Pollution Prevention and Control Act 1999

Environmental Permitting (England and Wales) Regulations 2016 (as amended)

Saint-Gobain Glass (United Kingdom) Ltd
Eggborough Plant
Weeland Road
Goole
DN14 0FD

Permit to Operate an Installation Prescribed by Part A(2) of Part 2 of Schedule 1 to the Environmental Permitting (England and Wales) Regulations 2016 (as amended)

Regulated activity:

To operate a float glass manufacturing installation of greater than 20 tonnes per day melting capacity, as prescribed by section 3.3A(2)(a) of Part 2 of Schedule I

Permit Number: NYC-SE-011

Permit Issued By:

Regulatory Services (Scientific)
North Yorkshire Council
County Hall
Racecourse Lane
Northallerton
North Yorkshire
DL7 8AD

TEL: 0300 131 2 131
E-mail: scientific@northyorks.gov.uk

Contents

1. Description of Installation 3
2. General Conditions 6
3. Control of Atmospheric Emissions 8
3.1 General Conditions controlling Atmospheric Emissions 3.2 8
General Conditions controlling the Monitoring of Emissions 9
3.3 Particulate Matter 10
3.4 Oxides of Nitrogen 12
3.5 Oxides of Sulphur 13
3.6 Chlorides and fluorides 14
3.7 Metals 14
3.8 Ammonia 14
3.9 Coating Plant 14
3.10 Laminating Plant 14
4. Noise and Vibration 15
5. Emissions to Water and Sewer 16
6. Environmental Management System and Proposed Improvement Plan 17
7. Energy Efficiency of the Installation 19
8. Systems to Minimise Environmental Risk and Accidents 20
9. Waste Management of the Installation 20
10. Efficient use of Raw Materials 21
11. Closure and Decommissioning 22
12. Records 22
13. Reporting 23
14. Notifications 23

Schedules

1. Process Description.
2. Site Location and Installation Plans
Figure 1A: Site location plan
Figure 1B: Installation boundary
Figure 1D: Drainage and Liquid Storage Tanks
Figure 1E: Waste Storage Areas
Figure 1F: Coating Line Storage Areas
Figure 1G: Laminating Line Storage Areas
3. Point source Emissions to Air and Emission Limits. (Figure 1c and Table 1a)
4. Storage and Handling of Raw Materials.
5. Proposed Improvement Plan.
6. Point Source Emissions of Surface Water and Sewer.
7. Derogation Request Decision Document
8. Explanatory Notes

Description of the installation and regulated activity

Saint-Gobain's Eggborough plant is a float glass manufacturing facility to produce a basic flat soda lime silica glass, for applications in the construction industry.

The installation includes the storage and handling of sand (silicon dioxide), soda ash (sodium carbonate), limestone (calcium carbonate), dolomite (calcium-magnesium carbonate), and cullet to produce the glass by the application of heat in a furnace followed by a float bath, lehr, glass cutting, and subsequent warehousing.

The flue gas from the furnace is treated to reduce harmful SOX, particulates and NOX components. The reagents for these processes, hydrated lime and aqueous ammonia solution (<25% concentration) are stored in a silo and double wall tank respectively for automatic dosing into the flue ducts via local pipework.

The process has an output of up to 230,000 tonnes of float glass per annum stacked and operates continuously. The float tank is operational 24 hours per day without stopping until it is refurbished approximately every 20 years.

The plant also operates a Physical Vapour Deposition (PVD) process which applies extremely thin coatings to glass sheets to enhance the thermal emissivity properties of the glass. The coating plant is housed in a purpose-built extension to the existing finished product warehouse. The glass to be coated can be sourced from within the production line or from external sources. The production capacity of the coater is up to approximately 130,000 tonnes and will operate across all shifts on a continuous basis.

The plant also operates a Laminating process which produces laminate and laminate safety glass by creating a sealed laminate sandwich consisting of glass/PVB/glass. The laminating plant is housed in a further purpose-built extension to the existing warehouse. The glass to be laminated can be sourced from within the production line or from external sources. The production capacity of the laminator is up to approximately 2.2 million m2 per annum.

A more detailed process description is appended in Schedule 1 to this Permit

Permit

Permit Reference Number: **NYC-SE-011**

North Yorkshire Council, 'the regulator' in exercise of its powers under Regulation 13 of the Environmental Permitting (England and Wales) Regulations 2016 (S.I. 2016 No.1154) as amended, hereby permits

Saint-Gobain Glass (United Kingdom) Ltd ("the operator")

Whose registered office is:

Saint-Gobain
House East Leake
Loughborough
Leicestershire
E12 6JU

Company registration number

2442570 To operate an installation at:

Saint-Gobain Glass (United Kingdom) Ltd Eggborough Plant
Weeland Road
Goole
DN14 0FD

The Operator is permitted to carry out the following activities as described in the permit application and in accordance with the conditions contained within this permit:

Listed/Directly Associated Activity	Description of specified activity	Limits of specified activity and waste types
Section 3.3 Part A(2)(a)	Manufacturing glass, unless falling within Part A(1) of this Section, where the melting capacity of the plant is more than 20 tonnes per day [Manufacturing of float glass on the Flat Glass Line]	From loading of raw materials into the batch mixer, to the production of finished glass sheets ready for warehousing, and emissions to air via the main stack.
Raw materials storage and handling	Receipt, handling and storage of non-waste raw materials and all process chemicals / substances	From receipt of raw materials at the installation until utilisation in the production process.

Storage and handling of waste raw materials	Receipt, handling and storage of waste raw materials i.e. externally sourced cullet	From receipt of cullet at the installation to delivery to the batch mixer via the cullet system.
Storage and handling of wastes generated on site	Storage and handling of process related wastes	From generation of waste by the permitted activities, to the dispatch of waste off-site, and/or re-use in the production process i.e waste glass as cullet.

To the extent permitted by and subject to the conditions of this Permit[1].

This Permit shall be subject to replacement, variation or amendment as may be considered appropriate by North Yorkshire Council, at any time, according to the provisions of Chapter 20 of the EPR.

Signed:

Dated this day 15th October 2025

Graham Tarn (Scientific Officer)
Authorised to sign for North Yorkshire Council

Permit Status Log:

Date	Permit Reference	Detail
15.10.2025	NYC-SE-011	Updated permit replaces former Selby District Council permit ref: A(2) 51P

[1] Nothing in this Permit grants or implies any consent under the Town and Country Planning Act.

Operating Conditions

1. The following Environmental Permit conditions are legal requirements.

2. General

2.1 It is a Condition for the validity of this Permit that no information provided by The Operator in connection with the obtaining of this Permit is false or misleading and that any change affecting the accuracy of such information is notified immediately in writing by the Operator to the Regulator.

2.2 The Permitted Installation shall, subject to the provisions of this Permit, operate using the techniques and in the manner described in the Application and in the description of the Installation forming part of this Permit.

2.3 The Permitted installation shall be managed and operated by sufficient persons who are suitably qualified, experienced, trained and supervised in respect of the duties to be undertaken in connection with the Installation.

2.4 The Operator shall provide all such persons described in Condition 2.3 above, with appropriate written operating instructions for their duties in relation to the operation of the Permitted Installation.

2.5 Any persons having duties which are or may be affected by the matters set out in this Permit shall have convenient access to a copy of this document kept at or near the place where such duties are carried out.

2.6 Safe and permanent means of access shall be provided by the Operator to any sampling or monitoring point which is required to demonstrate compliance with an emission limit specified in Schedule 3.

Safe means of access shall be provided to any other sampling or monitoring points when required by the Regulator.

2.7 A written log or other traceable record approved by the Regulator shall be kept by the Operator of the Installation containing a record of all inspections, assessments and monitoring required by the Conditions of this Permit.

The record shall include the time and date of the assessment, inspection or monitoring, the result and the name of the person carrying out the task.

The log or traceable record shall be kept available for inspection at the Installation by the Regulator and shall be retained by the Operator for a minimum of 2 years.

2.8 If the Operator proposes to make a change in operation of the installation, he must, at least 14 days before making the change, notify the Regulator in writing. The notification must contain a description of the proposed change in operation. It is not necessary to make such a notification if an application to vary this permit has been made and the application contains a description of the proposed change. In this condition 'change in operation' means a change in the nature and functioning, or an extension, of the installation, which may have consequences for the environment.

2.9 The best available techniques shall be used to prevent or, where that is not practicable, reduce emissions from the installation in relation to any aspect of the operation of the installation which is not regulated by any other conditions of this permit.

2.10 The operations on site shall be subject to constant monitoring of operations parameters by the DCS system which shall alarm when critical parameters for emissions to air and energy efficiency are exceeded. This shall include continuous monitoring of temperature, fuel feed and air flow.

2.11 The operations on site shall be subject to a comprehensive inspection and maintenance plan which shall form part of the Environmental Management Plan required by Condition 6.1. The inspection and maintenance plan shall cover all plant whose failure could lead to impact on the environment, including tanks, pipework, retaining walls, bunds, ducts and filters.

2.12 The Regulator shall be notified within 14 days of the occurrence of the following matters except where such disclosure is prohibited by Stock Exchange rules:

(a) Where the Operator is a registered company:

(i) any change in the Operator's trading name, registered name or registered office address; and
(ii) any steps taken with a view to the Operator going into administration, entering into a company voluntary arrangement or being wound up.

(b) Where the Operator is a corporate body other than a registered company:

(i) any change in the Operator's name or address; and
(ii) any steps taken with a view to the dissolution of the Operator

2.13 The Operator shall identify and list all environmentally critical process and abatement equipment whose failure could impact on the environment. For all such items identified:
• Alarms or other warning systems shall be provided, which indicate equipment malfunction or breakdown.
• Such warning systems shall be maintained and checked to ensure continued correct operation, in accordance with manufacturer's recommendations; and

• Essential spares and consumables for such equipment shall be held on site or be available at short notice from suppliers, so that breakdowns can be rectified rapidly.

Records of breakdowns shall be kept and analysed by the Operator in order to eliminate common failure modes.

3. Control of Atmospheric Emissions

3.1 General Conditions Controlling Emissions to Atmosphere

3.1.1 All emissions from the Installation shall be free from offensive odours when assessed by the Regulator at any point on the site boundary as identified in red on the attached plan ref: figure 1b in Schedule 2.

3.1.2 All emission point sources are identified on the attached plan ref: Figure 1c in Schedule 2. All emissions to air from a release point specified in Schedule 3 to this Permit shall arise only from the source for that release as specified in the Schedule.

3.1.3 An emission to air from a release point specified in Schedule 3 shall not exceed any limit for that release point specified in that Schedule. Subject to condition 3.2.4

3.1.4 All emissions to air, other than steam or water vapour, shall be free from visible and persistent mist, persistent fume and droplets.

