# Notice of variation and consolidation with introductory note

## The Environmental Permitting (England & Wales) Regulations 2016

British Sugar PLC

Cantley Sugar Factory
Cantley
Norwich
Norfolk
NR13 3ST

### Variation application number

EPR/BX0334ID/V010

### Permit number

EPR/BX0334ID

# Cantley Sugar Factory
# Permit number EPR/BX0334ID

## Introductory note

### This introductory note does not form a part of the notice

Under the Environmental Permitting (England & Wales) Regulations 2016 (schedule 5, part 1, paragraph 19) a variation may comprise a consolidated permit reflecting the variations and a notice specifying the variations included in that consolidated permit.

Schedule 1 of the notice specifies the conditions that have been varied and schedule 2 comprises a consolidated permit which reflects the variations being made. All the conditions of the permit have been varied and are subject to the right of appeal.

This consolidated permit has been issued following a full review against the best available techniques (BAT) conclusions for the Food, Drink and Milk Industries published on 4th December 2019 in the official journal of the European Union.

We have also implemented the requirements of the relevant BAT Conclusions from the Cement, Lime and Minerals Bref.

The Medium Combustion Plant Directive has also been considered.

The schedules specify the changes made to the permit.

The main features of the permit are as follows.

The British Sugar factory at Cantley produces crystalline sugar, that is distributed in bags and bulk, and concentrated sugar juice, which is later processed into sugar or shipped to other British Sugar sites for further processing.

The installation also produces and sells as co-products: animal feed (from the beet residues after extraction of the sugar), lime products for agricultural use (from the lime used to purify the sugar juice), topsoil for agricultural use (from the soil that comes in with the beet) and stones (that come in with the beet) used for construction purposes.

Beet is typically delivered from September to March (a period known as the ‘campaign’). Outside of the campaign period refining of sugar juice or raw sugar into crystal sugar may take place as well as maintenance activities.

The sugar production process comprises:

- Receipt, handling, unloading and storage of sugar beet. The beet is stored on a concrete flat pad until it is required in the process. It is transported to the beet slicing station by water flume.
- Feedstock cleaning. The beet is cleaned during fluming. Soil, stones and weed/leaf material is removed and reclaimed. Pieces of broken beet are recovered via screens and returned to the process. The water used in the flume is known as the transport water and is treated and re-used repeatedly. Alkali and antifoam are added to the transport water to maintain the quality of the water and improve the fluming.
- Beet slicing. The beet is sliced into cossettes using power driven rotary slicers.
- Extraction (diffusion and pulp pressing). The cossettes and reclaimed broken beet pieces are passed into a continuous counter-current extraction process that uses recycled pressed pulp water supplemented by recycled condensed vapour. The pH is adjusted with sulphuric acid. Microbial growth is inhibited with biocides. Antifoam is added to control foaming caused by saponins from the beet. Wet pulp from the extractor goes to mechanical pulp presses. After the addition of pressing aids, the pulp is mechanically pressed, the pressed pulp going on to conversion into animal feed, the water pressed from the process passing through screens to reclaim pieces of pulp, with the water being recycled into the

diffuser. The sugar juice emerging from the extraction process is called ‘raw juice’ and passes to the purification stage.

- Purification, including beet end filtration. Soluble and insoluble impurities are removed by a two stage carbonation process. The raw juice is treated with milk of lime from the lime slaking process, then passed to a gassing tank where carbon dioxide from the limekilns is added. Impurities are removed by the calcium carbonate, which is formed by the reaction between the milk of lime and the carbon dioxide. The calcium carbonate is allowed to settle in a clarifier. The juice from the clarifier goes through a second gassing tank where addition of further carbon dioxide precipitates out the remainder of the milk of lime. The calcium carbonate from this stage is filtered out. Calcium carbonate from the first clarifier is pressed to increase dry substance in the lime cake, which is sold as LimeX. Water from the LimeX filter press (‘sweet water’) is recycled to make the slaked lime. Small amounts of antifoam, flocculants, colour inhibitor, alkali and filtration aids may be added to assist processing.
- Sulphitation (decolourisation of sugar juices). Solid sulphur is burned in an enclosed stove, to form sulphur dioxide. The sulphur dioxide is added to the sugar juice via a counter-current juice absorption column before the evaporator station to inhibit the colour forming reactions that take place at high temperatures.
- Evaporation. The thin juice is concentrated from 15% dry solids to 67-69% by a series of evaporators. These are heated by steam from the onsite combined heat and power plant and incorporate a high degree of heat reclamation.
- Filtration and dissolving – sugar end. The thick juice is filtered in a two stage process using a filter aid to remove any small particles prior to crystallisation. Out of specification crystallised sugar and sugar syrups are recycled to the main process flow via a continuous high shear dissolving process.
- Thick juice import. The thick juice import system ensures the juice is returned in the correct condition for further processing by pre-heating the juice using recycled condensate, correcting the pH with alkali and sometimes the addition of a colour inhibitor.
- Juice and syrup export. During the campaign thick juice and low greens syrup (a syrup from the raw sugar boiling process which is intermediate in properties between thick juice and molasses) may be sent to store for later processing (normally out of campaign) or may be exported to other sites for processing. The export system conditions the juice for this by concentrating the juice to within a tightly controlled range of solids content (‘brix’), correcting the pH, and reducing its temperature to below 25°C.
- Sugar crystallisation and centrifuging. Crystallisation takes place in batch pans with up to three stages and continuous crystallisers. Syrup is boiled under vacuum (to minimise the temperature required). The batch is seeded with very fine sugar crystals dispersed in a small quantity of isopropanol which promotes the formation of sucrose crystals. These are removed from the liquid phase by centrifuging and washing with recycled condensate. The syrup is recycled for further crystallisation. There is extensive scope for reclaiming out of specification sugar and syrup in this process. As well as crystalline sugar, the process produces sugar syrup and molasses which is either sold as a product or applied to animal feed.
- Sugar drying and cooling. The hot, damp sugar is dried in rotary dryers in a counter-current stream of warm air. The dried sugar is cooled with filtered ambient air in rotary or fluidised bed coolers. Sugar dust from the process is trapped in filters and recycled.
- Bulk sugar is stored on site in 6 silos.
- Finished products. Granulated sugar is drawn from the silos, screened, and either bagged and palletised or despatched in bulk tankers.
- Animal feed drying. Following extraction of sugar, the sugar beet cossettes are mechanically pressed to reduce the water content. They may then be sold immediately as wet animal feed, or thermally dehydrated (dried). Syrup may be mixed with the pressed pulp prior to drying to increase the nutritional value of the final feed and to reduce the formation of particulate during drying. The pulp is dried in a rotary dryer, using hot gases generated by the burning of natural gas. The exhaust gases from the dryer are discharged via cyclones to remove particulates.
- Animal feed pelleting and coating. Dried animal feed (shreds) directly from the driers, is mixed with additional syrup and extruded to form pellets. These are cooled in ambient air and screened to remove fines, which are recycled. The pellets are transferred by a conveyor to the warehouse for despatch. The exhaust gas from the coolers is discharged via cyclones to remove particulates.

The factory operates a combined heat and power (CHP) plant producing steam and electricity for the site. Excess electricity is exported to the National Grid. The CHP plant currently comprises three boilers: No.1 Boiler is fired by natural gas (ICL – thermal input 47MWth), No.2 boiler is fired by coal (Aalborg – thermal input 48MWth) and No.3 Boiler is fired by heavy fuel oil or gas oil (Maxecon – thermal input 17MWth. In line with the MCPD implementation deadlines, the site will not operate Boiler No.2 and No.3 post 31 December 2024.

Slaked lime is produced on site for use in the sugar production process by calcining limestone with coke or anthracite and then slaking it with sweet water recycled from the sugar making process. The carbon dioxide produced during calcining is partly consumed in the sugar production process. Sulphur dioxide is produced on site for use in the sugar production process by burning sulphur in a closed reactor.

There is an extensive physical and biological treatment system for wastewater. This includes a clarifier (from which soil is reclaimed), settlement ponds (which are dug out annually and the soil reclaimed), a lagoon system, a reedbed lagoon, an aerobic treatment plant and a final pond from whence the treated wastewater is discharged to controlled water, namely the River Yare. There is extensive recycling of treated wastewater within the process. All process water is treated by the effluent treatment plant before discharge.

The installation emits sulphur dioxide, nitrogen oxides, carbon monoxide, ammonia, particulates and volatile organic compounds to air, and ammonia, nitrate and phosphate to water. Particulate emissions are abated by cyclones. Sulphur dioxide emissions from the sulphur burning stove are taken up in an absorption column.

The installation is operated under an EMS which is certified to ISO14001.

The surrounding land uses in the vicinity of the installation are a mixture of agricultural, residential and light industrial, the site is located approximately 1 km to the south-east of the village of Cantley. The River Yare is adjacent to the site to the south.

There are five European habitat sites within 10 km of the installation, namely The Broads Special Area of Conservation (SAC), Broadland Special Protection Area (SPA) and Ramsar, Breydon Water SPA and Ramsar. The Poplar Farm Meadows Langley Site of Special Scientific Interest (SSSI), Limpenhoe Meadows SSSI, Cantley Marshes SSSI, two National Nature Reserves and one Local Wildlife Site are within 2km of the installation.

