

Permitting Decisions- Variation

We have decided to grant the variation for Lane Side Quarry Landfill operated by Thomas Crompton Quarries Limited.

The variation number is EPR/FP3603BU/V002.

The existing permit authorised a broad range of non-hazardous waste types to be accepted for disposal. This variation is to limit the waste types to non-biodegradable waste only i.e. soils, construction and demolition waste and qualifying fines, rather than the existing permitted wide range of non-hazardous waste.

Due to the change in nature of the waste to be accepted, which will reduce the levels of gas and leachate produced compared to the original proposal, the variation authorises a number of changes in engineering and monitoring.

Activity A2 for the biological treatment of leachate has been removed from the permit as the waste will not generate significant levels of leachate with high chemical oxygen demand (COD) or ammonia. Any leachate produced will be discharged to sewer after settlement via a leachate lagoon. Surface water will be discharged to a surface water pond prior to discharge to the brook.

The Directly Associated Activities for flaring and operation of a gas engine have been removed from the permit as it is anticipated that volumes of gas produced will not be significant. However, monitoring requirements for gas with associated compliance and action levels will still be in place.

The engineered liner and landfill cap will meet the Landfill Directive requirements specified for non-hazardous landfill.

The variation also authorises the addition of a waste treatment activity to the permit to facilitate recycling of suitable incoming waste. This is to treat construction and demolition waste to separate soil from hardcore. The hardcore (e.g. bricks and concrete) will be separated by screening and then crushed. Waste soil which is separated from the hardcore will be transferred to the landfill site but the recovered hardcore will be processed into aggregate products. A maximum of 40,000 tonnes of waste will be stored at any one time in association with the waste treatment activity. The annual throughput will be a maximum of 75,000 tonnes per annum.

The treatment area will initially be situated in the quarry void but is planned to be relocated to another area once landfilling progresses to this part of the quarry.

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

Purpose of this document

This decision document provides a record of the decision-making process. It

- highlights key issues in the determination
- summarises the decision making process in the <u>decision considerations</u> section to show how the main relevant factors have been taken into account
- shows how we have considered the <u>consultation responses</u>

Unless the decision document specifies otherwise we have accepted the applicant's proposals.

Read the permitting decisions in conjunction with the environmental permit and the variation notice.

Key issues of the decision

1.0 Landfill capping

Precipitation or groundwater infiltration through the proposed waste deposit is likely to result in what would technically be classed as leachate but most likely just dirty water containing potentially high solids content and low landfill leachate chemistry due to:

- a) the low contact time with the waste; and
- b) a greater proportion of surface water runoff.

The proposed drainage landfill infrastructure relies on this being the case and also requires a landfill cap and for the waste to have a low permeability. The applicant has proposed the deposited waste achieve the same permeability standard as inert geological barrier requirement specifications. This means the waste permeability needs to achieve a permeability of 1x10-7 m/s.

To ensure achievement of the required waste permeability the applicant submitted a proposed operating technique on 23/07/2021 titled 'Waste Permeability Testing Procedure - Ref: CG/19877/210723-ea'. This procedure was submitted in response to the Schedule 5 Notice issued 05/05/2021.

We reviewed the operating technique and concluded it to be acceptable.

The landfill design proposals submitted as part of the variation did not include for an engineered landfill cap. The Design of capping systems LANDFILL GUIDANCE GROUP - Industry Code of Practice no. LGG 111 (ICoP LGG111) - Date: February 2018 - Document version: Version 1 Includes Table B1: LANDFILL DIRECTIVE CAPPING GUIDELINES. Table B1 shows that Non-Hazardous category of Landfill are required to include an 'Impermeable mineral layer' landfill cap.

Following discussions during determination of the variation, the applicant confirmed inclusion of the landfill cap in a revised landfill design. The Environment Agency concludes that inclusion of the landfill cap into the engineering design with the specification agreed with the applicant should have the effect of reducing the predicted volume of leachate the proposed waste deposit has the potential to generate. We draw our conclusion as this landfill cap should reduce the rate precipitation can infiltrate into the low permeability waste beneath the cap than would be the case if a landfill cap was absent.