3.2 General Conditions controlling the Monitoring of Emissions

All pollutant concentrations shall be expressed at standard Conditions of 273K and 101kPa without correction for water vapour content.

3.2.1 The concentrations of pollutants from the release point serving the glass melting furnace specified in Schedule 1 shall be normalised to 8% oxygen content measured dry.

3.2.2 The introduction of dilution air to achieve an emission limit specified in Table 1a in Schedule 3 shall not be permitted.

3.2.3 Emissions from the release point A1 serving the glass-melting furnace specified in Plan ref: Figure 1c in Schedule 3 shall be continuously monitored for Particulate Matter, Nitric Oxide, Ammonia and Oxides of Sulphur.

3.2.4 No monthly mean emissions concentrations shall exceed an emission limit specified in Schedule 3. No individual daily mean emissions concentration shall exceed 110% of an emission limit specified in Schedule 3. The number of hourly average values that exceed 200% of an emission limit specified in Schedule 3, shall be less than 5% of the total hourly averages in any year. In the event of such exceedance(s) monitoring results shall be forwarded to the Regulator within 7 working days.

3.2.5 The instantaneous emission concentrations monitored in Condition 3.2.3 above shall be on immediate display to operating staff responsible for the control of the glass-melting furnace.

3.2.6 An audio-visual alarm shall be fitted to instruments in 3.2.3 above to alert operating staff of any arrestment plant failure.

3.2.7 On each occasion that the alarm required by Condition 3.2.6 above is activated, this shall be automatically recorded and an investigation carried out into the cause of the cause of the alarm and process operations adjusted accordingly. Details of alarms shall also be notified to the Regulator every 6 months or immediately if there is a significant pollution risk.

3.2.8 Where any individual 1-hour mean concentration is twice the emission limit specified in Schedule 3 the Regulator shall be advised as soon as reasonably possible and in any case within 24 hours, by means identified in the Explanatory Notes attached to this Permit. Details of the exceedance, the subsequent investigation and any remedial actions undertaken shall be confirmed in writing within 7 days.

3.2.9 Emissions of particulates, Nitrogen Oxides, Ammonia, Chlorides (expressed as HCL), Fluorides (expressed as HF), Sulphur Dioxide and metals (groups 1 & 2) from the release point A1 serving the glass melting furnace identified in Schedule 3 shall be monitored annually in order to demonstrate compliance with the emission limits specified in that Schedule.

3.2.10 The monitoring carried out in relation to Condition 3.2.9 shall include at least three stop samples of at least 30 minutes each and cover a minimum of two firing reversals of the regenerator chambers.

3.2.11 Adequate facilities for sampling shall be provided on vents and ducts in order to obtain representative samples.

3.2.12 At least 7 days before any periodic monitoring exercise is undertaken, the Regulator shall be notified in writing, giving details of the times when monitoring will take place, the pollutants to be monitored and the sampling techniques to be employed.

3.2.13 The results of all non-continuous emission testing shall be forwarded to an The Regulator within 8 weeks of completion of the sampling.

3.2.14 Visual assessments of emissions from all sources within the installation shall be carried out at least once a day and the details entered in the log required by Condition 2.7 in order to demonstrate compliance with the requirements of Conditions 3.1.4, 3.3.1 and 3.3.2. The entry shall contain the date, time and result of the assessment and the name of the person carrying out the assessment. Any adverse result shall be investigated immediately, and the details of the investigation and any remedial action entered in the log.

3.2.15 A waste gas analysis is carried out to optimise combustion on periodic basis. The analysis shall include CO. Copies of the analysis shall be made available to the Regulator on request.

3.2.16 The EP system shall be subject to continuous monitoring of surrogate parameters to demonstrate its correct functioning. The parameters shall include temperature, pressures and dust level.

3.2.17 When special operations are being undertaken, including regular and extraordinary maintenance work and cleaning operations to either the furnace or EP. If the works are likely to exceed the critical emission limits detailed in Schedule 3 in this permit, then the operator must obtain Regulatory approval prior to the works being undertaken. The emissions shall be closely monitored, and corrective actions taken where emission limits are exceeded.

3.3 Control of Emissions of Particulate Matter.

3.3.1 All emissions to air shall be free from visible particulate matter, subject to the allowances in Condition 3.3.2 below.

3.3.2 All emissions to air from combustion processes shall be free from visible smoke in normal operation, with the exception of the periods allowed for under the Dark Smoke (Permitted Periods) Regulations 1958 and in any case shall not exceed at any time the equivalent of Ringelmann Shade 1 as described in British Standard 2742: 1969.

3.3.3 Exhaust gases from the glass melting furnace shall be vented through an Electrostatic Precipitator with associated sorbent injection as necessary, prior to final discharge to atmosphere via the release point specified in Schedule 3 and marked on Plan ref: Figure 1c, in order to meet the emission limit for particulate matter for that release point specified in Schedule 3. Exemption to this requirement shall be made during periods of maintenance allowed by Conditions 3.3.4 and 3.3.5 below and under exceptional circumstances, when the requirements of Condition 3.3.7 below shall be observed.

3.3.4 Essential planned periodic maintenance of the Electrostatic Precipitator shall, where practicable, be arranged to coincide with such times that the furnace throughput is likely to be minimal in order to minimise the emission of particulate matter.

3.3.5 Exemption from the requirements of Condition 3.3.3 above shall be requested from and approved in writing by the Regulator at least 7 days before any planned periodic maintenance of the Electrostatic Precipitator is carried out.

3.3.6 The details of all periodic maintenance of the Electrostatic Precipitator shall be recorded in the log required by Condition 2.7.

3.3.7 The bypass for the Electrostatic Precipitator shall be kept closed during normal operation. Every opening of the bypass shall be recorded and all reasons for and the duration of opening of the bypass shall be recorded in the log required by Condition 2.7 and a report submitted in writing to the Regulator within 7 days.

3.3.8 Stocks of powdered, granular or dusty materials, excluding cullet, shall be stored in purpose build silos or undercover. Procedures for loading to and from such storage locations shall be specified in the Environmental Management System required by Condition 6.1 and shall be designed so as to minimise the emission of particulate matter to the air. These procedures shall be communicated to all drivers and site personnel involved in such operations.

3.3.9 All storage silos shall be vented to air through reverse jet fabric filters.

3.3.10 All storage silos shall be fitted with audible and visual high-level alarms to warn of impending overfilling. The alarm shall be interlocked to interrupt the delivery should the silo capacity be approached. The correct operation of such alarms shall be tested monthly, and the results recorded in the logbook required by Condition 2.7.

3.3.11 All filter bags shall be inspected at least once every 6 months, and the details recorded in the logbook required by Condition 2.7. If defects or significant binding are detected, corrective action shall be taken prior to the next delivery and the details of this action recorded in the logbook.

3.3.12 All vehicular, mechanical, gravity dependent and pneumatic methods for the transportation and handling of powdered, granular or dusty materials shall be specified in the Environmental Management System required by Condition 6.1 and shall be so designed as to minimise the emission of particulate matter to the air and in particular the pneumatic system shall be a sealed system equipped with a filter to clean the transport air before release.

3.3.13 External above ground conveyors and bucket elevators for the movement of powdered, granular or dusty materials shall be totally enclosed so as to prevent wind whipping. Dust extraction equipped with reverse jet fabric filters shall be maintained on such conveyors.

3.3.14 Raw materials and cullet shall be stored and handled in accordance with Schedule 4 appended to this Permit. Procedures for loading to and from such storage locations shall be specified in the Environmental Management System required in Condition 6.1 and shall be so designed as to minimise the emission of particulate matter to the air. These procedures shall be communicated to all drivers and site personnel involved in such operations.

3.3.15 The cullet shall be stored in enclosed bays in the storage compound and the area shall be dampened during periods of windy weather by the Mist Spray System.

3.3.16 Prior to periods of dry windy weather steps shall be taken to dampen the cullet and other external raw materials stockpiles and to clean access roads in the vicinity of these storage areas. This shall be carried out in line with the procedure forming part of the Environmental Management System required by Condition 6.1.

3.4 Control of Emissions of Oxides of Nitrogen.

3.4.1 External examination and maintenance of the furnace shall be carried out at least once a day in order to check for and seal leaks and gaps allowing the ingress of air into the furnace and the subsequent formation of Oxides of Nitrogen. The result of the examination and any remedial action shall be recorded in the log required by Condition 2.7.

3.4.2 All furnace inspection holes shall be designed to close and seal.

3.4.3 The glass melting furnace shall be operated at a slight positive pressure respective to ambient external atmospheric pressure, to prevent the rogue ingress of air to the combustion chamber.

3.4.4 The emission of Nox shall not exceed the levels given in the table below. The levels given in the table below will be subject to an annual review and may be revised after consideration has been given to the current emission level, on-going trials, maintenance completed and planned maintenance.

Emission level	**Averaging period**	**Monitoring required**
700 mg/Nm^3	Daily average values. Where failures/maintenance work leads to temporary increases in level the averaging period may be extended at the regulator's discretion.	Continuous indicative and annual

3.4.5 **Emissions due to regenerator failure**:

Where regenerator failure leads to a sudden increase (over 300mg/Nm^3) in levels immediate actions in line with the examination, maintenance and reporting parts of this condition shall be carried out.

If the emission levels have exceeded the appropriate limit given above and cannot be reduced to the appropriate level within the timeframe agreed with the regulator under this condition; then the operator will produce a plan of action detailing either how the emission limit will be met and the associated time frame for consideration by the regulator. This plan may include the bringing forward the planned rebuild of the furnace.

3.4.6 Where a sudden increase (over 300mg/Nm^3) in NO_x levels is detected by the continuous monitor the operator shall take immediate steps to determine the cause of the increase, identify remedial action and determine a timescale for restoration.

3.4.7 **Reporting:**

A report on the daily average results of continuous monitoring of Nitrogen oxides shall be forwarded to the regulator once every three months. The report shall include a graph trending the average monthly emissions for the furnace, year on year.

3.4.8 Every two years the operator shall submit to the Regulator a report detailing the examinations and maintenance carried out in respect to the regenerators.

3.4.9 The Regulator shall be notified within one working day of a sudden increase in NO_x emission levels. A report detailing the reason for the increase, remedial actions identified and timescales for restoration shall be submitted to the Regulator within 1 month of the notification. The report shall be agreed with the Regulator and completion of the restorative actions shall be notified on a monthly basis until completion.

3.4.10 Where Saint-Gobain Glass (United Kingdom) Ltd intend to carry out maintenance work which will cause a temporary increase in NOx levels prior notice shall be sent to the Regulator and agreed in writing prior to work commencing.

