

Permitting Decisions- Variation

We have decided to grant the variation for Widnes Alumina Fibres, Pilkington Sullivan Site operated by Saffil Limited.

The variation number is EPR/XP3533CB/V003.

The variation is for the addition of production line 4 and associated equipment which replaces production line 1. The new production line will enable the facility to produce silica fibres in addition to alumina (aluminium oxide) fibres the facility currently produces.

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

Purpose of this document

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

- highlights key issues in the determination
- summarises the decision making process in the decision considerations section to show how the main relevant factors have been taken into account

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

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

Key issues of the decision

Process description

Saffil Limited have applied to add an additional production line at the Pilkington Sullivan Site. The additional line (line 4) will enable Saffil Limited to produce silica (silicon dioxide) fibres. The new line will also enable Saffil Limited to produce alumina (aluminium oxide) fibres using the same methods as implemented in lines 2 and 3 and replaces line 1 which has been decommissioned. The production of silica fibres follows similar procedures to the production of alumina fibres.

The additional equipment required to operate line 4 includes additional tanks for the receipt of silica solution and the mixing of reagents to develop the spinning solution. From the spinning solutions, fibres are extruded in spinning chambers in a warm stream of air. Steam boilers, fired on natural gas, provide steam to aid this process. The produced fibres are heat treated using a series of natural gas or electrically fired furnaces and ovens. The final heat treatment for silica fibres ranges between 550-800°C whilst the final heat treatment for alumina fibres ranges between 800-1100°C. Silica fibres are picked, shredded and milled using a jet mill, to give a bagged product. Alumina fibres are reeled or shredded and baled to give a bagged product.

Emissions of particulates are directed to suitable abatement (ceramic or bag filters) prior to discharge to the environment. The additional medium combustion plant required (steam boilers fired on natural gas) by the proposals for line 4 will meet the requirements of the medium combustion plant directive (MCPD, 2015) from the start of operation. Other emissions to air from the heat treatment processes including Volatile Organic Compounds (VOCs) and a small quantity of dioxins and furans are directed to a regenerative thermal oxidiser fuelled on natural gas. Emissions are further abated using wet scrubber units to remove hydrogen chloride prior to release to the environment. The liquor from the scrubber units is acidic and requires neutralisation (using sodium hydroxide) prior to discharge to sewer.

The site is within screening distances of protected conservation areas including the Mersey Estuary SPA, Ramsar, SSSI. Human health receptors include nearby residential receptors to the north and west including a local housing development to the west of the site.

Addition of MCPD conditions in the permit.

The applicant requested that the permit be issued with modern conditions. At the applicant's request we have reviewed conditions relating to the operation of Medium Combustion Plant (MCPs) in the consolidated permit in accordance with the Medium Combustion Plant Directive (MCPD, 2015). We consider that the three steam raising boilers on site (all with a thermal input of 8.045 MW) are MCPs as they heat steam which is used in the production processes and therefore the directive applies to this plant. The facility also uses other combustion plant including a furnace (direct heating) and thermal oxidisers (abatement). The requirements of MCPD do not apply to this plant as the furnace is used for direct heating and the thermal oxidisers are used to purify waste gases (Article 2, para 2 (d) and (f) of MCPD).

We have included in the permit conditions 2.3.6, 3.1.4 and 4.2.5 which relate to the requirements imposed by Article 7 paragraphs 9, 3 and 5 respectively of MCPD. We have added the requirement to annually monitor and report emissions of carbon monoxide from boilers fuelled on natural gas for all 3 steam raising boilers which are MCPs (emission limits for oxides of nitrogen are

described below). Schedule 6 (Interpretation) in the permit has been updated accordingly. The applicant confirmed that the dual fuelled boiler only utilises gas oil as a backup fuel for less than 50 hours a year for testing and less than 500 hours a year for emergency use. We have limited the hours of operation of this plant on gas oil accordingly in Table S1.1.

Emissions to air

The applicant assessed the impact of the final emissions from the installation following our process [Air emissions risk assessment for your environmental permit - GOV.UK \(www.gov.uk\)](http://www.gov.uk). Where pollutants could not be screened out as insignificant, following our process, the applicant submitted air dispersion modelling using the ADMS 5.2 model.

