

Notice of variation and consolidation with introductory note

The Environmental Permitting (England & Wales) Regulations 2016

Industrial Chemicals Limited
Stoneness Road Chemicals Facility
Stoneness Road
West Thurrock
Grays
Essex
RM20 3AG

Variation application number

EPR/BJ7298IF/V0067

Permit number

EPR/BJ7298IF

Stoneness Road Chemicals Facility

Permit number EPR/BJ7298IF

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.

The main purpose of the activities at the installation is to produce organic chemicals and inorganic salts. Following this variation there are eleven production units within a much larger industrial site. The installation comprises the areas occupied by the eleven technical units. Services are shared with the eleven units and other unregulated manufacturing operations which form part of the wider site development. The other process units and the shared services currently on the site do not fall, for control, under the Environmental Permitting Regulations (EPR).

This variation incorporates processes 5 - 11 into the permit under new scheduled activities and additional directly associated activities (DAA's). This variation also includes the incorporation of a DAA which relates to a separate permit operated by Industrial Power (EPR/SP3932JT) and will provide electricity, steam, hot and chilled water to the processes of this site.

Existing processes

Process 1 - Production of inorganic salts

Production of a portfolio of inorganic salts under the governance of a multi-product protocol. The manufacturing technique comprises a simple batch reaction between acid and base, with relevant acids and bases selected according to the required product from a raw material – product matrix. The raw materials are delivered to site by tanker and stored in bulk tanks. The process technique consists of charging the base to a stirred reactor and diluting with water (as required) before the controlled addition of the acid. The process is maintained sub-stoichiometric with an excess of base. On completion of the reaction, the aqueous solution is pumped to a storage tank from where it is tankered off site according to customer requirement.

Products will be manufactured in pre-scheduled campaigns to minimise reactor cleaning requirements at product changeover.

Potential for emissions to air arises only from the storage and handling of raw materials and products. Releases from bulk acid storage and the reactor vessel are vented through a scrubber and the process does not lead to significant releases to air. There are no wastes or by-products from the acid- base reaction, which is controlled in such a way that it proceeds to completion. There are therefore no releases from the reaction process itself to water, sewer or land. Reactor cleaning between product campaigns generates aqueous waste, which is retained for future use, but volumes are minimised by optimising campaign scheduling.

Process 2 - Oxidation of organic compounds

The process is operated on a continuous basis and involves the simple oxidation of an organic starter material in an aqueous solution. The raw materials are delivered to the site either in IBCs or by tanker and stored in bulk tanks. Materials are fed through reactors and the final product is pumped to closed storage tanks prior to tankering offsite for delivery to the customer.

Softened water for use in the process is produced on site. An oil-fired boiler and chillers provide steam and chilled water for heating and cooling of the reactor. Eluate from regeneration of the water softener together with condensate from the steam system and boiler blow-down are released periodically to the site drainage system that discharges under consent to Thames Water via the sewer.

The most significant environmental danger from the process is the potential for accidental release to groundwater from the organic starter material and its oxides (their higher molecular weights and low volatility prevent significant atmospheric risk). These are stored, handled and processed in bunded areas to prevent any material being released to land or groundwater.

All tanks and reactors are vented to atmosphere. The size and impact of releases from these vents are considered trivial given the low volatility of the materials described above.

Process 3 - Chlor - alkali plant

This process involves electrolysis of sodium chloride solution, which splits the solution into sodium hydroxide solution, chlorine gas and hydrogen. The plant has a combined manufacturing capability of 120 tonnes of chlorine a day. The chlorine is converted into hydrochloric acid or sodium hypochlorite solution (bleach). There is no provision for accumulation and storing chlorine at the site, it is continuously converted to product. The plant also has the capability for the electrolysis of other types of chloride salts, in particular potassium chloride. This process also has an evaporator attached which will be used to increase the concentration of the sodium hydroxide produced in this process from 32% up to 50%, the evaporator is an enclosed system (with the exception of one air vent D304 and with the 'second effect' being under vacuum), which can only be utilised by Process 3.

Process 4 - Ferric Sulphate plant

Ferric sulphate is the main chemical used by the water treatment industry within the UK to treat both drinking water and water that enters the system via the sewerage treatment works.

The process involves the oxidation of ferrous sulphate heptahydrate (Copperas) crystals in water, sulphuric acid and using nitric acid as the oxidising agent. In the oxidation process nitric acid is reduced to form nitric oxide gas which is drawn through an oxides of nitrogen NOx scrubber and recovered as reusable nitric acid.

An alternative method that may be used is the oxidation of ferrous sulphate heptahydrate crystals in water, sulphuric acid and using hydrogen peroxide as the oxidising agent.

Industrial chemicals have also adapted the plant at West Thurrock to use a further source of iron, a product called magnetite (a mixed iron oxide). In this process, the sulphuric acid & water are mixed in line (producing heat) and then pumped into the bottom of a dissolver containing a "bed" of magnetite. The exotherm generated by the sulphuric acid and water allows the magnetite to be dissolved (in a non-violent manner) to create iron sulphate in a continuous reaction with the magnetite being added regularly to the top of the dissolver.

The emissions at this point to air are steam from the top of the unit. The steam has been pH checked (recorded as pH7) and collected to determine if there are any sulphates in the steam, and none has been detected. The liquid (a mixed ferrous and ferric sulphate) is pumped through a filter to remove any undissolved solids. The filtered liquid then goes to the main ferric reactors for the remaining ferrous sulphate to be oxidised to ferric sulphate. There are no direct emissions to atmosphere, and the only fugitive emission is steam. The undissolved solids are then returned to the dissolver unit and the washings are used as the water that is mixed with the sulphuric acid. The only impact on the environment is the demand for water & the magnetite.

There is one emission point to air associated with the process from the NOx scrubber exhaust and there are no emissions to water/sewer.

A small amount of hazardous waste is produced from this process - for every tonne of copperas used, 15 g of waste is produced.