3.5 Control of Emissions of Oxides of Sulphur

3.5.1 Exhaust gases from the glass melting furnace shall be vented through an Electrostatic Precipitator with associated sorbent injection as necessary, prior to final discharge to atmosphere via the release point specified in Plan ref: Figure 1c in Schedule 3, in order to meet the emission limit for oxides of sulphur for that release point specified in Table 1a in Schedule 3.

3.5.2 Gas shall be used as the primary fuel for the furnaces.

3.5.3 Heavy Fuel Oil may be used to provide fuel flexibility and shall comply with the Sulphur Content of Liquid Fuels (England & Wales) Regulations 2007 in that the heavy fuel oil shall have a sulphur content of no greater than 1 percent by mass. A statement from the fuel supplier demonstrating the sulphur content of Heavy Fuel Oil shall be made available to the Regulator upon request.

3.5.4 The burning of waste oil is not permitted at any time.

3.6 Control of Emissions of Chlorides and Fluorides

3.6.1 The process Operator will seek to identify, as necessary, appropriate modification of the type of reactant substances used in the ESP and for the reduction of chlorides and fluorides to ensure compliance with the emission limit specified in Table 1a in Schedule 3.

3.6.2 The process Operator will seek to identify and implement systems to reduce ESP downtime and improve reliability to order to ensure consistently low levels of hydrogen chloride.

3.7 Control of Metal Emissions

3.7.1 Exhaust gases from the glass melting furnace shall be vented through an Electrostatic Precipitator with associated sorbent injection of lime as necessary, prior to the final discharge to atmosphere via the release point specified in Plan ref: Figure 1c in Schedule 3, in order to meet the emission limit for metals for that release point specified in Table 1a in Schedule 3.

3.8 Control of Emission of Ammonia

3.8.1 Exhaust gases from the glass melting furnace and SCR shall be vented through the release point specified in Plan ref: Figure 1c in Schedule 3, in order to meet the emission limit for ammonia for that release point specified in Table 1a in Schedule 3.

3.9 Control of Emission from the Coating Plant

3.9.1 Stocks of coating materials and gases shall be stored in purpose made containers and/or cylinders the locations of which shall be clearly identified and referenced on the site plan 1F: in Schedule 2.

3.10 Control of Emissions from the Laminating Plant

3.10.1 Stocks of laminating materials shall be stored in purpose made containers and/or cylinders the locations of which shall be clearly identified and referenced on the site plan 1G: in Schedule 2.

4. Noise and Vibration

4.1. The Noise Management Plan for the installation shall be maintained by the Operator, in accordance with the Environmental Management System required under Condition 6.1.

The plan identifies the noise levels at the boundary of the site in a format and at positions agreed with the Regulator, identifies key plant and equipment with the potential to give rise to significant noise and include any mitigation or maintenance measures to be undertaken.

The Plan shall be reviewed whenever changes are proposed to the installation which might have an impact on the Plan and, in any case, not less frequently than once in every period of two years.

The Plan shall establish the noise levels at the boundary of the site in a format and at positions agreed with the Regulator, identify key plant and equipment with the potential to give rise to significant noise and include any mitigation or maintenance measures to be undertaken.

4.2 During the discharge of raw materials from vehicles, the discharge mechanism of any such vehicle shall only be operated (opened and closed) whilst the vehicle is inside the loading/unloading area.

4.3 Deliveries and discharge of raw materials shall only take place between the hours of 04:00 and 19:00 Monday to Friday and 07:00 and 13:00 on Saturday, for Cullet deliveries, and 04:00-19:00 **Monday to Saturday** for sand bulk and other tippers.

The loading/unloading of vehicles shall not be permitted on Sundays. Any deviation from this requirement shall first of all be approved in writing by The Regulator.

4.4 The discharge of raw materials to silo by pneumatic means shall be achieved by connection to the on-site pneumatic system of the use of vehicle mounted pumps and compressors. Where this requirement cannot be met the details of the exceptional circumstances involved shall be recorded in the log required by Condition 2.7 and the details forwarded in writing to the Regulator within 7 days.

4.5 External above ground conveyors for the movement of cullet and raw materials shall be totally enclosed.

4.6 All goods vehicle drivers entering the site shall be directed to park up in a holding area with the vehicle engine switched off until such time that the vehicle can be unloaded in the case of delivery vehicles or loaded in the case of dispatch vehicles.

4.7 Any emergency diesel generators on site shall only be tested between the hours of 09:00 and 19:00 Monday to Friday and not on any public holiday. An exception to this requirement shall be allowed for testing after emergency repair, where the repair work is completed outside of the specified times.

5. Emissions to Water and Sewer

5.1 All liquid storage tanks containing liquids that could be harmful to the environment, including liquid discharges from the battery charging room and laboratories, as shown on plan Figure 1D (Schedule 3) shall be impermeable and resistant to the stored materials and located either underground or within an impervious bund with a capacity not less than 110% of the largest tank or largest combined volume of connected tanks or 25% of the total tank capacity, whichever is the greater. All associated pipe work, fill points, vents, gauges,

overflow outlets and sight glasses shall be located within the bunded area. Bunded areas shall have no outlet (i.e. drains of taps) and shall not discharge to any watercourse, land or underground strata.

5.2 The secondary containment system for the liquid storage tanks referred to in Condition 5.1 and shown on plan number Figure 1D (Schedule 3) shall be protected from the risk of damage by impact or collision.

5.3 The pipework carrying materials from the tanks shown on Figure 1D (Schedule 3) shall be positioned or protected to prevent damage by impact or collision.

5.4 The tanks and pipework referred to in Condition 5.1 and 5.3 shall be subject to a six monthly inspection programme.

5.5 Domestic effluent only shall be discharged to the existing public sewerage system in accordance with the assessments and proposals detailed in Schedule 6 attached to this Permit.

5.6 There shall be no discharge to foul sewer of surface water. All surface water from the installation shall be discharged in accordance with the proposals detailed in Schedule 6 attached to this Permit.

5.7 Surface water discharge shall be free from visible oil and grease. Surface water from vehicle parking and hard standing areas shall be passed through an oil interceptor of adequate capacity prior to discharge.

5.8 The interceptors required by condition 5.7 shall be:
- impermeable; and
- subject to monthly inspection, as part of the preventative maintenance programme required by condition 2.11, and contamination removed as necessary to ensure continuous function. The results of all inspections to be recorded.

5.9 There shall be no direct or indirect emission to groundwater from the installation of any Hazardous Substance or Non-Hazardous Pollutants as set out in Schedule 22 of the Environmental Permitting (England & Wales) Regulations 2016.

5.10 Liquid waste containing process effluent shall not be discharged to foul sewer or to any surface water drainage system without the agreement of the relevant water and sewerage Regulator.

5.11 The Operator shall ensure that all emissions are controlled, as a minimum, to avoid a breach of water quality standards and where required by an officer of North Yorkshire Council shall carry out monitoring and provide calculations and/or modelling to demonstrate this.

5.12 The Operator shall monitor effluent streams from activities at the installation in line with Yorkshire Water trade effluent consent parameters.

6. Environmental Management System and Proposed Improvement Programme for the Installation

6.1 An Environmental Management System for the installation shall be implemented and adhered to and incorporate the following features:

i. commitment of the management, including senior management:

ii. definition of an environmental policy that includes the continuous improvement of the installation:

iii. planning and establishing the necessary procedures, objectives and targets, in conjunction with financial planning and investment:

iv. implementation of the procedures paying particular attention to:
   a. structure and responsibility
   b. training, awareness and competence
   c. communication
   d. employee involvement
   e. documentation
   f. efficient process control
   g. maintenance programmes
   h. emergency preparedness and response.
   i. safeguarding compliance and environmental legislation

v. checking performance and taking corrective action, paying particular attention to:
   a. monitoring and measurement
   b. corrective and preventive action
   c. maintenance of records
   d. independent (where practicable) internal and external auditing in order to determine whether or not the EMS conforms to planned arrangements and has been properly implemented and maintained:

vi. review of the EMS and its continuing suitability, adequacy and effectiveness by senior management:

vii. requirement to follow the development of cleaner's technologies:

viii. Consideration of the environmental impacts from the eventual decommissioning of the installation at the stage of designing a new plant and throughout its operating life.

ix. Application for sectoral bench marking on a regular basis.

6.2 Any amendments made to the Environmental Management System documents shall be notified in writing to the Regulator within 1 week of the documents being issued.

6.3 The standards of competence and management systems required by Condition 6.1.1 above shall be maintained and., whenever possible, improved throughout the life of the installation. In order to demonstrate compliance with this requirement:

i. the results of all external audits of the Environmental Management System or part thereof shall be included in a report submitted annually to, and;

ii. the results of all internal audits shall be retained on site at the installation and shall be made available for inspection on request by, the Regulator.

Any deviation from the systems, procedures, techniques or timetables in Condition 6.1.1 above shall be approved in writing by the Regulator.

6.4 An appropriate person (and deputy) shall be appointed as the primary point of contact with the Regulator and the public. The Regulator shall be notified in writing of the name of the appointed person (and deputy).

6.5 The potential environmental risks posed by the work of contractors shall be assessed and the Operator shall provide instruction to contractors about protecting the environment while working on site.

7. Energy Efficiency of the Installation

7.1 The Operator shall reduce energy consumption by using one or a combination of the following techniques:

i. process optimisation through the control of operating parameters
ii. regular maintenance of the melting furnace
iii. optimisation of the furnace design and the selection of the melting technique
iv. application of combustion control techniques
v. use of increasing levels of cullet where available
vi. use of a waste heat boiler for energy recovery
vii. use of batch and cullet preheating where technically and economically viable.

7.2 The Operator shall ensure that all appropriate containment methods, (e.g. seals and self- closing doors) are employed and maintained to minimise energy loss.

7.3 The Operator shall demonstrate participation in and compliance with a Climate Change Agreement for the installation, and in doing so shall:

– make available, on request by the Regulator, records of all external and internal audits, which shall be retained on site; and

– advise the Regulator of any withdrawal or intended withdrawal from the Climate Change Agreement.

7.4 The Operator shall monitor oxygen and carbon monoxide concentrations in waste gases and the readings shall be used to optimise furnace combustion.

8.0 Systems to Minimise Environmental Risks and Accidents

8.1 The Operator shall maintain and implement an accident management plan which:

- identifies the hazards to the environment posed by the installation.
- assesses the risks of accidents and their possible consequences.
- introduces measures to reduce the risks of accidents and contingency plans for any accidents that occur.
- contains written procedures for investigating incidents and near misses and the identification of suitable corrective action.

The plan shall be made available for inspection by the Regulator and shall form part of the Environmental Management System for the installation required by Condition 6.1.

8.2 The accident management plan shall be reviewed at least every 4 years or as soon as practicable after an accident (whichever is the earlier) and appropriate changes identified by the review shall be implemented by the Operator.