Background to methodology for assessment of air emissions (other than dioxins and furans)

Emissions to air can be screened out as insignificant if:

- the short term process contribution PC (as defined in the above guidance) of a pollutant is less than 10% of the short-term environmental standard (ES) and;
- the long term PC is less than 1% of the long-term ES.

The PEC is the combination of the PC substance to air and the background concentration of the substance which is already present in the environment. Emissions can also be screened out as insignificant through calculation of the PEC and comparison to the ES. The PEC can be screened out as insignificant if:

- the long term PEC is less than 70% of the long term ES and;
- the short term PC is less than 20% of the short term ES minus twice the long term background concentration (the latter does not apply to assessments where protected conservation areas are within screening distance. In this instance, as the PC exceeds 10% of the short-term ES, detailed modelling is required).

These thresholds are conservative enough to ensure protection of the environment (including human health); ensuring that there will be no exceedance of an ES. Should a pollutant exceed these criteria, then detailed, air dispersion modelling is required. Where an emission cannot be screened out as insignificant, it does not mean it will necessarily be significant. For those pollutants which do not screen out as insignificant, we determine whether exceedances of the relevant ES are likely. This is done through detailed audit and review of the applicant's air dispersion modelling, taking background concentrations and modelling uncertainties into account. The

PECs can be considered 'not significant' if the assessment has shown that both the following apply:

- proposed emissions comply with BAT associated emission levels (AELs) or the equivalent requirements where there is no applicable AEL; and
- the resulting PECs won't exceed 100% of the environmental standards.

Whilst the permit was being determined, several Environmental Assessment Levels (EALs - Environmental Standards set by the Environment Agency) were updated. This update occurred as part of our Review of Environmental Assessment Levels (EALs) for emissions to air: second phase and was published on 20th November 2023.

Ethylene Oxide:

The applicant initially submitted a H1 assessment following our process [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) comparing emissions of ethylene oxide against the (old) long-term EAL of 18 µg/Nm³. We asked the applicant to consider the impact of ethylene oxide against the revised EAL of 0.002 µg/Nm³ published during the permit determination process on 20th November 2023. The applicant suggested that emissions of ethylene oxide across the facility will reduce because of their application to vary their permit and agreed to a reduction of emission limit values in the permit for production lines 2 and 3.

We agree that the variation application will likely result in a reduction of emissions of ethylene oxide from the facility for the following reasons:

- The newer equipment to be used in line 4 will operate to a higher level of efficiency compared to line 1.
- The applicant has agreed to a reduction in the emission limit value for the remaining production lines of 1mg/Nm³ from 5mg/Nm³. Whilst not adopted yet into UKBAT, this is in accordance with The BAT Conclusions for Common Waste Gas Management and Treatment Systems in the Chemicals Sector (2022) and demonstrates that the proposed techniques are BAT.
- The applicant has demonstrated a commitment to continued reduction of emissions of ethylene oxide through improvements to preventative maintenance regimes and exploring alternative abatement options.

We consider that the proposals are in accordance with guidance on BAT (Best Available Techniques). However, based on the information supplied by the applicant, we cannot discount potential exceedances of the new long-term EAL of 2 ng/Nm³ at local human health receptors and we consider that it may be possible to further reduce emissions of ethylene oxide from the installation. We have therefore included IC3 which requires the operator to review and implement

techniques to prevent or minimise emissions of ethylene oxide which achieve the best possible environmental outcome for their facility.

We have included an emission limit value of 1mg/Nm³ for ethylene oxide in the permit under Table S3.1 for gaseous emissions from the three remaining production lines; 2,3 and 4. We have required quarterly monitoring of emissions of ethylene oxide in accordance with the existing permit and requirements for monitoring of other VOCs. This goes beyond the 6 monthly requirement for monitoring listed in The BAT Conclusions for Common Waste Gas Management and Treatment Systems in the Chemicals Sector (2022) so we can conclude it is suitably protective of the environment in this instance.

Class A, Class B and other speciated VOCs:

The applicant assessed the impact of emissions of VOCs from the facility including the new production line (line 4). Environmental Assessment levels (EALs) exist for several substances which have been monitored as being present in the emission by the operator including hydrogen chloride, vinyl chloride, dioxane, acetaldehyde and toluene. EALs do not exist for ethene (ethylene), ethanol and ethyl chloride (chloroethane). VOCs are grouped in the existing permit under 'Class A' and Class B' as per the Sector Guidance Note for Inorganic Chemicals EPR 4.03 (SGN 4.03). The applicant modelled Class A VOCs as benzene and assessed Class B VOCs as toluene. We agree that these represent suitable proxy substances for assessment and are suitably conservative of the impact upon the environment.