The status log of a permit sets out the permitting history, including any changes to the permit reference number.

| **Status log of the permit** | | |
|---|---|---|
| **Description** | **Date** | **Comments** |
| Application BX0334ID (EPR/BX0334ID/A001) | Duly made 31/03/2005 | Application for PPC permit for activities covered by the descriptions S1.1 A(1)(a), S3.1A(1)(b)(i), S5.3 PA(1)(c)(i), S6.8A(1)(d)(ii), and B(c) in Part 1 to Schedule 1 of the PCC Regulations |
| Permit determined BX0334ID | 29/03/2006 | Permit issued to British Sugar PLC |
| Variation determined EPR/BX0334ID/V002 | 10/12/2007 | Variation to;<br>• Amend effluent discharge parameter<br>• Amend reporting periods<br>• Update the list of emission points to air<br>• Remove emission testing at A67, Maxecon Boiler due to low operating hours<br>• Remove annual emissions test from A77 |
| Variation determined EPR/BX0334ID/V003 | 20/01/2009 | Variation to add improvement conditions IC24 and IC25 |

| Status log of the permit | | |
|---|---|---|
| **Description** | **Date** | **Comments** |
| Application EPR/BX0334ID/V004 (variation) | Duly Made 13/10/2008 | Several changes made to allow Raw Sugar refining during the normal shut down period |
| Variation determined EPR/BX0334ID/V004 | 22/12/2009 | Variation issued |
| Variation determined EPR/BX0334ID/V005 | 06/12/2013 | Environment Agency variation to implement the changes introduced by Industrial Emissions Directive |
| Application EPR/BX0334ID/V006 (variation) | Duly Made 03/10/2014 | Application to vary the permit to include continuous monitoring for $NO_x$, CO and particulates from the Aalborg Boiler Stack (A66) and the ICL Boiler Stack (A65). Installation of a bag filter onto the Aalborg Boiler as required by the Improvement Condition 29 |
| Application EPR/BX0334ID/V007 (variation and consolidation) | Duly Made 08/10/2014 | Application to vary and update the permit to modern conditions |
| Variation determined EPR/BX0334ID/V006 | 20/11/2014 | Varied permit issued under the consolidated permit EPR/BX0334ID/V007 |
| Variation determined EPR/BX0334ID/V007 | 20/11/2014 | Varied and consolidated permit issued to British Sugar PLC |
| Application EPR/BX0334ID/V008 (variation and consolidation) | Duly Made 14/08/2017 | Application to vary the permit to change the operating fuel of major plant on site from Heavy Fuel Oil (HFO) and coke/anthracite to natural gas |
| Variation determined EPR/BX0334ID | 17/10/2017 | Varied permit issued |
| Application EPR/BX0334ID/V009 (variation and consolidation) | Duly made 24/06/2020 | Application for a variation |
| Variation determined EPR/BX0334ID | 24/11/2020 | Varied and consolidated permit issued |
| Application EPR/BX0334ID/V010 (variation and consolidation) | Regulation 61 response 07/10/2022 | Environment Agency initiated variation and consolidation following the Food, Drink & Milk Industries sector permit review. |
| Additional information received | 20/11/2023 | Confirmation of lime kiln production capacity and size of dryers. |
| Variation determined and consolidation issued EPR/BX0334ID<br>(Billing ref KP3023PN) | 30/11/2023 | Varied and consolidated permit issued in modern format |

End of introductory note

# Notice of variation and consolidation

## The Environmental Permitting (England and Wales) Regulations 2016

The Environment Agency in exercise of its powers under regulation 20 of the Environmental Permitting (England and Wales) Regulations 2016 varies

### Permit number

**EPR/BX0334ID**

### Issued to

**British Sugar PLC** ("the operator")

whose registered office is

**Weston Centre**
**10 Grosvenor Street**
**London**
**W1K 4QY**

company registration number 00315158

to operate a regulated facility at

**Cantley Sugar Factory**
**Cantley**
**Norwich**
**Norfolk**
**NR13 3ST**

to the extent set out in the schedules.

The notice shall take effect from 04/12/2023.

| Name | Date |
|---|---|
| **Stacey Tapsell** | **30/11/2023** |

Authorised on behalf of the Environment Agency

## Schedule 1

All conditions have been varied by the consolidated permit as a result of an Environment Agency initiated variation.

## Schedule 2 – consolidated permit

Consolidated permit issued as a separate document.

# Permit

## The Environmental Permitting (England and Wales) Regulations 2016

### Permit number

**EPR/BX0334ID**

This is the consolidated permit referred to in the variation and consolidation notice for application EPR/BX0334ID/V010 authorising,

**British Sugar PLC** ("the operator"),

whose registered office is

**Weston Centre**
**10 Grosvenor Street**
**London**
**W1K 4QY**

company registration number 00315158

to operate an installation at

**Cantley Sugar Factory**
**Cantley**
**Norwich**
**Norfolk**
**NR13 3ST**

to the extent authorised by and subject to the conditions of this permit.

| Name | Date |
|---|---|
| **Stacey Tapsell** | **30/11/2023** |

Authorised on behalf of the Environment Agency

# Conditions

## 1 Management

### 1.1 General management

1.1.1 The operator shall manage and operate the activities:

(a) in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances, closure and those drawn to the attention of the operator as a result of complaints; and

(b) using sufficient competent persons and resources.

1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.

1.1.3 Any person having duties that are or may be affected by the matters set out in this permit shall have convenient access to a copy of it kept at or near the place where those duties are carried out.

### 1.2 Energy efficiency

1.2.1 The operator shall:

(a) take appropriate measures to ensure that energy is used efficiently in the activities;

(b) take appropriate measures to ensure the efficiency of energy generation at the permitted installation is maximised;

(c) review and record at least every four years whether there are suitable opportunities to improve the energy efficiency of the activities; and

(d) take any further appropriate measures identified by a review.

### 1.3 Efficient use of raw materials

1.3.1 The operator shall:

(a) take appropriate measures to ensure that raw materials and water are used efficiently in the activities;

(b) maintain records of raw materials and water used in the activities;

(c) review and record at least every four years whether there are suitable alternative materials that could reduce environmental impact or opportunities to improve the efficiency of raw material and water use; and

(d) take any further appropriate measures identified by a review.

### 1.4 Avoidance, recovery and disposal of wastes produced by the activities

1.4.1 The operator shall take appropriate measures to ensure that:

(a) the waste hierarchy referred to in Article 4 of the Waste Framework Directive is applied to the generation of waste by the activities;

(b) any waste generated by the activities is treated in accordance with the waste hierarchy referred to in Article 4 of the Waste Framework Directive; and

(c) where disposal is necessary, this is undertaken in a manner which minimises its impact on the environment.

1.4.2 The operator shall review and record at least every four years whether changes to those measures should be made and take any further appropriate measures identified by a review.

# 2 Operations

## 2.1 Permitted activities

2.1.1 The operator is only authorised to carry out the activities specified in schedule 1 table S1.1 (the "activities").

## 2.2 The site

2.2.1 The activities shall not extend beyond the site, being the land shown edged in green on the site plan at schedule 7 to this permit.

## 2.3 Operating techniques

2.3.1 The activities shall, subject to the conditions of this permit, be operated using the techniques and in the manner described in the documentation specified in schedule 1, table S1.2, unless otherwise agreed in writing by the Environment Agency.

2.3.2 If notified by the Environment Agency that the activities are giving rise to pollution, the operator shall submit to the Environment Agency for approval within the period specified, a revision of any plan or other documentation ("plan") specified in schedule 1, table S1.2 or otherwise required under this permit which identifies and minimises the risks of pollution relevant to that plan , and shall implement the approved revised plan in place of the original from the date of approval, unless otherwise agreed in writing by the Environment Agency.

2.3.3 Any raw materials or fuels listed in schedule 2 table S2.1 shall conform to the specifications set out in that table.

2.3.4 The operator shall ensure that where waste produced by the activities is sent to a relevant waste operation, that operation is provided with the following information, prior to the receipt of the waste:

(a) the nature of the process producing the waste;

(b) the composition of the waste;

(c) the handling requirements of the waste;

(d) the hazardous property associated with the waste, if applicable; and

(e) the waste code of the waste.

2.3.5 The operator shall ensure that where waste produced by the activities is sent to a landfill site, it meets the waste acceptance criteria for that landfill.

## 2.4 Improvement programme

2.4.1 The operator shall complete the improvements specified in schedule 1 table S1.3 by the date specified in that table unless otherwise agreed in writing by the Environment Agency.

2.4.2 Except in the case of an improvement which consists only of a submission to the Environment Agency, the operator shall notify the Environment Agency within 14 days of completion of each improvement.

## 2.5 Pre-operational conditions

2.5.1 The operations specified in schedule 1 table S1.4 shall not commence until the measures specified in that table have been completed.

# 3 Emissions and monitoring

## 3.1 Emissions to water, air or land

3.1.1 There shall be no point source emissions to water, air or land except from the sources and emission points listed in schedule 3 tables S3.1 and S3.2.

