Notice of variation and consolidation with introductory note

The Environmental Permitting (England & Wales) Regulations 2016

Total Lindsey Oil Refinery Limited

Total Lindsey Oil Refinery
Eastfield Road
North Killingholme
Immingham
North Lincolnshire
DN40 3LW

Variation application number

EPR/TP3633NH/V004

Permit number

EPR/TP3633NH

Total Lindsey Oil Refinery
Permit number EPR/TP3633NH

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. All the conditions of the permit have been varied and are subject to the right of appeal.

Article 21(3) of the Industrial Emissions Directive (IED) requires the Environment Agency to review conditions in permits that it has issued and to ensure that the permit delivers compliance with relevant standards, within four years of the publication of updated decisions on Best Available Techniques (BAT) Conclusions. We have reviewed the permit for this installation against the revised BAT Conclusions for the refining of mineral oil and gas industry sector published on 28th October 2014.The rest of the installation is unchanged and continues to be operated as follows:

The Total Lindsey Oil Refinery is located at North Killingholme in North Lincolnshire and is operated by Total Lindsey Oil Refinery Limited. The refinery processes a mix of sour and sweet crudes for the production of fuels and bitumen.

The main environmental releases from the site to air are Sulphur Dioxide, Oxides of Nitrogen, Particulate Matter and Volatile Organic Compounds. Conditions within the permit have been set to ensure the permitted operation can comply with environmental standards relating to local receptors.

Releases to water are minimised by the use of a three stage effluent treatment plant.

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 UP3430LQ	Duly made 11/08/06	
Additional information requested	08/12/06	
Additional Information received	02/02/07	
Additional Information requested	03/04/07	
Additional Information received	07/06/07	
Additional Information received	04/07/07	
Permit determined EPR/UP3430LQ	14/12/07	
Application EPR/TP3633NH/T001	Duly made 21/03/13	Application to transfer the permit in full to Total Lindsey Oil Refinery Limited.

Status log of the permit		
Description	**Date**	**Comments**
(full transfer of permit EPR/UP3430LQ)		
Transfer determined EPR/TP3633NH	26/03/13	Full transfer of permit complete.
Environment Agency variation determined EPR/TP3633NH/V002	25/06/13	Environment Agency variation to implement the changes introduced by IED.
Regulation 60 Notice sent to the Operator	05/08/15	Issue of a Notice under Regulation 60(1) of the EPR. Environment Agency Initiated review and variation to vary the permit.
Regulation 60 Notice response	30/09/15	Response received from the Operator (Chapter III).
Regulation 60 Notice response	05/02/16	Compliance and operating techniques identified in response to the BAT Conclusions for the refining of mineral oil and gas industry sector published on 28th October 2014.
Variation determined EPR/TP3633NH/V0043 (PAS Billing ref: JP3230RN)	03/03/17	Varied permit issued.
Additional information in response to regulation 60(1) Notice EPR/TP3633NH/V004	23/01/18	Compliance and operating techniques identified in response to BAT Conclusion 7.
Additional information in response to regulation 60(1) Notice EPR/TP3633NH/V004	23/01/18	Compliance and operating techniques identified in response to BAT Conclusions 8 and 9.
Additional information in response to regulation 60(1) Notice EPR/TP3633NH/V004	23/01/18	Compliance and operating techniques identified in response to BAT Conclusion 11.
Additional information in response to regulation 60(1) Notice EPR/TP3633NH/V004	15/08/18	Approved Total Lindsey Oil Refinery Outline Calculation Methodology for SOx and NOx emissions
Variation determined EPR/TP3633NH/V0044 (PAS Billing ref: EP3932QS)	27/11/18	Varied and consolidated permit issued Variation effective from 27/11/2018.

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 2016 varies and consolidates

Permit number

EPR/TP3633NH

Issued to

Total Lindsey Oil Refinery Limited ("the operator")

whose registered office is

Lindsey Oil Refinery
Lindsey Oil Refinery
Eastfield Road
North Killingholme
Immingham
North Lincolnshire
DN40 3LW

company registration number **564599**

to operate a regulated facility at

Total Lindsey Oil Refinery
Eastfield Road
North Killingholme
Immingham
North Lincolnshire
DN40 3LW

to the extent set out in the schedules.

The notice shall take effect from 27/11/2018

Name	Date
M Bischer	27/11/2018

Authorised on behalf of the Environment Agency

Schedule 1

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

Schedule 2 – consolidated permit

Consolidated permit issued as a separate document.

Permit

The Environmental Permitting (England and Wales) Regulations 2016

Permit number

EPR/TP3633NH

This is the consolidated permit referred to in the variation and consolidation notice for application EPR/TP3633NH/V004 authorising,

Total Lindsey Oil Refinery Limited ("the operator"),

whose registered office is

Lindsey Oil Refinery
Eastfield Road
North Killingholme
Immingham
North Lincolnshire
DN40 3LW

company registration number 564599

to operate an installation at

Total Lindsey Oil Refinery
Eastfield Road
North Killingholme
Immingham
North Lincolnshire
DN40 3LW

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

Name	Date
M Bischer	**27/11/2018**

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;

(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.

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.

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 For the following activities referenced in schedule 1, table S1.1: LCP 355, LCP 356, LCP 357 and LCP 358. The end of the start up period and the start of the shutdown period shall conform to the specifications set out in Schedule 1, table S1.2.

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

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

(b) the composition of the waste;

(c) the handling requirements of the waste;

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

(e) the waste code of the waste.

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

2.3.7 (a) The Operator shall implement measures to ensure that periods when the acid gas removal systems are not available are minimised and that they operate with sufficient capacity to treat the acid gases produced.

(b) These measures shall include procedures for minimising the impact of periods of other than normal operation of the acid gas removal systems.

(c) The operator shall record periods when sufficient capacity is not available in the acid gas removal systems, to treat the sour gases produced. The Operator shall record the duration of the period of loss of capacity, the cause of the event and measures taken to reinstate the system's availability

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 and S3.2.

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

3.1.3 Total annual emissions from the emission points set out in tables schedule 3 S3.1 and S3.2 of a substance listed in schedule 3 table S3.3 shall not exceed the relevant limit in table S3.3.

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 schedule 1 table S1.4, 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 schedule 1 table S1.5 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 S3.1a, S3.1b, S3.2 and S3.3;

(b) process monitoring specified in table S3.4.

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 continuous), 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 Newly installed Continuous Emission Monitors (CEMs), or CEMs replacing existing CEMs, shall have MCERTS certification and have an MCERTS certified range which is not greater than 2.5 times the daily emission limit value (ELV) specified in schedule 3 table S3.1. The CEM shall also be able to measure instantaneous values over the ranges which are to be expected during all operating conditions. If it is necessary to use more than one range setting of the CEM to achieve this requirement, the CEM shall be verified for monitoring supplementary, higher ranges.

3.5.5 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 and S3.2 unless otherwise agreed in writing by the Environment Agency.

3.5.6 The operator shall monitor and record the following parameters for flaring events when the rate of gas flared exceeds 2.2 tonnes/hr (A11) and 4.3 tonnes/hr (A12) as a daily mean value:

(a) Duration of event;

(b) Total mass of gas flared;

(c) Mass of SO_2 released; and

(d) Calorific value of the gas flared.

The operator shall identify the root cause of the flaring event and consider ways to prevent or reduce the frequency and duration of recurrences.

3.6 Monitoring for the purposes of the Industrial Emissions Directive Chapter III

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

3.6.2 If the monitoring results for more than 10 days a year are invalidated within the meaning set out in condition 3.6.7, the operator shall:

(a) within 28 days of becoming aware of this fact, review the causes of the invalidations and submit to the Environment Agency for approval, proposals for measures to improve the reliability of the continuous measurement systems, including a timetable for the implementation of those measures; and

(b) implement the approved proposals.

3.6.3 Continuous measurement systems on emission points from the LCP shall be subject to quality control by means of parallel measurements with reference methods at least once every calendar year.

3.6.4 Unless otherwise agreed in writing by the Environment Agency in accordance with condition 3.6.5 below, the operator shall carry out the methods, including the reference measurement methods, to use and calibrate continuous measurement systems in accordance with the appropriate CEN standards.

3.6.5 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.

3.6.6 Where required by a condition of this permit to check the measurement equipment, the operator shall submit a report to the Environment Agency in writing, within 28 days of the completion of the check.