Table B1 of ICoP LGG111 includes the requirement for inclusion of a Drainage layer of >0.5m in the landfill cap engineering design. The applicant has proposed an alternative to a traditional drainage layer in the cap engineering design.

The proposal is to use a perimeter drain which, during the operation phase would be an open ditch that would collect surface water run-off from the proposed waste deposit area catchment. Following closure and restoration of the site the drain would be filled with stone to intercept any water draining between the base of the restoration soils and the surface of the waste. The applicant explains this perimeter drain would also intercept any perched leachate outbreaks. The Environment Agency are satisfied with this aspect of the proposal based on the type of waste proposed for acceptance, a permeability testing procedure being in place and the use of the mineral layer cap. This specification is linked to the permit via the operating techniques table S1.2.

2.0 Leachate

2.1 Number of landfill leachate extraction and monitoring points.

The Landfill Directive general requirement for all classes of landfill is that leachate accumulation at the base of the landfill is kept to a minimum through a system comprising of a geological barrier and a leachate collection and sealing system. A geological barrier and a leachate collection and sealing system is proposed for the site.

The design specification for the geological barrier should reflect non-hazardous landfill design requirements, subject to a risk assessment. During pre-application the Environment Agency agreed that for this landfill 'the standard could be reduced based on risk assessment'. The specification for the proposed geological barrier is lower than would be expected with a typical non-hazardous landfill. The reduction in standard is a consequence of the nature of the waste and the provision for the waste to achieve a specific permeability.

The information supporting the application shows the proposal includes a basal artificial sealing liner and a drainage layer with a stated purpose to ensure leachate accumulation is kept to a minimum (paragraph 3.3 of Annex I to the Directive.

We consider the applicant has provided a suitable risk assessment to demonstrate that the engineering proposed is adequate.

2.2 Groundwater Risk Assessment

The applicant provided a predictive risk assessment (ConSim) to assess the risk of the proposal in its specific location and hydrological setting. This excluded incorporation of a landfill cap into the engineering design of the landfill assessed for. The applicants predictive risk assessment used a source term for the leachate quality which is consistent with our understanding of what the proposed waste and waste acceptance criteria has the potential to generate.

This predictive risk assessment modelling concluded no significant impact of hazardous or non-hazardous chemicals for the predicted leachate source term resulting from the proposed disposal of non-biodegradable waste solids and qualifying fines.

The Environment Agency concludes with the outcome of the operators predicted risk assessment. We also conclude that inclusion of the landfill cap to the required specification at the site should reasonably likely further reduce the risk potential of the proposal to controlled water environments than has been predicted by the applicant. We conclude this as the inclusion of a landfill cap to the applicant's proposed specification in the engineering design of the proposed landfill should reduce the rate of infiltration into the waste, an action that would minimise the volume of leachate the waste can create beyond that the applicant has risk assessed.

We are satisfied that the applicant's predictive risk assessment (ConSim) adequately assesses the risk of the proposal in its specific location and hydrological setting. The applicant's risk assessment and conclusions they draw from it rely on accurate water balance calculations to quantify the potential leachate head build-up. The applicant has supported their application with a water balance calculation.

2.3 Water balance calculations to quantify the potential leachate head buildup on base of landfill.

A critical component of the leachate management proposals for the site is the size of Settlement Pond C as it needs to have the ability to control the liquid (leachate/dirty water and surface water runoff) the proposed waste mass catchment has the potential to generate.

Our assessment of the applicant's water balance calculations and the leachate volumes generated using them identified the leachate lagoon sizing and leachate drainage storage capacity was insufficient so we requested an updated assessment. The applicant submitted a further addendum which included an increased volume and additional proposals for a bund between the lagoon and the Beck as a contingency measure. We accepted the revised assessment.

3.0 Landfill Gas Risk Assessment:

3.1 In waste Monitoring

We are satisfied with the proposed locations of the proposed in-waste gas monitoring boreholes shown on the applicant's drawing No. 19877/13. In-waste gas monitoring for each cell will be required once waste inputs have ceased for that cell.

3.2 Gas collection and utilisation:

A methodology for how the applicant will monitor surface emissions of landfill gas at the site has been provided. The operator will use the monitoring data in combination with in-waste gas monitoring to options appraise whether and what management of landfill gas may be required should the gas monitoring show production of in-waste gas generation at specific concentrations and volumes. We are satisfied with this approach.

