City of Doncaster Council

LOCAL AUTHORITY POLLUTION PREVENTION AND CONTROL
POLLUTION PREVENTION AND CONTROL ACT 1999
ENVIRONMENTAL PERMITTING (ENGLAND & WALES) REGULATIONS 2016 (AS AMENDED)

PERMIT NUMBER: EPR 79 VN 4/2023

Operators Name and Registered Office:

Ardagh Glass Ltd
Headlands Lane
Knottingley
West Yorkshire
WF11 0HP

Company registration number: **567801**

Address of Permitted Installation:

Ardagh Glass Ltd
Barnby Dun Road
Wheatley
Doncaster
DN2 4RH

Regulated Activity: **Manufacturing container glass in a plant with a melting capacity of more than 20 tonnes per day.**

Issued by the City of Doncaster Council

Signed: Dated this day: 5 December 2023

K Hopkins
Assistant Director – Environment

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List of Tables

Permit Reference	Date	Details
EPA 6	01.10.1992	EPA Authorisation
LA-IPPC1	21.11.2004	PPC Permit
LA-IPPC1 VN A2 1	21.06.2007	Varied PPC Permit
LA-IPPC1 VN A2 1/2010	22.09.2010	Varied PPC Permit
LA-IPPC1 VN A2 2015	07.03.2016	Environmental Permit
EPR 79 VN 4/2023	05.12.23	Varied Environmental Permit

INTRODUCTORY NOTE

This introductory note does not form part of the permit conditions.

The following Permit is issued under Regulation 13 (1) of the Environmental Permitting (England & Wales) Regulations 2016 (as amended) to operate an installation carrying out one or more of the activities listed in Part 2 to Schedule 1 of those Regulations, to the extent authorised by the Permit.

This environmental permit includes conditions which detail the Best Available Techniques (BAT), for the management and operation of the installation, to prevent or where that is not practicable, to reduce emissions.

TALKING TO US

If you contact officers of the City of Doncaster Council about this permit, please quote the permit number.

The following telephone number should be used: 01302 552819
Alternately, you can contact us via email at the following addresses:
Kathryn.hardy@doncaster.gov.uk
Pollution.control@doncaster.gov.uk

PUBLIC REGISTERS & CONFIDENTIALITY

The Permit requires the operator to provide information to the Local Authority. The Local Authority will place the information onto the public registers in accordance with the requirements of the Environmental Permitting Regulations. If the operator considers that any information provided is commercially confidential, it may apply to the Local Authority to have such information withheld from the register as provided in the Environmental Permitting Regulations. To enable the Local Authority to determine whether the information is commercially confidential, the operator should clearly identify the information in question and should specify clear and precise reasons.

SURRENDER OF THE PERMIT

Before this permit can be wholly or partially surrendered, an application to surrender the permit has to be made. For the applicant to be successful, they would have to be able to demonstrate to the Local Authority, in accordance with Regulation 24 of the Environmental Permitting Regulations, that there is no pollution risk and that no further steps are required to return the site to a satisfactory state.

TRANSFER OF THE PERMIT OR PART OF THE PERMIT

Before The Permit can be wholly or partially transferred to another person, a joint application to transfer the permit has to be made by both the existing and proposed holders, in accordance with regulation 21 of the Environmental Permitting Regulations. A transfer will be allowed unless the Local Authority considers that the proposed holder will not be the person who will have control over the operation of the installation or will not ensure compliance with the conditions of the transferred permit.

ENFORCEMENT

An **Enforcement Notice** may be served if the Local Authority believes an operator has contravened, is contravening or is likely to contravene any condition of his permit.

A **Suspension Notice** may be served if in the opinion of the Local Authority the operation of an installation involves an imminent risk of serious pollution. This applies whether or not the operator has breached a permit condition.

The Local Authority can revoke a permit by written notice at any time by serving a **Revocation Notice.** The permit then ceases to authorise the operation of the installation.

OFFENCES

A limited summary of the offences is listed below:

a) operation of an installation without a permit
b) failure to comply with or contravene a permit condition
c) failure to comply with the requirements of an enforcement or suspension notice.

A full list is available under Regulation 38 of the Environmental Permitting (England & Wales) Regulations 2016.

PENALTIES

The maximum penalties for the above offences are a fine not exceeding £50000 and/or up to twelve months imprisonment per offence for a summary conviction (in a Magistrates court); and a fine and/or up to five years imprisonment for conviction on indictment (in a Crown court).

END OF INTRODUCTORY NOTE

BRIEF DESCRIPTION OF THE INSTALLATION REGULATED BY THIS PERMIT

The main purpose of the activities at the installation is the production of glass containers by melting mixed batch and cullet in one of three gas fired furnaces.

Raw materials, principally sand, cullet, soda ash, and limestone are stored on site. The raw materials are weighed and then mixed within a pan mixer, all located within the batch plant. The mixed batch and cullet is then moved out of the batch plant via one of three enclosed conveyors into one of 2, 50 tonne furnace hoppers.

The mixed batch and cullet is then charged into the furnaces and is subjected to temperatures of up to 1600°C at which it converts to glass. The three furnaces are each natural gas, regenerative furnaces and have additional electric boost fitted. The furnaces operate 24 hours a day, 365 days a year. Two of the furnaces operate to a nominal maximum pull of 350 tonnes per day and one at 330 tonnes per day. Emissions from the furnaces are vented to atmosphere via 2 stacks of height 55 metres (W1 and W2 combined stack – S1) and 65m (W3).

The molten glass leaves the furnaces, is refined and then cut into gobs. The gob then passes into the forming machine down chutes which are lubricated with oil emulsion to prevent the glass from sticking to the sides. The moulds on the forming machine itself are lubricated with a graphite-based grease, for glass release purposes. Reject glass is removed from the forming machines via a 'cullet chute' which is constantly lubricated with water. The rejected glass goes into a water filled metal skip from where it is taken for cooling and later re-introduced into the furnace. The water from the skips spills over onto the concrete floor and drains into sumps from where it is pumped into the process water recycling system.

From the forming machine, the glass emerges as a recognisable container.

Once cooled sufficiently to maintain their shape, the containers pass through the hot end coating hoods. Inside these hoods the hot containers are treated, using monobutyltin trichloride vapours, to coat them with a fine covering of tin oxide. This helps strengthen the containers. Emissions from the coating operation are discharged to the atmosphere via the furnace stacks S1 and W3.

The containers then progress down the line to the Lehr oven. The Lehr oven 'anneals' the glass by raising its temperature to around 550°C and then cooling it down at a gradual rate. This process removes any residual stresses, which have been created in the container by its rapid forming and cooling.

A second surface treatment is then applied to prevent scratching of the glass. No significant sources of environmental emissions are associated with this process.

The containers then undergo a series of rigorous quality checks. Reject containers are crushed and then re-introduced into the furnace batch mixer as required.

Some of the finished glass containers are then automatically packed and either loaded onto trailers or stored in the on-site warehouse, whilst others are sent to the brand enhancement plant after which they transported off site.

PERMIT

Permit Reference Number: EPR 79 VN 4/2023

City of Doncaster Council ("the Regulator") in exercise of its powers under Regulation 13(1) of the Environmental Permitting (England and Wales) Regulations 2016 (SI 2016 No 1154), hereby authorises **Ardagh Glass Ltd, Headlands Lane, Knottingley, West Yorkshire, WF11 0HP** to operate an installation as defined in Schedule 1, Section 3.3, Part A2 (a) of the Environmental Permitting (England and Wales) Regulations 2016 (as amended), at **Ardagh Glass Ltd, Barnby Dun Road, Wheatley, Doncaster, DN2 4RH.**

The operator is permitted to carry out the following activity and associated activities, specified in Table 1, to the extent authorised by and subject to the conditions of this Permit:

Table 1

ACTIVITY UNDER SCHEDULE 1 OF THE REGS/ ASSOCIATED ACTIVITY	DESCRIPTION OF SPECIFIED ACTIVITY	SCHEDULE 1 ACTIVITY REFERENCE	LIMITS OF SPECIFIED ACTIVITY
Storage & handling of raw materials	Delivery, storage, transport and blending of glass raw materials	Directly associated activity	Receipt & blending of raw material to transfer to furnaces.
Melting & Refining	Melting mixed batch and cullet in 2 cross fired regenerative furnaces and 1 end fired regenerative furnace.	Section 3.3 A(2)(a)	Receipt of furnace charge to transfer to forming & moulding machines.
Forming & Moulding	Pressing & blowing molten glass to produce formed containers	Directly associated activity	Receipt of molten glass to transfer of formed containers to hot end surface coating.
Hot end surface coating	Application of surface coatings whilst formed	Directly associated activity	Receipt of formed containers to

	containers are at a temperature over 500°c		transfer to annealing
Annealing	Containers passed through annealing oven where they are reheated to 550°C and then cooled under controlled conditions	Directly associated activity	Receipt of coated containers to transfer to cold end coating
Cold end coating	Application of lubricating treatments to the containers	Directly associated activity	Receipt of annealed container to transfer to finishing activities
Other finishing activities	Sleeves are applied to a small percentage of product	Directly associated activity	Receipt of containers from cold end coating to transfer to inspection lines.
Mould Repair	Maintenance & repair of mould equipment, including shot cleaning, welding, filing & re-coating.	Directly associated activity	Receipt of mould equipment to transfer of repaired mould equipment back to production area.
Storage & handling of solid & liquid wastes	Storage & handling of waste glass cullet, contaminated cullet, batch waste, oily waste, waste packaging & other waste	Directly associated activity	Separation of waste for recycling back into process or despatch from installation.
Water discharges to sewer via effluent treatment plant.	Discharge of process water & cooling water to sewer via effluent treatment plant.	Directly associated activity	From entry into site drains and effluent treatment plant to entry into foul sewer.
Backup Generators	2 Backup generators one of 2.34MW rated thermal input to	Directly associated activity.	Back-up generators operated less than 50 hours per

	serve the filter plant and one of < 1MW rated thermal input to serve the furnaces.	Medium Combustion Plant (MCP) Regulations apply but an exclusion applies in relation to Specified Generator Regulations due to the operation of the backup generator at an installation regulated under Chapter II of the IED.	year for test purposes. MCP ELV's will not apply where the backup generators are operational for less than 500 hours per year as a 3 year rolling average.

This Permit shall be subject to replacement, variation or amendment as may be considered appropriate by the City of Doncaster Council, at any time, according to the provisions of Regulation 20 of the Environmental Permitting Regulations.

This Permit is given in relation to the requirements of the Environmental Permitting Regulations. It must not be taken to replace any responsibilities you may have under Workplace Health and Safety legislation. Nothing in this Permit grants or implies any consent under the Town and Country Planning Act.

Conditions

The following conditions shall be complied with immediately unless otherwise stated.

1. The Installation

1.1. The activities authorised by this permit shall not extend beyond the site boundary, this being the land shown edged in red on the boundary plan in Appendix 1. The area edged in blue does not form part of the regulated activity covered by this permit.

2. Best Available Techniques (BAT)

2.1. 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 condition of this permit.

2.2. The Operator shall ensure that all appropriate preventative measures are taken against pollution and that no significant pollution is caused.

3. Emissions to Air.

3.1. Point Source Emissions to Air.

3.1.1. Emissions to air from the emission points specified in Table 2 below shall only arise from the source specified in that table.

Table 2

EMISSION POINT REFERENCE	SOURCE	LOCATION OF EMISSION POINT
S1 Stack	Stack serving furnaces W1 & W2 and associated hot end coating operations.	Point S1 Stack on Fig 1.
W3 Furnace Chimney	Furnace stack serving furnace W3 and associated hot end coating operations.	Point W3 Furnace Chimney on Fig.1.

3.2. Emission Limits

3.2.1. The limits for emissions to air for the parameters and emission points set out in Table 3 below shall not be exceeded and shall be complied with immediately.

Table 3

EMISSION POINT	PARAMETER	LIMIT mg/m^3	TYPE OF MONITORING & FREQUENCY	MONITORING METHOD
S1	OXIDES OF NITROGEN (NO_x) EXPRESSED AS NO2	500	CONTINUOUSLY RECORDED INDICATIVE MONITORING PLUS ANNUAL EXTRACTIVE	BS EN 14792, or equivalent
W3		800		
S1 & W3	PARTICULATE MATTER	20	CONTINUOUSLY RECORDED INDICATIVE MONITORING PLUS ANNUAL EXTRACTIVE	BS EN 13284-1:2002, or equivalent
	OXIDES OF SULPHUR (SOx) EXPRESSED AS SO2	800	CONTINUOUSLY RECORDED INDICATIVE MONITORING PLUS ANNUAL EXTRACTIVE	TGN M21, or equivalent
	HYDROGEN CHLORIDE (expressed as HCL)	20	ANNUAL EXTRACTIVE	BS EN 1911:1998 Parts 1-3, or equivalent
	HYDROGEN FLUORIDE (expressed as HF)	5	ANNUAL EXTRACTIVE	BS ISO 15713 and MID or equivalent
	METALS As, Co, Ni, Cd, Se, CrVI, Sb, Pb, CrIII, Cu, Mn, V, Sn (Total combined emission)	5	ANNUAL EXTRACTIVE	BS EN 14385, or equivalent
	CARBON MONOXIDE (CO)	100	ANNUAL EXTRACTIVE	BS EN 15058 or equivalent.
S1	AMMONIA EXPRESSED AS NH3	30	ANNUAL EXTRACTIVE	EN ISO 21877 or equivalent.

3.2.2. The emission limit for the following release points shall be achieved by the dates specified within Table 4 below.

Table 4

EMISSION POINT	PARAMETER	LIMIT mg/m^3	COMPLIANCE DATE
S1 & W3	OXIDES OF SULPHUR (SOx) EXPRESSED AS SO2	500	As agreed with the Regulator. (Notes 1 & 2)

Note 1: This limit is currently subject to derogation. (See Appendix 2).
Note 2: The Regulator is awaiting direction from DEFRA in accordance with representation made in the *Future Direction for achieving SO2 BAT-AEL' S. LAU Proposal to DEFRA* document located in Appendix 3 of this permit.

3.2.3. All pollution concentrations shall be expressed at reference conditions of 273k and 101.3kPa. The concentration of pollutants in the furnace emissions shall be normalised to 8% oxygen when measured dry.

3.2.4. For continuous measurements a 15 minute average sampling period shall be used.

3.2.5. For continuous measurements the emission limit values stipulated in Tables 3 and 4 shall refer to daily average values.

3.2.6. For discontinuous measurements, the emission limit values stipulated in Tables 3 and 4 shall refer to the average value of three spot samples of at least 30 minutes each and the measuring period shall cover a minimum of two firing reversals of the regenerator chambers. Where a single measurement is undertaken, no result shall exceed the emission concentration limits specified.

3.2.7. Emissions from the furnace stacks, S1 and W3 shall, in normal operation, be free from any persistent visible emission or droplets other than steam or condensed water vapour.

3.2.8. No visible particulate matter emission shall cross the site boundary, as perceived by the Regulator.

3.2.9. All emissions to air from the permitted installation shall be free from offensive odour outside the site boundary as perceived by the Regulator.

3.2.10. Emissions to air from the glass manufacturing process shall be dispersed in such a way as to ensure that the relevant National Air Quality Standards for nitrogen dioxide, sulphur dioxide, particulate matter, carbon monoxide, lead and any other relevant standards that may be introduced in the future are complied with.

3.3. Controlling Emissions to Air from the Glass Melting Process.

3.3.1. Emissions from the glass melting furnaces W1 and W2 shall be contained and extracted via the catalytic candle filter abatement plant and associated stack reference S1 to meet the specified emission limit values (BATAELS) as detailed in Table 3 and Table 4.

3.3.2. Emissions from the glass melting furnace W3 shall be contained and extracted via the particulate matter and sulphur dioxide arrestment system and associated stack reference W3 to meet the specified emission limit values (BATAELS) as detailed in Table 3 and Table 4.

3.3.3. The catalytic candle filter abatement plant stipulated in condition 3.3.1 and the bag filtration scrubbing plant stipulated in condition 3.3.2 shall be operational for at least 95% of the calendar year, which includes time required for planned preventative maintenance.

3.3.4. Bypass of the catalytic candle filter abatement plant and the bag filtration scrubbing plant shall only be used to effect maintenance or repair to the abatement plant. The regulator shall be notified without delay of all periods of abatement plant bypass.

3.3.5. The Operator shall maintain and service the catalytic candle filter abatement plant and the bag filtration scrubbing plant in accordance with the manufacturer's recommendations.

3.3.6. The Operator shall review the primary methods and/ or secondary techniques to control NO_X, SO_X and particulate matter emissions during major furnace shutdowns and long term repairs.

3.3.7. To aid in the control of combustion, visual inspections of the furnaces shall be undertaken, at least at the start of every shift, to assess the condition of the furnaces. The condition of the furnaces along with any necessary repairs and the time and date shall be recorded in the installation log stipulated in condition 11.4.1.

3.3.8. The furnaces shall operate under positive pressure, unless furnace repairs are being carried out.

3.3.9. All furnace peepholes shall be covered when not in use to prevent the ingress of air into the furnace.

3.3.10. The use of cullet shall be maximised within the batch to reduce melting energy requirements and lower operating temperatures.

3.3.11. Natural gas only shall be used to fuel the furnaces. The Regulator shall be notified prior to any alternative fuel source being brought onto site.

3.4. Controlling Emissions to Air from the Hot End Coating Processes

3.4.1. Emissions from the hot end coating processes associated with glass melting furnaces W1 and W2 shall be contained and combined with the waste gas from the melting furnace and extracted via the catalytic candle filter abatement plant and associated stack reference S1 to meet the specified emission limit values (BATAELS) as detailed in Table 3.