The applicant concluded from their assessments that the impact of emissions of Class A VOCs were not significant upon human health receptors and that the impact of emissions of speciated VOCs and Class B VOCs were insignificant. We audited the applicant's assessments and whilst we do not necessarily agree with the applicant's absolute numerical values, we agree with the conclusions above.

Table 1: Results from the applicants' air dispersion modelling of total class A VOCs as benzene. The table shows only the assessment outcome at the most impacted human health receptor.

| Short-term | | | | | Long-term | | | | |
|--|---|---|--|---|--|---|---|--|---|
| <u>PC</u> (<u>µg/m³</u>) | <u>PEC</u> (<u>µg/m³</u>) | <u>EAL</u> (<u>µg/m³</u>) | <u>PC</u> (<u>%</u> <u>of</u> <u>EAL</u>) | <u>PEC</u> (<u>%</u> <u>of</u> <u>EAL</u>) | <u>PC</u> (<u>µg/m³</u>) | <u>PEC</u> (<u>µg/m³</u>) | <u>EAL</u> (<u>µg/m³</u>) | <u>PC</u> (<u>%</u> <u>of</u> <u>EAL</u>) | <u>PEC</u> (<u>%</u> <u>of</u> <u>EAL</u>) |
| 1.61 | 3.10 | 30.0 | 5.4 | 10 | 0.09 | 0.75 | 5.00 | 1.72 | 17 |

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Table 2: Outcome of the applicant's risk assessment (H1) for selected substances. Speciated substances are included where a separate limit exists in the permit but also contribute to the assessment of the impact of Class A and Class B VOCs.

| Substance | Short - term | | | Long - term | | |
|---|------------------------------------|-------------------------------------|----------------|------------------------------------|-------------------------------------|------------------|
| | PC ($\mu\text{g}/\text{m}^3$) | EAL ($\mu\text{g}/\text{m}^3$) | % PC of EAL | PC ($\mu\text{g}/\text{m}^3$) | EAL ($\mu\text{g}/\text{m}^3$) | % PC of EAL |
| Hydrogen chloride | 15.0 | 750 | 2.00 | 0.0818 | N/A ¹ | N/A ¹ |
| Vinyl chloride | 14.0 | 1,300 | 1.09 | 0.0390 | 10,000 | 0.39 |
| Total Class B VOCs (expressed as toluene) | 127 | 1910 | 1.59 | 0.348 | 8,000 ² | 0.0182 |

Note 1: no EALs have been published for long-term exposure to hydrogen chloride.

Note 2: An error has been identified with the long-term EAL for toluene. It has been accepted that this should be $800 \mu\text{g}/\text{m}^3$. This was considered in our audit of the applicant's risk assessment.

The applicant suggested emission limits in their application. We agree these are suitable for the permit and have included the following ELVs and monitoring/reporting requirements:

- We have updated the emission limit for emissions from production lines 2, 3 and included a limit for line 4 for Class A VOCs of $20 \text{ mg}/\text{Nm}^3$ in accordance with SGN 4.03.
- We have updated the emission limit for emissions from production lines 2, 3 and included a limit for line 4 for Class B VOCs of $75 \text{ mg}/\text{Nm}^3$ in accordance with SGN 4.03.
- An emission limit of $10 \text{ mg}/\text{Nm}^3$ has been added to the permit for gaseous emissions of hydrogen chloride from production line 4 in accordance with SGN 4.03.
- An emission limit of $5 \text{ mg}/\text{Nm}^3$ has been added to the permit for gaseous emissions of vinyl chloride from production line 4 in accordance with the applicants' modelling and our guidance The Production of Large Volume Organic Chemicals (EPR 4.01).
- We have included the requirement for quarterly monitoring and reporting of emissions of VOCs in accordance with the existing permit and applicable technical guidance for the chemicals sector.