3.6.7 Where Continuous Emission Monitors are installed to comply with the monitoring requirements in schedule 3, table S3.1; the Continuous Emission Monitors shall be used such that:

(a) for the continuous measurement systems fitted to the LCP release points defined in Table S3.1 the validated hourly, monthly and daily averages shall be determined from the measured valid hourly average values after having subtracted the value of the 95% confidence interval;

(b) the 95% confidence interval for nitrogen oxides and sulphur dioxide of a single measured result shall be taken to be 20%;

(c) the 95% confidence interval for dust releases of a single measured result shall be taken to be 30%;

(d) the 95% confidence interval for carbon monoxide releases of a single measured result shall be taken to be 10%;

(e) an invalid hourly average means an hourly average period invalidated due to malfunction of, or maintenance work being carried out on, the continuous measurement system. However, to allow some discretion for zero and span gas checking, or cleaning (by flushing), an hourly average period will count as valid as long as data has been accumulated for at least two thirds of the period (40 minutes). Such discretionary periods are not to exceed more than 5 in any one 24-hour period unless agreed in writing. Where plant may be operating for less than the 24-hour period, such discretionary periods are not to exceed more than one quarter of the overall valid hourly average periods unless agreed in writing; and

(f) any day, in which more than three hourly average values are invalid shall be invalidated.

3.7 Integrated Air Emissions Management

3.7.1 In order to assess compliance with the integrated emissions management limit for oxides of nitrogen (NOx), specified in Table S3.1b:

(a) the operator shall undertake the monitoring and calculations described in the integrated emissions management technique as approved by the Environment Agency, for all units covered by the bubble limit.

(b) during a period of other than normal operation of one of these units, the operator shall use the 'standard contribution value' (as specified in the integrated emissions management technique) when assessing compliance with the bubble emission limit value. The Operator will record the start and conclusion of periods of 'other than normal operating conditions' and record the emissions from the affected unit during that period.

3.7.2 In order to assess compliance with the integrated emissions management limit for sulphur dioxide (SO_2), specified in Table S3.1b:

(a) the operator shall undertake the monitoring and calculations described in the integrated emissions management technique as approved by the Environment Agency, for all units covered by the bubble limit.

(b) during a period of other than normal operation of one of these units, the operator shall use the 'standard contribution value' (as specified in the integrated emissions management technique) when assessing compliance with the bubble emission limit value. The Operator will record the start and conclusion of periods of 'other than normal operating conditions' and record the emissions from the affected unit during that period.

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;

(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.

4.3 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 suspend the operation of the activities or the relevant part of it in a safe and controlled manner until compliance with the permit conditions has been restored.

4.3.2 Any information provided under condition 4.3.1 [(a)(i), 4.3.1 (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.

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:

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

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

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

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

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

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

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

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

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

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

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

4.3.9 In the event that more than 2 tonnes of sulphur dioxide has or is likely to be is emitted in a 24 hour period from the flaring of acid gases (emission points A11 and A12), the operator must immediately inform the Environment Agency, providing details of:

(a) The likely duration of the flaring event;

(b) The cause of the flaring event;

(c) Remedial actions being taken.

The operator shall confirm:

(d) The quantity of sulphur dioxide emitted and the duration of the flaring event;

(e) Whether the event had a negative impact on local air quality.

4.3.10 In the event that the operator wishes to make a change to the design or operation of the integrated emission management technique, for nitrous oxides and sulphur dioxide:

(a) The operator shall notify the Environment Agency at least 14 days before making the change; and

(b) The operator shall not implement the change until the changes have been approved in writing by the Environment Agency.

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 listed in Schedule 1 of the PPC Regulations	**Description of specified activity**	**Limits of specified activity**
S1.1 A(1) (a)	Boiler plant	Refinery fuel oil storage and supply, boilers and abatement plant including: (i) 1 x 120MWth GT (ii) 1 x 100MWth HRSG
S4.2 A(1)(a)(i)	Producing inorganic chemicals such as gases	Steam methane reformer 4.38 MWth
S1.2 A(1)(d)	Refining mineral oil	From feed to oil refining unit to use, storage or export including each of the following units and associated heaters: (i) 1 x 5 MWth Bitumen unit (ii) Cryogenic unit (iii) 2x 20 MWth FCC unit (iv) 1 x 30 MWth HDS2 unit (v) 1 x 5 MWth HDS3 unit (vi) 1 x 20 MWth HFA unit (vii) Super Fractionator unit (viii) 1 x 19.9 MWth Unifiner 1unit (ix) 1 x 38 MWth Unifiner 2unit (x) 1 x80 MWth VDU 2 unit (xi) 1 x43 MWth VDU 2 unit (xii) 1 x25 MWth VBR unit (xiii) 1 x72 MWth Platformer2 unit
S1.2 A(1)(e)(i)	Handling and processing crude oil	From receipt of crude to operation of crude distillation unit including: (i) 1 x 90MWth CDU2
S4.1 A(1)(a)(i)	Producing Organic Hydrocarbons	Catalytic polymerisation unit (CPU)

S4.1 A(1)(a)(ii)	Producing Organic compounds containing Oxygen	Methyl Tertiary Butyl Ether (MTBE) Unit
S4.1 A(1)(a)(ii)	Producing Organic compounds containing Oxygen	Tertiary Amyl Methyl Ether (TAME) Unit
S4.2 A(1)(a)(v)	Sulphur recovery and production	Amine systems and sulphur recovery unit plant including: (i) SRU2 (ii) SRU3
S5.3 A(1)(a)(i)	Biological treatment of waste waters and storage of sludge	Including oil separators, dissolved air flotation units, biological trickle filters, clarifiers (sedimentation plant).
S5.3 A(1)(a)(ii)	Physico-chemical treatment of waste waters and storage of sludge	South oil separator and holding sump.
Directly Associated Activity		
Flaring of gases	Burning of sour and sweet gases at flares.	Hydrocarbon gas recovery compressor, flare headers, knock-out pots and flare stacks and any ancillary equipment.
Cooling water systems	Systems used for cooling.	All cooling water systems including storage, pipelines and equipment, to discharge to ETP.
Lagoons	The holding or temporary storage of water, effluents or oil-based liquids for settling (sedimentation) or other purposes	The feed point to the lagoon(s), the lagoon(s) and its drainage point.
Surface water drainage	Collection and handling of surface waters within installation	Handling and storage of site drainage until discharge to the site waste water treatment system or to discharge off-site.
Water treatment	All water treatment activities	From receipt of raw materials to dispatch to effluents to sewer or site waste water treatment system.

Table S1.2 Operating techniques		
Description	**Parts**	**Date Received**
Application	The response to section 2.1 to 2.2.	11/08/06
Response to Schedule 4 Notice dated 08/12/06	Response to Q1 – 2 subject to the limits set in Schedule 4.1 Response to Q3 – 5 subject to the conditions in schedule 1.3	02/02/07 02/02/07
Response to Schedule 4 Notice dated 03/04/07	Response to FCCU Regenerative Scrubbing BAT review.	07/06/07
Additional information	Response to include HDS3 Expansion Project.	04/07/07
Response to regulation 60(1) Notice – request for information dated 05/08/15	Compliance route and operating techniques identified in response to questions 1 (ELV and monitoring requirements) and 2c (LCP configuration, layout, fuel options available and flue configuration), 2d (methodology for assessing which ELVs apply in accordance with Articles 40(2) and 40(3) of IED), 2e (methodology for assessing compliance with relevant ELVs for NOx, SO_2 and dust by reference to parts 3 and 4 of Annex V of Chapter III of IED) and 2f (methodology for assigning periods of start up and shutdown).	30/09/15
Response to regulation 60(1) Notice – request for information dated 05/08/15 EPR/TP3633NH/V004	Compliance and operating techniques identified in response to the BAT Conclusions for the refining of mineral oil and gas industry sector published on 28th October 2014.	05/02/16
Additional information in response to regulation 60(1) Notice EPR/TP3633NH/V004	Compliance and operating techniques identified in response to BAT Conclusion 7.	23/01/18
Additional information in response to regulation 60(1) Notice EPR/TP3633NH/V004	Compliance and operating techniques identified in response to BAT Conclusions 8 and 9.	23/01/18
Additional information in response to regulation 60(1) Notice EPR/TP3633NH/V004	Compliance and operating techniques identified in response to BAT Conclusion 11.	23/01/18
Additional information in response to regulation 60(1) Notice EPR/TP3633NH/V004	Approved Total Lindsey Oil Refinery Outline Calculation Methodology for SOx and NOx emissions.	15/08/18

