Notice of variation and consolidation with introductory note

The Environmental Permitting (England & Wales) Regulations 2010

Huntsman P&A UK Limited

Greatham Works
Tees Road
Hartlepool
TS25 2DD

Variation application number

EPR/TP3532PK/V008

Permit number

EPR/TP3532PK

Greatham Works
Permit number EPR/TP3532PK

Introductory note

This introductory note does not form a part of the notice

Under the Environmental Permitting (England & Wales) Regulations 2010 (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 and contains all conditions relevant to this permit. The permit has been consolidated based on the format of the last consolidation (EPR/TP3532PK/V005) and therefore has not been fully updated to modern conditions.

Only the variations specified in schedule 1 are subject to a right of appeal.

Purpose of Variation EPR/TP3532PK/V008

The requirements of the Industrial Emissions Directive (IED) 2010/75/EU are given force in England through the Environmental Permitting (England and Wales) Regulations 2010 (the EPR) (as amended).

This Permit, for the operation of large combustion plant (LCP), as defined by articles 28 and 29 of the Industrial Emissions Directive (IED), is varied by the Environment Agency to implement the special provisions for LCP given in the IED, by the 1 January 2016 (Article 82(3)). The IED makes special provisions for LCP under Chapter III, introducing new Emission Limit Values (ELVs) applicable to LCP, referred to in Article 30(2) and set out in Annex V.

The variation notice uses an updated LCP number in accordance with the most recent DEFRA LCP reference number. The LCP reference has changed from **LCP 80** to **LCP 354.**

The Operator has chosen to operate **LCP 354** as follows:

- **ELV** compliance route for all parameters with the exception of oxides of nitrogen (NO_x) where the Transitional National Plan (**TNP**) compliance route applies.

LCP 354 – comprises four natural gas fired boilers (2, 4, 5 & 6) which discharge via a common 76m stack/windshield at emission point A250. The boilers have a combined thermal input of 80 MW.

We have changed the operator name from Tioxide Europe Limited to Huntsman P&A UK Limited. The legal entity/company registration number remains unchanged.

Purpose of original Permit

The rest of the installation is unchanged and continues to be operated as follows.

The installation produces titanium dioxide and is covered by the following descriptions in Schedule 1 of the EP Regulations:

- Section 4.2 Part A(1)(a)(v)(a): - Producing inorganic chemicals such as: non-metals, metal oxides, metal carbonyls or other inorganic compounds such as calcium carbide, silicon, silicon carbide, titanium dioxide.
- Section 5.4 Part A(1)(a)(ii): - Disposal of non-hazardous waste in a facility with a capacity exceeding 50 tonnes per day by physico-chemical treatment.
- Section 1.1 Part A(1)(a) Burning any fuel in an appliance with a rated input of 50 megawatts or more.

The installation is located on Tees Road, Hartlepool, Cleveland, TS25 2DD. The centre of the main site is at National Grid Reference 4516 5266 and occupies an area of about 23 hectares.

The site currently produces titanium dioxide pigment at up to 150,000 tonnes/year, and in addition up to 12,000 tonnes/year of the intermediate titanium tetrachloride can be produced for export.

The process produces high purity titanium dioxide and titanium tetrachloride from titanium dioxide ores. The chemistry of the process is a chlorination reaction followed by an oxidation reaction as follows:

Chlorination:

$TiO_2 + 2Cl_2 + C \rightarrow TiCl_4 + CO/CO_2$

Oxidation:

$TiCl_4 + 02 \rightarrow TiO_2 + 2Cl_2$

ICON 1 and ICON 2 are the chlorination and oxidation plants, withTiO_2 product finishing taking place at the Wet Treatment and Packing plant.

Raw Materials

Ores are delivered to site by tipper wagons which discharge into a reception hopper fitted with a dust hood. The ore is then moved by belt conveyors, screw conveyors, and a bucket elevator into storage silos which vent directly to atmosphere and bunkers which have filtered vents. Releases of dust are minimised during the movement of the ore by means of local extraction fans, which discharge to atmosphere via dust filters, at points where the ore changes direction.

Coke is handled in a similar manner to the ores. However, although powdered coke can be offloaded from tipper wagons, it is more usually pneumatically discharged from tankers directly into process bunkers. The coke silo has a filtered vent designed to handle the conveying air.

Chlorine is delivered to the site in road tankers and unloaded by air padding into bulk storage tanks. The chlorine storage tanks are protected from overpressure by bursting discs which vent to an expansion tank which in turn vents to a caustic scrubbing system.

Chlorination

In the chlorination stage, titanium oxide ores are converted to pure titanium tetrachloride. This is achieved by reacting the ores with chlorine in the chlorination reactor, then cooling the resulting gas to precipitate various metal chloride impurities, further scrubbing of the gas with liquid titanium tetrachloride and condensing thetitanium tetrachloride out of the product stream. The condensed product can contain some impurities and these are removed by distillation to give a pure titanium tetrachloride product. The “tail gas” which remains after the titanium tetrachloride has been condensed is principally nitrogen, carbon dioxide, carbon monoxide, carbonyl sulphide, hydrogen sulphide and small amounts of hydrogen chloride, titanium tetrachloride and silicon tetrachloride. The tail gas is monitored continuously for chlorine on both plants and, if chlorine is detected, the plant is shut down to minimise the release of chlorine. Chlorine releases are further minimised by feeding caustic soda into the scrubber circulating liquor.

On each of the ICON plants a thermal oxidiser and an alkaline scrubber have been constructed for the abatement of releases to air of carbon monoxide, carbonyl sulphide, hydrogen sulphide and sulphur dioxide. In fault conditions the tail gas may contain chlorine.

The metal chloride impurities are neutralised with either lime or chalk and filtered in a filter press. Solids from the filter press are landfilled and the filtrate is discharged into the site liquid effluent lagoons.

Oxidation

In the oxidation stage oxygen and vaporised titanium tetrachloride are fed into an electric plasma arc reactor. The reactor product, a mixture of chlorine, oxygen and nitrogen gases with titanium dioxide powder feeds directly from the reactor into the cooling and separation section. Cooling takes place in water-cooled pipes which are scoured with sand to prevent product build-up occurring. The cooled product is fed to a filter which separates the product and sand from the tail gas which is recycled to the chlorination section. Product from the filter is discharged into a conveyor which is purged with either nitrogen or air in order to disentrain chlorine from the raw product into the filter exit gas.

The raw product is mixed with water to form a slurry before passing to a classifier where the sand is separated for disposal at an appropriate licensed waste disposal site. Any residual chlorine is either carried forward to wet treatment or routed to a caustic soda scrubbing column before discharge to atmosphere.

The slurry is then fed to the Wet Treatment Stage for conversion into the finished product.

Wet Treatment and Packing

In the wet treatment process the raw titanium dioxide is initially milled with electrofused zirconia/silica beads and then classified using rotary screens and hydrocyclones. The classified slurry is then mixed with various additives which give the surface properties required by customer specifications.

During this process some residual chlorine is released and vented via a dedicated ventilation system. The slurry is then passed to a vacuum filter where it is washed and reslurried before being refiltered on a segmental disc vacuum filter. The dewatered filter cake is then spray-dried in a natural gas/LPG direct-fired drier which exhausts to atmosphere via a bag filter. Each spray drier exhaust is fitted with a particulate monitor. Dried product is then fed to fluid energy mills which use superheated steam to impart the milling energy. The milled pigment product discharges from the vortex of the mill to storage bunkers and the steam exhausts via a filter to an energy recovery system. Each fluid energy mill is fitted with a particulate monitor.

All filtrates and washings from wet treatment are settled to enable solids to be recycled and liquids are then passed to final settlement lagoons before discharge to controlled waters.

Pigment product is packed in bags, Intermediate Bulk Containers (IBCs) and bulk wagons. During packing operations the product powder is conveyed using air and this vents to atmosphere via filters.

Titanium tetrachloride product is despatched in drums and road tankers which vent to atmosphere via scrubbing systems.

Chlorine Recovery

On the ICON plants the off-gas from the oxidation stage is recycled directly to chlorination.

Vent Cleaning

Chlorine contamination of gaseous effluent streams and relief vents is removed by a caustic soda scrubbed packed column. Spent sodium hypochlorite from the scrubber is either sold as a by-product or catalytically decomposed to sodium chloride and oxygen which vents directly as atmosphere. The sodium chloride solution is discharged into the liquid effluent system**.**

The point source releases to air are primarily off-gas from the chlorination reaction in the ICON (**I**ntegrated **C**hlorination and **O**xidatio**N**) plants (carbon dioxide, carbon monoxide, sulphur dioxide, carbonyl sulphide), steam from the milling operation in the Finishing plant, combustion products (carbon dioxide, oxides of sulphur and nitrogen) from the boiler plant and other process heating duties. Exhaust streams from operations handling powdery or granular material are passed through fabric filters to minimise particulate releases to atmosphere.

The boiler plant (**LCP 354**) comprises four natural gas fired boilers (2, 4, 5 & 6) which discharge via a common stack at emission point A250. The boilers have a combined thermal input of 80 MW:

Boiler 2 at 21.4 MW; and

Boilers 4, 5, 6 each at 19.5 MW.

There is one main outfall, which discharges all the site liquid effluent. Discharge only takes place on the ebb tide in order to ensure dispersion into a substantial volume of seaward flowing water. The site effluent is predominantly inorganic and before discharge all site wastewater is neutralised and precipitated solids removed by filtration or settling. This reduces the concentration of any potentially harmful metal species to levels so low they have no significant environmental effect.

The site generates a large volume of non-hazardous process waste. The great majority of the non-hazardous process waste consists of metal hydroxides and oxides, which originate from the impurities in the titanium dioxide ores processed. It is taken to a suitably licensed site for disposal.

