

Decision document variation

We have decided to grant the variation for Hull Sludge Treatment Facility operated by Yorkshire Water Services Limited.

The variation number is EPR/WP3030GC/V004.

The variation is for the recovery and disposal of non-hazardous waste with a capacity exceeding 100 tonnes per day involving biological treatment (Section 5.4 Part A (1)(b)(i)). Yorkshire Water (THE OPERATOR) are refurbishing an existing sludge treatment facility (STF) at Hull Wastewater Treatment Works (WwTW). This permit variation is required because the upgrade and refurbishment work replaces the existing boilers with new boilers and because imports of sludge will exceed the T21 exemption limit. The permit variation reflects these changes and increases the permit boundary for the area taken up by the new assets.

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 [decision considerations](#) section to show how the main relevant factors have been taken into account
- shows how we have considered the [consultation responses](#)

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. The Process

The process on site is the import, screening and storage of liquid sludge, import of sludge cake and re-wetting, storage and screening of primary and surplus activated sludge (SAS) generated at Hull WWTW. All sludge and cake will be sent to the four current digester tanks via the feed tanks for anaerobic digestion and biogas will be transported to the two gas holders. Sludge is dewatered with the addition of polymer. Digested, dewatered and lime treated sludge cake will be transferred by conveyors to a concrete slab for export from site. An open sided barn is provided on site for storage when cake export is not possible. The operator proposes to use processed limed sludge cake on agricultural land as a soil conditioner. The environmental permit does not authorise the spreading of digestate on any land.

Centrate generated from the dewatering of sludge is returned to the WWTW for final treatment. Biogas generated by the digestion process is stored in dual biogas holders. The gas is used for generation of electricity by combustion in three combined heat and power (CHP) engines, each with a thermal input of 1.362 MW. The heat generated by the CHP engines will be used to heat the digesters. Two duty/assist boilers, each with a thermal input of 2.8 MW will be used to provide additional heat for the digesters, and these will run on biogas or natural gas. The CHP engines will provide all the heat required for the digesters at most operating temperatures. The boilers will provide additional heat in cold weather. A waste gas burner is provided for emergency flaring of biogas. The flare will also be used during periods of breakdown and maintenance and periods where excess gas is generated. There is an odour control unit (OCU 2) adjacent to the sludge cake import facility. This OCU is installed to reduce odours from the STF.

2. BAT Conclusions for the Waste Treatment industry sector

We have reviewed the variation application against the revised BAT Conclusions for the Waste Treatment industry sector which were published by the European Commission on 10 August 2018. The decisions have been made with reference to establishing best available techniques (BAT) conclusions (BATc) for Waste Treatment. There are 53 conclusions included in the BAT Conclusions document but not all of them are applicable to the installation.

We consider that the operator is in compliance with the techniques and standards described in the BAT Conclusions. Full justification has been provided for BAT Conclusions 14d and 19d where an equivalent standard and therefore equivalent protection has been provided.

3. Alternative measures for compliance with BAT 19d – Secondary Containment

BAT 19d requires containment around all tanks to reduce the likelihood and impact of overflows and tank failures. Although there is a kerb around the sludge screen feed tank, there is no secondary containment around the thickener feed and digester feed tanks, digesters or the dewatering feed tanks. Therefore the operator was required to provide additional proposals for containment based on source-pathway-receptor pollutant linkage and site risk rating based on the probability and consequences. Where the secondary containment did not meet the standards as set out in the CIRIA 736, the operator provided a detailed justification supported by evidence as to how the site secondary containment design and construction is fit for purpose and achieves equivalent protection compared to CIRIA 736. The additional evidence was requested through a Schedule 5 notice dated 20/04/2020. The scope of report included a risk assessment to determine the classification system in line with ADBA, *Secondary Containment at AD Plants: An Industry Guide, July 2016, Risk Assessment Tool*.

The operator modelled catastrophic tank failure and provided additional risk assessment to assess the suitability of the secondary containment through the use of an ADBA risk assessment. The output from the risk assessment is the overall site risk rating was low. The indicated class of secondary containment required was Class 1. The site hazard rating is identified as low risk due to the low receptor and the low pathway hazard rating. The operator concluded the installation of Class 1 secondary containment would not provide a greater level of environmental protection at Hull STF. The Operator demonstrated via the risk assessment tool and the 2d model that any sludge spillage would remain on site and not be directed to watercourse, even following the catastrophic failure of one of the digesters. The operator has also demonstrated that the ground conditions would provide an impermeable barrier to potential contamination of groundwater.

For the majority of spills, leaks and catastrophic pipe failures the site surfacing and drainage would transfer liquid to the WwTW, which effectively acts as remote containment.