8.3 In the event of abnormal emissions arising from an accident, the Operator shall:

– investigate and undertake remedial action immediately.
– promptly record the events and actions taken.
– ensure the Regulator is made aware without delay.

8.4 The Regulator shall be notified without delay following the detection of:

(a) 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.

(b) the breach of a specified emission limit; or

(c) any significant adverse environmental effects.

9. Waste Management of Installation

9.1 A Waste Management Programme for the installation shall be implemented by the Operator in accordance with and form part of the Environmental Management System required by Condition 6.1.

The programme shall cover an inventory of the quantity, nature, origin and where relevant, the destination, frequency of collection, mode of transport and treatment method of any waste which is disposed of or recovered and shall follow the Environmental Management System document(s) EHS-EMS-27 and EHS-EMS-28 and the prevention of the generation of waste.

An annual review shall be carried out to demonstrate that the best environmental options are being used for dealing with the waste streams identified.

9.2 Prior to the rebuild of the furnace consideration shall be given to the valorisation of the refractory materials. A report of the proposals for the refractory materials shall be presented to the Regulator prior to the shutdown of the furnace.

9.3 Waste shall be stored in the appropriate containers as laid down in EHS-EMS-27 Handling, Recycling & Disposing of non-hazardous waste and in areas allocated on Figure 1E: Waste Storage Areas in Schedule 2.

9.4 Dust produced during production and removed by the EP unit shall be pneumatically transported from the holding hopper to an enclosed silo within the batch plant and added back into the batch material for processing.

9.5 Waste batch materials and cullet rejected from the production or brought back to site shall be recycled where possible. Within 14 months of the date of this permit the Operator shall provide a report to the Regulator detailing the waste produced on site and recycled for the preceding 12-month period.

9.6 To facilitate opportunities for recovery, recycling and re-use and to maximise the scope for effective waste management, the Operator shall ensure that waste types are segregated and stored in containers that are durable for the substances stored.

Waste storage areas shall be clearly marked and signed, and all individual containers clearly marked and labelled. Incompatible waste types shall be stored and kept separate.

9.7 At least once every three years, the Operator shall investigate potential markets for the recovery and/or re-use of wastes generated at the installation.

10. Efficient use of Raw Materials

10.1 The Operator shall adopt procedures to control the specification of raw materials in order to minimise the potential for environmental impact, and in particular shall:

(a) take appropriate measures to ensure that raw materials and water are used efficiently.

(b) maintain records of raw materials and water used at the installation.

(c) review and record annually 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 appropriate further measures identified by any audit or review.

10.2 The Operator shall reduce water consumption by minimisation of spillages and leaks, reusing cooling and purging water after purging and operating a quasi-closed loop waster system.

11. Closure and Decommissioning

Conditions relating to Closure and Decommissioning

11.1 The Operator shall maintain and operate the installation so as to prevent or minimise, upon its closure or decommissioning, any pollution risk including the generation of waste and shall do so in particular by:

- Attention to the design of new plant and equipment.
- The maintenance of a record of any events which have, or might have, impacted on the condition of the site along with further investigation or remediation work carried out. This shall include and be a development of the initial site condition report submitted as Appendix 2 in the Permit application.
- The development of a site closure plan to demonstrate that the installation can be decommissioned avoiding any pollution risk and returning the site of operation to a satisfactory condition.

11.2 The Operator shall carry out a full review of the site closure plan whenever major changes are made on site (with major being agreed with the regulator).

11.3 The site closure plan shall be implemented on final cessation or decommissioning of the permitted activities or part thereof.

11.4 The Operator shall give at least 30 days written notice to the Regulator before implementing the site closure plan.

12. Records

12.1 The Operator shall ensure that all records required to be made by this Permit and any other records made by it in relation to the operation of the Permitted installation shall:-

- be made available for inspection by the Regulator at any reasonable time.
- be supplied to the Regulator on demand and without charge.
- be legible.
- be made as soon as reasonably practicable.
- indicate any amendments which have been made and shall include the original record wherever possible.
- be retained at the Permitted installation, or other location agreed by the Regulator in writing, for a minimum period of 4 years from the date when the records were made, unless otherwise agreed in writing; and
- Where they concern the condition of the site of the installation, be kept at the Permitted installation, or other location agreed by the Regulator in writing, until all parts of the Permit have been surrendered.

13. Reporting

13.1 All reports and written and or oral notifications required by this Permit, and notifications required by Regulation 16 of the PPC Regulations shall be made or sent to the Regulator using the contact details indicated in the Explanatory Notes document issued with this Permit.

13.2 The Operator shall, unless otherwise agreed in writing, submit reports of the monitoring and assessments carried out in accordance with the conditions of this Permit.

14. Notifications

14.1 The Operator shall notify the Regulator **without delay** of:

- the detection of an emission of any substance, which exceeds any limit or criterion in this Permit, specified in relation to the substance.
- the detection of any fugitive emissions that has caused, is causing or may cause significant pollution, unless the quantity emitted is so trivial that it would be incapable of causing significant pollution.
- the detection of any malfunction, breakdown or failure of plant or techniques which has caused, is causing or has the potential to cause significant pollution; and

- any accident, which has caused, is causing or has the potential to cause significant pollution.

14.2 The Operator shall give written notification as soon as practicable (and at least 30 days prior to any of the following.

- permanent cessation of the operation of part or all of the Permitted installation.
- cessation of operation of all or part of the Permitted installation for a period likely to exceed 1 year; and
- resumption of the operation of part or all of the Permitted installation after a temporary cessation of activities as above.

14.3 Where the Operator has entered into a Climate Change Agreement with the Government, the Operator shall notify the Regulator within one month of:

- any decision by the Secretary of State no to re-certify that Agreement.
- a failure to comply with an annual target under that agreement at the end of the trading compliance period.

SCHEDULE 1

PROCESS DESCRIPTION AND IN-PROCESS CONTROLS

Saint-Gobain's Eggborough plant is a float glass manufacturing facility for the production of a basic flat soda lime silica glass, for applications in the construction industry. The installation includes the storage and handling of sand (silicon dioxide), soda ash (sodium oxide), limestone (calcium carbonate), dolomite (calcium-magnesium oxide) and cullet to produce the glass by the application of heat in a furnace followed by a float bath, lehr, glass cutting, and subsequent warehousing. The process has an output of up to 230,000 tonnes of float glass per

annum and operates continuously. The float tank is operational 24 hours per day without stopping until it its refurbished approximately every 20 years.

Furnace Operations

The raw materials are melted in the main cross fired regenerative type furnace to produce molten glass of uniform composition, temperature and viscosity for delivery to the float bath.

The glass is contained in an enclosed rectangular tank constructed of blocks of appropriate refractory materials. Mixed raw material is fed onto molten glass in the furnace by the means of a reciprocating plate which also serves to push the materials into the furnace through an enclosed doghouse, or filling pocket, reducing fugitive losses of volatiles and dust. The furnace is heated to 1600°C by natural gas burners. The burners are located immediately above the molten glass at either side of the furnace. Heat input is arranged to induce recirculation currents within the melted batch materials to ensure consistent homogeneity of the finished glass fed to the forming process. To ensure even fusion the furnace is equipped with banks of burners at both sides of the molten glass, which operate in sequence.

Significant energy efficiency gains are made through the “regenerative” furnace design, whereby heat contained in the waste gases from combustion and glass melting is recovered to preheat the combustion air. Incoming combustion air enters at the bottom of the regenerator at one side of the furnace, where it is preheated by the warm refractories. The waste gases from the combustion then reverses, and the combustion air enters from the opposite side and is preheated by the warm refractories, cooling them down, with the waste gases now re-heating the first bank of refractories. The mass of molten glass contained in the furnace is held constant, and the residence time is typically seventy-two hours.

On leaving the combustion or “melting” zone, the molten glass is cooled very gradually to 1100°C in the lower refiner or “braise” zone. At this temperature the glass is refined, air bubbles are removed, and the glass acquires a uniform consistency. Sodium sulphate is used as a refining agent in the furnace, the furnace design ensuring uniform consistency. From here the glass enters the float bath.

Waste [Flue] Gas Treatment

After exiting the regenerators into the flue gas system, the waste gases normally undergo treatment to reduce harmful emissions. Hydrated lime, a sorbent material, is injected into the gas steam and mixes with the waste gas before a flue gas cooler. This gives maximum time for the sorbent/SO_x reactions to take place. The flue gas cooler is necessary to reduce inlet temperatures to an electrostatic precipitator (EP) to acceptable levels. Between the flue gas cooler and EP, there is also a “reactor” to ensure the necessary mixing time of the hydrated lime with SO_x is completed prior to the resultant particulate removal.

The particulate matter removed in the EP is fed back into the batch fed into the glass making process.

After the EP there is a further stage to waste gas treatment by selective catalytic reduction (SCR), which will be operational from mid-2020. In this process aqueous ammonia <25% concentration is injected into the waste gas stream where it mixes prior to a reactor containing a catalyst to promote the reaction with the NO_X elements. This reduces the NO_X concentration in the waste gas to allowable levels.

An induced draft fan helps to draw the waste gas through the treatment systems and to the stack for emission to atmosphere (emission point reference A1).

Hydrated lime storage

The hydrated lime powder is stored in a silo on the EP forecourt close to its injection point in the process

Aqueous ammonia storage

The aqueous ammonia (<25% concentration) reagent is stored in a double wall tank system, providing its own bund, adjacent to the EP forecourt.

By-pass of waste gas treatment

From time to time, it is necessary to service and clean the waste gas treatment plant and equipment. For this purpose, there is a by-pass system that can route waste gas direct to the stack from the regenerators for limited periods.

The SCR system can also be by-passed independently of the overall bypass, so that SO_X/particulate removal can continue during any necessary SCR outages outside full by-pass periods.

Heavy Fuel Oil (HFO) Storage

A heavy fuel oil storage facility is placed on site to ensure flexibility to provide an uninterrupted supply of energy to the furnace and maintain the melting temperatures required. The installation consists of one fully bunded 500m^3 tank. The HFO is brought to site by a contractor who is responsible for filling the storage tank. Discharge operations will be carried out under the supervision of an SGGUK employee. In the event of an emergency situation site procedures as set out in SGGUK's EMS system will come into effect.

Production forming and conditioning processes

Flat Glass – The float process

After the melting and refining phases, flat glass is formed on a float bath. The principle is that the molten glass exits the furnace at a temperature of approximately 1100°C and discharges as a sheet onto a bath of molten tin, which is denser. Glass spreads on the molten tin as oil spreads on water. It must then be guided, floated on

the tin bath and pulled in order to form a sheet of determined thickness. The bath casing is ventilated and designed such that any leakages are solidified before they pass through the casing. As an additional precaution, the bath is constructed over a tanked basement.

