

Permitting decisions - Refusal

We have decided to refuse the variation application for United Utilities Blackburn Wastewater Treatment Works (WwTW) operated by United Utilities Water Limited, application number: EPR/XP3638LJ/V005 (the Application).

The proposed facility location is Blackburn WwTW, Cuerdale Lane, Samlesbury Lancashire, PR5 0UY indicatively shown edged green on the plan attached at Annex 3 (the Site).

The existing permit number is EPR/XP3638LJ.

We consider that in reaching this decision we have taken into account all relevant considerations and legal requirements.

Purpose of this document

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

- highlights key issues in the determination
- shows how the main relevant factors have been taken into account
- gives reasons for refusal
- shows how we have considered the Consultation responses

This decision document should be read in conjunction with the refusal notice.

Structure of this document

Part A: Administration issues

Part B: Process description

Part C: Reasons for refusal

Annex 1: Application Timeline

Annex 2: Consultation and engagement responses

Annex 3: Map showing location of the proposed Installation and surrounding area

Part A: Administration Issues

Legislative background

The Industrial Emissions Directive (IED) entered into force on 6 January 2011 and was transposed into UK law on 27 February 2013¹ by amendments to the Environmental Permitting Regulations 2010 (EPR 2010). The IED recast the Directive on Integrated Pollution Prevention and Control (IPPC) and introduced a revised schedule of industrial activities falling within scope of its permitting requirements. The schedule of waste management activities includes the recovery of non-hazardous waste with a capacity exceeding 75 tonnes per day (or 100 tonnes per day if the only waste treatment activity is anaerobic digestion) involving biological treatment, but excludes activities covered by the Urban Waste Water Treatment Directive² (UWWTD).

The IED seeks to achieve a high level of protection for the environment, taken as a whole, from the harmful effects of industrial activities. It does so by requiring each of the regulated industrial installations to be operated under a permit with conditions based around the use of best available techniques (BAT).

In July 2014, we deferred the need for the Water and Sewerage Companies (WaSCs) to submit permit applications for their facilities to allow for further consideration of whether they were already covered under UWWTD. All UK environmental regulators subsequently concluded this was not the case, and therefore WaSC facilities fall within the scope of the IED.

On 2 April 2019, we confirmed to the WaSCs operating in England that their sewage sludge anaerobic digestion (AD) facilities needed to comply with the requirements of the IED³.

The EPR 2010 set a deadline of 7 July 2015 for newly listed installations, such as those for biological treatment of waste for recovery, to obtain an environmental permit. Therefore, the implementation of this aspect of the IED had already been delayed by nearly four years at the point of our confirmation to the WaSCs on 2 April 2019.

We subsequently sought to ensure all sewage sludge AD facilities obtained and operated under an environmental permit in as short a timescale as could reasonably be achieved. We asked the WaSCs to provide a definitive list of all facilities used to carry out biological treatment of sewage sludge. A submission schedule was provided to the WaSCs, allowing applications for these facilities to be submitted to

¹ Environmental Permitting (England and Wales)(Amendment) Regulations 2013

² [Directive 91/271/EEC concerning urban waste water treatment](#)

³ [Directive 2010/75/EU - Industrial Emissions Directive](#)

us in 3-month tranches between 1 April 2021 and 1 July 2022. The Blackburn WwTW application was submitted in Tranche 1 of this programme of work.

The Application

The Application was scheduled to be submitted by 1 April 2021 and United Utilities Water Limited (“the Applicant”) submitted the Application to us on 1 April 2021.

The Applicant already holds an environmental permit at the Site – Permit number EPR/XP3638LJ (the Permit) - which authorises the following waste operations:

- Combustion of Biogas (R1: Use principally as a fuel or other means to generate energy)

The Application is to vary the Permit to add the following installation and waste activity to ensure compliance with IED as stated in the section above:

- Section 5.4 A(1)(b)(i)⁴ - Recovery or a mix of recovery and disposal of non-hazardous waste with a capacity exceeding 100 tonnes per day involving biological treatment. This relates to the anaerobic digestion process.
- Physical treatment of non-hazardous waste relating to the acceptance of digested sludge.

Although these activities were not permitted at the time of submission of the Application, it was already operational on the Site, apart from the assets associated with the acceptance of sludges from the Nereda system, identified as two enclosed sludge reception tanks, drum thickeners and lamella tank (the Nereda Assets). The Nereda Assets were proposed to commence operation in 2022.

The activity applied for, included an anaerobic digestion (AD) stationary technical unit (STU) and directly associated activities (DAA), including pre and post-digestion treatment, gas collection and storage, a combined heat and power (CHP) engine and boilers, an emergency flare, raw material storage and process/surface water collection.

The emissions from the existing permitted CHP engines and boilers on the Site were not re-assessed as part of the Application as they are already permitted under the Permit.

The initial Application advised that full liquor treatment would be undertaken, however no information was provided on how liquor treatment would be undertaken. Following further information provided as part of the duly making checks, this was confirmed not to be a regulated activity under section 5.4 (a)(i), as the lamella tanks were for dewatering only, and the WwTW did not form part of the permit boundary. As such liquor treatment was removed from the Application.

⁴ Part 2 of Schedule 1 of Environmental Permitting (England and Wales) Regulations 2016 (“EPR 2016”) (SI 2016 No. 1154) as amended

The initial Application stated that digested sludge imports would be received post digestion at the post digestion tanks requiring the addition of an activity relating to the physical treatment of non-hazardous waste. The Applicant removed this from the Application through a response to question 2 of Schedule 5 Notice dated 15 October 2021 stating “We do not propose to accept imported digested sludge, as described in Section 5.11 of the Application Support Document (March 2021). Site do not currently accept digested sludge; this was included in the original application in error”. As such the activity relating to the physical treatment of non-hazardous waste for the import of digested sludge was removed from the Application, however no refund in relation to the Application fee was provided as this element had been progressed to determination.

Duly making and consultation

We did not have enough information to confirm duly made status of the initial Application⁵. A not duly made letter⁶ was sent to the Applicant on 10 May 2021 outlining further information required to allow the Application process to continue to determination stage. We requested the Applicant submit additional information by 24 May 2021.

We requested the following information:

- Amendment of the charge to reflect the correct waste and installation activities, corrected costs and payment of a further £5,363.40.
- Provision of ISO 14001 certificate.
- Provision of a Site plan showing the areas of impermeable and permeable surfacing.
- Provision of information in relation to the design and installation of pressure relief valves.
- Details of the characteristics of waste accepted.

The Applicant responded to our request on 9 June 2021, with a payment of £3,965 being made on 10 June 2021. The reduction in payment request followed confirmation that the facility would not be operating a liquor treatment plant.

Despite this additional information being requested and provided, we considered that the Application significantly lacked the level of information we would need to determine it. At this point we considered whether we should:

⁵ Section 6.4 of [Environmental permitting: Core guidance \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/94444/environmental-permitting-core-guidance.pdf)

⁶ Appendix 1: Not duly made letter dated 10th May 2021

- Return the Application as “not duly made”; or
- Confirm the Application as “duly made” and seek to obtain the additional information during the determination through information notices (Schedule 5 Notices) and requests for further information.

Following further discussion with the Applicant, we agreed to confirm the Application as duly made. The Application was duly made on 10 June 2021⁷.

On 7 July 2021, the internal and external engagement/consultation process on the Application commenced.

Information requests

The determination has been protracted due to incomplete and insufficient responses and repeated Applicant requests for extensions of time to reply to Schedule 5 Notices. At the point of refusal, insufficient information had been provided in response to the Schedule 5 Notices we issued.

We requested information from the Applicant on several occasions. This was requested through two Schedule 5 Notices sent on 25 June 2021 (Schedule 5 Notice 1) and 15 October 2021 (Schedule 5 Notice 2) and two less formal requests for information sent on the 2 December and 10 December 2021.

Following the responses received to Schedule 5 Notices 1 and 2, we wrote to the Applicant on 5 November 2021 expressing our concerns regarding the lack of detail, their short notice requests for extensions of time to respond to the Schedule 5 Notices and deferring the provision of information in answer to questions without our prior agreement.

Following responses received to the Schedule 5 Notices and our requests for further information, we sent a subsequent letter dated 21 February 2022 (the Final Opportunity Letter) to the Applicant, giving them a final opportunity to provide the information we considered necessary to be able to make a fully considered determination of the Application.

This letter requested the information which we considered had not been responded to or required further clarification under Schedule 5 Notices 1 and 2 and the requests for further information dated 2 December 2021 and 10 December 2021.

The Final Opportunity letter outlined our concerns with, and deficiencies in, the information provided by the Applicant in key areas of the Application and repeated 2 questions from Schedule 5 Notice 1 and 15 questions from Schedule 5 Notice 2, which we had tried to clarify through the 2 further requests for information and an

⁷ Duly made email dated 5th July 2021.

email dated 2 December 2021. The key issues for the Applicant to respond to included:

- Odour Management Planning.
- Compliance with BAT 14d in relation to the containment, collection and treatment of diffuse emissions from open tanks.
- Compliance with BAT 19c, 19d and 19h in relation to containment and secondary containment.
- Compliance with BAT 34 in relation to the reduction of channelled emissions to air using appropriate techniques.
- Compliance with BAT 3, 6, 7 and 20 in relation to the characterisation and identification of indirect emissions (wastewater) to water returned to the wastewater treatment works.
- Waste pre-acceptance and waste acceptance.

In the Final Opportunity Letter, we gave the Applicant a response deadline of 1 April 2022, stating that after this deadline, we would continue to determine the Application on the basis of the information we had, and that we would not be making further requests for information.

We have included in Annex 1, a timeline in chronological order for Schedule 5 Notices 1 and 2 and our 2 requests for further information. This timeline also outlines the Applicant's responses and multiple requests for extensions of time to reply.

Summary

Despite having had ample opportunity to do so, we do not consider that the Applicant has satisfactorily responded to all the issues we have raised in relation to the Application, for the reasons set out in more detail in Part C below.

We also consider that if we had continued to provide further opportunities to the Applicant to address the identified deficiencies, we would still need to request a significant amount of additional information and potentially re-consult due to the significant revisions required to the submitted management plans and further information required to be provided in relation to containment and odour.

In our view, the information provided in the Application and the responses to Schedule 5 Notices 1 and 2, our 2 requests for further information, and the Final Opportunity Letter:

- Has not demonstrated that the proposal meets BAT nor proposed suitable alternative measures to provide at least the same level of environmental protection.

- Does not represent an acceptable risk to the environment or make satisfactory proposals to prevent or minimise the risks posed from odour.
- Has not demonstrated that the assets associated with the acceptance of sludges from the Nereda assets (proposed to be commissioned in 2022) meet BAT nor proposed suitable alternative measures to provide at least the same level of environmental protection

We consider that we have afforded the Applicant numerous opportunities to provide further information to a satisfactory standard so as to enable us to make a properly informed determination of the Application. This information has not been forthcoming. We consider that we have offered a greater degree of flexibility and advice to the Applicant than would normally be given to applicants during a determination of this nature.

We have determined the Application based on the information provided by the Applicant and consequently, we have decided to refuse the Application.

Part B: Process description

Location

The Site is in a rural area and is close to the A5 road (see the Plan at Annex 3). Approximately 70 m to the east of the Site boundary runs Hole Brook and the Site is located approximately 130 m to the south of the Riven Darwen. The National Grid Reference for the Site is SD 60382 29542.

There are several statutory and non-statutory habitats sites within the applicable screening distances from the Site. Screening distances for emissions to air are set out in our guidance [Air emissions risk assessment for your environmental permit - GOV.UK \(www.gov.uk\)](https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit), and are identified as 10 km for Special Protection Areas (SPA), Special Areas of Conservation (SACs), and Ramsar sites (protected wetlands), and 2 km for Sites of Special Scientific Interest (SSSIs) and local nature sites. Under our guidance [Risk assessments for your environmental permit - GOV.UK \(www.gov.uk\)](https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit) protected sites and species should also be identified to ensure that the activity will not cause damage.

As part of the Application, the following habitat sites were identified to be applicable within the relevant screening distances.

- Sites of Special Scientific Interest
 - Beeston Brook Pasture – 1877 m away
 - Darwen River Section – 524 m away
- 25 Local wildlife sites (within 2 km from the Site)
- 11 Ancient Woodland sites (within 2 km from the Site)

- Protected species
 - European Eel *Anguilla*, *Anguilla* migratory route.

Existing treatment operations

The Applicant holds the Permit for a waste operation. The Permit allows the Operator to operate two CHP engines with a combined thermal input of up to 4 MWth, and three dual fuel boilers with a combined thermal input of approximately 7 MWth giving a total combined thermal input of approximately 11 MWth for the combustion of biogas to generate electricity and heat for use within the AD facility, or for exportation to the grid. The Permit also allows for the flaring of excess biogas and discharge of surface water condensate and blowdown.

Proposed treatment operations

The purpose of the Application is to enable acceptance of up to 2,628,000 wet tonnes per year of indigenous raw sludge (produced at the adjacent WwTW) and imported sewage sludges. The Site can only lawfully undertake the activities permitted under the Permit and is not permitted to undertake the activities set out in the Application. However, as detailed in Part A above, the facility is already undertaking the operations set out in the Application, apart from the assets associated with the acceptance of sludge from the Nereda treatment system, which was proposed to be commissioned in 2022, and as such we have written in the present tense.