In the unlikely event of catastrophic tank failure, the 2d modelling demonstrates that the site has sufficient area (and therefore capacity) to effectively act as a bund and prevent any releases off site to surface water receptors. Site surfacing and drainage would transfer liquid to the WwTW, which effectively acts as remote containment, and emergency spill response and clean up procedure would provide remediation for permeable ground.

An impermeable layer in the geology below the site means that there is no pathway to the ground water receptors where any spills on the site are to permeable ground. Therefore, the emergency spill response and clean up procedures are considered to be appropriate for these areas of the site.

We agree with the risk assessment provided and therefore we are satisfied that the Operator has demonstrated equivalent protection has been achieved. We have therefore accepted the proposed alternative measures to comply with BAT 19d.

4. Alternative measures for compliance with BAT 14d - Enclosed building / Odour

BAT 14d requires that significant sources of odour will be covered or housed in buildings, and in many cases, ventilated to and treated by an odour control unit to ensure fugitive/diffuse emissions are minimised. However the operator's proposed sludge barn is three sided.

The Operator were asked to provide additional proposals to minimise fugitive emissions from the storage of sludge cake through two Schedule 5 notices dated 20/04/2020 and 02/07/2020, as we considered that the Operator proposal for the storage of sludge cake within the three sided sludge barn did not comply with BAT.

Yorkshire Water risk assessed the various options and based on the outputs from the risk assessment scoring exercise the Operator is proposing to install a wind-breaking Legato-block wall on the prevailing wind side of the building to reduce odour release via wind stripping and leaching. The Operator compared this option to full enclosure with negative pressure and air extraction (15m stack) and although scored highly on the IED permit requirements did not in the areas of carbon footprint or health and safety.

The Operator also confirmed that normal practice going forward will still be to limit storage within the sludge cake barn to less than 2 days compared to 3 days as was initially modelled. Where excess sludge is stored, the oldest sludge will be removed first. An aerosol masking unit is available outside of the building.

Revised odour modelling was performed to reflect these operational changes and illustrates the odour emissions of a 3-day storage operation and a 2-day storage operation scenario versus the current baseline (the cake within the cake barn has been modelled as volume sources). By limiting the residence time of the cake in the barn to 2 days rather than 3, there is a 5.5% reduction in overall odour emissions from the site.

The Operator have identified that the combination of operational improvements to sludge cake retention and an intervention through wind stripping mitigation is the most appropriate alternative technique for the Hull STF site.

We agree with the justification and that the solution has been supported through the risk assessment process and we are satisfied that the Operator has demonstrated equivalent protection has been achieved. We have therefore accepted the proposed alternative measures to comply with BAT 14d. Improvement Condition IC1 has been imposed to ensure the measures will be effective.

Improvement Condition (IC1)

The operator shall carry out a review of the odour management measures described in Odour Management Plan dated 05/06/2020 Issue 2, in order to determine whether the measures have been effective and adequate in minimising odorous emissions following the commencement of storage operations at the Sludge Treatment Facility. The operator shall submit a report to the Environment Agency for written approval which reviews the effectiveness of odour management techniques, and thereby verify the assumptions made in the application, in relation to releases of odour from the Sludge Storage Barn.

The report shall contain, but not be limited to the following:

- *Odour monitoring results at the site boundary;*
- *Records of odour complaints and odour related incidents;*
- *Process monitoring results; and*
- *Recommendations for improvement*

Where odour is detected at the boundary of the site or other improvements can be made, the report shall include timescales for implementation of improvements to the odour management measures (including sludge storage) for agreement with the Environment Agency.

The operator shall implement the improvements in line with the timescales agreed with the Environment Agency

5. Emissions to Air

We carried out an audit of the air quality impacts associated with the proposed variation to this site. We agree with the operator's conclusions and results presented in their air dispersion modelling report that it is unlikely to be any exceedances of the environmental standards (ES) as a result of the site operations.

- The annual mean process contributions (PC) at human receptors are likely to be above 1% so are not insignificant. However, predicted environmental concentrations (PEC) are unlikely to lead to an exceedance of the long-term ES, so impacts are not likely to be considered significant.
- The short-term PCs at human receptors are likely to be above 10% so are also not insignificant. However, the PECs are unlikely to exceed the short-term ES, so impacts are not considered to be significant.
- The annual mean and daily nitrogen oxides (NO_x) PCs at the Humber Estuary SAC, SPA, Ramsar and SSSI are not predicted to be insignificant. However, PECs are likely to be below critical levels.