At the end of the furnace canal the glass pours onto the tin bath through a special refractory lip ("the spout") which ensures correct glass spreading. The glass flow is controlled by means of an adjustable suspended refractory shutter in the canal ("the front tweel").

The float tank is approximately 60 metres long, divided into bays. The float tank consists of a steel bath casing, supported by a steel framework, with a refractory lining holding the molten tin itself. The tin is kept in molten state from the heat of the glass, backed up with electric heaters. The bath casing is ventilated to control temperature within safety parameters, by using cooled air, with backup generators ensuring ventilation continues in the event of a power failure. The ventilation air has no contact with the atmosphere within the float. As the ribbon passes through the tank, potentially 'dirty' glass flows to the edge of the ribbon to be removed with edge loss. Inside the float tank there are several pairs of water-cooled top rollers, adjustable in direction, height, penetration and angle. These rollers catch the glass sheet on both edges by cogwheels and draw it in length and width. Their rotation speeds up to help govern the thickness of the glass, typically from 2mm to 12mm.

The tank is airtight to prevent the molten tin from oxidising. The atmosphere over the tin is maintained oxygen free by injection though the roof of a slightly reducing N_2/H_2 mixture, supplied from the nitrogen hydrogen storage compound (see Section 3.1.4). The glass becomes gradually solid, as the temperature is reduced from 1100°C to 600°C, from where it can be laid on steel rollers at the end of the float bath. The temperature is carefully regulated by the use of heating zones.

The float atmosphere gases are extracted to atmosphere via a wet scrubbing system (Venturi scrubber, emission point reference A4). The wet scrubber, which uses water re-circulated (correct to give approximately pH7) scrubs the tin oxide and chlorides from the gas.

The liquor and any solids are contained in a tank which is neutralised by alkali solutions (automatic pH measurement and dosing system). The liquor is removed from the tank and disposed of as hazardous waste by specialist contractor as and when required.

Cooling and Annealing Area

At the exit of the float bath, glass taken out by the lift-out rollers is annealed and cooled down in the annealing lehr.

The lehr annealing chamber is approximately 85m x 5-6m and is divided into sections in which there is either heating or cooling of the glass by forced and natural convection, gradually reducing the glass temperature from 600 to 60°C. The environment in the lehr is carefully controlled in order to reduce residual stress in the glass to an acceptable level, which would otherwise be visible in the final product,

increasing waste generation. At the beginning of the lehr, a surface treatment of SO_2 is sprayed on to the underside of the ribbon, to provide protection for the surface of the glass from the rollers. Emissions from this area are vented to atmosphere (emission point reference A5-A8).

There is a location near the exit of the covered zone of the lehr where water can be sprayed onto the hot glass to break the ribbon when required. Any broken glass (cullet) is returned to the process.

Cutting, Quality Control Area and Storage

Glass exits the annealing area on rollers and passes through the online quality control procedures, which enable instantaneous identification of faults using laser. Any glass failing quality control checks is broken up for re-use in the process. The glass is cut into sheets of varying dimensions ranging from a maximum of 6m x 3m to smaller sizes.

The computer controlled cutting schedule minimises the amount of waste produced, by cutting around any remaining defects. All off-cuts and breakages are returned by conveyors to silos in the batch plant where they are recycled into the furnace. After being cut, the glass sheets are off-loaded and stored in a vertical position. The temperature of the warehouse is maintained at a set temperature to avoid condensation on the glass which would cause straining and defects. As required, further off-line quality test are undertaken in respect of dimensions, optical properties and glass chemistry.

Coating Process

In 2004 the Eggborough plant commenced the use of a Physical Vapour Deposition (PVD) process in order to apply extremely thin coatings to glass sheets to enhance the thermal emissivity properties of the glass. The coating plant is housed in a purpose-built extension to the existing finished product warehouse measuring some 100 x 48m. The glass to be coated will be sourced from within the production line or external sources.

The production capacity of the coater is up to approximately 130,000 tonnes and will operate across all shifts on a continuous basis.

Loading and Washing

Glass will be loaded automatically from a storage bay, from where each single sheet will move horizontally into an enclosed Washing Machine to remove surface deposits that would be detrimental to coating. A closed loop softened water system is used to supply the cleaning water at ambient temperature where cleaning occurs using a combination of brushes and rollers before drying off using an air knife. Used water will be subject to a filtering process and re-circulated. No detergents will be used but on occasion a polishing agent may be used. The glass sheets will be advanced towards the coating line on a horizontal conveyor system.

Configuration of the Coating Line

The coating process occurs under vacuum conditions, which are created within consecutive chambers subject to the action of vacuum pumps. The glass is advanced at a constant speed with an interlock operating between chambers opening to allow the passage of glass and closing to allow pumping of the vacuum once the sheet is fully within the chamber. The entrance and buffer chambers are for pumping a vacuum only as reduction from the atmospheric pressure to the operating pressure is only achievable in a staged sequence. The process area exists within fully enclosed compartments which act as a position to pump the vacuum or as a position for this film coating deposition.

The process can be stopped at any time although times to re-achieve necessary vacuum levels mean that these stop periods will be limited to maintenance requirements, periods of prolonged stoppage or due to abnormal operation. It is envisaged that there will be short maintenance stop periods between production runs, depending upon commercial product requirement and cathode life experienced.

In the event of an interruption to the process where no glass is travelling through, entry to the coating line would be closed and the coater would be maintained under stable vacuum conditions. The process chamber is constantly kept under vacuum because of the buffer and transfer chamber.

How Coating Works

An electrical potential is applied to the material to be deposited as the coating (known as the target). This acts as a cathode and gas is introduced into the chamber to create a plasma.

The cathodes used in the coating process are water cooled, on a dedicated cooling circuit, utilising three cooling towers. The water will be treated with biocide and corrosion inhibitor.

A permanent magnetic field concentrates the plasma at the cathode and the gas bombardment onto the cathode material cause target material to be displaced which is subsequently deposited onto the glass sheet giving the required thin film deposit or onto the sidewalls of the compartment. Individual film thickness is of the order of 10nm (nano metres). Several layers coating will be applied.

Gases to be used are either inert, when a single element coating layer is required, or reactive where the gas combines with the target material in vapour form in order to deposit the required compound:

- **Inert Gases**: Predominantly this will be Argon with other noble gases potentially used as alternatives, although this is unlikely on cost grounds.

- **Reactive Gases**: Nitrogen, Oxygen and Hydrogen are the reactive gases to be employed.

All gases used in the process will be stored in dedicated cylinders, with appropriate ventilation to reduce explosion risk. There will be no bulk storage of gases in relation to the coating process.

Target cathode materials to be deposited as layers may include:

- Tin
- Zinc
- Silver
- Nickel-Chrome alloy
- Titanium-Aluminium alloy
- Ti-Zinc-Antimony alloy
- Tin-Zinc-Aluminium alloy

Target materials will be vaporised and deposited onto the glass substrate or compartments walls. Compartment walls have interchangeable shields which are removed and sent away for external cleaning before re-use. The entry and exit chambers will vent to atmosphere each time the cycle completes, and a new sheet of glass is introduced to the entrance chamber or a coated sheet exits from the exit chamber. In normal operation the entry, exit and buffer chambers will be vented to atmosphere. Air venting at the entrance and exit chamber is fitted with a silencer and filter to remove any residual oil from the pumps. During processing small quantities of plasma gas and inert gas are continually released to atmosphere, at concentrations below detection limits.

Laminating Process

The Eggborough plant has commenced the use of a Laminating process in order to produce laminate and laminate safety glass for the building industry. The laminating plant is housed in a purpose built 3665m^2 extension to the existing finished produce warehouse.

The production capacity of the installation is up to approximately 2.2 million m^2 per annum, with initial production rate of the equivalent of 1 million m^2 per annum, running 24/7 by fully trained competent Operators, two shifts a day. The glass to be laminated will be sourced internally from float and coating line or from external sources.

Laminating Line

The aim of the laminating line is to create a sealed laminate sandwich consisting of a glass/PVB/glass as show opposite. In order to successfully create this, the line is split into four distinct sections.

Loading and Washing

Glass is loaded automatically from racks onto the line by one of two portal loading machines, from where each sheet will move horizontally into an enclosed washing machine to remove surface deposits that would be detrimental to the finished product. The glass initially passes through a pre-wash during which the interleave

powder applied to the glass on both the float and coater is removed with the wastewater filtered before entering the foul drain. The glass then enters the main washing section, a closed loop softened water system is used to supply the cleaning water at ambient temperature where cleaning occurs using brushed and spray bards before drying off using air knives. Used water is subject to a filtering process and re-circulated. No detergents will be used. The glass sheet will then advance into the assembly room.

Assembly/Trimming

The first glass sheet will enter the assembly room, which is temperature and humidity controlled, and travels through to the assembly table and is lifted vertically by the glass lifter. The second sheet enters and is stopped momentarily under the PVB film laying devise during which the front edge of the PVB film is aligned automatically on the front edge of the glass sheet. Transport of the sheet restarts and simultaneously the PVB is fed from the unwinding room directly above the laying device onto the glass sheet. The PVB is then cut and the sheet conveyed to the assembly table, the first sheet is then lowered to create the laminate sandwich. When leaving the assembly table the excess PVB along with longitudinal edge of the sandwich is trimmed to within 1mm of the glass edge and the plate then stops to allow the leading and trailing edge to be trimmed. (NB All trims are collected and sent recycled). The assembled and trimmed sandwich will then advance out of the assembly towards the de-airing section.

De-airing

When the glass/PVB/glass sandwich is initially created, a significant amount of air is present at both interfaces. This air must be removed in order to have intimate contact between the PV and the glass. Subsequent to removal of the air the edge of the sandwich must be sealed so the air cannot return and to avoid blow-ins during the autoclave cycle. The process is done by a nip roll and calendar system. The sandwich is heated, using medium wave heater and put through rollers which squeeze the air out along the length of the laminate and deal the edge.

Stacking

After de-airing the sheets will be conveyed to the stackers, during transit interleave powder will be applied. The laminate sandwich is picked up by vacuum stacker and loaded onto a special rack, suitable for entering the autoclave. At regular predefined interval spacers are automatically placed between packs and once the rack is complete it will be removed by glass moving vehicle and stored until it is able to be autoclaved.

Autoclave

Autoclaving is the final step in laminating. It is the process of subjecting the laminate sheets to high temperature (~135^{o}C and high pressure (~13 bar) to allow the PVB to flow and provide intimate contact with the glass which is required for full

development of the performance and to allow any residual air to dissolve and disperse.

A full rack of laminate glass is placed inside the autoclave and undergoes a cycle composed of three distinct steps: ramp up, hold and ramp down, all controlled by the inbuilt PID control system.

