

Permitting decisions

Variation

We have decided to grant the variation for Brookfoot Mills operated by Stephenson Group Limited.

The variation number is EPR/MP3435LB/V003.

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

Purpose of this document

This decision document provides a record of the decision making process. It summarises the decision making process in the decision checklist to show how all relevant factors have been taken in to account.

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

- highlights key issues in the determination
- summarises the decision making process in the decision checklist to show how all relevant factors have been taken into account
- shows how we have considered the consultation responses

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

Read the permitting decisions in conjunction with the environmental permit and the variation notice. The introductory note summarises what the variation covers.

Key issues of the decision

The variation application was made to:

- change the low impact permit to a bespoke permit, in line with –
 - the removal of non-hazardous waste and hazardous waste limits, which are capped in the low impact permit.
 - an increase in discharge to sewer above the low impact permit limit of 50 m³/day to the existing Yorkshire Water trade effluent consent limit of 200 m³/24 h; and
- install and operate a new esterification plant with an associated emission point (a variation under the existing Section 4.1A(1)(a)(ii) activity).

The increase in discharge to sewer specified above required the addition of a Section 5.4(A)(1)(a)(ii) activity, because the effluent is pH balanced and temperature monitored prior to discharge, which constitutes physico-chemical treatment.

The site used to manufacture a liquid colour chemical for use in the textile industry. Due to changes within the business, the site no longer manufactures this product and the associated Section 4.1A(1)(a)(iv) activity has been removed from the permit as part of this variation.

Changes on site have also led to the removal of emission points to air A3 (R2 scrubber), A8 (soap silo fugitive emissions) and A4 (combustion gases from an autoclave) from the permit.

The directly associated activities, listed in Table S1.1 of the permit have been updated to reflect those directly associated activities that occur on site.

The reporting forms have been updated.

Environmental impacts

Regulated activities can present different types of risk to the environment, these include odour, noise and vibration, accidents, fugitive emissions to air and water, point source releases to air, discharges to ground or groundwater, global warming potential and generation of waste and other environmental impacts. Consideration may also have to be given to the effect of emissions being subsequently deposited onto land (where there are ecological receptors).

The key factors considered for this permit variation application in relation to the change from the low impact permit to the bespoke permit were the generation of waste and the discharge to sewer.

The key factors considered for this permit variation application in relation to the new esterification plant were emissions to air, containment of emissions during accidents, noise emissions and odour emissions.

Change from low impact to bespoke permit

Generation of waste

Low impact installations must not produce more than 1 tonne of non-hazardous waste or 10 kg of hazardous waste per day, averaged over a year. Part of the reason the operator applied to change from a low impact permit to a bespoke permit was to remove these caps so that production capability would not be limited by this. The operator confirmed that they have waste management and reduction key performance indicators (KPIs) in place as part of their commitment to continuous improvement and that these are monitored through the ISO 14001:2015 system. They carry out audits of their waste management supplies through their Environmental Management System. The operator also encourages the participation of all employees on site in identifying waste and energy reduction projects and this is a standard agenda item at all site Environmental and Safety Improvement Team monthly meetings.

The operator confirmed that all waste is taken off-site by licensed waste disposal companies. Waste consists of general office, factory and engineering waste, including paper, cardboard, plastic packaging items, wood from pallets and metal. Out of specification or contaminated product or raw materials are in many cases reworked over a period of time.

The operator provided their waste management assessment for 2019 which showed the waste streams, EWC codes, routes of disposal, frequency of disposal and recycling rates.

We are satisfied that the operator has appropriate waste management and review procedures in place.

Discharge to sewer

Low impact installations must not release more than 50m³/day of waste water. Part of the reason the operator applied to change from a low impact permit to a bespoke permit was to remove this cap and increase their permitted discharge to sewer to match that allowed through their Trade Effluent Consent with Yorkshire Water. Their effluent is mainly comprised of cooling water, along with some wash water. The whole of the installation is bunded and any spillages are therefore collected and routed to the effluent pit. The effluent pit has sufficient capacity to contain a major spillage in the unlikely event that an incident occurs. We

asked the operator to characterise their effluent prior to treatment and identify if it contains any hazardous pollutants in line with our guidance; the operator confirmed that their effluent is non-hazardous. In line with this, no H1 assessment was required for the proposed increase in discharge.