Dioxins and furans

Model selection

Comparing the results of air dispersion modelling as part of the Environmental Impact assessment against European and national air quality standards effectively makes a health risk assessment for those pollutants (such as VOCs) for which a standard has been derived. These air quality standards have been developed primarily to protect human health via known intake mechanisms, such as inhalation and ingestion. Some pollutants, such as dioxins, furans and dioxin like PCBs, have human health impacts at lower ingestion levels than lend themselves to setting an air quality standard to control against. For these pollutants, a different human health risk model is required which better reflects the level of dioxin intake.

Models are available to predict the dioxin, furan and dioxin like PCBs intake for comparison with the Tolerable Daily Intake (TDI) recommended by the Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment, known as COT. These include the HHRAP model.

HHRAP has been developed by the US EPA to calculate the human body intake of a range of carcinogenic pollutants and to determine the mathematical quantitative risk in probabilistic terms. In the UK, in common with other European countries, we consider a threshold dose below which the likelihood of an adverse effect is regarded as being very low or effectively zero.

The TDI is the amount of a substance that can be ingested daily over a lifetime without appreciable health risk. It is expressed in relation to bodyweight to allow for different body size, such as for adults and children of different ages. In the UK, the COT has set a TDI for dioxins, furans and dioxin like PCBs of 2 picograms WHO-TEQ/kg-body weight/day (a picogram is a millionth of a millionth (10^{-12}) of a gram).

Assessment methodology and impact assessment:

For dioxins, furans and dioxin like PCBs, the principal exposure route is through ingestion, usually through the food chain, and the main risk to health is through accumulation in the body over the lifetime of the receptor.

The applicant considered the following pathways in their assessment: inhalation and ingestion of soil, consumption of home grown produce, consumption of poultry, eggs and breast milk. The applicant presented their results for individual pathways rather than expressing the result as an accumulated total for comparison with the COT-TDI of 2 pg WHO-TEQ/kg (BW)/day.

Table 3: Table shows the comparison of modelled impacts of dioxin and furan emissions at human receptors to the tolerable inhalation daily intake (TiDI - adjusted for body weight). The TiDI is 20% of the COT-TDI. The data in the table represents the worst-case scenario for offsite receptors at current and proposed limits.

| PC from ADMS modelling (pg/m ³) | Background (pg/m ³) | Predicted Environmental Concentration (pg/m ³) | Maximum Daily Intake (pg) | Receptor | TiDI (pg) | Max DI as % of TiDI |
|---|---------------------------------|--|---------------------------|----------|-----------|---------------------|
| 0.006 | 0.05 | 0.056 | 1.1 | Child | 6 | 4.0 |
| 0.006 | 0.05 | 0.056 | 1.1 | Adult | 28 | 18.7 |

Based on the outcomes of their modelling, the applicant concluded that emissions of dioxins and furans would not have any significant impacts on human receptors.

We audited the assessment and conclude that the intakes predicted by the applicant are unlikely to exceed 10% of the COT-TDI of 2 pg WHO-TEQ/kg (BW)/day. This is the criteria for insignificance as agreed by the United Kingdom Health Security Agency (UKHSA) and therefore we agree with the applicants' conclusions that the impacts of emissions of dioxins and furans from the facility are likely to be insignificant for human receptors. As part of our audit, we:

- assessed possible emission rates using a congener profile provided by the applicant.
- considered the impact of additional pathways including consumption of local dairy produce, beef, pork, fish and locally sourced drinking water.

We have added an emission limit value of 0.1 ng/Nm³ (as I-TEQ) for dioxins and furans for emissions arising from heat treatment from the new production line – production line 4. Whilst not directly applicable for this site, we consider that our guidance, The Production of Large Volume Organic Chemicals (EPR 4.01), sets out an achievable benchmark of 0.1 ng/Nm³ for similar industries and that the operator is able to comply with this emission limit value for production line 4 based on their monitoring data for production lines 2 and 3.

Monitoring and reporting of emissions of dioxins and furans is required annually for the new production line as per the existing production lines.