Table S1.3 Improvement programme requirements		
Reference	**Requirement**	**Date**
IC1	A written procedure shall be submitted to the Agency detailing the measures to be used so that monitoring equipment, personnel and organisations employed for the emissions to air monitoring programme shall have either MCERTS certification or accreditation in accordance with condition 3.6.3. The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the procedure. The procedure shall be implemented by the operator from the date of approval by the Agency	Completed
IC2	A written plan shall be submitted to the Agency for approval detailing the results of a survey of hard-standing, kerbing and secondary containment for raw material, intermediate, product and waste storage areas and the measures to comply with the requirements of section 2.2.5 of TGN S 1.02. Where appropriate the plan shall contain dates for the implementation of individual measures. The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the plan. The plan shall be implemented by the operator from the date of approval by the Agency.	Completed
IC3	A written plan shall be submitted to the Agency for approval detailing the results of a survey of bunding and other secondary containment measures for raw materials, intermediates, products and waste storage areas and the measures to meet the requirements of section 2.2.2 and 2.2.3 of Sector Guidance Note S 1.02. Where appropriate the plan shall contain dates for the implementation of individual measures. The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the plan. The plan shall be implemented by the operator from the date of approval by the Agency.	Completed
IC4	A written plan shall be submitted to the Agency for approval detailing the measures to be taken to improve the sulphur recovery efficiency of SRU2 and/or SRU1. Where appropriate the plan shall contain dates for the implementation of individual measures. The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the plan. The plan shall be implemented by the operator from the date of approval by the Agency.	Completed
IC5	A written plan shall be submitted to the Agency for approval detailing the measures to be taken to achieve a reduction in the sulphur dioxide emission concentration from the FCCU	Completed

	regenerator. The plan shall contain dates for the implementation of individual measures. The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the plan. The plan shall be implemented by the operator from the date of approval by the Agency.	
IC6	A written plan shall be submitted to the Agency for approval detailing the measures to be taken to reduce particulate emission concentration from the FCCU regenerator. Where appropriate the plan shall contain dates for the implementation of individual measures. The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the plan. The plan shall be implemented by the operator from the date of approval by the Agency.	Completed
IC7	A written plan shall be submitted to the Agency for approval detailing the measures to be taken to achieve continuous measurement of sulphur dioxide emission to air from the FCCU regenerator. Where appropriate the plan shall contain dates for the implementation of individual measures. The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the plan. The plan shall be implemented by the operator from the date of approval by the Agency.	Completed
IC8	A written plan shall be submitted to the Agency for approval detailing the work to be undertaken to carry out Leak Detection and Repair across all plant and pipework at the refinery installation. The plan shall include work necessary to bring the LDAR monitoring status at the installation to Tier 1, Tier 2 and Tier 3 versus the USEPA Method 21, all within 4 years. Where appropriate the plan shall contain dates for the implementation of individual measures. The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the plan. The plan shall be implemented by the operator from the date of approval by the Agency.	Completed
IC9	A written procedure shall be submitted to the Agency detailing the measures to be used so that monitoring equipment and sampling for the emissions to water monitoring programme shall have either MCERTS certification or accreditation in accordance with condition 3.6.3. The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the procedure. The procedure shall be implemented by the operator from the date of approval in writing by the Agency	Completed

IC10	A written plan shall be submitted to the Agency for approval detailing the measures to be taken to reduce oxides of nitrogen (NOx) emissions from the refinery installation. Where appropriate the plan shall contain dates for the implementation of individual measures. The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the plan. The plan shall be implemented by the operator from the date of approval by the Agency.	Completed
IC11	A written plan shall be submitted to the Agency for approval detailing the measures to be taken to cease burning of vacuum distillation unit (VDU) off-gases in combustion plant at the installation and to ensure that their sulphur content is recovered via the sulphur recovery unit. The plan shall contain dates for the implementation of individual measures. The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the plan. The plan shall be implemented by the operator from the date of approval by the Agency.	Completed
IC12	A written plan shall be submitted to the Agency for approval detailing the measures to be taken to recover gases which would otherwise be flared. Where appropriate the plan shall contain dates for the implementation of individual measures. The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the plan. The plan shall be implemented by the operator from the date of approval by the Agency.	Completed
IC13	A written plan shall be submitted to the Agency for approval detailing the installation of continuous NOx monitors to assess releases from release points A1-A3 at the refinery installation. The plan shall contain dates for the implementation of individual measures. The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the plan. The plan shall be implemented by the operator from the date of approval by the Agency.	Completed
IC14	A written report shall be submitted to the Agency giving details of any hydrocarbon-containing wastes that are currently disposed of. The report shall include a proposed plan and programme, for approval by the Agency, for the introduction of any techniques necessary to ensure the following in relation to the above wastes:	Completed

	(a) prevention or reduction of waste arisings, (b) recovery and/or recycling of any wastes that do arise, and (c) disposal of any wastes for which recovery is technically and economically impossible is carried out in a way that avoids or reduces any impact on the environment. Where appropriate the plan shall contain dates for the implementation of individual measures. The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the plan. The plan shall be implemented by the operator from the date of approval by the Agency.	
IC15	A written report shall be submitted to the Agency for approval detailing the findings of a water use audit. Where appropriate the report shall contain dates for the planned implementation of individual measures. The notification requirements of 2.5.2 shall be deemed to have been complied with on submission of the plan. The plan shall be implemented by the operator from the date of approval by the Agency.	Completed
IC16	A written evaluation shall be submitted to the Agency for approval detailing the technical and economic feasibility of routing surface water discharges from the south separator to the ETP. Where appropriate the evaluation shall contain dates for the planned implementation of individual measures. The notification requirements of 2.5.2 shall be deemed to have been complied with on submission of any plan. The plan shall be implemented by the operator from the date of approval by the Agency.	Completed
IC17	A written report shall be submitted to the Agency for approval detailing the findings of an evaluation of particulate arisings from RFG gas firing on combustion plant covered by the NERP. The report shall propose factors for estimating annual particulate releases based on fuel use. The notification requirements of 2.5.2 shall be deemed to have been complied with on submission of the report.	Completed
IC18	A written report shall be submitted to the Agency confirming the individual measures taken to replace the cryo unit refrigeration Freon-22 inventory with a propane based refrigerant. The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the report.	Completed

IC19	A written report shall be submitted to the Agency confirming the individual measures taken to install guide pole covers on motor spirit tanks. The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the report.	Completed
IC20	A written report shall be submitted to the Agency for approval detailing the findings of an evaluation for abating emissions from SRU1 pit eductor. Where appropriate the report shall contain dates for the planned implementation of individual measures. The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the plan. The plan shall be implemented by the operator from the date of approval by the Agency.	Completed
IC21	A written report shall be submitted to the Agency confirming the individual measures taken to install overfill protection on the bitumen road loading lances. The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the report.	Completed
IC22	A written report shall be submitted to the Agency confirming the individual measures taken to replace ammonia solution corrosion inhibitors with neutralising amines The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the report.	Completed
IC23	A written report shall be submitted to the Agency confirming the individual measures taken to refurbish heater 16F-1 and recommence processing of sour water stripper off gas. The notification requirements of condition 2.5.2 shall be deemed to have been complied with on submission of the report.	Completed
IC24	The operator shall submit a written monitoring plan to the Environment Agency for approval that includes: (a) proposals to undertake representative monitoring of hazardous pollutants (as set out in the Environment Agency's Surface Water Pollution Risk Assessment guidance) in the discharge to surface water from points W5 including the parameters to be monitored, frequencies of monitoring and methods to be used. The operator shall carry out the monitoring in accordance with the Environment Agency's written approval.	01/07/19
IC25	The operator shall submit a written report to the Environment Agency for approval that includes:	01/11/20

	the results of an assessment of the impact of the emissions to surface water from the site in accordance with the Environment Agency's Surface Water Pollution Risk Assessment Guidance available on our website. The report shall: (a) be based on the parameters monitored in IC24 above; and Include proposals for appropriate measures to mitigate the impact of any emissions where the assessment determines they are liable to cause pollution, including timescales for implementation of individual measures.	

Table S1.4 Appropriate measures for odour	
Measure	**Dates**
The operator shall maintain the odour management plan as described in section 2.2.6 of the application. The operator shall review the plan annually and record at least once a year or as soon as practicable after a complaint (whichever is the earlier), whether changes to the plan should be made and make any appropriate changes to the plan identified by a review.	From date of permit issue.