3.4.2. Emissions from the hot end coating process associated with glass melting furnace W3 shall be contained and combined with the waste gas from the melting furnace and extracted via the particulate matter and sulphur dioxide arrestment system and associated stack reference W3 to meet the specified emission limit values (BATAELS) as detailed in Table 3.

3.4.3. The volume of monobutyl tin-trichloride applied to the containers shall be checked by a designated person every 4 hours to ensure that over application of the coating is not occurring.

3.4.4. Following the checks stipulated in condition 3.4.3, if it is identified that the system is over applying the coating, then the pump rate shall be decreased to ensure that over application does not continue.

3.4.5. The Operator shall review the methods by which the hot end coatings are applied on a 2 yearly basis. This review shall look at how the coatings are applied and if usage can be minimised. A copy of the review shall be held on site and made available to the Regulator upon request.

3.5. Chimneys, Vents and Process Exhausts

3.5.1. The exit height of the stacks serving the furnaces shall be 55 metres (S1) and 65 metres (W3) above ground level.

3.5.2. The stacks, flues and any associated ductwork shall be leakproof, adequately insulated to prevent internal condensation and their integrity shall be maintained at all times.

3.5.3. The furnace stacks S1 and W3 shall be cleaned during furnace rebuilds to remove any accumulated material.

3.5.4. Adequate, safe facilities for sampling shall be provided on vents, ducts and stacks as appropriate. Care shall be taken in the design and location of sampling systems in order to obtain representative samples

3.5.5. In order to prevent the build-up of tin residues, the hot end coating hoods shall be inspected at least every job changeover or more frequently during an extended jobbing period and cleaned as required. The hoods shall also be inspected annually as part of the routine maintenance programme stipulated in condition 11.2.2.

3.5.6. Exhaust gases exiting the stacks S1 and W3, shall be discharged at an efflux velocity greater than 15m/s or such a level as determined necessary, during normal operating conditions, in order to achieve adequate dispersion of emissions.

3.5.7. All emission exhaust points shall not be fitted with any restrictions at the final opening such as plate, cap or cowl, except in the case of an efflux velocity enhancement cone.

3.6. Monitoring and Reporting of Emissions to Air

3.6.1. Emissions shall be monitored from the specified emission sources, for the parameters listed in, at the frequency quoted and to the methods described in Table 3.

3.6.2. Adverse results from any monitoring activity (both continuous and non-continuous) and malfunctions or breakdowns leading to abnormal emissions shall be investigated immediately with the cause and corrective action taken recorded in the installation log stipulated in condition 11.4.1. With regard to non-continuous monitoring, further testing shall be required to ensure compliance with the emission concentration values stipulated in Table 3.

3.6.3. Where any emission concentration is more than twice the specified emission concentration limit or if there is an emission likely to have an effect on the local community, the Regulator shall be notified at the email address provided in the permit introduction.

3.6.4. The introduction of dilution air to achieve the emission concentration limits in Table 3 and Table 4 shall not be permitted.

3.6.5. In relation to the generators described in Table 1, the Operator shall keep a record of the hours of operation and also hours of testing undertaken.

3.7. Non–continuous Stack Monitoring

3.7.1. All non-continuous monitoring shall be undertaken under representative operational manufacturing conditions.

3.7.2. Monitoring shall be carried out by a stack testing organisation accredited to MCERTS standards or an equivalent as agreed with the Regulator.

3.7.3. The Regulator shall be informed of any periodic monitoring exercise, at the email address provided in the permit introduction, at least 7 days before the exercise along with the time and date, the pollutants to be tested and the methods to be used.

3.7.4. Any deviation from the standard methods detailed in Table 3, shall be notified to the Regulator prior to a different method being implemented. Justification for the deviation shall also be provided.

3.7.5. A summary of the results of the non-continuous emission monitoring shall be forwarded to the Regulator at the address provided in the permit introduction, within 6 weeks of the date of sampling and shall include; uncertainty, rate of secondary abatement plant reagent injection, a comparison of the results against continuous monitoring data recorded at the time of the non-continuous monitoring exercise and any deviation from the sampling protocol as agreed by condition 3.7.3.

3.8. Continuous Stack Monitoring

3.8.1. Emissions of particulate matter, nitrogen oxides (as NO2) and sulphur oxides (as SO2) from the stacks serving the furnaces W1, W2 and W3 shall be continuously monitored and continuously recorded.

3.8.2. All continuous monitor readings shall be on display in the furnace control room in a position suitable for observation by all appropriately trained staff.

3.8.3. The continuous monitoring instrumentation shall be fitted with visual alarms which shall activate when any mean concentration exceeds the limit specified in Table 3 or Table 4. The alarms shall be located in a position where they can be seen by appropriately trained staff.

3.8.4. Upon activation of the alarm stipulated in condition 3.8.3, it shall be automatically recorded and the cause for the alarm/ exceedance be investigated and recorded along with remedial action taken in the installation log stipulated in condition 11.4.1.

3.8.5. All continuous monitoring instrumentation shall be operated and maintained in accordance with the manufacturer's instructions. The manufacturer's instructions shall be retained on site and made available, upon request, to the Regulator.

3.8.6. All continuous monitoring instrumentation shall be checked for correct operation daily by a trained operative and shall be calibrated at least once a year, or in accordance with the manufacturer's instructions, whichever is the shorter interval and details shall be recorded in the installation log stipulated in condition 11.4.1.

3.8.7. Maintenance and calibration records for the continuous monitoring instrumentation shall include details of any downtime. Downtime shall be kept to a minimum and the Operator shall review calibration and maintenance procedures in instances where this exceeds 5% over any 3 month period.

3.8.8. Data obtained through continuous emission monitoring shall comply with the following:

- No daily mean of all 15-minute mean emission concentrations shall exceed the specified emission concentration limits during normal operation; and
- No 15-minute mean emission concentration shall exceed twice the specified emission concentration limit during normal operation.

3.8.9. All continuous monitoring results shall be forwarded to the Regulator monthly at the email address provided in the permit introduction. This information shall include monthly averages, monthly maximum emission concentrations and the daily 95th percentile of 15 minute mean concentrations (that emission concentration exceeded for 5% of each day), along with details of process conditions during the monitoring period.

3.9. Visual Assessment of Emissions to Air

3.9.1. Visual assessments of emissions shall be carried out at least once a day by a competent person with a clear view of the installation, to ensure that final releases to air from stacks S1 and W3 comply with requirements of condition 3.2.7. The results shall be recorded in the installation log stipulated in condition 11.4.1 along with any remedial action taken.

3.9.2. Visual assessments shall be made of particulate matter emissions from areas of the site where dusty materials are stored, such as; raw material storage areas including the storage silos and the arrestment plant serving the storage silos and also during the delivery and transfer of raw materials to site to ensure compliance with the requirements of condition 3.2.8. The assessments shall be carried out at least once a day by a competent person with a clear view of the installation. All adverse assessments shall be investigated immediately and remedial action taken and a record kept in the installation log stipulated in condition 11.4.1.

4. Emissions to Water, Land & Soil

4.1. Point Source Emissions to Surface and Groundwater.

4.1.1. There shall be no intentional emission of any pollutants to surface water or groundwater from the Permitted Installation.

4.1.2. There shall be no intentional emission of List I and List II substances as defined by the Water Framework Directive to groundwater from the Permitted Installation.

4.1.3. If notified by the Regulator that the regulated activities are giving rise to pollution of surface water or groundwater, the Operator shall submit to the Regulator for approval, a plan to remedy pollution within a timeframe agreed in writing with the Regulator.

4.2. Point Source Emissions to Sewer

4.2.1. Effluent from the Permitted Installation shall be treated in the Effluent Treatment Plant specified in Table 1.

4.2.2. Discharges to sewer from the Effluent Treatment Plant stipulated in condition 4.2.1 shall be controlled so as to avoid any breach of the conditions of the consent to discharge trade effluent granted by Yorkshire Water, registration number S/89/1402C.

4.2.3. Any discharge that breaches any condition of the trade Effluent Discharge Consent stipulated in Condition 4.2.2 shall be notified to the Regulator within 8 weeks of the occurrence of the breach.

4.3. Emissions to Land and Soil

4.3.1. There shall be no intentional emission of any pollutants to land from the Permitted Installation.

4.3.2. If notified by the Regulator that the regulated activities are giving rise to pollution to land, the Operator shall submit to the Regulator for approval, a plan to remedy pollution within a timeframe agreed in writing with the Regulator.

4.4. Site Condition Report

4.4.1. The Operator shall retain on site a baseline site condition report which shall contain the information necessary to determine the state of soil and groundwater contamination so as to make quantified comparison with the state on definitive cessation. The original baseline report dated 9th June 2003, shall be updated where:

- Changes to the activity or the installation boundary are made; and,
- Measures are taken to protect land; and,
- Pollution incidents have had an impact on land resulting in below ground remediation; and
- To include details of soil, gas and water quality monitoring.

4.4.2. The Operator shall notify the Regulator of its' intention to update the baseline report where the requirements of condition 4.4.1 have triggered such a review. This notification shall be made no later than 2 weeks after the Operator has identified a need to review the report. The review shall be undertaken in accordance with current guidance and the completed report shall be forwarded to the Regulator at the address provided in the permit introduction within 3 months of the notification date.

4.5. Controlling Emissions to Water & Land

4.5.1. The routing of all installation drains and subsurface pipework, sumps and storage vessels shall be recorded on a plan and a copy held on site and made available to the Regulator upon request. The plan shall be updated as often as required to reflect any changes made and shall be kept by the Operator until the permit is surrendered.

4.5.2. An inspection and maintenance procedure for all subsurface structures (including pipework) shall be in place (such structures are those whose failure may lead to a fugitive emission to water). This procedure shall be incorporated into the documented preventative maintenance procedure stipulated in condition 11.2.2 and shall be made available to the Regulator upon request.

4.5.3. Impervious surfaces and containment kerbs shall be inspected and maintained as part of the preventative maintenance procedure stipulated in condition 11.2.2.

4.5.4. All liquid materials shall be stored in storage tanks that are fitted with bunds which are;

- Impermeable with the base of the contained area draining to an impermeable sump; and,
- Resistant to the material stored within the tanks; and,
- Have no outlet and drain to a blind collection point; and,
- Have pipework and drain cocks routed within the bunded area with no penetration of contained surfaces; and,
- Are designed to catch leaks from tanks and fittings; and,
- Are sufficient to contain 110% of the relevant tank contents.

4.5.5. The bunds stipulated in condition 4.5.4 shall be visually inspected at least once a week for collected material and emptied if required. A record of the inspection shall be kept in the installation log stipulated in condition 11.4.1.

4.5.6. The bunds stipulated in condition 4.5.4 shall be subject to an annual maintenance inspection, the findings of which shall be recorded in the installation log stipulated in condition 11.4.1.

4.5.7. All sumps shall be impermeable and resistant to stored materials.

4.5.8. The sumps stipulated in condition 4.5.7 shall be subject to 6 monthly visual inspections and any contents shall be removed and disposed of after checking for contamination. Inspections shall be recorded in the installation log stipulated in condition 11.4.1.

4.5.9. All storage tanks shall be filled via bunded filling points and be equipped with volume indicators to warn of overfilling. The operator shall ensure that there is

sufficient capacity within the tank prior to deliveries taking place. Filling and delivery connections shall be locked when not in use.

4.5.10. The inspection, recording and documenting of the integrity of the storage tanks shall be carried out as part of the preventative maintenance procedures stipulated in condition 11.2.2.

4.5.11. All stored materials shall be located away from drainage points and watercourses and protected against vandalism.

4.5.12. The maximum storage capacity of storage areas and containers shall be stated adjacent to the storage area or on the container, and not exceeded.

4.5.13. The inspection and maintenance of storage areas and containers shall be carried out as part of the preventative maintenance procedure stipulated in condition 11.2.2.

4.6. Monitoring Emissions to Water

4.6.1. The Operator shall undertake groundwater monitoring within 5 years of the date of this permit or at an earlier date should the review of the site condition report stipulated in condition 4.4.3 require this. Groundwater monitoring shall then be undertaken at least once every 5 years.

4.7. Monitoring Emissions to Land and Soil

4.7.1. The Operator shall undertake soil monitoring within 10 years of the date of this permit or at an earlier date should the review of the site condition report stipulated in condition 4.4.3 require this. Soil monitoring shall then be undertaken at least once every 10 years.

4.8. General Land and Water Monitoring Requirements

4.8.1. The monitoring stipulated in conditions 4.6.1 and 4.7.1 shall be carried out in accordance with the soil and groundwater monitoring plan required by condition 4.8.2.

4.8.2. The soil and groundwater monitoring plan for the monitoring required by conditions 4.6.1 and 4.7.1 shall be submitted to the Regulator, at least 28 days in advance of carrying out the monitoring. The monitoring plan shall include:

- Reference to the findings of the initial site condition report dated 9th June 2003 and any subsequent site condition reports; and,
- The details of the persons or organisation undertaking the monitoring; and,
- The locations at which the proposed monitoring will be carried out; and,

- The details of the proposed sampling methodology, including the pollutants under investigation, how the samples will be taken, the laboratory used for sample analysis and the limits of detection of pollutants for samples taken.

4.8.3. The Operator shall report the outcome of the monitoring required by conditions 4.6.1 and 4.7.1 to the Regulator within eight weeks of the completion of the monitoring. The report shall include:

- Interpretation of the results with reference to previous monitoring undertaken (including the site condition and baseline reports) and the operations undertaken at the installation; and,
- Details of corrective actions that are required to protect groundwater and soil and remedy any contamination that has occurred as a result of permitted activities; and,
- A review of the soil and groundwater monitoring plan in order to determine whether any changes to monitoring locations, frequency or parameters are required and where changes to the soil and groundwater monitoring plan are proposed.

4.8.4. The operator shall keep all soil and groundwater monitoring plans, monitoring results and monitoring reports undertaken and produced in accordance with conditions 4.6.1, 4.7.1, 4.8.2 and 4.8.3 until the permit is surrendered.

4.8.5. Any groundwater monitoring wells detailed in the plan required by condition 4.8.2 shall be maintained in a condition fit for purpose, unless otherwise agreed in writing with the Regulator. Where a well's function is compromised it shall be repaired or replaced to allow sample collection.

5. Raw Materials

5.1. Raw Materials Selection

5.1.1. An inventory covering the principal types of raw materials used (including recycled materials) shall be maintained on site. The inventory shall list materials and chemicals used on site which have the potential for significant environmental impact, along with their chemical composition, quantities used and an assessment of their environmental impact.

5.1.2. An annual review of the inventory stipulated in condition 5.1.1 shall be carried out in order to assess the viability of less polluting raw materials for use within the installation or opportunities to improve the efficiency of raw material use. Any such materials so identified shall become routinely used within the review period.

5.1.3. All records relating to conditions 5.1.1 and 5.1.2 shall form part of the installation log and be kept in accordance with condition 11.4.1.

5.1.4. Quality procedures to control the specification of raw materials used shall be in place.

5.1.5. Collected filter dust from the catalytic candle filter abatement plant and the bag filtration scrubbing plant shall, as far as practicable, be used as a raw material in the melting furnace and shall be transferred and contained by methods which do not give rise to particulate emissions.

5.2. <u>Handling, Storage , Mixing and Transfer of Raw Materials.</u>

5.2.1. All raw material conveyors and elevators shall be enclosed and the elevators fitted with reverse jet filters.

5.2.2. All bulk raw material storage areas shall be clearly identified and be suitable for the quantity and type of material stored.

5.2.3. Sand and reprocessed glass cullet shall be stored in three sided external storage bays.

5.2.4. With the exception of materials mentioned in condition 5.2.3, all materials of less than 3mm diameter shall be stored within hoppers or silos which shall be clearly labelled and locked off when not in use.

5.2.5. Any gravity discharged material, other than sand or cullet, shall be discharged in accordance with the Gravity Discharge Dust Control Procedure, a copy of which shall be made available to the Regulator upon request.

5.2.6. The operator shall check that there is sufficient capacity in the storage silos prior to the delivery of raw materials taking place. This check shall be recorded as part of the installation log stipulated in condition 11.4.1.

5.2.7. Air from the storage silos stipulated in condition 5.2.4 shall be vented to air filtration units fitted with reverse jet filters. All wagons delivering to the storage silos shall be equipped with pressure relief valves.

5.2.8. The reverse jet filters stipulated in condition 5.2.7 shall be serviced in accordance with the manufacturer's instructions and this shall form part of the planned maintenance schedule stipulated in condition 11.2.2.

5.2.9. The storage silos which vent externally to the batch plant shall be fitted with audible and/or visual alarms to warn of and thereby prevent overfilling. The alarms shall be located in a position where they can be seen and/or heard by the process operative.

5.2.10. The alarms stipulated in condition 5.2.9 shall be tested at least once a month for correct operation. The results of these tests shall be entered into the installation log stipulated in condition 11.4.1.

5.2.11. If the pressure relief valve stipulated in condition 5.2.7 becomes unseated during delivery, then the delivery shall cease immediately and no further delivery shall take place until the valve has been examined and re-seated. Details of such occurrences and action taken shall be recorded in the installation log stipulated in condition 11.4.1.

5.2.12. In the event of filtration unit failure no further delivery of raw materials shall take place until appropriate corrective action has been taken to return the arrestment plant to full working order. Details of such occurrences and action taken shall be recorded in the installation log stipulated in condition 11.4.1.