Oxides of Nitrogen and particulates

The applicant assessed the impact of emissions of oxides of nitrogen and particulates upon sensitive receptors using air dispersion modelling. A worst-case scenario assuming 100% conversion of oxides of nitrogen to nitrogen dioxide was used in the model. In addition to modelling the impact of oxides of nitrogen, the applicant also modelled the impact of acid and nitrogen deposition. The results are summarised in Tables 4, 5 and 6 below:

Table 4: Outcome of the applicant's modelling for impact of nitrogen dioxide upon sensitive receptors. All figures represent the worst-case impacts at the most affected receptor (where these are grouped together).

| Receptor | Oxides of nitrogen (expressed as NO ₂) | | | | | | | | | |
|-------------------|--|---|--|---|--|--|---|--|---|--|
| | Short-term | | | | | Long-term | | | | |
| | <u>PC</u> (<u>µg/m³</u>) | <u>PEC</u> (<u>µg/m³</u>) | <u>ES</u> (<u>µg/m³</u>) | <u>PC</u> (<u>%</u> <u>of</u> <u>ES</u>) | <u>PEC</u> (<u>%</u> <u>of</u> <u>ES</u>) | <u>PC</u> (<u>µg/m³</u>) | <u>PEC</u> (<u>µg/m³</u>) | <u>ES</u> (<u>µg/m³</u>) | <u>PC</u> (<u>%</u> <u>of</u> <u>ES</u>) | <u>PEC</u> (<u>%</u> <u>of</u> <u>ES</u>) |
| Human | 18.77 | 50.89 | 200 | 9.39 | 25 | 0.24 | 16.30 | 40 | 0.60 | 41 |
| Mersey Estuary | 0.42 | 30.18 | 75 | 0.56 | 40 | 0.02 | 14.90 | 30 | 0.06 | 50 |
| Local nature site | 4.00 | - | 75 | 5.33 | - | 0.15 | - | 30 | 0.49 | - |
| AQMA1 | 2.84 | 32.18 | 75 | 3.79 | 43 | 0.06 | 14.73 | 30 | 0.20 | 49 |
| AQMA2 | 2.46 | 31.80 | 75 | 3.28 | 42 | 0.06 | 14.73 | 30 | 0.19 | 49 |

Table 5: Outcome of the applicant's modelling for impact of nitrogen and acid deposition upon sensitive ecological receptors. All figures represent the worst-case impacts at the most affected receptor (where these are grouped together).

| Receptor | Nitrogen Deposition | | |
|-------------------|-----------------------|----------------------------------|------------------------------|
| | <u>PC (kgN/ha/yr)</u> | <u>Critical Load (KgN/ha/yr)</u> | <u>PC % of critical load</u> |
| Mersey Estuary | 0.0024 | 5 | 0.05 |
| Local Nature Site | 0.051 | 10 | 0.51 |
| Receptor | Acid Deposition | | |
| | <u>PC (keq/ha/yr)</u> | <u>Critical Load (keq/ha/yr)</u> | <u>PC % of critical load</u> |
| Mersey Estuary | 0.00017 | 0.86 | 0.02 |
| Local Nature Site | 0.00360 | 4.00 | 0.09 |

Table 6: Outcome of the applicant's modelling for impact of particulate matter (expressed as PM₁₀) on sensitive receptors. The figures represent the worst-case impacts at the most affected receptor.

| Receptor | Particulate matter (expressed as PM ₁₀) | | | | | | | | | |
|-------------------|---|---|--|---|--|--|---|--|---|--|
| | Short-term | | | | | Long-term | | | | |
| | <u>PC</u> (<u>µg/m³</u>) | <u>PEC</u> (<u>µg/m³</u>) | <u>ES</u> (<u>µg/m³</u>) | <u>PC</u> (<u>%</u> <u>of</u> <u>ES</u>) | <u>PEC</u> (<u>%</u> <u>of</u> <u>ES</u>) | <u>PC</u> (<u>µg/m³</u>) | <u>PEC</u> (<u>µg/m³</u>) | <u>ES</u> (<u>µg/m³</u>) | <u>PC</u> (<u>%</u> <u>of</u> <u>ES</u>) | <u>PEC</u> (<u>%</u> <u>of</u> <u>ES</u>) |
| Human | 3.16 | 28.72 | 50 | 6.3 | 57 | 0.90 | 13.68 | 40 | 2.26 | 34 |
| Local nature site | 0.97 | - | 50 | 1.9 | - | 0.20 | - | 40 | 0.51 | 32 |

We audited the assessment and whilst we do not necessarily agree with the applicant's absolute numerical values, we conclude that emissions of oxides of nitrogen and particulates from the installation will not be significant and are unlikely to result in exceedances of any environmental standard at sensitive receptors.