Table S1.5 Appropriate measures for noise	
Measure	**Dates**
A noise management plan shall be submitted to the Agency, detailing the measures to be used to control emissions of noise and shall be accordance with Appendix 4 (noise management plan) of Horizontal Guidance Note H3 (Horizontal Odour Guidance) Part 2). The plan shall be implemented by the operator from the date of approval in writing by the Agency. The operator shall review the plan annually and record at least once a year or as soon as practicable after a complaint (whichever is the earlier), whether changes to the plan should be made and make any appropriate changes to the plan identified by a review.	The plan shall be submitted by 01/04/08

Schedule 2 – Waste types, raw materials and fuels

Table S2.1 Raw materials and fuels	
Raw materials and fuel description	**Specification**
Refinery fuel gas (RFG)	Less than 200 ppmv sulphur as hydrogen sulphide (daily average)

Schedule 3 – Emissions and monitoring

Table S3.1 Point source emissions to air						
Emission point ref. & location	**Source**	**Parameter**	**Limit (including unit)-these limits do not apply during start up or shut down.**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
A1	South Stack	Sulphur dioxide	2700 mg/m^3	Hourly	Continuous	**Note 1**
		Oxides of nitrogen (NO and NO_2 expressed as NO_2)	No limit set	Annually	Continuous	BS EN 14181
		Dust	No limit set	Annually	Continuous	-
					CEMs calibration	BS ISO 9096
A1	South Stack (LCP 356) Firing on RFG, and Natural Gas. 90 MWth	Sulphur dioxide	35 mg/m^3	Calendar monthly mean of validated hourly averages	Continuous	BS EN 14181
		Oxides of nitrogen (NO and NO_2 expressed as NO_2)	150 mg/m^3 Note 6 (300 mg/m^3) Note 7	Calendar monthly mean of validated hourly averages	Continuous	BS EN 14181
		Dust	5 mg/m^3	-	At least every 6 months	BS EN 13284-1
		Carbon monoxide	100 mg/m^3	Average over sampling period	At least every 6 months	BS EN 15058

Table S3.1 Point source emissions to air						
Emission point ref. & location	**Source**	**Parameter**	**Limit (including unit)-these limits do not apply during start up or shut down.**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
A2	North Stack (LCP 357) Firing on RFG and Natural Gas. 125 MWth	Sulphur dioxide	35 mg/m^3	Calendar monthly mean of validated hourly averages	Continuous	BS EN 14181
			38.5 mg/m^3	Daily mean of validated hourly averages	Continuous	BS EN 14181
			70 mg/m^3	95% of validated hourly averages within a calendar year	Continuous	BS EN 14181
		Oxides of nitrogen (NO and NO_2 expressed as NO_2)	150 mg/m^3 Note 6 (300 mg/m^3) Note 7	Calendar monthly mean of validated hourly averages	Continuous	BS EN 14181
			330 mg/m^3	Daily mean of validated hourly averages	Continuous	BS EN 14181
			600 mg/m^3	95% of validated hourly averages within a calendar year	Continuous	BS EN 14181
		Dust	5 mg/m^3	-	At least every 6 months	BS EN 13284-1

Table S3.1 Point source emissions to air						
Emission point ref. & location	**Source**	**Parameter**	**Limit (including unit)-these limits do not apply during start up or shut down.**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
A2	North Stack (LCP 357) Firing on RFG and Natural Gas. 125 MWth	Carbon monoxide	100 mg/m^3	Calendar monthly mean of validated hourly averages	Continuous	BS EN 14181
		PCDD/F	No limit set	Periodic over minimum 6 hours, maximum 8 hour period	Once a year or once a regeneration-whichever is longer	BS EN 1948 Parts 1, 2 and 3
		Oxygen	-	-	Continuous as appropriate to reference	BS EN 14181
		Water vapour	-	-	Continuous as appropriate to reference	BS EN 14181
		Stack gas temperature	-	-	Continuous as appropriate to reference	Traceable to national standards
		Stack gas pressure	-	-	Continuous as appropriate to reference	Traceable to national standards
A3	Stg III/IV Stack	Sulphur dioxide	3500 mg/m^3	Hourly	Continuous	**Note 1**
		Oxides of nitrogen (NO and NO_2 expressed as NO_2)	No limit set	Annually	Continuous	BS EN 14181
		Dust	No limit set	Annually	Continuous	-

Table S3.1 Point source emissions to air						
Emission point ref. & location	**Source**	**Parameter**	**Limit (including unit)-these limits do not apply during start up or shut down.**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
					CEMs calibration	BS ISO 9096
A3	Stg III/IV Stack (LCP 358) Firing on RFG, and Natural Gas. 213 MWth	Sulphur dioxide	35 mg/m^3	Calendar monthly mean of validated hourly averages	Continuous	BS EN 14181
			38.5 mg/m^3	Daily mean of validated hourly averages	Continuous	BS EN 14181
			70 mg/m^3	95% of validated hourly averages within a calendar year	Continuous	BS EN 14181
		Oxides of nitrogen (NO and NO_2 expressed as NO_2)	150 mg/m^3 Note 6 (300 mg/m^3) Note 7	Calendar monthly mean of validated hourly averages	Continuous	BS EN 14181
			330 mg/m^3	Daily mean of validated hourly averages	Continuous	BS EN 14181
			600 mg/m^3	95% of validated hourly averages within a calendar year	Continuous	BS EN 14181
		Dust	5 mg/m^3	-	At least every 6 months	BS EN 13284-1

Table S3.1 Point source emissions to air						
Emission point ref. & location	**Source**	**Parameter**	**Limit (including unit)-these limits do not apply during start up or shut down.**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
A3	Stg III/IV Stack (LCP 358) Firing on RFG, and Natural Gas. 213 MWth	Carbon monoxide	100 mg/m^3	Calendar monthly mean of validated hourly averages	Continuous	BS EN 1418
		Oxygen	-	-	Continuous as appropriate to reference	BS EN 14181
		Water vapour	-	-	Continuous as appropriate to reference	BS EN 14181
		Stack gas temperature	-	-	Continuous as appropriate to reference	Traceable to national standards
		Stack gas pressure	-	-	Continuous as appropriate to reference	Traceable to national standards
A3a	FCCU Regenerator	Sulphur dioxide	800 mg/m^3 Note 6 600 mg/m^3 Note 8	Calendar monthly mean of validated hourly averages	Continuous	BS EN 14181
		Oxides of nitrogen (NO and NO_2 expressed as NO_2)	300 mg/m^3 Note 6	Daily mean of validated hourly averages	Continuous	BS EN 14181
		Dust	75 mg/m^3 50 mg/m^3 Note 9	Calendar monthly mean of validated hourly averages	Continuous	BS EN 14181
			115 mg/m^3	Daily	Continuous	-

Table S3.1 Point source emissions to air						
Emission point ref. & location	**Source**	**Parameter**	**Limit (including unit)-these limits do not apply during start up or shut down.**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
A3a	FCCU Regenerator		**Note 2**		CEMs calibration	BS ISO 9096
		Carbon monoxide	100 mg/m^3	Daily	Continuous	ISO 12039
		Metals (Nickel, Antimony and Vanadium)	No limit set	-	At least every 6 months or after significant changes to the unit	Direct measurement or analysis based on metals content in the catalyst fined and in the fuel
A5	Bitumen Stack 5 MWth	Sulphur dioxide	No limit set	-	-	-
		Oxides of nitrogen (NO and NO_2 expressed as NO_2)	No limit set	Average over sampling period	Annually	ISO 10849
		Dust	No limit set	-	-	-
A6	HRSG Stack	Sulphur dioxide	No limit set	-	-	-
A6	HRSG Stack (LCP 355) GT with supplementary firing waste heat boiler 220 MWth	Oxides of nitrogen (NO and NO_2 expressed as NO_2) (RFG and natural gas firing)	50 -120 mg/m^3 Note 4	Calendar monthly mean of validated hourly averages	Continuous	BS EN 14181
			55 - 132 mg/m^3 Note 4	Daily mean of validated hourly averages	Continuous	BS EN 14181

Table S3.1 Point source emissions to air						
Emission point ref. & location	**Source**	**Parameter**	**Limit (including unit)-these limits do not apply during start up or shut down.**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
A6	HRSG Stack (LCP 355) GT with supplementary firing waste heat boiler 220 MWth		100 - 240 mg/m^3 Note 4	95% of validated hourly averages within a calendar year	Continuous	BS EN 14181
		Oxides of nitrogen (NO and NO_2 expressed as NO_2) (100% natural gas firing only)	50 mg/m^3	Calendar monthly mean of validated hourly averages	Continuous	BS EN 14181
			55 mg/m^3	Daily mean of validated hourly averages	Continuous	BS EN 14181
			100 mg/m^3	95% of validated hourly averages within a calendar year	Continuous	BS EN 14181
		Dust	No limit set	-	-	-
		Carbon monoxide (RFG and/or natural gas firing)	100 mg/m^3	Calendar monthly mean of validated hourly averages	Continuous	BS EN 14181
		Carbon monoxide	110 mg/m^3	Daily mean of validated hourly averages	Continuous	BS EN 14181