The site operates and maintains an Environmental Management System (EMS) certified to ISO 14001. 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 TP3532PK (EPR/TP3532PK/A001)	05/08/05	
Additional information requested	13/01/06	Information on coke trials and waste heat boilers requested.
Additional information requested	28/01/06	Additional information on filters.
Extension requested	06/02/06	Query over cross reference on pg30 (heading B2.1, section 329) should be B2.2.19 and not B2.2.16.
Additional information received	06/02/06	Addendum relating to coke trials and waste heat boilers.
Additional information received	13/03/06	E-mail received explaining that stack A31 had been disconnected from the plant and that stacks A224 and A225 were operational. A224 is an intermittent vent, not necessarily in operation every month.
Additional information received	20/03/06	Addendum 2 relating to new bauxite vents A226 and A227 – IPC Variation CA 3394 24/03/06 refers.
Additional information received	15/05/06	Email requesting response to comments on ASR.
Permit EPR/TP3532PK granted	16/06/06	Permit granted to Tioxide Europe Limited.
Variation EPR/TP3532PK/V002 (LP3634ML) issued	16/04/07	Corrections and clarification
Variation application EPR/TP3532PK/V003 (GP3034UA)	27/04/07	An increase in site capacity to 150,000 tonne/year of TiO_2 pigment plus 12,000 tonne/year of titanium tetrachloride for export.
Variation EPR/TP3532PK/V003 issued	15/10/07	
Variation EPR/TP3532PK/V004 (EP3939XQ) issued	17/12/07	To implement the requirements of the NERP as set out in the LCPD.
Variation application EPR/TP3532PK/V005	Duly made 07/04/10	To change the max sulphur content of the coke and to amend monitoring methods.
Variation EPR/TP3532PK/V005 issued	09/09/10	Varied and consolidated permit issued
Variation application EPR/TP3532PK/V006	07/12/12	Change of company registered address to; Titanium House, Stockton-on-Tees.
Variation EPR/TP3532PK/V006 issued	12/12/12	Varied permit issued to Tioxide Europe Limited.
Environment Agency variation EPR/TP3532PK/V007 issued	17/12/13	Environment Agency variation to implement the changes introduced by IED.
Regulation 60 Notice sent to the Operator	31/10/14	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 special provisions for LCP under Chapter III, introducing new Emission Limit Values (ELVs) applicable to LCP, referred to in Article 30(2) and set out in Annex V.
Regulation 60 Notice response	23/03/15	Response received from the Operator.
Additional information received	15/06/15	Response to request for further information (RFI) dated 13/05/15.
Variation determined EPR/TP3532PK/V008 (Billing ref: BP3738AE)	17/12/15	Varied and consolidated permit issued. Variation effective from 01/01/16. Consolidation based on EPR/TP3532PK/V005, not been fully updated to modern conditions

End of introductory note

Notice of variation and consolidation

The Environmental Permitting (England and Wales) Regulations 2010

The Environment Agency in exercise of its powers under regulation 20 of the Environmental Permitting (England and Wales) Regulations 2010 varies and consolidates

Permit number

EPR/TP3532PK

Issued to

Huntsman P&A UK Limited ("the operator")

whose registered office is

Titanium House
Hanzard Drive
Wynard Park
Stockton-on-Tees
TS22 5FD

company registration number **00832447**

to operate a regulated facility at

Greatham Works
Tees Road
Hartlepool
TS25 2DD

to the extent set out in the schedules.

The notice shall take effect from 01/01/2016

Name	Date
Anne Nightingale	**17/12/2015**

Authorised on behalf of the Environment Agency

Schedule 1

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

Condition 1.1.1 refers to Table 1.1.1, *Activities* which shall be amended by the inclusion of a new description for the LCP, activity reference A3.

Condition 1.4.1 refers to Table 1.4.1, *Improvement Programme* which shall include additional condition IC10.

Condition 2.1.1 refers to Table 2.1.1, *Operating techniques* which shall be amended by the inclusion of operating techniques in the Regulation 60 response.

Condition 2.1.3 shall be added in accordance with the IED.

Condition 2.1.4 shall be added in accordance with the IED.

Condition 2.1.4 refers to Table 2.1.2, *Start-up and Shut-down thresholds* which shall be added in accordance with the IED:

Condition 2.2.1.2 refers to Table 2.2.1, *Emission points to air* which shall be amended to include the LCP number and to remove emission points A38 and A206.

Condition 2.2.1.3 refers to Table 2.2.2, *Emission limits to air and monitoring* which shall be amended to change the monitoring requirements at A250 in accordance with the IED and to add the standard for the monitoring infrastructure at A250. We have also changed some monitoring frequencies and methods.

Condition 2.2.1.4 shall be amended to include LCP 354.

Condition 2.2.1.4 refers to Table 2.2.3, *Annual limits (excluding start up and shut down except where otherwise stated)*, which shall be amended as necessary for LCP 354.

Condition 2.2.1.5 shall be amended in accordance with the IED.

Condition 2.2.1.6 shall be amended in accordance with the IED.

Condition 2.2.1.7 shall be added in accordance with the IED.

Condition 2.2.2.5 refers to Table 2.2.5, *Emission limits to water* which shall be amended to update monitoring methods and frequencies.

Condition 2.10.11 shall be added in accordance with the IED.

Condition 2.11.5 shall be deleted. This is a duplicate of condition 2.2.1.6.

Condition 4.1.2 refers to Table S2, *Reporting of monitoring data* which shall be amended in accordance with the IED (A250).

Condition 4.1.3 refers to Table S3, *Reporting forms* which shall be amended to update forms.

Condition 4.1.3 refers to Table S4.2, *Performance parameters* which shall be amended to include additional parameters for the LCP.

Condition 4.1.8 shall be amended. This is required for LCPs under the TNP to enable quarterly reporting of mass emissions.

Conditions 5.1.1 and 5.1.2 shall be amended in accordance with the IED.

Condition 6.1.1 refers to the meaning of expressions (*Interpretation*), the following expressions shall be deleted/amended/added:

"Daily composite sample" means a sample obtained by continually taking a sample of at least 30 millilitres from the effluent at a set effluent volume e.g. after every 400m^3 pumped to the estuary. This volume may be different for each pipeline. Amended

“Energy efficiency” the annual net plant energy efficiency means the value calculated from the operational data collected over the year. Added

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

“large combustion plant” or “LCP” is a combustion plant or group of combustion plants discharging waste gases through a common windshield or stack, where the total thermal input is 50 MW or more, based on net calorific value. The calculation of thermal input, excludes individual combustion plants with a rated thermal input below 15MW. Amended

“MSDL” means minimum shut-down load as defined in Implementing Decision 2012/249/EU. Added

“MSUL” means minimum start-up load as defined in Implementing Decision 2012/249/EU. Added

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

“National Emission Reduction Plan” (NERP) is a plan issued by Defra in accordance with Article 4.6 of the Large Combustion Plants Directive 2001/80/EC. Deleted

“NERP Register” means the register maintained by the Environment Agency in accordance with regulation 6(1) of the Large Combustion Plants (National Emission Reduction Plan) Regulations 2007. Deleted

*“*TNP Register” means the register maintained by the Environment Agency in accordance with regulation 4 of the Large Combustion Plants (Transitional National Plan) Regulations 2015 SI2015 No.1973. Added

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

Schedule 2 – consolidated permit

Consolidated permit issued as a separate document.

Permit

The Environmental Permitting (England and Wales) Regulations 2010

Permit number

EPR/TP3532PK

This is the consolidated permit referred to in the variation and consolidation notice for application EPR/TP3532PK/V008 authorising,

Huntsman P&A UK Limited ("the operator"),

whose registered office is

Titanium House
Hanzard Drive
Wynard Park
Stockton-on-Tees
TS22 5FD

company registration number **00832447**

to operate a regulated facility at

Greatham Works
Tees Road
Hartlepool
TS25 2DD

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

Name	Date
Anne Nightingale	**17/12/2015**

Authorised on behalf of the Environment Agency

Conditions

1 General

1.1 Permitted Activities

1.1.1 The Operator is authorised to carry out the activities and/or the associated activities specified in Table 1.1.1.

Table 1.1.1 activities			
Activity reference	**Activity listed in Schedule 1 of the EP Regulations**	**Description of specified activity**	**Limits of specified activity**
A1	Section 4.2 Part A(1)(a)(v)(a) Producing inorganic chemicals such as: non-metals, metal oxides, metal carbonyls or other inorganic compounds such as calcium carbide, silicon, silicon carbide, titanium dioxide	Chlorination of titanium ore to produce $TiCl_4$. Oxidation of $TiCl_4$ to produce TiO_2.	From handling of raw materials, receipt and storage, input to the process through, distillation, oxidation, classification, storage and packing.
A2	Section 5.4 Part A(1)(a)(ii) Disposal of non-hazardous waste in a facility with a capacity exceeding 50 tonnes per day by physico-chemical treatment	Neutralisation of aqueous effluent, filtration, lagoon settling, collection of filtered solids prior to off-site disposal.	From collection of effluent and neutralisation in dedicated tanks to filtration and collection of solids.
A3	Section 1.1 Part A(1) (a) Burning any fuel in an appliance with a rated input of 50 megawatts or more	**LCP 354** Steam produced in four natural gas-fired boilers (2, 4, 5 & 6), with a combined thermal input of 80MW. Capable of producing 23 tonne/hour of superheated steam at 250°C and 24barg.	From feed water treatment, steam raising to release of combustion gases.
	Directly Associated Activity		
A4	Reverse osmosis plant	Reverse osmosis plant operated by Anglian Water Services supplying up to 250 m^3/hr of treated water.	From feedwater input to discharge of effluent to site treatment plant.

1.2 Site

1.2.1 The activities authorised under condition 1.1.1 shall not extend beyond the Site, being the land shown shaded in turquoise on the Site Plan at Schedule 5 to this Permit, which is within 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.

1.3 Overarching Management Condition

1.3.1 Without prejudice to the other conditions of this Permit, the Operator shall implement and maintain a management system, organisational structure and allocate resources that are sufficient to achieve compliance with the limits and conditions of this Permit.

1.4 Improvement Programme

1.4.1 The Operator shall complete the improvements specified in Table 1.4.1 by the date specified in that table, and shall send written notification of the date of completion of each requirement to the Agency within 14 days of the completion of each such requirement.