New processes

Process 5 - Ferrous chloride manufacture from the treatment of waste mill scale

The method of manufacturing Ferrous chloride is not a clean process. The dissolving of the mill-scale in the hydrochloric acid is a slightly exothermic process. The dissolvers are open topped, to allow the addition of mill-scale to the dissolver, whilst the hydrochloric acid is pumped into the dissolver from the bottom. The use of up to 36% HCl will give off acid fume at the top of the dissolver which will be removed by use of a forced draft, recirculating water scrubber. When the undissolved mill-scale sludge is removed, it will be put directly into IBC containers that have been purchased for the containment of this product and it will, at every clean out, be stored in the IBC's and then sent off-site for disposal at a suitable treatment facility.

Process 6 - Ferric chloride manufacture

The manufacture of Ferric chloride is a continuation of the Ferrous chloride process. Once the Ferrous chloride has been made, it is tested for strength and sent to storage. Once in storage, it is fed continuously to the ferric chloride plant which consists of a scrubber tower, a ferrous tower and a ferric tower all which recirculate ferrous / ferric from the bottom to the top of the column. The chlorine and ferrous chloride are fed in a counter current manner so the chlorine (plus dilution air) goes into the ferric tower at the bottom where it contacts the ferrous / ferric and oxidises any remaining iron (II) to iron (III). The reduced concentration of chlorine then passes through to the ferrous tower where the majority of the iron (II) is oxidised to iron (III) and all the chlorine is used up. If there is any remaining chlorine it passes through the scrubber tower to be scrubbed with the fresh ferrous feed.

The recirculation of the ferrous and ferric towers goes through a water cooled heat exchanger to keep the temperature below 40°C. Once the product comes out of the ferrous tower it goes through a density meter to determine the specific gravity (and hence ferric strength) is correct. If the strength is correct it will go forward to storage, if not it will be recirculated back to ferrous storage if it is too low (i.e. insufficient conversion has taken place). There is an emission point to air after the scrubber column. The process will have chlorine detectors after each column which includes the final vent before going to atmosphere. During the process of external monitoring, the company carrying out the monitoring will sample and test before and after the scrubber to determine its effectiveness. Waste as with Process 5, can be an issue but it will be stored and disposed of with the waste from process 5 as the waste streams are the same.

Process 7 - Strengthening of sulphuric acid

As the acid will be arriving on site at a slightly lower strength, than required for the use in both process 4 and also for sale. The use of the evaporating system is to increase the strength of the acid and if there are any impurities, for them to be extracted at the same time as condensate. The only emission point (point source emission) is the condensate point, there should not be any fugitive emissions from this process. The condensate from this process has yet to be determined as either a by-product or as a waste. There are still discussions on going between ICL and the supplier as to if the condensate is returned to the supplier to be re-used.

Process 8 - PolyAluminium chloride.

The raw materials for PolyAluminium Chloride (PAC) are aluminium hydrate powder, hydrochloric acid and sulphuric acid. In the past this excess has been cleaned and disposed of off-site. However, in the past 5 years, Industrial Chemicals have been reducing the amount of aluminium hydrate powder added to the process to a point where a minimum excess is added. The process has a pressure leaf filter system. These filters enable the plant to filter and collect the part-spent aluminium hydrate which can be re-used in the next batch. The wash water is then re-used as dilution water. The reactors are operated under pressure and any steam that is released at the end of the batch manufacturing process is passed through a water scrubber. Once the strength of the scrubber liquor reaches 26% Hydrochloric acid it is sent to the dilution tank to be used a dilution water in the making of the 18% and 10% solutions. The monitoring of the acid strength is important as it will start fuming if it reaches 28%. The water scrubber system allows the used scrubber water to go back into process.

Process 9 - Sodium silicate.

The manufacture of Sodium silicate, as be a product produced by Industrial Chemicals since 1985, when the company first started manufacturing Zeolite powder (aka Sodium AluminoSilicate). Sodium silicate was the second main raw material for the manufacture of Zeolite powder along with Sodium Aluminate. The use of the hydrothermal method for production is effective in that there is minimal waste solid material. The water used to clean the filter after each batch is transferred to a slops tank with the residue and is then used in the next batch as a dilution. The wash water has been trimmed to use the minimal volume of water necessary, which can then be the correct dilution volume in the next batch and then reduces the volume of wastewater that would need to be treated prior to disposal. The only emission to atmosphere is the steam that is released after the reaction and cooling stage of the process finishing via the vent valves. The condensed steam from the heating coils is then returned to the boiler feed water to be reused in the steam raising. Overall, the only impact on the environment is the demand for water, electricity and gas.

Process 10 - Sodium citrate.

The manufacture of Sodium citrate only has steam as a fugitive emission. The citric acid powder is added to water followed by the addition of sodium hydroxide solution and a simple neutralising reaction takes place. This process is undertaken as a batch process. Both raw materials arrive in bulk, are stored in silos or bags. There is a slightly exothermic reaction when the two raw materials are mixed to react and the only emission from the process is steam. The product is manufactured in a dedicated vessel. There is no waste produced by this process.

Process 11 - Aluminium sulphate.

The manufacture of Aluminium sulphate uses energy to operate the conveyors to add the aluminium hydrate powder, operate the agitator & then to subsequently pump the product out of the reactor. Less than 20 tonnes of spent aluminium hydrate waste is produced per year. All wash water will be reused in the process. There are no emissions to water and the only emission to air is of sulphuric acid entrained steam at an insignificant concentration.

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 EPR/BJ7298IF/A001	Duly made 22/12/00	Application for an organic chemicals manufacturing plant.
Requests for information dated 18/07/01, 18/03/02, 09/05/02	04/02/02 01/08/03 11/11/02	Responses received.
Permit determined EPR/BJ7298IF	06/08/03	Permit issued to Industrial Chemicals Limited.
Application EPR/BJ7298IF/V002	Duly made 05/06/09	Variation to change the installation name to Stoneness Road Chemicals Facility.
Variation determined EPR/BJ7298IF	18/01/10	Varied permit issued.
Application EPR/BJ7298IF/V003 (variation and consolidation)	Duly made 07/03/11	Application to add Process 3a (Chlor-alkali plant) and Process 4a (Ferric sulphate plant).
Request for information dated 31/05/11	03/06/11	Response received.
Variation and consolidation determined EPR/BJ7298IF	22/08/11	Variation and consolidation issued in modern permit format.
Application EPR/BJ7298IF/V004 (variation and consolidation)	Duly made 10/11/14	Application to include an Evaporator into Process 3a (Chlor-alkali plant).
Request for information dated 05/12/14	08/12/14	Response received.
Variation and consolidation determined EPR/BJ7298IF	22/12/14	Variation and consolidation issued in modern permit format.
Application EPR/BJ7298IF/V006 (variation)	Duly made 10/02/15	Application to extend the installation boundary to include new location of an existing emission point A17.
Additional information received	12/02/15	Revised emission points drawing showing new location of A17.
Additional information received	10/03/15	Revised site plan.

