# Notice of variation and consolidation with introductory note

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

Johnson Matthey PLC

Royston Site
Orchard Road
Royston
Hertfordshire
SG8 5HE

### Variation application number

EPR/BT7086IJ/V017

### Permit number

EPR/BT7086IJ

# Royston Site
# Permit number EPR/BT7086IJ

## Introductory note

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

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

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

This variation is for:

- Updating the registered office address from 5th Floor, 25 Farringdon Street, London EC4A 4AB to 5th Floor, 2 Gresham Street, London EC2V 7AD.
- Updating the names of production activities: Advanced Glass Technologies (AgT) to Silver Coating Technologies (SCT); Homogeneous catalyst process (HCP) to Homogeneous Catalyst Process (HomCat); Chemicals, Catalysts and Refining to the Refining & Chemicals Europe (R&CE) business unit; Emission Control Technologies (ECT) to Clean Air.
- Removing references to Fine Chemicals Divisional Products (FCDP) since this plant has been decommissioned.
- Removing references to emission point A1, which has been decommissioned.
- Removing references to the ZeoCat process, which has been decommissioned.
- Adding the Third Century Refinery (3CR) as a Section 4.1 Part A(1) (a) (vii) activity (AR3) with two new emission points to air (A101 and A102).
- Updating the site plan to reflect the addition of the Third Century Refinery (3CR) and the associated installation boundary extension.
- Adding two emergency back-up diesel generators (emission points A103 and A104).
- Expanding the HomCat plant to include the production of two new catalysts.
- Adding the iridium-based manufacture of catalyst coated membrane (within activity AR8).
- Authorising the acceptance of waste classified under European Waste Catalogues codes 10 07 04, 10 07 99, 10 11 99, 12 01 04 and 16 08 01.
- Updating the monitoring standard used for emissions of volatile organic compounds from the Silver Coating Technologies (emission points A57, A109, A117 and A228).
- Reducing the emission limits for oxides of nitrogen from the Combined Heat & Power engines (emission points A8a and A8b).

The remainder of the site and its operation will continue as before.

The main features of the installation are:

The site at Royston operates a wide variety of processes primarily focused on the refining of precious metals, the development of speciality chemicals and their subsequent processing into a diverse range of products.

The operations are by nature diverse and complex covering a wide range of activities including auto catalysts and process catalyst manufacture, precious metal refining and fabrication, chemical production and engine/auto catalyst test facilities.

These processes have been divided into three categories: main production activities, small-scale activities and ancillary operations.

**Main production activities** consist of the following business units: Clean Air, Refining & Chemicals Europe (R&CE), Noble Metals and Silver Coating Technologies (SCT).

R&CE comprises three separate production areas:

- Platinum Group Metals Refinery (PGMR) consisting of PGMR including the Insoluble Metals Refinery (IMR):
- Fine Chemicals consisting of Inorganics and Homogeneous Catalyst Process (HomCat); and
- Supported Metal Catalysts production consisting of ProCat 1.

The site product range includes:

- Autocatalysts for cleaning up emissions from vehicle exhausts;
- Process Catalysts for use in the chemical and pharmaceutical industries. These enable processes to operate at lower temperatures and pressures and with greater material efficiency giving the consequent environmental benefits of reduced energy and raw material consumption;
- Precious Metals for investment purposes;
- Precious Metal Component Fabrication for engineering, glass and chemical applications;
- Precious Metal Inks, Pastes, Powders and Coatings for use in the electronic and automotive industries;
- Speciality Chemicals for use in research and development applications; and
- Catalyst coated membrane for use in hydrogen fuel cells.

These products are primarily manufactured using batch processing or on a campaign basis. The inherent high value of precious metals has a major bearing on processes and products in that every effort is made to prevent losses. Many of the Johnson Matthey products retain their value at the end of their working life, which encourages their return for precious metal recovery and subsequent reprocessing into new products.

The Johnson Matthey sister site at Brimsdown, Enfield undertakes the primary refining of feedstock before onward transfer to Royston.

**Small-scale activities** consist of the following operational units: Research and Development, Autocatalyst Testing and Metal Joining.

**Ancillary operations** are generally operated on a site wide basis and are mainly shared by more than one operational unit and consist of: Site Effluent Treatment Plant, Values Recovery Plant, Dispensing and Packing, Boiler House, Analytical Laboratories, Engineering, Main Stores, and Combined Heat and Power.

The installation has emissions to air of particulates, chlorine, hydrogen chloride, ammonium chloride, oxides of nitrogen, volatile organic compounds, carbon monoxide and ammonia. Assessment of these releases by dispersion modelling shows that they will have no adverse environmental impact.

Releases to water are treated in Johnson Matthey's on-site effluent treatment plant to ensure levels are below Anglian Water Services trade effluent consent limits. The effluent is discharged to the foul sewer where it undergoes further treatment in Anglian Water Services Royston sewage treatment works. Other effluent streams are sent off-site for further treatment or recovery.

The Royston site is located in north-west Royston, between the town centre and the A505 bypass within the Orchard Road Industrial Estate.

There are two SSSIs within 2 km of the site; Therfield Heath and Holland Hall Railway cutting. There are also several other conservation sites within 2km of the site.

The installation operates to ISO14001 standards under a number of separate certifications.

The schedules specify the changes made to the permit.

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

| Status log of the permit | | |
|---|---|---|
| **Description** | **Date** | **Comments** |
| Application for permit BT7086IJ received<br>(EPR/BT7086IJ/A001) | 27/06/2003 | |
| Response to request for information | 30/06/2003 | Response received 14/07/2003. |
| Duly made | 14/07/2003 | |
| Additional information received | 24/12/2003 | Accepted 30/12/2003. |
| Permit BT7086IJ issued | 21/06/2004 | |
| Application for variation NP3733BA<br>(EPR/BT7086IJ/V002) | 23/07/2004 | |
| Variation NP3733BA issued | 27/07/2004 | |
| Application for variation DP3834SU received.<br>(EPR/BT7086IJ/V003) | 22/03/2005 | |
| Request for H1 assessment and Health based assessment as requested by PCT | 31/05/2005 | Response received 27/06/2005. |
| Request by Agency for ADMS modelling files for audit by AQMAU | 23/05/2005 | Response received 02/06/2005. |
| Request by Agency for JM to repeat air modelling due to bug in version 3.2 of ADMS and to repeat using 3 years met data following AQMAU audit | 07/07/2005 | Response received 22/07/2005. |
| Variation DP3834SU issued | 17/08/2005 | |
| Application for variation NP3136LJ received.<br>(EPR/BT7086IJ/V004) | 15/12/2006 | |
| Schedule 7 Notice served. | 11/01/2007 | Response received 08/02/2007. |
| Additional Information received | 14/02/2007 | |
| Additional information received - Responses to question 2 detailing abatement equipment | 11/01/2007 | Response received 14/02/2007. |
| Additional information received - Platinum Reduction Project; information detailing re-ducting of platinum reduction process from stack A39 to A30 | 15/03/2007 | Response received 19/03/2007. |
| Additional information received - Process Monitoring Requirements - Details of abatement process monitoring | 03/04/2007 | Response received 26/04/2007. |
| Variation notice BT7086IJ/NP3136LJ issued | 29/06/2007 | |
| Application for variation KP3033XQ received | 21/10/2007 | |

| Status log of the permit | | |
|---|---|---|
| **Description** | **Date** | **Comments** |
| (EPR/BT7086IJ/V005) | | |
| Variation Notice KP3033XQ issued | 07/11/2007 | |
| Application for variation EPR/BT7086IJ/V006 received | 08/12/2010 | |
| Variation EPR/BT7086IJ issued | 03/03/2011 | |
| Application for variation EPR/BT7086IJ/V007 received | 24/06/2011 | |
| Variation EPR/BT7086IJ/V007 issued | 18/07/2011 | |
| Application for variation EPR/BT7086IJ/V008 received | 12/09/2011 | |
| Variation EPR/BT7086IJ/V008 issued | 09/12/2011 | |
| Agency variation determined EPR/BT7086IJ/V009 | 28/05/2013 | Agency variation to implement the changes introduced by IED. |
| Variation application EPR/BT7086IJ/V010 | Duly made 21/11/2013 | Expansion of storage facilities. |
| Variation determined EPR/BT7086IJ/V010 | 09/12/2013 | Varied permit issued. |
| Application EPR/BT7086IJ/V015 (variation) | Duly made 19/12/2014 | Application to expand the CSF2 manufacturing facility. |
| Additional information received | 23/01/2015 | Emission to air monitoring results for the CSF dryer cooling exhaust and ECT Tank Vents CSF2. |
| Variation determined EPR/BT7086IJ/V011 | 11/02/2015 | Varied permit issued. |
| Variation application EPR/BT7086IJ/V012 | Duly made 21/04/2016 | New production area PU12 to replace PU8-10. |
| Schedule 5 notice issued on 25/05/2016 | Response 14/06/2016 and 21/06/2016 | |
| Schedule 5 notice issued on 13/07/2016 | Response dated 01/08/2016 | Questions about dispersion modelling. |
| Variation determined EPR/BT7086IJ/V012 | 06/09/2016 | |
| Variation application EPR/BT7086IJ/V013 | Duly made 28/09/2017 | Application to replace two combined heat & power engines. |
| Variation application EPR/BT7086IJ/V014 | Duly made 08/09/2017 | Application to add a 3D printing pilot plant with two local exhaust ventilation emission points served by a dust extraction and filtration system. |
| Additional information received | 31/08/2017 | New engines specification. |
| Additional information received | 29/09/2017 | Stack and vents map. |
| Additional information received | 10/10/2017 | Improvement condition timescale and kiln details. |
| Variation determined EPR/BT7086IJ | 23/10/2017 | Variations V013 and V014 issued in consolidated format with Environment Agency |

| Status log of the permit | | |
|---|---|---|
| **Description** | **Date** | **Comments** |
| | | Variation to add in multi-product protocol condition and correct the point source emissions condition. |
| Application EPR/BT7086IJ/V015 (variation and consolidation) | Duly made 17/06/2020 | Application to add a process to impregnate platinum onto zeolite. |
| Additional information received | 24/07/2020 | Revised air dispersion modelling report and backing data to include scenario of adding only the platinum on zeolite process. |
| Additional information received | 26/08/2020 | Updated dispersion modelling data for the platinum on zeolite process scenario. |
| Additional information received | 17/11/2020 | Response to Schedule 5 Notice dated 25/09/2020. |
| Additional information received | 05/01/2021 | Response to request for further information dated 31/12/2020. |
| Variation determined and consolidation issued<br>EPR/BT7086IJ<br>Billing ref.<br>AP3905BH | 10/03/2021 | Varied and consolidated permit issued in modern format. |
| Application EPR/BT7086IJ/V016 (variation and consolidation) | Duly made 29/02/2024 | Application to add the production of catalyst coated membrane (Hydrogen Technology business unit) and replace the boilers. |
| Additional information received | 15/03/2024 | Air emission monitoring reports and revised air dispersion modelling report and files. |
| Additional information received | 19/03/2024 | Data sheets for boilers and Regenerative Thermal Oxidiser. |
| Additional information received | 18/04/2024 | Response to Schedule 5 Notice dated 26/03/2024. |
| Variation determined and consolidation issued EPR/BT7086IJ/V016 | 12/06/2024 | Varied and consolidated permit issued in modern format. |
| Application EPR/BT7086IJ/V017 (variation and consolidation) | Duly made 21/02/2025 | Application to:<br>• Make several administrative updates including updating the registered office address from 5th Floor, 25 Farringdon Street, London EC4A 4AB to 5th Floor, 2 Gresham Street, London EC2V 7AD.<br>• Add the Third Century Refinery (3CR).<br>• Expand the HomCat plant.<br>• Add the iridium-based production of catalyst coated membrane.<br>• Extend the installation boundary.<br>• Add two emergency diesel generators.<br>• Add five waste codes.<br>• Remove emission point A1 and the ZeoCat process. |
| Additional information received | 28/02/2025 | Confirmation of stack exit diameters used in air dispersion modelling. |