3.1.2 The limits given in schedule 3 shall not be exceeded.

3.1.3 Periodic monitoring shall be carried out at least once every 5 years for groundwater and 10 years for soil, unless such monitoring is based on a systematic appraisal of the risk of contamination.

## 3.2 Emissions of substances not controlled by emission limits

3.2.1 Emissions of substances not controlled by emission limits (excluding odour) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved emissions management plan, have been taken to prevent or where that is not practicable, to minimise, those emissions.

3.2.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution, submit to the Environment Agency for approval within the period specified, an emissions management plan which identifies and minimises the risks of pollution from emissions of substances not controlled by emission limits;

(b) implement the approved emissions management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

3.2.3 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.

## 3.3 Odour

3.3.1 Emissions from the activities shall be free from odour at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved odour management plan, to prevent or where that is not practicable to minimise the odour.

## 3.4 Noise and vibration

3.4.1 Emissions from the activities shall be free from noise and vibration at levels likely to cause pollution outside the site, as perceived by an authorised officer of the Environment Agency, unless the operator has used appropriate measures, including, but not limited to, those specified in any approved noise and vibration management plan to prevent or where that is not practicable to minimise the noise and vibration.

3.4.2 The operator shall:

(a) if notified by the Environment Agency that the activities are giving rise to pollution outside the site due to noise and vibration, submit to the Environment Agency for approval within the period specified, a noise and vibration management plan which identifies and minimises the risks of pollution from noise and vibration;

(b) implement the approved noise and vibration management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

## 3.5 Monitoring

3.5.1 The operator shall, unless otherwise agreed in writing by the Environment Agency, undertake the monitoring specified in the following tables in schedule 3 to this permit:

(a) point source emissions specified in tables S3.1 and S3.2.

(b) process monitoring specified in table S3.3.

3.5.2 The operator shall maintain records of all monitoring required by this permit including records of the taking and analysis of samples, instrument measurements (periodic and continuous), calibrations, examinations, tests and surveys and any assessment or evaluation made on the basis of such data.

3.5.3 Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme and the environmental or other monitoring specified in condition 3.5.1 shall have either MCERTS certification or MCERTS accreditation (as appropriate), where available, unless otherwise agreed in writing by the Environment Agency.

3.5.4 Permanent means of access shall be provided to enable sampling/monitoring to be carried out in relation to the emission points specified in schedule 3 tables S3.1 and S3.2 unless otherwise agreed in writing by the Environment Agency.

## 3.6 Pests

3.6.1 The activities shall not give rise to the presence of pests which are likely to cause pollution, hazard or annoyance outside the boundary of the site. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved pests management plan, have been taken to prevent or where that is not practicable, to minimise the presence of pests on the site.

3.6.2 The operator shall:

(a) if notified by the Environment Agency, submit to the Environment Agency for approval within the period specified, a pests management plan which identifies and minimises risks of pollution from pests;

(b) implement the pests management plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

# 4 Information

## 4.1 Records

4.1.1 All records required to be made by this permit shall:

(a) be legible;

(b) be made as soon as reasonably practicable;

(c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and

(d) be retained, unless otherwise agreed in writing by the Environment Agency, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:

(i) off-site environmental effects; and

(ii) matters which affect the condition of the land and groundwater.

4.1.2 The operator shall keep on site all records, plans and the management system required to be maintained by this permit, unless otherwise agreed in writing by the Environment Agency.

## 4.2 Reporting

4.2.1 The operator shall send all reports and notifications required by the permit to the Environment Agency using the contact details supplied in writing by the Environment Agency.

4.2.2 A report or reports on the performance of the activities over the previous year shall be submitted to the Environment Agency by 31 January (or other date agreed in writing by the Environment Agency) each year. The report(s) shall include as a minimum:

(a) a review of the results of the monitoring and assessment carried out in accordance with the permit including an interpretive review of that data;

(b) the annual production /treatment data set out in schedule 4 table S4.2;

(c) the performance parameters set out in schedule 4 table S4.3 using the forms specified in table S4.4 of that schedule.

4.2.3 Within 28 days of the end of the reporting period the operator shall, unless otherwise agreed in writing by the Environment Agency, submit reports of the monitoring and assessment carried out in accordance with the conditions of this permit, as follows:

(a) in respect of the parameters and emission points specified in schedule 4 table S4.1;

(b) for the reporting periods specified in schedule 4 table S4.1 and using the forms specified in schedule 4 table S4.4; and

(c) giving the information from such results and assessments as may be required by the forms specified in those tables.

4.2.4 The operator shall, unless notice under this condition has been served within the preceding four years, submit to the Environment Agency, within six months of receipt of a written notice, a report assessing whether there are other appropriate measures that could be taken to prevent, or where that is not practicable, to minimise pollution.

4.2.5 Where condition 3.5.5 applies the hours of operation in any year shall be reported to the Environment Agency by 31 January in the following year.

## 4.3 Notifications

4.3.1 In the event:

(a) that the operation of the activities gives rise to an incident or accident which significantly affects or may significantly affect the environment, the operator must immediately—

(i) inform the Environment Agency,

(ii) take the measures necessary to limit the environmental consequences of such an incident or accident, and

(iii) take the measures necessary to prevent further possible incidents or accidents;

(b) of a breach of any permit condition the operator must immediately—

(i) inform the Environment Agency, and

(ii) take the measures necessary to ensure that compliance is restored within the shortest possible time;

(c) of a breach of permit condition which poses an immediate danger to human health or threatens to cause an immediate significant adverse effect on the environment, the operator must

immediately suspend the operation of the activities or the relevant part of it until compliance with the permit conditions has been restored.

4.3.2 Any information provided under condition 4.3.1 shall be confirmed by sending the information listed in schedule 5 to this permit within the time period specified in that schedule.

4.3.3 Where the Environment Agency has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform the Environment Agency when the relevant monitoring and/or spot sampling is to take place. The operator shall provide this information to the Environment Agency at least 14 days before the date the monitoring is to be undertaken.

4.3.4 The Environment Agency shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:

Where the operator is a registered company:

(a) any change in the operator's trading name, registered name or registered office address; and

(b) any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.

Where the operator is a corporate body other than a registered company:

(c) any change in the operator's name or address; and

(d) any steps taken with a view to the dissolution of the operator.

In any other case:

(e) the death of any of the named operators (where the operator consists of more than one named individual);

(f) any change in the operator's name(s) or address(es); and

(g) any steps taken with a view to the operator, or any one of them, going into bankruptcy, entering into a composition or arrangement with creditors, or, in the case of them being in a partnership, dissolving the partnership.

4.3.5 Where the operator proposes to make a change in the nature or functioning, or an extension of the activities, which may have consequences for the environment and the change is not otherwise the subject of an application for approval under the Regulations or this permit:

(a) the Environment Agency shall be notified at least 14 days before making the change; and

(b) the notification shall contain a description of the proposed change in operation.

4.3.6 The Environment Agency shall be given at least 14 days notice before implementation of any part of the site closure plan.

4.3.7 Where the operator has entered into a climate change agreement with the Government, the Environment Agency shall be notified within one month of:

(a) a decision by the Secretary of State not to re-certify the agreement;

(b) a decision by either the operator or the Secretary of State to terminate the agreement; and

(c) any subsequent decision by the Secretary of State to re-certify such an agreement.

4.3.8 The operator shall inform the Environment Agency in writing of the closure of any LCP within 28 days of the date of closure.

## 4.4 Interpretation

4.4.1 In this permit the expressions listed in schedule 6 shall have the meaning given in that schedule.

4.4.2 In this permit references to reports and notifications mean written reports and notifications, except where reference is made to notification being made "immediately", in which case it may be provided by telephone.

# Schedule 1 – Operations

| Table S1.1 activities | | | |
|---|---|---|---|
| **Activity ref.** | **Activity listed in Schedule 1 of the EP Regulations** | **Description of specified activity** | **Limits of specified activity** |
| AR1 | **Section 1.1 Part A(1)(a)** Burning any fuel in an appliance with a rated thermal input of 50 megawatts or more. | Medium Combustion Plant Burning natural gas in an NEI-ICL boiler of 46.5 MW thermal input to generate steam and electricity.<br><br>Medium Combustion Plant Burning coal in an Aalborg boiler of 48.4 MW thermal input, to generate steam and electricity with lime addition treatment plant and bag filter abatement system operating no later than 31st December 2024<br><br>Medium Combustion Plant Burning gas oil in a Maxecon boiler of 16.8 MW thermal input to generate steam and electricity operating no later than 31st December 2024 | From the receipt of fuel to the use of steam and electricity in all listed activities and directly associated activities, the export of steam and electricity to other processes on the site, the export of electricity to the National Grid, the discharge of emissions to air and the disposal of waste arising. |
| AR2 | **Section 3.1 Part A(1)(b)** Producing lime in kilns or other furnaces with a production capacity of more than 50 tonnes per day. | Producing lime in a mixed feed shaft kiln with a capacity of 400 tonnes per day, for subsequent conversion to slaked lime to be used in the sugar production process. The kiln is able to be powered to operate on either coke / anthracite or natural gas. | From the receipt of fuel, anthracite, coke and limestone to the slaking of the lime produced, the use of the kiln gas in the sugar making process, the discharge of kiln gas to air and the disposal of ash and solid residues. |
| AR3 | **Section 4.2 Part A(1)(a)(i)** Producing inorganic chemicals such as gases, such as oxides of sulphur. | Producing sulphur dioxide to be used in the sugar production process. | From the receipt of sulphur to the use of sulphur dioxide in the sugar making process, the emission of exhaust gas to air and the disposal of waste. |
| AR4 | **Section 5.4 Part A(1)(a)(i)** Disposal of non-hazardous waste in a facility with a capacity exceeding 50 tonnes per day by biological treatment. | The treatment of wastewater by means of aerobic plant, clarifiers and several lagoons including a reed bed. | From the transfer of wastewater from site drains and processes, and the receipt of raw materials, to its reuse in the process or its disposal to river. |