3.3 Landfill Gas Trigger Levels

The revised GasSim modelling submitted by the applicant indicates that the gas production 50^{th} % ile is only marginally above $20m^3$ /hr and this peak only lasts for one year. The gas generation profile demonstrates a steep rise and decrease before generation tails off from ~2040 however the generation rate at this point in time is less than $4m^3$ /hr.

The updated understanding of the wastes being accepted at site suggest that these values are highly conservative and in reality, there is unlikely to be any meaningful generation within the waste, even to levels predicted within GasSim.

The waste streams are predominantly clay rich soils and are ultimately going to be compacted to permeability of 1×10^{-7} m/s. This material should not generate significant methane and will likely not support the free movement of gas which would impede any active systems trying to 'manage' the limited volumes of gas that may be generated if any are at all. Passive systems such as a BioBed (biological methane oxidation) may be an option, however the low predicted generation rate could impede the operation of even these systems as they require a certain flow to maintain the colony of microbes which feed on the methane and convert it. The efficiency of a BioBed would also be impacted by the permeability of the waste as it would likely not generate emissions across the whole surface but may be point source based on fissures within the material. It is

not feasible to install a BioBed over the whole capped surface, but may be possible to target certain areas, such as the sidewall drainage area, however this could only be assessed once the site is filled.

With this in mind the operator has committed to capping the site and undertaking in waste gas monitoring and surface emission monitoring to inform any future reviews and works needed, and they will review the emissions (or lack thereof) after a minimum of 12 months of data have been gathered. The review will encompass whether there has been any methane generated, and whether there is potential for some form of utilisation or mitigation.

We consider the proposed compliance and action levels acceptable and will provide warning of anything that may change in the gas conceptual model.

The operator has committed to reviewing the Gas Risk Assessment following capping of the site to determine whether any additional infrastructure or processes are required in the future.

We feel that the operator and consultant have provided sufficient information and assessment to justify the proposals from the gas risk perspective.

4.0 Lane Side Landfill Mining and Stability Risk Assessment (SRA)

4.1 Background info:

Table S1.4A Pre-operational measures in the extant permit requires evidence of stabilisation works to be provided prior to the commencement of the construction of the geological barrier.

The Stability Risk Assessment supporting the application LANESIDE QUARRY LANDFILL SITE, KIRKHEATON, HUDDERSFIELD, WEST YORKSHIRE, WF14 8EA. STABILITY RISK ASSESSMENT - Report No TA23 01-Rev 01 – SRA 14th December 2020 (SRA DEC2020) includes the statement in section 3.3.3 SRA DEC2020 that: 'There are shallow underground mine workings and mine entries in the vicinity of the landfill site; these have been investigated and stabilised/dug out in accordance with pre-operation condition 3 of Table S1.4a of the environmental permit.'

An interpretation of the statement immediately above is that it could give the impression that a stabilisation programme for the shallow underground mine workings and mine entries in the vicinity of the landfill site has been approved with the Environment Agency and that the PO3 Table S1.4A of the permit has been complied with.

Section 2.1.4 of the HRA-June2021 supporting the application states:

Following the partial completion of ground stabilisation works clearing shallow underground coal mine workings (see Section 2.2.3), approximately 6 m of quarry spoil material (sourced on-site) has been placed within the landfill area to

establish the base of the landfill at 90 m AOD and creation of a bund forming the southern and south-western side-slope of the landfill, with a minimum crest height of 100 m AOD.'

The statement above can be interpreted as showing that the stabilisation works required to address shallow underground mine workings and mine entries in the vicinity of the landfill site are incomplete which would mean the requirements of PO3 have not been satisfied.

It was unclear from the information presented in support of the permit variation application whether all, or only parts of PO3 Table S1.4A of the permit have been complied with.

On 15/09/2021 we communicated to the applicant that we were unable to locate information that shows the Environment Agency has approved that the stabilisation of the mine workings has been completed in accordance with a scheme approved by the Environment Agency, or what the outcome of such works was.

Through correspondence with the applicant and within the Environment Agency we established that although the operator had submitted a Construction Quality Assurance (CQA) it had not received final EA approval.