Table S3.1 Point source emissions to air						
Emission point ref. & location	**Source**	**Parameter**	**Limit (including unit)-these limits do not apply during start up or shut down.**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
A6	HRSG Stack (LCP 355) GT with supplementary firing waste heat boiler 220 MWth	(100% natural gas firing only)	200 mg/m^3	95% of validated hourly averages within a calendar year	Continuous	BS EN 14181
A6a	HRSG Stack (LCP 355) Auxiliary firing waste heat boiler 220 MWth	Oxides of nitrogen (NO and NO_2 expressed as NO_2) (100% RFG firing only)	120 mg/m^3	Calendar monthly mean of validated hourly averages	Continuous	BS EN 14181
			132 mg/m^3	Daily mean of validated hourly averages	Continuous	BS EN 14181
			240 mg/m^3	95% of validated hourly averages within a calendar year	Continuous	BS EN 14181
		Carbon monoxide (100% RFG firing only)	100 mg/m^3	-	Continuous	BS EN 14181
A7	GT Blast Stack	Sulphur dioxide	No limit set	-	-	-
		Oxides of nitrogen (NO and NO_2 expressed as NO_2)	No limit set	-	-	-

Table S3.1 Point source emissions to air						
Emission point ref. & location	**Source**	**Parameter**	**Limit (including unit)-these limits do not apply during start up or shut down.**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
A9	SMR Stack	Sulphur dioxide	No limit set	-	-	-
		Oxides of nitrogen (NO and NO_2 expressed as NO_2)	No limit set	Average over sampling period	Annually	ISO 10849
		Dust	No limit set	-	-	-
A10	HDS3 Stack	Sulphur dioxide	No limit set	-	-	-
		Oxides of nitrogen (NO and NO_2 expressed as NO_2)	No limit set	Average over sampling period	Annually	ISO 10849
		Dust	No limit set	-	-	-
A11	Stage I/II Flare	Sulphur dioxide	0.47 t/h equivalent	15 minutes	Continuous	**Note 1**
A12	Stage III/IV	Sulphur dioxide	0.85 t/h equivalent	15 minutes	Continuous	**Note 1**
A13	HFA PSVs	Hydrogen fluoride	No release permitted	-	-	-
A14	PSVs	Benzene	No release permitted	-	-	-
		VOCs (Class A)	No release permitted	-	-	-
A15	Hydrocarbon Storage Tank Vents	VOCs (Class B)	No limit set	Annually	Continuous	**Note 5**

Table S3.1 Point source emissions to air						
Emission point ref. & location	**Source**	**Parameter**	**Limit (including unit)-these limits do not apply during start up or shut down.**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**

Note 1 Continuous estimate of releases based on the method agreed with the Agency. Reference conditions for normalised flow (3% O_2, dry).

Note 2 Start up and shutdown periods excluded.

Note 4 Where there is the simultaneous use of two or more types of fuel in a combustion plant with different emission limit values (ELVs) the emissions shall not exceed the instantaneous ELV value. The ELV value should be calculated according to the formula provided in IED Article 40(2).

Note 5 Based on the USEPA method 21.

Note 6 Compliance with the emission limit value for this unit can be achieved through inclusion of the unit in the BREF integrated emissions management bubble for SO_2/NOx.

Note 7 When complying with the emission limit through the BREF integrated emissions management bubble; the emission concentration from the emission point must not exceed the value specified in brackets.

Note 8 Lower limit applies when using low sulphur feed (<0.5% w/w) sulphur calculated as a monthly average.

Note 9 Limit applies from 01/07/2023.

Table S3.1a Point Source emissions to air – bubble emission limit and monitoring requirements						
Release Points	**Parameter**	**Sources**	**Bubble Limit**	**Reference Period**	**Monitoring frequency**	**Method**
A1 - A4	Sulphur Dioxide	SRUs FCCU Combustion Gas Incineration	2500 mg/Nm^3	Hourly Limit applies when releases from A2 are < 50 g/s	Continuous	Table S3.1 Note 1 applies
A1 - A4 and A11		SRUs FCCU Combustion Gas Incineration Flares	1.7 t/h	Hourly Limit applies from 1/1/09.		
A1 - A4 and A12			2.0 t/h			

Table S3.1b Point source emissions to air – Integrated Emissions Management limits and monitoring requirements						
Release Points	**Parameter**	**Sources**	**Integrated emissions management limit (including unit)**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
The points specified in the Integrated Emissions Management Technique document or subsequently notified in accordance with condition 4.3.10 and agreed in writing by the Environment Agency	Oxides of nitrogen (NO and NO_2 expressed as NO_2)	Combustion units FCCU	Dynamic limit as calculated in accordance with approved bubble	Monthly average	Continuous	Calculation using the method agreed in writing by the Environment Agency in accordance with agreed Integrated Emissions Management Technique document

Table S3.1b Point source emissions to air – Integrated Emissions Management limits and monitoring requirements						
Release Points	**Parameter**	**Sources**	**Integrated emissions management limit (including unit)**	**Reference period**	**Monitoring frequency**	**Monitoring standard or method**
The points specified in the Integrated Emissions Management Technique document or subsequently notified in accordance with condition 4.3.10 and agreed in writing by the Environment Agency	Sulphur dioxide	Combustion units (excluding gas turbines) FCCU SRUs	Dynamic limit as calculated in accordance with approved bubble	Monthly average	Continuous	Calculation using the method agreed in writing by the Environment Agency in accordance with agreed Integrated Emissions Management Technique document

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 (incl. unit)**	**Reference Period**	**Monitoring frequency**	**Monitoring standard or method**
W1 emission to South Killingholme Drain	South Surface Water	Chemical Oxygen Demand	125 mg/l	Instantaneous	Monthly	Dichromate- Hach LOR 3/30 ISO 15705
		Oil	15 mg/l	Instantaneous	Monthly	Extraction / IR IP426
W2 emission to South Killingholme Drain	Engineering Building Surface Water	Chemical Oxygen Demand	125 mg/l	Instantaneous	Monthly	Dichromate- Hach LOR 3/30 ISO 15705
		Oil	15 mg/l	Instantaneous	Monthly	Extraction / IR IP426
W5 emission to North Killingholme Drain	Effluent treatment plant	Total daily volume of discharge	12,000 m^3	24 hour total	Continuous	Ultrasonic
		Temperature	30^0C	Instantaneous	Continuous	Thermometer
		pH	5 – 9	Instantaneous	Continuous	Meter
		TOC	50 mg/l	Instantaneous	Daily	UV Digestion/IR
		Chemical Oxygen Demand	125 mg/l Annual average	24-hour flow proportional sample	Daily	BS ISO 15705:2002 or as agreed in writing with the Environment Agency Note 1

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 (incl. unit)**	**Reference Period**	**Monitoring frequency**	**Monitoring standard or method**
W5 emission to North Killingholme Drain	Effluent treatment plant	Suspended solids	25 mg/l Annual average	24-hour flow proportional sample	Daily	BS EN 872:2005 or as agreed in writing with the Environment Agency
		Hydrocarbon oil index	2.5 mg/l Annual average	24-hour flow proportional sample	Daily	BS EN 9377 – 2 Note 2
		Total nitrogen expressed as N	25 mg/l Annual average	24-hour flow proportional sample	Daily	BS EN 12260 Note 3
		Phenol index	-	24-hour flow proportional sample	Monthly	BS EN ISO 14402 Note 4
		Benzene, toluene, ethyl benzene, xylene (BTEX)	Benzene 0.05 mg/l Annual average	Instantaneous	Monthly	ISO 11423-1
		Lead expressed as Pb	0.03 mg/l Annual average	24-hour flow proportional sample	Quarterly	BS EN ISO 11885
		Cadmium expressed as Cd	0.008 mg/l Annual average	24-hour flow proportional sample	Quarterly	BS EN ISO 11885
		Nickel expressed as Ni	0.1 mg/l Annual average	24-hour flow proportional sample	Quarterly	BS EN ISO 11885
		Mercury expressed as Hg	0.001 mg/l Annual average	24-hour flow proportional sample	Quarterly	BS EN 12846
		Vanadium	-	24-hour flow proportional sample	Quarterly	BS EN ISO 11885
		Oil	5 mg/l	24-hour flow proportional sample	Weekly	Extraction / IR IP 426
		Ammoniacal nitrogen	10 mg/l	24-hour flow proportional sample	Weekly	Nessler – Chemet LOR 3/11

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 (incl. unit)**	**Reference Period**	**Monitoring frequency**	**Monitoring standard or method**
W5 emission to North Killingholme Drain	Effluent treatment plant	Phenols	0.5 mg/l	24-hour flow proportional sample	Weekly	Amino anti pyrene – Chemet LOR 3/28
		Fluoride	20 mg/l	24-hour flow proportional sample	Weekly	Spadns – Hach LOR 3/14
		Sulphide	0.25 mg/l	24-hour flow proportional sample	Weekly	Methylene Blue LOR 3/25
		Cyanide	-	24-hour flow proportional sample	Quarterly	-
		Arsenic	0.015 mg/l	24-hour flow proportional sample	Quarterly	ICP/AA
		Chromium	0.25 mg/l	24-hour flow proportional sample	Quarterly	ICP/AA
		Copper	0.1 mg/l	24-hour flow proportional sample	Quarterly	ICP/AA
		Zinc	0.75 mg/l	24-hour flow proportional sample	Quarterly	ICP/AA

Note 1: Measurement of TOC and application of a correlation factor may be used as a surrogate for COD. Parallel monitoring of TOC and COD shall be undertaken over a period of 1 year (to allow for seasonal variance) to determine the applicable correlation factor. The TOC correlation factor shall be agreed in writing with the Environment Agency before parallel monitoring of COD can cease.