We assessed the impact of emissions of oxides of nitrogen upon ecological receptors; the Mersey Estuary SPA and Ramsar and local nature sites (within the relevant screening distances). We conclude that there will not be a significant effect/impact upon features at these sites.

We have included the following emission limit values and monitoring and reporting requirements in the permit:

- For steam raising boilers that are existing MCPs, the limit on oxides of nitrogen of 140 mg/Nm³ (emission point A7) and 100 mg/Nm³ (emission point A9) are retained in the consolidated permit. The limits go beyond the requirements of MCPD for existing plant.
- For the new steam raising boiler (emission point A13), the limit of 100 mg/Nm³ for oxides of nitrogen has been added to the permit in line with MCPD.
- We have included an annual monitoring and reporting requirement for MCPs. This is accordance with MCPD for combustion plant which aggregate > 20MWth.
- The applicant suggested emission limit values of 5 mg/Nm³ for particulates for emission points A4, A6 and A12a/A12b. We agree that these are suitable and in line with SGN 4.03.
- We have included quarterly monitoring and reporting requirements in the permit for particulates.
- We have added a new emission point (A14) to the permit for the operation of the low temperature furnace (0.9MWth) fired on natural gas. The furnace will emit small amounts of oxides of nitrogen, but these have been

assessed as being insignificant and the plant is excluded under MCPD. In accordance with our guidance, we have not added emission limits or monitoring requirements to the permit for this plant.

Emissions to receiving waters and addition of installation activity

The capacity of the installation to treat scrubber effluent by neutralisation (pH adjustment) prior to discharge to sewer has increased because of this application to more than 50m³ per day. We have therefore included activity AR2 in Table S1.1: Section 5.4 Part A(1) (a) (ii) Disposal of non-hazardous waste with a capacity exceeding 50 tonnes per day involving physico – chemical treatment.

Background and methodology of assessment of emissions to water

The applicant submitted an assessment of their emissions to receiving waters following our process [Surface water pollution risk assessment for your environmental permit - GOV.UK \(www.gov.uk\)](https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit) using the H1 tool.

Emissions of clean wastewater streams (such as cooling water and surface water run-off) discharge directly to the River Mersey through existing emission points W1, W2 and W3. The composition and volume of this discharge is unchanged by the application, so we have not assessed it further.

The application increases the volume of effluent discharged to sewer and introduces a new emission point S5. Process effluent from the installation is treated by United Utilities at Widnes Wastewater Treatment Works prior to discharge to the River Mersey. We assessed the discharge location and consider that the receiving water is TraC (Transitional and Coastal) with the discharge taking place into a low water channel where the receiving water is mostly freshwater rather than estuarine.

Emissions to receiving water bodies can be considered insignificant if the emission passes screening tests 1, or 2, or 3 and 4 as detailed in [Surface water pollution risk assessment for your environmental permit - GOV.UK \(www.gov.uk\)](https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit). These involve quantitative assessments against the relevant Environmental Quality Standards for specific pollutants and priority substances, considering the river flow rate and background concentration in the receiving water.

For priority hazardous pollutants, an additional test involves assessing the annual limit of pollutants discharged against the significant load limit. If the total load is less than the significant load, the pollutant can be screened as having an insignificant impact upon the environment.

Impact assessment

The applicant demonstrated through their H1 assessment that all the pollutants screen out at test 2. The process contribution (PC) is below 4% of the relevant EQS. Their results are presented below.

Table 7: Outcome of applicant's risk assessment (H1) for emissions to sewer.

| Substance | Annual Average EQS | | | Maximum Allowable Concentration EQS | | |
|--|--------------------|-----------|----------------|-------------------------------------|-----------|----------------|
| | EQS (µg/l) | PC (µg/l) | PC as % of EQS | EQS (µg/l) | PC (µg/l) | PC as % of EQS |
| 1,2 dichloroethane | 10 | 0.0003 | <0.01 | N/A | 0.0012 | N/A |
| Cadmium and its compounds (< 40 mg/l CaCO ₃) | 0.07 | <0.0001 | 0.02 | 0.44 | <0.0001 | <0.01 |
| Chromium VI (95%ile) (dissolved) | 3.4 | 0.0052 | 0.15 | N/A | 0.0116 | N/A |
| Copper | 1 | 0.0002 | 0.02 | N/A | 0.0011 | N/A |
| Dichloromethane | 20 | <0.0001 | <0.01 | N/A | <0.0001 | N/A |
| Lead and its compounds | 1.2 | 0.0001 | 0.01 | 14 | 0.0003 | <0.01 |
| Mercury and its compounds | N/A | <0.0001 | N/A | 0.07 | <0.0001 | <0.01 |
| Nickel and its compounds | 4 | 0.0159 | 0.40 | 34 | 0.0355 | 0.11 |
| Trichlorobenzenes | 0.4 | <0.0001 | <0.01 | N/A | <0.0001 | N/A |
| Trichloromethane | 2.5 | <0.0001 | <0.01 | N/A | 0.0001 | N/A |
| Zinc | 10.9 | 0.0004 | <0.01 | N/A | 0.0022 | N/A |