We concluded from the discussions between the Environment Agency and the applicant that only part of the site had been stabilised and that PO3 had not been fully satisfied. The reason for this conclusion is explained in section 4.4 of this decision document.

4.2 Site geological setting and historical anthropogenic mining at the site:

The site is located on Coal Measures stratigraphy with presence of fractures.

Section 2.2.3 of the applicant's HRA2020 reports:

- Former workings have collapsed beneath the western part of the current void (excavated to around 83 to 84 m AOD), posing no hazard to the stability of the landfill.
- Workings are present beneath the central part of the current void which require further excavation to remove.
- Workings are present beneath the eastern part of the current void, although these are sufficiently deep (>10 m bgl) so as to not pose a hazard to the stability of the landfill.

A description of the regional and local geology is presented in sections 2.4 and 2.5 of the HRA2020 respectively.

The applicant reports the geology encountered at the site as summarised below:

• Mudstones dominate the observed sequence, either yellow/brown or grey, frequently with siltstone bands.

- Sandstone bands are present.
- Coal is encountered up to 1 m thickness in several boreholes.

The geological descriptions presented are in accordance with our interpretation of the geological information available from the British Geological Survey (BGS) for the site.

4.3 Summary of outcome of assessment of SRA, CQA and Preoperational measure 3 (PO3) of 'Table S1.4A Pre-operational measures' of the extant permit:

We need the applicant to update their SRA to provide an assessment demonstrating the landfills proposed mineral liner integrity will not be compromised by differential settlement of the subgrade as a result of an unidentified void migrating to surface. Strain values should not exceed the suggested limiting values defined in LFE4

https://www.gov.uk/government/publications/earthworks-in-landfill-engineeringlfe4.

Pre-operational measure 4 (PO4) in Table S1.4A Pre-operational measures of the extant permit still needs to be satisfied.

The following is a summary of the reasoning for the outcome/actions resulting from EA assessment of SRA, Construction Quality Assurance (CQA), and Preoperational measure 3 (PO3) of permit 'Table S1.4A Pre-operational measures':

- pre-operational condition PO3 cannot be fully discharged until the remaining areas of site have been stabilised (Area C);
- CQA validation for the backfilling will be required for approval in order to fully discharge PO3 and prior to any cell construction, not as part of any future liner design and CQA submissions as proposed by the application;
- for PO3 be discharged, the applicant will need to demonstrate full stabilisation of the entire site, to include all relevant CQA validation of any backfilling in accordance to the appropriate specification as per the relevant sections of our guidance <u>https://www.gov.uk/guidance/landfilloperators-environmental-permits/design-and-build-your-landfill-site</u>.
- the SRA supporting the application needs to be updated to provide an assessment demonstrating the landfills proposed mineral liner integrity will not be compromised by differential settlement of the subgrade as a result of an unidentified void migrating to surface. Strain values should not exceed the suggested limiting values defined in LFE4 <u>https://www.gov.uk/government/publications/earthworks-in-landfillengineering-lfe4</u>. See example calculations in our guidance <u>https://www.gov.uk/government/publications/stability-of-landfill-liningsystems</u>.

PO4 is unresolved as is it contains requirements which are dependent on completion of ground stabilisation works and prior to construction of the artificial geological barrier. PO4 is therefore retained in the varied permit.

4.4 Commentary in support of Summary:

4.4.1 CQA and its relationship to PO3

The applicant has commissioned investigations to investigate and identify voiding or unconsolidated ground associated with shallow mine workings in the ground beneath the quarry. These works are reported to have been commissioned following a request of the Environment Agency. The applicant has provided a report on their findings and investigation works titled 'MD/10077 - REFA Consulting Engineers Geological Validation works at Laneside Quarry, Kirkheaton, Near Huddersfield – dated 22nd March 2016' (REFA report).

The report has delineated the site into 3 areas A - C in relation to further works and which are detailed on REFA drg no. 10077/08. The REFA report presents several recommendations for each of their 3 delineated Areas.

Our review of the available data and as highlighted by the applicant in an email dated 11/11/2020, showed the work to date only surmounts to a partial stabilisation (via complete extraction of Area B - see full geological validation report), and therefore PO3 cannot be fully discharged until the remaining areas of site have been stabilised (Area C).