Indigenous sludge and imported sludge are screened and thickened on Site prior to the AD process and the filtrate produced is discharged off-site to the adjacent WwTW.

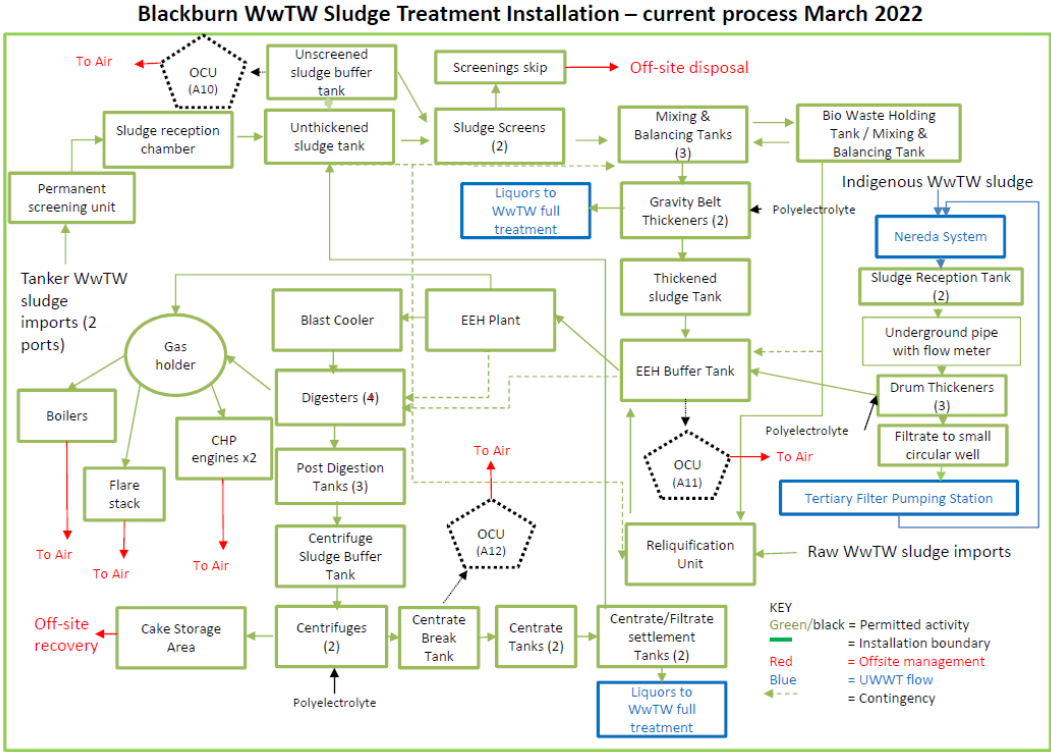
The current operational capacity of the digesters is 305,000 tonnes per year in four digesters. Biogas produced is stored on the Site in a biogas holder prior to use in the existing CHP engines. The remaining digestate produced from the AD process is stored in post digestion tanks on the Site prior to dewatering in onsite centrifuges. The centrate (liquor) produced following dewatering is discharged to the adjacent WwTW, with the separated cake stored on site prior to land spreading⁸. Leachate from the cake storage pad is discharged to the adjacent WwTW.

All liquid process wastes that are discharged to the adjacent WwTW, are discharged through an enclosed drainage system.

The Application also sought to increase the permit boundary to include the specified assets in the above process. The existing permitted waste treatment operations as outlined above would remain unchanged, however the Site would become an installation and consequently existing waste treatment operations would be regulated under the IED.

⁸ Subject to The Sludge (Use in Agriculture) Regulations 1989

Figure 1 – Blackburn WwTW Sludge Treatment Installation



Source – Installation activity process flow

Part C: Reasons for Refusal

Decision

The Application is refused. The primary reasons for refusal are:

- The Applicant has not satisfactorily demonstrated they are using BAT to prevent, or where that is not practicable, reduce emissions to soil and water in relation to:
 - the provision of impermeable surfaces
 - the provision of techniques to reduce likelihood and impact of overflows and failures from tanks and vessels; and
 - the design and maintenance provisions to allow detection and repair of leaks
- The Applicant has not satisfactorily demonstrated they are using BAT to prevent, or where that is not practicable, reduce diffuse emissions to air, in particular of dust, organic compounds and odour in relation to the containment, collection and treatment of diffuse emissions through techniques such as:

- The storage, treating and handling of waste material that may generate diffuse emissions in enclosed equipment.
- Collecting and directing diffuse emissions to an appropriate abatement system.
- The Applicant has not satisfactorily demonstrated they are using BAT to prevent or, where that is not practicable, to reduce odour emissions.
- The Applicant has not demonstrated that the assets associated with the acceptance of sludges from the Nereda system which was proposed to commence operation in 2022 meets BAT or proposed suitable alternatives to provide the same level of environmental protection.

Containment, odour management and the containment of diffuse emissions are the primary reasons for reaching the decision to refuse the Application. We do not consider it appropriate to grant the variation of the Permit. We do not consider it appropriate to resolve the identified deficiencies using improvement conditions, pre-operational conditions, or compliance visits/checks. We took this viewpoint as the Applicant has not demonstrated the use of BAT or proposed suitable equivalent alternatives. Where alternatives have been proposed they are vague and non-committal with proposed timescales for implementation by 2026 being unacceptable. We have provided further explanation for our decisions in relation to the use of improvement conditions, pre-operational conditions, or compliance visits/checks as part of our explanation below.

We may set improvement conditions where there is sufficient information in an application to determine it, but we require an applicant to examine some issues further or take steps which it cannot reasonably be expected to take before a permit is issued. It is inappropriate to set improvement conditions to obtain information that should be assessed during the application determination stage.

There were other aspects of the Application we considered had not been satisfactorily addressed by the Applicant during determination. However, had we considered it to be possible for a variation to the Permit to have been granted, we would have considered it may have been possible and appropriate to resolve these issues using improvement conditions, pre-operational conditions, or compliance visits/checks, as explained later on in this document.

How we reached our decision

In determining the BAT for the Site, we primarily used the following guidance documents:

- Waste Treatment BAT Conclusions as described in the Commission Implementing Decision (the BAT Conclusions)
- BAT Reference Document for Waste Treatment (the BREF)

- Containment systems for the prevention of pollution – Secondary, tertiary and other measures for industrial and commercial premises, dated 2014 (“CIRIA C736”)

Further guidance used included:

- Environment Agency, (April 2011), H4 Odour Management – how to comply with your environmental permit, Ref: LIT 5419.
- Environment Agency, (Consultation draft July 2020) Appropriate measures for the biological treatment of waste
- Anaerobic Digestion and Bioresources Association (ADBA) Containment Classification Tool
- Environment Agency, (February 2012), EPR 6.09 sector guidance note, How to comply with your environmental permit for intensive farming. Appendix 9: Producing a proposal for covering slurry stores.

Further guidance can be located at www.gov.uk, apart from the ADBA tool which can be found at [ADBA | Anaerobic Digestion & Bioresources Association \(adbioresources.org\)](http://adbioresources.org)

Control of Diffuse Emissions to Air from open tanks

Emissions to air in relation to feedstock controls, storage, ineffective processing and/or ineffective abatement systems can cause pollution. The control of diffuse emissions to air is a fundamental principle in pollution prevention at industrial sites and waste management facilities. The containment and collection of diffuse emissions is considered to be BAT for the waste treatment sector and is a standard requirement of an environmental permit.

The Site stores and treats significant volumes of sludge and liquids that have the potential to cause pollution through the release of diffuse emissions if systems are not effectively implemented to ensure adequate containment and/or abatement.

BAT 14 requirements

BAT Conclusion 14 of the BREF for Waste Treatment states:

“In order to prevent or, where that is not practicable, to reduce diffuse emissions to air, in particular of dust, organic compounds and odour, BAT is to use an appropriate combination of the techniques....”.

The appropriate techniques for the prevention, or where that is not practicable, the reduction of diffuse emissions to air from open tanks are listed in table 1 of the BREF and an extract from this is set out below.

Table 1: BAT 14 relevant techniques

Technique		Description	Applicability
d	Containment, collection and treatment of diffuse emissions	<p>This includes techniques such as:</p> <ul style="list-style-type: none"> storing, treating and handling waste and material that may generate diffuse emissions in enclosed buildings and/or enclosed equipment (e.g. conveyor belts); maintaining the enclosed equipment or buildings under an adequate pressure; collecting and directing the emissions to an appropriate abatement system, via an air extraction system and/or air suction systems close to the emission sources 	The use of enclosed equipment or buildings may be restricted by safety considerations such as the risk of explosion or oxygen depletion. The use of enclosed equipment or buildings may also be constrained by the volume of waste.

The Applicant did not submit appropriate proposals or provide any evidence of why such proposals were unnecessary or inapplicable to meet BAT 14d in relation to the containment, collection and treatment of diffuse emissions from open tanks on the Site in line with BAT requirements. In the absence of any sufficient justification to the contrary, we consider techniques in BAT 14d to be appropriate techniques to demonstrate BAT to prevent or, where that is not practicable, to reduce diffuse emissions to air.

We requested information in Schedule 5 Notice 2 through question 14, and we provided the Applicant with a final opportunity to provide the information requested in the Final Opportunity Letter. In the Final Opportunity Letter, we stated that after the specified response deadline (1 April 2022), we would continue to determine the Application on the basis of the information we had received by then.

The Final Opportunity Letter required the Applicant to provide, amongst other things, a description of any alternative techniques proposed for the control of diffuse emissions from all open tanks, and to demonstrate how they would provide a level of environmental protection that would be at least equivalent to the techniques specified in BAT conclusion 14. We also requested a cost benefit analysis of any proposed alternative method.

In the response to the Final Opportunity Letter, the Applicant identified seven open tanks. Table 2 below identifies the open tanks specified in the Application.

Table 2 – Open Tanks

Tanks	Volume m ³	Contents
2 x Liquor Balancing Tanks	1,000	Centrate from the post-digestion centrifuge process
2 x Mixing and Balancing Tanks	2,000	Screened raw sludge

Unthickened Sludge Tank	1,800	Indigenous flow
2 x Emergency Storage Tanks	Not advised	Contingency storage Capacity

The open tanks identified in this table did not match with, or correspond to, the information provided by the Applicant in the Environmental Quantitative Risk Assessment (EQRA), which also identified that the gravity belt thickener (GBT) Feed Tanks No. 1, 2, 3, 4 were open tanks (which was confirmed by pictures provided in the EQRA showing these tanks as being open).

The Applicant advised that the identified tanks in table 2 were “existing assets which have been used at Blackburn for many years without any evidence of nuisance odour”. They further stated that they believed that “the potential investment required is disproportionate to the risk of diffuse emissions from the identified open tanks at Blackburn” identifying concerns in relation to:

- A structural survey of tanks being required to determine if the existing structures would be capable of supporting the additional loads that they would be subjected to by an engineered cover or roof.
- The design of the open tanks at Blackburn potentially not being suitable for the installation of covers with supplementary engineering elements potentially required increasing the scope of works required.
- The risk of gas build-up to concentrations within the explosive range
- The health and safety risks associated with undertaking operational and maintenance tasks on covered tanks

The Applicant advised that they had considered alternative measures such as floating covers but had not considered these appropriate due to the equipment present within the tanks, but did not provide any evidence, information or assessment to support this statement

While the Applicant raised concerns in relation to the containment, collection and treatment of diffuse emissions from open tanks they provided no evidence to support the statements provided. The Applicant did not provide a cost benefit analysis to demonstrate any disproportionate cost, and they proposed no timescales for the structural assessment of tanks.

The Applicant proposed a program of monitoring for ammonia, hydrogen sulphide and organic compounds carrying out 2 samples over a 12-month period with a view to confirming the low risk of diffuse emissions. The Applicant stated this would identify opportunities to reduce the potential source of diffuse emissions (e.g. by reducing the number of open tanks in routine use); or developing a solution if unacceptable emissions were identified and stated that they would provide the completion of an IED derogation cost-benefit analysis tool if required.

The Applicant requested as part of the Application a derogation from BAT 14 for the open tanks, however the formal derogation process only applies to associated emission levels (AELs) which are not applicable to open tanks as the relevant BAT

technique requires “storing, treating and handling waste and material that may generate diffuse emissions in enclosed buildings and/or enclosed equipment”. This is not a prescriptive requirement, however, any deviation from identified BAT would require evidence to demonstrate either that:

- any alternative technique would provide at least the same level of environmental protection that is equivalent to the BAT
- there are specific and demonstrable reasons why the BAT should not apply in this case
- there are specific and demonstrable reasons why a lower standard of environmental protection should be permitted

No evidence in support of any of these points has been provided by the Applicant.

Unless the applicability criteria say otherwise, BAT is usually considered to be affordable across the industry sector as a whole for both newly built plant and a “typical” existing plant. A cost benefit analysis is only relevant in cases which qualify for a derogation from BAT and cost alone would not be considered sufficient or appropriate as a reason for a derogation/deviation from BAT.