Status log of the permit		
Description	Date	Comments
Variation determined EPR/BJ7298IF (Billing Ref: LP3337WZ)	27/03/15	Varied permit issued.
Regulation 60 Notice sent to the Operator	12/05/15	Issue of a Notice under Regulation 60(1) of the EPR. Environment Agency Initiated review and variation to vary the permit under IED to implement the provisions for activities listed in Annex I under Chapter II.
Regulation 60 Notice response	21/08/15	Response received from the Operator.
Additional information received	23/02/16 24/02/16	Responses to request for further information in emails dated 21/01/16 and 10/02/16
Variation EPR/BJ7298IF/V006 (PAS Billing ref: RP3736RD)	17/03/16	Varied permit issued for review of conditions resulting from the response to the Regulation 60(1) Notice of EPR.
Application EPR/BJ7298IF/V007 variation and consolidation	Duly made 06/07/18	Application to include processes 5 - 11 and DAA's, incorporate changes to process 4, add emission point A23 for Process 3 line 2 burner and add multi-operator conditions as a result of the other environmental permit SP3932JT for the Gas CHP plant issued to Industrial Power Ltd on 03/06/2019.
Additional information received	07/01/19 18/01/19 23/01/19 04/02/19	Responses to request for further information (Schedule 5 Notice) dated 03/12/18.
Additional information received	16/04/19 20/05/19 20/05/19	Responses to request for further information (Schedule 5 Notice 2) dated 13/03/19.
Variation EPR/BJ7298IF/V007 (PAS Billing Ref: BP3132JP)	05/06/19	Varied and consolidated permit issued to Industrial Chemicals Limited.

Other permits relating to this installation		
Operator	Permit number	Date of issue
Industrial Power	EPR/SP3932JT	03/06/19

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 and consolidates

Permit number

EPR/BJ7298IF

Issued to

Industrial Chemicals Limited (“the operator”)

whose registered office is

Titan Works

Titan Industrial Estate

Hogg Lane

Grays

Essex

RM17 5DU

company registration number 03886037

to operate a regulated facility at

Stoneness Road Chemicals Facility

Stoneness Road

West Thurrock

Grays

Essex

RM20 3AG

to the extent set out in the schedules.

The notice shall take effect from 05/06/2019

Name	Date
Dan Timney	05/06/2019

Authorised on behalf of the Environment Agency

Schedule 1

Only the following conditions have been varied by the consolidated permit EPR/BJ7298IF:

The following conditions were varied as a result of an Environment Agency initiated variation:

- Process 4 has been included into table S1.1 of the permit as this is a separate production line to process 1 and such is a scheduled activity in its own right. This has been done to correct an error in the permit.

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

- Condition 1.5 has been included due to the site now being a multi-operator site (stand-alone DAA operated by Industrial Power)
- Condition 2.3.4 has been included into the permit due to the acceptance of non-hazardous waste
- Condition 3.6 FPP condition has been included due to the acceptance of non-hazardous waste
- Condition 4.2.5 has been included due to the site now accepting waste
- Table S2.2 (permitted waste types) has been included into the permit
- Table S3.5 has been added to include process monitoring requirements for processes 3, 5 and 8

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

- Condition 2.2.1 to replace the site condition with a multi-operator version of this condition
- Condition 3.5.1 has been amended to include reference to table S3.5
- Table S1.1 (activities) to include the following scheduled activities and directly associated activities
 - Seven 4.2 A (1)(a)(iv) activities to include process lines 4, 5, 6, 8, 9, 10 & 11
 - Two Directly Associated Activities
 - To include process 4 - sulphuric acid concentrator/evaporator
 - To include the acceptance of wastes to be used as raw materials in processes 4, 5 & 6
- Table S1.2 (operating techniques) to include the following documents submitted in variation application
 - Response to technical standards question in application form
 - Responses to relevant Schedule 5 Notice questions
 - Revised emission point and layout plan
 - BAT assessments of new processes
 - Site emergency plan
 - P&ID drawings for all new processes (5 - 11)
 - Response to question 6 - confirmation of bunding and infrastructure design and construction
- Table S1.3 (improvement programme requirements) has been amended to show references 9.15 and 9.16 as complete.
- Table S3.1 to include additional point source emission point
 - Process 3 - A23 - Line 2 burner (Cl₂ - gas)
 - Process 5 - A24 (dissolvers scrubber, HCl - acid)
 - Process 5 - A31 (HCl acid storage scrubber, HCl - acid)
 - Process 6 - A25 (Cl₂ - gas)
 - Process 8 - A27 (HCl - acid)
 - Process 11 - A30 (H₂SO₄ - acid)
 - and vents associated with processes 4, 5, 6, 8, 9, 10 & 11
- Table S3.1 to amend:
 - The source name of A19 (Process 3 - Line 1) - Line 1 Burner
 - The source name of A20 (Process 3) - Process Scrubbers (Line 1 and Line 2)
 - The monitoring method for continuous Chlorine monitoring on PSE points A19, A20, A23 and A25 to be both Drager and/or API
 - Note [1] to include reference to the point source emission point plan submitted in this variation

- Table S4.1 to include additional point source emission points A23 (Process 3 - Line 2) - Line 2 Burner and A25 (Process 6) - Process Scrubber.
- Table S4.2 to include annual production reporting requirements for processes 5 - 11
- Table S4.3 to include performance parameter reporting for Hydrochloric Acid and Sodium Hydroxide usage
- Table S4.4 to update reporting forms for emissions to air and performance indicators
- Schedule 6 to update the “EP Regulations” to refer to 2016 and to include interpretations for “List of Wastes” and “quarter”
- Schedule 7 - inclusion of a revised site plan which incorporates all new processes (5 - 11) and the stand-alone combustion plant DAA

Schedule 2 – consolidated permit

Consolidated permit issued as a separate document.