5.2.13. During filling operations the silos shall not be charged at a rate which exceeds that prescribed by the filter manufacturer or that it will cause any visible emission of raw material from any part of the silo.

5.2.14. A designated person shall attend every delivery transfer of raw material. The person shall ensure that the transfer lines are securely connected to the tanker discharge point and the silo delivery point. The person shall make visual assessments of emissions of particulate matter from the silo, arrestment plant and tanker lines and be empowered and capable of terminating delivery and shall do so if emissions occur. If the designated person is not in the direct employ of the process operator, the onus for compliance with this condition still remains with the process operator.

5.2.15. All batch plant equipment and the raw material delivery and transfer systems shall be inspected at least daily to identify any arrestment plant or spillage problems. Any problems identified shall be recorded in the installation log stipulated in condition 11.4.1 along with any actions taken to rectify the problem.

5.2.16. Selenium and any other raw powdered material which are received pre-packed shall be stored and handled in the small weigh room, vented to a filtration unit, with the extraction running.

5.2.17. All external spillages shall be cleaned up immediately. Dry or dusty materials shall be cleaned up using either a water washing system or a vacuum cleaner. Dry sweeping shall not be permitted.

5.3. <u>Raw Materials – Abatement Plant</u>

5.3.1. The operator shall provide and maintain a sulphur mass balance for the glass melting activity, which should be forwarded to the Regulator upon request. The mass balance shall:

- Detail all sulphur inputs in raw materials; and,

- Detail all sulphur inputs in recycled materials; and,
- Detail all sulphur outputs in waste products; and,
- Detail all sulphur outputs in products; and,
- Detail all sulphur outputs in waste gases.

5.3.2. The rate of lime injection into the bag filtration scrubbing plant shall be recorded.

5.3.3. The rate of ammonia injection into the catalytic candle filter abatement plant shall be recorded

6. Waste

6.1.1. The Operator shall take appropriate measures to ensure that:

- The waste hierarchy referred to in Article 4 of the Waste Framework Directive (2008/98/EC) is applied to the generation of waste by the Regulated Activities;
- Any waste generated by the Regulated Activities is treated in accordance with the waste hierarchy referred to in Article 4 of the Waste Framework Directive; and,
- Where further treatment or disposal is necessary, this is undertaken in a manner which minimises its impact on the environment.

6.1.2. An annual review to assess waste disposal routes and demonstrate that the best environmental option is being used for each waste type shall be carried out. This shall form part of the installation's Environmental Management System stipulated in condition 11.1.1.

6.1.3. A report detailing the findings of the annual review stipulated in condition 6.1.2 shall be forwarded to the Regulator at the email address given in the permit introduction within 6 weeks of the completion of the review.

6.2. Waste Minimisation

6.2.1. A formal waste minimisation audit shall be undertaken at least once every 4 years. Specific improvements resulting from the recommendations of the waste minimisation audit shall be carried out within a timescale approved by the Regulator.

6.2.2. Within 2 months of completion of the audit required in condition 6.2.1, the report along with a plan to action the report's recommendations shall be submitted to the Regulator at the email address provided in the permit introduction.

6.3. Waste Handling, Storage & Destination

6.3.1. A Waste Management Plan shall be implemented for the installation. The plan shall contain details 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. The waste management plan shall be updated and reviewed on an annual basis taking into consideration that the best environmental options are being employed for dealing with waste from the installation. A copy of the waste management plan shall be kept available for inspection by the Regulator.

6.3.2. Wastes generated at the Installation shall be segregated and stored ready for re-introduction into the process, or for reuse, recycling or disposal off site as appropriate.

6.3.3. Waste storage areas shall be clearly marked with details of the types of waste they are permitted to accept.

6.3.4. All waste drums and containers shall be clearly labelled indicating the nature of their contents.

6.3.5. All drums and containers, including those which are empty shall be kept lidded and any valves secured prior to removal from site.

6.3.6. All skips and vessels containing dusty or volatile materials shall be covered to minimise emissions to air.

6.3.7. Waste storage areas shall be located as close as possible to the activities generating those waste streams which they are permitted to accept, in order to minimise movement of waste materials around the site.

6.3.8. Suitable storage facilities shall be provided for those waste substances that are flammable or sensitive to heat or light.

6.3.9. Incompatible wastes shall be kept separate.

6.3.10. A spill response plan shall be in place in order to deal with spillages from damaged or leaky storage containers a copy of which shall be clearly displayed in all waste storage areas.

7. Water Use

7.1.1. A water efficiency audit shall be carried out at least once every 4 years.

7.1.2. A report detailing the findings of the water efficiency audit stipulated in condition 7.1.1 shall be forwarded to the Regulator at the email address provided in the permit introduction, within 6 weeks of the completion of the audit.

7.1.3. The information derived during the water efficiency audit stipulated in condition 7.1.1 shall be used to assess opportunities for reduction in water usage at the

Installation and where necessary shall be undertaken within a timescale as agreed with the Regulator.

7.1.4. The volume of mains and any abstracted water used in the Installation shall be directly measured on a monthly basis and shall be used to assess and address any unexplained usage.

7.1.5. All water measurements shall be recorded in the installation log stipulated in condition 11.4.1.

8. Energy Efficiency

8.1.1. All plant and equipment within the installation shall be purchased, operated and maintained to optimise the use and minimise the loss of energy.

8.1.2. The installation shall be operated and maintained within an energy management system accredited to and conforming with ISO 500001 standard.

8.1.3. Evidence of continual compliance with the standard specified in condition 8.1.2 shall be provided to the Regulator upon request.

8.1.4. The Operator shall demonstrate compliance with the UK ETS (Permit No UK-E-IN-11670) and shall notify the Regulator as soon as practicable of;

- any non-compliance; or,
- cancellation of the permit.

9. Incidents, Accidents and Unauthorised Releases

9.1. Accident Management Plan

9.1.1. An accident management plan that identifies the hazards, assesses the risks and identifies the measures required to reduce the risk of potential events or failures that might lead to an environmental impact shall be held on site. The plan shall identify actions to be taken to minimise these potential occurrences and identify the actions to deal with such occurrences so as to limit their consequences and shall be made available to the Regulator upon request.

9.1.2. The accident management plan stipulated in condition 9.1.1 shall be reviewed at least every 2 years or as soon as practicable after an accident, whichever is the earlier and the Regulator shall be notified of the results of the review within 2 months of its completion.

9.2. Investigating & Reporting Incidents

9.2.1. Incidents (for example major spillages and unauthorised releases) and near misses shall be investigated according to a written procedure. The procedure shall

identify the appropriate corrective action required for such incidents. It shall be updated every two years and kept available for inspection by the Regulator.

9.2.2. A record shall be maintained of any incident that has, or might have, impacted on the condition of any soil or groundwater under the permitted installation, either as a result of that incident or as a result of an accumulation of incidents, together with a record of any further investigation or remediation work carried out. All records made under this condition shall be kept by the Operator until the permit is surrendered

9.2.3. The Operator shall;

- in the event 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:

    - inform the Regulator,
    - take the measures necessary to limit the environmental consequences of such an incident or accident, and
    - take the measures necessary to prevent further possible incidents or accidents;

- in the event of a breach of any permit condition, the operator must immediately:

    - inform the Regulator, and
    - take the measures necessary to ensure that compliance is restored within the shortest possible time;

- in the event 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 or where immediate suspension is not safely achievable undertake immediate actions to reduce the danger and restore permit compliance.

9.2.4. The Operator shall confirm the details if the incident to the Regulator by the next working day after identification of the incident. This confirmation shall include:

- The time and duration of the incident; and,
- The receiving environmental medium or media where there has been any emission as a result of the incident; and,
- An initial estimate of the quantity and composition of any emission; and,
- The measures taken to prevent or minimise any emission or further emission; and,
- A preliminary assessment of the cause of the incident.

9.2.5. Further to any incident reported to the Regulator, the Operator shall investigate the cause of the incident and shall provide a report detailing the findings to the Regulator. The report shall detail at a minimum:

- The circumstances of the incident; and,
- An assessment of any harm to the environment; and,
- The steps taken to bring the incident to an end.

The report shall also set out proposals for remediation, where necessary, and for preventing a repetition of the incident. Unless otherwise agreed in writing the report shall be sent to the Regulator within 14 days of the date of the incident.

10. Noise and Vibration

10.1. Noise Management Plan

10.1.1. A Noise Management Plan which identifies individual items of plant or equipment that may have an impact on the noise profile of the installation shall be followed. The plan shall include the following for each item of plant or equipment :-

- A description of the plant or equipment;
- Its location within the installation (shown on a plan);
- The sound power level and directivity of the noise source;
- The characteristic of the noise sources (intermittent, continuous, tonal, specifying frequency of tone where relevant);
- Hours of operation;
- Details of any required routine maintenance or servicing;
- Details of any noise control or attenuation;
- Details of the best available techniques for noise control for the plant or equipment;
- The contribution to the overall site noise and the calculated overall rating level of noise at nearby noise sensitive properties, in accordance with BS4142: 2014 + A1: 2019 (and subsequent amendments).

10.1.2. An updated noise management plan shall be submitted to the Regulator within 3 months of the date of this permit. The plan shall then be updated every two years and within 30 days of any additional plant or equipment being installed or any process changed and kept available for inspection by the Regulator.

10.2. Controlling Noise

10.2.1. Prior to the introduction of new plant or equipment that may have an impact on the noise profile of the installation, including minor or major furnace rebuilds, an acoustic assessment of noise emissions shall be carried out, in accordance with BS4142: 2014 + A1: 2019 (and subsequent amendments) and any necessary attenuation measures

shall be completed so as to ensure that the new plant or equipment does not result in any increase above the existing background noise level, measured as an L_{90} over the specified reference period, at nearby noise sensitive properties and meets the 'No Observed Effect Level' when assessed in accordance with the Noise Policy Statement for England. A copy of the assessment report shall be forwarded to the Regulator for approval at the email address provided in the permit introductory note prior to the proposed installation going ahead.

10.2.2. In relation to any new plant or equipment installed subject to the requirements of condition 10.2.1, the Operator shall undertake a further assessment of noise emissions within 30 days of any new plant or equipment becoming operational whether fully, partially or intermittently operational. The assessment shall be undertaken when the installation is working under normal operating conditions. The assessment report shall be submitted to the Regulator for approval to demonstrate that the measured noise levels from the new plant or equipment do not exceed the predicted levels as detailed within the report required in condition 10.2.1. If the noise levels are exceeded, the Operator shall propose and implement further mitigation measures, within 30 days of becoming aware of the breach, so as to meet the required standards, carrying out further acoustic assessment and remedial action until such levels are achieved within the following 30 days.

10.2.3. No audible warning alarm associated with the failure of equipment shall be sited on any external façade of the main process building.

10.2.4. The testing of the audible alarms required by conditions of this permit, shall only be conducted between the hours of 0900 and 1800 Monday to Friday and not on Saturday, Sunday or public holidays.

10.2.5. Raw materials deliveries shall only take place between the hours of 0700 and 2100.

10.2.6. Cullet drop heights shall be minimised at all times.

11. Management

11.1. Environmental Management Systems

11.1.1. The Operator shall manage and operate the regulated activities using an effective environmental management system with policies and procedures for environmental compliance and improvements. Audits shall be carried out against those procedures at regular intervals.

11.1.2. A competent person shall be appointed to liaise with the Regulator and the public with regard to the requirements of this Permit and complaints against the company. Any change to the appointed person shall be communicated to the Regulator immediately.

11.2. Operations & Maintenance

11.2.1. A list of key process equipment and abatement equipment along with a description of any alarms or warning systems which indicate equipment malfunction or breakdown shall be kept and made available upon request to the Regulator. This list shall be updated following any changes made to the process.

11.2.2. A documented schedule of preventative maintenance for all aspects of the installation whose failure could impact on the environment shall be implemented. In particular there shall be operational control procedures and maintenance schedules (including for major 'non-productive' items such as tanks, pipes, ducts and filters). The plan shall be updated on an annual basis and kept available for inspection by the Regulator.

11.2.3. The preventative maintenance schedule stipulated in condition 11.2.2 shall include procedures to ensure the correct operation of the key process and abatement equipment warning systems described in the list stipulated in condition 11.2.1 Such warning systems shall be maintained in accordance with the manufacturer's recommendations.

11.2.4. Records of maintenance undertaken shall be kept on site and made available to the Regulator upon request.

11.2.5. Essential spares shall be held on site or shall be available at short notice from suppliers in order that plant breakdown can be rectified rapidly.

11.3. Competence and Training

11.3.1. A formal structure shall be provided to clarify the extent of each level of

11.3.2. Relevant staff (those staff whose jobs have the potential for a significant impact on the environment) shall receive training concerning control of emissions to the environment including an awareness of operating procedures in relation to their duties. This shall include;

- Awareness of the regulatory implications of the permit; and,
- Awareness of all potential environmental impacts under normal and abnormal circumstances; and,
- Awareness of the procedures for dealing with a breach of the permit conditions; and,
- Prevention of accidental emissions and action to be taken when accidental emissions occur.
- Training needs shall be reviewed on an annual basis and also as part of the induction programme for new operatives involved in operations covered by this permit.

11.3.3. The skills and competencies necessary for key posts, including contractors and those purchasing equipment and materials shall be documented and records of training needs and training received for those posts maintained.

11.3.4. Contractors shall be advised of the relevant procedures to be followed in relation to carrying out duties on site and for control of emissions to the environment.

11.3.5. An Environmental Awareness training programme which includes procedures on waste handling, spill response and waste storage issues shall be implemented.

11.4. Documentation

11.4.1. All systems, procedures, results of monitoring, assessments and inspections used to demonstrate compliance with a condition of this permit shall be recorded, either digitally or in written form, within an Installation Log.

11.4.2. All documentation and records kept in compliance with Condition 11.4.1 that being the installation log shall:-

- be made available for inspection by the Regulator upon their request.
- be supplied to the Regulator on demand and without charge.
- be legible
- be made as soon as reasonably practicable
- indicate any amendments that have been made and shall include the original record wherever possible; and
- unless stated otherwise within a condition, be retained at the permitted installation or other location agreed by the Regulator in writing, for a minimum of 2 years from the date when the records were made.

11.5. Reporting

11.5.1. All reports and notifications shall include this permit number and name of the operator.

11.5.2. All reports and notifications required by this permit shall be made in writing and sent to the Regulator using the contact details provided in the permit introduction.

11.6. Notifications

11.6.1. The Operator shall give at least 20 working days prior notification of intention to transfer the permit to another Operator, using a form supplied by the Regulator for this purpose.

11.6.2. 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, the Regulator shall be notified at least 14 days before making the change; and the notification shall contain a description of the proposed change in operation.

11.6.3. The Operator shall notify the Regulator within 14 days of the occurrence of the following:

- Any change in the operator's trading name, registered name or registered office address: and,
- Any steps taken by the operator going into administration, entering into a company voluntary arrangement, being wound up or bankruptcy.

11.6.4. The Operator shall respond to any Information Notice served in respect of the installation for the purposes of complying with the obligation to report information on releases and off-site transfers of waste or pollutants as required by Article 5 of Regulation (EC) No 166/2006 and Commission Implementing Decision 2019/1741 for the purposes of the United Kingdom Pollutant Release and Transfer Register (United Kingdom – PRTR).

11.6.5. The operator shall notify the regulator at least 30 days prior to the implementation of any part of the site closure plan stipulated in condition 12.1.1.

12. Closure & Decommissioning

12.1.1. The operator shall maintain a site closure plan for the definitive cessation of the activities. The site closure plan shall include:

- Site details; and,
- Details of the condition of the land at permit issue (initial site condition report and baseline report) and any subsequent reports undertaken in support of the requirements of condition 4.4.4; and,
- Details of permitted activities; and,
- Outline proposals for decommissioning.

12.1.2. Upon definitive cessation of the activities, the Operator shall assess the state of soil and groundwater for contamination by relevant hazardous substances used, produced or released by the Installation. Where the Installation has caused significant pollution of soil or groundwater by relevant hazardous substances compared to the state established in the baseline report referred to in condition 4.4.1, the Operator shall take the necessary measures to address that pollution so as to return the site to that state as is technically feasible.