| Table S1.1 activities | | | |
|---|---|---|---|
| **Activity ref.** | **Activity listed in Schedule 1 of the EP Regulations** | **Description of specified activity** | **Limits of specified activity** |
| AR5 | **Section 6.8 Part A(1)(d)(ii)** Treating and processing materials intended for the production of food products from vegetable raw materials at plant with a finished product production capacity of more than 300 tonnes per day (average value on a quarterly basis). | The production of sugar juice from sugar beet. | From the receipt of sugar beet to the transfer of thick juice to the filtration and dissolving unit, to storage tank, or to tanker.<br><br>Maximum sugar beet processed: 9,500 tonnes per day. |
| AR6 | **Section 6.8 Part A(1)(d)(ii)** Treating and processing materials intended for the production of food products from vegetable raw materials at plant with a finished product production capacity of more than 300 tonnes per day (average value on a quarterly basis). | The production of animal feed from sugar beet. | From the receipt of fuel and the transfer of spent cossettes (pulp) from the sugar diffuser to the despatch of animal feed, emissions to air and disposal of ash and waste, including solid waste from the combustion process used for drying the pulp with a thermal capacity of 32MWth.<br><br>Maximum production capacity:<br>Pellets: 850 tonnes per day<br>Pressed pulp: 1650 tonnes per day |
| AR7 | **Section 6.8 Part A(1)(d)(ii)** Treating and processing materials intended for the production of food products from vegetable raw materials at plant with a finished product production capacity of more than 300 tonnes per day (average value on a quarterly basis). | The production of sugar crystal from sugar juice. | From the transfer of thick juice from the process or from storage to the dispatch of crystal sugar, the discharge of dust, vapour and incondensable gases to air and the disposal of waste arising. |
| AR8 | **Section 6.8 Part A(1)(d)(ii)** Treating and processing materials intended for the production of food products from vegetable raw materials at plant with a finished product production capacity of more than 300 tonnes per day (average value on a quarterly basis). | The production of sugar crystal from raw sugar. | From the receipt of raw sugar to the despatch of crystal sugar, sugar syrups and molasses, the discharge of dust, vapour and incondensable gases to air and the disposal of waste arising. |
| AR9 | **Section 3.1 Part B(c)** Slaking lime for the purpose of making calcium hydroxide or calcium magnesium hydroxide. | The production of slaked lime to be used in the sugar production process. | From the transfer of lime to the slaker to its use in the sugar making process, the emission of dust to air and the disposal of waste arising. |
| AR10 | **Section 3.1 Part B(c)** Slaking lime for the purpose of making calcium hydroxide or calcium magnesium hydroxide. | The production of slaked lime to be used in the sugar production process. | From the receipt of burnt lime through its addition to the slaker to its use in the sugar making process, the emission of dust to air and the disposal of waste arising. |

| Table S1.1 activities | | | |
|---|---|---|---|
| **Activity ref.** | **Activity listed in Schedule 1 of the EP Regulations** | **Description of specified activity** | **Limits of specified activity** |
| **Directly Associated Activities** | | | |
| AR11 | Manufacture, conditioning and storage of Limex 45 co-product. | The recovery of impure calcium carbonate from the carbonatation process for use as a treatment to improve agricultural land. | From the filtration of the calcium carbonate from thin juice to its despatch, and the disposal of waste arising. |
| AR12 | Manufacture, conditioning and storage of Limex 70 co-product. | The recovery of impure calcium carbonate from the carbonatation process for use as a treatment to improve agricultural land. | From the filtration of the calcium carbonate from thin juice to its despatch, and the disposal of waste arising. |
| AR13 | Treatment of wastewater for the recovery of soil for re-use. | The treatment of wastewater by means of a clarifier/mud thickener and settling ponds from which topsoil is recovered. | From the generation of wastewater to its return either to the beet fluming clean water tank or to further treatment, the recovery of soil and the disposal of waste arising. |
| AR14 | Thick juice storage. | Conditioning of sugar juice and storage for later processing during the juice run. | From the concentration and cooling of thick juice (thick juice export) to the return of thick juice to the sugar end (thick juice import). |
| AR15 | Conditioning, storage and despatch of sugar. | Conditioning and storage of sugar, and its bagging or transfer to bulk container and despatch | From transfer of sugar into the silos to its despatch or reuse in the process. |
| AR16 | Generation of conditioned air for the sugar storage silos. | The cooling, dehumidifying and filtration of air. | From intake of air to its emission, and the disposal of waste. |
| AR17 | Composting | The composting of green leaf and straw delivered with the beet. | From the removal of green leaf and straw from the beet prior to processing to the despatch or use on-site of compost and the transfer of leachate to the wastewater treatment system. The maximum quantity of material be processed at any one time is 1000$m^3$. |
| AR18 | Conditioning, storage and handling of soil. | The recovery of soil delivered with the beet by washing and settling (for agricultural use), conditioning, blending and, where appropriate, screening for sale (for horticultural use). | From the excavation of soil from the settling ponds to its despatch, and the disposal of waste arising. |
| AR19 | Conditioning, storage and handling of stones. | The recovery of stones delivered with the beet for use by the construction industry. | From the separation of stones from beet to their despatch or onsite use, and the disposal of waste arising. |

| Table S1.1 activities | | | |
|---|---|---|---|
| **Activity ref.** | **Activity listed in Schedule 1 of the EP Regulations** | **Description of specified activity** | **Limits of specified activity** |
| AR20 | Preparation of wet animal feed as a co-product. | The production of pressed pulp without drying as animal feed. | From the pressing of pulp from the diffuser to the despatch of wet animal feed and the disposal of waste arising. |

| Table S1.2 Operating techniques | | |
|---|---|---|
| **Description** | **Parts** | **Date Received** |
| Application BX0334ID | The response to questions 2.1 and 2.2 given in pages/section 14-23, 28-35 and 38-62 and supplemented by Appendix 9 of the application. | 31/03/2005 |
| Variation EPR/BX0334ID/V004 | The responses to Part C of the application form and the supporting documents. | 13/10/2008 |
| Application EPR/BX0334ID/V006 | Updated Technical Description of the Activities, Appendix 9 of the original application (referenced BX0334ID/V006 Appendix 4 and 5) in response to section 3a, and Part C3 of the application form. | 11/08/2014 |
| Application EPR/BX0334ID/V008 | Parts C2 and C3 of the application documents and all supporting information. | Duly Made 14/08/2017 |
| Regulation 61 (1) Notice – Responses to questions dated 08/06/2022 | All parts | Received 07/10/2022 |

| Table S1.3 Improvement programme requirements | | |
|---|---|---|
| **Reference** | **Requirement** | **Date** |
| IC34 | The operator shall submit a report to the Environment Agency of a review the sources of ammonia emissions to air and identify proposals for reduction.<br><br>The review shall include comprehensive monitoring of emissions of ammonia from significant emission points on site under representative operating conditions and shall be in accordance with BS EN ISO 21877 including, but not limited to, those points identified in the Regulation 61 response. The monitoring shall determine the concentration and release rates from these emission points.<br><br>The operator shall use the results of the monitoring to undertake a feasibility study and develop an action plan to reduce the emissions of ammonia to air from the permitted installation. | By 30/11/2025 unless otherwise agreed in writing by the Environment Agency |