Permit

The Environmental Permitting (England and Wales) Regulations 2016

Permit number

EPR/BJ7298IF

This is the consolidated permit referred to in the variation and consolidation notice for application EPR/BJ7298IF/V0067 authorising,

Industrial Chemicals Limited (“the operator”),

whose registered office is

Titan Works

Titan Industrial Estate

Hogg Lane

Grays

Essex

RM17 5DU

company registration number 03886037

to operate an installation at

Stoneness Road Chemicals Facility

Stoneness Road

West Thurrock

Grays

Essex

RM20 3AG

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

Name	Date
Dan Timney	05/06/2019

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 Multiple operator installations

- 1.5.1 For the following activities referenced in schedule 1, table S1.1 (AR1 to AR16). Where the operator notifies the Environment Agency under condition 4.3.1 (a) or 4.3.1 (c), the operator shall also notify without delay the other operator of the installation of the same information.

2 Operations

2.1 Permitted activities

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

2.2 The site

- 2.2.1 The activities shall not extend beyond the site, being the land shown edged in green on the site plan at schedule 7 to this permit, excluding the area edged in red on the site plan that represents the extent of the installation covered by this permit and that of the other operator of the installation.

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.

2.4 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.

3 Emissions and monitoring

3.1 Emissions to water, air or land

- 3.1.1 There shall be no point source emissions to water, air or land except from the sources and emission points listed in schedule 3 tables S3.1, S3.2 and S3.3.
- 3.1.2 The limits given in schedule 3 shall not be exceeded.
- 3.1.3 Total annual emissions from the emission point(s) set out in schedule 3 table S3.1 of a substance listed in schedule 3 table S3.4 shall not exceed the relevant limit in table S3.4.
- 3.1.4 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 S3.1, S3.2 and S3.3;
 - (b) process monitoring specified in table S3.5
- 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 S3.1, S3.2 and S3.3 unless otherwise agreed in writing by the Environment Agency.

3.6 Fire prevention

- 3.6.1 The operator shall take all appropriate measures to prevent fires on site and minimise the risk of pollution from them including, but not limited to, those specified in any approved fire prevention plan.
- 3.6.2 The operator shall:
- (a) if notified by the Environment Agency that the activities are giving rise to a risk of fire, submit to the Environment Agency for approval within the period specified, a fire prevention plan which prevents fires and minimises the risk of pollution from fires;
 - (b) implement the fire prevention plan, from the date of approval, unless otherwise agreed in writing by the Environment Agency.

4 Information

4.1 Records

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

- (a) be legible;
- (b) be made as soon as reasonably practicable;
- (c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and
- (d) be retained, unless otherwise agreed in writing by the Environment Agency, for at least 6 years from the date when the records were made, or in the case of the following records until permit surrender:
 - (i) off-site environmental effects; and
 - (ii) matters which affect the condition of the land and groundwater.

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

4.2 Reporting

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

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

- (a) a review of the results of the monitoring and assessment carried out in accordance with the permit including an interpretive review of that data;
- (b) the annual production /treatment data set out in schedule 4 table S4.2; and
- (c) the performance parameters set out in schedule 4 table S4.3 using the forms specified in table S4.4 of that schedule.

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

- (a) in respect of the parameters and emission points specified in schedule 4 table S4.1;
- (b) for the reporting periods specified in schedule 4 table S4.1 and using the forms specified in schedule 4 table S4.4; and
- (c) giving the information from such results and assessments as may be required by the forms specified in those tables.

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

4.2.5 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.

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 (a)(i), or 4.3.1 (b)(i) where the information relates to the breach of a limit specified in the permit, 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.

4.4 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	Limits of specified activity
AR1	4.2 Part A (1) (a) (iv)	Producing inorganic chemical salts. Production of more than one inorganic chemical in one plant.	Receipt of raw materials to despatch of finished product in solution. The production of a portfolio of inorganic salts (process 1).
AR2	4.1 Part A (1) (a) (ii)	Producing an organic chemical containing oxygen Production of more than one organic chemical in one plant.	Receipt of raw materials to despatch of finished product. The oxidation of an organic starter material in an aqueous solution (process 2).
AR3	4.2 Part A (1) (a) (iii)	Producing an inorganic chemical bases. Production of one inorganic chemical in one plant.	Chlor-alkali facility (process 3) Receipt of raw materials to despatch of finished product.
AR4	4.2 A (1) (a) (iv)	Producing inorganic chemical salts. Production of one inorganic chemical in one plant.	Ferric sulphate plant (process 4) Receipt of raw materials to despatch of finished product.
AR5	4.2 A (1) (a) (iv)	Producing inorganic chemical salts. Production of one inorganic chemical in one plant.	Ferrous chloride plant (process 5) <i>Hydrochloric acid supplied from process 3</i> Receipt of raw materials to despatch of finished product.
AR6	4.2 A (1) (a) (iv)	Producing inorganic chemical salts. Production of one inorganic chemical in one plant.	Ferric chloride plant (process 6) <i>Hydrochloric acid supplied from process 3</i> Receipt of raw materials to despatch of finished product.
AR7	4.2 A (1) (a) (iv)	Producing inorganic chemical salts. Production of one inorganic chemical in one plant.	Polyaluminium chloride plant (process 8) <i>Hydrochloric acid supplied from process 3</i> Receipt of raw materials to despatch of finished product.
AR8	4.2 A (1) (a) (iv)	Producing inorganic chemical salts. Production of one inorganic chemical in one plant.	Sodium silicate plant (process 9) <i>Sodium hydroxide supplied from process 3</i> Receipt of raw materials to despatch of finished product.