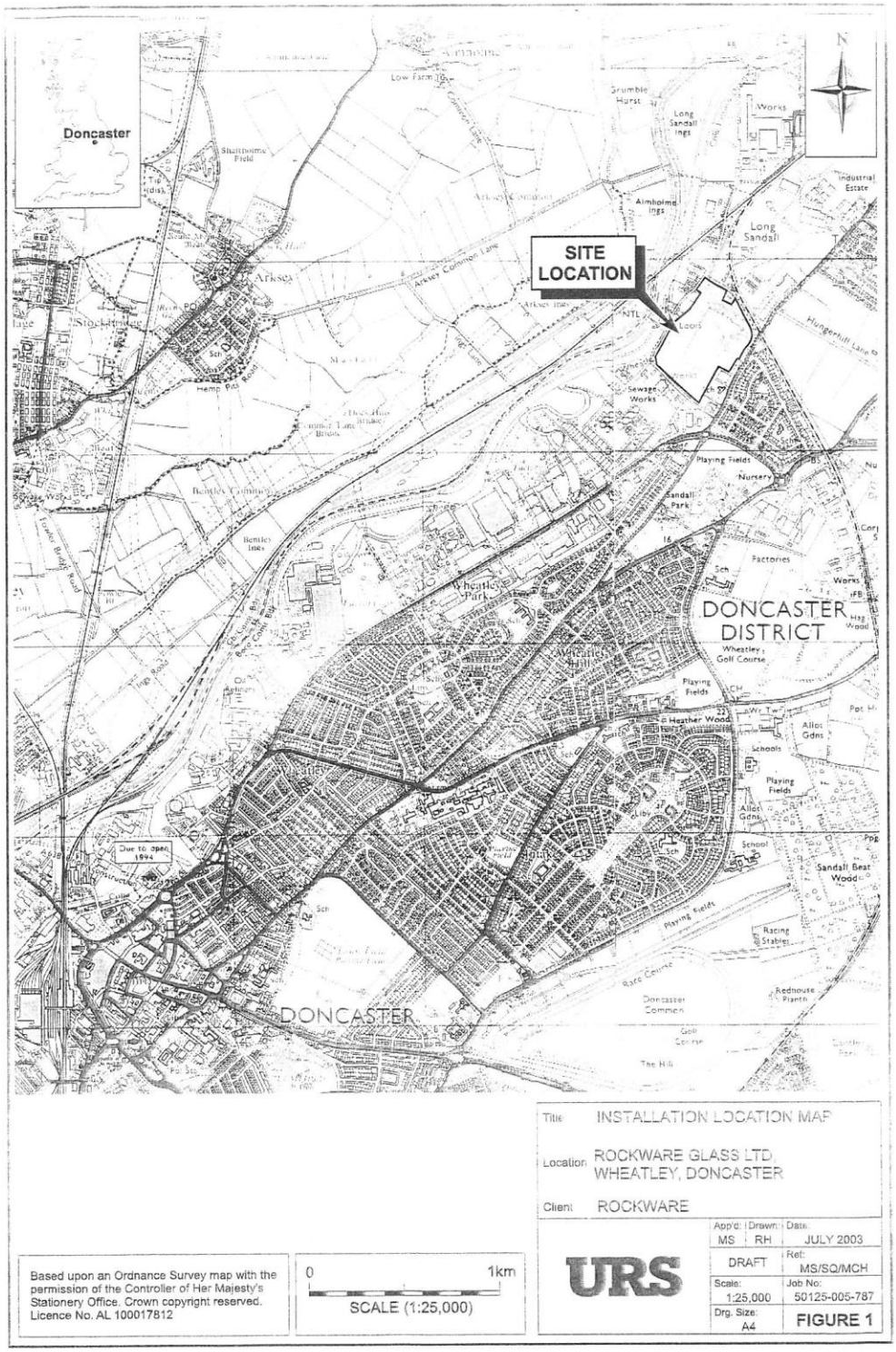
12.1.3. The Operator shall submit a final site condition report detailing the assessment required by condition 12.1.2 with any permit surrender application. The site condition report shall include:

- Site details; and,

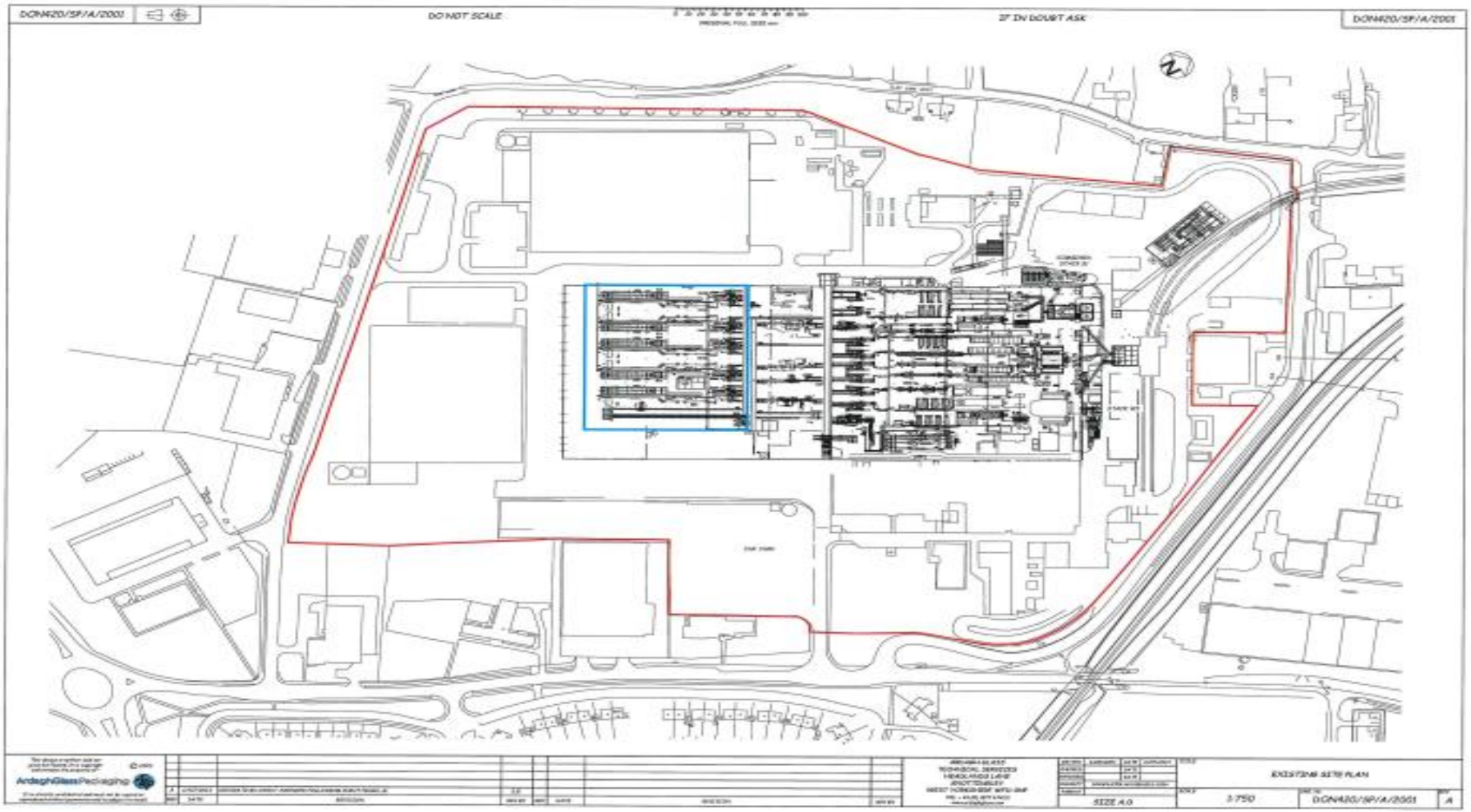
- Details of the condition of the land at permit issue (initial site condition report and any subsequent updated baseline report); and,
- Details of permitted activities; and,
- Measures taken to protect land; and,
- Pollution incidents that may have an impact on land and their remediation; and,
- Details of soil, gas and water quality monitoring; and,
- Decommissioning and removal of pollution risk; and,
- Reference data and remediation; and,
- Statement of site condition.

End of Conditions

Appendix 1- Site Location Plan



Appendix 1 - Boundary Plan



Appendix 2 - SO2 Derogation Document

Doncaster MBC
Derogation Assessment Methodology for BAT-AELs
Initial Assessment form

Table 1. Summary information	
Operator, Location, Permit:	Ardagh Glass Limited, Wheatley, Doncaster. Permit Reference: LA-IPPC 1 VN A2 1/2010
BREF:	Best Available Techniques (BAT) Reference Document for the Manufacture of Glass Industrial Emissions Directive 2010/75/EU (Integrated Pollution Prevention and Control)
BAT Conclusions Ref. No.& date:	2012/134/EU, 28.02.2012
BAT-AEL compliance date:	08/03/2016
Details of any Regulation 60 Notices:	The Regulation 60 notice to initiate the permit review was issued on 18/03/2014 and the response to this was received on 06/08/2014.
Details of additional information requested by letter or e-mail:	We requested additional information on 05/11/2014 and after further discussions and advice from EA Economists the operator responded on 18/08/2015.

Summary of Derogations Requested by the Operator

Table 2.1 Derogation from the BAT AEL for SOx emissions from the melting furnace in the container glass sector.	
Short description:	The BAT AELs for SOx, expressed as SO2, emissions from the melting furnace in the container glass sector are stated as; <200–500 mg/Nm³ (Natural gas) <500-1200 mg/Nm³ (Fuel oil) The Operator has requested a long term derogation from the BAT AEL of 200–500 mg/Nm³ (Natural gas). The Operator has proposed that an emission limit value (ELV) of 800 mg/Nm³ should be permitted.
Has operator claimed that releases are insignificant?	No
Permitting Officer confirms releases are insignificant?	Not applicable
Derogation criteria:	Technical characteristics
Duration of derogation:	Long term (not time limited)

Permitting Officer initial assessment (applicability of the BAT-AEL, interaction between multiple derogations etc.)	The BAT-AEL is definitely applicable to this installation
Permitting Officer: Kathryn Hardy	Date: 21/01/2016

OFFICIAL
Annex DM3. Derogation Panel (DP)
Thursday 21st January 2016

Table 3.1: Executive summary of the derogation request and minded to position	
Installation details	Ardagh Glass Limited, Wheatley, Doncaster
Short description of derogation request	**2012/134/EU - 08/03/2012** - **The Manufacture of Glass** The BAT AELs for SOx, expressed as SO2, emissions from the melting furnace in the container glass sector are stated as; <200–500 mg/Nm³ (Natural gas) <500-1200 mg/Nm³ (Fuel oil) The Operator has requested a long term derogation from the BAT AEL of 200–500 mg/Nm³ (Natural gas). The Operator has proposed that an emission limit value (ELV) of 800 mg/Nm³ should be permitted.
Permitting officers minded to position	I am minded to temporarily accept the derogation request (as submitted by the operator), subject to new permit conditions requiring further information to be submitted, for the reasons set out below; The application is based on the technical characteristics and is within the scope of derogations allowed under article 15(4) of the Industrial Emissions Directive. The operator has provided a credible argument that the increased costs for achieving the BAT AEL are linked to the technical characteristics; To achieve the BAT AEL the operator states that there will be additional costs of [redacted] per year associated with extra waste disposal costs, extra raw materials costs and extra limestone required for the abatement plant. The

	Operator currently recycles all filter dust back into the batch, which they state is BAT for their Installation. A Cost Benefit Analysis has been carried out and this indicates that the cost of meeting the BAT AEL outweighs the benefit and therefore should be dismissed as it has a negative Net Present Value (NPV). However, only 1 option for meeting the BAT AEL was assessed and it is felt that further analysis should be undertaken which considers recycling a proportional range of filter dust ie) recycling 25%, 50%, 75% and 90% filter dust. This requirement is supported by the Environment Agency guidance for carrying out Cost Benefit Analysis which suggests that undertaking an assessment using only 2 options is not considered good practice. There would be no negative impact on the short term Air Quality Standard (AQS) for SO2 associated with the derogation request and there is no long term AQS for SO2 with respect to human health. The emissions of SO2 associated with the derogation request will not affect any sites of heritage, landscape or nature conservation, and/or protected species or habitat. SO2 concentrations at the nearest SSSI to the installation show compliance with the long term Environmental Assessment Level (EAL) for the protection of ecosystems.
Previous DP recommendations or comments on this or similar requests	There have been no requests for a derogation in the container glass sector before. The Environment Agency has received derogation requests from other operators in different sectors. It should be noted that a number of different operators throughout the UK have submitted similar derogation requests.

Overview of the site and installation

The main purpose of the activities at the installation is the production of glass containers by melting mixed batch and cullet in one of three gas fired furnaces.

Raw materials, principally sand, cullet, soda ash, and limestone are stored on site. The raw materials are weighed and then mixed within a pan mixer, all located within the batch plant. The mixed batch and cullet is then moved out of the batch plant via one of three enclosed conveyors into one of 2, 50 tonne furnace hoppers.

The mixed batch and cullet is then charged into the furnaces and is subjected to temperatures of up to 1600°C at which it converts to glass. The three furnaces are each natural gas, cross fired, regenerative furnaces. Two of the furnaces, W1 and W2 have additional electric boost fitted. The furnaces operate 24 hours a day, 365 days a year. Two of the furnaces operate at 350 tonnes per day and one at 300 tonnes per day.

Emissions from the furnaces are vented to atmosphere via 3 stacks of height, 65 metres (W1 and W3) and 72.3 metres (W2). Bag filters are associated with each stack to capture emissions of particulate matter and dry scrubbing of the waste gas stream is undertaken to reduce SOx emissions.

The molten glass leaves the furnaces, is refined and then cut into gobs. The gob then passes into the forming machine down chutes which are lubricated with oil emulsion to prevent the glass from sticking to the sides. The moulds on the forming machine itself are lubricated with a graphite-based grease, for glass release purposes. Reject glass is removed from the forming machines via a 'cullet chute' which is constantly lubricated with water. The rejected glass goes into a water filled metal skip from where it is taken for cooling and later re-introduced into the furnace. The water from the skips spills over onto the concrete floor and drains into sumps from where it is pumped into the process water recycling system.

From the forming machine, the glass emerges as a recognisable container.

Once cooled sufficiently to maintain their shape, the containers pass through the hot end coating hoods. Inside these hoods the hot containers are treated, using monobutyltin trichloride vapours, to coat them with a fine covering of tin oxide. This helps to strengthen the containers. Emissions from the coating operation are discharged to the atmosphere via stacks W1, W2 and W3.

The containers then progress down the line to the Lehr oven. The Lehr oven 'anneals' the glass by raising its temperature to around 550°C and then cooling it down at a gradual rate. This process removes any residual stresses, which have been created in the container by its rapid forming and cooling.

A second surface treatment is then applied to prevent scratching of the glass. No significant sources of environmental emissions are associated with this process.

The containers then undergo a series of rigorous quality checks. Reject containers are crushed and then re-introduced into the furnace batch mixer as required.

The finished glass containers are then automatically packed and either loaded onto trailers or stored in the on-site warehouse.

Summary of the minded to position

The Operator requested a long term derogation from BAT 5.2.3 the BAT AEL for SOx, expressed as SO2, emissions from the melting furnace in the container glass sector which is <200–500 mg/Nm³ (for furnaces using natural gas) on the basis of technical characteristics.

The Operator has also requested a time limited derogation from BAT 5.2.2 the BAT AEL for NOx, expressed as NO2, emissions from the melting furnace in the container glass sector which has been considered separately because this is a time limited derogation request and is controlled by different abatement techniques.

In their application the operator considered 1 option for meeting the BAT AEL. Their proposal is to implement business as usual and reject achieving the BAT AEL option. Doncaster Metropolitan Borough Council has reviewed the application and concluded

- That the application is based on the technical characteristics and is within the scope of derogations allowed under article 15(4) of the Industrial Emissions Directive and is based on;
    1) The configuration of the plant on the site, making it more technically difficult and costly to comply
    2) The effect of reducing the excess emission(s) upon other pollutant emissions, the energy efficiency, water use or waste arisings from the installation as a whole
    3) The recent history of pollution control investment in the installation in respect of the pollutant(s) for which the derogation is sought.

- That the operator has provided a credible argument that the increased costs for achieving the BAT AEL are linked to the technical characteristics;

  It is important to note that the Installation already has the appropriate abatement equipment fitted, the Derogation request relates to the operation of the abatement equipment.
  The Operator has identified that in table 9 of the BAT conclusions it states that "values reported in the table may be difficult to achieve in combination with filter dust recycling and the rate of recycling external cullet". The Operator argues that they will not be able to achieve the BAT AEL without additional costs of [redacted] per year, which relate to the extra waste generated, extra raw materials required and extra limestone required for the abatement plant. They currently recycle all filter dust back into the batch, which they state is BAT for their Installation.
- That the Operator has demonstrated that the costs of achieving the BAT AEL are disproportionate to the environmental benefits;

  The annual emissions of SOx from the activity are currently 547 tonnes per year and these would reduce to at least 356 tonnes per year if the BAT AEL was met in accordance with the timeline set by the IED.
  The Operators proposal will mean that the annual emissions of SOx will remain at 547 tonnes per year.
  The Operator has produced a Cost Benefit Analysis, using the Environment Agency's CBA tool, which has compared 2 different options to meet the BAT AEL's for control of SOx (expressed as SO2) emissions from the melting furnace in the container glass sector. The costs that have been used are similar to those submitted to other Regulators by other Operators within the Container Glass sector. The 2 different options given are;
  Option 1
  The granting of a full derogation with an emission limit of 800 mg/Nm3.
  There would be no changes to current operations for this option and therefore the SOx emissions associated with this option have been monetised and are £11.85 million over the 8 year assessment period.
  Option 2
  Achieve the emission limits within the BAT AEL of 200-500mg/Nm3.

The upfront investment costs would be nil and the operating costs are given as [redacted] million. The energy consumption will be [redacted] million and the waste costs will be [redacted] million for this option. The SOx emissions associated with this option have been monetised and are £9.59 million, therefore this option would save £2.26 million of SOx emissions compared to the do nothing option over the 8 year assessment period.
The Net Present Value incremental to BAT is -£0.27 million and according to Environment Agency Economist guidance should be dismissed as it is a negative figure. This is because the costs of the option are greater than the benefits.
We also are aware that all container glass manufacturers within the UK have submitted the same derogation request based on the same justification. These requests are being processed by different regulators including Local Authorities, SEPA and DOENI and it is important that consistency is achieved throughout the UK, so it is likely the same decision will be adopted by all the Regulators.
It is important to note that Environment Agency guidance for carrying out Cost Benefit Analysis suggests that assessing only 2 options is not good practice. This would add support for requiring further options to be considered such as recycling 25% filter dust, recycling 50% filter dust, recycling 75% filter dust or recycling 90% filter dust.