Yorkshire Water collect and test samples for compliance in line with their Trade effluent consent (NC/306/78C). On-site testing of the effluent to sewer is also carried out on a daily basis to verify compliance with the Trade effluent consent. The trade effluent consent requires the operator to keep a continuous record of the volume and rate of discharge and the pH of the effluent discharged, and to record the nature and quantity of chemicals used. The trade effluent consent limits the operator to:

- rate of discharge of 18 L/sec and 200 m³/24 h
- temperature <43.3°C
- pH 6-10
- settled chemical oxygen demand <15,000 mg/L
- total load of settled COD <1000 kg/24 h
- settleable solids <3500 mg/L.

In line with our current regulatory position that we do not mirror-regulate emissions that are also subject to limits imposed by a trade effluent consent, these limits have not been included in the permit.

New Esterification Plant

The purpose of the new esterification plant will be to carry out two types of reaction:

- Esterification of fatty acids with glycerol/polyglycerols
- Trans-esterification of vegetable oils with glycerol/polyglycerols.

The reactions will occur in batches from 250 kg to 2000 kg. At a batch size of 2000 kg, the reactor vessel will be approximately 2/3 full.

All raw materials, including vegetable oils, used in the process will be virgin oils; that is, no recycled oils or waste vegetable oils will be used in the processes. Liquid raw materials will be dosed into the reaction vessel from drums and/or intermediate bulk containers (IBCs) by vacuum pump. The materials will be mixed with an agitator and heated to 260°C or 280°C via a coil supplied with thermal oil. The reaction mixture will be fully purged with nitrogen to prevent discolouration of the product, which occurs on contact with air.

The fatty acid reaction will produce water as a by-product. This will be evaporated in the reactor. It is recognised that some of the reactants will also be evaporated in this process. The evaporated vapours will leave the reaction vessel via a vent line and enter a condenser; the condensate will be captured in a catch pot.

The trans-esterification reactions will be carried out under vacuum. A relatively small amount of water will be produced in this reaction (up to 1% of batch size).

Once a reaction has finished, the product will be cooled down to 80°C and discharged to a filling machine.

As part of the design process, the operator has completed a HAZOP study for the new esterification plant.

Controlling and monitoring emissions

Emissions to air

There will be two new emission points to atmosphere: the reaction vessel vent line (A9) and the pressure relief tank vent line (A10).

On the reaction vessel vent line there will be a condenser, catch pot, vacuum pump and bubbling pot (a water-based scrubber). The vacuum pump and bubbling pot will only be used for the trans-esterification reactions. For both reaction types, the reaction vapours will contain water, glycerol, acid vapours and

nitrogen. The condenser (25°C) in the vent line will ensure that close to 100% of the fatty acids, fatty acid esters and glycerol will be removed as condensate. The condensate will be collected in the catch pot and will be emptied into an IBC at the end of the reaction and sampled. The IBC contents will then be discharged to effluent via the floor drain. The operator has recognised that vapour discharged from the vacuum pump during the trans-esterification reactions may contain some caprylic acid; this will be removed from the reaction vapours using the bubbling pot (see odour section below for further details). From both reaction types, the gases finally venting to atmosphere will be nearly 100% nitrogen.

The pressure relief tank will be used to capture any hot fluids released during an overpressure event in the reaction vessel and vapours could then be released to atmosphere via the pressure relief tank's vent line. However, the plant reaction vessel will be controlled using a programmable logic controller (PLC), which should prevent any over pressure events.

The operator confirmed that the thermal oil will be heated through an electrical heating system; that is, the boiler currently present on site will not be utilised more as a result of this variation.