| Table S1.3 Improvement programme requirements | | |
|---|---|---|
| **Reference** | **Requirement** | **Date** |
| IC35 | The operator shall submit a report of an investigation into the emissions of carbon monoxide and other substances (such as methane and formaldehyde) from the existing beet pulp dryers. The report shall consider measures to reduce the emissions and where appropriate provide an impact assessment of the emissions to air of these parameters. | By 30/05/2024 unless otherwise agreed in writing by the Environment Agency |
| IC36 | The operator shall submit a report to the Environment Agency of a review the sources of particulate emissions to air and identify proposals for reduction.<br>The review shall include comprehensive monitoring of emissions of PM10 and PM2.5 from significant emission points on site under representative operating conditions and shall be in accordance with EN ISO 23210 including, but not limited to, those points identified in the Regulation 61 response. The monitoring shall determine the concentration and release rates from these emission points.<br>The operator shall use the results of the monitoring to undertake a feasibility study and develop an action plan to reduce the emissions of particulates to air from the permitted installation. | By 30/05/2024 unless otherwise agreed in writing by the Environment Agency |
| IC37 | The operator shall submit a report of a review the sources of input of EDTA into the wastewater stream and identify proposals to reduce the input of this parameter in accordance with BATc8 of the Food, Drink and Milk Industries BAT Conclusions. | By 30/11/2025 unless otherwise agreed in writing by the Environment Agency |
| IC38 | The operator shall undertake an investigation into the fate of the lime kiln gases, including but not limited to:<br>• The most representative location of their release into the environment.<br>• The characteristics and composition of the gases as released.<br>• An assessment of the characteristics and composition of the gases against typical lime kiln vent gases, and the representative nature of the release.<br>• An assessment of the concentrations of emissions against the CLM BAT-AELs.<br>The operator shall submit a report detailing their investigation for review by the Environment Agency | By 30/11/2025 unless otherwise agreed in writing by the Environment Agency |
| IC39 | The operator shall submit a report to the Environment Agency of monitoring carried out to determine the size distribution of particulate matter in the exhaust gas emissions to air from emission points A56 & A57 identifying the fractions within the PM10 and PM2.5 ranges. The monitoring shall be carried out under representative operating conditions and shall be in accordance with EN ISO 23210. | By 30/05/2024 unless otherwise agreed in writing by the Environment Agency |

| Table S1.4 Pre-operational measures | |
|---|---|
| **Reference** | **Pre-operational measures** |
| PO1 | The Operator shall inform the Environment Agency in writing of the intention to proceed with the Raw Sugar Refinery process and provide the proposed date of commencement. |
| PO2 | During the first year of operation of the Raw Sugar Refinery process within the Regulated Facility, the Operator shall carry out the following measures:<br>• A noise survey shall be carried out around all plant, equipment and buildings installed as part of this project. Once the survey is completed a written report of the results shall be submitted to the Agency. Should the survey show that noise levels are above acceptable levels, the operator shall include information regarding actions to be taken to reduce noise.<br>• A noise survey shall be carried out at the locations of the nearest receptors, as indicated in Report 1906/R2. Once the survey is completed a written report of the results shall be submitted to the Agency. Should the survey show that noise levels are above acceptable levels, the operator shall include information regarding actions to be taken to reduce noise.<br>The Operator shall not commence the second year of Operation until they have completed the above actions and received written confirmation from the Agency that the plant can be brought into operation. |

# Schedule 2 – Raw materials and fuels

| Table S2.1 Raw materials and fuels | |
|---|---|
| **Raw materials and fuel description** | **Specification** |
| Coal smalls for combustion and power generation [NOTE 1] | Less than 1.7% w/w sulphur content |
| Gas oil | Less than 0.1% w/w sulphur content |
| NOTE 1 – Coal boiler will not be operated after 31/12/2024 | |

# Schedule 3 – Emissions and monitoring

| Table S3.1 Point source emissions to air – emission limits and monitoring requirements | | | | | | |
|---|---|---|---|---|---|---|
| **Emission point ref. & location as referred to in Site Plans in Schedule 7** | **Source** | **Parameter** | **Limit (including unit)** [NOTE 1] | **Reference period** | **Monitoring frequency** | **Monitoring standard or method** |
| A1, A2, A3, A4, A5, A6, A7, A8, A9, A10, A11, A12, A13, A14, A15, A16, A17, A18, A19, A20, A21, A23, A24, A25, A26, A27, A28, A29, A30, A31, A32, A35, A36, A37, A38, A50, A51, A59, A60, A63, A64, A68, A69, A70, A71, A72, A73, A74, A75 & A76 | Vents from main factory local exhaust ventilation and sundry sources, treated collectively. | - | - | - | - | - |
| A22 | Vent from sulphitation absorption column | Sulphur dioxide | 150 $mg/m^3$ | Periodic (minimum 4 hour period, data reported as 15 minute averages) | Annually | BS EN 14791 |
| A33 & A34 | Vapour extraction from white centrifuges | - | - | - | - | - |
| A39, A40, A41, A42, A43 & A44 | Silo air conditioning reactivation air | - | - | - | - | - |
| A45 & A46 | Granulators | - | - | - | - | - |
| A47 | Wet sugar scroll extraction | - | - | - | - | - |
| A52 & A53 | Condensate cooling tower | - | - | - | - | - |
| A55 | Vent from natural gas fired dryer abated by cyclone | Oxides of Nitrogen (NO and NO2 expressed as NO2) | 55 $mg/m^3$ | Average over the sampling period | Monthly | BS EN 14792 |

| Table S3.1 Point source emissions to air – emission limits and monitoring requirements | | | | | | |
|---|---|---|---|---|---|---|
| **Emission point ref. & location as referred to in Site Plans in Schedule 7** | **Source** | **Parameter** | **Limit (including unit) [NOTE 1]** | **Reference period** | **Monitoring frequency** | **Monitoring standard or method** |
| | | Carbon monoxide | 1500 $mg/m^3$ | Average over the sampling period | Monthly | BS EN 15058 |
| | | Total particulates | 80 $mg/m^3$ | Average over the sampling period | Monthly | BS EN 13284-1 |
| | | $PM_{2.5}$ | No limit set | Average over the sampling period | Annually | EN ISO 23210 |
| | | $PM_{10}$ | No limit set | Average over the sampling period | Annually | EN ISO 23210 |
| | | TVOCs | No limit set | Average over the sampling period | Annually | BS EN 12619 |
| A56 | Vent from pellet cooler cyclones 1 - 3 | Total particulates | 20 $mg/m^3$ | Average over sampling period | Annually | BS EN 13284-1 |
| A57 | Vent from pellet cooler cyclones 4 - 6 | Total particulates | 20 $mg/m^3$ | Average over sampling period | Annually | BS EN 13284-1 |
| A58 | Nuisance dust filter vent | Total particulates | 10 $mg/m^3$ | Average over sampling period | Annually | BS EN 13284-1 |
| A61 | Lime slaker vent abated via a hydro cyclone | Total particulates | 20 $mg/m^3$ | Average over sampling period | Annually | BS EN 13284-1 |
| A65 | ICL Boiler No.1 fired on natural gas | Oxides of Nitrogen (NO and $NO_2$ expressed as $NO_2$) | 200 $mg/m^3$ | Daily average (NOTE 2) | Continuous | BS EN 14181 |
| | | Oxides of Nitrogen (NO and $NO_2$ expressed as $NO_2$) | 200 $mg/m^3$ | Periodic (minimum 4 hour period data reported as 30 minute averages) | Annually | BS EN 14792 |
| | | Carbon monoxide | 50 $mg/m^3$ | Daily average (NOTE 2) | Continuous | BS EN 15058 |

| Table S3.1 Point source emissions to air – emission limits and monitoring requirements | | | | | | |
|---|---|---|---|---|---|---|
| **Emission point ref. & location as referred to in Site Plans in Schedule 7** | **Source** | **Parameter** | **Limit (including unit)** [NOTE 1] | **Reference period** | **Monitoring frequency** | **Monitoring standard or method** |
| | | Carbon monoxide | 50 mg/$m^3$ | Periodic (minimum 4 hour period data reported as 30 minute averages) | Annually | BS EN 15058 |
| A66 | Aalborg boiler No.2<br>fired on coal abated via bag filter<br>[boiler to be removed by 31/12/2024] | Oxides of Nitrogen (NO and $NO_2$ expressed as $NO_2$) | 350 mg/$Nm^3$ | Daily average (NOTE 2) | Continuous | BS EN 14792 |
| | | Oxides of Nitrogen (NO and $NO_2$ expressed as $NO_2$) | 350 mg/$Nm^3$ | Periodic (minimum 4 hour period, data reported as 30 minute averages) | Annually | BS EN 14792 |
| | | Carbon monoxide | 50 mg/$Nm^3$ | Daily average (NOTE 2) | Continuous | BS EN 15058 |
| | | Carbon monoxide | 50 mg/$Nm^3$ | Periodic (minimum 4 hour period, data reported as 10 minute averages) | Annually | BS EN 15058 |
| | | Total particulates | 30 mg/$Nm^3$ | Daily average (NOTE 2) | Continuous | BS EN 13284-1 |
| | | Total particulates | 30 mg/$Nm^3$ | Periodic (minimum 1 hour period) | Annually | BS EN 13284-1 |
| | | $PM_{10}$ | No limit set | Periodic (minimum 1 hour period) | Annually | BS EN 13284-1 |
| A67 | Maxecon boiler No.3<br>fired on gas oil<br>[boiler to be removed by 31/12/2024] | Oxides of Nitrogen (NO and $NO_2$ expressed as $NO_2$) | 1000 mg/$Nm^3$ | Periodic (minimum 4 hour period, data reported as 30 minute averages) | Monthly | BS EN 14792 |
| | | Carbon monoxide | 100 mg/$Nm^3$ | Periodic (minimum 4 hour period, data reported as 30 minute averages) | Monthly [NOTE 3] | BS EN 15058 |

| Table S3.1 Point source emissions to air – emission limits and monitoring requirements | | | | | | |
|---|---|---|---|---|---|---|
| **Emission point ref. & location as referred to in Site Plans in Schedule 7** | **Source** | **Parameter** | **Limit (including unit)** [NOTE 1] | **Reference period** | **Monitoring frequency** | **Monitoring standard or method** |

NOTE 1: See Schedule 6 of Permit for reference conditions, except for A55 where the oxygen reference condition is 16-vol % with no correction for water.