- That there would be no effects to short term AQS for SO2 associated with the derogation request and there are no long term AQS for SO2 with respect to human health. The emissions of SO2 associated with the derogation request will not affect any sites of heritage, landscape or nature conservation, and/or protected species or habitat. SO2 concentrations at the nearest SSI to the installation show compliance with the long term EAL for protection of ecosystems.

Doncaster Metropolitan Borough Council is therefore minded to temporarily allow this derogation request for a period of 2 years subject to the following conditions;

- *Emissions from the glass melting furnaces W1, W2 and W3 shall be exhausted to atmosphere through the stacks W1, W2 and W3 via the sulphur dioxide scrubbing unit. The scrubbing unit shall be designed, operated and maintained in such a way as to ensure that the emission limits for sulphur dioxide as detailed in Table 3 of this permit are being complied with.*

- *The Operator shall maintain and service the sulphur dioxide scrubbing unit stipulated in condition 1.5.1 above in accordance with the manufacturers recommendations. A copy of the manufacturer's recommendations and a record of maintenance and service shall be held on site and made available for inspection upon the request of the Regulator.*

- *Natural gas only shall be used to fuel the furnaces. The Regulator shall be notified prior to any alternative fuel source being brought onto site.*

- *By 1st March 2018, the Operator shall submit to the Regulator a review of the recycling of filter dust back into each furnace in order that options for potential*

compliance with the BAT AEL of 500mg/m3 can be demonstrated. The review shall be in writing and, as a minimum, include the following:

a. *Chemical and physical characterisation of the filter dust generated in each bag filter;*

b. *The waste classification of the filter dust, including what components, if any, trigger a classification as hazardous waste;*

c. *A sulphur balance for each furnace, and for each glass type produced, to investigate the link between recycling rates of filter dust and the associated value for SO2;*

d. *The identification of any alternative uses/outlets for any filter dust in excess of the recycle rates determined in c). This should be undertaken in accordance with the Waste Framework Directive; in order of priority consideration shall be given to: re-use, recycling, recovery or, where that is technically and economically impossible, disposal while avoiding or reducing any impact on the environment.*

e. *A description, for each furnace, of the options for filter dust recycling into the furnace in combination with treatment and/or disposal offsite of excess filter dust, including a cost benefit analysis for each option and the timescale for implementation; and*

f. *A full BAT assessment, using the information obtained in a) to e) above, identifying the operators proposed option for filter dust recycling, treatment and/or disposal.*

Permitting officer's assessment of the derogation request

Table 3.2. Is the derogation request within the scope of the derogations allowed under the IED?	**YES**
1	Is the emission subject to a mandatory minimum emission limit value in Annex 5 or 6 of the IED? No, limits in Annexes 5 or 6 do not apply to this release
2	Where the BAT Conclusions identify multiple options for achieving the BAT-AEL, has the operator addressed all the options for achieving the BAT AEL? Yes There are 3 techniques identified in the BAT conclusions which the Operator has considered Dry or semi-dry scrubbing in combination with a filtration system

	To control SOx at the Installation a dry lime injection scrubber is used to reduce emissions, with the reacted lime captured in the particulate abatement equipment. Minimisation of the sulphur content in the batch formulation and optimisation of the sulphur balance The Operator states that the primary method of SOx reduction at the Installation is through the management of the batch composition to minimise the overall presence of sulphur within the furnace. However, this can be of limited benefit due to the use of cullet, which often has a higher sulphate content than the glass produced within the furnace and also introduces organic components as a consequence of the recycling process. Sulphur levels within the batch raw materials are therefore adjusted to ensure a high level of refinement and control of 'foaming' within the furnace – an issue which can increase with the presence of organics (from cullet). As a consequence, secondary abatement measures are often required to remove the additional sulphur. Use of low sulphur content fuels The Installation uses natural gas as a fuel which has a low sulphur content
3	Where the operator is proposing not to conduct a cost effectiveness / cost benefit assessment of an option for achieving the BAT AEL have they adequately justified this decision? No options were rejected ahead of cost effectiveness/ cost benefit assessment.
4	Is the derogation request based on one of the three criteria set out in the IED? Yes The derogation request is based on technical characteristics. The DEFRA Part A guidance provides a number of examples of technical characteristics, those applicable to this derogation request are listed below; • The recent history of pollution control investment in the installation in respect of the pollutant(s) for which the derogation is sought; Yes - the installation already operates limestone scrubbers which abate the pollutant and are capable of achieving the BAT AEL, subject to operational parameters. (ie proportion of dust recycled). The Derogation request is based on the operation of the scrubbers and the impact of this on achieving the BAT-AEL. • The configuration of the plant on the site, making it more technically difficult and costly to comply Yes- In order to comply with BAT AEL limits the operator will be required to increase the amount of lime injected into the abatement plant, resulting in increased waste for disposal. In addition the amount of filter dust that is included in the batch will have to be reduced, which in turn will result in increased waste to be disposed of.

	• The effect of reducing the excess emission(s) upon other pollutant emissions, the energy efficiency, water use or waste arisings from the installation as a whole Yes- Increased lime injection and reduced filter dust recycling will increase the amount of waste to be disposed of from the installation.

Table 3.3 : Has the operator provided a credible argument that increased costs for achieving the BAT AEL are linked to the criteria (set out in section 4 of table 3.2) which is the basis of their derogation request	**YES**
1	Summarise the costs of achieving the BAT AEL versus the cost of achieving the alternative or alternatives and identify any issues with these costs that are relevant for your final decision. The operator has proposed 2 BAT options Option 1 – Baseline. Continue as currently operating. Option 2 - Application of the Glass BREF (2012) BAT-AEL Limits. Option 1. To control SO2 at Doncaster, dry lime injection is typically used to reduce emissions, with the re-acted lime captured in the particulate abatement equipment. The addition of lime is carefully managed to achieve the current emission limit values whilst maintaining the ability to recycle the filter dust within the furnaces. Furthermore, the use of low-sulphur fuels such as natural gas also reduces SO2 levels through primary means. Monitoring results for 2012 to 2013 show an average SO2 concentration of around 700 to 850mg/Nm3 being achieved on all operational furnaces at Doncaster, utilising the current dry scrubbing process, against the current permitted discharge limits of 800mg/Nm3. The monitoring results demonstrate that attainment of the consent limits is generally achievable through careful management and utilisation of the existing equipment. The Operator states that currently they feel they apply BAT at the Installation as they recycle all of the filter dust into the batch. The Operator states that there are no significant additional costs associated with continuing the application of lime injection and recycling of bag filter dust. There are no technical restrictions to continued lime injection into the current bag filters and the application of filter dust recycling at the current rates, although careful management of the bag filter dust recycle levels against cullet use and sodium sulphate addition is required to maintain the quality of the product. Option 2

	The Operator states that to consistently comply with the BAT-AEL limit of 200-500mg/Nm3, recycling of filter dust would have to be reduced and potentially completely removed to control the level of sulphate within the furnace. Additional lime injection can also be applied to increase sulphur capture. To achieve the BAT-AEL, a reduction of approximately [redacted] of sulphate from the mass balance for each furnace is required (a total of [redacted] across the three furnaces). This would allow the plant to consistently achieve <500mg/Nm3 for SO2, and would therefore comply with the BAT conclusion benchmark levels. This is likely to be achieved primarily through increased injection of lime, although removal of filter dust recycling would also be needed to ensure continued compliance. Running at the BREF optimum level of 40% removal through lime injection, and using a stoichiometric ratio of 2:1 for reagent: SO2 removed as set out in Table 4.30 of the March 2012 BREF, this would equate to an additional use of approximately [redacted] tonnes of lime (calcium hydroxide) per year. The Operator states that should additional lime injection be applied (anticipated as [redacted] tonne / year), the cost of the additional SO2 abatement is estimated at [redacted] per year, based upon the current price paid for lime of [redacted]. In addition to the extra lime injection, it is assumed that additional filter dust would need to be disposed of in order to maintain the sulphur balance. This is anticipated as being a minimum of [redacted] tonnes per year of hazardous filter dust. Disposal of the dust through incineration is estimated as a minimum of [redacted], which is equivalent to [redacted] per year. To maintain the batch composition, increased costs for the addition of [redacted] tonnes extra raw material would be incurred, estimated at approximately [redacted] using an approximate average cost of [redacted] for the combined raw materials. Therefore, in summary the Operator states that compliance with the BAT AEL will cost an additional [redacted] per year.
2	Has the operator satisfactorily demonstrated that the costs of meeting the BAT AEL at this site are significantly increased due to the technical characteristics referred to in 1.7 compared to the typical cost of installing the appropriate technique? <u>Yes</u> The Installation already has the appropriate abatement equipment fitted, the derogation request relates to the operation of the equipment. The Operator has identified that in table 9 of the BAT conclusions it states that "*values reported in the table may be difficult to achieve in combination with filter dust recycling and the rate of recycling external cullet*". The Operator argues that they will not be able to achieve the BAT AEL without additional costs of [redacted] per year and refer back to this statement as they currently recycle all filter dust back into the batch, which they state is BAT for their Installation.

Table 3.4 Summary of the environmental consequences of allowing a derogation

<table>
<tr>
<td>1</td>
<td>Summarise the relevant impacts of achieving the BAT AEL vs the impacts of delivering the alternative or alternatives and identify any issues with the data provided by the operator that are relevant for your final decision.

The annual emissions of SOx from the activity are currently 547 tonnes per year and these would reduce to at least 356 tonnes per year if the BAT AEL was met in accordance with the timeline set by the IED.

The Operators proposal will mean that the annual emissions of SOx will remain at 547 tonnes per year.</td>
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Amber
G</td>
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<tr>
<td>2</td>
<td>Summarise the current and predicted impact of derogating from the BAT AEL on any short term Air Quality Standards (AQS) / Environmental Assessment Levels (EAL).

In order to assess the potential impact of the emissions to air from the installation on the environment for the different emissions control options, detailed dispersion modelling has been undertaken.

The installation is not located within an Air Quality Management Area (AQMA).

There are several short term AQS for SO_2, these are detailed below and contained within UK Regulations for the purpose of LAQM in England:
<table>
<tr><th rowspan="2">Pollutant</th><th colspan="2">Air Quality Objective</th></tr>
<tr><th>Concentration</th><th>Measured as</th></tr>
<tr><td rowspan="3">Sulphur dioxide</td><td>350 µg/m^3, not to be exceeded more than 24 times a year</td><td>1-hour mean</td></tr>
<tr><td>125 µg/m^3, not to be exceeded more than 3 times a year</td><td>24-hour mean</td></tr>
<tr><td>266 µg/m^3, not to be exceeded more than 35 times a year</td><td>15-minute mean</td></tr>
</table>
These objectives can be expressed as percentiles:
The 99.9th percentile of 15-minute averages;
The 99.73th percentile of hourly averages; and
The 99.18th percentile of 24-hour averages.

For Option 1 – Current Emission Concentrations, the following maximum process contributions have been predicted:

96.3 ug/m^3 as the 99.9th percentile of 15-minute averages;
80.0 ug/m^3 as the 99.73th percentile of hourly averages; and
44.9 ug/m^3 as the 99.18th percentile of 24-hour averages.

These represent 36%, 23% and 36% of the respective AQS objectives for SO2. When combined with the ambient concentrations (assumed to be 22.6ug/m3 for short-term impacts), this leads to Predicted Environmental</td>
<td>R
A
Green</td>
</tr>
</table>

	Concentrations(PEC) representing 40%, 24% and 44% of the respective AQS objectives. For Option 2 – applying the BAT-AEL**,** the following maximum concentrations have been predicted; 56.7ug/m^3 as the 99.9th percentile of 15-minute averages; 46.8ug/m^3 as the 99.73th percentile of hourly averages; and 26.3ug/m^3 as the 99.18th percentile of 24-hour averages. These represent 21%, 13% and 21% of the respective AQS objectives for SO2. When combined with the ambient concentrations (double the annual average background, in accordance with the H1 Guidance), this leads to PECs representing 30%, 20% and 39% of the respective AQS objectives, therefore no significant environmental impact is predicted as a result of the emissions of SO2 from the installation. These values represent reductions of 15%, 9% and 15% of the respective AQSs over current impacts (Option 1). There are no significant short term environmental impacts predicted as a result of the emissions of sulphur dioxide from the installation when considering either Option 1 or 2.	
3	Summarise the predicted impact of derogating from the BAT AEL on any long term Air Quality Standards / Environmental Assessment Levels? There is no long term AQS for SO_2 with respect to human health.	**R** **A** **Green**
4	*Would the environmental impacts resulting from derogating from a BAT AEL as covered in 3.2 and 3.3 above mean that an Air Quality Standard or an EQS for water may not be achieved?* No The short term AQS is achieved for both Options 1 and 2.	**R** **A** **Green**
5	Summarise the predicted impact of derogating from the BAT AEL on any relevant site of heritage, landscape or nature conservation, and/or protected species or habitat The long term EAL for SO_2 is 20ug/m^3. In order to assess the potential impact of the SO_2 emissions to air from the installation on the nearest habitat receptor (Sandall Beat SSSI), dispersion modelling has been undertaken. For Option 1, at the Sandall Beat Habitats receptor (SSSI), the long-term Process Contribution (PC) for SO2 was 0.6 ug/m^3 which represents 3% of the relevant EAL. When combined with the background concentration of 5.1 ug/m^3 it forms a PEC of 5.8 ug/m^3, representing 29% of the EAL. At the Sandall Beat Habitats receptor, the long-term PC for SO2 was 0.4ug/m3, which represents 2% of the relevant EAL. When combined with	**R** **A** **Green**

	the background concentration of 5.1ug/m3 it forms a PEC of 5.6ug/m3, representing 28% of the EAL. This is a reduction of only 1% of the EAL over current impacts (Option 1). There is no significant environmental impact at the nearest SSSI as result of the emissions of SO2 from the installation when considering both Options 1 and 2.	
6	Would derogating from the BAT AEL result in higher emissions of persistent, bio-accumulative and/or biologically active compounds from the site? No	**R** **A** **Green**
7	Has the operator identified any other site or region specific environmental impacts that support derogating from the BAT AEL? Yes The Operator states that to consistently comply with the BAT-AEL limit of 200-500mg/Nm3, recycling of filter dust would have to be reduced and potentially completely removed to control the level of sulphate within the furnace. Additional lime injection can also be applied to increase sulphur capture. The increased volume of injected lime would increase the dust concentration within the flue gas, potentially increasing the risk of exceedance of the particulate matter BAT – AEL. Assuming a 99% removal rate of the additional dust generated by the increased injection, there would be an increase in annual mass emissions to air of approximately 4 tonnes of particulates. The operator states that increased injection of lime and cessation of filter dust recycling to comply with the BAT AEL would require additional storage facilities for the accumulation of dust prior to disposal, and result in increased site traffic to facilitate the off-site disposal of the dust. Transport of the dust off-site would typically occur once a week, therefore safe storage and handling of the dust on site would be required between collections to minimise fugitive release of dust. The diversion of filter dust away from recycling through the process would result in the requirement for additional raw material input of approximately [redacted] a year to maintain the same level of production. Sodium sulphate input levels may also need to be increased to maintain the correct sulphur balance within the process, hence offsetting the reduction in sulphur input achieved by the removal of filter dust recycling. Over at least the past 10 years, the LA have not received any environmental related complaints about the site from local residents and the operator has a history of general compliance with the permit conditions.	**R** **A** **Green**

8	Are there any other environmental impacts that are relevant to the consideration of the derogation request? Yes The Operator states that to consistently comply with the BAT-AEL limit of 200-500mg/Nm3, recycling of filter dust would have to be reduced and potentially completely removed to control the level of sulphate within the furnace. Additional lime injection can also be applied to increase sulphur capture. The additional lime injected will be captured and subsequently removed as waste filter dust (as it cannot be incorporated further into the batch recipe), resulting in approximately [redacted] of filter dust requiring disposal. Stopping the recycling of dust within the process will result in the generation of a minimum [redacted] a year of filter dust rich in calcium sulphate requiring disposal (including the additional [redacted] injected for abatement). Although the filter dust may be suitable for re-use in the fertiliser/agricultural industry, or water treatment applications, the potential presence of trace levels of heavy metals may affect the use within these sectors. Therefore, disposal as hazardous waste through incineration or landfill are considered the most likely options, contrary to the application of the waste hierarchy as set out within the Waste Framework Directive.	**R** **A** **Green**
9	Summarise the benefits of achieving the BAT AEL compared to the alternative or alternatives and identify any issues that are relevant for your final decision. The benefits have been monetised and the following information provided; The Operator has produced a Cost Benefit Analysis, using the Environment Agency's CBA tool, which has compared 2 different options to meet the BAT AEL's for control of SOx (expressed as SO2) emissions from the melting furnace in the container glass sector. The costs that have been used are similar to those mentioned in the Glass BREF and are similar to those submitted to other Regulators by other Operators within the Container Glass sector. The operator has proposed 2 BAT options; Option 1 – The granting of a full derogation with an emission limit of 800 mg/Nm3 Option 2 – Achieve the emission limits within the BAT AEL of 200-500mg/Nm3 Option 1 The granting of a full derogation with an emission limit of 800 mg/Nm3. The SOx emissions associated with this option have been monetised and are £11.85 million over the 8 year assessment period. Option 2 Achieve the emission limits within the BAT AEL of 200-500mg/Nm3.	

	The SOx emissions associated with this option have been monetised and are £9.59 million, therefore this option would save £2.26 million of SOx emissions over the 8 year assessment period.