During the ramp up and hold section the glass is heated via a heat exchanger supplied from a closed loop hot oil system. The oil is heated using a natural gas burner. During the ramp down section the same principle is used but this time with chilled water to cool the glass.

Once complete the finished laminate glass is inspected pack by pack and samples cut, on a semi-automatic cutting table, for testing.

Ancillary Processes

Batch House steam raising boiler

A small gas fired boiler is operated in the batch house for raising the steam for injection into the batch prior to transport to the furnace. The boiler, which is rated at 0.95 MW Thermal (MWTh) is operated continuously, supplying steam on demand. The boiler has a dedicated soft water supply, dosed with corrosion inhibitors. Blow down water goes to foul sewer, under trade effluent consent. Emissions from the boiler are vented to air via a dedicated stack (emission point reference A9).

Hydrogen/Nitrogen Storage

A nitrogen storage plant is in place on site to provide the necessary gases for maintaining the appropriate reducing atmosphere within the float bath. Additionally, nitrogen is used to supply some control systems. There are two liquid nitrogen storage tanks (approximately 62.5 tons per tank), with compressed hydrogen gas stored in portable multi-cylinder trailers. Gases are brought to site by a contractor, who is responsible for re-filling the storage tanks. Re-filling operations are done under the supervision of Saint-Gobain Operators. In the event of an emergency, procedures supplied by the gas supply contractors will be followed.

There is separate hydrogen producing facility which is owned and controlled by HYGEAR and is permitted under an A permit from the Environment Agency. If this facility fail then there is a back up facility to use stored hydrogen in bottle format.

Water Treatment Plants

There are two existing water treatment plants on site:

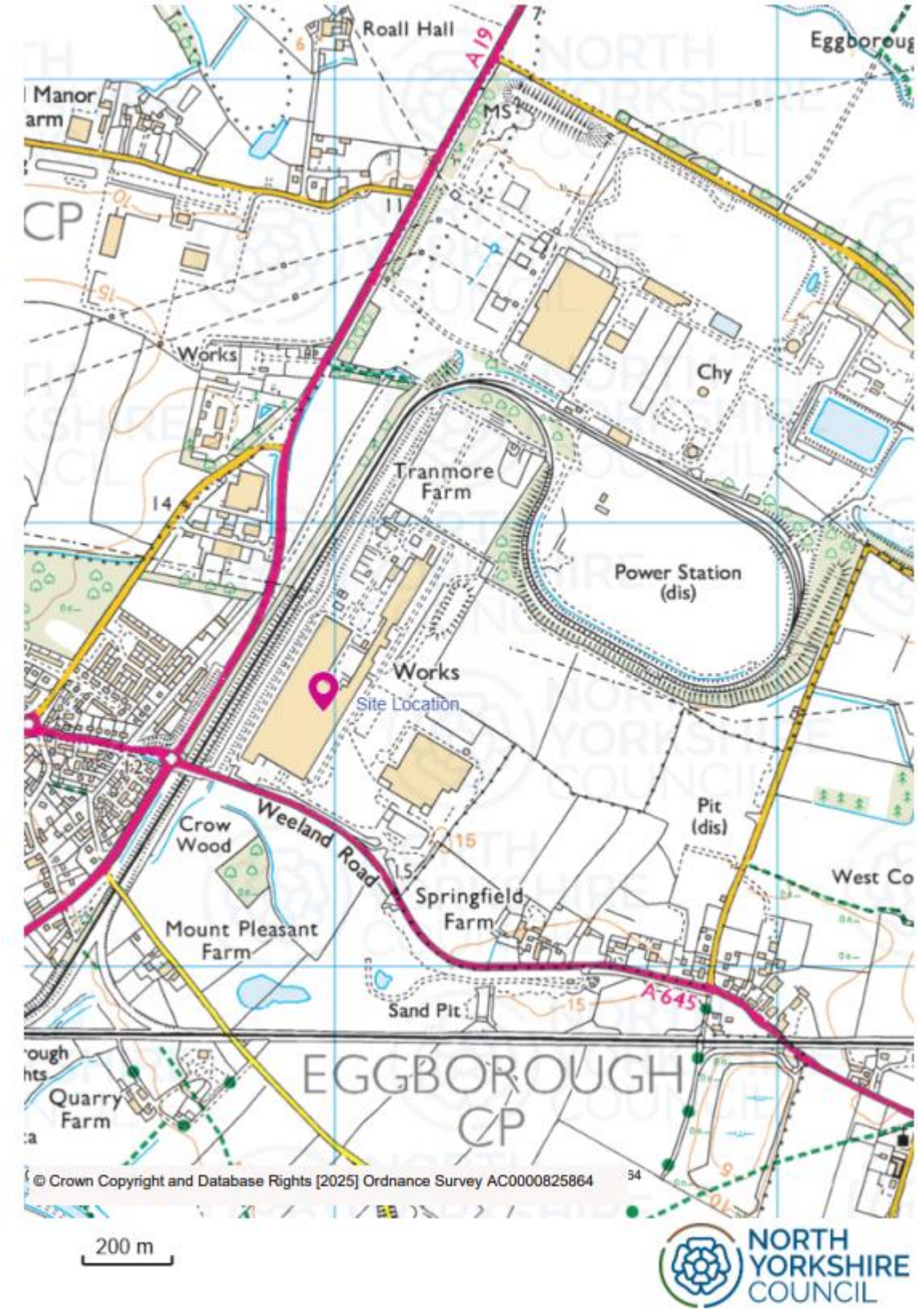
- A small water treatment plant is in place on site to provide softened water for the boiler cooling circuits. An ion exchange resin system is used, with brine to back flush the resin. Corrosion inhibitors and primary/secondary biocides are also automatically dosed at this point; and

- A small reverse osmosis plant (RO) is also located on site to provide demineralised water for the zinc nitrate coating and the laboratory.

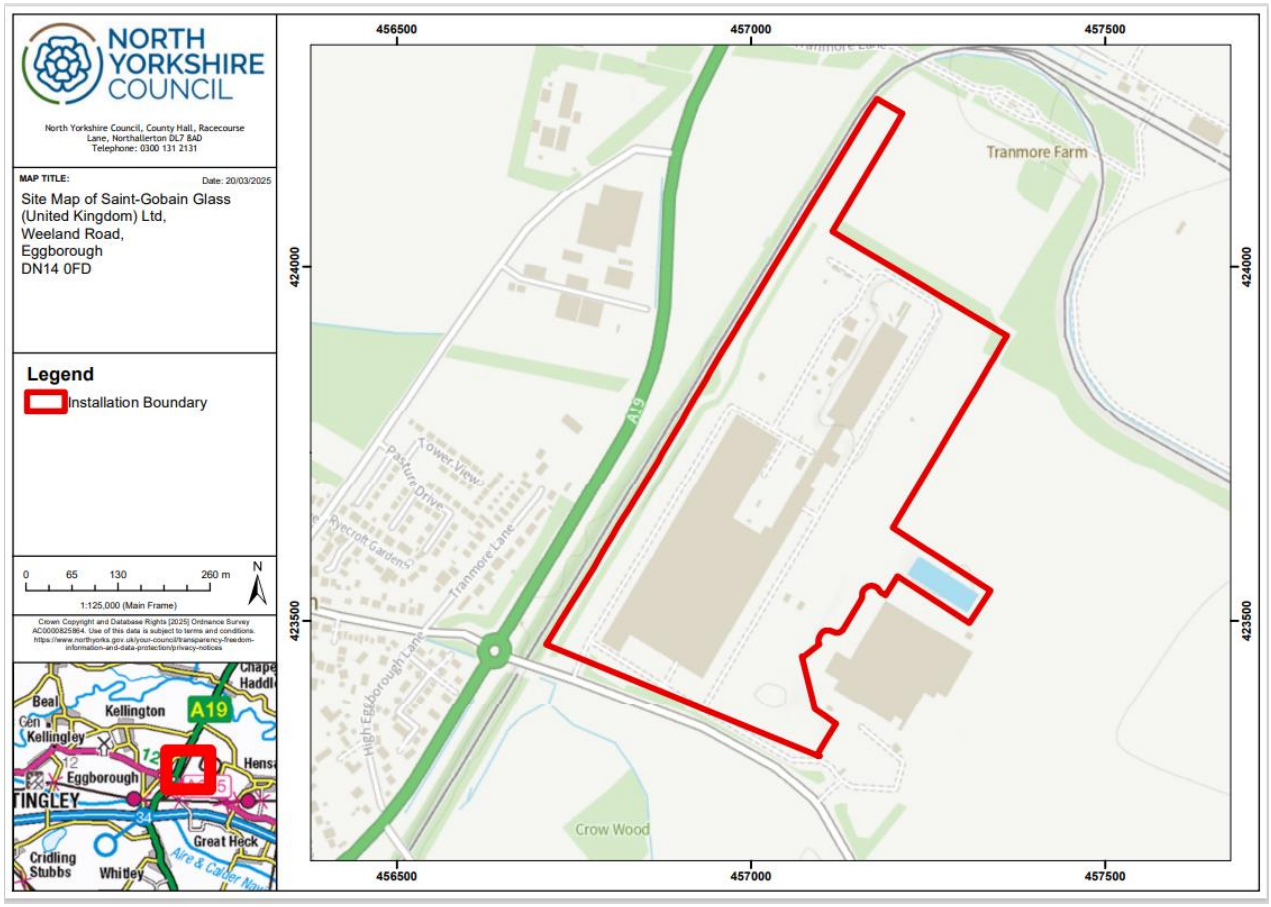
Additionally, another RO demineralisation plant is used to provide water for the washing machine on the coating line and laminating line. These are located in the coating building and laminating building respectively.