On assessment of this proposal, the Applicant has not specified the standards to which the emissions would be monitored i.e., monitoring emissions to air, land, and water Monitoring Certification Scheme (MCERTS). In addition, the Applicant has not demonstrated that the emissions identified as those proposed to be monitored would assess pollutants in the waste diffuse gas as no characterisation of the potential diffuse emission has been carried out. No justification has been provided to demonstrate to our satisfaction that 2 samples over a 12-month period would provide a representative sample of emissions being produced.

As stated in BAT 14d, we recognise that the use of enclosed equipment or buildings may be restricted by safety considerations such as the risk of explosion or oxygen depletion, but the Applicant must justify this from the use of techniques that are not BAT and demonstrate that the alternative techniques will adequately control the pollution risk to a standard at least equivalent to BAT. To demonstrate this, the Applicant will either have to prove there is no risk or that suitable and sufficient measures are, or will be, in place. The Applicant has not demonstrated how they would prevent or, where that is not practicable, reduce diffuse emissions to air in line with BAT requirements or proposed suitable equivalent alternative measures for open tanks.

The approach provided by the Applicant to assess emissions from open tanks does not provide a robust method to determine potential emissions. Not all relevant tanks have been included within the proposal, and no timescales have been proposed for solutions to be developed following an assessment. We consider that the Applicant’s proposals to prevent or, where that is not practicable reduce diffuse emissions to air do not meet BAT or provide an appropriate alternative equivalent level of protection. We do not consider that the Applicant has demonstrated that the risk posed by the diffuse emissions from open tanks will be controlled by suitable techniques, which are identified in BAT 14d as:

- Storing, treating and handling waste and material that may generate diffuse emissions in enclosed buildings and/or enclosed equipment
- Maintaining enclosed equipment or buildings under an adequate pressure
- Collecting and directing emissions to an appropriate abatement system, via an air extraction system and/or air suction systems close to the emission sources

We do not have sufficient information to assess and have not been provided with suitable proposals on which we could impose an improvement condition. Whilst it may be possible to use an improvement condition to allow time for BAT to be achieved, we need to be satisfied it will be achieved. It is not suitable or appropriate to use improvement conditions as an opportunity for an Applicant to work out how they will demonstrate BAT after an application has been consulted on and determined.

For a pre-operational condition, we need to be satisfied in principle, in advance of operation, that the proposals are BAT, even if some of the fine detail can be provided later. As explained earlier, the facility is already operational so a pre-operational condition for the existing open tanks cannot be imposed.

Containment

Background Information

Containment is a fundamental principle in pollution prevention at industrial sites and waste management facilities. We assess containment provisions when determining permit applications. Secondary containment is BAT for the waste treatment sector and is a standard requirement of an environmental permit. This section of the decision document explains why we do not consider that the Applicant has demonstrated the use of BAT in relation to containment. The Applicant attempted to consider alternatives to BAT requirements for secondary containment, however, the information submitted provided further evidence demonstrating that without effective secondary containment infrastructure, there could be significant pollution at sensitive receiving environments. In particular on Hole Brook.

The Site stores and treats significant volumes of sludge and liquids that have the potential to cause pollution to the environment, in particular, land and water receptors. The Site is co-located with a WwTW. Hole Brook, that enters the River Darwen, runs to the east and south boundary of the Site.

The Site has little in the way of secondary containment provision. Impermeable and permeable surfacing in place across the Site would provide little protection to receptors in the event of a loss of containment, and the underground and partially submerged tanks on Site have no leak detection measures in place.

The most likely receptors that we consider could be impacted by a loss of containment include groundwater (aquifers), watercourses, conservation designations (SSSI, SAC, SPA, Ramsar, protected habitats and protected species),

the adjacent WwTW and human receptors such as nearby residential and commercial premises.

Given the number, significance, and complexity of the WaSC sludge AD facilities that are required to be permitted as a result of the implementation of the IED, we provided WaSCs with additional support and advice, including two workshops specifically about secondary containment on what an applicant should have regard to when assessing their facilities. We consider that the advice, and timescales afforded to the WaSCs, including the Applicant, to submit supporting information, is above and beyond that which would typically be given to applicants for environmental permits generally.

For existing operational plant and infrastructure, we have required that an assessment of the current operational facilities be undertaken in line with CIRIA C736 requirements, with alternative proposals submitted to provide at least an equivalent level of environmental protection for assets which do not, or cannot, meet indicative BAT. For new plant and infrastructure (in the case of the Application, the assets associated with the acceptance of sludges from the Nereda system), the only plant we are treating as new plant, we require applicants to design infrastructure and plant to meet BAT requirements taking into account relevant guidance such as CIRIA C736. Therefore, new plant and infrastructure should be compliant with BAT from the date of permit issue.

We advised the WaSCs to provide two main components of assessment to demonstrate and identify the class of containment ('class of containment' is defined in CIRIA C736) required for the existing and any new plant and infrastructure, and where this class was not met for existing plant and infrastructure, provide measures to provide an equivalent level of environmental protection for identified receptors. This would also demonstrate, where relevant, that any new plant and infrastructure would be built to the relevant class of containment required, so as to comply with BAT requirements.

The two components are:

- Containment assessment against the recommendations of CIRIA C736 guidance - Containment systems for the prevention of pollution: Secondary, tertiary and other measures for industrial and commercial premises. This guidance is widely recognised as the industry standard for containment systems.
- Completion of the ADBA tool to identify sources, pathways and receptors, and risks.

We also advised that a spill modelling assessment should be provided to support this, to demonstrate the effectiveness of current containment measures and any identified improvements.

We advised the WaSCs of the requirements of containment assessments on multiple occasions, including:

- At a workshop held by Water UK in February 2020 (Water UK members are UK water and wastewater service suppliers for England, Scotland, Wales and Northern Ireland, the Applicant is a member of Water UK) – Presentation Title: Permitting Overview – Including section on containment – Surfacing, bunding and capacity, presented by Senior Permitting Officer – Installations.
- Written advice sent in March 2021 by the Environment Agency including.
 - Specific sector pre-application advice note.
 - BAT gap analysis template tool.
- Presentation on 14 July 2021, delivered to Water UK, Titled: IED Permitting TaF + Spill Modelling. Attended by United Utilities Water Limited in which spill modelling was specifically discussed, along with a reiteration of application requirements. Spill modelling seminar presented by David Cole – Member of the Project Steering Group of CIRIA C736.

This is in addition to Schedule 5 Notices and requests for further information sent as part of this Application.

There are also various additional references to containment in guidance that is widely disseminated in the industry including:

- Waste Treatment BAT Conclusions.
- [Environmental permitting guidance on the control of emissions \(gov.uk\)](#).
- How to comply with your environmental permit. Additional guidance for: Anaerobic Digestion Reference LIT 8737 Report version 1.0 dated November 2013.
- [Appropriate measures for the biological treatment of waste](#) – consultation document and response comments.
- [Emissions control - Non-hazardous and inert waste: appropriate measures for permitted facilities](#) - This is not directly applicable to biological treatment but will be replicated in the appropriate measures as mentioned in the above bullet point.
- [SR2021 No 10: anaerobic digestion of non-hazardous sludge at a waste water treatment works, including the use of the resultant biogas](#). This specifically applies to sludge AD facilities.

BAT 19 requirements

BAT Conclusion 19 of the BREF for Waste Treatment states:

“In order to optimise water consumption, to reduce the volume of wastewater generated and to prevent or, where that is not practicable, to reduce emissions to soil and water, BAT is to use an appropriate combination of the techniques...”.

The appropriate techniques for the prevention, or where that is not practicable, the reduction of emissions to soil and water from primary risks identified as tank failure, leakage, and the transfer and handling of wastes and raw materials are listed in table 3, an extract from this is set out below.

Table 3: BAT 19 relevant techniques

Technique		Description	Applicability
c	Impermeable surface	Depending on the risks posed by the waste in terms of soil and/or water contamination, the surface of the whole waste treatment area (e.g. waste reception, handling, storage, treatment and dispatch areas) is made impermeable to the liquids concerned.	Generally applicable.
d	Techniques to reduce the likelihood and impact of overflows and failures from tanks and vessels	Depending on the risks posed by the liquids contained in tanks and vessels in terms of soil and/or water contamination, this includes techniques such as: <ul style="list-style-type: none"> • overflow detectors; • overflow pipes that are directed to a contained drainage system (i.e. the relevant secondary containment or other vessel); • tanks for liquids that are located in a suitable secondary containment; the volume is normally sized to accommodate the loss of containment of the largest tank within the secondary containment; • isolation of tanks, vessels and secondary containment (e.g. closing of valves); 	Generally applicable.
h	Design and maintenance provisions to allow detection and repair of leaks	Regular monitoring for potential leakages is risk-based, and, when necessary, equipment is repaired. The use of underground components is minimised. When underground components are used and depending on the risks posed by the waste contained in those components in terms of soil and/or water contamination, secondary containment of underground components is put in place.	The use of above-ground components is generally applicable to new plants. It may be limited however by the risk of freezing. The installation of secondary containment

			may be limited in the case of existing plants.
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CIRIA C736

CIRIA C736 is considered the industry standard of choice and is based on the source-pathway-receptor approach to risk assessment. It provides a clear methodology for demonstrating BAT, appropriate measures and compliance with permit conditions.

It is applicable for identifying and managing the risk of storing substances which may be hazardous to the environment and applies to everything from small commercial premises to large chemical facilities. It primarily considers the potential consequences of tank failure and provides a risk assessment methodology to support a classification system for containment, providing different levels of performance for different risks. The aim is to break the pathway between source and receptor.

The guidance provides containment options and examples of good practice, but it is not prescriptive and there may be circumstances where it could be appropriate to use other methods where at least an equivalent level of environmental protection is provided.

Due to the nature of sewage sludge, cake or liquor, it is clear that this would be considered to be both a short and long-term hazard to the environment if released. Given the locations of these facilities generally, it is reasonable to conclude that any major tank failure at an individual facility has the potential to cause significant damage to sensitive receptors.

Where CIRIA C736 measures are not considered to be relevant or appropriate for a specific facility, an explanation should be provided using a risk-based approach. For existing facilities where measures cannot easily be achieved, we expect alternative measures to be proposed which achieve at least an equivalent standard to provide the same level of environmental protection. It should be recognised however that CIRIA C736 includes specific guidance for operators who need to implement secondary containment provisions at existing facilities.

Newly built facilities and assets should be designed and built to CIRIA C736 report recommendations or to at least an equivalent approved standard. Newly built facilities and assets not designed and built to CIRIA C736 report recommendations, or to at least an equivalent standard would not be considered to provide suitable primary and secondary containment, and as such would not comply with BAT. Existing facilities may be unlikely to be compliant with CIRIA C736 due to the viability of retrofitting to meet the recommendations. However, the same containment

assessments are still required, and improvements should be proposed to demonstrate at least equivalent appropriate measures of environmental protection.

ADBA tool and guidance

The ADBA tool and guidance have been specifically designed as a guide for secondary containment for anaerobic digestion. The guide states “Both the guide and the classification tool draw upon the principles and methodologies within CIRIA C736. The principles within CIRIA C736 are generally accepted as good practice in the design and construction of containment systems. The principles of CIRIA C736 are distilled into this accessible guide, which attempts to draw out the parts relevant to the AD sector.”

The tool itself is clearly set out to provide an inventory of sources, pathways and receptors and aligns with the containment system class types in CIRIA C736. It provides risk ratings and allows mitigation measures to be considered.

Alternative assessment methods

Where our guidance refers to CIRIA C736, it also allows for the use of other at least equivalent approved standards. This provides operators/applicants with the flexibility of using other standards, but they must offer at least the same level of environmental protection.

Where CIRIA C736 and ADBA tool assessments, or at least equivalent approved standards, are not provided, it is difficult or impossible to satisfactorily assess permit applications for compliance with BAT, appropriate measures, or an environmental permit.

Summary Application information

The Applicant did not submit appropriate proposals or provide evidence of why such proposals were unnecessary in the Application so as to meet BAT 19 or equivalent. This is specifically in relation to the prevention or where that is not practicable the reduction of emissions to soil and water from primary risks identified as asset/tank failure, leaks, and the transfer and handling of wastes and raw materials in line with BAT requirements. In the absence of any sufficient justification to the contrary, we consider techniques in BAT 19c, 19d and 19h to be an appropriate combination of techniques in this case to demonstrate BAT to prevent pollution of soil and water.

We requested information about this in Schedule 5 Notice 1 through questions 15, 16 and 19 and Schedule 5 Notice 2 through question 25. The questions were as follows:

- Q15 - The provision of a site plan showing areas of impermeable and permeable surfaces.

- Q16 - A request to explain how leak detection and maintenance would be carried out for underground tanks and pipes to ensure that contamination to groundwater and soil would be managed.
- Q19 - The provision of a risk assessment, and analysis of containment measures on site in line with CIRIA C736 guidance, requesting where guidance could not be met, the proposal of alternative measures that would achieve the same level of environmental protection.
- Q25 - A request to explain how leak detection is undertaken for underground tanks and pipework. How maintenance would be carried out for underground tanks and pipework, and for confirmation of the integrity of underground tanks and pipework and when this was last checked.

We again requested information on 2 December 2021 by e-mail in relation to question 15 and 19 of Schedule 5 Notice 1 as the information submitted by the Applicant had not addressed the questions we had raised.

We provided the Applicant a final opportunity to provide the information requested in the Final Opportunity Letter, in which we stated that after the response deadline in that letter (1 April 2022), we would continue to determine the Application on the basis of the information we had received by then.