Table 3.5: Does the Cost Benefit Analysis / Cost Effectiveness Analysis support a derogation	**YES**
1	Summarise the outcome of any Cost Effectiveness Analysis and / or Cost Benefit Analysis The Operator has produced a Cost Benefit Analysis, using the Environment Agency's CBA tool, which has compared 2 different options to meet the BAT AEL's for control of SOx (expressed as SO2) emissions from the melting furnace in the container glass sector. The costs that have been used are similar to those mentioned in the Glass BREF and are similar to those submitted to other Regulators by other Operators within the Container Glass sector. The operator has proposed 2 BAT options; Option 1 – The granting of a full derogation with an emission limit of 800 mg/Nm3 Option 2 – Achieve the emission limits within the BAT AEL of 200-500mg/Nm3 Option 1 Current operations would not alter. The SOx emissions associated with this option have been monetised and are £11.85 million over the 8 year assessment period. Option 2 The upfront investment costs would be nil and the operating costs are given as [redacted] million. The energy consumption will be [redacted] million and the waste costs will be [redacted] million for this option. The SOx emissions associated with this option have been monetised and are £9.59 million, therefore this option would save £2.26 million of SOx emissions over the 8 year assessment period. The Net Present Value (NPV) incremental to BAT is -£0.27 million and according to Environment Agency Economist guidance, should be dismissed as it is a negative figure. This is because the costs of the option are greater than the benefits. It is important to note that Environment Agency guidance for carrying out Cost Benefit Analysis suggests that it is not good practice to undertake an analysis using only 2 options.
2	Does a sensitivity analysis change the outcome of the CBA? No
3	Are there any other factors that are relevant to the cost benefit decision? Yes Following the Operators submission of their Cost Benefit Analysis DEFRA published, on the 12th September 2015, new air quality damage costs. The SOx damage costs

	are very similar to the ones previously used and had very little impact on the cost benefit analysis results.

Table 3.6: Final Considerations	
1	The information contained in the BAT Reference Document (BRef for the Manufacturing of Glass), and Glass Sector BAT Conclusions provides that: • Closed loop recycling of filter dust should be encouraged over disposal (page 268 of the BREF) • The SOx BAT-AEL may be difficult to achieve in combination with filter dust recycling and the rate of recycling of external cullet (footnote 1 to table 9 of the BAT Conclusions). • There may also be a need for a trade-off between the removal of SOx emissions and the management of solid waste (filter dust) that is produced by the abatement units which contains the sulphur removed from the air emissions (BAT Conclusion19). Another relevant factor is that all container glass manufacturers within the UK have submitted the same derogation request based on the same reasons. It is important to try and achieve some sort of consistency throughout the UK. Information from UK Operators, who also operate in other EU Member States is that other Member State Regulators have accepted derogation requests for SOx where high levels of filter dust is recycled, although this has not been ratified and no evidence of this has been presented or collated. However, it is important to note that the Operator has only considered 2 different options these being to either comply with the BAT AEL limits, or to continue to recycle all filter dust. This would be against the advice of Environment Agency guidance for carrying out Cost Benefit Analysis which suggests that it is not good practice to undertake an analysis using only 2 options. Therefore, the operator could have considered other options such as recycling 25% filter dust, recycling 50% filter dust, recycling 75% filter dust or recycling 90% filter dust. With this in mind it is felt appropriate that the derogation be granted but with a condition requiring the operator to undertake a review of the recycling of filter dust back into each furnace within 2 years of the date of the varied permit.
2	In the event that we are proposing to accept a derogation request but place additional conditions on it summarise the reasons for these. Yes It is felt that although the Operator has provided a case that the costs of meeting the BAT AEL will outweigh the environmental benefits, further options for compliance could be explored. It is therefore proposed to allow the derogation but with a

	condition requiring the Operator to provide further information for compliance with the BAT AEL within 2 years of the date of permit issue.

Annex DM4 NFSoD and public consultation summary
Table 4.

Permitting officers minded to position	I am minded to temporarily accept the derogation request (as submitted by the operator), subject to new permit conditions requiring further information to be submitted, for the reasons set out below; The application is based on the technical characteristics and is within the scope of derogations allowed under article 15(4) of the Industrial Emissions Directive. The operator has provided a credible argument that the increased costs for achieving the BAT AEL are linked to the technical characteristics; To achieve the BAT AEL the operator states that there will be additional costs of [redacted] per year associated with extra waste disposal costs, extra raw materials costs and extra limestone required for the abatement plant. The Operator currently recycles all filter dust back into the batch, which they state is BAT for their Installation. A Cost Benefit Analysis has been carried out and this indicates that the cost of meeting the BAT AEL outweighs the benefit and therefore should be dismissed as it has a negative Net Present Value (NPV). However, only 1 option for meeting the BAT AEL was assessed and it is felt that further analysis should be undertaken which considers recycling a proportional range of filter dust ie) recycling 25%, 50%, 75% and 90% filter dust. This requirement is supported by the Environment Agency guidance for carrying out Cost Benefit Analysis which suggests that undertaking an assessment using only 2 options is not considered good practice. There would be no negative impact on the short term Air Quality Standard (AQS) for SO2 associated with the derogation request and there is no long term AQS for SO2 with respect to human health. The emissions of SO2 associated with the derogation request will not affect any sites of heritage, landscape or nature conservation, and/or protected species or habitat. SO2 concentrations at the nearest SSSI to the installation show compliance with the

	long term Environmental Assessment Level (EAL) for the protection of ecosystems.
Recommendation from Derogation Panel meeting on 21.1.16	Approve
Assistant Director - Gill Gillies Decision	Approve
Date:	21/01/2016

Appendix 3 –The Future Direction for achieving SO2 BAT-AEL' S. LAU Proposal Document to DEFRA

Sulphur Oxide Emissions from UK Container Glass Plants

Executive Summary

Glass production is as a Part A(2) activity in England and is regulated by the Local Authority where the plant is located. In Scotland, Glass production is regulated by SEPA and in Northern Ireland by the DAERA.
The UK glass industry produces approximately 3 million tonnes per year of glass of which approximately 63% is container glass used to produce bottles and jars. There are 6 companies in the UK producing container glass across 12 manufacturing sites using a total of 28 furnaces. 10 of these manufacturing sites currently have a derogation from the BAT-AEL for emissions to air of SO_2. These derogations cover 23 of the 28 furnaces. Typically emissions of SO_2 to air are in the range 600 – 800 mg/Nm^3, whereas the BAT-AEL is 200 – 500 mg/Nm^3. Although both emissions and the BAT-AEL are higher in Northern Ireland due to the use of fuel oil.
When these derogations were granted in 2016, each operator was asked to make further assessments and report within 2 years. These reports have now been assessed and meetings held with some UK operators and British Glass (the UK Trade Body) to consider the issues raised. In addition, a further reassessment of the Glass BAT conclusions (published in 2012) and Glass BREF (published in 2013) has been made to better understand the basis on which the BAT-AELs were drawn up.
The key findings from this review are:
The principal reason why so many UK plants cannot achieve the BAT-AEL for SO_2 emissions to air is the high level of external cullet used in the glass making process and dealing with the levels of organic contamination present in the cullet. The organic matter present in cullet results in higher levels of sodium sulphate being added into the process, and this in turn is resulting in levels of SO_2 in the exhaust gas from the furnaces beyond the removal capacity of the dry scrubbing systems employed at these sites.
At the time the derogations were granted, it was believed that the practice of 100% recycling of filter dust into the furnace contributed to UK plants not achieving the BAT-AEL. This has been found not to be the case, but this practice means the dry scrubbing process should be viewed in a different light as primarily a sulphur recovery process for recycling, as well as abatement.
Solving this problem is not straightforward because:
All the plants with derogations comply with the narrative statement in BAT 19 of the Glass BREF BAT conclusions for minimising SO_2 emissions. Notwithstanding this, they are unable to achieve the BAT-AEL. There are no site specific factors preventing the operators from applying BAT. The 2 plants (5 furnaces) operating

without a derogation all produce high quality glass with no cullet (or filter dust) included.
Derogation under Article 15(4) of IED is therefore not the right mechanism for addressing this problem. All the operators are applying BAT, and whilst there may be site specific reasons why some of them cannot do more, there are no site specific reasons preventing them applying BAT as it is currently written.
From reassessing the BREF, the process for deriving the BAT-AEL does not appear to have been derived in line with current BREF practice, in that it appears to be based on a statistical analysis of the BREF data. No analysis is presented on the impact of filter dust recycling and the rate of incorporating external cullet. Although the BAT-AEL is flawed in this respect, there can be no certainty that future reviews of the BREF will see a relaxation in the BAT-AEL.
Maintaining SO_2 emissions at their current levels of around 800 mg/Nm^3 is therefore probably not sustainable in the long term and despites its faults, the BAT-AEL range of 200 – 500 mg/Nm^3 represents the target to aim at.

There are 4 possible options to reduce SO_2 emissions to air:

1) Improve the operation of the current sulphur recovery systems
2) Limit the amount of external cullet that can be incorporated into the glass
3) Improve the quality, (i.e. reduce the organic contamination) of external cullet
4) Install second stage SO_2 abatement

Whilst improving the operation of existing dry scrubbing systems could yield some reduction in SO_2 emissions, it is unlikely to be sufficient to achieve the BAT-AEL. Thus in the short term limiting the amount of external cullet is the only available option, but this will come at a penalty of increased energy consumption. It could also have a significant negative impact on the recycling of glass.
In the longer term, improving the quality of cullet (e.g. improved collection, processing or pre-treatment) or second stage SO_2 abatement or a combination of these represents the only way of achieving BAT-AELs if current rates of glass recycling are to be maintained.
Consideration could be given to reducing emission limit values either through a revision to UK statutory guidance, or through an industry agreement with government under the umbrella of its air quality strategy. The time period for implementation would need to be sufficient for operators to install any process changes that might be necessary, e.g. secondary abatement. Otherwise, they would have to limit their use of external cullet.
In the interim, ELVs in permits should be retained at their current levels; derogations for SO_2 could be retained, but should eventually be cancelled once the future direction has been agreed.
Further work should be carried out to assess the cullet supply chain from the collection of waste glass, its separation from other waste streams and subsequent treatments and processing prior to its reincorporation into glass products, with a view to improving its quality.

1. Introduction

1.1 Background – UK Glass Industry

The UK glass industry produces approximately 3 million tonnes per year of glass of which approximately 63% is container glass used to produce bottles and jars. UK production accounts for around 10% of the EU total, with 18 other countries producing container glass. Most of the output goes into the food and drinks industry. High transportation costs mean that most of the output is for drinks products consumed in the UK.

Glass manufacture is a capital intensive industry. Glass furnaces typically have operating lives of up to 20 years, although there will normally be a major refurbishment during this period. The main environmental issue associated with container glass production is that it is a high temperature, energy intensive process, with emissions to air of nitrogen oxides, sulphur oxides and dust. Glass production however has distinct advantages over some other forms of packaging, e.g. plastic bottles and cartons, in that it is capable of recycling and reuse.

There are 6 companies in the UK producing container glass across 12 manufacturing sites using a total of 28 furnaces. Of these 28 furnaces, 16 produce flint (i.e. clear) glass or primarily flint glass, 8 produce amber glass and 4 produce green glass. All use gas fired furnaces, except the plant in Northern Ireland which is currently not connected to a gas supply. This plant uses fuel oil. Glass production is as a Part A(2) activity in England and so is regulated by the Local Authority where the plant is located. In Scotland, Glass production is regulated by SEPA and in Northern Ireland by the DAERA.

1.2 Current position on SO_2 derogations

10 UK manufacturing sites currently have a derogation from the BAT-AEL for emissions to air of SO_2, (see Appendix 1). These derogations cover 23 furnaces. 7 sites (15 furnaces) are in England, 2 are in Scotland (6 furnaces) with one in Northern Ireland (2 furnaces). Typically emissions of SO_2 to air are in the range 600 – 800 mg/Nm^3, whereas the BAT-AEL is 200 – 500 mg/Nm^3. Although both emissions and the BAT-AEL are higher in Northern Ireland due to the use of fuel oil. Most of the derogations are not time limited, but in each case they are accompanied by an improvement condition seeking further investigation of the issues considered in this report.

The derogation process in IED is intended to be an exceptional measure which can be used to allow higher emissions that the BAT-AEL, when the costs of achieving BAT are disproportionate to the environmental benefits due to site specific factors.

The fact that 10 out of 12 UK sites (or 23 out of 28 furnaces) have been granted a derogation is therefore worrying and indicates that some part of the regulatory system is not working correctly. It could indicate that there is either some systemic problem in UK glass manufacturing; errors in compiling / interpreting the BAT conclusions resulting in an inappropriate and unachievable BAT-AEL; or a failure by UK regulators to properly apply the IED. Whilst the derogations were made in good faith by UK Regulators at the time, 10 out of 12 installations holding derogations is not a sustainable or defendable position in the long term.

1.3 Scope of this study

When these derogations were granted in 2016, each operator was asked to make further assessments and report within 2 years. These reports have now been assessed and meetings held with some UK operators and British Glass (the UK Trade Body) to consider the issues raised.

In addition, a further reassessment of the Glass BAT conclusions (published in 2012) and Glass BREF (published in 2013) has been made to better understand the basis on which the BAT-AELs were drawn up.

This report presents the key finding from this review and presents the main options for addressing this problem.

2. The Container Glass Manufacturing Process

2.1 Typical plant configuration

A flow diagram of a typical container glass manufacturing plant is shown in Appendix 2.

The typical container glass manufacturing process comprises a batch mixing plant, where the raw materials in the glass product formulation are brought together. These are then fed continuously into regenerative melting furnaces (normally using a combination of gas firing and electrical heating). In some cases, oil is used as a back-up fuel. The batch mixing plant can comprise 2 or more mixers operating sequentially or a single mixer discharging into a feed vessel.

Cullet is the name given to the waste glass that is fed into the glass furnace for recycling into new glass. Waste glass recycled from domestic and commercial wastes is referred to as external cullet, whereas the recycling of waste glass within the glass making process is referred to as internal cullet.

Cullet is incorporated at the batch mixing stage. The amount of cullet included depends on the quality and the colour of the glass product and the quality of the cullet. Typically, where cullet is included, it can account for between 30% and 70% of the glass product. However, many high quality grades of flint (i.e. clear) glass do not have cullet in their formulations. The BREF says that the forecasted cullet consumption is one of the important parameters in the design of the process.

The melting furnaces operate in the temperature range 1,300 to 1,600°C. The different designs available are not discussed here and are not considered a significant influence on SO_2 emissions. The molten glass goes to downstream processing. Other than the molten glass, the only stream leaving the furnace is the hot waste gas stream.

Potential pollutants in the hot waste gas stream are NO_X, SO_2, dust, CO, CO_2, and traces of chlorides, fluorides and metals present as impurities in the raw materials.

Downstream of the furnace is a dry scrubbing system. Hydrated lime is injected into the waste gas stream and this reacts with the SO_2 and the chloride/fluoride impurities. The spent lime is removed from the waste gas stream using either an electrostatic precipitator (ESP) or a bag filter. This produces a filter dust, which is

incorporated back into the glass product into the batch mixers. The ESPs / bag filters also have the benefit of removing any dust in the waste gas stream.
Of the 28 furnaces producing container glass; 13 furnaces each have a bag filter and 15 furnaces are served by 8 ESPs.
Downstream of the dry scrubbing system, one of the plants has a Selective Catalytic Reduction (SCR) unit to reduce NO_X emissions. NO_X abatement is not discussed here as it is not considered a significant influence on SO_2 emissions.
As with cullet, the amount of filter dust included at the batch mixing stage depends on the quality of the final product. Some high quality grades of flint glass do not include filter dust. However, overall it is normal that all the filter dust is incorporated back into the product. Management of cullet and filter dust and its reincorporation into the glass product is therefore an important aspect of the operation of a glass manufacturing plant.

2.2 The sulphur mass balance and role of sodium sulphate in glass production

The sulphur inputs into the process are:

- Sodium sulphate, which is included alongside the other raw materials.
- Sulphur which is present in cullet (recycled glass).
- Sulphur present in fuel oil where this is used in place of natural gas.

Sodium sulphate has 2 principal functions in the glass making process. First, it has a surfactant effect promoting good mixing of the raw materials and the glass melt to help create a homogenous glass product. Then as the process temperature is increased, the sodium sulphate decomposes releasing SO_2, the SO_2 promotes the removal of air bubbles from within the glass melt. The SO_2 dissolves in the glass melt, then diffuses into any trapped air bubbles. This increases the size of the air bubbles, it also results in a change in the interfacial tension between the air bubble and the glass melt promoting bubble agglomeration. Trapped air bubbles are thus released from the glass melt. As the temperature then reduces, any remaining SO_2 is re-dissolved into the glass melt.
Cullet contains an amount of sulphur arising from its initial production. However this sulphur is not in a form that makes it available to fulfil the function of sodium sulphate. This means that any sulphur present in the cullet cannot be offset against the amount of sodium sulphate that needs to be added into the process with the raw materials. Sulphur present in fuel oil plays no part in the glass making process and is oxidised directly to SO_2.

The sulphur outputs from the process are:

- Sulphur contained in the glass product.
- Sulphur oxides in the emissions to air.

The practice of recycling 100% of the filter dust from the sulphur recovery system means there is usually no output of sulphur in solid waste or waste waters. Thus all sulphur not trapped in the glass is emitted to atmosphere and the only way to reduce overall sulphur emissions to air is to minimise the sodium sulphate added into the process.