Schedule 2: Site Location and Site Boundary

Figure 1A: – Site Location



Site 1B: Site Boundary



1C Emission Points

Figure 1D: Liquid and Storage Tanks

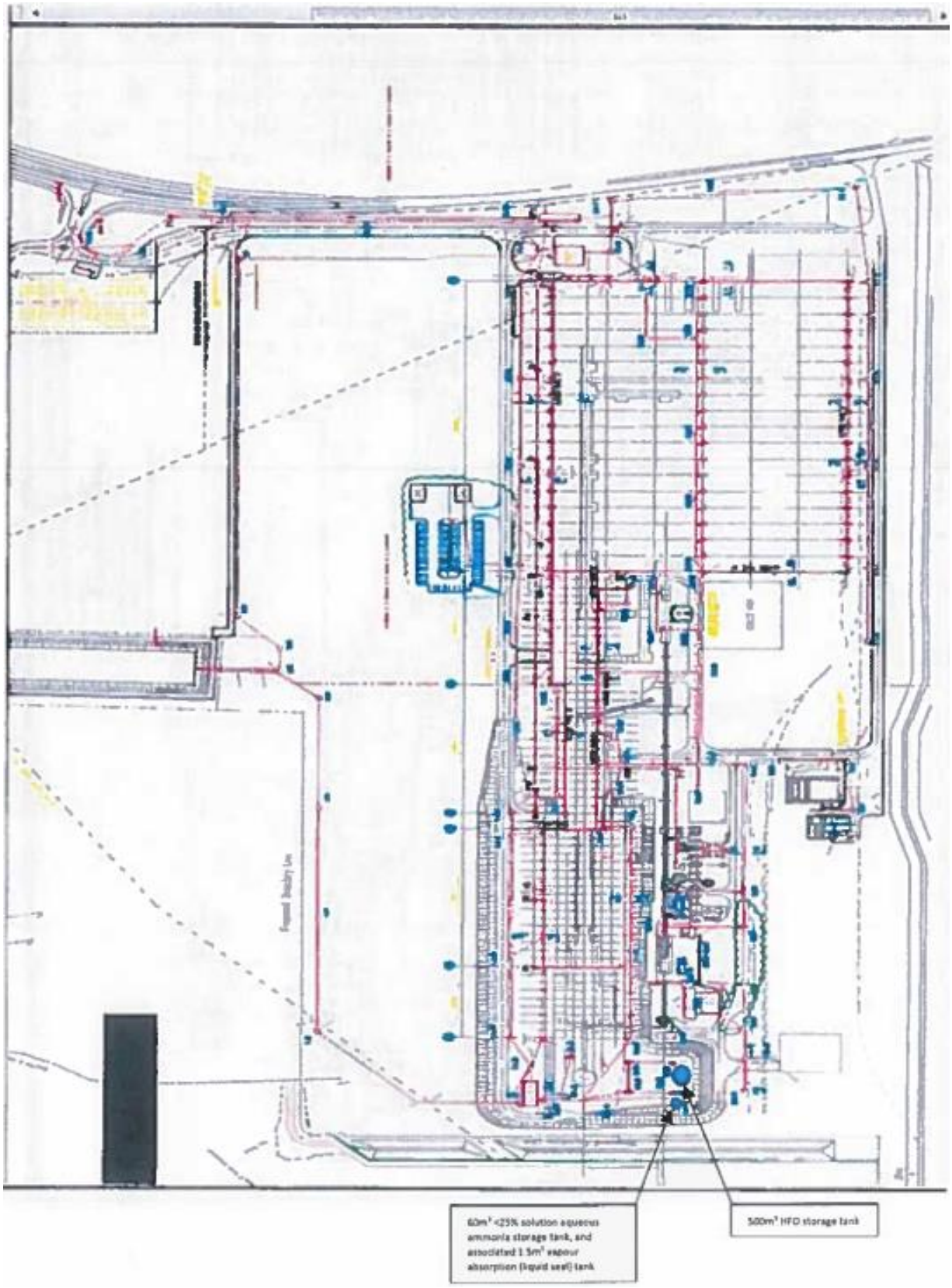


Figure 1E Waste Storage Areas


Solid glass waste from coating line. Line rejects for recycling internally back into the furnace
Road scraping solid waste skip for recycling off site
Solid glass waste compound from float line for recycling back into furnace
Used oil storage liquid waste container for recycling off site
Solid glass waste for recycling back into the furnace and for recycling off site
Segregated solid waste skips for recycling and disposal off site
IBC for occasional rinse water form <25% aqueous ammonia solution

Figure 1F: Coating Line Storage Areas

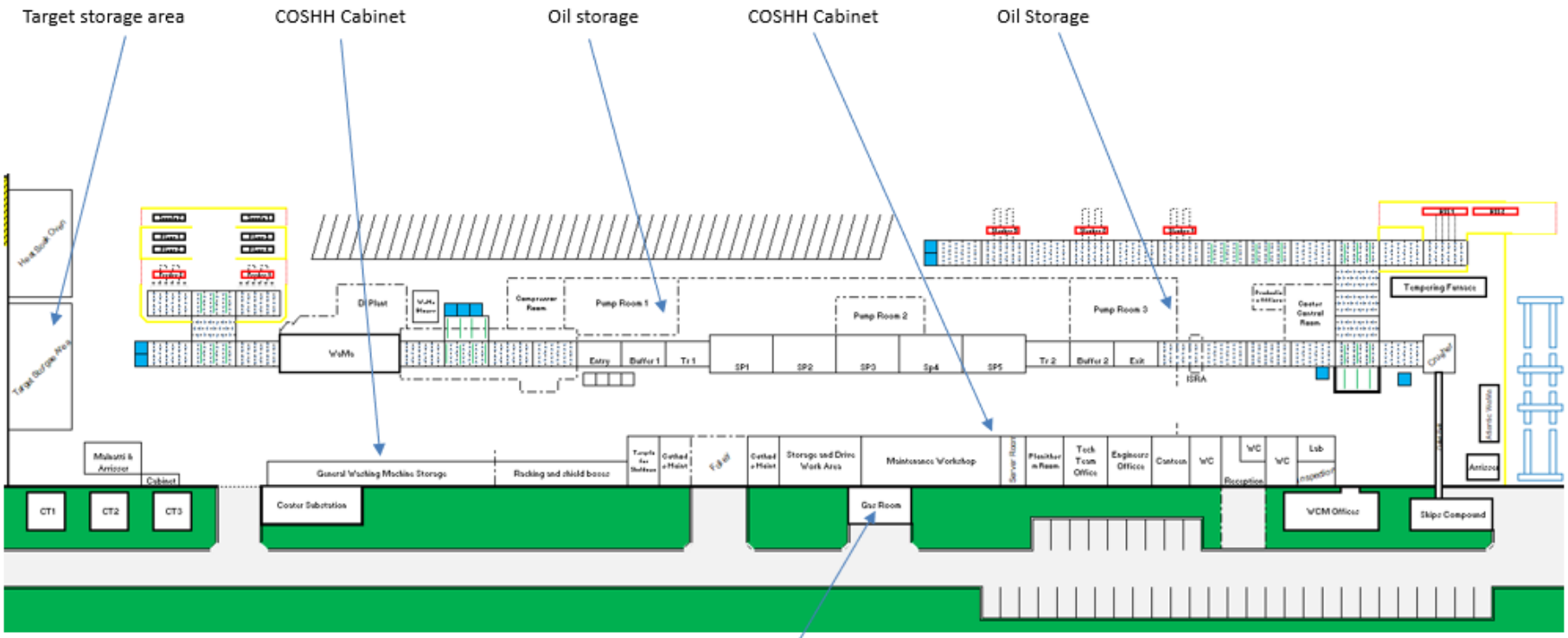
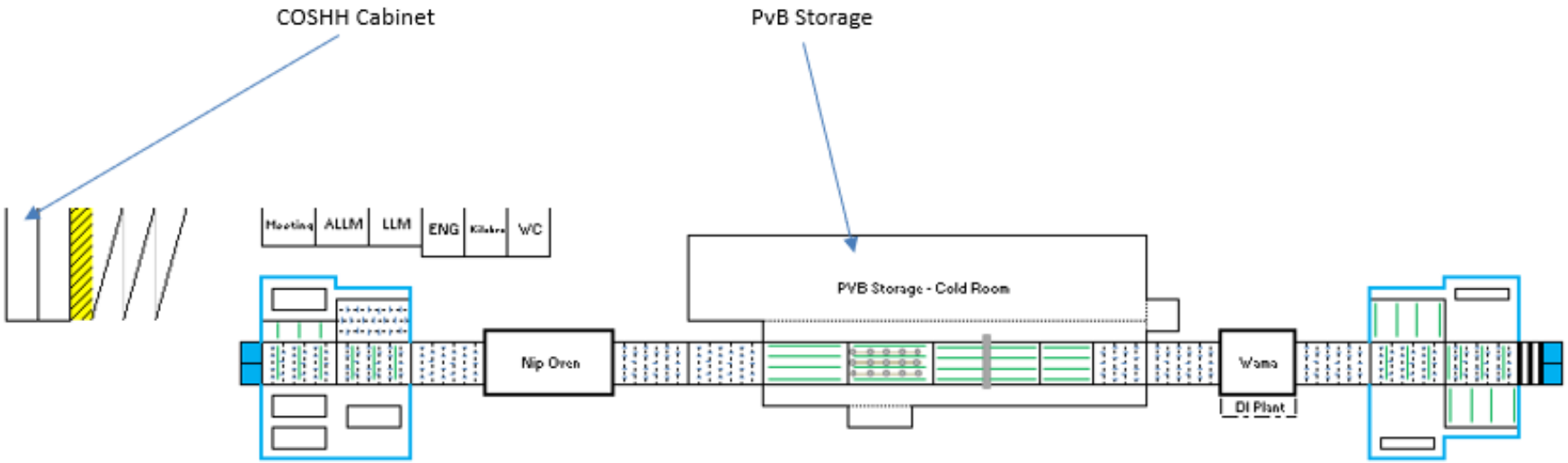


Figure 1G: Laminating Line Storage Areas



SCHEDULE 3

POINT SOURCE EMISSIONS TO AIR AND ASSOCITED EMISSION LIMITS

Table 1a – Emission Limits

Release Point Reference	Emission Type	Concentration not to be exceeded (mg/m^3)	Monitoring required C=Continuous I=Indicative NR=None A=Annual
A1-Main Stack	Particulates	20	CI, A
		Gas Fired Oil Fired	CI, A
	Sulphur Oxides (as SO_2)	300-500 500-1200	CI, A
	Nitrogen Oxides (as NO_2)-	See Condition 3.4.4	CI, A
	Ammonia (expressed as NH_3)	30	CI, A
	Carbon monoxide (as CO)	<100 mg/Nm^3	A
	Chloride (as HCL)	25	A
	Fluorides (as HF)	4	A
	Arsenic Cobalt Nickelt Selenium Chromium VI-Group1	1 (annual)	A
	Antimony lead Chromium III Vanadium-Group2	5 (annual)	A
A2 – EP cooling stack*	E P cooling stack not measured		NR
A3-Working end* Chimney	Particulates	20	NR
	Chlorides	30	NR
	Fluorides	5	NR
	Arsenic Cobalt Nickel Selenium Chromium VI	<1	NR
	Total metals	< 5	NR
A4-wet scrubber vent*	Particulates	20	NR
A5 to A8	Chlorides	10	NR
Emissions measured at	Fluorides	5	NR
A5 if considered to be representative are de-minimis.	Arsenic, Cobalt, Nickel, Selenium, Chromium VI	<1	NR
	Total Metals	<5	NR
A9 A10 to A20, A27	Combustion	see conditions 3.3.1 and 3.3.2	Visual
A21 A22*	Extraction/vacuum	see condition 3.3.1	Visual

Table 1a – Emission Limits

Release Point Reference	Emission Type	Concentration not to be exceeded (mg/m^3)	Monitoring required C=Continuous I=Indicative NR=None A=Annual
A21-portable extractor*	Not identified/measured		NR
A22-Batteryroom extractor*	Not identified/measured		NR
A23 A24 A25-Coating Vacuum discharge*	Not identified/measured		NR
A26 Coating plant workshop extractor*	Not identified/measured		NR
A27 Coating plant space heater*	Not identified/measured		NR
A28 A29 A30 Coating vacuum room exhaust*	Not identified/measured		NR
A31 Laminate exhaust*	Not identified/measured		NR

*Sources of emissions considered not to be significant

Table1b: Emissions to Water and Sewer and monitoring provisions (to be read in conjunction with Figure 1c in Schedule 3)

Release Point	Operational Description	Parameter	Release mg/1	Justification
S1	Point of exit to public sewer	Not measured	Not measured	Domestic and Trade effluent only; No monitoring requirements placed on the trade effluent consent. Saint-Gobain commits to undertake any monitoring required by the sewage undertaker, in line with revised trade effluent consent issued due to coating process.
W1	Discharge point to land drainage board	Not measured	Not measured	Surface water releases only, no monitoring parameters in respect of land drainage discharge consent.