We consider no detailed assessment is required for emissions to air.

Containing emissions during accidents

The site is fully bunded and all waters are collected in the effluent containment pit for pH and temperature treatment prior to discharge to sewer. All surface water drains, which direct surface water to Oil Mill Beck, are sealed and all seals are regularly inspected and replaced. Spill containment materials are available across site.

Liquid raw materials (fatty acids, vegetable oils, glycerol and polyglycerols) will be dosed into the reactor tank from 210 L drums or 1000 L IBCs. These drums/IBCs will be delivered to the plant via forklift truck and placed onto a floor scale, which will be located within a bund.

Stearic acid in powder form is the main solid raw material that will be used. This will be added manually to the reactor via an additions port before any nitrogen addition to the reactor vessel and while there is no vacuum in the vessel. Other solid raw materials will be added in the same way, or premixed with liquid raw materials before dosing into the reactor vessel.

The operator has confirmed that the reactor will be built as a full SKID design, with a bund/drip tray containing 110% of the maximum reactor capacity.

Noise and vibration

The operator consider noise and vibration in their Environmental Risk Assessment and associated risk assessment for the proposed storage area. They have white noise alarms on fork lift trucks that are used 24 hours a day and flexi trucks with standard reversing alarms are restricted to indoor use only between 9 pm and 6 am. Roadways around the site were also re-tarmacked in 2018 to reduce traffic noise. Equipment on site is monitored through a planned preventative maintenance (PPM) program. In addition, the onsite compactor is restricted in use and not operated between 9 pm and 6 am.

The principal noise sources that may arise from the new esterification plant would be associated with ancillary activities like vehicle movements, rather than the process itself. The new esterification plant will be located within a fully enclosed building (previously used as internal warehousing). External and internal walls have been fitted with cladding primarily to improve housekeeping standards, but this will also reduce any external noise. All materials for production and despatch of the products for the new esterification plant will be stored within the warehouse, with no movement of goods between the main site storage area and esterification plant area. General transport movements will be as current or reduced; the new esterification plant will allow the operator to produce a number of their own raw materials that are currently transported to site, which could reduce their supply chain complexity, resulting in a reduction in vehicle movements.

We consider there is no significant increase in risk of noise emissions from the site. Should activities give rise to noise pollution in the future, condition 3.4.2 in the permit allows us to request submission of and adherence to a Noise Management Plan.

Odour

The operator consider odour in their Environmental Risk Assessment. They consider that no offensive materials are or will be used on site that could give rise to offensive odours outside the site boundary. They monitor materials and products on site within a raw material inventory list. This includes consideration of odour properties both during storage and processing.

The operator has recognised during the new trans-esterification reactions, the vapour discharged from the vacuum pump may contain some caprylic acid. Caprylic acid is currently used on site at 80°C with no odour issues. However, it can have a mild fat-like odour at higher temperatures that could be irritating. As production temperature for the new reactions will be 220°C, the operator has proactively designed a water-based scrubber, the 'bubbling pot', into the new plant. Vapour discharged from the vacuum pump will be bubbled through water within the bubbling pot to reduce the risk of any odours emissions. The water in the bubbling pot will be replaced in the bubbling pot before production of each batch.

We consider there is no significant increase in risk of odour emissions from the site. Should activities give rise to odour pollution in the future, condition 3.3.2 in the permit allows us to request submission and adherence to an Odour Management Plan.

Best Available Techniques

To consider whether the new esterification plant follows Best Available Techniques we have compared the process against the following:

- How to comply with your environmental permit. Additional guidance for Speciality Organic Chemicals Sector (EPR 4.02) (February 2009).
- Reference Document on the Best Available Techniques for the Manufacture of Organic Fine Chemicals (August 2006).

As evidence of BAT, the operator has provided:

- their Environmental Risk Assessment, which includes consideration of the new esterification plant;
- an associated risk assessment of the proposed storage area;
- their system hazard and operability (HAZOP) study for the esterification plant
- detailed design of the esterification plant;
- their design checklist and residual risk register;
- an overview of their Environmental Management System (EMS); and
- evidence and overview of ISO 14001:2015 and ISO 9001:2015.