Note 2: Test method IP426 shall be run in parallel with test method (BS EN ISO 9377-2) for up to 12 months adaptation period, whilst quality assurance of the new test method is undertaken. During this time compliance with the limit shall be assessed against the result from test method, IP426. At the end of the quality assurance period the operator shall confirm in writing that compliance with the hydrocarbon oil index BAT AEL is now assessed using monitoring standard BS EN ISO 9377-2.

Note 3: Analysis of ammoniacal nitrogen shall be undertaken in parallel with monitoring for total nitrogen for up to 12 months. During this period compliance shall be assessed against the ammoniacal nitrogen limit using the existing monitoring method. At the end of this period the operator shall confirm in writing that monitoring for total nitrogen is now in place and compliance will be measured against the total nitrogen limit.

Note 4: Test method LOR3/28, shall be run in parallel with test method (BS EN ISO 14402) for up to 12 months adaptation period, whilst quality assurance of the new test method is undertaken. At the end of the quality assurance period the operator shall confirm in writing that monitoring according to BS EN ISO 14402 is now the method used for monitoring phenol index.

Table S3.3 Annual limits (excluding start up and shut down except where otherwise stated).		
Substance	**Medium**	**Limit (including unit)**
Sulphur dioxide	Air	6000 tonnes as sulphur dioxide until 31/12/2018
Sulphur dioxide	Air	2,500 tonnes as sulphur dioxide from 01/01/2019

Table S3.4 Process monitoring requirements				
Emission point reference or source or description of point of measurement	**Parameter**	**Monitoring frequency**	**Monitoring standard or method**	**Other specifications**
SRU survey	Performance evaluation	Every 2 years	Not applicable	
Fugitive emissions of VOCs from operational plant at the installation, as described in Section 2.2.4 of their application.	VOCs	-	LDAR programme in accordance with BAT conclusion 6 and with regard to the Institute of Petroleum [Energy Institute] protocol) for testing potential sources of fugitive emissions of VOCs.	The operator shall complete repairs and/or carry out other actions to prevent, or where that is not possible, minimise continued emissions from those sources.
Refinery Fuel Gas Monitoring (RFG on-line analyser)	H_2S	Continuous	Continuously sampling chromatographic S gas analyser or Electrochemical cell or as approved by the Environment Agency.	Sampling to be undertaken at locations within the RFG system that are representative of the RFG composition burnt in major combustion units. Monthly average, maximum and minimum values to be recorded from data collected.
Refinery Sulphur Balance	Sulphur	Quarterly	Calculation by method to be approved in writing by the Environment Agency that identifies the sources of the data used.	A mass balance shall be undertaken of incoming sources of sulphur to the refinery versus sulphur outputs.

Table S3.4 Process monitoring requirements				
Emission point reference or source or description of point of measurement	**Parameter**	**Monitoring frequency**	**Monitoring standard or method**	**Other specifications**
Sulphur Recovery Units	SRU availability and recovery efficiency	Continuous	Calculation by method to be agreed in writing with the Environment Agency that identifies the sources of the data used.	Sulphur recovery efficiency must be >98.5% Note 1
Note 1 Compliance with the emission limit value for this unit can be achieved through inclusion of the unit in the BREF integrated emissions management bubble for SO_2.				

Schedule 4 – Reporting

Table S4.1 Reporting of monitoring data			
Parameter	**Emission or monitoring point/reference**	**Reporting period**	**Period begins**
Emissions to air – sulphur dioxide Parameters as required by condition 3.5.1.	A1, A2, A3, A3a, A4, A11 and A12	Every 3 months	01/01/08
Emissions to air – oxides of nitrogen Parameters as required by condition 3.5.1.	A1, A2, A3, A3a, A4, A5, A6, A9 and A10	Every 3 months	01/01/08
Emissions to air – particulate matter Parameters as required by condition 3.5.1.	A1, A2, A3, A3a and A4	Every 3 months	01/01/08
Emissions to air – VOCs Parameters as required by condition 3.5.1.	A15	Every 12 months	01/01/08
Emissions to air – NOx Parameters as required by condition 3.3.1 and 3.7.1	All emission points specified in the integrated emissions management technique for NOx that is approved in writing by the Environment Agency, in accordance with condition 3.7.1.	Every 3 months	01/11/18
Emissions to air – SO_2 Parameters as required by condition 3.3.1 and 3.7.2	All emission points specified in the integrated emissions management technique for SO_2 that is approved in writing by the Environment Agency, in accordance with condition 3.7.2.	Every 3 months	01/11/18
Emissions to water – oil Parameters as required by condition 3.5.1	W1, W2 and W5	Every 3 months	01/01/08
Emissions to water – COD Parameters as required by condition 3.5.1	W1, W2 and W5	Every 3 months	01/01/08
Emissions to water – Flow Parameters as required by condition 3.5.1	W5	Every 3 months	01/01/08
Emissions to water – Temperature Parameters as required by condition 3.5.1	W5	Every 3 months	01/01/08
Emissions to water – pH Parameters as required by condition 3.5.1	W5	Every 3 months	01/01/08

Emissions to water – TOC Parameters as required by condition 3.5.1	W5	Every 3 months	01/01/08
Emissions to water – Suspended Solids Parameters as required by condition 3.5.1	W5	Every 3 months	01/01/08
Emissions to water – Ammoniacal Nitrogen Parameters as required by condition 3.5.1	W5	Every 3 months	01/01/08
Emissions to water – Phenols Parameters as required by condition 3.5.1	W5	Every 3 months	01/01/08
Emissions to water – Sulphides Parameters as required by condition 3.5.1	W5	Every 3 months	01/01/08
Emissions to water – Fluorides Parameters as required by condition 3.5.1	W5	Every 3 months	01/01/08
Emissions to water – Cyanides Parameters as required by condition 3.5.1	W5	Every 3 months	01/01/08
Emissions to water – Heavy Metals Parameters as required by condition 3.5.1	W5	Every 12 months	01/01/19
Emissions to water – Mercury Parameters as required by condition 3.3.1	W2a/b	Every 12 months	01/01/19
Emissions to water – Total nitrogen expressed as N Parameters as required by condition 3.3.1	W2a/b	Every 12 months	01/01/19
Emissions to water – Hydrocarbon oil index Parameters as required by condition 3.3.1	W2a/b	Every 12 months	01/01/19
Emissions to water – Phenol index Parameters as required by condition 3.3.1	W2a/b	Every 12 months	01/01/19
Emissions to water – BTEX Parameters as required by condition 3.3.1	W2a/b	Every 12 months	01/01/19
Emissions to water – Vanadium Parameters as required by condition 3.3.1	W2a/b	Every 12 months	01/01/19
Noise monitoring Parameters as required by condition 3.5.1	As identified in the noise management plan reference Table S1.6	-	-

Table S4.2: Annual production/treatment	
Parameter	**Units**
Road and other transport fuels	Tonnes
Non-transport / heating fuels	Tonnes
Chemical / petrochemical feedstocks	Tonnes
Bitumen / petcoke / other heavy-end products	Tonnes