Table 1.4.1 Improvement programme requirements

Reference	Requirement	Date
IC 1	The Operator shall review containment measures for the prevention or minimisation of liquid releases from all process, storage and waste areas, including sub-surface structures and bulk storage taking into account Agency Guidance Notes IPPC S4.03, May 2004. On completion of the review a summary report shall be submitted in writing to the Agency, including a timetable for implementation of any identified improvements.	Complete
IC 2	The Operator shall review the usage of water on-site with the objective of further reducing the quantity of water utilised in the process and process washings. On completion of the review a summary report shall be submitted in writing to the Agency, including a timetable for implementation of any improvements identified.	Complete
IC 3	The Operator shall undertake a review of monitoring procedures having regard to Environment Agency Technical Guidance Notes M1, M2 and M18, the monitoring standards listed in Tables 2.2.2 and 2.2.5, and MCERTS certification/accreditation as specified in conditions 2.10.7. On completion of the review the Operator shall submit a summary report in writing to the Agency, setting out the monitoring methods used for both sampling and analysis. The report shall as a minimum consider The validation of current methods against standards as specified in Tables 2.2.2 and 2.2.5 of this Permit, and a timetable to implement any improvements identified to meet the standards as specified in Tables 2.2.2 and 2.2.5 of this Permit. or Proposals for any alternative monitoring where that specified in Tables 2.2.2 and 2.2.5 cannot be achieved; The MCERTS certification/accreditation status of equipment, and /or the monitoring organisation as appropriate for the methods used for sampling and analysis. A timetable for achieving the MCERTS standard or an equivalent acceptable to the Agency, for any elements that are not currently MCERTS.	Complete
IC 4	The Operator shall develop a written Site Closure Plan with regard to the requirements set out in Section 2.11 of the Agency Guidance Notes IPPC S4.03, May 2004.	Complete
IC 5	The Operator shall review the use of the HCFC refrigeration systems and develop a planned programme to replace existing equipment with non-HCFC refrigerants with a completion time scale and submit this review to the Agency.	Complete

Table 1.4.1 Improvement programme requirements		
Reference	**Requirement**	**Date**
IC 6	The Operator shall submit a plan which details how the availability of the thermal oxidisers and associated abatement equipment for ICON 1&2 will be improved to achieve a minimum of 90% availability. (The percentage availability is to be calculated for periods when waste gas is on line to the thermal oxidser). The plan shall be accompanied by a review and feasibility study detailing the options available for improving thermal oxidiser reliability and reducing the probability of exceedances of the short term carbon monoxide and carbonyl sulphide environmental quality standard action level.	Complete
IC 7	Prior to commencing the site trials detailed in the Application for Variation CA3394 the Operator shall submit a written report to the Agency. The report shall detail the expected programme for the trials including anticipated start and finish dates and proposals for aborting trials in the event of the COCOS thermal oxidiser units not being available. The report shall also detail the criteria which will be used to judge the success or otherwise of the trials. These criteria shall as a minimum cover the following areas: i) impact of higher sulphur coke on gaseous emissions ii) impact of higher sulphur coke on aqueous emissions iii) impact of higher sulphur coke on quantity and composition of solid waste streams iv) environmental impact of releases v) efficiency and impact on overall Titanium Dioxide production process	Complete
IC 8	a) The Operator shall update the Environment Agency on plans to carry out the site coke trials as previously detailed in IC7 response submitted on 23 June 2006. b) Following completion of these site trials the Operator shall submit a written report to the Agency describing the trials. As a minimum the report shall: i) detail and summarise all monitoring of solid, aqueous and gaseous waste streams undertaken during the trials ii) detail and summarise all monitoring of ore and coke feed stocks undertaken during the trial iii) detail the sulphur mass balance for the process iv) detail the impact of the trials on the overall efficiency of the Titanium Dioxide production process v) review the environmental impact of using higher sulphur coke	Complete
IC9	a) A written plan shall be sent to the Agency for approval to undertake off-site ambient monitoring for carbon monoxide during periods when waste gases are released to atmosphere from the Divert stack(s). The proposal shall take in to account the Environment Agency's Technical Guidance Notes M8 and M9 and shall include proposed dates for this monitoring. b) The plan shall be implemented by the Operator from the date of written approval by the Agency. A written report of the findings from the monitoring shall be submitted to the Agency.	

Table 1.4.1 Improvement programme requirements		
Reference	**Requirement**	**Date**
IC10	For LCPD LCP 80 (now LCP 354 under IED). Annual emissions of dust, sulphur dioxide and oxides of nitrogen including energy usage for the year 01/01/2015 to 31/12/2015 shall be submitted to the Environment Agency using form AAE1 via the NERP Registry. If the LPCD LCP was a NERP plant the final quarter submissions shall be provided on the RTA 1 form to the NERP Registry.	28/01/16

1.4.2 Where the Operator fails to comply with any requirement by the date specified in Table 1.4.1 the Operator shall send written notification of such failure to the Agency within 14 days of such date.

1.5 Minor Operational Changes

1.5.1 The Operator shall seek the Agency's written agreement to any minor operational changes under condition 2.1.1 of this Permit by sending to the Agency: written notice of the details of the proposed change including an assessment of its possible effects (including waste production) on risks to the environment from the Permitted Installation; any relevant supporting assessments and drawings; and the proposed implementation date.

1.5.2 Any such change shall not be implemented until agreed in writing by the Agency. As from the agreed implementation date, the Operator shall operate the Permitted Installation in accordance with that change, and relevant provisions in the Application shall be deemed to be amended.

1.5.3 When the qualification "unless otherwise agreed in writing" is used elsewhere in this Permit, the Operator shall seek such agreement by sending to the Agency written notice of the details of the proposed method(s) or techniques.

1.5.4 Any such method(s) or techniques shall not be implemented until agreed in writing by the Agency. As from the agreed implementation date, the Operator shall operate the Permitted Installation using that method or technique, and relevant provisions in the Application and the Site Protection and Monitoring Programme, as the case may be shall be deemed to be amended.

1.6 Pre-Operational Conditions

1.6.1 There are no pre-operational conditions.

1.7 Off-site Conditions

1.7.1 There are no off-site conditions.

2 Operating conditions

2.1 In-Process Controls

2.1.1 The Permitted Installation shall, subject to the conditions of this Permit, be operated using the techniques and in the manner described in the documentation specified in Table 2.1.1, or as otherwise agreed in writing by the Agency in accordance with conditions 1.5.1 and 1.5.2 of this Permit.

Table 2.1.1 Operating techniques

Description	Parts	Date Received
Application EPR/TP3532PK/A001	The response to questions B2.1 and B2.2 of the Application Form given in pages/section B2.3 and B2.4 of the application	5/08/05
Additional information	Requested information on coke trials and Waste Heat boilers	02/02/06, 06/02/06
Additional information	Information provided on new and non-operational stacks	13/03/06
Additional information	New bauxite vents A226 and A227	20/03/06
Additional information	Requested information on ASR	19/05/06
Application for variation EPR/TP3532PK/V003	Amendments to sections B2.1 and B2.2 in the original Application as given in sections C2.1 and C2.2 in this Application for variation.	27/04/07
Application for variation EPR/TP3532PK/V005	Information provided on the installation of the auxiliary pipeline system given in Section 1, subsection 040/042/043 of the original PPC Application and in Section 2 Attachment 1 – Non-technical summary of this variation Application.	August 2005 March 2010
Response to Regulation 60(1) Notice – request for information dated 31/10/14	Compliance route and operating techniques identified in response to questions: 362 (TNP compliance route for NO_x) 365 (net rated thermal input) 366 (start-up and shut-down load)	23/03/15

2.1.2 The Permitted Installation shall, subject to the other conditions of this Permit, be operated using the techniques and in the manner described in the Site Protection and Monitoring Programme submitted under condition 4.1.7 of this Permit (as amended from time to time under condition 4.1.7), or as otherwise agreed in writing by the Agency.

2.1.3 For activity A3 (LCP 354) referenced in schedule 1, table 1.1.1; without prejudice to condition 2.1.1, the activities shall be operated in accordance with the “Electricity Supply Industry IED Compliance Protocol for Utility Boilers and Gas Turbines” revision 1 dated February 2015 or any later version unless otherwise agreed in writing by the Environment Agency.

2.1.4 For activity A3 (LCP 354) referenced in schedule 1, table 1.1.1; the end of the start up period and the start of the shutdown period shall conform to the specifications set out in Schedule 1, tables 2.1.1 and 2.1.2.

Table 2.1.2 Start-up and Shut-down thresholds		
Emission Point and Unit Reference	**"Minimum start up load" When two of the criteria listed below for the LCP or unit have been met.**	**"Minimum shut-down load" When two of the criteria listed below for the LCP or unit have been met.**
A250 **LCP 354** Boilers	1. 7 t/hr steam flow 2. >Steam pressure 21.5 barg 3. >Steam temperature 230°C	1. < 7 t/hr steam flow 2. < Steam pressure 21.5 barg 3. < Steam temperature 230°C

2.2 Emissions

2.2.1 Emissions to Air, (including heat, but excluding Odour, Noise or Vibration) from Specified Points

2.2.1.1 This Part 2.2.1 of this Permit shall not apply to releases of odour, noise or vibration.

2.2.1.2 Emissions to air from the emission points in Table 2.2.1 shall only arise from the source(s) specified in that Table.

