

Environment Agency

Review of an Environmental Permit for an Installation subject to Chapter II of the Industrial Emissions Directive under the Environmental Permitting (England & Wales) Regulations 2016

Decision document recording our decision-making process following review of a permit

The Permit number is: EPR/PP3336TC
The Operator is: Whitetower Energy Limited
The Installation is: Viking Plant
This Variation Notice number is: EPR/PP3336TC/V004

What this document is about

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 large combustion plant (LCP) published on 17 August 2017. This is our decision document, which explains the reasoning for the consolidated variation notice that we are issuing.

It explains how we have reviewed and considered the techniques used by the Operator in the operation and control of the plant and activities of the installation. This review has been undertaken with reference to the decision made by the European Commission establishing BAT Conclusions for LCP as detailed in document reference IEDC-7-1. It is our record of our decision-making process and shows how we have taken into account all relevant factors in reaching our position. It also provides a justification for the inclusion of any specific conditions in the permit that are in addition to those included in our generic permit template.

As well as considering the review of the operating techniques used by the Operator for the operation of the plant and activities of the installation, the consolidated variation notice takes into account and brings together in a single document all previous variations that relate to the original permit issued. It also modernises the entire permit to reflect the conditions contained in our current generic permit template.

The introduction of new template conditions makes the permit consistent with our current general approach and philosophy and with other permits issued to installations in this sector. Although the wording of some conditions has changed, while others have been removed because of the new regulatory approach, it does not reduce the level of environmental protection achieved by the permit in any way. In this document we therefore address only our determination of substantive issues relating to the new BAT Conclusions.

This is our record of our decision-making process and shows how we have taken into account all relevant factors in reaching our position.

Throughout this document we will use a number of expressions. These are as referred to in the glossary and have the same meaning as described in “Schedule 6 Interpretation” of the permit.

We try to explain our decision as accurately, comprehensively and plainly as possible. We would welcome any feedback as to how we might improve our decision documents in future. A lot of technical terms and acronyms are inevitable in a document of this nature: we provide a glossary of acronyms near the front of the document, for ease of reference.

How this document is structured

Glossary of terms

- 1 Our decision
- 2 How we reached our decision
- 2.1 Requesting information to demonstrate compliance with BAT Conclusions for Large Combustion Plant
- 2.2 Review of our own information in respect to the capability of the installation to meet revised standards included in the BAT Conclusions document
- 3 The legal framework
- 4 Key issues
- 5 Decision checklist regarding relevant BAT Conclusions
- 6 Review and assessment of derogation requests made by the operator in relation to BAT Conclusions which include an associated emission level (AEL) value
- 7 Emissions to water
- 8 Additional IED Chapter II requirements
- 9 Review and assessment of changes that are not part of the BAT Conclusions derived permit review.

Glossary of acronyms used in this document

(Please note that this glossary is standard for our decision documents and therefore not all these acronyms are necessarily used in this document.)

APC	Air Pollution Control
BAT	Best Available Technique(s)
BAT-AEEL	BAT Associated Energy Efficiency Level
BAT-AEL	BAT Associated Emission Level
BATc	BAT conclusion
BREF	Best available techniques reference document
CCGT	Combined Cycle Gas Turbine
CEM	Continuous emissions monitor
CHP	Combined heat and power
CV	Calorific value
DAA	Directly associated activity – Additional activities necessary to be carried out to allow the principal activity to be carried out
DLN	Dry Low NOx burners
DLN-E	Dry Low NOx effective
EIONET	European environment information and observation network is a partnership network of the European Environment Agency
ELV	Emission limit value derived under BAT or an emission limit value set out in IED
EMS	Environmental Management System
EPR	Environmental Permitting (England and Wales) Regulations 2016 (SI 2016 No. 1154)
EWC	European waste catalogue
FSA	Food Standards Agency
IC	Improvement Condition
IED	Industrial Emissions Directive (2010/75/EU)
IPPCD	Integrated Pollution Prevention and Control Directive (2008/1/EC) – now superseded by IED
LCP	Large Combustion Plant subject to Chapter III of IED
MSUL/MSDL	Minimum start up load/minimum shut-down load
NOx	Oxides of nitrogen (NO plus NO ₂ expressed as NO ₂)
NPV	Net Present Value
OCGT	Open Cycle Gas Turbine
PHE	Public Health England
SAC	Special Area of Conservation
SGN	Sector guidance note
TGN	Technical guidance note
TNP	Transitional National Plan
TOC	Total Organic Carbon
WFD	Water Framework Directive (2000/60/EC)

1 Our decision

We have decided to issue the consolidated variation notice to the Operator. This will allow them to continue to operate the installation, subject to the conditions in the consolidated variation notice.