| Status log of the permit | | |
|---|---|---|
| **Description** | **Date** | **Comments** |
| Additional information received | 07/05/2025 | Clarification of assumptions used in air dispersion modelling. |
| Additional information received | 12/05/2025 | Further information on wastes received by Noble Metals. |
| Additional information received | 15/05/2025 | Assessment against the Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector (CWW) Best Available Techniques Conclusions. |
| Additional information received | 04/06/2025 | Further information on wastes received by Noble Metals. |
| Additional information received | 30/06/2025 | Further information on emission rates used in air dispersion modelling for emission point A197. |
| Additional information received | 02/06/2025 | Clarifications of administrative updates to permit. |
| Additional information received | 15/07/2025 | Clarification of a waste code description. |
| Additional information received | 16/07/2025 | Information on carbon bed abatement. |
| Additional information received | 1707/2025 | Solvent usage in relation to manufacture of iridium-based catalyst coated membrane. |
| Additional information received | 24/07/2025 | Monitoring standard used for emission points A57, A109, A117 and A228.<br>Reduction of emission limits for emission points A8a and A8b. |
| Variation determined and consolidation issued EPR/BT7086IJ/V017 | 30/07/2025 | Varied and consolidated permit issued in modern format. |

End of introductory note

# Notice of variation and consolidation

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

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

### Permit number

**EPR/BT7086IJ**

### Issued to

**Johnson Matthey PLC** ("the operator")

whose registered office is

**5th Floor**
**2 Gresham Street**
**London**
**EC2V 7AD**

company registration number 00033774

to operate a regulated facility at

**Royston Site**
**Orchard Road**
**Royston**
**Hertfordshire**
**SG8 5HE**

to the extent set out in the schedules.

The notice shall take effect from 30/07/2025

| Name | Date |
|---|---|
| **Denise Horton** | **30/07/2025** |

Authorised on behalf of the Environment Agency

## Schedule 1

The following conditions were varied as a result of the application made by the operator:

- Table S1.1, as referenced by conditions 2.1.1 and 2.3.7
- Table S1.2, as referenced by conditions 2.3.1 and 2.3.2
- Table S1.3, as referenced by condition 2.4.1
- Table S2.2, as referenced by condition 2.3.4
- Table S3.1a, as referenced by conditions 3.1.1, 3.5.1 and 3.5.4
- Table S3.1c, as referenced by conditions 3.1.1, 3.5.1 and 3.5.4
- Table S3.1e, as referenced by conditions 3.1.1, 3.5.1 and 3.5.4
- Table S3.1i, as referenced by conditions 3.1.1, 3.5.1 and 3.5.4
- Table S3.1j, as referenced by conditions 3.1.1, 3.5.1 and 3.5.4
- Table S3.1m, as referenced by conditions 3.1.1, 3.5.1 and 3.5.4
- Table S3.3, as referenced by condition 3.5.1
- Table S4.1, as referenced by condition 4.2.3
- Table S4.2, as referenced by condition 4.2.2
- Schedule 6, as referenced by condition 4.4.1
- Schedule 7, as referenced by condition 2.2.1

The following conditions are added as a result of the application made by the operator:

- 2.5.1 The operations specified in schedule 1 table S1.4 shall not commence until the measures specified in that table have been completed.
- Table S1.4, as referenced by condition 2.5.1.

| **Table S1.4 Pre-operational measures for future development** | | |
|---|---|---|
| **Reference** | **Operation** | **Pre-operational measures** |
| PO1 | Third Century Refinery (3CR) | **Noise management plan**<br>Prior to commissioning of the Third Century Refinery (3CR), the operator shall submit a Noise Management Plan to the Environment Agency for assessment and written approval.<br>The Noise Management Plan must contain:<br>• Demonstration that best available techniques are being used to reduce operational sound emissions from existing operations and those proposed by application EPR/BT7086IJ/V017.<br>• Specifications for plant associated with application EPR/BT7086IJ/V017.<br>The Noise Management Plan must be developed in line with the requirements set out in the guidance 'Noise and vibration management: environmental permits' found on www.gov.uk.<br>The operator must implement any proposals within the plan in accordance with the Environment Agency's written approval and within the approved timescales. |

## Schedule 2 – consolidated permit

Consolidated permit issued as a separate document.

# Permit

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

### Permit number

**EPR/BT7086IJ**

This is the consolidated permit referred to in the variation and consolidation notice for application EPR/BT7086IJ/V017 authorising,

**Johnson Matthey PLC** ("the operator"),

whose registered office is

**5th Floor**
**2 Gresham Street**
**London**
**EC2V 7AD**

company registration number 00033774

to operate an installation at

**Royston Site**
**Orchard Road**
**Royston**
**Hertfordshire**
**SG8 5HE**

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

| Name | Date |
|---|---|
| **Denise Horton** | **30/07/2025** |

Authorised on behalf of the Environment Agency

# Conditions

## 1 Management

### 1.1 General management

1.1.1 The operator shall manage and operate the activities:

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

(b) using sufficient competent persons and resources.

1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.

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

### 1.2 Energy efficiency

1.2.1 The operator shall:

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

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

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

### 1.3 Efficient use of raw materials

1.3.1 The operator shall:

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

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

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

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

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

1.4.1 The operator shall take appropriate measures to ensure that:

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

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

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

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

## 1.5 Multi product protocol

1.5.1 Where the operator proposes to make a change under a multi product protocol that is not otherwise the subject of an application for approval under the Regulations or this permit:

(a) the Environment Agency shall be notified of the proposed change;

(b) the notification shall contain a description of the change including: an assessment of its environmental impact; any relevant supporting assessments and drawings; and the proposed implementation date;

(c) the change shall not be implemented unless approved in writing by the Environment Agency;

(d) as from any approved implementation date, the operator shall operate in accordance with the changed multi product protocol in place of the previously approved version.

# 2 Operations

## 2.1 Permitted activities

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

2.1.2 Waste authorised by this permit shall be clearly distinguished from any other waste on the site.

## 2.2 The site

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

## 2.3 Operating techniques

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

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

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

2.3.4 Waste shall only be accepted if:

(a) it is of a type and quantity listed in schedule 2, table S2.2; and

(b) it conforms to the description in the documentation supplied by the producer and holder.

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

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

(b) the composition of the waste;

(c) the handling requirements of the waste;

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

(e) the waste code of the waste.

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

2.3.7 Hazardous waste shall not be mixed, either with a different category of hazardous waste or with other waste, substances or materials, unless it is authorised by schedule 1, table S1.1 and appropriate measures are taken.

## 2.4 Improvement programme

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

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

## 2.5 Pre-operational conditions

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

# 3 Emissions and monitoring

## 3.1 Emissions to water, air or land

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

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

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

## 3.2 Emissions of substances not controlled by emission limits

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

3.2.2 The operator shall:

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

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

3.2.3 All liquids in containers, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.

## 3.3 Odour

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

3.3.2 The operator shall:

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

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

## 3.4 Noise and vibration

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

3.4.2 The operator shall:

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

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

## 3.5 Monitoring

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

(a) point source emissions specified in tables S3.1a-o, and S3.2; and

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

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

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

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

# 4 Information

## 4.1 Records

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

(a) be legible;

(b) be made as soon as reasonably practicable;

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

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

(i) off-site environmental effects; and

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

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

## 4.2 Reporting

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

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

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

(b) the performance parameters set out in schedule 4, table S4.2 using the forms specified in table S4.3 of that schedule.

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

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

(b) for the reporting periods specified in schedule 4, table S4.1 and using the forms specified in schedule 4, table S4.3; and

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

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

4.2.5 Within 1 month of the end of each quarter, the operator shall submit to the Environment Agency using the form made available for the purpose, the information specified on the form relating to the site and the waste accepted and removed from it during the previous quarter, if during that quarter the total amount accepted exceeds 100 tonnes of non-hazardous waste or 10 tonnes of hazardous waste.

## 4.3 Notifications

4.3.1 In the event:

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

(i) inform the Environment Agency,

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

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

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

(i) inform the Environment Agency, and

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

(c) of a breach of permit condition which poses an immediate danger to human health or threatens to cause an immediate significant adverse effect on the environment, the operator must immediately suspend the operation of the activities or the relevant part of it until compliance with the permit conditions has been restored.