- At the assumed sulphur dioxide (SO₂) emissions, the annual mean PCs at the Humber Estuary SAC, SPA, Ramsar and SSSI are likely to be insignificant compared to the critical level.
- The nutrient nitrogen deposition PCs at the Humber Estuary are all below 1% so are considered insignificant.
- The acid deposition PCs are above 1% so are not insignificant. However, the PECs are not predicted to exceed the acid critical load at the Humber Estuary.
- At local nature sites the NO_x, SO₂, nutrient nitrogen and acid deposition PCs are predicted to be less than the 100% insignificance threshold.

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 comments and our responses are summarised in the [consultation responses](#) section.

The application was publicised on the GOV.UK website.

We consulted the following organisations:

Local Authority Planning Department East Riding (LPA)
Local Authority Environmental Health East Riding (LAEH)
Fire and Rescue Service (FRS)

Director of Public Health England (PHE)
Natural England (NE)

Comments were received from Natural England only.

The comments and our responses are summarised in the [consultation responses](#) 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', Appendix 2 of RGN 2 'Defining the scope of the installation', Appendix 1 of RGN 2 'Interpretation of Schedule 1', guidance on waste recovery plans and permits.

The extent of the facility 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 a plan which we consider to be satisfactory.

These show the extent of the site of the facility.

The plan is included in the permit.

Site condition report

The operator has provided a description of the condition of the site, which we consider is satisfactory. The decision was taken in accordance with our guidance on site condition reports and baseline reporting under the Industrial Emissions Directive.

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.

The operation is not directly connected with or necessary to the management of any European site but is located approximately 780 m north of the Humber Estuary Ramsar Site, Special Area of Conservation (SAC) and Special Protected Area (SPA). In addition, the European Sites are underpinned by four Sites of Special Scientific Interest (SSSI), the closest of which is the Humber Estuary SSSI located approximately 780 m south of the site.

HRA Stage 1 Screening report has concluded that the works will result in no likely significant effects to the European sites. The primary qualifying habitats include: estuaries; mudflats and sandflats not covered by seawater at low tide; dune systems and humid dune slacks, estuarine water, intertidal mud and sand flats, saltmarshes, and coastal brackish / saline lagoons none of which are present within the site and will not be impacted by the scheme. The works will not result in an increase in effluent or a change in composition of effluent discharged to the River Humber. Nor will they result in nitrogen or acid deposition to qualifying habitats above 1% of their minimum critical load. Humber Estuary SSSI located approximately 780 m south of the site.

An assessment has been undertaken to determine the effect on air quality associated with emissions from the site using advanced dispersion modelling. For sensitive ecological sites the method of the assessment has taken a conservative approach by assuming continual full load operation all year round. No exceedances of the EQS are predicted. The air quality effects are highly localised and the impact at sensitive ecological receptors is insignificant in accordance with EA guidance. The air quality dispersion modelling has assessed that emissions produced from the Hull WwTW will be below the threshold of the lower critical load values for relevant habitats and therefore will not detrimentally impact any qualifying habitats or features).

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 consulted Natural England on our Habitats Regulations and SSSI assessments for information only. Natural England agreed with our assessment that there will be no likely significant effect on the European site.

Environmental risk

We have reviewed the operator's assessment of the environmental risk from the facility.

The operator's risk assessment is satisfactory.

The assessment shows that, applying the conservative criteria in our guidance on environmental risk assessment all emissions may be screened out as environmentally insignificant.

Operating techniques

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

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

Odour management

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

We consider that the odour management plan is satisfactory.

We have approved the odour management plan as we consider it to be appropriate measures based on information available to us at the current time. The applicant should not take our approval of this plan to mean that the measures in the plan are considered to cover every circumstance throughout the life of the permit.

The applicant should keep the plans under constant review and revise them annually or if necessary sooner if there have been complaints arising from operations on site or if circumstances change. This is in accordance with our guidance 'Control and monitor emissions for your environmental permit'.

Noise

An acoustic assessment of the baseline noise levels in respect of the Hull WwTW has been carried in accordance with the requirements of the site specification and BS4142:2014. The existing plant and equipment operate 24-hours either 100% of the time or on a demand basis.

The primary existing noise sources affecting the nearby noise sensitive premises to the site have been identified and found to be due to traffic movements along local road network with additional heavy industrial plant and activities audible.

The residential premises located to the west, north and north east of the site boundary at location A, B and C are not being influenced by the on-site activities which are inaudible at all times of the day and night when compared against the existing background noise.

We considered that, at this stage, a noise and vibration management plan is not required for the site. The area around the site is not historically sensitive to noise or vibration. However, all equipment being installed on the site will comply with the Yorkshire Water noise and vibration Engineering Specifications requirements of no

more than 80 dB from 1 m distance. Where this cannot be achieved, acoustic enclosures and/or buildings will be utilised to minimise noise impact.