The Applicant was given multiple opportunities to provide the requested information over an extended period. Table 4 below summarises the information submitted by the Applicant during the determination in relation to containment.

Table 4 – Requests and responses to questions in relation to BAT 19

Originally requested	Question	Response/document provided	Date provided
Request for further information dated 10/05/21	Q1b – Provide a site plan identifying areas of impermeable surfacing, permeable surfacing, and the location of containment kerbs	IED – Site Surveys and Permitting Blackburn WwTW Site Surfacing plan.	01/04/2022
Schedule 5 Notice 1, dated: 25/06/21	Q15 – Permeable and impermeable surfacing	IED – Site Surveys and Permitting Blackburn WwTW Site Surfacing plan.	01/04/2022
Schedule 5 Notice 1, dated: 25/06/21	Q16 – Leak detection and maintenance of underground tanks	Applicant provided a part response advising that further information would be submitted as part of the containment assessment report provided in response to question 19 of Schedule 5 Notice 1. On assessment of	10/09/2021

		this report, this question had not been addressed.	
		Written response provided	07/04/2022
Schedule 5 Notice 1, dated: 25/06/21	Q19 – Containment	EQRA for Blackburn Wastewater Treatment works, Ref: 331001867R4 D1, dated; November 2021. (23 pages)	30/11/2021
		ADBA Containment Classification Tool	07/02/2022
		EQRA for Blackburn Wastewater Treatment works, Ref: 331001867R42, dated; April 2022. (224 pages)	17/05/2022
		Secondary Containment Modelling Assessment, revision 2, dated; 06/05/2022	27/05/2022
		Written response addressing issues raised in letter dated 21/02/2022.	07/04/2022
Schedule 5 Notice 2, dated: 15/10/21	Q25 - Overflows of tanks and vessels	Written response provided.	07/12/2021

Our assessment

BAT 19c – Impermeable surfacing

Summary

We consider that the Applicant has not demonstrated how they would meet the requirements of BAT19c. Nor have they, in the alternative, demonstrated either that this BAT requirement is not applicable or provided suitable alternative measures that would provide at least the same level of environmental protection for emissions to soil and water from key risks. These risks are identified in the Applicants fugitive risk assessment provided as part of the Application as leaks/spills from treatment process and plant, leaks/spillages from connective pipelines, spillage of sludge, failure of any of the pipework on the installation and loss of containment of vessels. It is noted that BAT 19c is generally applicable to all sites including existing sites.

Impermeable surfacing is required in operational areas to prevent soil and water contamination. The Applicant stated in their Application Support Document dated March 2021 that *“The site is mainly impermeably surfaced with a sealed drainage system that returns all drainage back to the flow to full treatment within the WwTW”*. The Site surfacing plan identified areas within the proposed permitted boundary that are *“Grass/ Soft Landscaping”* or *“Mixed Surfacing (Gravel with Concrete)”* which

procedure initiated, ensuring a rapid clean up. SCADA controls would also, via a number of surrogate metrics, such as level monitoring, transfer, pump and valve status, provide rapid process control indications of certain loss of containment scenarios.

- A fleet of sludge tankers across the region which could form part of operational response to sludge spills.
- Increasing the area of hard standing would reduce rainwater dispersal through infiltration and increase the amount of rainwater flow collected and returned to the WwTW through surface water drainage.
- Large amounts of concrete involved would incur high capital and carbon costs, impacting United Utilities specific aim of achieving net zero carbon emissions by 2030.
- The site geology is underlain by the Triassic Sherwood Sandstone Group and the Carboniferous Millstone Grit Group which is overlain by Glacial Till, referred to as Boulder Clay on older geological maps.

We disagreed that the factors outlined above would provide an equivalent level of environmental protection to the provision of impermeable surfacing as outlined in BAT 19c (provision of impermeable surfacing). Information provided by the Applicant was vague and did not demonstrate how the proposals would mitigate any impact in the event of catastrophic failure. While the Applicant proposed the use of a fleet of sludge tankers, it was not clear how this would minimise any environmental impact, and no further details were provided in relation to the maintenance plans proposed to minimise the risk of tank failure.

It will be noted that the Applicant advised that large amounts of concrete would incur high capital cost and impact the Applicant's aim of achieving net zero. However, the Applicant did not provide any evidence of, or otherwise demonstrate, the carbon impact, or consider alternatives to the use of concrete for impermeable surfacing. Unless the applicability criteria states otherwise, the BAT is usually considered to be affordable across the industry sector as a whole for both newly built plant and a "typical" existing plant. A cost benefit analysis in relation to impermeable surfacing would not be appropriate in relation to the Application as it is only relevant in cases which may qualify for a derogation (or deviation) from BAT AELs. In any event, cost alone is not a valid reason for seeking a derogation (or deviation) from BAT AELs and so is of even less relevance to other aspects of BAT.

The Applicant specified the site geology as a potential factor in not providing impermeable surfacing but did not carry out a suitable risk assessment to demonstrate that the impact of any spillage would be within the relevant environmental standards, or in concentrations that are the same as the natural background levels in the groundwater. As such no evidence was provided to support the Applicant's submission that this should be considered as a factor in providing at least equivalent environmental protection to an impermeable surfacing in line with BAT 19c.

The Applicant proposed no solutions for areas of permeable surfacing to prevent the contamination of soil and water in line with BAT requirements.

The Applicant did not make any proposals to implement impermeable surfacing across the proposed operational areas which include waste reception, handling/transfer, storage treatment and despatch areas. Nor did the Applicant demonstrate that suitable alternative options had been explored.

We consider that the risks posed by the waste and raw materials stored on Site, in terms of potential soil and or water contamination, are significant enough to require that these storage areas are made impermeable to the liquids concerned in line with BAT 19c requirements or that alternative protection to at least an equivalent standard is provided. No such proposals have been made.

We consider it would not be appropriate to use improvement conditions or pre-operational conditions to address these issues which are fundamental principles of environmental protection. The Applicant has not submitted proposals for the implementation of impermeable surfacing prior to the commencement of operation of the new assets associated with the acceptance of sludges from the Nereda system in line with BAT 19c requirements. For existing areas, the Applicant had not proposed suitable measures that would provide environmental protection for emissions to soil and water to meet the requirements set out in BAT 19c or to at least an equivalent standard of protection.

We do not have sufficient information to assess and have not been provided with suitable proposals on which we could implement an improvement condition. Whilst it may be possible to use an improvement condition to allow time for BAT to be achieved, we need to be satisfied it will be achieved. It is not suitable or appropriate to use improvement conditions as an opportunity for an applicant to work out how they will demonstrate BAT after an application had been consulted on and determined.

For a pre-operational condition, we need to be satisfied in principle, in advance of operation, that the proposals are BAT, even if some of the fine detail can be provided later. As explained earlier, the facility is already operational so a pre-operational condition for the existing operations (excluding assets associated with the acceptance of sludges from the Nereda system) cannot be imposed.

We therefore consider that the Applicant has failed to demonstrate their proposals regarding the provision of impermeable surfaces are BAT or would be within a reasonable time were we to permit the Application.

BAT 19d – Overflows and failures

Summary

We consider that the Applicant has not satisfactorily demonstrated how they would meet the requirements of BAT19d, in relation to the provision of techniques to reduce the likelihood and impact of overflows and failures from tanks and vessels, nor proposed suitable alternative measures providing at least equivalent levels of protection.

With regards to the secondary containment aspect of BAT, the Applicant provided a 'Secondary Containment Modelling Assessment' dated: 17/05/2022, an ADBA tool received 07/02/2022, and an EQRA dated April 2022.

We consider that:

- The EQRA report is not an equivalent to a CIRIA C736 assessment and does not demonstrate BAT.
- The spill modelling and improvements are incomplete.
- The ADBA tool is incomplete.

Our permits include standard permit conditions regarding the control of emissions, which require that:

“All liquids in containers, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.”

As explained in earlier sections of this document, part of the facility is already operational. We therefore consider that, taking into account the containment information provided, the Applicant would have been immediately in breach of this condition had we granted the variation to the Permit.

Spill modelling and improvements

The Applicant provided spill modelling, which was conducted for eighteen higher risk tanks identified in Table 6 below, which it grouped into 5 areas.

Table 6 – Applicant’s identified high risk tanks

Group	Tanks	Volume m ³	Description	Leak detection system present	Secondary containment in place
1	Digester No. 1	2,500	Partially buried concrete. Applicant advised almost 12m above ground.	No	Yes, but insufficient volume
	Digester No. 2	2,500		No	Yes, but insufficient volume
	Digester No. 3	2,500		No	Yes, but insufficient volume
	Digester No. 4	2,500		No	Yes, but insufficient volume
	Post Digestion Tank No. 3	1,200	Glass fused to steel, above ground	No	No

2	Post Digestion Tank No. 1	900 (350)	Partially buried concrete, Applicant had suggested 2m of the tank was above ground and so only 350cum considered per tank	No	No
	Post Digestion Tank No. 2	900 (350)		No	No
	Sludge Import Tank	500	Glass fused to steel, above ground	No	No
3	Thickened Sludge Holding Tank	1,200	Glass fused to steel, above ground	No	No
4	EEH Reactor No. 1	280	Glass fused to steel, above ground	No	Yes ⁽¹⁾
	EEH Reactor No. 2	280		No	Yes ⁽¹⁾
	EEH Reactor No. 3	280		No	Yes ⁽¹⁾
	EEH Reactor No. 4	280		No	Yes ⁽¹⁾
	EEH Reactor No. 5	280		No	Yes ⁽¹⁾
	EEH Reactor No. 6	280		No	Yes ⁽¹⁾
5	Liquor Balancing Tank No. 1	500	Glass fused to steel, above ground	No	No
	Liquor Balancing Tank No. 2	500		No	No
	Unscreened Sludge Buffer Tank	1,800		No	No
Note [1] – Applicant advised as part of the EQRA (April 2022) Appendix C EQRA Workbooks that effective secondary containment was in place. No explanation, type, or class of containment in line with CIRIA C736 was provided for the tank identified.					

The modelling illustrates that in the event of a catastrophic failure of the assessed tanks, with the current infrastructure, waste could spread to permeable ground, breach the permit boundary, breach the wider Site boundary, and potentially impact

the WwTW and identified receptors, including Hole Brook, the River Darwen and a drainage ditch. Figures 3, 4, 5, 6 and 7 below are taken from the report.

Figure 3 – Digester No. 4 Burst



Source: Secondary Containment Modelling Assessment Dated 17/05/2022 - (Figure: 7: Blackburn STC predicted flow paths following Digester No. 4 Burst)

Figure 4 – Post Digestion Tank No. 2 Burst



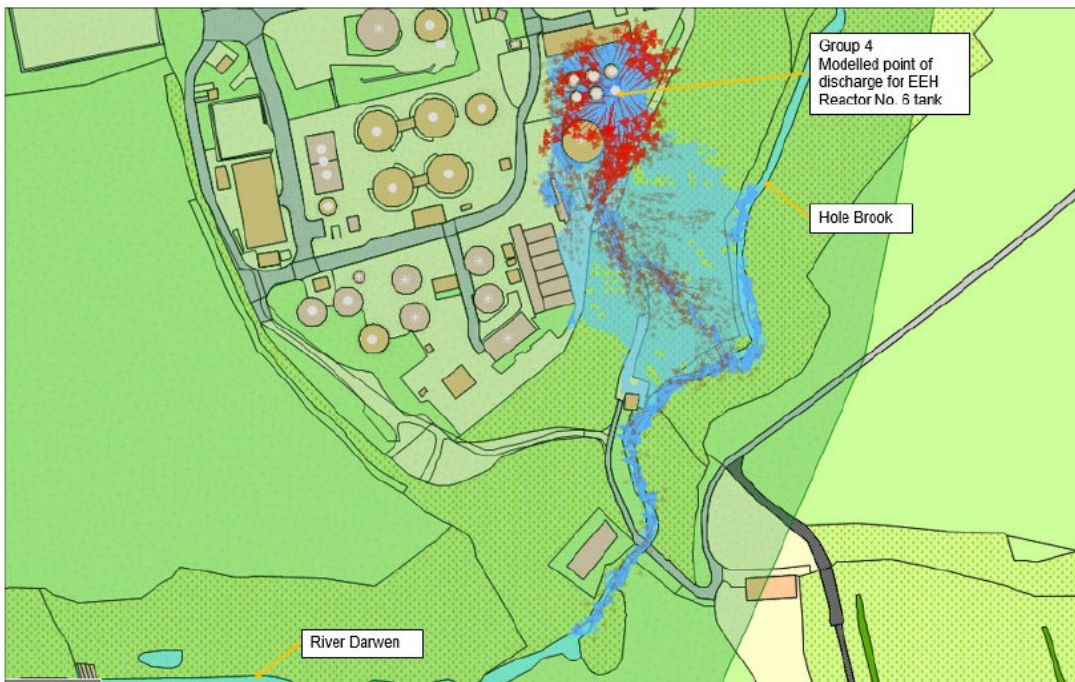
Source: Secondary Containment Modelling Assessment Dated 17/05/2022 - (Figure: 9: Blackburn STC predicted flow paths following Post Digestion Tank No. 2 burst)