Table 2.2.1 Emission points to air		
Emission point reference or description	**Source**	**Location of emission point**
A5	Coke Transfer Point Dust Filter Vent	NZ 5159 2647
A11	Ore/Coke Unloading Dust Hood Filter Vent	NZ 5159 2647
A13	Coke Silo Dust Filter Vent	NZ 5159 2646
A19	ICON1 Divert Process Stack	NZ 5144 2637
A20	ICON1 Rutile Day-Bunker Filter Vent	NZ 5153 2634
A21	ICON1 Ore Day-Bunker Filter Vent	NZ 5153 2635
A22	ICON1 Coke Day-Bunker Vent Filter	NZ 5153 2636
A23	ICON1 Lime Silo Filter Vent	NZ 5151 2636
A24	ICON1 Chlorinator Start-Up Scrubbing System Stack	NZ 5151 2636
A37	ICON1 Stage 1 O_2 Heater Stack	NZ 5142 2634
A39	ICON1 Stage 3 $TiCl_4$ Furnace Stack	NZ 5142 2634
A40	ICON1 Sand Silo Filter Vent	NZ 5142 2634
A41	ICON1 Vent Cleaning Stack	NZ 5142 2634
A43	ICON1 Hygiene Scrubber Vent	NZ 5142 2634
A60	Strong Vent Cleaning Circulation Tank Vent	NZ 5157 2651
A63	Decomposition Tank Vent	NZ 5158 2650
A67	Stream 1 FEM Stack	NZ 5149 2662
A68	Stream 2 FEM Stack	NZ 5149 2662
A69	Stream 1 Spray Drier Vent	NZ 5148 2661
A70	Stream 2 Spray Drier Vent	NZ 5148 2661
A74	CSA Digester No.1 Vent	NZ 5147 2664
A90	Coating Tanks Hygiene Vent	NZ 5145 2665
A91	Bauxite Silo Filter	NZ 5148 2664
A103	Bulk Silo Filter	NZ 5146 2648
A104	Bulk Silo Filter	NZ 5146 2648
A121	Stream 1 Transfer Bunker Vent	NZ 5150 2663
A122/1	ICON 1 CO/COS Scrubber Stack	NZ 5157 2638

Table 2.2.1 Emission points to air		
Emission point reference or description	**Source**	**Location of emission point**
A122/2	ICON 2 CO/COS Scrubber Stack	NZ 5157 2638
A123	Stream 2 Transfer Bunker Vent	NZ 5150 2663
A124	ICON 1 CO/COS Effluent treatment tank vent	NZ 5155 2642
A125	ICON AlCl3 Silo Filter Vent	NZ 5142 2634
A126	ICON 1 CO/COS Flame Trap Lute Pot Vent	NZ 5156 2639
A202	ICON2 Divert Stack	NZ 5152 2623
A203	ICON2 Oxidation Vent Cleaning Stack	NZ 5146 2622
A204	ICON2 Oxidation Hygiene Scrubber Stack	NZ 5146 2622
A205	ICON2 Stage 1 O_2 Heater Stack	NZ 5147 2623
A207	ICON2 Stage 3 $TiCl_4$ Heater Stack	NZ 5147 2623
A208	ICON2 Sand Silo Filter Vent	NZ 5147 2622
A209	ICON2 $AlCl_3$ Silo Filter Vent	NZ 5147 2622
A211	ICON2 Chlorinator Dry Out Stack	NZ 5155 2632
A212	ICON2 Start-Up Scrubber Stack	NZ 5156 2630
A213	ICON2 Coke Day-Bunker Filter Vent	NZ 5155 2633
A214	ICON2 Ore Day-Bunker Filter Vent	NZ 5155 2633
A215	ICON2 Ore Day-Bunker Filter Vent	NZ 5155 2633
A216	ICON2 Lime Silo Filter Vent	NZ 5155 2631
A220	Tetra Tank Farm Stack	NZ 5155 2631
A222	CSA Dissolver No. 2 Vent	NZ 5146 2664
A223	ICON 2 CO/COS Flame Trap Lute Pot Vent	NZ 5158 2638
A224	GEPT Stack	NZ 5164 2652
A225	Vent Cleaning Stack	NZ 5158 2651
A226	Bauxite Delivery System No. 1 Vent	NZ 5147 2664
A227	Bauxite Delivery System No. 2 Vent	NZ 5146 2664
A228	Free Flow Pigment Hopper Dust Extraction Vent	NZ 5143 2660
A229	Free Flow Pigment PPM Dust Extraction Vent	NZ 5143 2660
A235	Stream 3 Spin Flash Drier Vent	NZ 5158 2658
A238	Stream 3 Transfer Bunker Filter Vent	NZ 5156 2657
A246	Stream 3 FEM Stack	NZ 5157 2659
A250	LCP 354 – Four natural gas-fired boilers (2,3,5 & 6) with Common Boiler Stack Exhaust	NZ 5151 2665

2.2.1.3 The limits for emissions to air for the parameter and emission point set out in Table 2.2.2 shall not be exceeded.

Table 2.2.2 Emission limits to air and monitoring

Emission point ref. & location	Parameter	Source (8)	Limit (including unit)-these limits do not apply during start up or shut down.	Reference period	Monitoring frequency	Monitoring standard or method
A19	Hydrogen chloride mg/m^3		10	-	Annual	BS EN 1911
A19	Chlorine mg/m^3		5	Daily average	Continuous(7)	
A19	Chlorine mg/m^3		40	maximum	Continuous(7)	
A19	Particulate mg/m^3		50	-	Annual	BS EN 13284-1
A67	Particulate mg/m^3		50	hourly average(2)	Continuous	As agreed in writing with the Environment Agency
A68	Particulate mg/m^3		50	hourly average (2)	Continuous	As agreed in writing with the Environment Agency
A69	Particulate mg/m^3		50	hourly average (2)	Continuous	As agreed in writing with the Environment Agency
A70	Particulate mg/m^3		50	hourly average (2)	Continuous	As agreed in writing with the Environment Agency
A90	Chlorine mg/m^3		40	maximum	Monthly	
A121	Particulate mg/m^3		50	hourly average (2)	Continuous	As agreed in writing with the Environment Agency
A122/1(3)	Hydrogen chloride mg/m^3		10	-	Monthly	
A122/1(3)	Sulphur dioxide mg/m^3		50	hourly average (99.5%ile)	Continuous	BS EN 15267-3
A122/1(3)	Carbonyl sulphide mg/m^3		40	-	Monthly	
A122/1(3)	Chlorine mg/m^3		5	daily average	Continuous(7)	
A122/1(3)	Chlorine mg/m^3		40	maximum	Continuous(7)	
A122/1(3)	Carbon monoxide mg/m^3		100	hourly average(4)	Continuous	BS EN 15267-3

Table 2.2.2 Emission limits to air and monitoring						
Emission point ref. & location	**Parameter**	**Source (8)**	**Limit (including unit)-these limits do not apply during start up or shut down.**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
A122/1(3)	Hydrogen sulphide mg/m^3		5	-	Monthly	
A122/1(3)	Particulate mg/m^3		50	-	Monthly	BS EN 13284-1
A122/2(3)	Hydrogen chloride mg/m^3		10	-	Monthly	BS EN 1911
A122/2(3)	Sulphur dioxide mg/m^3		50	hourly average (99.5%ile)	Continuous	BS EN 15267-3
A122/2(3)	Carbonyl sulphide mg/m^3		40		Monthly	
A122/2(3)	Chlorine mg/m^3		5	daily average	Continuous (7)	
A122/2(3)	Chlorine mg/m^3		40	maximum	Continuous (7)	
A122/2(3)	Carbon monoxide mg/m^3		100	hourly average(4)	Continuous	BS EN 15267-3
A122/2(3)	Hydrogen sulphide mg/m^3		5	-	Monthly	
A122/2(3)	Particulate mg/m^3		50	-	Monthly	BS EN 13284-1
A123	Particulate mg/m^3		50	hourly average(2)	Continuous	As agreed in writing with the Environment Agency
A202	Hydrogen chloride mg/m^3		10	hourly average	Annual	BS EN 1911
A202	Chlorine mg/m^3		5	daily average	Continuous (7)	
A202	Chlorine mg/m^3		40	maximum	Continuous (7)	
A202	Particulate mg/m^3		50	hourly average	Annual	BS EN 13284-1
A224	Hydrogen chloride mg/m^3		10	-	Monthly	BS EN 1911
A224	Particulate mg/m^3		50	-	Monthly	BS EN 13284-1
A225	Chlorine mg/m^3		5	daily average	Continuous	
A225	Chlorine mg/m^3		40	maximum	Continuous	
A235	Particulate mg/m^3		50	hourly average(2)	Continuous	As agreed in writing with the Environment Agency

Table 2.2.2 Emission limits to air and monitoring						
Emission point ref. & location	**Parameter**	**Source (8)**	**Limit (including unit)-these limits do not apply during start up or shut down.**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
A238	Particulate mg/m^3		50	hourly average(2)	Continuous	As agreed in writing with the Environment Agency
A246	Particulate mg/m^3		50	hourly average(2)	Continuous	As agreed in writing with the Environment Agency
LCP 354 – Boiler plant fired on natural gas						
A250	Oxides of Nitrogen (NO and NO_2 expressed as NO_2)		400 mg/m^3	-	At least every 6 months	BS EN 14792
A250	Sulphur dioxide mg/m^3		35 mg/m^3	-	At least every 6 months	Concentration by calculation, as agreed in writing with the Environment Agency
A250	Dust mg/m^3		5 mg/m^3	-	At least every 6 months	Concentration by calculation, as agreed in writing with the Environment Agency
A250	Carbon Monoxide		110 mg/m^3	-	At least every 6 months	BS EN 15058
A250	Oxygen		-	-	Periodic As appropriate to reference	BS EN 14789
A250	Water Vapour		-	-	Periodic As appropriate to reference	BS EN 14790
A250	Stack gas volume flow		-	-	-	BS EN 16911 & TGN M2

Table 2.2.2 Emission limits to air and monitoring						
Emission point ref. & location	**Parameter**	**Source** [8]	**Limit (including unit)-these limits do not apply during start up or shut down.**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
A250	As required by the Method Implementation Document for BS EN 15259		-	-	Pre-operation and when there is a significant operational change	BS EN 15259
Natural rutile ore, Synthetic rutile ore & slag	Sulphur content in raw material		Normal 0.7 % w/w [5] Maximum 0.8% w/w			
Coke	Maximum Sulphur content in raw material		Normal operation and change over [6] 4.0% w/w			
			Abnormal operation [6] 2.0 % w/w			

Note 1: See Section 6 for reference conditions.

Note 2: Not applicable at start up and shut down.

Note 3: Applicable only when waste gas is on line to the thermal oxidiser. In addition for carbon monoxide the limit is only applicable when titanium tetrachloride is on line to the oxidation continuous oxidation reactor.

Note 4: Excludes first 15 minutes after start up and last 5 minutes before shut down.

Note 5: 19 of the 20 most recent ore shipments are to be less than or equal to 0.7% w/w sulphur.

Note 6: As defined in interpretation.