The applicant confirmed that both pre and post scheme noise surveys will be carried out which will ensure noise from the site has not been increased by the scheme, as well as to give the ongoing management plan a baseline to work from. During normal operation equipment will be routinely monitored to check for any increase in noise or vibration, and maintenance jobs raised and carried out where this is the case.

Waste types

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

- 19 02 06 sludges from physico/chemical treatment other than those mentioned in 19 02 05 (sewage sludge only)
- 19 06 06 digestate from anaerobic treatment of animal and vegetable waste (sewage sludge only)
- 19 08 05 Sludges from treatment of urban waste water

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.

Improvement programme

Based on the information on the application, we consider that we need to include an improvement programme.

Improvement condition 1

See key issues section Point 4.

Improvement condition 2

As part of the Environment Agency approach to reduce emissions in the biowaste treatment sector, we have included Improvement condition 2 (IC2) requires the operator to review abatement plant on site, in order to determine whether existing measures have been effective and adequate to prevent and /or minimise emissions released to air. Where further improvements are identified, the operator is required to implement these measures.

Improvement condition 3

We have included improvement condition 3 (IC3) in the permit which requires the operator to assess methane slip resulting from the combustion of biogas via the CHP engine. Following an assessment of the data, the Environment Agency shall consider

whether or not emission limits for volatile organic compounds are applicable for this installation.

Existing Medium Combustion Plant

CHP Engines - We have reviewed the information provided and we consider that the declared combustion plant qualify as “existing” medium combustion plant.

For existing MCP with a rated thermal input of less than or equal to 5 MW, the emission limit values are set out in table 3 of Part 1 of Annex II MCPD. The ELV referred to here is based on a 15% for Oxygen, therefore the emission limits have been converted based on normal operating conditions and load - temperature 0°C (273 K); pressure 101.3 kPa and oxygen 5% (for gas engines burning biogas) and oxygen 3% (for medium combustion plants other than engines and gas turbines burning biogas).

New Medium Combustion Plant

Boilers – As new combustion plant the emission limit values are set out in table 1 of Part 2 of Annex II MCPD. The ELV referred to here is based on a 15% for Oxygen, therefore the emission limits have been converted based on normal operating conditions and load - temperature 0°C (273 K); pressure 101.3 kPa and oxygen 5% (for gas engines burning biogas) and oxygen 3% (for medium combustion plants other than engines and gas turbines burning biogas).

The operator has provided the grid reference for the emission point(s) from the medium combustion plant. (516432.1, 429160.7)

Emission limits

Emission Limit Values (ELVs) based on BAT have been specified for the following substances:

CHP engines (Existing MCP)

- Oxides of nitrogen
- Sulphur dioxide
- Carbon monoxide

Boilers (New MCP)

- Oxides of nitrogen
- Sulphur dioxide

Emergency flare (New)

- Oxides of nitrogen
- Sulphur dioxide

- Total VOCs

Refer to Table S3.1 of Schedule 3 of the permit.

Monitoring

We have decided that monitoring should be carried out for the parameters listed in the permit, using the methods detailed and to the frequencies specified. These monitoring requirements have been imposed in order to demonstrate compliance with the conditions of the permit requiring the management of emissions to air.

We made these decisions in accordance with the Waste Treatment BREF and BAT Conclusions and our guidance on Medium Combustion Plant and LFTGN 05: Guidance for monitoring enclosed landfill gas flares.

Based on the information in the application, we are satisfied that the operator's techniques, personnel and equipment have either MCERTS certification or MCERTS accreditation as appropriate.

Reporting

We have specified reporting in the permit under table S4.1. We have specified reporting in the permit.

Reporting will be required annually in line with the annual emissions monitoring, ensuring the operator is complying with the limits in their permit. We made these decisions in accordance with the Draft Technical Guidance for Anaerobic Digestion (Reference LIT 8737, November 2013).

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.

Technical competence

Technical competence is required for activities permitted.

The operator is a member of an agreed scheme

We are satisfied that the operator is technically competent.

Financial competence

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

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 non-compliance 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, our notice on GOV.UK for the public and the way in which we have considered these in the determination process.

Responses from organisations listed in the consultation section:

Response received from Natural England.

Brief summary of issues raised: Natural England agree with the EA's assessment that there will be no likely significant effect on the European site Natural England also requested the Appendix 4 proforma for their records. This was subsequently provided. Summary of actions taken: Provision of Appendix 4 to Natural England for information only.