Table S1.1 activities			
Activity Reference	Activity listed in Schedule 1 of the EP Regulations	Description of specified activity	Limits of specified activity
AR9	4.2 A (1) (a) (iv)	Producing inorganic chemical salts. Production of one inorganic chemical in one plant.	Sodium citrate plant (process 10) <i>Sodium hydroxide supplied from process 3</i> Receipt of raw materials to despatch of finished product.
AR10	4.2 A (1) (a) (iv)	Producing inorganic chemical salts. Production of one inorganic chemical in one plant.	Aluminium sulphate plant (process 11) <i>Sulphuric acid supplied from process 4</i> Receipt of raw materials to despatch of finished product.
Directly Associated Activity			
AR11	Production of softened water	Purification of mains water in an ion exchange unit	Receipt of raw materials to use of water in process
AR12	Boiler fired by gas oil	Steam generation with capacity of 0.7 MWh	Within area of process 2 and 4
AR13	Water discharge to site sewer drainage system	Discharge of eluate from the ion exchange unit, discharge of boiler blow down water, discharge of any spilt oxidant after dilution and effluent from the Chlor-alkali process.	From ion exchange plant to site drainage, from process 2 area to site drainage and from off-loading bay to site drainage. Effluent produced from the Chlor-alkali process
AR14	Evaporator	Concentration of sodium hydroxide produced in the Chlor-alkali process	Directly linked to the Chlor-alkali process only
AR15	Acceptance of waste as raw materials	Acceptance of waste codes 10 02 10 - mill scales and 19 10 01 - iron and steel waste for use as raw materials.	Acceptance of wastes to be used as raw materials in processes 4, 5 and 6.
AR16 (Process 7)	Sulphuric acid concentrator/evaporator	Acceptance of lower strength sulphuric acid to strengthen for use in other on site processes and for sale.	From acceptance of lower strength sulphuric acid to use in process 4.

Table S1.2 Operating techniques		
Description	Parts	Date Received
Application	The response to question 2.1 given in section 2.1 and the response to question 2.3 given in section 2.3 of the application.	22/12/00
Response to the first schedule 4 part 1 Notice	Response items 3,4,5,6,7,8,12,13,14,15,16 and 17	04/02/02
Application to vary the permit EPR/BJ7298IF/V002	The multi product protocol set out in document ICL-EMS-WT-DOC5144	05/06/09

Table S1.2 Operating techniques		
Description	Parts	Date Received
Variation and consolidation application EPR/BJ7298IF/V003	Appendix C2 2b - changes to Activity, Appendix C2 5a iii - Proposed amendment to permitted area BJ7298IF whole site view, Appendix C2 5c - non technical summary, Appendix C2 6 ii Chlor-alkali risk assessment, Appendix C2 6 iii Ferric sulphate risk assessment, Appendix C2 6 iv chlorine dispersion modelling, Appendix C3 3b fugitive emissions, Appendix C3 4a Emission monitoring, Appendix C3 4b, point source emissions.	31/01/11
Variation and consolidation application EPR/BJ7298IF/V003	Information required for assessing the NO ₂ ELV. Email dated 29/07/2011	29/07/11
Variation and consolidation to modern conditions application EPR/BJ7298IF/V004	Appendix C2 2b - Changes to permitted activity, Appendix C2 5a - drawing of process 3 illustrating the location of the proposed evaporator, Appendix C2 4d2 - copy of front page & index of site safety report for COMAH, Appendix C2 5c - Non technical summary, Appendix C2 6 - H1, Appendix C3 3a - Technical standards, Appendix C3 3c - Types & Raw Materials, Appendix C3 4a - Emissions monitoring, Appendix C3 4b - Point Source emissions, Appendix C3 6a - Energy efficiency, Appendix C3 6b - Breakdown of energy change, Appendix C3 6c - Climate Change Levy, Appendix C3 6d - raw material justification, Appendix X3 6e - Waste avoidance, Appendix C3 Appendix 2 1 - Technical description of activity.	29/09/14
Response to Request for Further Information	All parts received in emails dated 10 th November 2014 - includes a Risk Assessment for the proposed evaporator, HAZOP summary for proposed evaporator.	10/11/14
Response to Request for Further Information	Email received dated 8 th December 2014 - includes confirmation of an air vent within the evaporator, the composition of the evaporator (Nickel alloy - Ni 200) being fit for purpose and the extent to which the evaporator is under vacuum.	08/12/14
Variation application EPR/BJ7298IF/V005	Appendix C3 3a - Technical standards	10/02/15
Variation application EPR/BJ7298IF/V005	Revised emission points drawing showing new location of A17.	12/02/15
Variation application EPR/BJ7298IF/V005	Revised site plan.	10/03/15
Regulation 60(1) Notice – request for further information dated 12/05/15	Technical standards in relation to Best available techniques as described in BAT conclusions under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions for iron and steel production BAT Conclusions Numbers: BAT 1 (cell technology); BAT 4 (waste water generation); BAT 5 and BAT 6 (energy efficiency); BAT 7 (emissions monitoring); BAT 8 and BAT 10 (emissions to air); BAT 11, BAT 12, BAT 13, BAT 14 and BAT 15 (emissions to water); BAT 16 (waste generation); BAT 17 (site remediation). (BAT 2, BAT 3 and BAT 9 are not relevant for this activity)	21/08/16
Variation application EPR/BJ7298IF/V007	Supporting documents: <ul style="list-style-type: none"> • 'Appendix C2 5c - Non Technical Summary' • 'Appendix C3 3a - Technical standards' 	23/03/18