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

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

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

Where the operator is a registered company:

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

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

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

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

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

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

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

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

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

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

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

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

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

## 4.4 Interpretation

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

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

# Schedule 1 – Operations

| Table S1.1 Activities | | | |
|---|---|---|---|
| **Activity reference** | **Activity listed in Schedule 1 of the EP Regulations** | **Description of specified activity and WFD Annex I and II operations** | **Limits of specified activity and waste types** |
| AR1 | S4.1 A(1) (a) (vii) | Carried out in Homogeneous Catalyst Process (HomCat) of Fine Chemicals production area, which is part of Refining & Chemicals Europe (R&CE) business unit. | From receipt of raw materials to despatch/use of finished product incorporating the activities in Table S1.1. |
| AR2 | S4.2 A(1) (a) (iv) | Carried out in Refining & Chemicals Europe (R&CE), within the Platinum Group Metals Refinery (PGMR), (comprising the platinum and palladium refinery, and the Insolubles Metals Refinery (IMR)), and Inorganic Fine Chemicals production area. It is also carried out in research and development within R&CE Process Technology, including Silver Coating Technologies (SCT) development, and Clean Air. | From receipt of raw materials to despatch/use of finished product incorporating the activities in Table S1.1.<br>Only carried out within the PGMR if the 3CR (see activity reference AR3) is not in normal operation. |
| AR3 | S4.2 A(1) (a) (iv) Producing inorganic chemicals such as salts | Aqueous acid based chemical processes to refine precious metal solutions and salts, carried out in Refining & Chemicals Europe (R&CE) within the Third Century Refinery (3CR). | From receipt of raw materials to despatch/use of finished product incorporating the activities in Table S1.1.<br>Only carried out if the PGMR (see activity reference AR2) is not in normal operation. |
| AR4 | S4.2 A(1) (c) | Carried out in the manufacture of coatings for the autocatalyst (Fastcat) and catalytic soot filter (CSF) manufacture within the Clean Air business unit.<br>Also carried out in the manufacturing of other materials (ProCat 1) in the Refining & Chemicals Europe (R&CE) business unit. | From receipt of raw materials to despatch/use of finished product incorporating activities in Table S1.1. |
| AR5 | S4.2 A(1) (c) (viii): Any manufacturing activity involving the use of, or the use or recovery of, any compound of platinum. | Manufacture of catalyst coated membrane within Hydrogen Technology business sector. | From receipt of raw materials to the manufacture, storage and dispatch/use of finished products (including the storage and handling of waste |

| Table S1.1 Activities | | | |
|---|---|---|---|
| **Activity reference** | **Activity listed in Schedule 1 of the EP Regulations** | **Description of specified activity and WFD Annex I and II operations** | **Limits of specified activity and waste types** |
| | | | arising from the process). |
| AR6 | S4.2 A(1) (f) | Carried out in the manufacture of coatings for the autocatalyst (Fastcat) and catalytic soot filter (CSF) manufacture within the Clean Air business unit. | From receipt of raw materials to despatch/use of finished product incorporating the activities listed in Table S1.1. |
| AR7 | S5.4 A(1) (a) (ii) | Physico-chemical treatment of waste waters and storage of sludge. | From receipt of process effluent to the discharge to Anglian Water foul sewer including sludge tanker loading. |
| AR8 | S6.4 B (a) | Coating operations in the manufacture of catalysts within the supported metal catalysts (ProCat 1) production area of the R&CE business unit.<br>Also within the Fastcat and CSF production areas of the Clean Air business unit.<br>Also in the iridium-based manufacture of catalyst coated membrane within the Hydrogen Technology business sector. | From receipt of raw materials to despatch/use of finished product incorporating activities in Table S1.1. |
| | **Directly Associated Activity** | | |
| AR9 | Refining any non-ferrous metal or alloy, other than the electrolytic refining of copper | Carried out in Noble Metals business unit. Precious metal components are fabricated for engineering, glass and chemical applications. | From receipt of raw materials to despatch/use of finished product incorporating activities in Table S1.1. |
| AR10 | Ceramic production | Manufacturing less than 20 tonnes per year of ceramic catalyst/abatement support products using 3D printing and firing in kilns.<br>Carried out in the Noble Metals business unit. | From receipt of raw materials to despatch/use of finished product. |
| AR11 | Values Recovery Plant | For the recovery of precious metals from process effluent prior to final effluent treatment. | The recovery of precious metals from process effluent prior to final effluent treatment. |
| AR12 | Steam and electrical power supply | 2 x CHP gas engines with a thermal input of 4.5MWth.<br>3 gas fired boilers rated at a thermal input of 2.95MW each.<br>Used for provision of process steam and hot water. | Includes oil receipt and storage. Oil is used as a fuel in temporary boilers in emergencies or during plant maintenance of main boilers. |

| Table S1.1 Activities | | | |
|---|---|---|---|
| **Activity reference** | **Activity listed in Schedule 1 of the EP Regulations** | **Description of specified activity and WFD Annex I and II operations** | **Limits of specified activity and waste types** |
| | | 2 x 0.8 MWth diesel generators for use when power supply is interrupted. | The generators shall not be tested for more than 50 hours per year and shall be used for no more than 500 hours per year (emergency use only). |
| AR13 | Support Engineering Services | These exist in R&CE, Clean Air and Noble Metals. | These exist in R&CE, Clean Air and Noble Metals. |
| AR14 | Analytical Services Laboratory | These exist in R&CE, Clean Air, Noble Metals and Hydrogen Technology. | These exist in R&CE, Clean Air, Noble Metals and Hydrogen Technology. |
| AR15 | Dispensing and packing | For products. | |
| AR16 | Fuel Storage, transport and handling | The storage and handling of fuels, supplying engine and vehicle test work at the Clean Air. | Includes fuel receipt, storage and transfer. |
| AR17 | Hydrogen Technology Test Facility (HTTF) | Four Single Cell Test Stands for testing individual cells up to 0.5 kW output and three larger Short Stack Test Stands for testing stacked cells up to 12 kW output. | For testing catalyst coated membrane and membrane electrode assembly products as produced by Hydrogen Technology. |

| Table S1.2 Operating techniques | | |
|---|---|---|
| **Description** | **Parts** | **Date Received** |
| Application | The response to questions 2.1 and 2.2 given in section 2.1 and 2.2 of volume 1 of the application BT7086IJ | 27/06/2003 |
| | The response to questions 2.1 and 2.2 given in section 2.1, 2.2 and 2.6 of volume 1 of the application DP3834SU | 22/03/2005 |
| | The response to questions 2.1 and 2.2 given in section 2.1, and 2.2 in the Application NP3136LJ | 15/12/2006 |
| | The response to questions 2.1 and 2.2 given in section 2 of the BAT assessment ammonia stripping plant and acid scrubbing in application KP3033XQ. | 22/10/2007 |
| Multi-product protocol | Multi-Product Protocol Procedure ref. RS.EHS.006a | 24/10/2007 |
| Schedule 7 Notice Request dated 11/01/2007 | Response to question 1 detailing process control. | 14/02/2007 |
| Additional information (Schedule 7 response) | Responses to question 2 detailing abatement equipment. | 14/02/2007 |
| Platinum Reduction Project dated 15/03/2007 | Information detailing re-ducting of platinum reduction process from stack A39 to A30. | 19/03/2007 |
| Process Monitoring Requirements | Details of abatement process monitoring | 26/04/2007 |

| Table S1.2 Operating techniques | | |
|---|---|---|
| **Description** | **Parts** | **Date Received** |
| Clean Air (formerly ECT) Tech Centre Release Points | Listed under heading, Schedule 5, paragraph 13, details of release points in Clean Air (formerly ECT) Tech Centre | 24/05/2007 |
| Variation EPR/BT7086IJ/V006 | Response to question 3 of Part C3 of the application. | 08/12/2010 |
| Additional information EPR/BT7086IJ/V006 | Minor changes to detail relating to updated calcining technique | 21/02/2011 |
| Variation EPR/BT7086IJ/V007 | The operating techniques described in the application for variation | 24/06/2011 |
| Variation EPR/BT7086IJ/V008 | The operating techniques described in the application for variation, specifically referring to the operation of a fuel tank farm and fuel transfer system for the use of the specified fuel and fuel additives. | 12/09/2011 |
| Variation application EPR/BT7086IJ/V010 | Parts C2 and C3 of the application form and referenced supporting documents. | 29/10/2013 |
| Variation application EPR/BT7086IJ/V010 further information request response | Answers to questions 1, 2 and 3 in email confirming details on emissions to air and bunding specifications. | 21/11/2013 |
| Variation application EPR/BT7086IJ/V011 | Parts C2 and C3 of the application documents and all supporting information. Responses to request for information (email dated 18/12/14) and revised air emissions site plan. | 19/12/2014 |
| Variation application EPR/BT7086IJ/V011 further information request response | Emission to air monitoring results for the CSF dryer cooling exhaust and Clean Air (formerly ECT) Tank Vents CSF2. | 23/01/2015 |
| Variation application EPR/BT7086IJ/V012 | Application document EPR/BT7086IJ/V012, sections 3, 4.1, 4.2, 4.3, 4.4, 4.5 and 4.6 | 21/04/2016 |
| Response to schedule 5 notice dated 25/05/2016 | Response to questions 1 and 4 | 14/06/2016 |
| Variation Application EPR/BT7086IJ/V013 | Section 2.2 of the application document. | 28/09/2017 |
| Variation Application EPR/BT7086IJ/V014 | Sections 2.1 and 2.2 of the application document. | 08/09/2017 |
| | Stack map ref. PPC Stacks and Vents | 29/09/2017 |
| Variation application EPR/BT7086IJ/V015 | Technical standards and operating techniques detailed in document:<br>- EPR Application for a Normal Variation to Permit No. BT7086IJ/V015<br>provided in response to section 3a – technical standards, Part C3 of the application form.<br><br>Technical standards and operating techniques detailed in document:<br>- Johnson Matthey response to platinum on zeolite not duly made letter (response dated 27/05/20). | 17/06/2020 |
| Air Quality Report and dispersion modelling data provided with | Minimum scrubber of 80% for recovery of NOx prior to discharge from stack, A11. | 24/07/2020 and 26/08/2020 |

| Table S1.2 Operating techniques | | |
|---|---|---|
| **Description** | **Parts** | **Date Received** |
| Application EPR/BT7086IJ/V015 | | |
| Response to Schedule 5 Notice dated 25/09/2020 | Operating techniques described in the responses to the Notice (including accompanying information):<br>- Response to Questions 1 -2 on operating techniques to demonstrate compliance with Best Available Techniques (BAT);<br>- Response to Question 9 on operation of local exhaust ventilation (LEV):<br>- Response to Question 11 on handling of liquids within sumps in the buildings used for the PTZ process;<br>- Response to Question 12 on operation of aqueous effluent abatement systems;<br>- Response to Question 13 on operational procedure, PC 2103R126;<br>- Response to Question 14 on ensuring containment of materials whilst transferring zeolite to the charging impregnator vessels;<br>- Response to Question 15 on inspection and maintenance of assets within the ProCat 1 building;<br>- Response to Question 17 on the storage and handling of materials used within the PTZ process;<br>- Response to Question 18 on the control of fire water;<br>- Response to Question 19 on the use of reagents within the PTZ process to minimise odour. | 13/11/2020 |
| Response to Schedule 5 Notice dated 26/03/2024 | Revised Best Available Techniques & Operating Techniques (BATOT) document (V4) provided in response to section 3a – Technical standards of Part C3 of the application form<br>Responses to:<br>• Questions 4 and 13 on storage<br>• Questions 5 and 6 on process monitoring<br>• Question 12 on secondary containment | 18/04/2024 |
| Variation application (EPR/BT7086IJ/V017) | Best Available Techniques / Operating Techniques (BATOT) document (Final) dated 27/09/2024. | 21/02/2025 |
| Response to request for further information dated 02/05/2025 | Responses to questions 1B and 1C, describing acceptance of waste for Noble Metals.<br>Assessment against the Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical Sector (CWW) Best Available Techniques Conclusions. | 12/05/2025 & 15/05/2025 |
| Response to request for further information dated 23/05/2025 | Responses to questions 2b and 2c, describing acceptance of waste for Noble Metals. | 04/06/2025 |
| Response to request for further information dated 14/07/2025 | Response to question 3, describing the management of the HomCat plant expansion carbon bed abatement. | 16/07/2025 |