Furthermore, we identify that the CQA validation for the backfilling will be required for approval in order to fully discharge PO3 and prior to any cell construction, not as part of any future liner design and CQA submissions as intended by the applicant (email dated 11/11/2020).

The applicant explained to us on 31/01/2022 that the report 'MD/10077 - REFA Consulting Engineers Geological Validation works at Laneside Quarry, Kirkheaton, Near Huddersfield – dated 22nd March 2016' (REFA report) was:

- a 'Phase 1' investigation agreed with the Environment Agency to make observations of the ground conditions across the area of the proposed landfill with which to feed back into the landfill design process;
- not to satisfy PO3 or provided CQA validation of works undertaken on the site in respect of coal mine workings within the footprint are of the landfill; and
- assess the competent rock cover thickness requirements required to in place above mine workings identified.

Based on the evidence provided and consideration of the abandoned mine working manual C758D (which now supersedes SP32) we are satisfied that the required intact rock cover requirements above the coal mine workings can be reduced from the original 10m to the proposed 7.5m going forward. This means that where further excavations are required to remove coal mine workings these

will only be necessary where the intact rock cover is less than 7.5 m above the roof of the Better Bed coal or worked horizon.

We concluded from our assessment of the REFA report and works that in order for PO3 be discharged, the applicant will need to demonstrate full stabilisation of the entire site, to include all relevant CQA validation of any backfilling in accordance to the appropriate specification as per the relevant sections of our guidance <u>https://www.gov.uk/guidance/landfill-operators-environmental-</u> <u>permits/design-and-build-your-landfill-site</u>.

As the ground stabilisation and CQA work for the site are unresolved at this time this also means that pre-operational measure reference 4 (PO4) of Table S1.4A of the extant permit also remains unresolved. PO4 is unresolved as is it contains requirements which are dependent on completion of ground stabilisation works and prior to construction of the artificial geological barrier.

Our conclusion means that both PO3 and PO4 of the extant permit need to be retained.

Pre-operational measure 2 of 'Table S1.4A Pre-operational measures' in the extant permit is linked to some degree to the outcome of PO3 and PO4 which means PO2 also needs to be retained in the permit.

4.4.2 Table S1.4A Pre-operational measures - Reference 4. Pre-operational measure (PO4) in the extant permit.

Pre-operational measure 4 (PO4) of Table S1.4A of the extant permit requires that:

'Following ground stabilisation works and prior to construction of the artificial geological barrier.

The Operator shall take measurements of groundwater levels and quality from all groundwater boreholes once per month for 3 months after completion of the stabilisation ground works.

A written report shall be submitted to the Environment Agency for approval, identifying changes to the hydrogeological risk assessment as a result of these ground works.'

Pre-operational measure reference 4 (PO4) of Table S1.4A of the extant permit needs to be retained as a consequence of:

• the ground stabilisation and CQA work for the site being unresolved matters.

Decision considerations

Confidential information

A claim for commercial or industrial confidentiality has not been made.

The decision was taken in accordance with our guidance on confidentiality.

Identifying confidential information

We have not identified information provided as part of the application that we consider to be confidential.

The decision was taken in accordance with our guidance on confidentiality.

Consultation

The consultation requirements were identified in accordance with the Environmental Permitting (England and Wales) Regulations (2016) and our public participation statement.

The application was publicised on the GOV.UK website.

We consulted the following organisations:

Public Health England (now the UK Health Security Agency) Director of Public Health Local Authority – Planning Local Authority – Environmental Health The Health and Safety Executive The Sewerage Undertaker

The comments and our responses are summarised in the <u>consultation responses</u> section.

The regulated facility

We considered the extent and nature of the facility at the site in accordance with RGN2 'Understanding the meaning of regulated facility' and Appendix 2 of RGN2 'Defining the scope of the installation'.

The extent of the facility is defined in the site plan and in the permit. The activities are defined in table S1.1 of the permit.

The site

The operator has provided plans which we consider to be satisfactory.

These show the extent of the site of the facility including the discharge points.

The installation boundary plan is included in the permit.

Nature conservation, landscape, heritage and protected species and habitat designations

We have checked the location of the application to assess if it is within the screening distances we consider relevant for impacts on nature conservation, landscape, heritage and protected species and habitat designations. The application is within our screening distances for these designations.