Note 7: Chlorine monitoring is carried out at the exit of the Tail Gas Scrubbing system and converted to a concentration at the stack using estimated flow rates for waste gases and other post-abatement gaseous inputs.

Note 8: Source information included in Table 2.2.1 of his permit.

2.2.1.4 Total emissions to air from LCP 354 emission point set out in Table 2.2.1 in any year of a substance listed in Table 2.2.3 shall not exceed the relevant limit in that Table.

Table 2.2.3 Annual limits (excluding start up and shut down except where otherwise stated)				
Substance	**Medium**	**Limit (including unit)**		**Emission Points**
Oxides of nitrogen	Air	**Assessment year** 01/01/16 and subsequent years until 31/12/19 01/01/20-30/06/20	**LCP 354** **TNP Limit** Emission allowance figure shown in the TNP Register as at 30 April the following year	A250

2.2.1.5 If CEN standards are not available, ISO standards, national or international standards which will ensure the provision of data of an equivalent scientific quality shall be used, as agreed in writing with the Environment Agency.

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

Monitoring for the purposes of the Industrial Emissions Directive Chapter III

2.2.1.7 All monitoring required by this permit shall be carried out in accordance with the provisions of Annex V of the Industrial Emissions Directive.

2.2.2 Emissions to water (other than groundwater), including heat, from specified points

2.2.2.1 This Part 2.2.2 of this Permit shall not apply to releases of odour, noise or vibration or to releases to groundwater.

Emissions to water (other than sewer)

2.2.2.2 Conditions 2.2.2.3 - 2.2.2.6 shall not apply to emissions to sewer.

2.2.2.3 Emissions to water from the emission point(s) specified in Table 2.2.4 shall only arise from the source(s) specified in that Table.

Table 2.2.4 Emission points to water		
Emission point reference or description	**Source** **Monitoring frequency** **Monitoring standard or method**	**Receiving water**
W1	Effluent Treatment Plant Liquor NZ 5230 2640	Seaton Channel
W2	Site Surface Water Drain East 1 NZ 5172 2659	Greenabella Marsh
W3	Site Surface Water Drain East 2 NZ 5170 2637	Greenabella Marsh
W5	Site Surface Water Drain East 4 NZ 5157 2630	Greenabella Marsh
W6	Site Surface Water Drain East 5 (ICON 2 Storm Drain) NZ 5161 2617	Greenabella Marsh

2.2.2.4 The limits for the emissions to water for the parameter and emission point set out in Table 2.2.5 shall not be exceeded.

2.2.2.5 Where a substance is specified in Table 2.2.5 but no limit is set for it, the concentration of such substance in emissions to water from the relevant emission point shall be no greater than the background concentration.

Table 2.2.5 Point Source emissions to water (other than sewer) – emission limits and monitoring requirements

Emission point ref. & location	Parameter	Source (6)	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
W1	pH range		5-9[4]	Auto sampler sample taken for each tidal pump-out period	Normally two per day	ISO 10523
W1	Suspended solids (mg/l)		150[4]	Auto sampler sample taken for each tidal pump-out period Average of results from each individual pump-out in that month.	Normally two per day	BS EN 872
W1	Total kg Chloride per tonne of Titanium Dioxide equivalent produced		130[1] 228[2] 450[3] every 3 months	Flow proportional quarterly composite prepared from individual pump-out samples	Quarterly	
W1	Cadmium (µg/l)		2.5	Flow proportional quarterly composite prepared from individual pump-out samples	Quarterly	BS EN 17294
W1	Mercury (µg/l)		1.0	Flow proportional quarterly composite prepared from individual pump-out samples	Quarterly	BS EN ISO 17852

Table 2.2.5 Point Source emissions to water (other than sewer) – emission limits and monitoring requirements						
Emission point ref. & location	**Parameter**	**Source** (6)	**Limit (incl. unit)**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
W1	Hexachlorobenzene (µg/l)		1.0	Flow proportional quarterly composite prepared from individual pump-out samples	Quarterly	BS 6068
W1	1,2 Dichloroethane (µg/l)		5.0	Flow proportional quarterly composite prepared from individual pump-out samples	Quarterly	BS 6068
W1	Lead (µg/l)		25	Flow proportional quarterly composite prepared from individual pump-out samples	Quarterly	BS EN 17294
W1	Zinc (µg/l)		240	Flow proportional quarterly composite prepared from individual pump-out samples	Quarterly	BS EN 17294
W1	Iron (µg/l)		75000	Flow proportional quarterly composite prepared from individual pump-out samples	Quarterly	BS EN 11885
W1	Chromium (µg/l)		90	Flow proportional quarterly composite prepared from individual pump-out samples	Quarterly	BS EN ISO 15586

Table 2.2.5 Point Source emissions to water (other than sewer) – emission limits and monitoring requirements						
Emission point ref. & location	**Parameter**	**Source (6)**	**Limit (incl. unit)**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
W1	Vanadium (µg/l)		200	Flow proportional quarterly composite prepared from individual pump-out samples	Quarterly	BS EN 11885
W1	Copper (µg/l)		100	Flow proportional quarterly composite prepared from individual pump-out samples	Quarterly	BS EN 17294
W1	Nickel (µg/l)		300	Flow proportional quarterly composite prepared from individual pump-out samples	Quarterly	BS EN 17294
W1	Arsenic (µg/l)		25	Flow proportional quarterly composite prepared from individual pump-out samples	Quarterly	BS ISO 17378-2
W2, W3, W5	pH		5-9[5]	Continuous monitoring	Twice daily	BS ISO 10523
W6	pH		5-9[5]	Manual monitoring	Only monitored when opened	BS ISO 10523

Note 1: When using Natural Rutile ore.

Note 2: When using Synthetic Rutile ore.

Note 3: When using slag.

Note 4: Limit refers to each pump out.

Note 5: Limit only applies when in use as follows -W2, W3, W5 and W6, whether alone or in any combination, is only permitted under flood conditions and their discharges will be monitored for pH using the installed meter.

Note 6: Source information included in Table 2.2.4 of his permit.

2.2.2.6 Total emissions to water in any year of a substance listed in Table 2.2.6 shall not exceed the relevant limit in that Table.

Table 2.2.6 Annual emission limits	
Substance	**Limit - Kg**
Not applicable	-

Emissions to sewer

2.2.2.7 No emission from the Permitted Installation shall be made to sewer.

2.2.3 Emissions to groundwater

2.2.3.1 No emission from the Permitted Installation shall give rise to the introduction into groundwater of any substance in List I (as defined in the EP Regulations 2010 (S.I. 2010 No. 675)).

2.2.3.2 No emission from within the Permitted Installation shall give rise to the introduction into groundwater of any substance in List II (as defined in the EP Regulations 2010 (S.I. 2010 No. 675)) so as to cause pollution (as defined in the EP Regulations 2010 (S.I. 2010 No. 675)).

2.2.3.3 For substances other than those in List I or II (as defined in the EP Regulations 2010 (S.I. 2010 No. 675)), the Operator shall use BAT to prevent or where that is not practicable to reduce emissions to groundwater from the Permitted Installation provided always that the techniques used by the Operator shall be no less effective than those described in the Application.

2.2.4 Fugitive emissions of substances to air

2.2.4.1 The Operator shall use BAT so as to prevent or where that is not practicable to reduce fugitive emissions of substances to air from the Permitted Installation in particular from:

- storage areas
- buildings
- pipes, valves and other transfer systems
- open surfaces

provided always that the techniques used by the Operator shall be no less effective than those described in the Application, where relevant.

2.2.5 Fugitive emissions of substances to water and sewer

2.2.5.1 Subject to condition 2.2.5.2 below, the Operator shall use BAT so as to prevent or where that is not practicable to reduce fugitive emissions of substances to water (other than Groundwater) and sewer from the Permitted Installation in particular from:

- all structures under or over ground
- surfacing
- bunding
- storage areas

provided always that the techniques used by the Operator shall be no less effective than those described in the Application, where relevant.

2.2.5.2 There shall be no release to water that would cause a breach of an EQS established by the UK Government to implement the Dangerous Substances Directive 2006/11EC.

2.2.6 Odour

2.2.6.1 The Operator shall use BAT so as to prevent or where that is not practicable to reduce odorous emissions from the Permitted Installation, in particular by:

- limiting the use of odorous materials
- restricting odorous activities
- controlling the storage conditions of odorous materials
- controlling processing parameters to minimise the generation of odour
- optimising the performance of abatement systems
- timely monitoring, inspection and maintenance
- employing, where appropriate, an approved odour management plan

provided always that the techniques used by the Operator shall be no less effective than those described in the Application, where relevant.

2.2.6.2 No condition applies.

2.2.6.3 No condition applies.

2.2.7 Emissions to Land

2.2.7.1 This Part 2.2.7 of this Permit shall not apply to emissions to groundwater.

2.2.7.2 No condition applies.

2.2.7.3 No condition applies.

2.3 Management

2.3.1 A copy of this Permit and those parts of the application referred to in this Permit shall be available, at all times, for reference by all staff carrying out work subject to the requirements of the Permit.

Training

2.3.2 The Permitted Installation shall be supervised by staff who are suitably trained and fully conversant with the requirements of this Permit.

2.3.3 All staff shall be fully conversant with those aspects of the Permit conditions which are relevant to their duties and shall be provided with adequate professional technical development and training and written operating instructions to enable them to carry out their duties.

2.3.4 The Operator shall maintain a record of the skills and training requirements for all staff whose tasks in relation to the Permitted Installation may have an impact on the environment and shall keep records of all relevant training.

Maintenance

2.3.5 All plant and equipment used in operating the Permitted Installation, the failure of which could lead to an adverse impact on the environment, shall be maintained in good operating condition.

2.3.6 The Operator shall maintain a record of relevant plant and equipment covered by condition 2.3.5 and for such plant and equipment:

2.3.6.1 a written or electronic maintenance programme; and

2.3.6.2 records of its maintenance.