2.3 Sulphur recovery and filter dust recycling

All plants have a sulphur recovery / abatement system downstream of the furnace. This normally comprises a lime injection system (scrubber) followed by either a bag filter or an electrostatic precipitator, although one plant uses sodium bicarbonate in place of lime. In both cases, the powdered scrubbing material reacts with the sulphur dioxide (and other acid gases) present in the waste gas with the resulting material removed before the waste gas is released to atmosphere.

The sulphur contained in the filter dust is in a suitable form to be used as a replacement for sodium sulphate in the formulation. Thus the industry practice is to recycle 100% of the filter dust back into the glass making process. The sulphur present in the dust means the amount of fresh sodium sulphate in the raw materials can be reduced and it is this reduction that leads to a reduction in SO_2 emissions to air.

2.4 Impact of External Cullet on the Sulphur Mass Balance

Cullet contains more air than the raw materials it replaces, which when added into the glass melt leads to formation of a larger number of air bubbles than would otherwise be the case. Cullet also contains some level of contamination with carbonaceous compounds. This could arise from product residues or from glues and paper used for product labels. Sodium sulphate will react with the carbon present in the cullet before the furnace reaches the temperatures needed for glass making, thereby reducing the amount of sodium sulphate available for homogenising the mix and removing air bubbles.

Together, this means that more sodium sulphate needs to be added into the process with the raw materials than would otherwise be the case.

Cullet is also likely to include within it different coloured glasses making it unsuitable for some types of glass, e.g. high quality flint glass does not usually include any cullet in the formulation. The 2 plants (5 furnaces) operating without a derogation all produce high quality glass with no cullet (or filter dust) included.

2.5 Impact of Throughput

If the furnace throughput is reduced, the SO_2 loading on the dry scrubbing plant is also reduced and this means a greater proportion is removed, resulting in lower concentrations of SO_2 in air. Thus a plant operating at full capacity is likely to have higher emissions of SO_2 than one operating at part load.

2.6 Current Emission Levels

The revised Glass BAT conclusions were published on 28th Feb 2012, with implementation on existing plants required within 4 years. Table 1 below shows

the BAT-AELs and the ELVs in place. The previous ELV of 800 mg/Nm^3 for SO_2 was set in the 2000 BREF.

Table 1 – BAT-AELs for the manufacture of container glass

Parameter	BATc Reference	IED BAT-AEL (mg/Nm^3)	Previous ELVs (mg/Nm^3)
Dust	BAT 16, table 6	<10 – 20	30
NO_X	BAT 17, table 7	<500 – 800	700
SO_2	BAT 19, table 9	<200 – 500 ([2])	800 ([2])
CO	BAT 9, table 3	<100	No limit
HCl	BAT 20, table 10	<10 – 20	30
HF	BAT 20, table 10	<1 – 5	5
Metals ([1])	BAT 21, table 11	1 – 5	5
([1]) Sum of As, Co, Ni, Cd, Se, Cr(III), Cr(VI), Sb, Pb, Cu, Mn, Vn, Sn ([2]) Gas firing furnaces – the BAT-AEL range is higher for oil fired furnaces			

The BAT conclusions recognise that in certain circumstances, the BAT-AEL for SO_2 may be difficult to achieve, although the reasons for this are somewhat ambiguously worded.

Current emissions levels are taken primarily from the improvement conditions reports and summarised in table 2 below. Note the plant codes are listed in Appendix 1.

Table 2 – Current emission levels

Parameter	Plant Emissions (mg/m^3)								
	Elton	B1/B3	B4/B7	G1	L1	L2	W1	W2	W3
Dust	1.2	15	7.6	87.5 ([2])	0.54	5.3	13	11	1
NO_X	No data	1212	921	755	856	1002	1323	1282	857
SO_2	963	565	637	552	777	666	631	670	716
CO	No data	3	33.4	94	48	36	3	3	100
HCl	No data	11	5.3	0.2	12.2	8.8	1	1	1
HF	No data	1.7	0.8	1.8	3.5	2.8	1	0.3	1
Metals ([1])	No data	No data	No data	2.4	1.4	1.9	0.38	0.59	0.23
([1]) Sum of As, Co, Ni, Cd, Se, Cr(III), Cr(VI), Sb, Pb, Cu, Mn, Vn, Sn ([2]) Non-compliance with ELV reported to Wakefield Council									

Table 2 – Current emission levels (continued)

Parameter	Plant Emissions (mg/m^3)								
	K6	**K7**	**K8**	**80's**	**85**	**Derrylin (4)**	**P4**	**P5**	**F1**
Dust	4	14	10	1.5	17.7	23.6 (3)	1.1	11	63
NO_X	1784	573	1209	765	827	1107	576	360	770
SO_2	537	617	673	738	638	1577	474	402	407
CO	34	4	9	127	11	0.74	17	<3.7	14
HCl	7	2	2	1	16.8	6.1	0.33	1.3	0.9
HF	1	0.4	1	1.4	2.7	2.8	<0.17	<0.20	< 0.1
Metals (1)	No data	No data	No data	No data	1.82	0.3	No data	No data	1.12

(1) Sum of As, Co, Ni, Cd, Se, Cr(III), Cr(VI), Sb, Pb, Cu, Mn, Vn, Sn
(3) The ELV is 30 mg/Nm^3 at this installation
(4) Oil fired furnaces at this installation

2.7 Current position on derogations

Derogations at all sites are to 800 mg/Nm^3, except for Ardagh Barnsley, and Furnace K6 at Ardagh Knottingley, where it is to 700 mg/Nm^3, and in Northern Ireland where fuel oil is used.

All the derogations granted in 2015 and 2016 came with an improvement condition to provide reports setting out sulphur mass balances for the process, the role of filter dust recycling in the glass making process and further assessment of options to reduce SO_2 emissions to air.

These are discussed in section 4.

3. Review of Glass BREF and BAT Conclusions

3.1 Review of Chapters 1 to 4 of BREF

Chapters 1 to 4 of the BREF documents the information and data from which the BAT conclusions are drawn. BAT conclusions are normally set out in chapter 5 and published separately as a European Commission Implementing Decision.

The scope of the Glass BREF is for all glass manufacturing activities. Listed below are some of the key points and observations relevant to the production of container glass.

The BREF notes that container glass, is almost exclusively manufactured using soda-lime formulations and there is only limited variation in the raw materials used. Emissions to air of SO_2 come from sulphur contained in the raw materials, cullet and the fuel. Degassing and drying can account for between 3% and 20% of the input.

The BREF recognises that many container glass processes utilise a substantial level of cullet, reporting a range of 0 – 80% and a sector average of 50%. The BREF does not differentiate between internal cullet which it says accounts for around 10% of the batch and post-consumer cullet. The BREF found the highest levels of cullet in green glass and the lowest in flint glass. High purity flint glass termed 'extra flint' will only contain recycled internal cullet. Typically 1 tonne of cullet in the formulation replaces 1.2 tonnes of raw materials.

Post-consumer cullet will always contain some level of contamination, the BREF suggests this could be up to 5%. However, the major benefit of using cullet is a reduction in energy consumption, typically energy consumption will reduce by 2.5% for a 10% increase in cullet.

The emissions data in the BREF is from 2005 and from 244 fossil fuel furnaces across the EU (all types). Data for SO_2 emissions is reported in Table 3.15 of the BREF. There are 150 data points for gas firing furnaces. After outliers are eliminated, this reduces to 127 data points. Not all data points have emissions expressed as concentrations. Of the 122 data points, 76 are reported as being without secondary abatement and 46 with secondary abatement. No mention is made of primary abatement. However, elsewhere in the document primary techniques for controlling dust emissions relate to the batch formulation and furnace conditions only and are captured in BAT 6.

In both cases, the average emission is around 500 mg/Nm^3, with the upper value around 1,000 mg/Nm^3, there is a difference in the lower value of around 100 mg/Nm^3 for no secondary abatement and 200 mg/Nm^3 for secondary abatement. Footnote 2 in table 3.15 refers to secondary abatement as comprising dry scrubbing followed by an ESP or bag filter. Interestingly, it says that as all the filter dust is recycled, this cannot be considered abatement as such. Note: this report refers to sulphur recovery / abatement in sections 2.2 and 2.3. By recycling filter dust, the amount of sodium sulphate added into the batch can be reduced and it is this reduction in sodium sulphate addition that produces a reduction in SO_2 emissions.

From the narrative in the BREF, the BAT-AEL appears to have been set based on a statistical mean for the upper end of the range and the minimum values for the lower end of the range. There is no correlation of the data with rates of cullet addition or filter dust recycling presented in the BREF.

At this point, it should be recognised that the Glass BREF review began (and the data collection carried out) before the IED was enacted, i.e. it was begun as a review of a ‘PPC BREF’ when the status of BAT conclusions and BAT-AELs was different to that under IED. As an early ‘IED BREF’ the process for setting the BAT-AEL and rigour of the data analysis had not developed to the extent that they have today. Using a statistical mean as the basis of setting a BAT-AEL would not be regarded as a valid method today unless supported by more detailed evidence. It is also possible that the installations chosen and the data collected was not fully representative of the industry as in 2005, there would have been no way of knowing the use to which the data would eventually be put.

The data presented in Chapter 3 leads directly to BAT 16 which requires ESP or Bag filter to minimise dust emissions, and BAT 19 on SO_2 emissions.

3.2 Conformance with BAT 19

BAT 19 says BAT is to reduce SO_X emissions from the melting furnace by using one or a combination of the following three techniques:

(1) Dry or semi-dry scrubbing in combination with a filtration system. This technique is described as being generally applicable.

All UK operators use this technique.

(2) Minimisation of the sulphur content in the batch formulation and optimisation of the sulphur balance. This technique is described as being generally applicable within the quality requirements of the final glass product. The BAT conclusion says that sulphur balance optimisation requires a trade-off approach between the removal of SO_X emissions and the management of solid waste (filter dust). It further says that the effective reduction of SO_X emissions depends on the retention of sulphur compounds in the glass which may vary significantly depending on the glass type.

The extent to which UK operators apply this technique is set out in this report, but in principle all UK operators use this technique to some extent. The key findings of this report are that it is the quality of the glass and the incorporation of external cullet that are of greatest significance and the management of filter dust is of less importance.

(3) The use of low sulphur fuels. The BAT conclusion says that the applicability of this technique may be limited by the constraints associated with the availability of low sulphur fuels, which may be impacted by the energy policy of the Member State.

All UK operators use gas, (other than in Northern Ireland) some with electric boost. Fuel oil is a backup fuel in some instances.

Notwithstanding that all UK operators apply BAT 19, 10 are unable to achieve the BAT-AEL for SO_X emissions of <200 – 500 mg/Nm^3.

There are 2 footnotes in table 9 of the BAT conclusions – footnote (1) says that for special types of coloured glasses (e.g. reduced green glasses), concerns related to the achievable emission levels may require investigating the sulphur balance. Values reported in the table may be difficult to achieve in combination with filter dust recycling and the rate of external cullet. Footnote (2) says that the lower levels (of the BAT-AEL range) are associated with conditions where the reduction of SO_X is a high priority over a lower production of solid waste corresponding to the sulphate rich dust.

Footnote 1 is intended to describe the circumstances in which it might not be possible to achieve the upper value of the BAT-AEL range despite deploying all the techniques in BAT 19. The wording is somewhat ambiguous in that it is unclear whether the second sentence relates to special types of glass or is more generally applicable. UK experience is that it is rate of external cullet which has the biggest impact on the sulphur balance and this is common across all glass

types. High quality glass contains little or no external cullet and it is these plants that are able to achieve the BAT-AEL.
Footnote 2 is intended to describe the circumstances where it might be appropriate to set an ELV towards the bottom end of the BAT-AEL range. This is not relevant to the issues being examined in this report.

3.3 Industry Split View on BAT 19

Split views are a way for TWG members to register their concerns over a BAT conclusion or BAT-AEL when they are not content with the decision. The European Container Glass federation (FEVE) raised a split view on BAT 19. They considered that the upper value of the BAT-AEL range for both natural gas and oil fired furnaces was difficult to achieve when there was complete recycling of filter dust and high external cullet rates in the batch formulation. They warned the concluded BAT-AEL ranges would cause a waste stream of filter dust and would endanger the recycling of glass (external cullet) in Europe.
This may go some way to explaining footnote 1, as an attempt by the JRC to recognise the issue and head off the expression of a split view.
UK experience is that the split view is not justified in its concern over creating a filter dust waste stream but gives warning of exactly what we have found with respect to the use of external cullet.

3.4 The Derogation Process

The process for obtaining a derogation from achieving a BAT-AEL is described in Article 15(4) of the IED. The operator must demonstrate that achieving the BAT-AEL would result in disproportionately higher costs compared to the environmental benefits due to:

- the geographical location; or the
- local environmental conditions; or the
- technical characteristics of the installation concerned.

The first stage of the process is to demonstrate the issues relating to the geographic location, local environmental conditions or technical characteristics of the site that make costs disproportionate in comparison with the rest of the sector.
The second stage of the process is a cost benefit analysis to show that these costs are disproportionate to the environmental benefits that would result from achieving the BAT-AEL.
Derogations are a site specific assessment and the intent of the Directive is that they should be exceptional. This means that the situation which exists in the glass industry where the majority of installations have a derogation simply should not arise.
The derogation process is not the appropriate mechanism to set SO_2 emission levels because there are no site specific reasons preventing the operators applying BAT. The problem is that the glass operators generally apply all the techniques set out in the BREF, yet despite this are unable to achieve the BAT-AELs. So achieving the BAT-AEL will require measures beyond those identified as BAT. Other than for reasons of local air quality, there is no requirement in the

IED for Competent Authorities to require operators to apply beyond BAT measures.
This is a highly unsatisfactory situation. That being said, the likelihood that future reviews of the BREF will see a relaxation in the BAT-AEL may be low, as the European Commission may be unwilling to admit that the current value was set incorrectly, also back-sliding on environmental emission standards will be resisted by some members of the Technical Working Group.
Therefore, maintaining SO_2 emissions at their current levels of around 800 mg/Nm^3 is probably not sustainable in the long term and the BAT-AEL range of 200 – 500 mg/Nm^3 is likely to remain the target to aim at.

4. Review of operator improvement condition reports

4.1 Overview of options

The operators' reports generally consider 3 options:

1) Continuation of current practice (business as usual)
2) Increasing the rate of lime injection into the dry scrubbing plant with no recycling of filter dust
3) Increasing the rate of lime injection into the dry scrubbing plant with partial recycling of filter dust

For the Allied plant at Leeds a fourth option was considered at the request of the Council.

4) As for options 2 and 3 but reducing the emissions to 650 mg/Nm^3 rather than 500 and seeking a derogation for this higher value (Leeds)

The reports however point out that there are limits to the throughput and performance of the dry scrubbing units, e.g. the inability of hydrated lime to further absorb further SO_2 as the system has reached equilibrium, it is claimed the further addition of lime would therefore have no effect
Overall, the reports do not demonstrate that any of the options considered can actually deliver the claimed benefits.

4.2 Stopping or limiting the recycling of filter dust

The mass balances produced in the reports, made by the operators in response to the improvement conditions, show that even with 100% recycle of filter dust, substantial amounts of sodium sulphate are still added to the batch mixing plant. The sulphur contained in the filter dust is available for use in the furnace to promote good mixing and the release of trapped air from within the melt. If filter dust recycling were stopped or limited in some way, then the sulphur in the dust would need to be replaced with sodium sulphate. Thus there would be no overall benefit to the sulphur balance and therefore no reduction in SO_2 emissions to air.
Selenium is also used in flint glass production as a decolouriser. A large proportion of selenium is volatilised in the furnace and recovered in the filter dust. Recycling of the filter dust therefore also results in the need to add less fresh selenium to the batch mix.
However, the practice of 100% filter dust recycling also runs the risk that impurities present in the raw materials concentrate up to a point where this

impacts on the quality of the glass. Industry representatives recognise this possibility but claim that it does not occur in practice. Although it is interesting to note that filter dust is not included in the batch mix of some high quality flint glass products.
Notwithstanding the potential practical limitations on filter dust recycling, it is concluded that filter dust recycling is a positive beneficial practice. Indeed if the effectiveness of the sulphur recovery could be improved, there is plenty of scope for increasing the level of recycle, thus reducing sodium sulphate input and thereby reducing SO_2 emissions.

4.3 Going beyond BAT to achieve the BAT-AEL

There are 4 possible options to reduce SO_2 emissions to air:

1) Improve the operation of the sulphur recovery system
2) Limit the amount of external cullet that can be incorporated into the glass
3) Improve the quality, (i.e. reduce the organic contamination) of external cullet
4) Install second stage SO_2 abatement

Whilst improving the operation of existing dry scrubbing systems could yield some reduction in SO_2 emissions, it is unlikely to be sufficient to achieve the BAT-AEL. Thus in the short term limiting the amount of external cullet is the only available option, but this will come at a penalty of increased energy consumption. It could also have a significant negative impact on the recycling of glass as described in the industry split view of BAT 19.
In the longer term, improving the quality of cullet (e.g. improved collection, processing or pre-treatment) or second stage SO_2 abatement or a combination of these represents the only way of achieving BAT-AELs if current rates of glass recycling are to be maintained.
Second stage abatement would certainly be a measure beyond that set out currently in the Glass BREF BAT conclusions. However effective SO_2 abatement would enable emissions to air to be reduced to the lower end of the BAT-AEL range in the Glass BREF BAT conclusions.