We have assessed the application and its potential to affect sites of nature conservation, landscape, heritage and protected species and habitat designations identified in the nature conservation screening report as part of the permitting process.

We consider that the application will not affect any site of nature conservation, landscape and heritage, and/or protected species or habitats identified.

We have not consulted Natural England.

The decision was taken in accordance with our guidance.

Environmental risk

We have reviewed the operator's assessment of the environmental risk from the facility. See key issues section for further information.

Operating techniques

We have reviewed the techniques proposed by the operator and compared these with the relevant technical guidance and we consider them to represent appropriate techniques for the facility.

The operating techniques that the applicant must use are specified in table S1.2 in the environmental permit.

Updating permit conditions during consolidation

We have updated permit conditions to those in the current generic permit template as part of permit consolidation. The conditions will provide the same level of protection as those in the previous permits.

Waste types

We have specified the permitted waste types, descriptions and quantities, which can be accepted at the regulated facility.

We are satisfied that the operator can accept these wastes for the following reasons:

- they are suitable for the proposed activities
- the proposed infrastructure is appropriate; and
- the environmental risk assessment is acceptable.

Pre-operational conditions

Based on the information in the application, we consider that we need to include pre-operational conditions. See key issues section for further information.

During determination of this variation the applicant requested that existing Pre operational condition PO3 was split into two distinct parts relating to the two separate proposed cells. We did not consider that adequate evidence was available to demonstrate that the splitting of the pre operational condition is appropriate and therefore it remains as one which is applicable to all stabilisation works required.

We have removed the requirement for an odour management plan from the pre operational conditions as we consider this is not necessary based on the change in nature of wastes at the site and low levels of gas that are likely to be generated. Condition 3.3 in the permit allows the Environment Agency to request an odour management plan if required.

We have removed the requirement for a dust management plan from the pre operational conditions as one has been submitted with the variation application. This dust management plan will need to be reviewed during site operations and updated on a frequent basis and as a minimum in the event of a change on site or if any complaints are received.

Improvement programme

Based on the information on the application, we consider that we need to include an improvement programme. The surface water management plan does not reflect the site layout and is required to be updated through an improvement condition.

Emission limits

Emissions limits have been amended as a result of this variation.

Monitoring and reporting

We have decided that monitoring and reporting should be amended for the parameters listed in the permit, using the methods detailed and to the frequencies specified.

Management system

We are not aware of any reason to consider that the operator will not have the management system to enable it to comply with the permit conditions.

The decision was taken in accordance with the guidance on operator competence and how to develop a management system for environmental permits.

We only review a summary of the management system during determination. The applicant submitted their full management system. We have therefore only reviewed the summary points.

A full review of the management system is undertaken during compliance checks.

Financial competence

There is no known reason to consider that the operator will not be financially able to comply with the permit conditions.

Financial provision

We are satisfied that the operator has made the necessary financial provision.

Financial Provision information is being withheld from the Public Register.

Growth duty

We have considered our duty to have regard to the desirability of promoting economic growth set out in section 108(1) of the Deregulation Act 2015 and the guidance issued under section 110 of that Act in deciding whether to grant this permit variation.

Paragraph 1.3 of the guidance says: "The primary role of regulators, in delivering regulation, is to achieve the regulatory outcomes for which they are responsible. For a number of regulators, these regulatory outcomes include an explicit reference to development or growth. The growth duty establishes economic growth as a factor that all specified regulators should have regard to, alongside the delivery of the protections set out in the relevant legislation."

We have addressed the legislative requirements and environmental standards to be set for this operation in the body of the decision document above. The guidance is clear at paragraph 1.5 that the growth duty does not legitimise noncompliance and its purpose is not to achieve or pursue economic growth at the expense of necessary protections.

We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution. This also promotes growth amongst legitimate operators because the standards applied to the operator are consistent across businesses in this sector and have been set to achieve the required legislative standards.

Consultation Responses

The following summarises the responses to consultation with other organisations, and the way in which we have considered these in the determination process.

Responses from organisations listed in the consultation section

Response received on 5th March 2021 from UK Health Security Agency (formerly PHE).

Brief summary of issues raised: No issues raised.