We are satisfied that the new esterification plant and process represents BAT for the installation.

A summary of the key generic operating techniques is provided below:

- The site is fully bunded.
- Spill containment and leakage procedures are in place.
 - Containment measures prevent fugitive emissions to surface water, sewer and land.
 - Hazardous materials are stored below any COMAH limits.

- The management policies, systems and procedures are subject to routine review.
- Emergency equipment and procedures are in place to minimise the effect of potential incidents and accidents.

A summary of the key operating techniques in relation to the new esterification plant is provided below:

- The new esterification plant will be located within an area previously used as internal warehousing. The new plant will be built within a bund/drip tray that can contain 110% of the maximum reactor capacity.
- Storage of materials for the production and despatch of the products of the new plant will be located in the same warehouse as the esterification plant.
 - No materials will be supplied or stored in pressurised containers.
 - All materials will be stored at least 8 m away from the pressurised reactor.
 - Flammable materials (sodium methoxide) to be stored within an internally banded flammables cabinet, away from any combustible packaging storage.
 - The storage area is fully banded.
- The vacuum system has been appropriately designed for the load and its maintenance is included within the PPM programme.
- The pressure relief system has been appropriately designed and will be maintained through the PPM programme.
 - Pipework will be hydraulically pressure tested to 1.5 times the design pressure.
 - In the event of overpressure, a high pressure alarm will trip relevant nitrogen valves to close and shut down the thermal oil system.
 - bursting disc/pressure relief valve on the reactor vents to a safe discharge point or catch tank.
- Oxygen monitors will be located around the rig with audible alarms.
- Heating and cooling of the reaction vessel will be performed using a thermal oil system, which will be heated through an electrical heating system. There will be no increase in boiler usage (no plant steaming or cooling water is required).
- The plant will be purged with nitrogen from a local nitrogen bottle bank, with associated pressure gauge and clear operating procedure for valve opening. The bottle bank will be located outdoors.
- There will be a fault alarm on thermal oil system in case of failure.
- The plant design includes a simple form of wet scrubbing (the bubbling pot) for the removal of caprylic acid; this is included as a precautionary measure for potential low odour emissions.
 - The bubbling pot will have low level alarm to prevent discharge of potentially odourous vapour direct to atmosphere.
 - There will be a fault signal on the condenser system that will lead to shutdown of the esterification plant to prevent potential odour emissions.
 - The condenser system catchpot will be drained to IBC after each batch for disposal to effluent or offsite as determined by analysis. Spill containment around discharge point will be included.
 - Fugitive emissions will be minimised. Close to 100% of emissions from the new plant will comprise of nitrogen.

Decision checklist

Aspect considered	Decision
Receipt of application	
Confidential information	A claim for commercial or industrial confidentiality has not been made.
Identifying confidential information	We have not identified information provided as part of the application that we consider to be confidential. The decision was taken in accordance with our guidance on confidentiality.
Consultation/Engagement	
Consultation	The consultation requirements were identified in accordance with the Environmental Permitting Regulations and our public participation statement. The application was publicised on the GOV.UK website. We consulted the following organisations: Environmental Health Health and Safety Executive Yorkshire Water The comments and our responses are summarised in the consultation section .
The facility	
The regulated facility	We considered the extent and nature of the facility at the site in accordance with RGN2 'Understanding the meaning of regulated facility', Appendix 2 of RGN 2 'Defining the scope of the installation', and Appendix 1 of RGN 2 'Interpretation of Schedule 1'. The extent of the facility is defined in the site plan and in the permit. The activities are defined in table S1.1 of the permit.
The site	
Extent of the site of the facility	The operator has approved a plan which we consider is satisfactory, showing the extent of the site of the facility. The plan is included in the permit.
Biodiversity, heritage, landscape and nature conservation	The application is not within the relevant distance criteria of a site of heritage, landscape or nature conservation, and/or protected species or habitat.
Environmental risk assessment	
Environmental risk	We have reviewed the operator's assessment of the environmental risk from the facility.