Figure 5 – Centrate Tank Burst



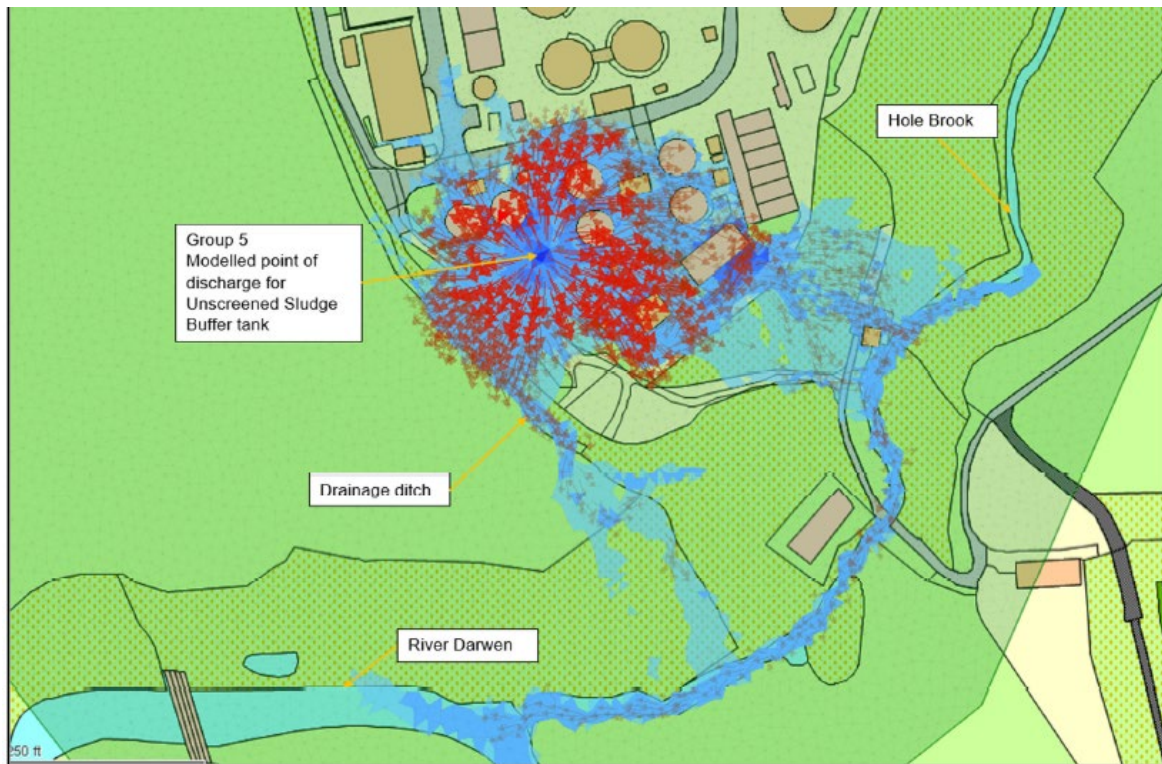
Source: Secondary Containment Modelling Assessment Dated 17/05/2022 - (Figure 11: Blackburn STC predicted flow paths following Centrate tank burst).

Figure 6 – EEH Reactor No. 6 Tank Burst



Source: Secondary Containment Modelling Assessment Dated 17/05/2022 - (Figure 13: Blackburn STC predicted flow paths following EEH Reactor No. 6 Tank Burst.).

Figure 7 – Unscreened Sludge Buffer Tank Burst



Source: Secondary Containment Modelling Assessment Dated 17/05/2022 - (Figure 15: Blackburn STC predicted flow paths following Unscreened Sludge Buffer Tank Burst.).

The Applicant did not include all relevant above ground tanks in the Secondary Containment Modelling Assessment. Relevant Tanks in CIRIA C736 are identified as tanks that store substances which may be flammable/combustible or hazardous to the environment. Relevant above ground tanks identified by the Applicant in the EQRA that could not be identified in the Secondary Containment Modelling Assessment have been identified in table 7 below.

Table 7 – Tanks identified in the EQRA but not included in Secondary Containment Modelling Assessment.

Tanks	Volume	Description
Sludge Reception Tank No. 1	Between 100m ³ and 1000m ³	Identified in EQA report dated April 2022 and advised “asset subject to spill modelling”
Sludge Reception Tank No. 2	Between 100m ³ and 1000m ³	Identified in EQA report dated April 2022 and advised “asset subject to spill modelling”

Centrifuge Feed Tank	Between 100m ³ and 1000m ³	Post Primary Digested Sludge
Centrate/Filtrate Settlement Tanks	Could not locate	Identified on site plan, advised to be decommissioned, but no date provided.

The Applicant also identified overground and buried pipe work as part of the assets in the EQRA, with some pipework being identified as not BAT compliant. The Applicant advised that this pipework would “require further investigation” however proposed no measures to undertake this investigation, to undertake any necessary works to bring the identified pipework up to BAT requirements or proposed any timescales to achieve this.

The Applicant identified within the EQRA that some tanks were fitted with overflow protection and identified that other tanks were “Self-contained / has a lid”. BAT 19 identifies overflow detectors as a suitable technique. We do not consider that a lid on a tank would provide the same level of protection as an overflow detector. We identified that 22 of the tanks did not have in place overflow detectors.

As part of the spill model, the Applicant has based the predicted spillages on either “110% of the largest tank capacity, or 25% of the aggregate capacity (whichever is greater)”. CIRIA C736 states that for 25% of the total capacity to be used, the tanks must not be hydraulically linked, in which case they should be treated as if they were a single tank. On assessment of the Applicant’s Secondary Containment assessment, the 25% calculation had been used for groups 1 and 4, however we could see no consideration or assessment to demonstrate and confirm that the tanks were not hydraulically linked, and as such could not determine for groups 1 and 4 that the spill models were representative.

The proposals identified for groups 1 to 5 did not address all potential scenarios such as jetting through the rupture or corrosion of a tank wall, which CIRIA C736 requires to be taken into consideration in bund wall heights and distance from the tank.

The EQRA, Secondary Containment Modelling Assessment and Application Support Document provided conflicting information on tanks, volumes and names which made determination difficult. An example of this is included in the Thickened Sludge holding tanks which were referred to as the EEH buffer tank on the Site plan. These tanks were also identified as having conflicting reported volumes with 1,400m³ capacity being stated in the Application Support Document, but 1,200m³ capacity being identified in the Secondary Containment Modelling Assessment. A further example of this included the Post Digestion Tank 1 which was identified as 1,200m³ total capacity in the Secondary Containment Modelling Assessment, but 1,400m³ in the Application Support Document.

It is noted that as part of the EQRA, the Applicant advised that for some tanks, suitable secondary containment had been provided, however no information on

what class of containment in line with CIRIA C736 was provided, and as such we could not determine whether any such containment was suitable.

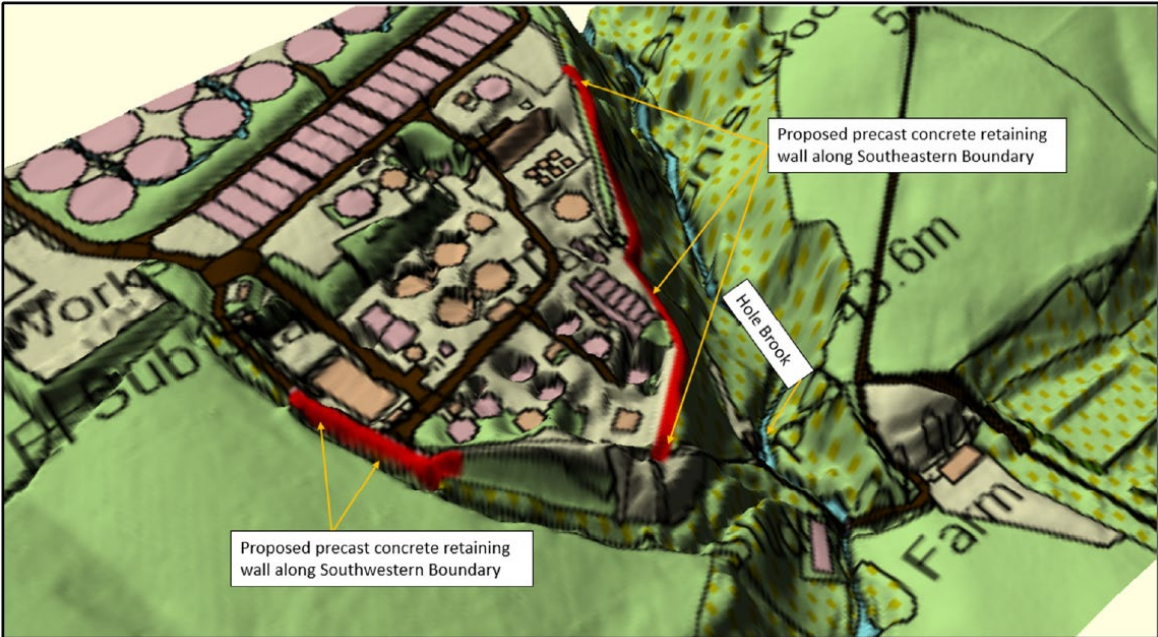
The assets associated with the acceptance of sludges from the Nereda system, identified as two enclosed sludge reception tanks, drum thickeners and lamella tank (the Nereda Assets), were identified by the Applicant as new assets due to commence operation in 2022. These assets had been built after the WaSCs were advised in 2019 that their sewage sludge anaerobic digestion (AD) facilities needed to comply with the IED⁹.

The Applicant did not provide evidence that the Nereda Assets had been designed and built to CIRIA C736 report recommendations, or to at least an equivalent standard.

For the eighteen tanks modelled, the Applicant did outline proposals for secondary containment which they grouped into 5 main areas of the Site. However, the proposals provided were vague, did not demonstrate that containment capacities would be suitable for the volumes required to be contained and stated that identified solutions would contain spillages “wherever possible”, which is not sufficient or acceptable.

The Applicant did not propose containment solutions for tanks identified in Group 2. For Groups 1, 3, 4 and 5, the Applicant proposed to construct a one metre high retaining wall on the south-eastern and south-western edges of the Site to contain spillages within the impermeable areas ‘wherever possible’ (see comment above).

Figure 8 – Applicants proposed containment solution



⁹ [Directive 2010/75/EU - Industrial Emissions Directive](#)

Source: Secondary Containment Modelling Assessment Dated 17/05/2022 - (Figure 16: Proposed Mitigation Measures for Group 1, Group 3 and group 4 Assets.)

The Applicant's supporting information showed that in the event of a failure of Digester no 4 (Group 1), Thickened Sludge Holding Tank (Group 3), EEH Reactors (Group 4) and Unscreened Sludge Buffer tank (Group 5), spilled sludge would flow back into the Site and down the embankment on the south-eastern edge of the Site to the Hole Brook and River Darwen receptors. The information also demonstrates that, in the event of a failure of Group 5, sludge will reach the drainage ditch to the south-western edge of the Site.

On assessment of this solution the "*proposed pre-cast concrete retaining wall*" (identified as a red line on figure 8 above), would have contained a spill within areas identified in the Site surfacing plan as "Grass / Soft Landscaping", and "Mixed surfacing e.g. gravel with concrete" which have not been identified as impermeable surfaces. No calculations were provided to demonstrate that the solutions proposed would allow for the containment of 110% of the largest tank, or 25% of the total volume of the tanks, and no spill modelling has been undertaken to demonstrate the impacts of a tank failure following the implementation of the Site improvements identified. It was also identified that the solution provided in figure 16 by the Applicant did not include proposals to contain tanks identified in Group 5 which were identified as reaching receptors.

The proposals lacked the detail required for us to adequately assess improvements, they did not explain or provide information on existing containment in place, they did not address failures in tanks included and not included in the spill modelling, and they were not run through the spill modelling to show the impact following implementation or installation of the proposed solutions/improvements.

The information provided in the Application submissions did not satisfactorily demonstrate that the Applicant had adequately considered how they will meet BAT for new or existing tanks in relation to the provision of suitable secondary containment or propose suitable alternative measures that would provide at least the same level of environmental protection.

Initial EQRA¹⁰

The EQRA submitted on 30 November 2021 was in draft format, did not include identified appendices, or set out an alternative approach to CIRIA C736. On assessment we did not consider that it provided an equivalent approved standard to CIRIA C736, and we advised the Applicant on 2 December 2021 that their response did not address questions 15 and 19 in Schedule 5 Notice 1. We again communicated this to the Applicant in the Final Opportunity Letter, outlining that we had found significant deficiencies in the EQRA assessment against CIRIA C736

¹⁰ Environmental Quantitative Risk Assessment for Blackburn Wastewater Treatment Works, Dated November 2021

standards, and directly conflicting information against the ADBA assessment provided.

Final EQRA

The Applicant submitted a revised EQRA on 17 May 2022. The assessment was intended to propose an alternative assessment method to CIRIA C736 and included a lengthy report with conflicting information and conclusions when compared with the ADBA tool and Secondary Containment Modelling assessment previously provided. This made it difficult to assess key aspects of the Application, which we have identified below.

The EQRA stated that it was based on a source, pathway, receptor model following the principles of:

- The Anaerobic Digestion and Bioresources Association (ADBA) report: Secondary Containment at AD Plants: An Industry Guide, 2016
- The Construction Industry Research and Information Association (CIRIA) C736 report: Containment Systems for the Prevention of Pollution, 2014

The EQRA section of the report provided an alternative method to CIRIA C736 for the classification of containment, allocating a 'BAT or BAT equivalent status' for assets according to the perceived likelihood of fugitive emissions to cause harm to controlled waters allocating a 'Risk of Harm' score.