5. Key Findings

10 out of 12 UK manufacturing sites covering 23 out of 28 furnaces producing container glass have a derogation from BAT-AELs for emissions of SO_2 to air. All the plants with derogations comply with the narrative statement in BAT 19 of the Glass BREF BAT conclusions for minimising SO_2 emissions, notwithstanding this they are unable to achieve the BAT-AEL. There are no site specific factors preventing the operators from applying BAT.
The principal reason why so many UK plants cannot achieve the BAT-AEL for SO_2 emissions to air is the high level of external cullet used in the glass making process and dealing with the levels of organic contamination present in the cullet. The organic matter present in cullet results in higher levels of sodium sulphate being added into the process, and this in turn is resulting in levels of SO_2 in the exhaust gas from the furnaces beyond the removal capacity of the dry scrubbing

systems employed at these sites. The 2 plants (5 furnaces) operating without a derogation all produce high quality glass with no cullet (or filter dust) included. The BAT-AEL is flawed in that it appears to be based on a statistical analysis of the data and no analysis is presented on the impact of filter dust recycling and the rate of incorporating external cullet. The process for deriving the BAT-AEL does not appear to have been derived in line with current BREF practice. That being said, there can be no certainty that future reviews of the BREF will see a relaxation in the BAT-AEL.
At the time the derogations were granted, it was believed that the practice of 100% recycling of filter dust into the furnace contributed to UK plants not achieving the BAT-AEL. This has been found not to be the case, but this practice means the dry scrubbing process should be viewed in a different light as primarily a sulphur recovery process for recycling, as well as abatement.

6. Recommendations

Maintaining SO_2 emissions at their current levels of around 800 mg/Nm^3 is probably not sustainable or defendable in the long term and despites its faults, the BAT-AEL range of 200 – 500 mg/Nm^3 represents the target to aim at.
Derogation under Article 15(4) of IED is not the right mechanism for addressing this problem. All the operators are applying BAT, and whilst there may be site specific reasons why some of them cannot do more, there are no site specific reasons preventing them applying BAT as it is currently written.
Consideration could be given to reducing emission limit values either through a revision to UK statutory guidance, or through an industry agreement with government under the umbrella of its air quality strategy. The time period for implementation would need to be sufficient for operators to install any process changes that might be necessary, e.g. secondary abatement. Otherwise, they would have to limit their use of external cullet.
In the interim, ELVs in permits should be retained at their current levels; derogations for SO_2 could be retained, but should eventually be cancelled, once the future direction has been agreed.
Further work should be carried out to assess the cullet supply chain from the collection of waste glass, its separation from other waste streams and subsequent treatments and processing prior to its reincorporation into glass products, with a view to improving its quality.

Appendix 1 – Container Glass Installations

The following sites have a derogation from the BAT-AEL in table 9 (BAT 19) of the BAT conclusions:

- Allied Glass Limited, Knottingley (partial)
- Allied Glass Limited, Leeds
- Ardagh Glass Limited, Barnsley
- Ardagh Glass Limited, Doncaster
- Ardagh Glass Limited, Irvine
- Ardagh Glass Limited, Knottingley
- Encirc Limited, Derrylin

- Encirc Limited, Elton
- Owens Illinois Limited, Alloa
- Stolzle Flaconnage Limited, Knottingley

Each of these is described in outline below.

The Allied Knottingley site comprises:

Two end-fired gas fired regenerative furnaces (G1 and G2). The nominal capacity of the furnaces are 320 tonnes/day for G1, and 130 tonnes/day for G2. G1 produces normal flint glass, whereas G2 produces high quality flint glass and does not include cullet or filter dust in the batch mix. Filter dust from G2 is thus incorporated into G1. Each furnace has its own dedicated dry scrubbing system and bag filter. G1 has a derogation for SO_2, whereas G2 is able to achieve the BAT-AEL.

The Allied Leeds site comprises:

Two end-fired gas fired regenerative furnaces, (L1, 2007 and L2, 2009), a rebuild of L1 is scheduled for 2020, with L2 in 2023. The nominal capacity of the furnaces are 275 tonnes/day for L1, and 255 tonnes/day for L2. Although both plants are currently operating at a little below their full capacity. Both furnaces are used to manufacture flint glass only. Each furnace has its own dedicated dry scrubbing system and bag filter.

The Ardagh Barnsley site comprises:

Four end-fired gas fired regenerative furnaces (B1, B3, B4 and B7). The capacity of the units range between 160 to 400 tonnes per day with a combined capacity of all four units of 1,045 tonnes/day. There are two dry scrubbing units each with an ESP, B1 and B3 combine into EP1 with B4 and B7 combining into EP2. Amber, Green and Flint glass is produced on all four furnaces.

The Ardagh Doncaster site comprises:

Three cross-fired gas fired regenerative furnaces (W1, W2 and W3); W1 and W2 have electric boost. The capacity of each unit is 330 tonnes/day, although each typically operates at between 225 and 275 tonnes/day. Each furnace has its own dedicated dry scrubbing system and bag filter.

The Ardagh Irvine site comprises:

Two regenerative gas fired furnaces, one of the cross-fired type (P4) and one end-fired type (P5). The capacity of P4 is 360 tonnes/day, this furnace produces Flint glass operating with a maximum of 20% cullet in the melt feeding into 3 production lines. The P5 furnace capacity is 180 tonnes/day, this furnace produces green glass and operates with a maximum of 88% cullet feeding 2 production lines. Each furnace has its own dedicated dry scrubbing system and bag filter.

The Ardagh Knottingley site comprises:

Three gas fired furnaces, one of the cross-fired type (K6) and two end-fired regenerative furnaces (K7 and K8). The capacities of furnaces K6, K7 and K8 are 315 tonnes/day, 280 tonnes/day and 250 tonnes/day respectively. However throughput is currently around 239 tonnes/day, 200 tonnes/day and 206 tonnes/day. K6 produces green glass, K7 produces both green and amber glass

and K8 produces amber glass. Each furnace has its own dedicated dry scrubbing system and bag filter.

The Encirc Derrylin site comprises:

Two end-fired regenerative furnaces powered by a combination of HFO, electric boost and diesel gas oil. Each of the furnaces has a capacity of approximately 475 tonnes melt per day. Typical throughput of green and amber containers varies from approximately 90% of maximum upwards. Waste gases from the furnaces pass through a four-stage precipitator abatement plant (EP) with lime injection and are discharged through a stack (emission point A1) which stands 91 m high.

Note: Furnaces are oil fired as there is no natural gas in the area, this is currently being installed and once the infrastructure is in place, furnaces will be renewed / rebuilt.

The Encirc Elton site comprises:

Two gas fired regenerative furnaces (A and B) with a maximum combined capacity of 1,500 tonnes/day; furnace A produces flint glass about 2/3^{rds} of the time and amber glass at other times on a campaign basis, typical output is 865 tonnes/day. Furnace B only produces flint glass, typical output is 684 tonnes/day. The dry scrubbing system for each line feeds into a common ESP unit. Thus there is only one air emission point. Hydrated lime has recently been replaced with sodium bicarbonate in an attempt to increase the level of sulphur recovery. Furnace B was rebuilt early 2018 with Furnace A scheduled for rebuild in the first quarter of 2020. The Furnace A rebuild programme will include additional / upgraded abatement plant to ensure compliance with BAT AELs.

The Owens Illinois Alloa site comprises:

The site has 4 furnaces (nos. 81, 82, 84 and 85), 3 of which (81, 82 and 84 furnaces commonly known as ' the 80s furnaces') are linked to one abatement unit (an Electrostatic Precipitator (EP) with lime injection), whilst the remaining furnace 85) has a dedicated abatement unit (EP with lime injection). 81 and 82 furnaces have been recently rebuilt to include NOx reduction primary measures, including air staging, low NOx burners and a modified furnace design. The NOx reduction benefits of the new furnaces have however not been realised due to the fact that the emissions from all 3 furnaces are combined into 1 EP.

The Stolzle Flacconage Knottingley site comprises:

Stolzle Flaconnage operates a single furnace known as “F1” which has a capacity of approximately 185 tonnes/day. It is a gas-fuelled, electrically boosted end-fired regenerative furnace producing extra-white flint for “flint flaconnage and prestige ware”. Waste gases pass through a dry scrubber and bag filter. Filter dust is currently not recycled into the batch. (It has previously been partially recycled.)

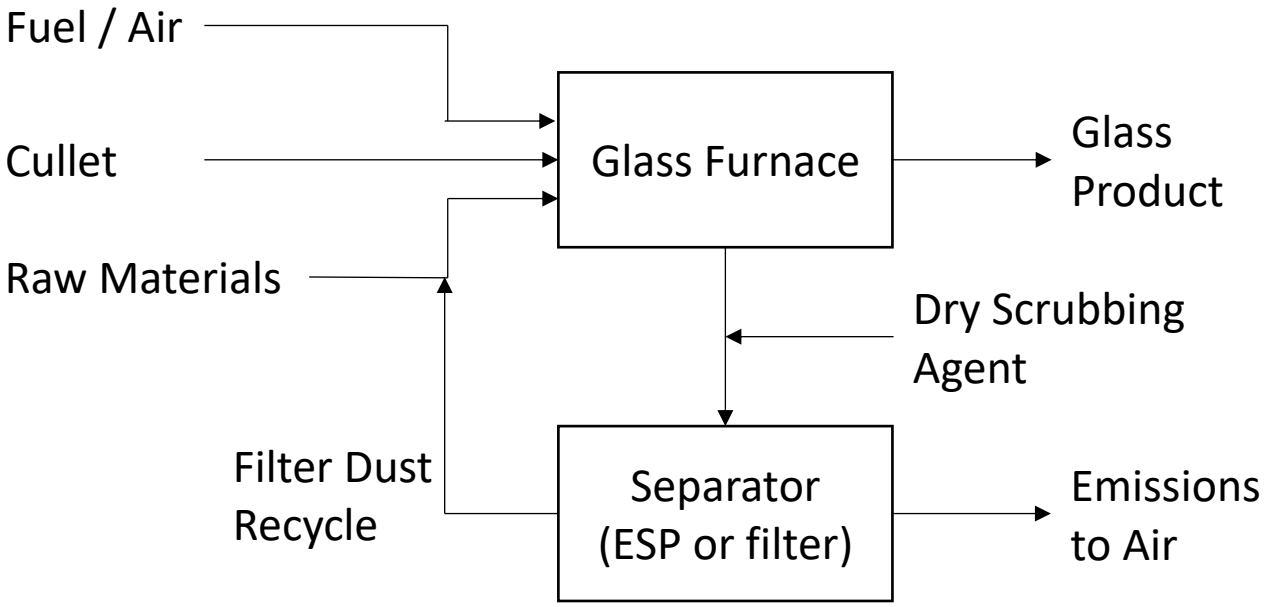
Generally, only internal cullet is used because of the high chemical purity required for most products. However, some external flint cullet may be used where product quality permits.

Other Derogations

A number of these plants also have time limited derogations for NO_X emissions, normally linked to the date of future furnace rebuilds. Two plants have a

derogation for dust, one of which is linked to a specific mode of operation. These derogations are not considered in this report and have no impact on the emissions of SO_2.

Appendix 2 – Flow Diagram of Container Glass Manufacturing Process



Appendix 3 - References

1) Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions (integrated pollution prevention and control).
2) Best Available Techniques (BAT) Reference Document for the Manufacture of Glass – JRC – 2013.
3) Commission Implementing Decision of 28 February 2012 establishing the best available techniques (BAT) conclusions under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions for the manufacture of glass.
4) BAT Assessment and IED Derogation Application, Allied Glass Limited – Leeds – Report by AECOM to Leeds City Council, January 2018.
5) BAT Assessment and IED Derogation Application, Allied Glass Limited – Knottingley – Report by AECOM to Wakefield Metropolitan District Council, March 2018.
6) BAT Assessment and IED Derogation Application, Ardagh Glass Limited – Barnsley – Report by AECOM to Barnsley Metropolitan Borough Council, February 2018.
7) BAT Assessment and IED Derogation Application, Ardagh Glass Limited – Doncaster– Report by AECOM to Doncaster Metropolitan Borough Council, February 2018.
8) BAT Assessment and IED Derogation Application, Ardagh Glass Limited – Knottingley – Report by AECOM to Wakefield Metropolitan District Council, February 2018.
9) BAT Assessment and IED Derogation Application, Encirc Limited – Elton – Report by AECOM to Cheshire West and Chester Council, May 2018.
10) Environmental Permit PPC/W/20028 – SEPA
11) Compliance Assessment Report, IPRI Ref No. 2017/18-3, Permit Number P0053/04A – Northern Ireland Environment Agency
12) Permit Variation Notice, P0053/04A/V7 – Northern Ireland Environment Agency
13) Clean Air Strategy 2018 – DEFRA

APPENDIX 4

INTERPRETATION & EXPLANATORY NOTES

These interpretations and explanatory notes do not form part of your Environmental Permit conditions, however they do provide useful information about the Environmental Permitting Regulations (EP Regulations):

In relation to this Permit, the following expressions shall have the following meanings:

"Activity" - An activity listed in Part 2 of Schedule 1 to the EP Regulations that will form part of an EP installation or be a mobile plant

"Best Available Techniques (BAT)" Best available techniques means the most effective and advanced stage in the development of activities and their methods of operation which indicates the practical suitability of particular techniques for providing in principle the basis for emission limit values designed to prevent, and where that is not practical, generally to reduce emissions and the impact on the environment as a whole. For those purposes:

- "Available techniques" means those techniques which have been developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the cost and advantages, whether or not the techniques are used or produced inside the United Kingdom, as long as they are reasonably accessible to the Operator;

- "Best" means, in relation to techniques, the most effective in achieving a high general level of protection of the environment as a whole;

- "Techniques" includes both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned. Schedule 2 of the Regulations shall have effect in relation to the determination of best available techniques

"Change in Operation" - In relation to an installation or mobile plant, a change in its nature or functioning or an extension which may have consequences for the environment.

"Enforcement notice" - A notice served by a local authority to enforce compliance with the permit conditions or require remediation of any harm following a breach of any condition.

"The EPR / EP Regulation" - The Environmental Permitting (England and Wales) Regulations 2016 S.I. 2016 No.1154 and words and expressions defined in the EPR shall have the same meanings when used in this Permit save to the extent they are explicitly defined in this Permit.

“Fugitive Emission” - Means an emission to air or water (including sewer) from the permitted installation that is not controlled by an emission limit imposed by a condition of this Permit.

“Installation” - A stationary technical unit where one or more activities listed in Part 2 of Schedule 1 to the EP Regulations are carried out and any other location on the same site where any other directly associated activities are carried out and any activities that are technically linked. The terms ‘regulated facility’ and ‘installation’ are, in effect, interchangeable for A(2) and B activities.

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

“Operator”- The person who has control over the operation of the installation/regulated facility (EP Regulation 7).

“Permit”- A permit granted under EP Regulation 13 by a Local Authority allowing the operation of an installation subject to certain conditions.

“Pollution”- Any emission as a result of human activity which may be harmful to human health or the quality of the environment, cause offence to any human senses, result in damage to material property, or impair or interfere with amenities and other legitimate uses of the environment (EP Regulation 2(1)).

“Regulator” - Means any officer of the City of Doncaster Council who is authorised 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(1) of that Act.

“Revocation notice” A notice served by the Regulator under EP regulation 22 revoking all or part of a permit.

“Monitoring” - Includes the taking and analysis of samples, instrumental measurements (periodic and continual), calibrations, examinations, tests and surveys.

APPEAL AGAINST PERMIT CONDITIONS

Any person who is aggrieved by the conditions attached to a permit can appeal under regulation 31 of the Environmental Permitting (England & Wales) Regulations 2016 to the Planning Inspectorate. Appeals must be received by the Planning Inspectorate no later than **6 Months** from the date of the decision (normally the date on the bottom of the permit.)

Appeals relating to Prescribed Activities in England should be sent to:

The Planning Inspectorate
Environment Team, Major & Specialist Casework

Room 4/04 – Eagle Wing
Temple Quay House
2 The Square
Temple Quay
Bristol
BS1 6PN

There are no charges for appealing and there is no statutory requirement to submit an appeal form. However, an appeal form has been prepared and is available for use at: **www.planninginspectorate.gov.uk/pins/environment/environment/index.htm**

For an appeal to be valid, appellants (the person/operator making the appeal) are legally required to provide all of the following:

- written notice of the appeal;
- a statement of the grounds of appeal;
- a statement indicating whether the appellant wishes the appeal to be dealt with by written representations procedure or at a hearing.

(The above three documents must be forwarded to the regulator in addition to the Planning Inspectorate.)

- a copy of any relevant application;
- a copy of any relevant permit;
- a copy of any relevant correspondence between the person making the appeal ("the appellant") and the regulator;
- a copy of any decision or notice, which is the subject matter of the appeal.

Appellants should state whether any of the information enclosed with the appeal has been the subject of a successful application for commercial confidentiality under EP regulation 49 and provide relevant details. Unless such information is provided all documents submitted will be open to inspection.

On receipt of an appeal and during the appeal process both main parties will be informed by the Inspectorate about the next steps, which will explain the procedures and submission timetable for representations.

To withdraw an appeal – which may be done at any time – the appellant must notify the Planning Inspectorate in writing and copy the notification to the local authority who must in turn notify anyone who has expressed an interest in the appeal.

Please Note.

An appeal will **not** suspend the effect of the conditions appealed against; the conditions must still be complied with.

On determination the Inspector, if the case is recovered, can affirm or quash conditions and can direct the regulator to grant and vary conditions of a permit. The Inspector can give directions as to the conditions to be attached to a permit.

Our enforcement of your permit will be in accordance with the Regulators' Compliance Code