SCHEDULE 4

STORAGE AND HANDLING OF RAW MATERIALS

The primary raw materials are delivered to that factory by road in bulk, where they are elevated to closed hoppers at the batch house for storage prior to being used in the glass production process. Traffic circulation around the site is possible via a perimeter road with ample space for manoeuvring of HGV's, parking and queuing. Incoming vehicles delivering raw materials to the plant circulate in a clockwise direction.

Although the principal raw materials are inert, their storage and handling is managed to minimise emissions of dust and to avoid overfilling during loading. Raw materials are stored in fully enclosed storage silos which are fitted with high level probes and alarms to warn of overfilling (both locally and in the central control room), with interlocks which automatically stop loading. The alarms are tested, as part of ongoing site maintenance programmes. Air displayed during filling passes through a reverse jet air filter to minimise dust emissions to atmosphere.

Sand is transferred to the silos by bucket elevators, all other materials by pneumatic discharge. Air displaced from the storage silos on filling is passed through a reverse air jet filter to arrest particulate material. To ensure that the unloading processes are operated safely and with minimal environmental impact, written procedures have been developed. These procedures will be incorporated into the EMS which is currently under development and will be revised to formally include consideration of potential environmental impacts from unloading operations.

Cullet, which arises from both internal and external sources is stored in partially enclosed storage bays and fully enclosed silos. The size of the cullet is such that windblown loses are minimal. Internal cullet arises due to unavoidable losses, e.g. edge loss, quality and cutting loss. External pre-consumer cullet is received from glass processers and recyclers mainly returned through the Saint Gobain Glass Forever cullet scheme. Post-consumer cullet is returned to the site from the renovation of commercial and domestic buildings again collected through the Glass Forever Scheme operated by Saint Gobain, a quantity of this cullet is also purchased from glass recyclers.

Once received, all cullet is visually inspected to ensure it meets the sites quality and contamination requirements, with any out of specification material returned to the supplier, sold or pay to be removed. All cullet is then processed through a modern processing line, which uses magnets, eddy current separator and metal detectors to remove ferrous and non-ferrous metals. It then uses screening technology to remove fine particles of glass before employing optical sorting machines to remove ceramics, stones and other glass types form the cullet. Post processing cullet is inspected and checked to ensure it meets quality standards. Any rejected materials from the sorting process will be segregated sold where possible or transferred to a waste contractor. Saint Gobain Glass Forever cullet scheme enables laminated cullet return to site where the cullet is stored and weathered before processing to enable to be used in the furnace. Laminated cullet processing is carried out by a specialist machine and is intermittent depending on stocks.

Cullet received to site complies with European Waste Catalogue codes:

10 WASTE FROM THERMAL PROCESSES
10 11 10 waste preparation mixture before thermal processing, other than those mentioned in 10 11 09

17 CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)
17 02 02 Glass

16 WASTES NOT OTHERWISE SPECIFIED IN THE LIST
16 01 20 Glass

Cullet and products from the treatment of cullet leaving site comply with European Waste Catalogue codes:

19 WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE
19 12 12 other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11

17 CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)
17 02 02 Glass

The existing and proposed cullet bays, which are on hard-standing will drain to the balancing pond, via the oil interceptor, together with other site surface drainage (See also Section 3.3.4).

Other raw materials stored on site include:

- **Diesel fuel** is stored on site for use in safety generators and on-site vehicles (see Section 3.4.2). Maximum storage capacity is 80,000 litres in two above ground storage vessels. The tanks are bunded to 110% capacity of the largest tank. The loading connections are within a dedicated bunded area and unloading is supervised.

  - Loading and unloading areas designated and marked and are protected by an oil interceptor.
  - Automatic cut off valves to prevent overfilling of the diesel oil tank. The tank is protected with high level alarms.
  - Diesel oil tanks are bottom filled, to reduce fume generation.

- **Water treatment chemicals.** Water treatment chemicals are stored in bulk vessels, protected by bunding. Storage volumes on site are kept low, due to regular deliveries by water treatment contractors.

- **Lube oil/glass cutting oil storage areas**. Lube and glass cutting oils are stored in bunded containers, or on portable bunds skids.

- **Hydrated Lime.** Hydrated lime is stored a silo near its injection point in the flue gas ducting. The silo is filled directly from delivery tankers via pipework.

- **Aqueous Ammonia (<25% Solution).** Aqueous ammonia is stored in a 60m3 capacity double walled tank, providing integral bunding. The tank is re-filled via pump from supply tankers.

Raw materials are removed form storage silos by vibrational feeders. The raw materials are weighed on scales at the bottom of he silos, to an accuracy of 0.2% to minimise raw material wastage, and then deposited on to conveyors which lead to the mixer. Raw materials are mechanically mixed in discrete quantities of between 3 to 6 tonnes. Steam is added in the mixer to control temperature and water content of batch. The mixed batch is deposited onto a conveyor (which is enclosed within the process building to minimise dust) then cullet is deposited on top, comprising up to approximately 25% of batch (although if necessary 100% cullet can be used, to detriment of glass quality). At the top of this conveyor, the falling of batch and cullet onto a further conveyor mixes batch and cullet before entry into the furnace. The procedure of measuring and mixing raw materials from the hoppers to produce that batch is fully automated. Any dust associated wit the transport and mixing of granular materials is abated through a reverse jet dust extraction system and may be returned to the batch.

The batch is conveyed to a reciprocating spade batch charger where it is contained in 6 hoppers before being introduced to the furnace for melting. To minimise “carry-over” of fine particulates in the furnace (which could ultimately be transferred to the flue gas stream), the moisture content of the batch is checked and adjusted (if required) every two hours.

The **Coating Process** will use either inert gases, when a single element coating layer is required, or reactive gases where the gas combines with the target material in vapour form in order to deposit the required compound:

All gases used in the process will be stored in dedicated cylinders, with appropriate ventilation to reduce explosion risk. There will be no bulk storage of gases in relation to the coating process.

Schedule 5:

Submission Timetable

Condition Number	Document/Record/Result/Notification	Frequency of submission
3.2.7	Details of audio/visual alarm activations for release point A1	Submitted every 6 months (if needed)
3.2.12	Notification of any periodic monitoring exercise	Minimum of 7 days
3.2.4	Notification of exceedances of monthly mean emissions concentrations, 110% daily mean emissions, etc	Within 7 days
3.2.8	Notification of 1-hour mean concentrations that exceed twice the emission limit	Within 24 hours
3.2.9	Annual monitoring from release point A1	Submitted within 8 weeks of sampling completion.
3.3.5	Exemption request for electrostatic precipitator for planned preventative maintenance	More than 7 days
3.3.7	Report on the of use of bypass for the electrostatic precipitator	Within 7 days
3.4.7	Report on daily average results of continuous monitoring of nitrogen oxides	Every 3 months
3.4.8	Report detailing the examinations and maintenance carried out on regenerators	Every 2 years
3.4.9	Notification of sudden increase in NOx emission levels	Within one working day
3.4.9	Report detailing reasons, remedial actions identified, and timescales for restoration	Within one month
6.2	Notification on amendments to EMS	Within 1 week
9.5	Report detailing waste produced on site and recycled for the preceding 12 month period	Within 14 months of permit issue (current version)
11.4	Notification of implementation of site closure plan	Minimum 30 days
14.3	Notifications re Climate Change Agreements	Within one month

SCHEDULE 6

POINT SOURCE EMISSIONS TO SURFACE WATER AND SEWER

Emissions to water from the process are minimal. Wastewater streams are kept separate and disposed of in a manner appropriate to their nature, as described below.

Principal process water usage is for cooling systems, and for steam generation for injection into batch. Wastewater is minimised through careful control and management of water usage in the process. Discharges of cooling water and boiler blowdown water are authorised under a trade effluent discharge consent, with Yorkshire Water Services Ltd. Liquid discharges from the laboratories and battery charging room are collected in sub-surface tanks, and are disposed of off-site as special waste.

Surface run-off from all areas of hard-standing (pavements, roadways, raw material storage areas) is discharged from the site drainage system into a balancing pond, via a full retention oil-fuel interceptor, and from there via a point source discharge to the local land drainage system (managed by Danvm Drainage Commissioners, consented under the Land Drainage Act 1991, consent number: DN 2022-23_07, dated 9/9/22).

The roof run-off water is interconnected into the roads surface drainage system where it is then pumped into the balancing pond, again, via the oil interceptor. The site has considered utilising roof water for re-use as “brown” supplies; the study is still ongoing.

The oil interceptors are inspected and cleaned monthly, as appropriate, with any oily residues being disposed of off-site by appropriately licensed contractor. To ensure that the effectiveness of the oil interceptors are maintained, any detergents which may be used for domestic cleaning purposes (e.g. office toilet facilities) are disposed of to foul sewer.

The balancing pond is situated within the installation to accommodate run-off storm flow periods. The pond is approximately 3000m^3 in area, and holds some 1500m^3 of water, but provides a temporary storage capacity of a further 6000m^3 for storm water. In addition to isolating both the interceptors through the use of cut-off valves (via automatic oil level detection), the outfall from the balancing pond can also be shut to create a totally closed system. Water is pumped from the pond to a drain managed by Danvm Drainage Commission. The ultimate outfall of this system, together with discharge from the remainder of the drainage board area is to the River Aire.

The site has a closed circuit cooling water system, with a total volume of approximately 300m^3.

Domestic effluents from the site are disposed of to foul sewer for subsequent treatment at Hensall STW