Table S4.3 Chapter III Performance parameters for reporting to DEFRA and other Performance parameters		
Parameter	**Frequency of assessment**	**Units**
Thermal Input Capacity for each LCP	Annually	MW
Annual Fuel Usage for each LCP	Annually	TJ
Total Emissions to Air of NOx for each LCP	Annually	Tonnes
Total Emissions to Air of SO_2 for each LCP	Annually	Tonnes
Total Emissions to Air of CO for each LCP	Annually	Tonnes
Total Emissions to Air of dust for each LCP	Annually	Tonnes
Operating Hours for each LCP	Annually	hr
NOx Factors by fuel type	Annually	Kg/tonne
Crude oil and other hydrocarbons import (i.e. feedstocks)	Annually	Tonnes
Water usage	Annually	Tonnes
Energy usage (electrical)	Annually	MWh
Energy usage (all fuels)	Annually	MJ
Total release of oil to water per tonne of feedstock	Annually	g oil / 1000 tonnes feedstock

Table S4.4 Reporting forms				
Media/ parameter	**Reporting format**	**Starting Point**	**Agency recipient**	**Date of form**
Air & Energy	Form IED AR1 – SO_2, NO_x and dust mass emission and energy	01/04/17	National	31/12/15
LCP	Form IED HR1 – operating hours	01/04/17	National	31/12/15
Air	Form IED CON 2 – continuous monitoring CEMs reporting for Gas Turbines Only	01/04/17	Area Office	31/12/15
CEMs	Form IED CEM – Invalidation Log	01/04/17	Area Office	31/12/15
Air	Form IED PM1 - discontinuous monitoring and load.	01/04/17	Area Office	31/12/15

Table S4.4 Reporting forms				
Media/ parameter	**Reporting format**	**Starting Point**	**Agency recipient**	**Date of form**
Air – Fuels, Sulphur Balance, SRU performance	Form Air – 5 Refinery fuel analyses (daily average data – RFO, RFG), Refinery Sulphur Balance and SRU availability and efficiency	01/01/08	Area Office	01/01/08
Air – FCCU SO_2, NOx, CO, Dust	Form Air – 6 continuous monitoring or other form as agreed in writing by the Agency	01/01/08	Area Office	01/01/08
Air - Flares	Form Air – 7 Report of the flaring rate and energy loss and SO2 released from flaring.	01/01/08	Area Office	01/01/08
Air - VOCs	Form Air – 8 Report of VOC losses [following the Institute of Petroleum protocol]	01/01/08	Area Office	01/01/08
Air – VOCs	Form Air – 9 PRV VOC releases	01/01/08	Area Office	01/01/08
Air - NOx Factors	Form Air - 10 NOx factor annual review	01/01/08	Area Office	01/01/08
Air – SO2 ELVs	Form Air – 11 SO2 Hourly Stack ELVs and Refinery Bubble	01/01/08	Area Office	01/01/08
Water	Form Water – 1 Daily. Flow, pH, temperature and TOC (W2)	01/01/08	Area Office	01/01/08
Water	Form Water – 2 Weekly. COD, Ammoniacal Nitrogen, phenols, sulphide, Fluoride, Oil and suspended solids (W2)	01/01/08	Area Office	01/01/08
Water	Form Water – 3 Quarterly Cyanide and Heavy Metals (W2)	01/01/08	Area Office	01/01/08
Water	Form Water – 4 Monthly Oil and COD (W1)	01/01/08	Area Office	01/01/08
Water	Form Water – 5 Annual suspended solids, heavy metals, mercury, total nitrogen, hydrocarbon oil index, phenol index, BTEX and vanadium.	01/01/19	Area Office	28/10/18
Water usage	Form Water Usage1 or other form as agreed in writing by the Agency	01/01/08	Area Office	01/01/08
Energy usage	Form Energy 1 or other form as agreed in writing by the Agency	01/01/08	Area Office	01/01/08
Waste	Form Waste1 or other form as agreed in writing by the Agency	01/01/08	Area Office	01/01/08
Other performance indicators	Form Performance 1 or other form as agreed in writing by the Agency Tables S4.2 and S4.3 indicators.	01/01/08	Area Office	01/01/08

Schedule 5 – Notification

These pages outline the information that the operator must provide.

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

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

Part A

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

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

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

(b) Notification requirements for the breach of a limit		
To be notified within 24 hours of detection unless otherwise specified below		
Measures taken, or intended to be taken, to stop the emission		
Time periods for notification following detection of a breach of a limit		
Parameter		Notification period

(c) Notification requirements for the 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.

"Acid Gas" means an offgas that contains high levels of hydrogen sulphide (H_2S).

"Annual average" means average of all daily averages obtained within a year, weighted according to the daily flows.

"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.

"BAT" means Best available techniques, as defined in Article 3 of the Industrial Emissions Directive

"BAT AEL" means the range of achievable emission level associated with application of the best available techniques.

"BS EN 14181" will include the requirements of BS EN 15267-3 through QAL1. MCERTS certification for the appropriate ranges and determinands is a way of demonstrating of compliance with the requirements of BS EN 15267-3.

"Bubble emission limit" means a single aggregated emission limit, expressed as a mean monthly concentration, which when complied with will result in equivalent emission levels to hose that would have been released when complying with each BREF BATAEL separately.

"CEM" Continuous emission monitor

"CEN" means Commité Européen de Normalisation

"DSD" means Dangerous Substances Directive.

"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.**.**

"emissions to land" includes emissions to groundwater.

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

"FCCU" means fluidised catalytic cracking unit.

"Flaring event" means a large scale temporary operation of a flare system, caused by a process disruption.

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

"Industrial Emissions Directive" means Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) as published in The Official Journal.

"Integrated emissions management technique" means the principal of delivering compliance with a number of BREF BATAELs for the same pollutant, by setting a single overarching "bubble emission limit".

"Invalid hourly average" means an hourly average period invalidated due to malfunction of, or maintenance work being carried out on, the continuous measurement system. However, to allow some discretion for zero and span gas checking, or cleaning (by flushing), an hourly average period will count as valid as long as data has been accumulated for at least two thirds of the period (40 minutes). Such discretionary periods are not to exceed more than 5 in any one 24-hour period unless agreed in writing. Where plant may be operating for less than the 24-hour period, such discretionary periods are not to exceed more than one quarter of the overall valid hourly average periods unless agreed in writing.

"invalid day" means any day in which more than three hourly average values are invalid.

"ISO" means International Standards Organisation.

"hazardous property" has the meaning given in Schedule 3 of the Hazardous Waste (England and Wales) Regulations 2005 No.894 and the Hazardous Waste (Wales) Regulations 2005 No. 1806 (W.138).

"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.

"LDAR", means Leak Detection and Repair, a managed scheme and programme for testing potential sources of fugitive emissions, from operational plant at the installation, and repairing or carrying out other actions to prevent, or where that is not possible, minimise continued emissions from those sources. The LDAR programme at the installation shall be consistent with the requirements of the Institute of Petroleum (Energy Institute) Protocol.

"mcr" means maximum continuous rating.

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

MFF Protocol" means IED Chapter III Protocol for Multi-fuel Firing Refinery Combustion Plants granted a Permit prior to 7 January 2013, version 5.

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

"ncv" means net calorific value.

"Normal Operation" means the range of process conditions that can occur when a process unit is performing its intended duty.

"Offgas" means a gas stream produced by a refinery process

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

"Other than normal operating conditions" means process conditions that would not occur during the normal operation of a process unit.

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

"RFG" means Refinery Fuel Gas: off-gases from distillation or conversion units used as a fuel.

"Sector Guidance Note" means IPPC Sector Guidance Note on Gasification, Liquefaction and Refining Activities, IPPC S1.02.

"SRU" means sulphur recovery unit.

"*SRU performance evaluation*" means measurement of process stream compositions, overall and inter-stage material balances, calculation of overall and inter-stage recovery efficiency, performance check of key equipment items [reaction furnaces, condensers, reheaters, converters (including superclaus), incinerator], key analyser performance checks and recommendations for unit performance improvements [including how to restore recovery to design capability].

"The BREF" means the BAT Reference Document for the Refining of Mineral Oil and Gas published by the European commission 2014/738/EU.

"VOC" means Volatile organic compounds as defined in Article 3(45) of Directive 2010/75/EU - 'volatile organic compound' means any organic compound as well as the fraction of creosote, having at 293,15 K a vapour pressure of 0,01 kPa or more, or having a corresponding volatility under the particular conditions of use

"Waste code" means the six digit code referable to a type of waste in accordance with the List of Wastes (England)Regulations 2005, or List of Wastes (Wales) Regulations 2005, as appropriate, and in relation to hazardous waste, includes the asterisk.

"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.