Table S1.2 Operating techniques		
Description	Parts	Date Received
	<ul style="list-style-type: none"> 'Appendix C3 Appendix 2 1 - Technical Descriptions' (sections referring to processes 5 - 7 only) 	
Variation application EPR/BJ7298IF/V007	<ul style="list-style-type: none"> Material Balance for Ferrous & Ferric Chloride Manufacture. Document reference: CL-EMS-RUN-DOC5030 Sulphuric Acid concentrator P&ID. Drawing number: TPSSE 05794, Issue B Sulphuric Acid storage tank P&ID. Drawing number: TPSSE 05795, Issue B 77% Sulphuric Acid end of waste confirmation (letter from the EA dated 12th October 2011) 'Appendix C3 4b - Fugitive Emissions - amended 25-06-2018' 'Appendix C3 4a - Monitoring of Emissions - amended' (sections referring to processes 5 - 7 only) 	12/06/18
Variation application EPR/BJ7298IF/V007	<ul style="list-style-type: none"> 'Appendix C3 3ci - Raw Materials list - amended 30/05/18' 'Appendix C3 4b - Fugitive Emissions - amended 25-06-2018' 	25/06/18
Variation application EPR/BJ7298IF/V007	<ul style="list-style-type: none"> Answer to Form C3, Question 3a 'Appendix C3 3ci - Raw Materials list - amended 30/05/18' Response to question on Part C2, Q6 of the Not Duly Made Letter dated 15th May 2018 	06/07/18
Response to request for further information	<ul style="list-style-type: none"> Sulphuric Acid concentrator DAA scrubber P&ID. Drawing number: TPSSE 05820, Issue A Sulphuric Acid concentrator DAA cooling tower P&ID. Drawing number: TPSSE 06051, Issue A Procedure No 38: Bunds. Document Ref: ICL-EMS-GEN-DOC5077 Procedure No 36: Oil. Document Ref: ICL-EMS-GEN-DOC5048 Procedure No 61: Fire Safety. Document Ref: ICL-EMS-GEN-DOC7048 	07/01/19
Response to request for further information	<ul style="list-style-type: none"> Ferric Chloride plant P&ID. Drawing number: TPSFC 05736, Issue H Polyaluminium Chloride plant P&ID - Part 1. Drawing number: PAC 01133 SHT 1 OF 2, Issue 3 Polyaluminium Chloride plant P&ID - Part 2. Drawing number: PAC 01133 SHT 2 OF 2, Issue 4 Sodium Silicate plant P&ID. Drawing number: ZEO 00929, issue 1 Procedure No 84: Chemical Warehousing. Document Ref: ICL-SMS-GEN-DOC7116 	18/01/19
	<ul style="list-style-type: none"> Ferrous Chloride plant P&ID. Drawing number: TPSFRC 05879, issue B 	23/01/19
Response to request for further information	<ul style="list-style-type: none"> Revised emission point and layout plan. Drawing number: EN 03137, titled: EAIPPC: Permit BJ 7298 IF V007. West Thurrock Site 	20/05/19

Table S1.2 Operating techniques		
Description	Parts	Date Received
Response to request for further information	<ul style="list-style-type: none"> BAT assessments for processes 5 - 11 	04/02/19
Response to request for further information	<ul style="list-style-type: none"> Response to monitoring question for processes 5, 8 and 11 	20/05/19
Response to request for further information	<ul style="list-style-type: none"> BAT assessment for missing info on processes 5 - 11 	20/05/19

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
9.1	Provide details to the Agency of the location of storage of general waste and scrap materials described in table	Complete
9.2	Confirm to the Agency the completion of a preventative maintenance schedule for relevant plant and equipment. The confirmation shall include: an outline of the methods used for recording maintenance; and a description of the proposals to review the programme.	Complete
9.3	Prepare and submit to the Agency a structured accident management plan having regard to the indicative BAT requirements detailed in section 2.8 of the sector guidance note IPPC S4.02 for speciality organic chemicals	Complete
9.4	A report shall be sent to the Agency on establishing an Environmental Management System having regard to section 2.3 of the sector guidance note IPPC S4.02 for speciality organic chemicals. The report shall include any proposals to implement such a programme.	Complete
9.5	Prepare and submit to the Agency an energy efficiency plan having regard to the indicative BAT requirements detailed in sections 2.7.2 and 2.7.3 of the Horizontal Guidance Note H2: Energy efficiency.	Complete
9.6	Carry out a comprehensive waste minimisation audit having regard to section 2.4.2 of the sector guidance note IPPC S4.02 for Speciality Organic Chemicals. Report findings to the Agency together with any proposals for improvements.	Complete
9.7	Carry out a comprehensive water efficiency audit having regard to section 2.4.3 of the Sector Guidance Note IPPC S4.02 for speciality organic chemicals. Report the findings to the Agency together with any proposals for improvements	Complete
9.8	Prepare and submit to the Agency a site-closure plan for the installation having regard to section 2.11 of the Sector Guidance Note IPPC S4.02 for speciality organic chemicals.	Complete
9.9	Prior to the installation and commissioning of the dryer to Process 1, report to the Agency on the effectiveness of the filters installed on the drying plant at Titan Works. The report shall include revised proposals for the plant to be installed at Stoneness road together with proposed emissions limits and energy consumption.	Complete
9.10	<p>The operator shall amend the Multi Product Protocol (MPP), set out in document ICL-EMS-WT-DOC5144, to incorporate the following:</p> <ul style="list-style-type: none"> The Listed Activity for the application of the MPP shall be amended to correspond with the new listed activity for process 1 identified by this variation notice. <p>The operator shall also amend the multi product protocol (MPP), set out in document ICL-EMS-WT-DOC5144, to incorporate the following systems and procedures, which shall be implemented for each product campaign:</p> <ul style="list-style-type: none"> A documented pre-campaign audit system to check all start up conditions, including (but not limited to) plant configuration, use of correct instrumentation ranges and limits, operator training, completion 	Complete

Reference	Requirement	Date
	<p>of safety studies and actions, availability of start up procedures and review of the previous campaigns for the same product.</p> <ul style="list-style-type: none"> • A system of recording campaign length, emissions, waste disposals, plant modifications, maintenance and equipment failures; • A system to ensure that process, raw materials and product incompatibilities do not lead to any environmental impacts during routine operation or foreseeable non routine events; • A requirement for interim reviews during extended campaigns to confirm that the process is optimised and the environmental impact is minimised; this review may include (but not be limited to) a waste minimisation audit, energy survey, process efficiency review, mass balance, process route review and equipment review; • A requirement for a commissioning report for the first campaign of each product which compares predicted and actual results; any significant deviation from expected performance would require a report to describe the environmental impact and improvements required to demonstrate BAT prior to the next campaign, to be confirmed by a repeat application of the protocol before manufacture of the same product again; the commissioning report shall include proposals, based on predicted and achieved performance during the first campaign, for an annual mass emission limit for each new acid species introduced to the installation which: <ul style="list-style-type: none"> a) Have regard for the continued application of BAT for the prevention or minimisation of releases to air; b) Have regard for the worst case impact assessment incorporated into the MPP; and, c) Have regard for the annual mass emission limit for acetic acid currently imposed by conditions in the permit. <p>The agency may vary the permit to incorporate such acid emission limits into the permit.</p> <ul style="list-style-type: none"> • A requirement for notification to the Agency of a new substance data. 	
9.11	The Operator shall submit a copy of the amended Multi-Product protocol required in accordance with Improvement Condition 9.10 to the Agency.	Complete
9.12	The Operator shall submit a written report for the subsequent approval of the Environment Agency that summarises a review of the provision of MCERTS accreditation for the monitoring equipment, personnel and organisations employed for the emissions to air monitoring programme in condition 3.5.1. The report shall also propose a timetable for achieving this standard for any elements that are not MCERTS certified or justify deviation from MCERTS and agree in writing with the Environment Agency other appropriate methods.	Complete
9.13	The Operator shall submit a written report for the subsequent approval of the Environment Agency that demonstrated the abatement equipment for emissions to air, for emission points A17 - A20 is effective and ELV's are being met.	Complete
9.14	The Operator shall submit an up-dated drawing showing all emission points to air for the permitted site - Processes 1-4.	Complete
9.15	<p>The operator shall submit, for approval by the Environment Agency, a report setting out progress to achieving the BAT conclusion Associated Emission Levels (BATc AEL) where BAT is currently not achieved, but will be achieved before 9 December 2017. The report shall include, but not be limited to, the following:</p> <ol style="list-style-type: none"> 1) Current performance against the BAT-AEL. 2) Methodology for reaching the AELs. 3) Associated targets / timelines for reaching compliance by 9 December 2017. <p>The report shall address the following: BAT 8 and BAT 13.</p>	Complete