NOTE 2: The Continuous Emission Monitors shall be used such that;

(a) the values of the 95% confidence intervals of a single measured result at the daily emission limit value shall not exceed the following percentages:

- Carbon monoxide 10%
- Sulphur dioxide 20%
- Oxides of nitrogen (NO & NO2 expressed as NO2) 20%
- Particulate matter 30%

(b) valid hourly average values shall be determined within the effective operating time (excluding the start-up and shut-down periods) from the measured values after having subtracted the value of the confidence intervals in (a);

(c) where it is necessary to calibrate or maintain the monitor and this means that data are not available for a complete hour period, the hourly average shall in any case be considered valid if measurements are available for a minimum of 40 minutes during the hour period.

(d) daily average values shall be determined as the average of all the valid hourly average values within a calendar day.

NOTE 3: Monthly monitoring required if plant is run for more than 7 days per calendar month.

| Table S3.2 Point Source emissions to water (other than sewer) – emission limits and monitoring requirements | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Emission point ref. & location** | **Source** | **Parameter** | **Limit (including unit) during the periods below as specified** | | **Reference period** | **Monitoring frequency** | **Monitoring standard or method** |
| | | | **Beet processing campaign period [NOTE 1]** | **Non-beet processing period [NOTE 2]** | | | |
| W1 on site plan in Schedule 7 | Site effluent treatment plant via final settlement pond to the River Yare Discharge Point | Discharge volume | 6,800 $m^3$/day | 4,545 $m^3$/day | Daily | Continuous | Electro-magnetic flow |
| | | BOD concentration | 420 mg/l | 140 mg/l | Spot sample | Weekly | BS EN ISO 5815-1 |
| | | BOD mass emission load | 1,250 kg/d | 600 kg/d | Calculated daily load | Daily | -- |
| | | COD concentration | 155 mg/l [NOTE 3] | 155 mg/l [NOTE 3] | Spot sample | Daily | BS EN ISO 6060 |
| | | COD mass emission load | 1,054 kg/d | 705 kg/d | Calculated daily load | Daily | -- |
| | | Total Nitrogen concentration | 30 mg/l [NOTE 3] | 30 mg/l [NOTE 3] | Spot sample | Daily | BS EN 20236 |
| | | Total Nitrogen mass emission load | 204 kg/d | 137 kg/d | Calculated daily load | Daily | -- |
| | | Total suspended solids | 50 mg/l | 50 mg/l | Spot sample | Daily | BS EN 872 |
| | | Suspended solids mass emission load | 340 kg/day | 228 kg/day | Mass balance | Daily | -- |
| | | Total Phosphorous concentration | 2 mg/l | 2 mg/l | Spot sample | Daily | BS EN ISO 6878 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Total Phosphorous mass emission load | 14 kg/d | 10 kg/d | Calculated daily load | Daily | -- |
| | | Chloride | No limit set | No limit set | Spot sample | Monthly | BS EN ISO 15682 |
| | | Neonicotinoids [NOTE 4] | No limit set | N/A | Spot sample | Twice per campaign with a minimum of 28 days between samples | As agreed by the Environment Agency |
| | | Temperature (when discharging treated wastewater) | 25 °C maximum | | Instantaneous | Daily (during process operations)<br>Weekly (outside of processing operations) | -- |
| | | Time of discharge | Discharge in any period to be only during the period 30 minutes after high water to one hour before low water | | -- | -- | -- |
| W2 on site plan in Schedule 7 | Turbine Colling Water River Yare Discharge Point | Discharge volume<br>(when discharging turbine colling water only) | 9090 $m^3$/day | | 24 hour maximum | Continuous | Electro-magnetic flow |
| | | Temperature (when discharging treated wastewater) | 25 °C maximum | | Instantaneous | Daily (during process operations)<br>Weekly (outside of processing operations) | -- |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | BOD5<br>(when discharging turbine cooling water only) | 10 mg/litre | Spot sample | Weekly | BS EN ISO 5815-1 |
| NOTE 1: Beet processing period typically October to February<br>NOTE 2: Non-beet processing period typically March to September<br>NOTE 3: Based on a yearly average and calculated on a flow weighted basis. For total nitrogen (TN) if the annual average removal efficiency is <80% then the TN ELV will be 20 mg/l. If the COD removal efficiency is <95% then the COD ELV will be 100 mg/l.<br>NOTE 4: Monitoring of parameter only required when crop has been dressed with neonicotinoids. | | | | | | |

| **Table S3.3 Process monitoring requirements** | | | | |
|---|---|---|---|---|
| **Emission point reference or source or description of point of measurement** | **Parameter** | **Monitoring frequency** | **Monitoring standard or method** | **Other specifications** |
| W1 | Abatement efficiency - COD & TN % removal | Calculated annually from October to September | Refer to Table S3.2 | Annual average and calculated on a flow weighted basis, excluding start up and shutdown as defined in EMS |
| Storage lagoons and storage tanks | Volume | Weekly (minimum) | Visual | Records of volume must be maintained, and the levels adequately controlled to prevent “over-topping” |
| | Flow | Daily | Flow metre measurement | |

# Schedule 4 – Reporting

Parameters, for which reports shall be made, in accordance with conditions of this permit, are listed below.

| **Table S4.1 Reporting of monitoring data** | | | |
|---|---|---|---|
| **Parameter** | **Emission or monitoring point/reference** | **Reporting period** | **Period begins** |
| Oxides of nitrogen | A55, A65, A66, A67 | Every 3 months for continuous monitoring | 1 January, 1 April, 1 July, 1 October |
| | | Every 6 months for periodic monitoring | 1 January, 1 July |
| | | Every year where there is an annual average | 1 January |
| | | Every 2 years for concentration by calculation | 1 January |
| Carbon monoxide | A55, A65, A66, A67 | Every 3 months for continuous monitoring | 1 January, 1 April, 1 July, 1 October |
| | | Every 6 months for periodic monitoring | 1 January, 1 July |
| | | Every year where there is an annual average | 1 January |
| | | Every 2 years for concentration by calculation | 1 January |
| Sulphur dioxide | A22 | Every 3 months for continuous monitoring | 1 January, 1 April, 1 July, 1 October |
| | | Every 6 months for periodic monitoring | 1 January, 1 July |
| Total particulates | A55, A66 | Every 3 months | 1 January, 1 April, 1 July, 1 October |
| | A56, A57, A58, A61 | Annually | 1 January |
| $PM_{2.5}$ | A55 | Annually | 1 January |
| $PM_{10}$ | A55, A66 | Annually | 1 January |
| Total Volatile Organic Compounds | A55 | Annually | 1 January |
| Process monitoring requirements | As specified by Table S3.3 | Annually | 1 January unless otherwise specified |

| Table S4.1 Reporting of monitoring data | | | |
|---|---|---|---|
| **Parameter** | **Emission or monitoring point/reference** | **Reporting period** | **Period begins** |
| Discharge volume | W1, W2 | Every 3 months | 1 January, 1 April, 1 July, 1 October |
| Biological Oxygen Demand | W1, W2 | Every 3 months | 1 January, 1 April, 1 July, 1 October |
| Chemical Oxygen Demand | W1 | Every 3 months | 1 January, 1 April, 1 July, 1 October |
| Total nitrogen | W1 | Every 3 months | 1 January, 1 April, 1 July, 1 October |
| Suspended solids | W1 | Every 3 months | 1 January, 1 April, 1 July, 1 October |
| Total phosphorus | W1 | Every 3 months | 1 January, 1 April, 1 July, 1 October |
| Temperature °C | W1, W2 | Every 3 months | 1 January, 1 April, 1 July, 1 October |
| Chloride | W1 | Annually | 1 January |
| Temperature | W1, W2 | Annually | 1 January |
| Neonicotinoids (as required) | W1 | Annually (as required) | 1 January |

| Table S4.2 Annual production/treatment | |
|---|---|
| **Parameter** | **Units** |
| Sugar beet processed | tonnes |
| Production of crystal sugar | tonnes |
| Production of other sugars | tonnes |
| Quantity of thick juice / sugar syrups exported | tonnes |
| Production of wet animal feed | tonnes |
| Production of dry animal feed | tonnes |
| Production of soil | tonnes |
| Production of stones | tonnes |
| Production of “Lime X” | tonnes |

| Table S4.3 Other Performance parameters for reporting to the Environment Agency | | |
|---|---|---|
| **Parameter** | **Frequency of assessment** | **Units** |
| Water usage | Annually | $m^3$ |
| Specific wastewater discharge | Annually | $m^3$ / tonne of beets sliced |
| Energy usage | Annually | MWh |
| Specific energy usage | Annually | MWh/tonne of beets sliced |
| Power generated | Annually | GWh |
| Food waste | Annually | tonnes |
| Total particulate matter to air/tonne beet sliced | Annually | kg/t |
| Total PM2.5 to air/tonne beet sliced | Annually | kg/t |

| Table S4.4 Reporting forms | | |
|---|---|---|
| **Parameter** | **Reporting form** | **Form version number and date** |
| Point source emissions to air | Emissions to Air Reporting Form, or other form as agreed in writing by the Environment Agency | Version 1, 08/03/2021 |
| Point source emissions to water (other than sewer) | Emissions to Water Reporting Form, or other form as agreed in writing by the Environment Agency | Version 1, 08/03/2021 |
| Water usage | Water Usage Reporting Form, or other form as agreed in writing by the Environment Agency | Version 1, 08/03/2021 |
| Energy usage | Energy Usage Reporting Form, or other form as agreed in writing by the Environment Agency | Version 1, 08/03/2021 |

| Table S4.4 Reporting forms | | |
|---|---|---|
| **Parameter** | **Reporting form** | **Form version number and date** |
| Food Waste | Food waste Reporting Form, or other form as agreed in writing by the Environment Agency | Version 1 06/02/2023 |
| Other performance parameters | Other Performance Parameters Reporting Form, or other form as agreed in writing by the Environment Agency | Version 1, 08/03/2021 |