The risk of harm score provided that any asset allocated a score of 4.9 or below would be considered 'BAT or BAT equivalent', with a zero-score allocation if no source-pathway-receptor linkage was identified. On assessment of this approach, we could see no justification that a score of 4.9 or below would provide at least the same level of environmental protection as CIRIA C736.

Further concerns were identified within the scoring allocation with examples including:

- Scores could only be allocated for tanks up to 1000m³, with all tanks above this capacity being allocated the same score.
- Statutory habitats were scored based on the number of habitats, we could see no consideration of the habitat type, location, proximity or sensitivity being taken into account in the score allocation.
- Scores for specific areas were allocated based on a decimal point approach. E.g., a score of 0.2 was allocated for each statutory habitat identified up to 0.6 (three or more), where no further score allocation could be provided.
- Risk of harm score was based on the Total Leak Likelihood x Total Pathway rating x Total Receptor Rating. Due to the allocation of decimal point scores as identified above this could potentially reduce risk scores with no justification provided.

- Some assets were allocated a risk of harm score of 0 as the Applicant determined that the source-pathway-receptor linkage had been broken. This included the EEH Reactors No, 1 - 6, which were allocated a score of 0 for leak likelihood based on mitigating factors being in place to reduce the leak likelihood. No explanation of mitigating factors in place was provided apart from the indication in the score allocation. This score directly conflicted with the spill modelling report which showed that a tank failure would leave the Site boundary and enter Hole Brook, feeding directly into the River Darwen.

CIRIA C736 guidance is considered the industry standard of choice and is based on the source-pathway-receptor approach to risk assessment, providing a clear methodology for demonstrating BAT, appropriate measures and compliance with permit conditions. The ADBA classification tool draws upon the principles and methodologies within CIRIA C736 and when compared to the findings of the Applicant's completed EQRA and allocation of 'BAT or BAT equivalent status' for identified assets directly conflicted with the finding of the Applicant's submitted ADBA tool where a minimum of 'Class 2' containment was required. We therefore concluded that the EQRA could not be used as part of the determination process.

We do not consider the Applicant's EQRA report meets the recognised CIRIA C736 standard requirements or demonstrates that they have used a suitable alternative approach that would provide at least the same level of environmental protection. Some key areas of concern have been identified below:

- The findings of the EQRA directly conflict with the findings of the Applicant's ADBA tool and spill modelling assessment which identified that a 'Class 2' containment system was required, as per CIRIA C736. For example, the EQRA allocated a score of 4.3 for the digesters and allocated a 'BAT or BAT equivalent' status to the tank. The spill modelling showed a catastrophic failure would breach the permit and Site boundary, enter identified receptors, flow across permeable ground, and potentially impact the operability of the adjacent WWTW.
- The EQRA stated that the risk to controlled waters from the sludge tanks was insignificant. The Applicant specified that the EQRA was provided to identify the compliance in respect to BAT 19 in terms of fugitive emissions that may arise from an asset by way of leaks and/or spills. The Secondary Containment Modelling Assessment was provided to address catastrophic failures. The reports did not adequately address how regular monitoring of tanks would be carried out, with most tanks being identified as having no leak detection system in place. As such we could not identify how the report identified an equivalent standard for tanks assigned a 'BAT or BAT equivalent' status.
- The 'risk of harm' score provides that a score of below 4.9 determines the asset is 'BAT or BAT equivalent'. This appears to be an entirely arbitrary threshold. We can see no justification for how a score below 4.9 will provide the same level of protection as providing containment in line with BAT requirements.

- A score of zero is provided when no source, pathway, receptor linkage is identified, however not all potential receptors have been included within the assessment.
- The EQRA provides no details on the existing secondary containment present, apart from a Yes/No answer.

ADBA tool

The Applicant provided an ADBA assessment. The report determined that the Site's overall risk rating was medium with 'Class 2' containment required.

The three classes of containment are defined by increasing requirements in terms of design and construction integrity. Class 1 containment systems are provided where the risk of pollution arising from the storage of the inventory is relatively low, whereas class 3 containment systems are provided where this risk is relatively high.

On assessment of the ADBA tool, it did not include all relevant tanks identified in the EQRA report or include all relevant receptors.

As such we could not determine if the risk level associated with the ADBA assessment was suitable for the risk posed.

Conclusion

We consider that the information submitted to demonstrate compliance with BAT 19d is conflicting and incomplete. We have provided multiple opportunities for the Applicant to provide the information requested through Schedule 5 Notices 1 and 2 and requests for further information.

We consider that the Applicant's proposals to manage potential leaks, overflows or catastrophic failures do not meet BAT or provide an appropriate alternative at least equivalent level of protection. We do not consider that the Applicant has demonstrated that the risk posed by the liquids and sludges contained in the tanks and vessels in terms of soil and/or water contamination will be controlled by suitable techniques, which are identified as the provision of overflow detectors and suitable secondary containment in BAT 19d. This requires that site secondary containment should be 110% of the largest tanks or 25% of the aggregated tank volume, whichever is greater, taking into consideration rainfall and firewater, and allowing for suitable freeboard, and that overflow detectors should be provided.

The Applicant proposed timescales for the implementation of containment by 2026. However, the proposals lacked details, do not include all relevant tanks or provide clarity on how a solution would be achieved. We consider that an implementation date of 2026 is inappropriate and unacceptable when full appropriate provision should have been achieved from August 2022, nor is it clear that any containment provided would adequately protect the environment.

The Nereda Assets were identified as commencing operation during 2022. The Applicant identified in the EQRA that these assets did not have effective secondary containment present. As such we determined, based on the information provided by the Applicant, that the Nereda Assets had not been designed and developed to meet BAT which requires that tanks for liquids are located within suitable secondary containment.

As explained previously, we do not consider it appropriate to use improvement conditions or pre-operational conditions to address the issues identified, which are fundamental principles of environmental protection. While the Applicant provided a timescale for the implementation of proposals by 31 October 2026, this timescale is not acceptable, in any event, the proposals do not include sufficient information for the implementation of overflow measures, suitable secondary containment, or the isolation of tanks, vessels and secondary containment to demonstrate that they could be considered BAT.

As such we do not have sufficient information to assess and have not been provided with suitable proposals on which we could implement an improvement condition. Whilst it may be possible to use an improvement condition to allow time for BAT to be achieved, we need to be satisfied it will be achieved. It is not appropriate to use Improvement conditions as an opportunity for the Applicant to work out how they will demonstrate BAT after the application has been consulted on and determined.

For a pre-operational condition, we need to be satisfied in principle, in advance of operation, that the proposals are BAT even if some of the fine detail can be provided later. As explained earlier, the facility is already operational so a pre-operational condition for the existing operations (excluding the Nereda Assets) cannot be imposed.

BAT 19h – detection and repair of leaks

Summary

We consider that the Applicant has not satisfactorily demonstrated how they would meet the requirements of BAT 19h in relation to design and maintenance in order to satisfactorily be able to detect and repair leaks and did not propose suitable alternative measures providing at least equivalent environmental protection.

The Applicant has identified several partially submerged and fully submerged tanks identified in Table 8 below.

Table 8 – Partially submerged and fully submerged tanks.

Tanks	Total Capacity m ³	Description	Leak detection system present	Secondary containment in place
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Digester (x4)	10,000	Partially Buried	No	Yes, but insufficient volume
Post digestion Tanks (x2)	700	Partially Buried	No	No
GBT Feed Tank (x4)	Not provided	Wholly Buried	No	No
Supernatant Sump	Not provided	Wholly Buried	No	No
Thickened Sludge Tank	400	Wholly Buried	No	No
Unthickened Sludge Tank	1,800	Wholly Buried	No	No
Centrate Pumping station	Not Provided	Wholly Buried	No	No
Reliquified Sludge Pumping Chamber	Not Provided	Partially Buried	No	No
Emergency Storage tanks (x2)	Not Provided	Wholly Buried	Not Provided	Not Provided

We requested information on how leak detection and maintenance would be carried out in question 16 of Schedule 5 Notice 1, and question 25 of Schedule 5 Notice 2 and again in our Final Opportunity Letter. The Applicant advised that *“site inspection tours are carried out daily and will include visual inspection of assets, where possible, and inspection of the ground for any signs of leak or spillage”* identifying that signs of leakage could be *“staining, softer ground, odour or any deviation in appearance from normal conditions.”* The Applicant advised that some underground assets may be accessible for visual inspection, however these assets were not identified. The Applicant advised further control measures through process control monitoring, specifically monitoring flows, pressures and loads throughout the sludge treatment process. Advising that any suggestion of leakage would be verified and investigated without delay.

We determined that the approach provided by the Applicant would not provide a robust system to identify potential leaks. No trigger points for investigation were provided for flow measurements, and it was unclear how visual inspections would be carried out for tanks that could not be seen. Potential evidence to identify leaks relies on the impact of the leak being visually detectable.

The EQRA Appendix C identified that the partially buried and wholly buried tanks did not have leak detection in place. While BAT advises that *“regular monitoring for potential leaks is risk-based”*, the Applicant did not demonstrate or provide sufficient evidence for us to determine that the risk posed by leaks/spills from these tanks would be an acceptable risk.

As stated in BAT 19h, we recognise that the installation of secondary containment may be limited in the case of existing plant, but site-specific limitations need to be justified and it needs to be adequately demonstrated that any risks will be adequately controlled by suitable alternative measures. Demonstrating this will either require the Applicant to prove there is no risk, or that they have or will have suitable alternative measures in place. However, the Applicant has not demonstrated how they would regularly monitor for potential leaks in line with BAT requirements and has not proposed suitable alternative measures.

We do not consider that the Applicant has demonstrated that the risks posed by the liquids contained in above ground and underground tanks and vessels in terms of soil and/or water contamination will be controlled by suitable techniques to minimise the environmental risk from leaks. Nor do we consider that BAT has been met or suitable alternative provisions proposed through the use of suitable design measures and maintenance procedures to detect and repair leaks to provide an adequate or appropriate level of protection to the environment.

Odour management

Summary

We consider that the Applicant has not demonstrated that the Site is using BAT for the control of odour arising from its operations or that it is supported by suitable proposals to improve the operations for future development for the following reasons:

The Applicant provided an Odour Management Plan (OMP) with the Application. We reviewed the plan against the relevant BAT and considered whether the Applicant had given sufficient regard to our guidance on odour management¹¹.

We requested information from the Applicant on multiple occasions in relation to odour management. This resulted in four revisions to the OMP being submitted. The most recent version was received 1 April 2022. We assessed this version for our determination.

We consider that the Applicant did not respond to all the questions we asked in our requests. We consider that the Applicant did not provide the necessary information with sufficient clarity or detail.

We were therefore not able to approve the Applicant's OMP.

¹¹ [Additional guidance for - H4 Odour Management - How to comply with your environmental permit](#)

Table 9 – Odour Management Plan submitted revisions.

Information	Requested	Received
Odour Management Plan (OMP), Version 4, October 2019 [SUPERSEDED]	n/a	Received with application
Odour Management Plan (Version 08, 03 September 2021) [SUPERSEDED]	25 June 2021 Q30 to Q49 of Schedule 5 Notice 1	23 September 2021
Odour Management Plan (Version; Draft for EA review, 21 January 2022) [SUPERSEDED]	15 October 2021 Q26 to Q44 of Schedule 5 Notice 2	21 January 2022
Odour Management Plan (Version; Second draft for EA review, 31 March 2022)	15 October 2021 Clarifications of Questions 26, 27, 28, 30, 33, 36, 37, 38, 39 and 40 of Schedule 5 Notice 2 and subsequent letter dated 21 February 2022	1 April 2022

BAT 8 – monitor channelled emissions

BAT is to monitor channelled emissions to air, at defined frequencies, and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of at least an equivalent scientific quality.

For odour and waste treatment processes identified as ‘biological treatment of waste’ and “treatment of water-based liquid waste”, BAT specifies that:

- H₂S should be monitored once every six months (no EN standard available)
- Odour concentration should be monitored once every six months to EN 13725 standards
- NH₃ should be monitored once every six months (no EN standard available)
- Hydrogen Chloride (HCl) should be monitored once every 6 months to EN 1911 standards

- Total volatile organic compounds (TVOC) should be monitored once every 6 months to EN 12619 standards

The BAT conclusion states that odour may be monitored instead of NH₃ and H₂S.

For TVOC and HCl the monitoring requirement only applies when the substance(s) concerned is identified as relevant in the waste gas stream based on the inventory in BAT 3. However, the Applicant has not undertaken the characterisation of the gas stream and as such could not demonstrate that TVOC and HCl are not present.

The Applicant's OMP (March 2022), section 4.3 proposed to monitor for NH₃ and H₂S every six months from the Odour Control Units (OCUs) identified as emissions points A10, A11 and A12. However, the Applicant also advised that the OCUs were not operational. The OMP stated that *"Until such time that the OCUs are operating, olfactory monitoring ('sniff' testing) will be undertaken on a weekly basis at the boundary of the sludge treatment facility. Subject to instrument availability, this will include the use of a Jerome hydrogen sulphide monitor or a photo-ionisation detector."* As such no adequate solution for the monitoring of channelled emissions to air was proposed in line with BAT 8 until reinstatement/recommissioning of the OCUs in October 2026. As such, channelled air emissions cannot be assessed against BAT. It should also be noted that no quantitative risk assessment was submitted by the Applicant to determine the current channelled emissions to air from the process areas of the Site.