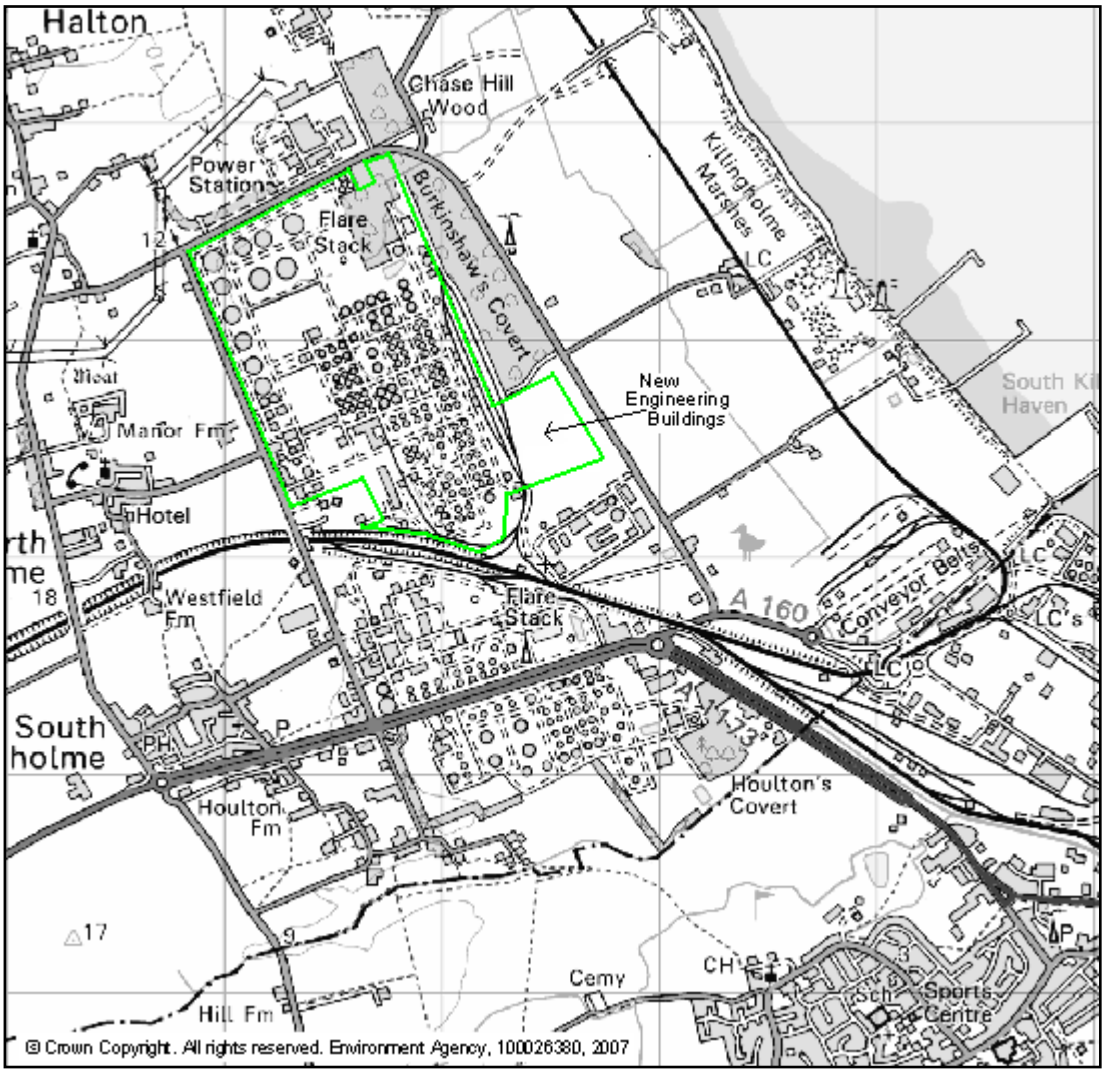
Unless otherwise stated, any references in this permit to concentrations of substances in emissions into air means:

(a) 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

(b) in relation to emissions from gas turbine and compression ignition engine 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 15% dry for liquid and gaseous fuels; and/or

(c) 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



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END OF PERMIT

Annex to conditions – Derogation under Industrial Emissions Directive

Derogation under Article 15(4) of Industrial Emissions Directive

DIRECTIVE 2010/75/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 24 November 2010 on industrial emissions

Management Techniques
We have considered the Operator's proposed techniques and its comparison against other relevant techniques as described in the BAT Conclusions in the Commission Implementing Decision 2014/738/EU for the refining of mineral oil and gas, published 28 October 2014. Our full reasoning is given in our decision document that accompanies the permit determination. Total Lindsey Oil Refinery Limited requested a derogation from BAT 25 that requires operators to reduce dust and metals emissions to air from the catalytic cracking process (regenerator) and sets a BAT-AEL for dust emissions to air of 10 – 50 mg/Nm^3 (monthly average). Total Lindsey Oil Refinery Limited has supplied a valid derogation request against the BAT 25. The derogation request is based on technical characteristics, specifically the pending process changes to the operation of the Fluidised Catalytic Cracking Unit (FCCU) which will change the flow characteristics and hence the design parameters of any abatement technology. <u>Existing abatement</u> Efficient capture of dust depends on particle size distribution and in most plants a combination of separation techniques are used. Cyclones are the most efficient abatement technique for coarser dust (> 10 - 40 microns) and Electrostatic Precipitators (ESP) or filters are most effective for finer dust. The combination of these technologies is considered a Best Available Technique (BAT) and is recognised under BAT Conclusion 25. The FCCU employs a combination of techniques to aid the recovery and capture of FCC catalyst and process fines. Multistage Cyclone Separators (two sets of internal cyclones in the Regenerator followed by a third set of cyclones in a Third Stage Separator (TSS)) are used to recover the majority of catalyst and dust, whilst a fourth stage ceramic blowback filter captures any remaining dust. <u>Current emissions.</u> The current permit has a dust emission limit value (ELV) of 115 mg/Nm^3. Existing abatement equipment allows the site to be compliant with the current limits, reporting emission levels of 47 - 102 mg/Nm^3. Effectiveness of the existing plant and the maintenance regime have been discussed with the Operator as part of the permit review. It was agreed to increase the frequency of changes of the existing ceramic filters (thereby improving performance & reliability) to be improved. The revised permit therefore imposes tighter limits for dust emissions from the FCCU to 75 mg/Nm^3. This is closer to BAT-AELs than current permit limits. These emission limits are applicable from the implementation date for the BREF in October 2018. They still do not meet BAT AEL standards so a derogation was sought until BAT AEL standards can be met. <u>Derogation</u> The proposed derogation is to delay modifications to the third stage separator vessels cyclones and fourth stage separator until Q2 2023 for the reasons detailed below. Whilst some changes can be made to catalyst and other process flows during operation, significant changes such as installation of new abatement equipment can only be made in the plant

turnarounds when the whole process is shut down. These turnarounds happen approximately every 4 years.

Lindsey Oil Refinery has an ongoing adaptation programme, part of that programme is modifying the mass balance for the FCCU in several steps which will alter flow and particulates formation.

Further modifications to the refinery's mass balance are expected beyond 2020. Until stable conditions are established the design of better abatement technology cannot be finalised. Any capital investment in new equipment prior to the modifications would be only suitable for current operations and would represent an unwarranted expenditure.

The case for upgrading the abatement equipment prior to the process modifications shows a Net Present Value of – £2.99M and the cost of compliance is disproportionate compared to the benefit achieved.

The collection of data and final design of abatement technology will take place after 2020 to enable the modifications to take place in the 2023 shutdown. Delaying any TSS modifications until the 2023 shutdown enables design of abatement to be assessed against the future unit operating conditions, enabling an efficient abatement system, suitable for the modified conditions, to be installed. Following the 2023 modifications the emissions will be <50 mg/Nm^3 and compliant with the BAT AEL.

Summary of the environmental consequences of allowing a derogation.

Allowing the proposed derogation would not cause any significant pollution or prevent a high level of protection of the environment as a whole to be achieved. There will be no increase in emissions,and impacts on sensitive receptors.

Releases at current levels have already been assessed as part of the permitting process and the agreed reduction in the dust ELV from October 2018 will offer enhanced protection of the environment.

Overall conclusion

The operator has demonstrated that achieving BAT 25 Dust BAT AELs by the 28 October 2018 would lead to disproportionately higher costs compared to the environmental benefits.

All suitable options have been considered and taken forward for Cost Benefit Analysis (CBA) where appropriate. A robust CBA has been completed to support the derogation application.

There will be no increase in dust emissions. Impacts at sensitive receptors at current levels have already been assessed as acceptable when permitted. The operator has committed to increased frequency of ceramic filter changes thereby improving reliability and reducing annual emissions. This represents a 35% reduction in the ELV from the current 115 mg/Nm^3 to a newly permitted limit of 75 mg/Nm^3 to apply from 28th October 2018.

The Environment Agency has reviewed the application and agreed to grant the derogation