# Schedule 5 – Notification

These pages outline the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the EP Regulations.

# Part A

| | |
|---|---|
| Permit Number | |
| Name of operator | |
| Location of Facility | |
| Time and date of the detection | |

| **(a) Notification requirements for any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution** | |
|---|---|
| **To be notified within 24 hours of detection** | |
| Date and time of the event | |
| Reference or description of the location of the event | |
| Description of where any release into the environment took place | |
| Substances(s) potentially released | |
| Best estimate of the quantity or rate of release of substances | |
| Measures taken, or intended to be taken, to stop any emission | |
| Description of the failure or accident. | |

| **(b) Notification requirements for the breach of a limit** | |
|---|---|
| **To be notified within 24 hours of detection unless otherwise specified below** | |
| Emission point reference/ source | |
| Parameter(s) | |
| Limit | |
| Measured value and uncertainty | |
| Date and time of monitoring | |

| (b) Notification requirements for the breach of a limit | |
|---|---|
| **To be notified within 24 hours of detection unless otherwise specified below** | |
| Measures taken, or intended to be taken, to stop the emission | |

| Time periods for notification following detection of a breach of a limit | |
|---|---|
| **Parameter** | **Notification period** |
| | |
| | |
| | |

| (c) Notification requirements for the breach of permit conditions not related to limits | |
|---|---|
| To be notified within 24 hours of detection | |
| Condition breached | |
| Date, time and duration of breach | |
| Details of the permit breach i.e. what happened including impacts observed. | |
| Measures taken, or intended to be taken, to restore permit compliance. | |

| (d) Notification requirements for the detection of any significant adverse environmental effect | |
|---|---|
| **To be notified within 24 hours of detection** | |
| Description of where the effect on the environment was detected | |
| Substances(s) detected | |
| Concentrations of substances detected | |
| Date of monitoring/sampling | |

# Part B – to be submitted as soon as practicable

| | |
|---|---|
| Any more accurate information on the matters for notification under Part A. | |
| Measures taken, or intended to be taken, to prevent a recurrence of the incident | |
| Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission | |
| The dates of any unauthorised emissions from the facility in the preceding 24 months. | |

| | |
|---|---|
| Name* | |
| Post | |
| Signature | |
| Date | |

* authorised to sign on behalf of the operator

# Schedule 6 – Interpretation

“accident” means an accident that may result in pollution.

“application” means the application for this permit, together with any additional information supplied by the operator as part of the application and any response to a notice served under Schedule 5 to the EP Regulations.

“authorised officer” means any person authorised by the Environment Agency under section 108(1) of The Environment Act 1995 to exercise, in accordance with the terms of any such authorisation, any power specified in section 108(4) of that Act.

“average over the sampling period” means the average value of three consecutive measurements of at least 30 minutes each or as agreed in writing with the Environment Agency.

“daily average” means the average over a period of 24 hours of validated hourly averages obtained by continuous measurements.

“emissions of substances not controlled by emission limits” means emissions of substances to air, water or land from the activities, either from the emission points specified in schedule 3 or from other localised or diffuse sources, which are not controlled by an emission limit.

“EP Regulations” means The Environmental Permitting (England and Wales) Regulations SI 2016 No.1154 and words and expressions used in this permit which are also used in the Regulations have the same meanings as in those Regulations.

“groundwater” means all water, which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

“Industrial Emissions Directive” means DIRECTIVE 2010/75/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 24 November 2010 on industrial emissions, as read in accordance with Schedule 1A to the Environmental Permitting (England and Wales) Regulations 2016.

“MCERTS” means the Environment Agency’s Monitoring Certification Scheme.

“Natural gas” means naturally occurring methane with no more than 20% by volume of inert or other constituents.

“ncv” means net calorific value.

“operational hours” are whole hours commencing from the first unit ending start up and ending when the last unit commences shut down.

“pests” means Birds, Vermin and Insects.

“quarter” means a calendar year quarter commencing on 1 January, 1 April, 1 July or 1 October.

“recovery” means any of the operations provided for in Annex II to Directive 2008/98/EC of the European Parliament and of the Council on waste.

“Waste Framework Directive” or “WFD” means Waste Framework Directive 2008/98/EC of the European Parliament and of the Council on waste

Where a minimum limit is set for any emission parameter, for example pH, reference to exceeding the limit shall mean that the parameter shall not be less than that limit.

**Unless otherwise stated**, any references in this permit to concentrations of substances in emissions into air means:

- in relation to emissions from combustion processes, the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 3% dry for liquid and gaseous fuels, 6% dry for solid fuels; and/or

- in relation to emissions from gas turbine or compression ignition engine combustion processes, the concentration in dry air at a temperature of 273K, at a pressure of 101.3kPa and with an oxygen content of 15% dry for liquid and gaseous fuels; and/or
- in relation to emissions from combustion processes comprising a gas turbine with a waste heat boiler, the concentration in dry air at a temperature of 273K, at a pressure of 101.3kPa and with an oxygen content of 15% dry, unless the waste heat boiler is operating alone, in which case, with an oxygen content of 3% dry for liquid and gaseous fuels; and/or
- in relation to emissions from non-combustion sources, the concentration at a temperature of 273K and at a pressure of 101.3 kPa, with no correction for water vapour content.

“year” means calendar year ending 31 December.

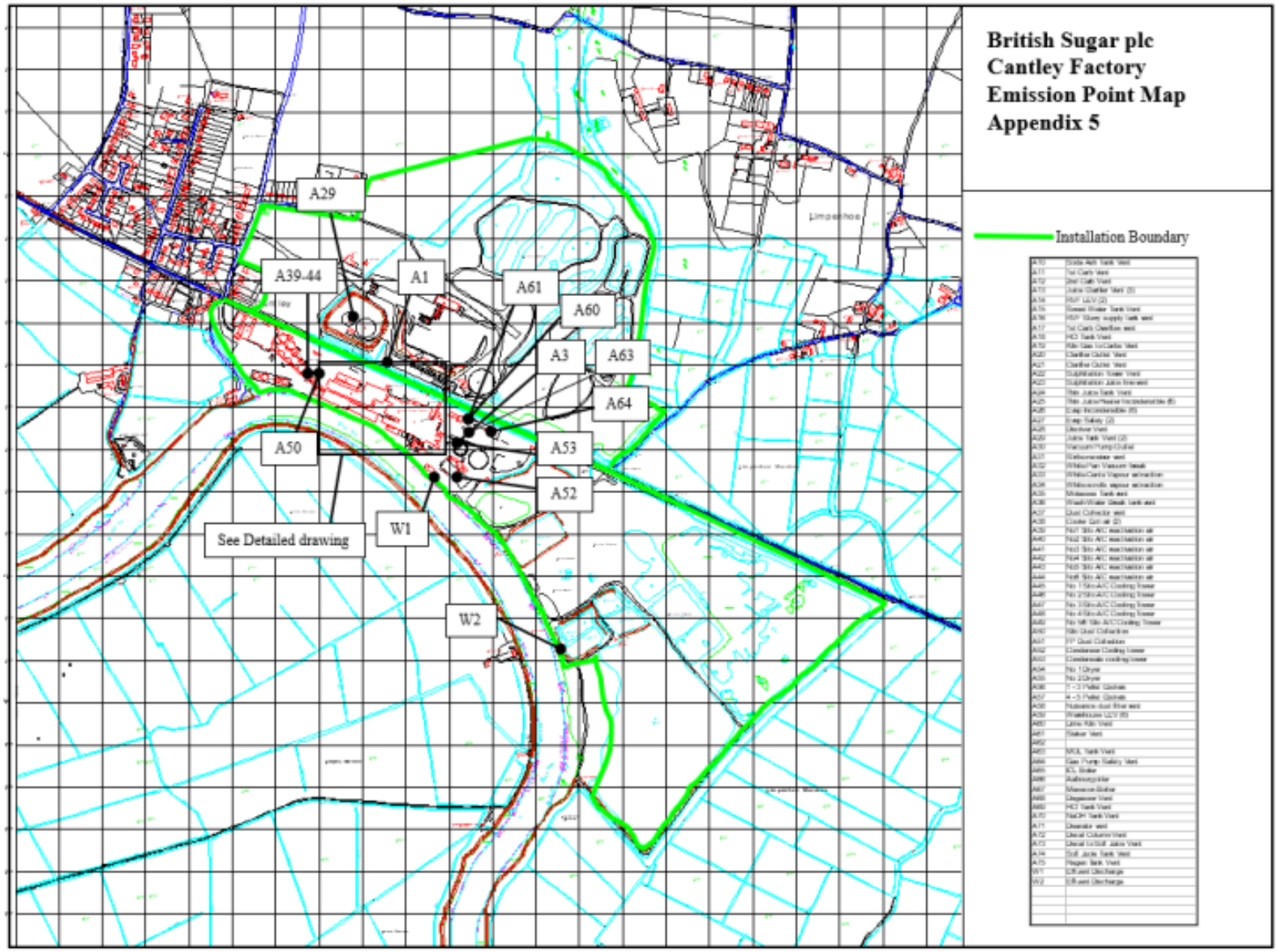
For dioxins/furans the determination of the toxic equivalence concentration (I-TEQ, & WHO-TEQ for dioxins/furans, WHO-TEQ for dioxin-like PCBs) stated as a release limit and/ or reporting requirement, the mass concentrations of the following congeners have to be multiplied with their respective toxic equivalence factors before summing.

