1 The Environmental Management and Monitoring Plan (Appendix H of the Environmental Permit Application) provides details regarding the proposed monitoring schedule for the site.

DRAWINGS

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