| Table S1.3 Improvement programme requirements | | |
|---|---|---|
| **Reference** | **Requirement** | **Date** |
| IC 9 | A written report shall be submitted to the Agency for approval. The report should detail the development and implementation of a strategy for reducing releases of Class B VOCs from AgT to less than 75 $mg/m^3$.<br>The notification requirements of condition 2.4.2 shall be deemed to have been complied with on submission of the procedure.<br>Any improvements arising from the strategy shall be implemented by the operator from the date of approval in writing by the Agency. | Complete |
| IC13 | The operator shall conduct monitoring of the new clean air vents from the muenstermann ovens. A written report demonstrating the conclusions of the monitoring should be submitted to the Environment Agency for approval.<br>The report shall include but not be limited to the following:<br>• Monthly samples for six months of $NO_x$, VOC and Particulate emissions from new emission points to air A272-A278. | Complete |
| IC 14 | The operator shall investigate the use of sub-metering of water. The operator shall submit a report summarising the investigation to the Environment Agency. The report shall include proposals for implementing sub-metering where appropriate. | Complete |
| IC15 | A written report shall be submitted to the Agency. The report should detail options out to reduce HCl emissions to 10 $mg/m^3$ from stacks A28, A30 and A31.<br>The notification requirements of condition 2.4.2 shall be deemed to have been complied with on submission of the report.<br>The preferred option shall be implemented by the operator from the date of approval in writing by the Agency. | Complete |
| IC16 | (a) The operator shall submit a written proposal to the Environment Agency for approval on the commissioning of the 3-D printing plant. This report shall include:<br>- The date of commencement of commissioning;<br>- Details of all activities to be carried out during commissioning (including emissions monitoring);<br>- The extent and duration of commissioning;<br>- Criteria for confirming the completion of commissioning.<br>Approved commissioning proposals shall be implemented by the operator in line with the timescales approved by the Environment Agency subject to such amendments or additions as notified by the Environment Agency.<br>(b) The operator shall submit a written report to the Environment Agency for approval that details the emissions to air during the commissioning of the 3D Printing Plant LEVs from stacks A284 and A285 and the kiln from stack A243. The report shall compare the emissions from the stacks to the emission conclusions made in application EPR/BT7086IJ/V014.<br>In the event that the monitoring identifies the need for further dust and particulate matter abatement measures or monitoring, the operator shall propose additional measures along with timescales | (a) At least one month before commencing commissioning.<br>(b) Within two months of completion of commissioning. |

| Table S1.3 Improvement programme requirements | | |
|---|---|---|
| **Reference** | **Requirement** | **Date** |
| | for implementation to the Environment Agency for written approval.<br>The operator shall implement any further abatement measures in line with the timescales agreed with the Environment Agency subject to such amendments or additions as notified by the Environment Agency. | |
| IC17 | A written report shall be submitted to the Environment Agency. The report should detail the emissions to air following the commissioning of the new CHP engines from stacks A8a and A8b. The report should compare the emissions from the stacks to the emission conclusions made in application EPR/BT7086IJ/V013.<br>In the event the monitoring identifies the need for further abatement measures or monitoring the operator shall propose additional measures along with timescales for implementation to the Environment Agency for written approval.<br>The Operator shall implement any further abatement measures in line with the timescales agreed with the Environment Agency. | Complete |
| IC18 | The operator shall submit a written report to the Environment Agency for approval on the commissioning of the PTZ process. This report shall include:<br>- the results of monitoring of gaseous emissions from release point A11 to demonstrate compliance with permitted emission limit values;<br>- an assessment of the operation of the LEV dust abatement within the PTZ process;<br>- an review of noise and odour arising from the operation of the PTZ process to verify the assessments provided for each in the permit variation application;<br>- an updated assessment of the stoichiometry of the decomposition reaction during calcination and an updated assessment of the proportion of $N_2O$ and $N_2O$ in the off-gases from the decomposition process.<br>The report shall also contain an updated assessment of the expected chemical reactions occurring and the decomposition products created within the impregnation and calcination stages of the PTZ process.<br>The report shall also include any recommendations with timescales for further optimisation of the PTZ process to minimise its potential for environmental impact.<br>Any approved proposals shall be implemented by the operator in line with the timescales approved by the Environment Agency subject to such amendments or additions as notified by the Environment Agency. | Complete |

| Table S1.3 Improvement programme requirements | | |
|---|---|---|
| **Reference** | **Requirement** | **Date** |
| IC19 | The operator shall submit a written report to the Environment Agency for approval to verify the conclusions of mass balance calculations submitted in the variation application relating to the concentration of nitrate and nitrite species produced from abatement of off-gases from the platinum on zeolite process.<br>The report shall include:<br>- results of sampling and testing of site effluent for nitrate and nitrite prior to final discharge from site to sewer;<br>- results of sampling and testing of the receiving waters after Royston waste water treatment works for nitrate and nitrite;<br>- an assessment of the monitored levels of nitrate and nitrite compared with those levels predicted in the permit application;<br>- an assessment of the environmental impact of the monitored levels of nitrate and nitrite on receiving waters using the Environment Agency's H1 risk assessment tool, detailed water modelling or an equivalent mechanism;<br>- any proposals with timescales for further reduction in levels of nitrate and nitrite released from site or proposals to reduce the potential environmental impact of those releases of nitrate and nitrite.<br>Any approved proposals shall be implemented by the operator in line with the timescales approved by the Environment Agency subject to such amendments or additions as notified by the Environment Agency. | Complete |
| IC20 | The operator shall submit a written report to the Environment Agency for approval that confirms, with monitoring data, a minimum NOx abatement efficiency of 80% for emissions discharged from stack, A11.<br>Should the monitoring data indicate that abatement efficiency is not at least 80%, the report shall include proposals and timescales for achieving 80% NOx abatement for releases from stack A11.<br>Any approved proposals shall be implemented by the operator in line with the timescales approved by the Environment Agency subject to such amendments or additions as notified by the Environment Agency. | Complete |
| IC21 | **Environmental Management Systems**<br>The operator shall submit a written report to the Environment Agency for assessment and written approval.<br>The report must contain a summary of the changes to the site's Environmental Management Systems as a result of application EPR/BT7086IJH/V016.<br>The operator must implement the changes in the report as agreed with the Environment Agency's written approval. | Within four months of commencing commissioning of Hydrogen Technology operations |
| IC22 | **Noise risk**<br>The operator shall submit a Noise Management Plan to the Environment Agency for assessment and written approval.<br>The Noise Management Plan must contain:<br>• Proposals for reducing the noise impact of the site.<br>• Demonstration that noise mitigation measures are compliant with best available techniques.<br>The Noise Management Plan shall be developed in line with the requirements set out in the guidance on 'Noise and vibration management: environmental permits' found on www.gov.uk. | Within 12 months of commencing commissioning of Hydrogen Technology operations or superseded by completion of PO1 as agreed in writing with the Environment Agency |

| Table S1.3 Improvement programme requirements | | |
|---|---|---|
| **Reference** | **Requirement** | **Date** |
| | The operator must implement the proposals in the plan as agreed with the Environment Agency's written approval. | |
| IC23 | **Hydrogen Technology air emissions**<br>The operator shall submit a written report to the Environment Agency for assessment and written approval.<br>The report must contain, in relation to the Regenerative Thermal Oxidiser in application EPR/BT7086IJ/V016:<br>• Emissions monitoring data obtained during the first year of operation for parameters identified in the application.<br>• A comparison of the actual emissions with those assumed in the air dispersion modelling submitted with the application.<br>• Where actual emissions are higher than those assumed in the air dispersion modelling, a revised air emissions risk assessment using the results of the monitoring.<br>• Where emissions do not screen out within the revised risk assessment, detailed air dispersion modelling.<br>• Where detailed modelling does not screen out the emissions, measures to be taken to reduce or abate emissions with a timescale for delivery.<br>The operator must implement any improvement measures in the report in line with the timescales agreed with the Environment Agency's written approval. | Within 18 months of commencing operation of Regenerative Thermal Oxidiser |
| IC24 | **HomCat plant emissions to air validation, following expansion**<br>The operator shall submit a written report to the Environment Agency for assessment and written approval.<br>The report must contain, in relation to emissions to air of non-methane volatile organic compounds from emission point A197:<br>• Emissions monitoring data obtained during the first year of operation of the HomCat plant expansion detailed in application EPR/BT7086IJ/V017.<br>• A comparison of the actual emissions with those assumed in the air dispersion modelling submitted with application EPR/BT7086IJ/V017.<br>• Where actual emissions are higher than those assumed in the air dispersion modelling, a revised air emissions risk assessment using the results of the monitoring.<br>• Where emissions do not screen out within the revised risk assessment, detailed air dispersion modelling.<br>• Where detailed modelling does not screen out the emissions, proposals for measures to be taken to reduce or abate emissions.<br>The operator must implement any proposals identified within the report in accordance with the Environment Agency's written approval and within the approved timescales. | Within 18 months of commencing operation of the HomCat plant expansion detailed in application EPR/BT7086IJ/V017 |
| IC25 | **Third Century Refinery (3CR) emissions to air validation**<br>The operator shall submit a written report to the Environment Agency for assessment and written approval.<br>The report must contain, in relation to emissions to air of hydrogen chloride, chlorine, ammonia, non-methane volatile organic compounds and oxides of nitrogen from emission points A101 and A102: | Within 18 months of commencing operation of the 3CR |

| Table S1.3 Improvement programme requirements | | |
|---|---|---|
| **Reference** | **Requirement** | **Date** |
| | • Emissions monitoring data obtained during the first year of operation of the 3CR.<br>• A comparison of the actual emissions with those assumed in the air dispersion modelling submitted with application EPR/BT7086IJ/V017.<br>• Where actual emissions are higher than those assumed in the air dispersion modelling, a revised air emissions risk assessment using the results of the monitoring.<br>• Where emissions do not screen out within the revised risk assessment, detailed air dispersion modelling.<br>• Where detailed modelling does not screen out the emissions, proposals for measures to be taken to reduce or abate emissions.<br>The operator must implement any proposals identified within the report in accordance with the Environment Agency's written approval and within the approved timescales. | |

| Table S1.4 Pre-operational measures for future development | | |
|---|---|---|
| **Reference** | **Operation** | **Pre-operational measures** |
| PO1 | Third Century Refinery (3CR) | **Noise management plan**<br>Prior to commissioning of the Third Century Refinery (3CR), the operator shall submit a Noise Management Plan to the Environment Agency for assessment and written approval.<br>The Noise Management Plan must contain:<br>• Demonstration that best available techniques are being used to reduce operational sound emissions from existing operations and those proposed by application EPR/BT7086IJ/V017.<br>• Specifications for plant associated with application EPR/BT7086IJ/V017.<br>The Noise Management Plan must be developed in line with the requirements set out in the guidance 'Noise and vibration management: environmental permits' found on www.gov.uk.<br>The operator must implement any proposals within the plan in accordance with the Environment Agency's written approval and within the approved timescales. |