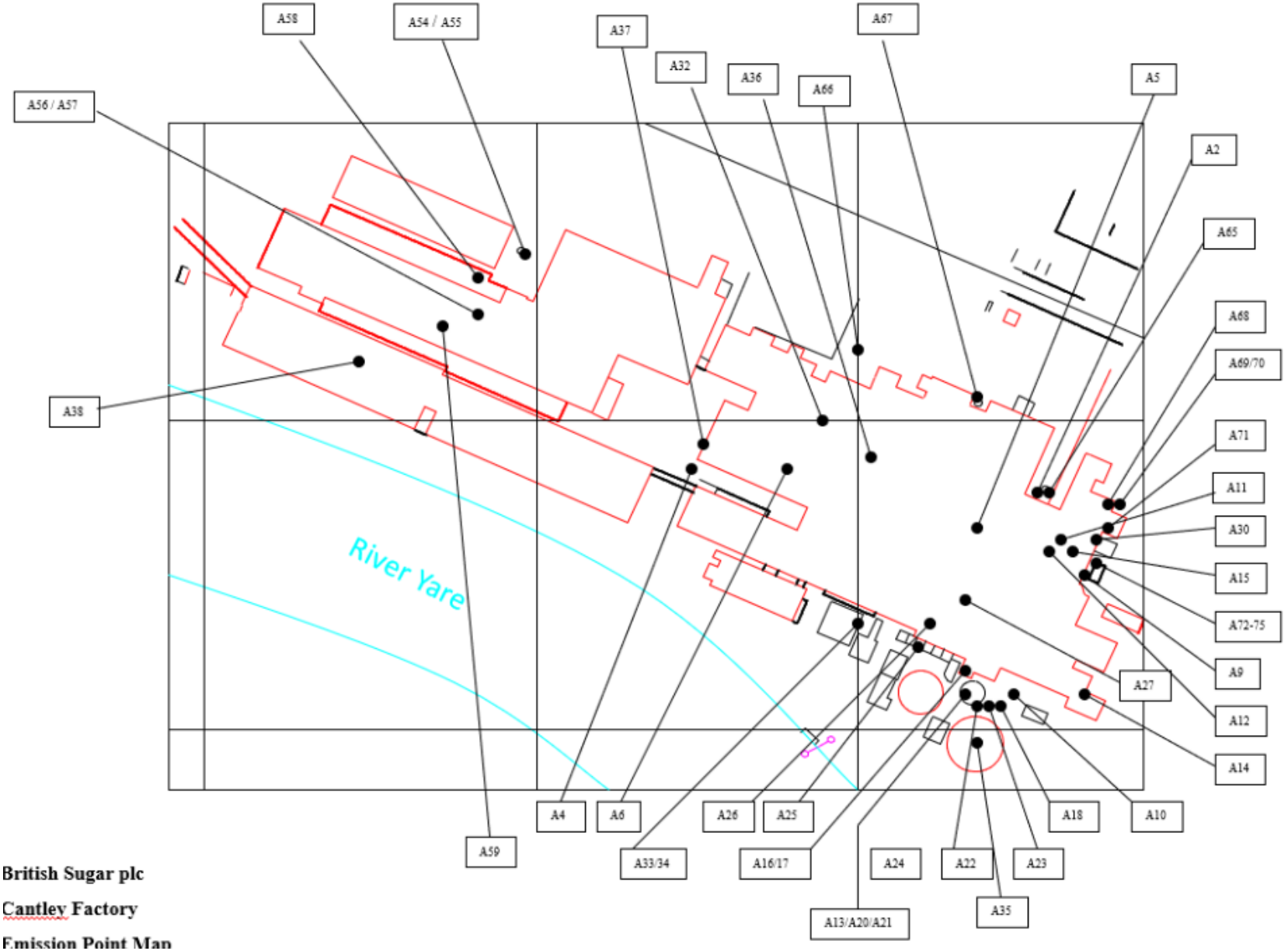
| **TEF schemes for dioxins and furans** | | | | |
|---|---|---|---|---|
| **Congener** | **I-TEF** | **WHO-TEF** | | |
| | **1990** | **2005** | **1997/8** | |
| | | **Humans / Mammals** | **Fish** | **Birds** |
| **Dioxins** | | | | |
| 2,3,7,8-TCDD | 1 | 1 | 1 | 1 |
| 1,2,3,7,8-PeCDD | 0.5 | 1 | 1 | 1 |
| 1,2,3,4,7,8-HxCDD | 0.1 | 0.1 | 0.5 | 0.05 |
| 1,2,3,6,7,8-HxCDD | 0.1 | 0.1 | 0.01 | 0.01 |
| 1,2,3,7,8,9-HxCDD | 0.1 | 0.1 | 0.01 | 0.1 |
| 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.01 | 0.001 | <0.001 |
| OCDD | 0.001 | 0.0003 | - | - |
| **Furans** | | | | |
| 2,3,7,8-TCDF | 0.1 | 0.1 | 0.05 | 1 |
| 1,2,3,7,8-PeCDF | 0.05 | 0.03 | 0.05 | 0.1 |
| 2,3,4,7,8-PeCDF | 0.5 | 0.3 | 0.5 | 1 |
| 1,2,3,4,7,8-HxCDF | 0.1 | 0.1 | 0.1 | 0.1 |
| 1,2,3,7,8,9-HxCDF | 0.1 | 0.1 | 0.1 | 0.1 |
| 1,2,3,6,7,8-HxCDF | 0.1 | 0.1 | 0.1 | 0.1 |
| 2,3,4,6,7,8-HxCDF | 0.1 | 0.1 | 0.1 | 0.1 |
| 1,2,3,4,6,7,8_HpCDF | 0.01 | 0.01 | 0.01 | 0.01 |
| 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.01 | 0.01 | 0.01 |
| OCDF | 0.001 | 0.0003 | 0.0001 | 0.0001 |

| **TEF schemes for dioxin-like PCBs** | | | |
|---|---|---|---|
| **Congener** | **WHO-TEF** | | |
| | **2005** | **1997/8** | |
| | **Humans / mammals** | **Fish** | **Birds** |
| **Non-ortho PCBs** | | | |
| 3,4,4',5-TCB (81) | 0.0001 | 0.0005 | 0.1 |
| 3,3',4,4'-TCB (77) | 0.0003 | 0.0001 | 0.05 |
| 3,3',4,4',5 - PeCB (126) | 0.1 | 0.005 | 0.1 |
| 3,3',4,4',5,5'-HxCB(169) | 0.03 | 0.00005 | 0.001 |
| **Mono-ortho PCBs** | | | |
| 2,3,3',4,4'-PeCB (105) | 0.00003 | <0.000005 | 0.0001 |
| 2,3,4,4',5-PeCB (114) | 0.00003 | <0.000005 | 0.0001 |
| 2,3',4,4',5-PeCB (118) | 0.00003 | <0.000005 | 0.00001 |
| 2',3,4,4',5-PeCB (123) | 0.00003 | <0.000005 | 0.00001 |
| 2,3,3',4,4',5-HxCB (156) | 0.00003 | <0.000005 | 0.0001 |
| 2,3,3',4,4',5'-HxCB (157) | 0.00003 | <0.000005 | 0.0001 |

| | | | |
|---|---|---|---|
| 2,3',4,4',5,5'-HxCB (167) | 0.00003 | <0.000005 | 0.00001 |
| 2,3,3',4,4',5,5'-HpCB (189) | 0.00003 | <0.000005 | 0.00001 |

# Schedule 7 – Site plans



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