Aspect considered	Decision
	<p>The operator's risk assessment is satisfactory.</p> <p>The assessment shows that, applying the conservative criteria in our guidance on environmental risk assessment, all emissions may be categorised as environmentally insignificant.</p>
Operating techniques	
<p>General operating techniques</p>	<p>We have reviewed the techniques used by the operator and compared these with the relevant guidance notes and we consider them to represent appropriate techniques for the facility.</p> <p>The operating techniques that the operator must use are specified in table S1.2 in the environmental permit.</p>
Permit conditions	
<p>Updating permit conditions during consolidation</p>	<p>We have updated permit conditions to those in the current generic permit template as part of permit consolidation. The conditions will provide the same level of protection as those in the previous permit(s).</p>
<p>Emission limits</p>	<p>No emission limits have been added, amended or deleted as a result of this variation.</p>
Operator competence	
<p>Management system</p>	<p>There is no known reason to consider that the operator will not have the management system to enable it to comply with the permit conditions.</p>
<p>Relevant convictions</p>	<p>The Case Management System has been checked to ensure that all relevant convictions have been declared.</p> <p>No relevant convictions were found. The operator satisfies the criteria in our guidance on operator competence.</p>
Growth Duty	
<p>Section 108 Deregulation Act 2015 – Growth duty</p>	<p>We have considered our duty to have regard to the desirability of promoting economic growth set out in section 108(1) of the Deregulation Act 2015 and the guidance issued under section 110 of that Act in deciding whether to grant this permit.</p> <p>Paragraph 1.3 of the guidance says:</p> <p>“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.”</p> <p>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</p>

Aspect considered	Decision
	<p>not legitimise non-compliance and its purpose is not to achieve or pursue economic growth at the expense of necessary protections.</p> <p>We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution. This also promotes growth amongst legitimate operators because the standards applied to the operator are consistent across businesses in this sector and have been set to achieve the required legislative standards.</p>

Consultation

The following summarises the responses to consultation with other organisations, our notice on GOV.UK for the public, and the way in which we have considered these in the determination process.

Responses from organisations listed in the consultation section

Response received from
Environmental Health
Brief summary of issues raised
<p>Environmental Health expressed concern in regards of the new esterification plant to be installed and the associated larger scale of production at the site. They identified that they have received three complaints in the last two years about noise from vehicle movements and reversing beepers within the installation boundary during the night time period. They also received an odour complaint five years ago.</p> <p>They consider there is potential for disturbance to nearby residents that could be exacerbated through the proposed intensification of the site and want to ensure that the Environment Agency has fully considered noise and vibration, emissions to air and the release of odours from the installation, with appropriate measures to protect the amenity of nearby occupants imposed as conditions of any permit issued.</p>
Summary of actions taken or show how this has been covered
<p><i>Noise and vibration</i></p> <p>The key issues section details how we have considered noise and vibration in relation to the proposed changes on site. We consider that the risk of noise will not increase.</p> <p>Condition 3.4.2 in the permit allows for the Environment Agency to request submission and adherence to a Noise Management Plan should the activities give rise to pollution outside the site due to noise and vibration.</p> <p><i>Emissions to air</i></p> <p>The key issues section details how we have considered emissions to air. We consider no detailed assessment is required for emissions to atmosphere.</p> <p><i>Release of odours</i></p> <p>The key issues section details how we have considered odour in relation to the proposed changes on site. We consider that the risk of odour will not increase.</p> <p>The operator identified that the odour complaint received 5 years ago was related to the use of tallow, which is currently used in very small quantities and from November 2019 will no longer be used on site.</p> <p>Condition 3.3.2 in the permit allows for the Environment Agency to request submission and adherence to an Odour Management Plan should the activities give rise to pollution outside the site due to odour.</p>