# Schedule 2 – Waste types, raw materials and fuels

| Table S2.1 Raw materials and fuels | |
|---|---|
| **Raw materials and fuel description** | **Specification** |
| Mercury content of sodium hydroxide | Discharges of mercury as a result of the impurities of raw materials used shall be controlled by ensuring that impurity levels are the minimum available in the commercial product |
| Mercury and cadmium content of hydrochloric acid | Discharges of mercury and cadmium as a result of the impurities of raw materials used shall be controlled by ensuring that impurity levels are the minimum available in the commercial product |
| Gas oil | Less than 0.1% w/w sulphur content |

| Table S2.2 Permitted waste types and quantities for Noble Metals process | |
|---|---|
| **Maximum quantity** | **5000 kg per annum** |
| **Waste code** | **Description** |
| **10** | **Wastes from thermal processes** |
| **10 07** | **wastes from silver, gold and platinum thermal metallurgy** |
| 10 07 04 | other particulates and dust |
| 10 07 99 | wastes not otherwise specified comprising spent or damaged precious metal components previously used for their chemical, mechanical or thermal properties |
| **10 11** | **wastes from manufacture of glass and glass products** |
| 10 11 99 | wastes not otherwise specified comprising wastes containing precious metals |
| **12** | **Wastes from shaping and physical and mechanical surface treatment of metals and plastics** |
| **12 01** | **wastes from shaping and physical and mechanical surface treatment of metals and plastics** |
| 12 01 04 | non-ferrous metal dust and particles |
| 12 01 99 | crucibles, coated sheets and wires |
| **16** | **Wastes not otherwise specified in the list** |
| **16 08** | **spent catalysts** |
| 16 08 01 | spent catalysts containing gold, silver, rhenium, rhodium, palladium, iridium or platinum (except 16 08 07) |
| 16 08 07* | spent catalysts contaminated with hazardous substances |

# Schedule 3 – Emissions and monitoring

| Table S3.1a Point source emissions to air – emission limits and monitoring requirements from Clean Air | | | | | | |
|---|---|---|---|---|---|---|
| **Emission point Ref. & Location** | **Source** | **Parameter** | **Limit (including unit)** | **Reference Period** | **Monitoring Frequency** | **Monitoring Standard or Method** |
| A207 | Abatement plant | Oxides of Nitrogen (NO and $NO_2$ expressed as $NO_2$) | 50 $mg/m^3$ | 95 percent of monthly hourly averages | Continuous | Chemiluminescence |
| | | | 50 $mg/m^3$ | Average of minimum 1 hour period | Annually | Chemiluminescence BSEN 14792 |
| | | Carbon Monoxide | 100$mg/m^3$ | Average of minimum 1 hour period | Annually | NDIR BS EN 15058:2006 |
| | | Ammonia | 15 $mg/m^3$ | Average of minimum 1 hour period | Annually | Procedural requirements of BS EN 14791 for sampling |
| | | Volatile Organic Compounds (VOCs) as total carbon | 20 $mg/m^3$ | Average of minimum 1 hour period | Annually | FID method BS EN 12619 |
| A230 | Abatement plant | Oxides of Nitrogen (NO and $NO_2$ expressed as $NO_2$) | 50 $mg/m^3$ | 95 percent of monthly hourly averages | Continuous | Chemiluminescence |
| | | Oxides of Nitrogen (NO and $NO_2$ expressed as $NO_2$) | 50 $mg/m^3$ | Average of minimum 1 hour period | Annually | Chemiluminescence BSEN 14792 |
| | | Carbon Monoxide | 100 $mg/m^3$ | Average of minimum 1 hour period | Annually | NDIR BS EN 15058:2006 |
| | | Ammonia | 15 $mg/m^3$ | Average of minimum 1 hour period | Annually | Procedural requirements of BS EN 14791 for sampling |
| | | Volatile Organic Compounds (VOCs) as total carbon | 20 $mg/m^3$ | Average of minimum 1 hour period | Annually | FID method BS EN 12619 |

| Table S3.1a Point source emissions to air – emission limits and monitoring requirements from Clean Air | | | | | | |
|---|---|---|---|---|---|---|
| **Emission point Ref. & Location** | **Source** | **Parameter** | **Limit (including unit)** | **Reference Period** | **Monitoring Frequency** | **Monitoring Standard or Method** |
| A231 | Abatement | Oxides of Nitrogen (NO and $NO_2$ expressed as $NO_2$) | 50 $mg/m^3$ | 95 percent of monthly hourly averages | Continuous | Chemiluminescence |
| | | Oxides of Nitrogen (NO and $NO_2$ expressed as $NO_2$) | 50 $mg/m^3$ | Average of minimum 1 hour period | Annually | Chemiluminescence BSEN 14792 |
| | | Carbon Monoxide | 100 $mg/m^3$ | Average of minimum 1 hour period | Annually | NDIR BS EN 15058:2006 |
| | | Ammonia | 15 $mg/m^3$ | Average of minimum 1 hour period | Annually | Procedural requirements of BS EN 14791 for sampling |
| | | Volatile Organic Compounds (VOCs) as total carbon | 20 $mg/m^3$ | Average of minimum 1 hour period | Annually | FID method BS EN 12619 |
| A272 | Muenstermann oven (clean air cooling vent) | No parameters set | No limits set | -- | -- | -- |
| A273 | Muenstermann oven (clean air cooling vent) | No parameters set | No limits set | -- | -- | -- |
| A274 | Muenstermann oven (clean air cooling vent) | No parameters set | No limits set | -- | -- | -- |
| A275 | Muenstermann oven (clean air cooling vent) | No parameters set | No limits set | -- | -- | -- |
| A276 | Muenstermann oven (clean air cooling vent) | No parameters set | No limits set | -- | -- | -- |
| A277 | Muenstermann oven (clean air cooling vent) | No parameters set | No limits set | -- | -- | -- |
| A278 | Muenstermann oven (clean air cooling vent) | No parameters set | No limits set | -- | -- | -- |
| A279 | Vent from 39 washer vessels | No parameters set | No limits set | -- | -- | -- |

| Table S3.1a Point source emissions to air – emission limits and monitoring requirements from Clean Air | | | | | | |
|---|---|---|---|---|---|---|
| **Emission point Ref. & Location** | **Source** | **Parameter** | **Limit (including unit)** | **Reference Period** | **Monitoring Frequency** | **Monitoring Standard or Method** |
| A280 | Fastcat and CSF1 vessel extraction | No parameters set | No limits set | -- | -- | -- |
| A281 | Clean cooling air exhaust from dryer 3 within CSF2. | Products of combustion | No limits set | -- | -- | -- |

| Table S3.1b Point source emissions to air – emission limits and monitoring requirements – ProCat 1 | | | | | | |
|---|---|---|---|---|---|---|
| **Emission point ref. & location** | **Source** | **Parameter** | **Limit (including unit)** | **Reference period** | **Monitoring frequency** | **Monitoring standard or method** |
| A152 | Abatement plant | No parameters set | - | - | - | - |
| A178 | Abatement plant | No parameters set | - | - | - | - |
| A182 | Abatement plant | Total Particulate matter | 20 $mg/m^3$ | Average of minimum 1 hour period | Annually | Manual method BS EN 13284 |

| Table S3.1c Point source emissions to air – emission limits and monitoring requirements – SCT | | | | | | |
|---|---|---|---|---|---|---|
| **Emission point ref. & location** | **Source** | **Parameter** | **Limit (including unit)** | **Reference period** | **Monitoring frequency** | **Monitoring standard or method** |
| A57 | Sturvent Fan (SCT 1) | Volatile Organic Compounds (VOCs) | No limits set | Average of minimum 1 hour period | 6 monthly | BS EN 12619 |
| A109 | Main Ext Fan (SCT 1) | Volatile Organic Compounds (VOCs) | No limits set | Average of minimum 1 hour period | 6 monthly | BS EN 12619 |
| A117 | Barlow Whitney Oven 2 (SCT 1) | Volatile Organic Compounds (VOCs) | No limits set | Average of minimum 1 hour period | 6 monthly | BS EN 12619 |
| A205 | Dustmaster unit (SCT 1) | No parameters set | No limits set | - | - | - |
| A228 | Abatement plant (SCT 2) | Volatile Organic Compounds (VOCs) | 75 $mg/m^3$ | Average of minimum 1 hour period | 6 monthly | BS EN 12619 |

| Table S3.1d Point source emissions to air – emission limits and monitoring requirements – Fine Chemicals – Inorganics | | | | | | |
|---|---|---|---|---|---|---|
| **Emission point ref. & location** | **Source** | **Parameter** | **Limit (including unit)** | **Reference period** | **Monitoring frequency** | **Monitoring standard or method** |
| A4 | Abatement Plant | Hydrogen chloride | 10 $mg/m^3$ | Average of minimum 1 hour period | Annually | BS EN 1911 |
| A4 | Abatement plant | Chlorine | 10 $mg/m^3$ | Average of minimum 1 hour period | Annually | USEPA method 26A |
| A4 | Abatement plant | Oxides of Nitrogen (expressed as $NO_2$) | 200 $mg/m^3$ | Average of minimum 1 hour period | Annually | BS EN 14792 |
| A4 | Abatement plant | Total particulate matter | 20 $mg/m^3$ | Average of minimum 1 hour period | Annually | BS EN 13284-1 |
| A4 | Abatement plant | Ammonia | 15 $mg/m^3$ | Average of minimum 1 hour period | Annually | Procedural requirements of BS EN 14791 for sampling |
| A11 | Abatement plant | Oxides of Nitrogen (expressed as $NO_2$) | 200 $mg/m^3$ | Average of minimum 1 hour period | Annually | BS EN 14792:2017 |
| A11 | Abatement plant | Nitrous Oxide | 200 $mg/m^3$ | Average of minimum 1 hour period | Annually | EN 21258:2010 |
| A11 | Abatement plant | Acetic Acid | 50 $mg/m^3$ | Average of minimum 1 hour period | Annually | Sampling BS CEN/TS 13649, NIOSH 1603 for analysis |

| Table S3.1e Point source emissions to air – emission limits and monitoring requirements – Fine Chemicals - HomCat | | | | | | |
|---|---|---|---|---|---|---|
| **Emission point ref. & location** | **Source** | **Parameter** | **Limit (including unit)** | **Reference period** | **Monitoring frequency** | **Monitoring standard or method** |
| A197 | Abatement plant | Volatile Organic Compounds (VOCs) as acetone | 5 tonne/annum | Maximum value | Continuous | FID-BS EN 13526:2002 |

| Table S3.1f Point source emissions to air – emission limits and monitoring requirements – PGMR – PPR | | | | | | |
|---|---|---|---|---|---|---|
| **Emission point ref. & location** | **Source** | **Parameter** | **Limit (including unit)** | **Reference period** | **Monitoring frequency** | **Monitoring standard or method** |
| A28 | Abatement plant | Hydrogen chloride | 10 $mg/m^{3(1)}$ | Average of minimum 1 hour period | 3-monthly | USEPA method 26A |
| | | Chlorine | 70 $mg/m^3$ | 95 percent of monthly hourly averages | Continuous | Electrochemical diffusion sensor |
| | | Ammonium chloride ($NH_4Cl$) | 10 $mg/m^3$ | Average of minimum 1 hour period | 3-monthly | As agreed in writing |
| A30 | Abatement plant | Hydrogen chloride | 10 $mg/m^{3(1)}$ | Average of minimum 1 hour period | 3-monthly | USEPA method 26A |
| | | Chlorine | 70 $mg/m^3$ | 95 percent of monthly hourly averages | Continuous | Electrochemical diffusion sensor |
| | | Ammonium chloride ($NH_4Cl$) | 10 $mg/m^3$ | Average of minimum 1 hour period | 3-monthly | As agreed in writing |
| A31 | Abatement plant | Ammonium chloride ($NH_4Cl$) | 10 $mg/m^3$ | Average of minimum 1 hour period | 3-monthly | As agreed in writing |
| | | Hydrogen chloride | 10 $mg/m^3$ | Average of minimum 1 hour period | 3-monthly | USEPA method 26A |
| | | Chlorine | 70 $mg/m^3$ | 95 percent of monthly hourly averages | Continuous | Electrochemical diffusion sensor |