The applicant also assessed the loading of cadmium and its compounds (using the worst-case scenario of water containing < 40 mg/l CaCO₃) and mercury and its compounds against the significant load thresholds of 5kg and 1 kg per annum respectively. The applicant concluded that the calculated loads of these compounds are well below the threshold.

We audited the applicant's assessment including assessing pollutant concentrations against the EQSs for estuarine and coastal waters. We agree with the conclusion of the assessment that the annual average and maximum concentrations of the pollutants released are unlikely to exceed 4% of the relevant EQS. We also agree that releases of compounds containing cadmium and mercury will not exceed the significant load limit. We conclude that the proposed changes will therefore not have a significant impact upon the receiving water body.

We assessed the impact of the proposals upon the Mersey Estuary SPA, Ramsar and SSSI. We consider that as the impact upon the receiving water is

insignificant, the change in emissions to the Mersey Estuary SPA, Ramsar and SSSI will not significantly affect/impact any of its features.

Emission Limit Values and monitoring

The applicant suggested limits of 0.04 mg/l 1,2 dichloroethane and pH 6-10 for emissions via emission point S5 in the permit. This is in accordance with existing permitted limits and suitable for inclusion in the permit based on the applicable technical guidance.

Decision considerations

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.

Consultation

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

The application was publicised on the GOV.UK website.

We consulted the following organisations:

- Director of Public Health and UKHSA
- Food Standards Agency
- Local Authority – Environmental Health.
- Health and Safety Executive
- Sewerage Authorities.

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

The regulated facility

We considered the extent and nature of the facility at the site in accordance with RGN2 'Understanding the meaning of regulated facility', Appendix 2 of RGN2 'Defining the scope of the installation' and Appendix 1 of RGN 2 'Interpretation of Schedule 1'. An additional activity for the physico-chemical treatment of effluent

by pH adjustment was added to the permit. This is discussed in the Key Issues section. AR5 concerning the abatement of air emissions was added as an additional directly associated activity (DAA) to the permit. Previously this was included in AR4.

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.

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

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

We have assessed the application and its potential to affect sites of nature conservation, landscape, heritage and protected species and habitat designations identified in the nature conservation screening report as part of the permitting process. The site is within screening distances of protected conservation areas including the Mersey Estuary SPA, Ramsar, SSSI and several local nature sites. We assessed the possibility of impacts upon these sites using the source – pathway – receptor model. We consider that the applicable pathways are through emissions of pollutants dispersed through the air (including subsequent deposition) and emissions of pollutants into the River Mersey.

We consider that the application will not affect any site of nature conservation, landscape and heritage, and/or protected species or habitats identified. We have come to this conclusion based on our assessment of the emissions of pollutants to air and water. This is discussed further in the Key Issues section of this document.

We have not consulted Natural England.

The decision was taken in accordance with our guidance.

Environmental risk

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

The operator's risk assessment is satisfactory.

The assessment shows that, applying the conservative criteria in our guidance on environmental risk assessment or similar methodology supplied by the operator and reviewed by ourselves, all emissions may be screened out as

environmentally insignificant, with the exception of emissions of ethylene oxide. The outcome of the risk assessment and our audit is discussed further in the Key Issues section.