Reference	Requirement	Date
9.16	<p>The operator shall submit, for approval by the Environment Agency, a report setting out progress to achieving the 'Narrative' BAT where BAT is currently not achieved, but will be achieved before 9 December 2017. The report shall include, but not be limited to, the following:</p> <ol style="list-style-type: none"> 1) Assessment of applicability of each technique specified in the BAT conclusions 2) Methodology for achieving BAT. 3) Associated targets / timelines for reaching compliance by 9 December 2017. <p>The report shall address the following: BAT 4, BAT 7, BAT 11.</p>	Complete

Schedule 2 – Waste types, raw materials and fuels

Table S2.1 Raw materials and fuels	
Raw materials and fuel description	Specification
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Table S2.2 Permitted waste types and quantities for use in processes 4 & 5	
Maximum quantity	For use in processes 4, 5 & 6; maximum throughput of 100,000 tonnes per annum
Waste code	Description
10 02 10	Mill scales
19 10 01	Iron and steel waste

Schedule 3 – Emissions and monitoring

Table S3.1 Point source emissions to air – emission limits and monitoring requirements						
Emission point ref. & location [1]	Source	Parameter	Limit	Reference period	Monitoring frequency	Monitoring standard or method
A17 (Process 4) as referenced in emission points to air plan submitted on 12/02/15	Atmospheric Vent on nitric acid recovery column	Nitrogen Dioxide	200 mg/m ³	Hourly Average	Continuous	BS EN 15267-3 [2]
			120 mg/m ³	Monthly Average		
A19 (Process 3 - Line 1)	Line 1 Burner	Chlorine	No limit set [3]	Monthly Average	Continuous	Dräger and/or API
			1 mg/m ³ [3]	Spot sample [4]		
A20 (Process 3)	Process scrubbers (Line 1 and Line 2)	Chlorine	No limit set [3]	Monthly Average	Continuous	Dräger and/or API
			1 mg/m ³ [3]	Spot sample [4]		
A21 - Boiler	Boiler	Oxides of Nitrogen (NO and NO ₂)	No limit set	Spot sample hourly mean during operation	Annually	BS EN 14792
		Carbon Monoxide	No limit set			BS EN 15058
A23 (Process 3 - Line 2)	Line 2 Burner	Chlorine	No limit set	Monthly Average	Continuous	Dräger and/or API
			1 mg/m ³	Spot Sample [4]		
A25 (Process 6) as referenced in point source emission plan submitted with V007 (Drawing number: EN 03137)	Process scrubber	Chlorine	No limit set	Monthly Average	Continuous	Dräger and/or API
			1 mg/m ³	Spot sample [4]		
A30 (Process 11) as referenced in point source emission plan submitted with V007 (Drawing number: EN 03137)	Aluminium sulphate plant	Sulphuric Acid	No limit set	Spot sample	Annually	US EPA Method 8

- Note [1] Emission point references (except A17) as described in the air plan submitted in response to IC 9.14 and also referenced in point source emission plan submitted with V007 (Drawing number: EN 03137).
- Note [2]: Certification to the MCERTS performance standards indicates compliance with BS EN 15267-3.
- Note [3]: This limit shall apply from 9 December 2017. Until then the limit shall be 10 mg/m³.
- Note [4]: With effect from 9 December 2017, this limit is for the average value of at least three consecutive hourly measurements of chlorine and chlorine dioxide, measured together and expressed as Cl₂, performed at least once every quarter at the emission point by absorption in a solution with subsequent analysis.

Table S3.1 (Continued) The following emission points have no limits set or monitoring requirements		
Emission point ref. & location [1]	Source	Parameter
A1 (Process 1)	Acid storage and reactor	--
A1 (Process 2)	Chelant storage	--
A2 (Process 2)	Chelant dissolution tank	--
A4, A5 (Process 2)	Organic starter storage tanks	--
A7, A8, A9 (Process 2)	Oxidant storage tanks	--
A10, A11, A12 (Process 2)	Reactor vents	--
A13, A14, A15, A16 (Process 2)	Product storage silos	--
A18 (Process 3)	Cathode cell Vent	Hydrogen
A22 - Evaporator, referenced as D304 on the Evaporator P&ID received in V004 application	Evaporator	Evacuated air
Process 4 - Magnetite Dissolver steam vent	Magnetite Dissolver	--
Process 5 - Storage tank vents to tanks referenced as VSL.0006 and VSL.0007 on process 5 P&ID received in V007 application	Storage tanks	--
Process 6 - iron salts feed tank referenced VSL.5000 and ferric chloride storage tank referenced VSL.5003 on process 6 P&ID received in V007 application	Storage tanks	--
Process 7 (DAA) - Sulphuric acid concentrator steam vent (A26 on Emission Point Plan received in V007 application), Sulphuric acid storage tank vents referenced VSL.0003 and VSL.0004 on process 7 P&ID received in V007 application	Reactor and storage vents	--
Process 9 - steam vent (A28) on Emission Point Plan received in V007 application)	Steam from pressure relief vents	Steam
Process 10 - steam vent (A29) on Emission Point Plan received in V007 application)	Steam from pressure relief vents	Steam

- Note [1] Emission point references (except A22) as described in the air plan submitted in response to IC 9.14 point source emission plan submitted with V007 (Drawing number: EN 03137) and P&ID for process 5,6,7 9 and 10 received in V007 application.