Incidents and Complaints

2.3.7 The Operator shall maintain and implement written procedures for:

2.3.7.1 taking prompt remedial action, investigating and reporting actual or potential non-compliance with operating procedures or emission limits; and

2.3.7.2 investigating incidents, (including any malfunction, breakdown or failure of plant, equipment or techniques, down time, any short term and long term remedial measures and near misses) and prompt implementation of appropriate actions; and

2.3.7.3 ensuring that detailed records are made of all such actions and investigations.

2.3.8 The Operator shall record and investigate complaints concerning the Permitted Installation's effects or alleged effects on the environment. The record shall give the date and nature of complaint, time of complaint, name of complainant (if given), a summary of any investigation and the results of such investigation and any actions taken.

2.4 Efficient use of raw materials

2.4.1 The Operator shall -

2.4.1.1 maintain the raw materials table or description submitted in response to Section 2.4 of the Application and in particular consider on a periodic basis whether there are suitable alternative materials to reduce environmental impact;

2.4.1.2 carry out periodic waste minimisation audits and water use efficiency audits. If such an audit has not been carried out in the 2 years prior to the issue of this Permit, then the first such audit shall take place within 2 years of its issue. The methodology used and an action plan for increasing the efficiency of the use of raw materials or water shall be submitted to the Agency within 2 months of completion of each such audit and a review of the audit and a description of progress made against the action plan shall be submitted to the Agency at least every 4 years thereafter; and

2.4.1.3 ensure that incoming water use is directly measured and recorded.

2.5 Waste Storage and Handling

2.5.1 The Operator shall design, maintain and operate all facilities for the storage and handling of waste on the Permitted Installation such that there are no releases to water or land during normal operation and that emissions to air and the risk of accidental release to water or land are minimised.

2.5.2 The Operator shall use BAT so as to prevent or where that is not practicable to reduce emissions of litter from the Permitted Installation provided always that the techniques used by the Operator shall be no less effective than those described in the Application, where relevant.

2.6 Waste recovery or disposal

2.6.1 Waste produced at the Permitted Installation shall be:

2.6.1.1 recovered to no lesser extent than described in the Application; and

2.6.1.2 where not recovered, disposed of while avoiding or reducing any impacts on the environment provided always that this is not done in any way that would have a greater effect on the environment than that described in the Application.

2.6.2 The Operator shall maintain the waste recovery or disposal table or description submitted in response to Section 2.6 of the Application and in particular review the available options for waste recovery and disposal for the purposes of complying with condition 2.6.1 above.

2.6.3 The Operator shall maintain and implement a system which ensures that a record is made of the quantity, composition, origin, destination (including whether this is a recovery or disposal operation) and where relevant removal date of any waste that is produced at the Permitted Installation.

2.7 Energy Efficiency

2.7.1 The Operator shall produce a report on the energy consumed at the Permitted Installation over the previous calendar year, by 31 January each year, providing the information required by condition 4.1.2.

2.7.2 The Operator shall maintain and update annually an energy management system which shall include, in particular, the monitoring of energy flows and targeting of areas for improving energy efficiency.

2.7.3 The Operator shall design, maintain and operate the Permitted Installation so as to secure energy efficiency, taking into account relevant guidance including the Agency's Energy Efficiency Horizontal Guidance Note as from time to time amended. Energy efficiency shall be secured in particular by:

- ensuring that the appropriate operating and maintenance systems are in place;
- ensuring that all plant is adequately insulated to minimise energy loss or gain;
- ensuring that all appropriate containment methods, (e.g. seals and self-closing doors) are employed and maintained to minimise energy loss;
- employing appropriate basic controls, such as simple sensors and timers, to avoid unnecessary discharge of heated water or air;
- where building services constitute more than 5% of the total energy consumption of the installation, identifying and employing the appropriate energy efficiency techniques for building services, having regard in particular to the Building services part of the Agency's Energy Efficiency Horizontal Guidance Note H2; and

maintaining and implementing an energy efficiency plan which identifies energy saving techniques that are applicable to the activities and their associated environmental benefit and prioritises them, having regard to the appraisal method in the Agency's Energy Efficiency Horizontal Guidance Note H2.

2.8 Accident prevention and control

2.8.1 The Operator shall maintain and implement when necessary the accident management plan submitted or described in response to Section 2.8 of the Application. The plan shall be reviewed at least every 2 years or as soon as practicable after an accident, whichever is the earlier, and the Agency notified of the results of the review within 2 months of its completion.

2.9 Noise and Vibration

2.9.1 The Operator shall use BAT so as to prevent or where that is not practicable to reduce emissions of noise and vibration from the Permitted Installation, in particular by:

- equipment maintenance, eg. of fans, pumps, motors, conveyors and mobile plant;
- use and maintenance of appropriate attenuation, eg. silencers, barriers, enclosures;
- timing and location of noisy activities and vehicle movements;
- periodic checking of noise emissions, either qualitatively or quantitatively; and
- maintenance of building fabric,

provided always that the techniques used by the Operator shall be no less effective than those described in the Application, where relevant.

2.9.2 No condition applies.

2.9.3 No condition applies.

2.10 On-site Monitoring

2.10.1 The Operator shall maintain and implement an emissions monitoring programme which ensures that emissions are monitored from the specified points, for the parameters listed in and to the frequencies and methods described in Tables 2.2.2 and 2.2.5, unless otherwise agreed in writing, and that the results of such monitoring are assessed. The programme shall ensure that monitoring is carried out under an appropriate range of operating conditions.

2.10.2 The Operator shall carry out environmental or other specified substances monitoring to the frequencies and methods as described below:

The site should be operated in such a way as to prevent pollution of any surface or underground waters and there should be no discharge of trade effluent to any underground strata.

The process liquid effluent shall be discharged at a rate not exceeding 2,000m^3/hr for 4.5 hours during the 5 hours commencing immediately after the time of local high water (a pump out). The volume of process liquid effluent shall not exceed 12,000 cubic meters per day and may include up to 80 cubic meters of treated sewage effluent.

The operator shall monitor the process liquid effluent at release point W1 by analysing spot samples fortnightly for:

Sulphate

The operator shall maintain records of the daily volume, rate and composition of the process liquid effluent.

The operator shall monitor the process liquid effluent quarterly at release point W1 by analysing 24 hr flow proportional samples for:

Total Organic Carbon

Manganese (total)

Calcium (total)

Boron (total)

Magnesium (total)

Aluminium (total}

Zirconium (total)

Titanium (total)

Niobium (total)

1,1,1 Trichloroethane

Chloroform

Carbon tetrachloride

2.10.3 No condition applies.

2.10.4 No condition applies.

2.10.5 The Operator shall notify the Agency at least 14 days in advance of undertaking monitoring and/ or spot sampling, where such notification has been requested in writing by the Agency.

2.10.6 The Operator shall maintain records of all monitoring taken or carried out (this includes 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.

2.10.7 Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme in condition 2.10.1 of this Permit shall have either MCERTS certification or MCERTS accreditation (as appropriate) unless otherwise agreed in writing.

2.10.8 There shall be provided:

2.10.8.1 safe and permanent means of access to enable sampling/monitoring to be carried out in relation to the emission points specified in Schedule 2 to this Permit, unless otherwise specified in that Schedule; and

2.10.8.2 safe means of access to other sampling/monitoring points when required by the Agency.

2.10.9 The Operator shall carry out the on-going monitoring identified in the Site Protection and Monitoring Programme submitted under condition 4.1.7, unless otherwise agreed in writing by the Agency.

2.10.10 The Operator shall, within 6 months of the issue of this Permit, in accordance with and using the format given in the Land Protection Guidance:

2.10.10.1 collect the site reference data identified in the Site Protection and Monitoring Programme submitted under condition 4.1.7, and

2.10.10.2 report that site reference data to the Agency,

- unless otherwise agreed in writing by the Agency.

2.10.11 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.

2.11 Closure and Decommissioning

2.11.1 The Operator shall maintain and operate the Permitted Installation so as to prevent or minimise any pollution risk, including the generation of waste, on closure and decommissioning in particular by:-

2.11.1.1 attention to the design of new plant or equipment;

2.11.1.2 the maintenance of a record of any events which have, or might have, impacted on the condition of the site along with any further investigation or remediation work carried out; and

2.11.1.3 the maintenance of a site closure plan to demonstrate that the installation can be decommissioned avoiding any pollution risk and returning the site of operation to a satisfactory state.

2.11.2 Notwithstanding condition 2.11.1 of this Permit, the Operator shall carry out a full review of the Site Closure Plan at least every 4 years.

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

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

2.12 Multiple Operator installations

2.12.1 There are no conditions as a result of the interactions of the Permits covering this installation.

2.13 Transfer to effluent treatment plant

2.13.1 No transfers to effluent treatment plant are controlled under this part of this Permit.

2.13.2 No condition applies.

3 Records

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

3.1.1 be made available for inspection by the Agency at any reasonable time;

3.1.2 be supplied to the Agency on demand and without charge;

3.1.3 be legible;

3.1.4 be made as soon as reasonably practicable;

3.1.5 indicate any amendments, which have been made and shall include the original record wherever possible;

3.1.6 be retained at the Permitted Installation, or other location agreed by the Agency in writing, for a minimum period of 4 years from the date when the records were made, unless otherwise agreed in writing; and

3.1.7 where they concern the condition of the site of the Installation or are related to the implementation of the Site Protection and Monitoring Programme, be kept at the Permitted Installation, or other location agreed by the Agency in writing, until all parts of the Permit have been surrendered.

4 Reporting

4.1.1 All reports and written and or oral notifications required by this Permit and notifications required by Regulation 16 of the EP Regulations shall be made or sent to the Agency using the contact details notified in writing to the Operator by the Agency.

4.1.2 The Operator shall, unless otherwise agreed in writing, submit reports of the monitoring and assessment carried out in accordance with the conditions of this permit, as follows:-

4.1.2.1 in respect of the parameters and emission points specified in Table S2 to Schedule 2;

4.1.2.2 for the reporting periods specified in Table S2 to Schedule 2 and using the forms specified in Table S3 to Schedule 3;

4.1.2.3 giving the information from such results and assessments as may be required by the forms specified in those Tables; and

4.1.2.4 to the Agency within 28 days of the end of the reporting period.