Note 1: Increased to 50 $mg/m^3$ until completion of improvement condition IC15 in table S1.3, or as agreed in writing with the Environment Agency

| Table S3.1g Point source emissions to air – emission limits and monitoring requirements – PGMR – IMR | | | | | | |
|---|---|---|---|---|---|---|
| **Emission point ref. & location** | **Source** | **Parameter** | **Limit (including unit)** | **Reference period** | **Monitoring frequency** | **Monitoring standard or method** |
| A35 | Abatement plant | Hydrogen chloride | 10 $mg/m^3$ | Average of minimum 1 hour period | Annually | Manual method BS EN 1911 |
| A35 | Abatement plant | Chlorine | 5 $mg/m^3$ | Average of minimum 1 hour period | Annually | US EPA method 26/26a |
| A80 | Abatement plant | Hydrogen chloride | 10 $mg/m^3$ | Average of minimum 1 hour period | Annually | Manual method BS EN 1911 |
| A80 | Abatement plant | Volatile Organic Compounds (VOCs) (class B) as total carbon | 75 $mg/m^3$ | Average of minimum 1 hour period | Annually | Manual method BS EN 13649 [1] |

Note 1: Method used in conjunction with FID method BS EN 13526 to give temporal profile of total VOC emissions.

| Table S3.1h Point source emissions to air – emission limits and monitoring requirements – Noble Metals | | | | | | |
|---|---|---|---|---|---|---|
| **Emission point ref. & location** | **Source** | **Parameter** | **Limit (including unit)** | **Reference period** | **Monitoring frequency** | **Monitoring standard or method** |
| A225 | Abatement plant | Hydrogen chloride | 10 $mg/m^3$ | Average of minimum 1 hour period | Annually | Manual method BS EN 1911 |
| A225 | Abatement plant | Chlorine | 10 $mg/m^3$ | Average of minimum 1 hour period | Annually | US EPA method 26/26a |
| A226 | Abatement plant | Hydrogen chloride | 10 $mg/m^3$ | Average of minimum 1 hour period | Annually | Manual method BS EN 1911 |
| A226 | Abatement plant | Oxides of Nitrogen (expressed as $NO_2$) | 150 $mg/m^3$ | Average of minimum 1 hour period | Annually | Chemiluminecsence BSEN 14792 |
| A243 | Firing Kiln | No parameters set | No limits set | - | - | - |
| A284 | 3D Printing Plant LEV | No parameters set | No limits set | - | - | - |
| A285 | 3D Printing Plant LEV | No parameters set | No limits set | - | - | - |

| Table S3.1i Point source emissions to air – emission limits and monitoring requirements – 3CR | | | | | | |
|---|---|---|---|---|---|---|
| **Emission point ref. & location** | **Source** | **Parameter** | **Limit (including unit)** | **Reference period** | **Monitoring frequency** | **Monitoring standard or method** |
| A101 (identified in Appendix 01 – Stack Location Drawing submitted with application EPR/BT7086IJ/ V017) | Acid scrubber | Hydrogen chloride | 10 mg/Nm$^3$ | Average over sample period | Annual (Note 1) | US EPA 26A |
| | | Chlorine | 2 mg/Nm$^3$ | Average over sample period | Annual (Note 1) | US EPA 26A |
| | | Ammonia | 10 mg/Nm$^3$ | Average over sample period | Six monthly (Note 2) | BS EN 21877 |
| | | Oxides of Nitrogen (expressed as $NO_2$) | 150 mg/Nm$^3$ | Average over sample period | Six monthly (Note 2) | BS EN 14792 |
| | | Total Volatile Organic Carbon (TVOC) | 20 mg/Nm$^3$ | Average over sample period | Six monthly (Note 2) | BS EN 12619 |
| A102 (identified in Appendix 01 – Stack Location Drawing submitted with application EPR/BT7086IJ/ V017) | Ammonia scrubber | Hydrogen chloride | 10 mg/Nm$^3$ | Average over sample period | Annual (Note 1) | US EPA 26A |
| | | Chlorine | 2 mg/Nm$^3$ | Average over sample period | Annual (Note 1) | US EPA 26A |
| | | Ammonia | 10 mg/Nm$^3$ | Average over sample period | Six monthly (Note 2) | BS EN 21877 |
| | | Oxides of Nitrogen (expressed as $NO_2$) | 150 mg/Nm$^3$ | Average over sample period | Six monthly (Note 2) | BS EN 14792 |
| | | Total Volatile Organic Carbon (TVOC) | 20 mg/Nm$^3$ | Average over sample period | Six monthly (Note 2) | BS EN 12619 |
| A103 and A104 (identified in 'Drawing 005 Proposed Site Layout – 3CR Annex' submitted with application EPR/BT7086IJ/ V017) | Emergency diesel generators (<1 MW rated thermal input each) | No parameters set | No limits set | - | - | - |

| | | | | | | |
|---|---|---|---|---|---|---|
| A399 to A412 (identified in Appendix 01 – Stack Location Drawing submitted with application EPR/BT7086IJ/ V017) | Air handling units | No parameters set | No limits set | - | - | - |
| Note 1: Frequency may be reduced to once every 3 years if the emission levels are proved to be sufficiently stable and in line with the Environment Agency's written agreement.<br>Note 2: Frequency may be reduced to once every year or once every 3 years if the emission levels are proved to be sufficiently stable and in line with the Environment Agency's written agreement. | | | | | | |

**Table S3.1j Point source emissions to air – emission limits and monitoring requirements - CHP**

| Emission point ref. & location | Source | Parameter | Limit (including unit) | Reference period | Monitoring frequency | Monitoring standard or method |
|---|---|---|---|---|---|---|
| A8a | SCR - CHP | Oxides of Nitrogen (NO and $NO_2$ expressed as $NO_2$) | 190 $mg/m^3$ | Average over minimum 1 hour period | Annually | Chemiluminescence method BS EN 14792 |
| A8b | SCR - CHP | Oxides of Nitrogen (NO and $NO_2$ expressed as $NO_2$) | 190 $mg/m^3$ | Average over minimum 1 hour period | Annually | Chemiluminescence method BS EN 14792 |

**Table S3.1k Point source emissions to air – emission limits and monitoring requirements - Boilerhouse**

| Emission point ref. & location | Source | Parameter | Limit (including unit) | Reference period | Monitoring frequency | Monitoring standard or method |
|---|---|---|---|---|---|---|
| A13 | Boiler house | Oxides of Nitrogen (NO and $NO_2$ expressed as $NO_2$) | 100 $mg/m^3$ | Periodic | Every 3 years | Chemiluminescence method BS EN 14792 |
| | | Carbon monoxide | No limit set | Periodic | Every 3 years | NDIR BS EN 15058:2006 |
| A15 | Boiler house | Oxides of Nitrogen (NO and $NO_2$ expressed as $NO_2$) | 100 $mg/m^3$ | Periodic | Every 3 years | Chemiluminescence method BS EN 14792 |
| | | Carbon monoxide | No limit set | Periodic | Every 3 years | NDIR BS EN 15058:2006 |
| A16 | | Oxides of Nitrogen (NO and $NO_2$ expressed as $NO_2$) | 100 $mg/m^3$ | Periodic | Every 3 years | Chemiluminescence method BS EN 14792 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Boiler house | Carbon monoxide | No limit set | Periodic | Every 3 years | NDIR BS EN 15058:2006 |

| Table S3.1l Point source emissions to air – emission limits and monitoring requirements - VRP | | | | | | |
|---|---|---|---|---|---|---|
| **Emission point ref. & location** | **Source** | **Parameter** | **Limit (including unit)** | **Reference period** | **Monitoring frequency** | **Monitoring standard or method** |
| A27 | VRP | Hydrogen chloride | 10 mg/m$^3$ | Average of minimum 1 hour period | Annually | Manual method BS EN 1911 |
| | | Total Volatile Organic Compounds as total carbon | 100 mg/m$^3$ | Average of minimum 1 hour period | Annually | BS EN 12619 |
| | | Ammonia | 10 mg/m$^3$ | Average of minimum of 1 hour period | Annually | Procedural requirements of BS EN 14791 for sampling |

| Table S3.1m Point source emissions to air – emission limits and monitoring requirements – Clean Air Tech Centre | | | | | | |
|---|---|---|---|---|---|---|
| **Emission point ref. & location** | **Source** | **Parameter** | **Limit (including unit)** | **Reference period** | **Monitoring frequency** | **Monitoring standard or method** |
| A232 | TC3 | No parameters set | No limits set | - | - | - |
| A3 | Tech centre | No parameters set | No limits set | - | - | - |
| A42 | Synthetic catalyst activity test orbital rig | No parameters set | No limits set | - | - | - |
| A74 | Synthetic catalyst activity test SIGU rig | No parameters set | No limits set | - | - | - |
| A82 | Cell 1 | No parameters set | No limits set | - | - | - |
| A85 | Cell 1 | No parameters set | No limits set | - | - | - |
| A86 | Cell 2 | No parameters set | No limits set | - | - | - |
| A91 | Cell 2 | No parameters set | No limits set | - | - | - |
| A92 | Cell 3 | No parameters set | No limits set | - | - | - |