Table S3.2 Point Source emissions to water (other than sewer) and land – emission limits and monitoring requirements

Emission point ref. & location	Source	Parameter	Limit	Monitoring frequency	Monitoring standard or method
W1 Site drain discharging to River Thames At NGR: TQ 59000 76550	Brine purge	Chlorides	No limit set	1 batch per Month	EN ISO 10304-4 or EN ISO 15682
		Sulphates	No limit set	1 batch per Year	EN ISO 10304-4
		Halogenated organic compounds			Annex A to EN ISO 9562
		Relevant heavy metals			EN ISO 11885 or EN ISO 17294-2
	RO Waste water stream	Free Chlorine	0.2 mg/l [1]	Every batch	EN ISO 7393-1 or -2
		Chlorates	No limit set	1 batch per Month	EN ISO 10304-4

Note [1]: This limit, expressed as Cl₂, shall apply from 9 December 2017. Until then no limit shall be set.

Table S3.3 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	Reference period	Monitoring frequency	Monitoring standard or method
S1	Ion-exchange eluate	As agreed with the Sewerage Undertaker	-	-	As agreed with the Sewerage Undertaker	-
S2	Boiler blowdown		-	-		-
S3	Spilt oxidant		-	-		-

Table S3.4 Annual limits

Substance	Medium	Limit
Acetic acid	Air	20 grams per tonne of product
Process 2 organic starter	Air	20 grams per tonne of product
Process 2 oxidant	Air	5 grams per tonne of product
Process 2 oxidant	Air	2 grams per tonne of product

Table S3.5 Process monitoring requirements

Emission point reference or source or description of point of measurement	Parameter	Limit	Reference period	Monitoring frequency	Monitoring standard or method	Other specifications
Process 5 - Process scrubber water (A24)	Hydrogen Chloride	26%	Spot sample	Daily	HCl-TM001: Determination of HCl content (Volumetric Method)	The scrubber system shall be regularly checked and maintained to ensure the appropriate concentration of HCL.
Process 8 - Process scrubber water (A27)	Hydrogen Chloride	26%	Spot sample	Daily	HCl-TM001: Determination of HCl content (Volumetric Method)	The scrubber system shall be regularly checked and maintained to ensure the appropriate concentration of HCL.
Process 3 and 5 - Process scrubber water (HCl storage) (A31)	Hydrogen Chloride	26%	Spot sample	Daily	HCl-TM001: Determination of HCl content (Volumetric Method)	The scrubber system shall be regularly checked and maintained to ensure the appropriate concentration of HCL.

Schedule 4 – Reporting

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

Table S4.1 Reporting of monitoring data			
Parameter	Emission or monitoring point/reference	Reporting period	Period begins
Emissions to air: Nitrogen dioxide, chlorine	A17, A19, A20, A23, A25	Quarterly	1 January, 1 April, 1 July, 1 October
Emissions to air: Oxides of nitrogen (NO and NO ₂), carbon monoxide	A21	Annually	1 January
Emissions to water: Free Chlorine, Chlorides, Chlorates	W1	Quarterly [1]	1 January, 1 April, 1 July, 1 October
Emissions to water: Sulphates, halogenated organic compounds, relevant heavy metals	W1	Annually [1]	1 January

Note [1]: Reporting for discharges to W1 is only required after 9 December 2017

Table S4.2: Annual production/treatment	
Parameter	Units
Ferric Sulphate	tonnes
Hydrochloric Acid	tonnes
Sodium Hydroxide (separate tonnages per different concentration)	tonnes
Sodium Hypochlorite	tonnes
Ferrous Chloride	tonnes
Ferric Chloride	tonnes
Sulphuric Acid	tonnes
Polyaluminium Chloride	tonnes
Sodium Silicate	tonnes
Sodium Citrate	tonnes
Aluminium Sulphate	tonnes

Table S4.3 Performance parameters		
Parameter	Frequency of assessment	Units
Water usage	Annually	tonnes
Energy usage	Annually	MWh
Copperas (ferrous sulphate heptahydrate)	Annually	tonnes
Nitric acid (30%)	Annually	tonnes
Hydrogen Peroxide (35%)	Annually	tonnes
Sodium Chloride Solid	Annually	tonnes
Hydrochloric acid (up to 36%)	Annually	tonnes
Sodium Hydroxide	Annually	tonnes

Table S4.4 Reporting forms		
Parameter	Reporting format	Date of form
Air	Form air 1 or other form as agreed in writing by the Environment Agency	29/05/2019
Water	Form water 1 or other form as agreed in writing by the Environment Agency	10/03/2016
Water usage	Form water usage 1 or other form as agreed in writing by the Environment Agency	22/08/2011
Energy usage	Form energy 1 or other form as agreed in writing by the Environment Agency	22/08/2011
Performance indicators	Form performance 1 or other form as agreed in writing by the Environment Agency	29/05/2019

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	EPR/BJ7298IF
Name of operator	Industrial Chemicals Limited
Location of Facility	Stoneness Road Chemical Facility, Stoneness Road, West Thurrock, Grays, Essex, RM20 3AG.
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	
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 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.

“ADT” means Air Dried Tonnes (6% moisture)

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

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

“emissions to land” includes emissions to groundwater.

“EP Regulations” means The Environmental Permitting (England and Wales) Regulations SI 2016 No.675 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.

“free chlorine” means the sum of dissolved elementary chlorine, hypochlorite, hypochlorous acid, dissolved elementary bromine, hypobromite, and hypobromic acid, measured together and expressed as Cl₂.

“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.

“Hazardous property” has the meaning in Annex III of the Waste Framework Directive.

“Industrial Emissions Directive” means DIRECTIVE 2010/75/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 24 November 2010 on industrial emissions

“List of Wastes” means the list of wastes established by Commission Decision 2000/532/EC replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous waste, as amended from time to time.

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

“Waste code” means the six digit code referable to a type of waste in accordance with the List of Wastes and in relation to hazardous waste, includes the asterisk.

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

“year” means calendar year ending 31 December.

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

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

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

Schedule 7 – Site plan



END OF PERMIT