4.1.3 The Operator shall submit to the Agency a report on the performance of the Permitted Installation over the previous year, by 31 January each year, providing the information listed in Tables S4.1 and S4.2 of Schedule 4, assessed at any frequency specified therein, and using the form specified in Table S3 to Schedule 3.

4.1.4 The Operator shall review fugitive emissions, having regard to the application of Best Available Techniques, on an annual basis, or such other period as shall be agreed in writing by the Agency, and a summary report on this review shall be sent to the Agency detailing such releases and the measures taken to reduce them within 3 months of the end of such period.

4.1.5 Where the Operator has a formal environmental management system applying to the Permitted Installation which encompasses annual improvement targets the Operator shall, not later than 31 January in each year, provide a summary report of the previous year's progress against such targets.

4.1.6 The Operator shall, within 6 months of receipt of written notice from the Agency, submit to the Agency a report assessing whether all appropriate preventive measures continue to be taken against pollution, in particular through the application of the best available techniques, at the installation. The report shall consider any relevant published technical guidance current at the time of the notice which is either supplied with or referred to in the notice, and shall assess the costs and benefits of applying techniques described in that guidance, or otherwise identified by the Operator, that may provide environmental improvement.

4.1.7 The Operator shall, within two months of the date of this permit, submit a detailed Site Protection and Monitoring Programme, in accordance with and using the appropriate template format given in the Land Protection Guidance. The Operator shall implement and maintain the Site Protection and Monitoring Programme (SPMP) submitted under condition 4.1.7, and shall carry out regular reviews of it at a minimum frequency of every 2 years. The results of such reviews and any changes made to the SPMP shall be reported to the Agency within 1 month of the review or change.

4.1.8 For activity A3 (LCP 354) referenced in schedule 1, table 1.1.1; unless otherwise agreed in writing with the Environment Agency, within 1 month of the end of each quarter, the operator shall submit to the Environment Agency using the form IED RTA1, listed in table S3, the information specified on the form relating to the site's mass emissions.

5 Notifications

5.1.1 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.

(d) any period when both divert stacks for ICON 1&2 are off-line simultaneously for 4 hours or more.

5.1.2 Any information provided under condition 5.1.1 (a)(i), 5.1.1 (b)(i), where the information relates to the breach of a condition 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.

5.1.3 The Operator shall give written notification as soon as practicable prior to any of the following:-

5.1.3.1 permanent cessation of the operation of part or all of the Permitted Installation;

5.1.3.2 cessation of operation of part or all of the Permitted Installation for a period likely to exceed 1 year; and

5.1.3.3 resumption of the operation of part or all of the Permitted Installation after a cessation notified under condition 5.1.3.2.

5.1.4 The Operator shall notify the Agency, as soon as reasonably practicable, of any information concerning the state of the Site which adds to that provided to the Agency as part of the Application or to that in the Site Protection and Monitoring Programme submitted under condition 4.1.7 of this Permit.

5.1.5 The Operator shall notify the following matters to the Agency in writing within 14 days of their occurrence:-

5.1.5.1 where the Operator is a registered company:-

- any change in the Operator's trading name, registered name or registered office address;
- any change to particulars of the Operator's ultimate holding company (including details of an ultimate holding company where an Operator has become a subsidiary)
- any steps taken with a view to the Operator going into administration, entering into a company voluntary arrangement or being wound up;

5.1.5.2 where the Operator is a corporate body other than a registered company:

- any change in the Operator's name or address;
- any steps taken with a view to the dissolution of the Operator.

5.1.5.3 In any other case: -

- the death of any of the named Operators (where the Operator consists of more than one named individual);
- any change in the Operator's name(s) or address(es);
- any steps taken with a view to the Operator, or any one of them, going into bankruptcy, entering into a composition or arrangement with creditors, or, in the case them being in a partnership, dissolving the partnership.

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

5.1.6.1 a decision by the Secretary of State not to re-certify that Agreement.

5.1.6.2 a decision by either the Operator or the Secretary of State to terminate that agreement.

5.1.6.3 any subsequent decision by the Secretary of State to re-certify such an Agreement.

5.1.7 Where the Operator has entered into a Direct Participant Agreement in the Emissions Trading Scheme which covers emissions relating to the energy consumption of the activities, the Operator shall notify the Agency within one month of:-

5.1.7.1 a decision by the Operator to withdraw from or the Secretary of State to terminate that agreement.

5.1.7.2 a failure to comply with an annual target under that Agreement at the end of the trading compliance period.

6 Interpretation

6.1.1 In this Permit, the following expressions shall have the following meanings:-

"Abatement equipment" means that equipment dedicated to the removal of polluting substances from

releases from the Installation to air or water media.

"abnormal operation" means when waste gas is on line to both divert stacks (release points A19 and A202)

Application" means the application for this Permit, together with any response to a notice served under the EP Regulations and any operational change agreed under the conditions of this Permit.

"background concentration" means such concentration of that substance as is present in:

- water supplied to the site; or
- where more than 50% of the water used at the site is directly abstracted from ground or surface water on site, the abstracted water; or
- where the Permitted Installation uses no significant amount of supplied or abstracted water, the precipitation on to the site.

"BAT" means best available techniques means the most effective and advanced stage of development of activities and their methods of operation which indicates the practical suitability of particular techniques to prevent and where that is not practicable to reduce emissions and the impact on the environment as a whole. For these purposes: "available techniques" means "those techniques which have been developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the cost and advantages, whether or not the techniques are used or produced inside the United Kingdom, as long as they are reasonably accessible to the operator"; "best" means "in relation to techniques, the most effective in achieving a high general level of protection of the environment as a whole" and "techniques" "includes both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned". In addition, the EP Regulations have effect in relation to the determination of BAT.

"changeover" means the operational time period when waste gas is first introduced to a second divert stack, such that waste gas is on line to both divert stacks at the same time, until such time that the coke feed day bunker is emptied of max 4.0%w/w sulphur coke, having not been replenished with this material

"Daily" means, for sampling purposes, a 24 hour period starting at 7.00 am.

"Daily composite sample" means a sample obtained by continually taking a sample of at least 30 millilitres from the effluent at a set effluent volume e.g. after every 400m^3 pumped to the estuary. This volume may be different for each pipeline.

"*ELV*" means emission limit value

"*Energy efficiency*" the annual net plant energy efficiency means the value calculated from the operational data collected over the year.

"*EPR*" means the Environmental Permitting (England and Wales) Regulations SI 2010 No.675 (as amended) and words and expressions defined in the Environmental Permitting Regulations shall have the same meanings when used in this Permit save to the extent they are specifically defined in this Permit.

"Fugitive emission" means an emission to air or water (including sewer) from the Permitted Installation which is not controlled by an emission or background concentration limit under conditions 2.2.1.3, 2.2.2.4, or 2.2.2.5 of this Permit.

"flood conditions" means when the 1100mm level in the effluent receipt sump of the Total Neutralisation Plant is exceeded and there is visible evidence of standing water in locations highly likely to cause operational impacts.

"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.

"Hourly average" means the average value from continuous monitoring over each 60 minute period starting on the hour at 1.00, 2.00 etc.

"24 hour rolling average" means the average of the previous 24 hourly averages and is determined each hour at 1.00, 2.00 etc.

"Daily average" means the average of continuous monitoring with a data logging interval of 60 seconds or less over a day, 07.00 to 07.00.

"Monthly average" means the average of all daily averages obtained during a calendar month.

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

"Land Protection Guidance" means the version of the Agency guidance note "H5 – Site Conditioning Report Guidance" for data reporting, which is current at the time of issue of the Permit.

"LAeq,T" means the equivalent continuous A-weighted sound pressure level in dB determined over time period, T.

"LA90, T" means the A-weighted sound pressure level in dB exceeded for 90% of the time period, T.

"LAFmax" means the maximum A weighted sound level measurement in dB measured with a fast time weighting.

"*large combustion plant*" or "*LCP*" is a combustion plant or group of combustion plants discharging waste gases through a common windshield or stack, where the total thermal input is 50 MW or more, based on net calorific value. The calculation of thermal input, excludes individual combustion plants with a rated thermal input below 15MW.

"LCPD" means Large Combustion Plant Directive (Directive 2001/80/EC) of the European Parliament and of the Council of 23 October 2001on the limitation of emissions of certain pollutants into air from large combustion plants.

"MCERTS" means the Environment Agency's Monitoring Certification Scheme.

"Monitoring" includes the taking and analysis of samples, instrumental measurements (periodic and continual), calibrations, examinations, tests and surveys.

"*MSDL*" means minimum shut-down load as defined in Implementing Decision 2012/249/EU.

"*MSUL*" means minimum start-up load as defined in Implementing Decision 2012/249/EU.

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

"*TNP Register*" means the register maintained by the Environment Agency in accordance with regulation regulation 4 of the Large Combustion Plants (Transitional National Plan) Regulations 2015 SI2015 No.1973.

"normal operation" means when waste gas on line to one or both COCOS scrubber stacks or one of the divert stacks (release point A19 or A202)

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

"Permitted Installation" means the activities and the limits to those activities described in Table 1.1.1 of this Permit.

"Quarterly" for reporting means after each 3 month period, January to March; April to June; July to September and October to December.

"Quarterly" for sampling means during each 3 month period, January to March; April to June; July to September and October to December, and when sampling, with at least 4 weeks between each sampling date.

"6 monthly" for reporting means after each 6 month period, January to June; July to December.

"6 monthly" for sampling means during each 6 month period, January to June; July to December and, when sampling, with at least 8 weeks between each sampling date

"Sewer" means sewer within the meaning of section 219(1) of the Water Industry Act 1991.

"Shutdown" is any period where a section of plant is being taken out of steady-state operations.

"Staff" includes employees, directors or other officers of the Operator, and any other person under the Operator's direct or indirect control, including contractors.

"*Start-up"* is any period, where a section of plant has been non-operational, and is being returned to steady-state conditions.

"Suspended Solids" means those suspended solids measured after drying at 105°C.

"Titanium Dioxide Equivalent Produced" means the sum of the actual titanium dioxide produced plus the titanium dioxide that could be produced from the titanium tetrachloride product despatched from the factory assuming 1 Tonne of titanium tetrachloride would yield 0.421 tonne of titanium dioxide.