| Table S3.1m Point source emissions to air – emission limits and monitoring requirements – Clean Air Tech Centre | | | | | | |
|---|---|---|---|---|---|---|
| **Emission point ref. & location** | **Source** | **Parameter** | **Limit (including unit)** | **Reference period** | **Monitoring frequency** | **Monitoring standard or method** |
| A94 | Cell 3 | No parameters set | No limits set | - | - | - |
| A95 | Cell 4 | No parameters set | No limits set | - | - | - |
| A96 | Cell 4 | No parameters set | No limits set | - | - | - |
| A112 | Cell 5 | No parameters set | No limits set | - | - | - |
| A129 | Cell 5 | No parameters set | No limits set | - | - | - |
| A130 | Cell 6 | No parameters set | No limits set | - | - | - |
| A131 | Cell 6 | No parameters set | No limits set | - | - | - |
| A153 | Cell 7 | No parameters set | No limits set | - | - | - |
| A158 | Cell 8 | No parameters set | No limits set | - | - | - |
| A159 | Cell 9 | No parameters set | No limits set | - | - | - |
| A160 | Constant volume sampling 1 | No parameters set | No limits set | - | - | - |
| A161 | Super ultra low emissions vehicles cell | No parameters set | No limits set | - | - | - |
| A162 | Mileage accumulation facility cell | No parameters set | No limits set | - | - | - |
| A233 | Vehicle prep area | No parameters set | No limits set | - | - | - |

| Table S3.1n Point source emissions to air – emission limits and monitoring requirements – Fine chemicals in plant PU12 | | | | | | |
|---|---|---|---|---|---|---|
| **Emission point ref. & location** | **Source** | **Parameter** | **Limit (including unit)** | **Reference period** | **Monitoring frequency** | **Monitoring standard or method** |
| A97 | Abatement plant | Hydrogen chloride | 3 $mg/m^3$ | Average over sampling period | Annual | BS EN 1911 |
| | Abatement plant | Chlorine | 3 $mg/m^3$ | Average over sampling period | Annual | USEPA method 26A |
| A98 | Abatement plant | Oxides of Nitrogen (expressed as $NO_2$) | 200 $mg/m^3$ | Average over sampling period | Annual | BS EN 14792 |
| | Abatement plant | Ammonia | 1.3 $mg/m^3$ | Average over sampling period | Annual | Procedural requirements of BS EN 14791 for sampling |
| A99 | Abatement plant | Hydrogen chloride | 3 $mg/m^3$ | Average over sampling period | Annual | BS EN 1911 |
| | Abatement plant | Chlorine | 3 $mg/m^3$ | Average over sampling period | Annual | USEPA method 26A |
| | Abatement plant | Oxides of Nitrogen (expressed as $NO_2$) | 200 $mg/m^3$ | Average over sampling period | Annual | BS EN 14792 |
| | Abatement plant | Ammonia | 1.3 $mg/m^3$ | Average over sampling period | Annual | Procedural requirements of BS EN 14791 for sampling |
| | Abatement plant | Acetic acid | 50 $mg/m^3$ | Average over sampling period | Annual | BS CEN/TS 13649 and NIOSH 1603 |
| A100 | Fume cupboards | No parameters set | No limits set | - | - | - |

| Table S3.1o Point source emissions to air – emission limits and monitoring requirements – Hydrogen Technology (catalyst coated membrane production) | | | | | | |
|---|---|---|---|---|---|---|
| **Emission point ref. & location** | **Source** | **Parameter** | **Limit (including unit)** | **Reference period** | **Monitoring frequency** | **Monitoring standard or method** |
| A286 (identified on Figure 3-5 of BATOT document submitted with application EPR/BT7086IJ/V016) | Regenerative Thermal Oxidiser | No parameters set | No limits set | - | - | - |
| A287 to A294 (identified on Figure 3-5 of BATOT document submitted with application EPR/BT7086IJ/V016) | Ionomer vessel vents | No parameters set | No limits set | - | - | - |
| A295 (identified on Figure 3-5 of BATOT document submitted with application EPR/BT7086IJ/V016) | Heat treatment line vent | No parameters set | No limits set | - | - | - |
| A296 (identified on Figure 3-5 of BATOT document submitted with application EPR/BT7086IJ/V016) | Ink mixing room vent | No parameters set | No limits set | - | - | - |
| A297 to A299 | HTTF vents | No parameters set | No limits set | - | - | - |

| Table S3.2 Point source emissions to sewer, effluent treatment plant or other transfers off-site– emission limits and monitoring requirements | | | | | | |
|---|---|---|---|---|---|---|
| **Emission point ref. & location** | **Source** | **Parameter** | **Limit (incl. Unit)** | **Reference period** | **Monitoring frequency** | **Monitoring standard or method** |
| S1 | Site Effluent Treatment Plant | No parameters set | No limits set | - | - | - |

| Table S3.3 Process monitoring requirements | | | | |
|---|---|---|---|---|
| **Emission point reference or source or description of point of measurement** | **Parameter** | **Monitoring frequency** | **Monitoring standard or method** | **Other specifications** |
| Process scrubber - Fastcat | Liquor flow rate | Continuous | Not applicable | - |
| Process scrubber – Fastcat, venturi, demister and packing | Pressure drop | Continuous | Not applicable | - |
| Process scrubber – PGMR, A28 | Liquor flow rate | Continuous | Not applicable | - |
| Process scrubber – PGMR, A28 | Pressure drop | Continuous | Not applicable | - |
| Process scrubber – PGMR, A30 | Liquor flow rate | Continuous | Not applicable | - |
| Process scrubber – PGMR, A30 | Pressure drop | Continuous | Not applicable | |

| Table S3.3 Process monitoring requirements | | | | |
|---|---|---|---|---|
| **Emission point reference or source or description of point of measurement** | **Parameter** | **Monitoring frequency** | **Monitoring standard or method** | **Other specifications** |
| Process scrubber – PGMR, A31 | Liquor flow rate | Continuous | Not applicable | - |
| Process scrubber – PGMR, A31 | Pressure drop | Continuous | Not applicable | - |
| Process scrubber – PGMR, A35 | pH | Continuous | Not applicable | - |
| Process scrubber – Fine Chem, A4 | pH | Continuous | Not applicable | - |
| Process scrubber – Fine Chem, A11 | pH | Continuous | Not applicable | - |
| Process scrubber – HomCat, A197 | pH | Daily | Not applicable | - |
| Process scrubber – Noble metals, A225 | pH | Daily | Not applicable | - |
| Process scrubber – Noble metals, A226 | pH | Daily | Not applicable | - |
| SCR – Fastcat, A207 | Pressure drop | Continuous | Not applicable | - |
| SCR – Fastcat, A207 | Temperature | Continuous | Not applicable | - |
| SCR – CSF 1, A230 | Pressure drop | Continuous | Not applicable | - |
| SCR – CSF 1, A230 | Temperature | Continuous | Not applicable | - |
| SCR – CSF 2, A231 & A207 | Pressure drop | Continuous | Not applicable | - |
| SCR – CSF 2, A231 & A207 | Temperature | Continuous | Not applicable | - |
| SCR – CHP, A8a and b | Pressure drop | Continuous | Not applicable | - |
| SCR – CHP, A8a and b | Temperature | Continuous | Not applicable | - |
| Fabric filter - Fastcat, A207 | Pressure drop | Continuous | Not applicable | - |
| Fabric filter – ProCat 1, A178 | Pressure drop | Continuous | Not applicable | - |
| Fabric filter – ProCat 1, A182 | Pressure drop | Continuous | Not applicable | - |
| Fabric filter – SCT 2, A229 | Pressure drop | Continuous | Not applicable | - |
| Cyclone – CSF, A230 | Pressure drop | Continuous | Not applicable | - |
| Carbon bed – SCT 2, A228 | Temperature | Continuous | Not applicable | - |
| Carbon bed – SCT 2, A228 | Pressure drop | Continuous | Not applicable | - |
| Carbon bed – HomCat, A197 | Temperature | Continuous | Not applicable | - |
| Acid scrubber - VRP | Pressure drop (demister and packing) | Daily | Not applicable | - |
| Acid scrubber - VRP | pH | Continuous | Not applicable | - |

| Table S3.3 Process monitoring requirements | | | | |
|---|---|---|---|---|
| **Emission point reference or source or description of point of measurement** | **Parameter** | **Monitoring frequency** | **Monitoring standard or method** | **Other specifications** |
| Scrubbers serving A97, A98 and A99 | pH, pressure drop, liquid flow rate, specific gravity of liquor | Continuous | Not applicable | - |
| Regenerative Thermal Oxidiser – A286 | Pressure drop | Continuous | Not applicable | - |
| Regenerative Thermal Oxidiser – A286 | Temperature | Continuous | Not applicable | - |
| Ink vessels (cathode ionomer, CV1, CV2, CV3, anode ionomer, AV2, AV3, AV4, anode propanol buffer) – Hydrogen Technology | Pressure | Continuous | Not applicable | - |
| Ink vessels (cathode ionomer, CV1, CV2, CV3, anode ionomer, AV2, AV3, AV4, anode propanol buffer) – Hydrogen Technology | Temperature | Continuous | Not applicable | - |
| Ink vessels (cathode ionomer, CV1, CV2, CV3, anode ionomer, AV2, AV3, AV4, anode propanol buffer) – Hydrogen Technology | Level | Continuous | Not applicable | - |
| Ionomer mixing vessels 1 and 2 – Hydrogen Technology | Pressure | Continuous | Not applicable | - |
| Ionomer mixing vessels 1 and 2 – Hydrogen Technology | Temperature | Continuous | Not applicable | - |
| Ionomer mixing vessels 1 and 2 – Hydrogen Technology | Level | Continuous | Not applicable | - |
| Ionomer storage vessel – Hydrogen Technology | Pressure | Continuous | Not applicable | - |
| Ionomer storage vessel – Hydrogen Technology | Temperature | Continuous | Not applicable | - |
| Ionomer storage vessel – Hydrogen Technology | Level | Continuous | Not applicable | - |
| Scrubbers serving A101 and A102 | pH | Continuous | Not applicable | - |
| | Liquor flow rate | | | |
| | Level | | | |