The Applicant, in their response to our Final Opportunity Letter, identified the measures it proposed would be taken to re-instate the non-operational OCUs, advising that investigation work and installation would be completed by October 2026.

In the interim, the Applicant proposed the use of a Jerome H₂S monitor or photo-ionisation detector. However, the Applicant did not: commit to a defined frequency of testing; demonstrate that the proposed method would provide an accurate reading; or propose this for channelled emissions to air as the Jerome H₂S monitor is designed and intended to be used for ambient air monitoring, not channelled emissions. The Applicant proposed to monitor NH₃ every 6 months until the reinstatement of the OCUs had been undertaken, however no details of how this would be carried out was provided. There were no proposals to monitor odour in the interim, and no proposals to monitor TVOC or HCl or any evidence to show this was not required in line with BAT requirements.

We consider that the Applicant has not demonstrated BAT for the monitoring of channelled emissions to air.

BAT 10 – Odour monitoring

BAT is to periodically monitor odour emissions.

Odour can be monitored using:

- EN standards (e.g. dynamic olfactometry according to EN 13725 in order to determine the odour concentration or EN 16841-1 or -2 in order to determine the odour exposure);
- Alternative methods for which no EN standards are available (e.g. estimation of odour impact), ISO, national or other international standards that ensure the provision of data of at least an equivalent scientific quality.

The monitoring frequency is determined in the OMP (cross-referring to BAT Conclusion 12).

The applicability of these requirements is restricted to cases where an odour nuisance at sensitive receptors is expected and/or has been substantiated.

The submitted OMP (March 2022) identified potential sources of odour in Table 3.2 identifying the odour potential based on a low, medium or high risk. No odour dispersion modelling was undertaken to identify the sources requiring abatement or confirm the level of odour potential assigned.

Section 5.4 of the Applicant's OMP proposed that weekly olfactory monitoring would be carried out, along with ambient odour monitoring for hydrogen sulphide and ammonia on a six-monthly basis until the three non-operational OCUs had been reinstated.

To monitor H₂S, the Applicant proposed the use of the Jerome H₂S monitor or photo-ionisation detector. This monitoring practice is not to a recognised EN standard, and it has not been demonstrated to provide data of at least an equivalent scientific standard. While the Applicant advised that monitoring of ammonia would be carried out, we could find no mention in the OMP how this would be undertaken. The Applicant has not clearly identified that monitoring will be undertaken to a suitable standard, or that they will periodically monitor odour emissions in line with BAT 10. The Jerome monitor is designed and intended to be used for ambient monitoring and not point source monitoring and so cannot be considered to be a suitable, appropriate or adequate monitoring tool.

BAT 12 – Odour management plan

In order to prevent or, where that is not practicable, to reduce odour emissions, BAT is to set up, implement and regularly review an odour management plan, as part of the environmental management system. That includes a protocol containing actions and timelines, and an odour prevention and reduction programme designed to: identify the source(s); characterise the contributions of the sources; and implement prevention and/or reduction measures

The submitted OMP (March 2022) proposed odour control measures that would be implemented to reduce odour potential. Our assessment found that whilst the Applicant had proposed actions to be carried out, no clear timescales had been provided for these actions to be undertaken.

The Applicant identified mitigation measures to reduce the residual risk of odour which could not be implemented. An example of this includes the reduction of the odour potential from the unscreened sludge buffer tank, which was assigned a 'high' odour potential prior to odour control measures being carried out, and 'low' potential following implementation of the proposed control measures. The control measures stated that "Tanks are enclosed and connected to an OCU (A10) comprising a catalytic iron filter (CIF) and activated carbon unit" and "six monthly monitoring of the OCU emissions for H₂S and ammonia". The OCU identified in this mitigation measure had been identified as one of the OCUs that is currently non-operational, with an expected timeline for re-instatement by October 2026.

The OMP (March 2022) included further references to operational odour control units in Appendix C: Design Operating Parameters for Odour Control Units and Appendix D: General Inspection and Maintenance, which would be implemented to prevent or reduce odour emissions. All of which would not be implemented until the OCUs were recommissioned and operational again, by October 2026.

The Applicant's OMP includes control measures which would not be in effect until October 2026, with no proposals for how the Applicant would be BAT compliant in the interim between August 2022 and October 2026. We consider that this substantially exceeds any reasonable time period for implementation from the BAT implementation date of August 2022.

We provided the Applicant with an opportunity to revise the proposed timeline for re-instatement of the OCUs in our Final Opportunity Letter. No revised timeline was forthcoming.

The OMP includes actions that would not be implemented at permit issue. The key identified odour prevention and/or reduction measures, identified as the OCUs, are not proposed to be implemented for prevention and reduction measures until 2026 as they are not scheduled to be commissioned or reinstated until this date. The reason(s) for this delay in the implementation of odour reduction measures has not been justified.

We would not have sufficient information to assess prevention and/or reduction measures for the period between August 2022 and October 2026 as alternative measures proposed to the operation of OCUs during that period were not to a recognised standard and could not provide the necessary assessment information. No quantitative risk assessment or modelling has been undertaken for point source emissions to identify potential impacts and implement suitable abatement or reduction techniques. As such, we do not have sufficient information to undertake an assessment and have not been provided with suitable proposals on which we could consider the imposition of an improvement condition.

Whilst it may be possible to use an improvement condition to allow time for BAT to be achieved, we need to be satisfied it will be achieved. It is not appropriate to use

improvement conditions to enable an applicant to work out how they will demonstrate BAT after an application has been consulted on and determined.

For a pre-operational condition, we need to be satisfied in principle, in advance of operation, that the proposals are BAT even if some of the fine detail can be provided later. As explained earlier, the Site is already operational so a pre-operational condition for the existing operations (excluding the Nereda Assets) cannot be imposed.

We have therefore concluded that the OMP does not meet the requirements set out in BAT 12.

BAT 14d – diffuse emissions

In order to prevent or, where that is not practicable, to reduce diffuse emissions to air, in particular of dust, organic compounds and odour, BAT is to use an appropriate combination of techniques.

This can include the containment, collection and treatment of diffuse emissions through collecting and directing the emissions to an appropriate abatement system via an air extraction system and/or air suction system close to the emission source(s).

The OMP (March 2022) identified diffuse and point source emissions in table 3.2. In section 4.2.1, three OCUs were identified including:

- A two stage OCU comprising of CIF and an activated carbon unit (dry media adsorption process) serving the Unscreened Sludge Buffer Tank. (Emission point A10)
- A two stage OCU comprising of CIF and an activated carbon adsorption odour control unit serving the EEH Buffer (thickened Sludge) Tank. (Emission Point A11)
- A one stage OCU comprising of an activated carbon unit serving the Centrate Break Tank. (Emission Point A12)

The OMP stated that the OCUs are not currently operational, with engineering studies being undertaken to allow for a programme of refurbishment (or if necessary, replacement). In response to our Final Opportunity Letter, the Applicant provided the proposed OCU reinstatement /replacement timeline in Table 27.2. The Applicant did not explain how they would demonstrate BAT in the interim, from August 2022 until October 2026.

Table 10 – Applicant’s proposals for OCU reinstatement timeline

Project Phase	Expected delivery date	Additional notes
Solution developed	02.09.2022	<p>The initial phase will include a review of existing information and may require additional monitoring, modelling or detailed inspection of asset condition to confirm the scope of work.</p> <p>The remainder of the project timeline assumes major capital works will be required. If smaller scale solutions are identified at this stage then delivery times will be revised with the expectation that work will be completed sooner.</p> <p>The proposed solution design, including any revised delivery dates, will be provided to the EA for review and approval.</p>
Issue tender	31.01.2023	Following approval by the EA, the contract will be issued for tender.
Award contract	27.07.2023	The contract will be awarded in accordance with UU governance procedures.
Mobilisation to site	10.05.2024	Following contract award, the design will be finalised and site works will commence.
Project in use	31.10.2026	The project will be fully commissioned and the assets in use.

Table 27.2: OCU reinstatement details – Taken from response to EA letter dated 21 February 2022.

It was noted that the non-operational OCUs were the only abatement technology identified to control diffuse emissions from assets identified as:

- Unscreened Sludge Buffer Tank
- EEH Buffer (Thickened Sludge) Tank
- Centrate Break Tank

The Applicant identified tanks with vents in the OMP (dated March 2022). These were highlighted as “presence of vents to be confirmed upon completion of commissioning. If not present, then this OMP will be updated accordingly”. The Applicant provided no further information on these vents and did not provide plans to contain and abate any potential emissions in line with BAT.

We consider that the information submitted to demonstrate compliance with BAT 14d does not demonstrate that the Applicant will collect and direct emissions to an appropriate abatement system within a reasonable timescale as the OCUs identified are not operational, and no suitable alternative measures have been proposed prior to re-instatement or replacement in October 2026.

BAT 34 – channelled emissions

In order to reduce channelled emissions to air of dust, organic compounds and odorous compounds, including H₂S and NH₃, BAT is to use one or a combination of the listed techniques including;

- (a) Adsorption
- (b) Biofilter
- (c) Fabric filter
- (d) Thermal oxidation
- (e) Wet scrubbing

The BAT conclusion further sets BAT AELs for channelled NH₃ and odour, which are applicable for this Site. This BAT directly links to BAT 8 which has been addressed above.

The OMP (March 2022) identified three OCUs. Section 4.3 states that the three existing OCUs are not currently operational.

The Applicant reported in section 4.2 of the OMP (March 2022) that “*engineering studies are being undertaken to allow for a programme of refurbishment (or if necessary, replacement) of the existing OCUs to be costed and funding secured for implementation of the works*”. In the response to the Final Opportunity Letter, the Applicant proposed the completion of this work by October 2026, with no suitable alternative measures being proposed to demonstrate BAT between August 2022 and October 2026.

We determined that the Applicant would not be compliant with BAT 34 if the variation to the Permit were to be granted as they would not have an appropriate technique or techniques for reducing channelled emissions to air in place. While the Applicant proposed the replacement/reinstatement of the three OCUs in October 2026, we did not consider this to be a reasonable or acceptable timescale given that the Applicant was informed in April 2019 that they needed to comply with IED, and therefore was required to be BAT compliant at the point of permit issue.

H4 Odour management guidance

The Applicant submitted the 4th revision of their OMP (March 2022) in response to our Final Opportunity Letter. This was assessed against Environment Agency Guidance “Environmental Permitting: H4 Odour Management”. Many deficiencies were noted raising significant concerns regarding the proposed management and control of Site operations and infrastructure to minimise the potential for significant environmental impact, specifically in relation to odour management. As such, we

were not satisfied that the Applicant had a robust management and operational system in place to control odour. Further deficiencies are outlined below:

- The OMP specifies control measures, monitoring and maintenance processes that would not be implemented prior to the re-instatement/replacement of OCUs in 2026.
- Odour modelling had not been carried out for the Site to verify the sources requiring abatement, justify the OCU placement/effectiveness, or substantiate the odour risk levels identified.
- The OMP identifies the residual risk of odour following the implementation of control measures as “low” or “moderate”, however non-operational OCUs have been used as control measures, with no demonstration as to how odour risk has been reduced. Further information on the risk classification and justification for the sources identified would be required, as well as an explanation as to how non-operational OCUs can effectively reduce the odour risk.
- Section 5.1 of the OMP advises that complaints will be passed to the production manager within 24 hours. H4 guidance specifies that complaints should be dealt with promptly. We do not consider that a time period of up to 24 hours before an odour complaint is passed on (action on which can only follow on from the report being made) can be sufficiently prompt within the meaning of the guidance.

We consider that we are unable to approve the OMP as being sufficient to demonstrate that the Applicant will acceptably manage and control odours resulting from Site operations.

New plant and equipment

As outlined in the sections above the Applicant has not demonstrated to our satisfaction that the Nereda Assets meet BAT and has not proposed suitable alternatives to provide at least the same level of environmental protection.

This is particularly relevant to BAT conclusions, 12, 14d, 19c, 19d which have been addressed in the sections above.

BAT 19 requires that in order to optimise water consumption, to reduce the volume of wastewater generated and to prevent or, where that is not practicable, to reduce emissions to soil and water, BAT is to use an appropriate combination of specified techniques as identified above. Applicants must design infrastructure and plant to meet BAT requirements taking into account relevant guidance such as CIRIA C736 report recommendations or an equivalent approved standard. Newly built facilities and assets not designed and built either to comply with BAT requirements (as confirmed by CIRIA C736 report recommendations or otherwise), or an alternative standard that will provide at least an equivalent level of environmental protection would not be considered to provide suitable primary and secondary containment, and as such would not comply with BAT.

We consider that the information submitted to demonstrate compliance with BAT 14d does not demonstrate that the Applicant will collect and direct emissions to an appropriate abatement system, with new assets being identified as potentially venting.