"Week" means, for sampling purposes, a period of 7 days starting each Monday at 7.00 am.

"Year" means calendar year ending 31 December.

"*mg/m3*" means milligramme per cubic metre.

"g/s" means gramme per second.

"kg/h" means kilogramme per hour.

"µ*g/l*" means microgramme per litre.

"*mg/l*" means milligramme per litre.

"*g/l*" means gramme per litre.

"kg" means kilogramme.

"t" means tonne.

"MWh" means megawatt hour.

6.1.2 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.

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

6.1.3.1 in relation to gases 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

6.1.3.2 in relation to gases 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

6.1.4 Where any condition of this Permit refers to the whole or parts of different documents, in the event of any conflict between the wording of such documents, the wording of the document(s) with the most recent date shall prevail to the extent of such conflict.

Schedule 1 - Notification of abnormal emissions

This page outlines the information that the Operator must provide to satisfy conditions 5.1.1 and 5.1.2 of this Permit.

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 PPC Regulations.

Part A

Permit Number	EPR/TP3532PK
Name of Operator	Huntsman P&A UK Limited
Location of Installation	Greatham Works, Hartlepool
Location of the emission	
Time and date of the emission	

Substance(s) emitted	Media	Best estimate of the quantity or the rate of emission	Time during which the emission took place

Measures taken, or intended to be taken, to stop the emission	

Part B

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 or harm which has been or may be caused by the emission	
The dates of any unauthorised emissions from the installation in the preceding 24 months.	

Name*	
Post	
Signature	
Date	

Part C

Permit Number	EPR/TP3532PK
Name of Operator	Huntsman P&A UK Limited
Location of Installation	Greatham Works, Hartlepool

Time at which Thermal Converter from ICON 1&2 diverted simultaneously.	
Time at which Thermal Converter from ICON 1&2 divert no longer simultaneously diverted.	
Duration of this incidence.	
Reasons for diverting ICON1	
Reasons for diverting ICON2	

Name*	
Post	
Signature	
Date	

* authorised to sign on behalf of Huntsman P&A UK Limited

Schedule 2 - Reporting of monitoring data

Parameters for which reports shall be made, in accordance with conditions 4.1.2 and 4.1.3 of this Permit, are listed below.

Table S2 Reporting of monitoring data			
Parameter	**Emission or monitoring point/reference**	**Reporting period**	**Period begins**
Sulphur Dioxide mg/m^3	A122/1, A122/2, A250	Every 6 months	1st January/1st July
Hydrogen sulphide mg/m^3	A122/1, A122/2	Every 6 months	1st January/1st July
Carbonyl sulphide mg/m^3	A122/1, A122/2	Every 6 months	1st January/1st July
Carbon monoxide mg/m^3	A122/1, A122/2 A250	Every 6 months	1st January/1st July
Oxides of nitrogen mg/ m^3	A250	Every 6 months	1st January/1st July
Operating hours	A250 (LCP354)	Every 3 months	1st January/1st April/1st July/1st October
Hydrogen chloride mg/m^3	A19, A122/1, A122/2, A202, A224	Every 6 months	1st January/1st July
Chlorine mg/m^3	A19, A90, A122/1, A122/2, A202, A225	Every 6 months	1st January/1st July
Particulates/Dust mg/m^3	A19, A67, A68, A69, A70, A121, A122/1, A122/2, A123, A202, A224 A235, A238, A246, A250	Every 6 months	1st January/1st July
Suspended solids mg/l	W1	Every 6 months	1st January/1st July
Total kg chloride per tonne of Titanium Dioxide equivalent produced	W1	Every 6 months	1st January/1st July
Cadmium (µg/l)	W1	Every 6 months	1st January/1st July
Mercury (µg/l)	W1	Every 6 months	1st January/1st July
Hexachlorbenzene (µg/l)	W1	Every 6 months	1st January/1st July
1,2 Dichloroethane (µg/l)	W1	Every 6 months	1st January/1st July
Lead (µg/l)	W1	Every 6 months	1st January/1st July
Zinc (µg/l)	W1	Every 6 months	1st January/1st July

Table S2 Reporting of monitoring data			
Parameter	**Emission or monitoring point/reference**	**Reporting period**	**Period begins**
Iron (µg/l)	W1	Every 6 months	1st January/1st July
Vanadium (µg/l)	W1	Every 6 months	1st January/1st July
Chromium (µg/l)	W1	Every 6 months	1st January/1st July
Copper (µg/l)	W1	Every 6 months	1st January/1st July
Nickel (µg/l)	W1	Every 6 months	1st January/1st July
Arsenic (µg/l)	W1	Every 6 months	1st January/1st July
pH max	W1	Every 6 months	1st January/1st July
pH min	W1	Every 6 months	1st January/1st July
Energy usage	Permitted Installation	Annually	1st January
Waste disposal and/or recovery.	Permitted Installation	Annually	1st January
Water usage	Permitted Installation	Annually	1st January

Schedule 3 - Forms to be used

Table S3 Reporting forms				
Media/ parameter	**Reporting format**	**Starting Point**	**Agency recipient**	**Date of form**
Air(Periodic Monitoring)	A1	-	Area Office	31/12/15
Air (Continuous monitoring- chlorine and particulates)	A2	-	Area Office	31/12/15
Air (Continuous monitoring- sulphur dioxide and carbon monoxide)	A3	-	Area Office	31/12/15
Operation of Release Points - A19 and A202 (divert stacks)	A4	-	Area Office	31/12/15
Air & Energy	Form IED AR1 – SO_2, NO_X and dust mass emissions and energy	01/01/16	National	31/12/15
Air	Form IED RTA1 – TNP quarterly emissions summary log	01/01/16	National	31/12/15
LCP	Form IED HR1 – operating hours	01/01/16	National	31/12/15
Air	Form IED PM1 – discontinuous monitoring and load	01/01/16	Area Office	31/12/15
Water (excluding sewer)	W1		Area Office	31/12/15
Energy	E1		Area Office	31/12/15
Performance data	PI1 or other form as agreed in writing by the Environment Agency		Area Office	31/12/15

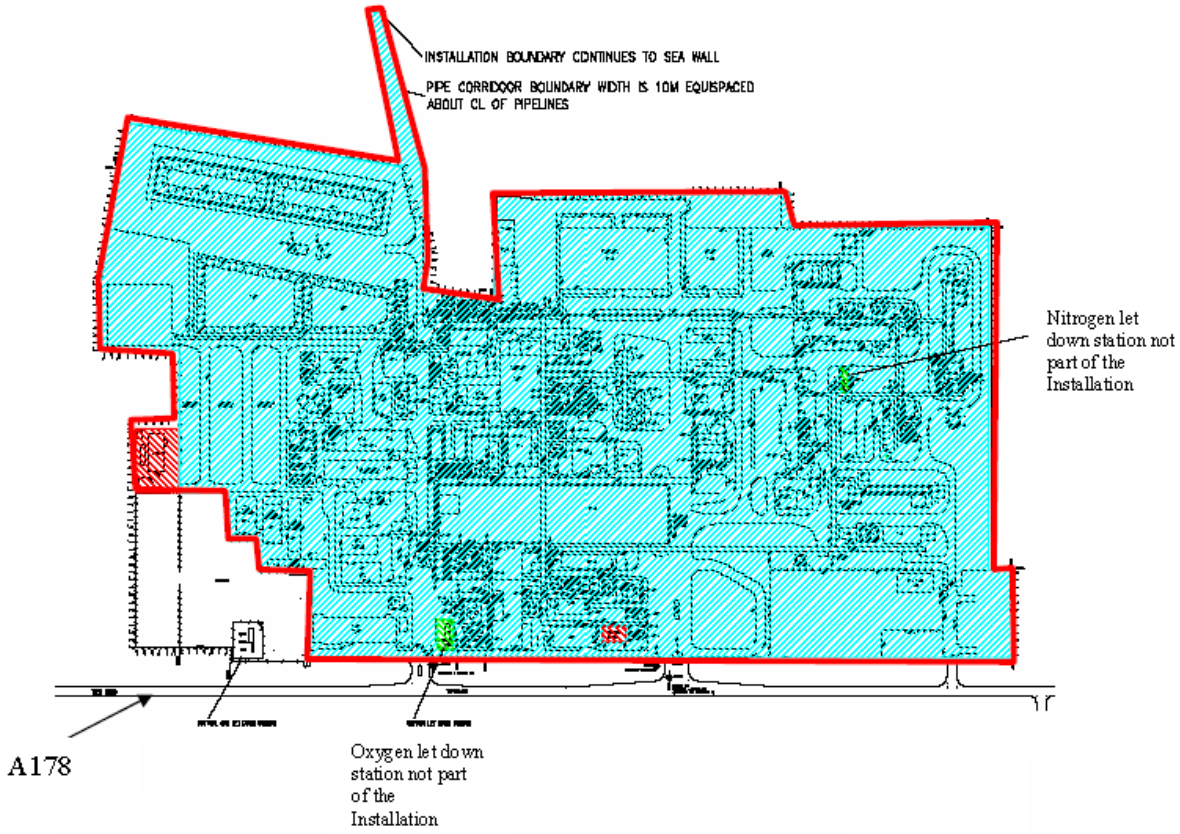
Schedule 4 - Reporting of performance data

Data required to be recorded and reported by Condition 4.1.3. The data should be assessed at the frequency given and reported annually to the Agency.

Table S4.1 Annual Production/Treatment		
Parameter	**Frequency of assessment**	**Units**
No entry	-	-

Table S4.2 Chapter III Performance parameters for reporting to DEFRA and other Performance parameters		
Parameter	**Frequency of assessment**	**Performance indicator**
Thermal oxidiser availability ICON 1&2	Annually	%
Thermal Input Capacity for each LCP	Annually	MW
Annual Fuel Usage for each LCP	Annually	TJ
Total Emissions to Air of NO_x for each LCP	Annually	t
Total Emissions to Air of SO_2 for each LCP	Annually	t
Total Emissions to Air of Dust for each LCP	Annually	t
Operating Hours for each LCP	Annually	hr

Schedule 5 - Site Plan



DWG/GM/AO/095165

END OF PERMIT