General operating techniques

We have reviewed the techniques proposed by the operator and compared these with the relevant guidance notes and we consider them to represent appropriate techniques for the facility. The installation is a chemical facility and several BAT/BREF documents may be applicable. We reviewed the proposed techniques against the most relevant vertical BREF: Large Volume Inorganic Chemicals – Solids and Others Industry (LVIC-S, 2007), and the horizontal BREF/BAT Conclusions: Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector BAT Conclusions (CWW, 2016) and Emissions From Storage BREF (EFS, 2006). We also reviewed the proposed techniques against our technical guidance: Additional Guidance for The Inorganic Chemicals Sector EPR 4.03. We considered additional guidance including The BAT Conclusions for Common Waste Gas Management and Treatment Systems in the Chemicals Sector (2022) and Additional Guidance for the Production of Large Volume Organic Chemicals EPR 4.01 in our decision making.

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

Operating techniques for emissions that do not screen out as insignificant

Emissions of ethylene oxide cannot be screened out as insignificant based on the information provided. We have assessed whether the proposed techniques are Best Available Techniques (BAT). The summary of our decision making is described in the Key Issues section.

Operating techniques for emissions that screen out as insignificant

Emissions of all other parameters emitted to air and water described by the applicant (other than ethylene oxide) have been screened out as insignificant, and so we agree that the applicant's proposed techniques are Best Available Techniques (BAT) for the installation. This is further described in the Key Issues section.

We consider that the emission limits included in the installation permit reflect the BAT for the sector.

National Air Pollution Control Programme

We have considered the National Air Pollution Control Programme as required by the National Emissions Ceilings Regulations 2018. By setting emission limit values in line with technical guidance we are minimising emissions to air. This will aid the delivery of national air quality targets. We do not consider that we need to include any additional conditions in this permit.

Noise and vibration management

We have reviewed the noise and vibration management plan in accordance with our guidance on noise assessment and control.

We consider that the noise and vibration management plan is satisfactory and we approve this plan.

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

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

The plan has been incorporated into the operating techniques S1.2.

Dust management

We have reviewed the dust and emission management plan in accordance with our guidance on emissions management plans for dust.

We consider that the dust and emission management plan is satisfactory and we approve this plan.

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

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

The plan has been incorporated into the operating techniques S1.2.

Updating permit conditions during consolidation

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

Raw materials

We have specified limits and controls on the use of raw materials and fuels. We have specified a limit upon sulphur content of gas oils used as fuels for medium combustion plant on site.

Pre-operational conditions

Pre-operational condition PO1 has been completed and has been removed from the permit as it is no longer relevant.

Improvement programme

Based on the information on the application, we consider that we need to include an improvement condition in the permit. We have included improvement condition IC3 to minimise emissions of ethylene oxide from the installation. This is discussed further in the Key Issues section. Improvement conditions IC1 and IC2 have been marked complete.

Emission limits

Emission Limit Values (ELVs) have been added to the permit for emissions to air and discharges to foul sewer based on the relevant technical guidance. This is discussed further in the Key Issues section.

Monitoring

Monitoring requirements have been added to the permit for emissions to air and discharges to foul sewer based on the relevant technical guidance. This is discussed further in the Key Issues section.

Reporting

Reporting requirements have been added to the permit for emissions to air and discharges to foul sewer based on the relevant technical guidance. This is discussed further in the Key Issues section

Management system

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

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

Growth duty

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

Paragraph 1.3 of the guidance says:

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

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

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

Consultation Responses

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

Responses from organisations listed in the consultation section

Response received from UKHSA

Brief summary of issues raised:

1. Errors with the risk assessment and original air dispersion modelling submitted by the applicant.
2. Requirement to consult with Food Standards Agency over possible contamination of foods from release of dioxins.
3. Changes to the Environmental Assessment Levels (EALs) for toluene and ethylene oxide.

Summary of actions taken:

1. We required the applicant to resubmit their air dispersion modelling and risk assessment addressing errors noted by UKHSA and requirements in our guidance: '[Air emissions risk assessment for your environmental permit - GOV.UK \(www.gov.uk\)](http://www.gov.uk)'. We audited the updated submission by the applicant. The results are summarised in the Key Issues section of this document.
2. We consulted with the Food Standards Agency as per our operating instruction. We received no response to our consultation. We do not consider that there will be significant risk of contamination of food with dioxins based on our assessment of the applicant's risk assessment. This is summarised in the Key Issues section.
3. We required the applicant to reassess their emissions against revised EALs when they were published on 20th November 2023. We have accepted the applicants' proposals on the basis that emissions of ethylene oxide from the installation will be reduced by the permit application. Our decision process is described in the Key Issues Section of this decision document.