Other issues not resolved

The containment provision, odour control measures and control of diffuse emissions aspects are our main reasons for refusal. We are not satisfied that areas identified as waste pre-acceptance and acceptance and characterisation of wastewater streams have been adequately addressed. However, had the variation to the Permit been granted, we would have sought to address specific deficiencies and missing information through improvement conditions, or compliance visits/checks. Accordingly, we did not identify the below as reasons for refusal.

Waste pre-acceptance and acceptance

The Applicant submitted a Waste Characterisation and Acceptance procedure, (Version 2, 31 March 2022), Technical Evaluation Review Form (WwTW Sludge Imports) and WwTW Sludge Waste Declaration Form on the 1 April 2022. Sections 5 and 6 of the Waste Characterisation and Acceptance procedure explain how the pre-acceptance and acceptance system will operate.

While the Applicant provided a range of potential parameters that could be checked as part of pre-acceptance process, no commitment was provided on what parameters would actually be checked, stating that this would be determined by the technical resource completing the assessment. It was not clear how the Applicant would carry out pre-acceptance checks to ensure that they understood the effects of potential sources on the biological treatment process, or which parameters would be checked as a minimum.

For waste acceptance, the Applicant stated in section 6 of the Waste Characterisation and Acceptance procedure, (Version 2, 31 March 2022) that the sampling of imports on arrival to Blackburn Port WwTW is not required as the material consists of sewage sludge from WwTW. We disagree with this statement as the Site will be operated under IED which seeks to achieve a high level of protection for the environment by requiring each of the industrial installations to be operated under a permit with conditions based around the use of BAT. While not all loads must be sampled, a representative approach should be adopted, with clear parameters and guidance on processes to be carried out.

Pre-acceptance and acceptance measures and requirements are set out in the draft Appropriate measures for the biological treatment of waste, which has been consulted on. Although the Applicant does not strictly need to apply these measures currently, they will be published shortly, at which point the Applicant will be expected to put these measures in place.

We could not determine that waste pre-acceptance procedures would ensure that waste received at Site would be suitably assessed to understand the effects of potential sources on the biological treatment process as no clear sampling parameters have been provided.

We could not determine that waste acceptance procedures would be in place to confirm the characteristics of the waste, as identified in the pre-acceptance stage, or what characteristics would be verified upon the arrival of the waste at the Site, as well as the waste acceptance and rejection criteria.

However following consideration and subject to the publishing of the 'Appropriate measures for the biological treatment of waste' guidance, we consider that we could have addressed this through an improvement condition.

Characterisation of wastewater streams

The Applicant identified various emissions of process effluents and surface run-off being discharged to the adjacent WwTW.

The Applicant has not provided a full characterisation of the wastewater streams as required by BAT 3 which we requested in question 7 of Schedule 5 Notice 2. In response to Schedule 5 Notice 2, the Applicant provided a partial characterisation of emissions returned to the WwTW which did not include all emissions or provide a full characterisation in line with BAT 3 requirements. Following further discussions with the Applicant, we agreed for returns to the WwTW to be addressed through the inclusion of improvement conditions which would implement a monitoring and sampling procedure to fully characterise emissions and carry out subsequent further assessment if required.

Growth Duty

Section 108 Deregulation Act 2015 - 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 100 of that Act in deciding whether to grant this variation to the Permit.

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. 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.

Annex 1 – Application Timeline

Schedule 5 Notice 1

25 June 2021

We served a Schedule 5 Notice¹² (“Schedule 5 Notice 1”) requesting information which we considered to be necessary to determine the application and included 49 questions for the Applicant to respond to, with a response date of the 13 August 2021.

12 August 2021

The Applicant e-mailed to request a two-week extension to the submission of information in relation to Schedule 5 Notice 1.

20 August 2021

We agreed and e-mailed the Applicant to confirm our conversation to extend the Schedule 5 Notice 1 response deadline until the 27 August 2021. We again agreed verbally to extend the response deadline to the 3 September 2021.

6 September 2021

We e-mailed the Applicant to chase the submission of the information in relation to Schedule 5 Notice 1.

9 September 2021

We e-mailed the Applicant to chase the submission of the information in relation to Schedule 5 Notice 1 and advised that if no response was received by 10 September, we would deem the Application as being withdrawn.

10 September 2021

The Applicant provided a part response to the Notice. This included responses to questions 1 to 14, 17 to 18 and 20 to 29. It did not include a response to questions 15, 16 and 19 which were in relation to containment and impermeable surfacing. The Applicant stated a response would be provided by 27 September 2021. We had not agreed to this extension.

The Applicant also did not respond to questions 30 to 49, which were in relation to the Odour Management Plan (OMP). The Applicant stated a response would be provided by 17 September 2021. We had not agreed to this extension.

22 September 2021

The Applicant provided a response to questions 30-49 in relation to odour.

¹² Notice of request for more information under paragraph 4 of Part 1 of Schedule 5 of the Environmental Permitting (England and Wales) Regulations (“the EPR 2016”)

27 September 2021

No response was received to questions 15, 16 and 19, contrary to the indication given by the Applicant on 9 September 2021.

1 October 2021

The Applicant requested a further extension to the Notice 1 response deadline, until 30 November 2021 with respect to questions 15, 16 and 19.

8 October 2021

We confirmed with the Applicant that the Notice 1 response deadline had been extended to 30 November 2021 for questions 15, 16 and 19 in relation to containment, as requested.

30 November 2021

The Applicant responded to question 19 with a draft Environmental Quantitative Risk Assessment (EQRA) which did not include all identified appendices and was 23 pages. No response was received to question 15 and 16.

2 December 2021

We wrote to the Applicant to confirm that their response to question 19 did not adequately address the question, and we had not received a response to question 15. We advised that we would extend the period to respond to Schedule 5 Notice 1 until 14 January 2022.

7 February 2022

The Applicant provided a response to question 19 with the addition of a completed Anaerobic Digestion and Bioresources Association (ADBA) tool. No response was received to question 15 and 16 in relation to impermeable surfacing, and no updated EQRA was provided.

No further responses were received until after we had sent the Final Opportunity Letter to the applicant on 21 February 2022, which is detailed below.

Schedule 5 Notice 2**15 October 2021**

We served a further Schedule 5 Notice ("Schedule 5 Notice 2") requesting further information which we considered to be necessary to determine the Application.

The notice included 44 questions for the Applicant to respond to.

We gave the Applicant a response deadline of 6 December 2021.

26 November 2021

The Applicant e-mailed us to confirm that they had now instructed a consultant to prepare a new OMP and requested an extension to the deadline to respond to questions 26 – 44 until 14 January 2022.

29 November 2021

We wrote to the Applicant to confirm the extension date of 14 January 2022 for questions 26 to 44 of Notice 2 in relation to odour.

6 December 2021

The Applicant contacted us by e-mail to request an extension to the Schedule 5 Notice 2 response until 7 December 2021.

07 December 2021

We received responses to questions 1 to 25. The Applicant advised that they would response to questions 26 to 44 by 14 January 2022.

21 January 2022

The Applicant provided a response to questions 26 to 44 of the Notice. This response included a new OMP Version: Draft for EA review Dated; 21 January 2022.

No further responses were received until after we had sent the Final Opportunity Letter to the Applicant on 21 February 2022, which is detailed below.

Request for further information dated 10 December 2021

We requested via e-mail further information from the Applicant regarding questions 2, 3, 4, 7, 8b, 9,11, 14 and 22b of Schedule 5 Notice 2 that had not been adequately addressed. This included further clarification on:

- Adequate separation of waste
- Waste Characterisation and Acceptance
- Inventory of wastewater and gas streams
- Adequate storage capacity
- Emissions leaving the permit boundary
- Leak detection and repair plan
- Containment of diffuse emissions
- Contingency cake storage pad.

We agreed a response date of 21 January 2022 and to extend the deadline to respond to the Schedule 5 Notice 2 until this date.

4 February 2022

We e-mailed the Applicant to chase the response for the above request for further information.

7 February 2022

The Applicant submitted a response to the request for further information.

No further responses were received until after we had sent the Final Opportunity Letter to the Applicant, which is detailed below.

Other correspondence

5 November 2021

We wrote to the Applicant¹³ to express our concerns regarding the lack of response and their continued requests for extensions. We also stated we were concerned that in their Schedule 5 Notice responses, they were deferring their responses to questions without prior agreement with us.

12 November 2021

The Applicant responded to our concerns we had highlighted on 5 November 2021, stating that *“This has been due to strict governance processes we have in place at UU to authorise the additional work required.”*

Meetings

During the determination, we attended meetings with the Applicant on:

- 17 August 2021
- 17 September 2021
- 29 November 2021
- 7 December 2021
- 13 December 2021
- 20 December 2021

These were to provide clarity on questions raised in the Schedule 5 Notices and requests for further information.

Final opportunity letter

21 February 2022

We wrote a letter to the applicant¹⁴ (the “Final Opportunity Letter”). This requested information which we considered had not been responded to or required further clarification under Schedule 5 Notices 1 and 2 and the requests for further information dated 2 December 2021 and 10 December 2021. We deemed this information necessary to be able to properly consider the determination of the Application.

¹³ Email dated 10 December 2021 regarding Schedule 5 responses

¹⁴ Final Opportunity Letter dated 21 February 2022

The letter outlined our concerns and deficiencies in the information provided by the Applicant in key areas of the Application and included 3 questions from Schedule 5 Notice 1, and 15 questions from Schedule 5 Notice 2 which we had tried to clarify through further requests for information. The key issues for the Applicant to respond to included:

- Odour Management Planning
- Compliance with BAT 19c and 19d in relation to containment.
- Waste pre-acceptance and waste acceptance.

We gave the Applicant a response deadline of **1 April 2022**, stating that after this deadline, we would continue to determine the Application based on the information that the Applicant had, by then, provided to us, and that we would not be making further requests for information.

1 April 2022

The Applicant provided:

- Site Surfacing Plan (Drawing No. 80063025-BLACK-DR-C-000001)
- EQRA Report (Report No. 331001867R42, April 2022) Advising an update was to follow
- Waste Acceptance and Characterisation Procedure plus forms (March 2022)
- Process Flow Diagram (Version 5)
- Emissions Point Plan (Figures 1 – 4)
- Leak Detection and Repair Plan (March 2022)
- Odour Management Plan (March 2022)

7 April 2022

The Applicant submitted a revised EQRA and a revised response to the questions raised in the letter dated 21 February 2022.

10 May 2022

The Applicant contacted us verbally to advise that their contract for spill modelling at the Site should be completed by the 27 May 2022, and that further information would be provided after this date. No commitment in relation to what was to be provided was given.

27 May 2022

The Applicant submitted a revised Secondary Containment Modelling Assessment dated 17 May 2022.

No further information has been provided.

Annex 2 - Consultation and Engagement Responses

Consultation Notice

We carried out consultation on the Application in accordance with the Environmental Protection Regulations 2016 and our statutory Public Participation Statement. We consider that this process satisfies, and frequently goes beyond the requirements of the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, which are directly incorporated into the IED, which applies to the Installation and the Application. We have also taken into account our obligations under the Local Democracy, Economic Development and Construction Act 2009 (particularly Section 23). This requires us, where we consider it appropriate, to take such steps as we consider appropriate to secure the involvement of representatives of interested persons in the exercise of our functions, by providing them with information, consulting them or involving them in any other way. In this case, our consultation already satisfies the Act's requirements.

The Application was received and determined as a substantial variation to the existing United Utilities Water Limited permit.

We publicised the Application by placing a notice on our website, which contained all the information required by the Industrial Emissions Directive, including informing the public where and when they could see a copy of the Application. The notice ran from 7 July 2021, with a deadline for responses to be submitted by 4 August 2021.

We sent copies of the Application to the following organisations, which includes those with whom we have "Working Together Agreements":

- UK Health Security Agency (formerly Public Health England) – The comments and our responses are summarised below.
- Director of Public Health – South Ribble Borough Council – No response was received.
- Health and Safety Executive – No response was received.
- Environmental Health Department, South Ribble Borough Council – No response was received.

Consultation responses

The following summarises the responses to the notice, and the way in which we have considered these in the determination process.

Response received from UK Health Security Agency

Brief summary of issues raised:

The main emissions of potential concern are odorous emissions from waste treatment. The Application indicates that controls are in place and risks associated with dust and odour off-site are low.

Based on the information contained in the Application supplied to us, UKHSA has no significant concerns regarding the risk to the health of the local population from the installation.

Summary of actions taken:

For the reasons given in the above sections of this Decision Document, we do not consider that the Applicant proposes to take all appropriate measures to prevent or control pollution in accordance with the relevant sector guidance and industry best practice. Therefore, we consider that the assumption underlying the UKHSA response is inappropriate.

We requested in Schedule 5 Notices 1 and 2 that the Applicant provide significant further information on the management of odour arising from waste storage, handling and processing. We are not satisfied that the additional detail provided fully addressed our concerns and we have not approved the OMP (March 2022). The Applicant advised that the Odour Control Units which are identified as appropriate mitigation measures are not currently operational, with plans for re-instatement/replacement in October 2026.

Due to the Odour Control Units not being operational we determined that the Applicant had not provided suitable evidence of mitigation of odorous emissions, or satisfied us that they would adequately address the release of odorous emissions in line with BAT requirements. We have therefore decided to refuse the Application. Please also see the odour section in the main body of this document.

Annex 3 - Map Showing Location of Proposed Installation and Surrounding Area