# Schedule 4 – Reporting

| Table S4.1 Reporting of monitoring data | | | |
|---|---|---|---|
| **Parameter** | **Emission or monitoring point/reference** | **Reporting period** | **Period begins** |
| Oxides of Nitrogen mg $m^{-3}$ | A207, A4, A226, A230, A231, A201, A11, A8a, A8b, A98, A99 | Annually | 01/07/2007 |
| Oxides of Nitrogen mg $m^{-3}$ | A207, A230, A231 | Quarterly | 01/07/2007 |
| Oxides of Nitrogen mg $m^{-3}$ | A13, A15, A16 | Every three years | 01/01/2024 |
| Oxides of Nitrogen mg $m^{-3}$ | A101, A102 | 6 monthly | 1 January, 1 July |
| Nitrous oxide mg $m^{-3}$ | A11 | Annually | 01/01/2021 |
| Carbon monoxide mg $m^{-3}$ | A230, A231, A207 | Annually | 01/07/2007 |
| Carbon monoxide mg $m^{-3}$ | A13, A15, A16 | Every three years | 01/01/2024 |
| Ammonia mg $m^{-3}$ | A230, A231, A207, A4, A27, A98, A99 | Annually | 01/07/2007 |
| Ammonia mg $m^{-3}$ | A101, A102 | 6 monthly | 1 January, 1 July |
| Total VOCs as carbon mg $m^{-3}$ | A207, A230, A231, A27 | Annually | 01/07/2007 |
| Total VOCs as carbon mg $m^{-3}$ | A101, A102 | 6 monthly | 1 January, 1 July |
| VOCs as acetone mg $m^{-3}$ | A197 | Quarterly | 01/07/2007 |
| VOCs (Class B) as total carbon mg $m^{-3}$ | A57, A58, A69, A117, A228 | 6 monthly | 01/07/2007 |
| VOCs (Class B) as total carbon mg $m^{-3}$ | A80 | Annually | 01/07/2007 |
| Gaseous chlorides as HCl mg $m^{-3}$ | A4, A225, A226, A27, A35, A80, A97, A99, A101, A102 | Annually | 01/07/2007 |
| Gaseous chlorides as HCl mg $m^{-3}$ | A28, A30, A31 | Quarterly | 01/07/2007 |
| Chlorine mg $m^{-3}$ | A4, A225, A35, A97, A99, A101, A102 | Annually | 01/07/2007 |
| Chlorine mg $m^{-3}$ | A28, A30, A31 | Quarterly | 01/07/2007 |
| Ammonium chloride mg $m^{-3}$ | A28, A30, A31 | Quarterly | 01/07/2007 |
| Hydrogen sulphide mg $m^{-3}$ | A4 | Annually | 01/07/2007 |
| Acetic acid mg $m^{-3}$ | A11, A99 | Annually | 01/07/2007 |
| Total Particulate matter mg $m^{-3}$ | A182, A4 | Annually | 01/07/2007 |
| Note1. Quarterly reporting is required for all continuous monitoring. The results are to be expressed as the average of the hourly means for each month. Also the report shall include the hourly maximums for each day. Readings obtained where the process is not operating are not to be included in the calculation. | | | |

| Table S4.2 Performance parameters | |
|---|---|
| **Parameter** | **Frequency of assessment** |
| Water usage (for each business unit) (tonnes) | Annually |
| Energy usage (MWh) | Annually |
| Energy usage per site unit of operation (MWh/Uop) | Annually |
| **PGMR Inputs** | |
| Energy/UoP | Annually |
| Tonne chlorine/tonnePt | Annually |
| **PGMR Waste** | |
| Tonne chlorine (air)/UoP | Annually |
| Tonne HCl (air)/UoP | Annually |
| Tonne waste (for disposal)/UoP | Annually |
| Tonne waste (for recovery)/UoP | Annually |
| **3CR Inputs** | |
| Energy/UoP | Annually |
| Tonne chlorine/tonnePt | Annually |
| **3CR Waste** | |
| Tonne chlorine (air)/UoP | Annually |
| Tonne HCl (air)/UoP | Annually |
| Tonne waste (for disposal)/UoP | Annually |
| Tonne waste (for recovery)/UoP | Annually |
| **ETP Wastes** | |
| Tonne effluent press cake(recovery)/UoP | Annually |
| Tonne effluent press cake(disposal)/UoP | Annually |
| **Fine Chemicals Inputs** | |
| Energy/UoP | Annually |
| Tonne chlorine/UoP | Annually |
| **Fine Chemicals Waste** | |
| Tonne chlorine (air)/UoP | Annually |
| Tonne HCl (air)/UoP | Annually |
| **HomCat Inputs** | |
| Energy/UoP | Annually |
| | |
| **HomCat waste** | |
| Reverts to refining as % metal input | Annually |
| | |
| **PRO CAT 1 Input** | |
| Energy/UoP | Annually |
| **PRO CAT 1 Waste** | |
| Reverts to refining as % metal input | Annually |
| PGMs to effluent as % metal input | Annually |
| Tonne solvent waste (for recovery)/UoP | Annually |
| Tonne VOCs (air)/UoP | Annually |
| **SCT Input** | |
| Energy/UoP | Annually |
| Tonne solvent/UoP | Annually |
| **SCT Waste** | |
| Tonne of PGM waste (refining for recovery)/UoP | Annually |

| Table S4.2 Performance parameters | |
|---|---|
| **Parameter** | **Frequency of assessment** |
| Tonne of PGM waste (to landfill for disposal)/UoP | Annually |
| Tonne solvent waste (for recovery)/UoP | Annually |
| **Noble Metals Input** | |
| Energy/UoP | Annually |
| Tonne chlorine/UoP | Annually |
| Tonne de-greasing solvent/UoP | Annually |
| **Noble Metals waste** | |
| Tonne chlorine (air)/UoP | Annually |
| Tonne HCl (air/UoP | Annually |
| Tonne spent crucibles (for recovery)/UoP | Annually |
| Tonne spent crucibles (for disposal)/UoP | Annually |
| Tonne of liquid waste/UoP | Annually |
| **Clean Air, Fastcat and CSF 1 and 2 Input** | |
| Energy/UoP | Annually |
| **Clean Air, Fastcat and CSF 1 and 2 Waste** | |
| Tonne NOx/UoP | Annually |
| **Hydrogen Technology Input** | |
| Energy/UoP | Annually |
| Tonne solvent/UoP | Annually |
| **Hydrogen Technology Waste** | |
| Tonne of PGM waste (for recovery)/UoP | Annually |
| Tonne of non PGM waste (for disposal)/UoP | Annually |

| Table S4.3 Reporting forms | | |
|---|---|---|
| **Media/parameter** | **Reporting format** | **Date of form** |
| Air | Form air 1 or other form as agreed in writing by the Agency | 29/06/2007 |
| Water usage | Form water usage 1 or other form as agreed in writing by the Agency | 29/06/2007 |
| Energy usage and energy/ UoP | Form energy 1 or other form as agreed in writing by the Agency | 29/06/2007 |
| Other performance indicators | Form performance 1 or other form as agreed in writing by the Agency | 29/06/2007 |

# Schedule 5 – Notification

These pages outline the information that the operator must provide.

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

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

# Part A

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

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

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

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

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

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

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

# Part B – to be submitted as soon as practicable

| | |
|---|---|
| Any more accurate information on the matters for notification under Part A. | |
| Measures taken, or intended to be taken, to prevent a recurrence of the incident | |

| | |
|---|---|
| Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission | |
| The dates of any unauthorised emissions from the facility in the preceding 24 months. | |

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

* authorised to sign on behalf of the operator

# Schedule 6 – Interpretation

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

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

“average over sample period” means the average value of three consecutive samplings/measurements of at least 30 minutes each. For any parameter where, due to sampling or analytical limitations and/or due to operational conditions (e.g. batch processes), a 30-minute sampling/measurement and/or average of three consecutive samplings/measurements is inappropriate, a more representative sampling/measurement procedure may be employed.

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

“emissions to land” includes emissions to groundwater.

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

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

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

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

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

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

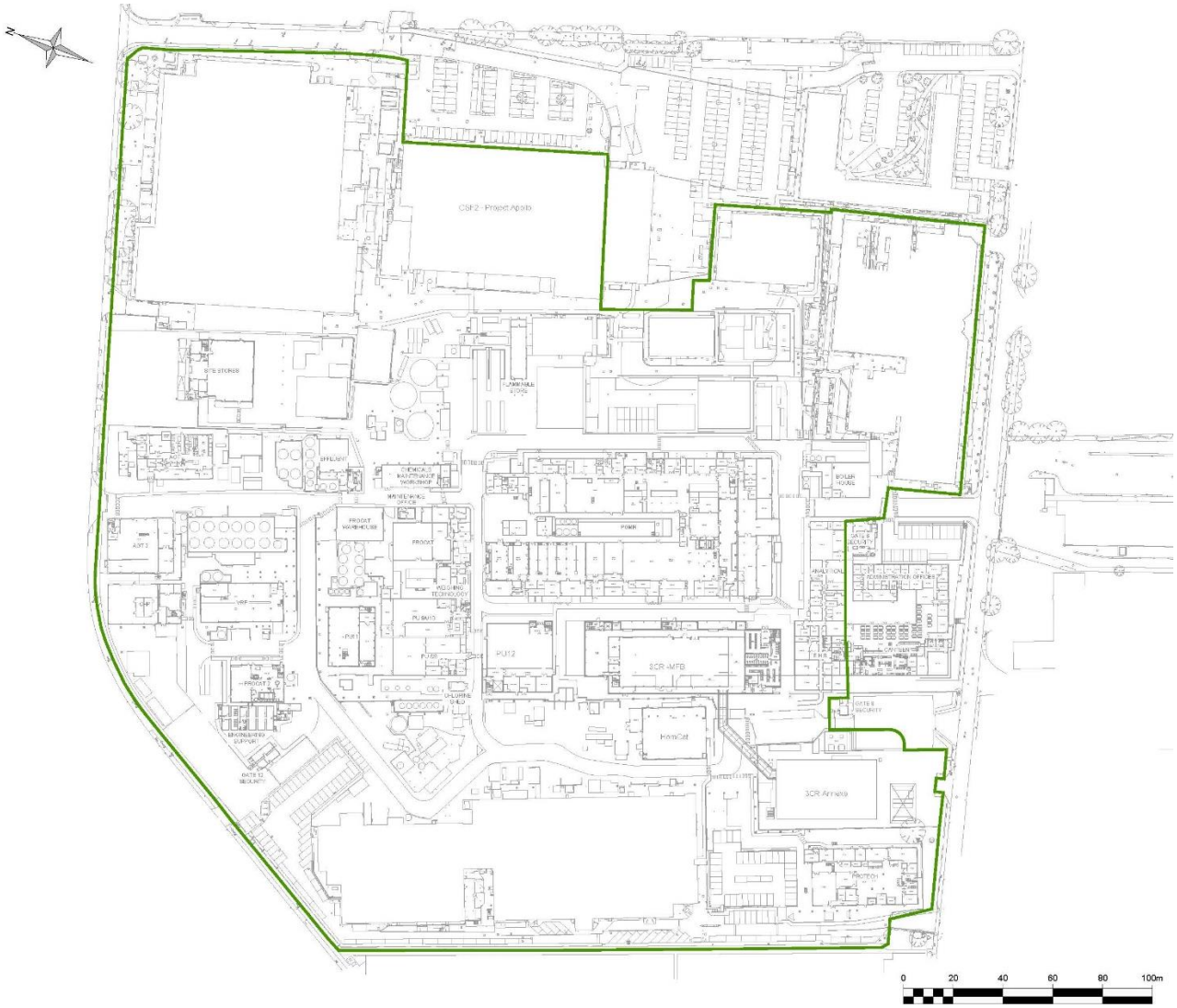
Where a minimum limit is set for any emission parameter, for example pH, reference to exceeding the limit shall mean that the parameter shall not be less than that limit.

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

- in relation to emissions from combustion processes, the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 3% dry for liquid and gaseous fuels other than gas engines or gas turbines, 6% dry for solid fuels; and/or
- in relation to emissions from gas engines or gas turbines, the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 15% dry for liquid and gaseous fuels; and/or
- in relation to emissions from non-combustion sources, the concentration at a temperature of 273K and at a pressure of 101.3 kPa, with no correction for water vapour content.

“year” means calendar year ending 31 December.

# Schedule 7 – Site plan




END OF PERMIT