We consider that, in reaching that decision, we have taken into account all relevant considerations and legal requirements and that the varied permit will ensure that a high level of protection is provided for the environment and human health.

The consolidated variation notice contains many conditions taken from our standard environmental permit template including the relevant annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of the Environmental Permitting Regulations and other relevant legislation. This document does not therefore include an explanation for these standard conditions. Where they are included in the Notice, we have considered the techniques identified by the Operator for the operation of their installation, and have accepted that the details are sufficient and satisfactory to make those standard conditions appropriate. This document does, however, provide an explanation of our use of “tailor-made” or installation-specific conditions, or where our permit template provides two or more options.

2 How we reached our decision

2.1 Requesting information to demonstrate compliance with BAT Conclusions for Large Combustion Plant

We issued a Notice under Regulation 61(1) of the Environmental Permitting (England and Wales) Regulations 2016 (a Regulation 61 Notice) on 01 May 2018 requiring the Operator to provide information to demonstrate how the operation of their installation currently meets, or will subsequently meet, the revised standards described in the LCP BAT Conclusions document. The Notice also required that where the revised standards are not currently met, the Operator should provide information that:

- Describes the techniques that will be implemented before 17 August 2021, which will then ensure that operations meet the revised standard, or
- Justifies why standards will not be met by 17 August 2021, and confirmation of the date when the operation of those processes will cease within the installation or an explanation of why the revised BAT standard is not applicable to those processes, or
- Justifies why an alternative technique will achieve the same level of environmental protection equivalent to the revised standard described in the BAT Conclusions.

Where the Operator proposed that they were not intending to meet a BAT standard that also included a BAT Associated Emission Level (BAT AEL) described in the BAT Conclusions Document, the Regulation 61 Notice requested that the Operator make a formal request for derogation from compliance with that AEL (as provisioned by Article 15(4) of IED). In this circumstance, the Notice identified that any such request for derogation must be supported and justified by sufficient technical and commercial information that would enable us to determine acceptability of the derogation request.

The Regulation 61 Notice response from the Operator was received on 30 October 2018.

We considered it was in the correct form and contained sufficient information for us to begin our determination of the permit review but not that it necessarily contained all the information we would need to complete that review: see below.

Request for information sent 05 March 2020 BAT Conclusions 1, 2, 3, 6, 9, 12 to 14, 17, 42 and 44.	Response received from Operator 14 April 2020.
Request for information sent 15 April 2020 BAT Conclusions 1, 3, 6, 12, 42 and 44.	Response received from Operator 28 April 2020.
Request for information sent 29 April 2020 BAT Conclusions 1 and 44.	Response received from Operator 30 April 2020.
Submission of an amended Regulation 61 response which replaces previous submissions.	

2.2 Review of our own information in respect to the capability of the installation to meet revised standards included in the BAT Conclusions document

Based on our records and previous regulatory activities with the facility we have no reason to consider that the Operator will not be able to comply with the conditions that we include in the permit.

3 The legal framework

The consolidated variation notice will be issued under Regulation 20 of the EPR. The Environmental Permitting regime is a legal vehicle which delivers most of the relevant legal requirements for activities falling within its scope. In particular, the regulated facility is:

- an *installation* as described by the IED;
- subject to aspects of other relevant legislation which also have to be addressed.

We consider that the consolidated variation notice will ensure that the operation of the installation complies with all relevant legal requirements and that a high level of protection will be delivered for the environment and human health.

We explain how we have addressed specific statutory requirements more fully in the rest of this document.

4 The key issues

The key issues arising during this permit review are:

- Emissions to air and the emission limits applied to the plant.
- The energy efficiency levels associated with the Best Available Techniques (BAT-AEELs)

We therefore describe how we determined these issues in most detail in the relevant sections of this document.

4.1 Emissions to air and the emission limits applied to the plant

A number of general principles were applied during the permit review. These included:

- The upper value of the BAT AELs ranges specified were used unless use of the tighter limit was justified.
- The principle of no backsliding where if existing limits in the permit were already tighter than those specified in the BREF, the existing permit limits were retained.
- Where a limit was specified in both IED Annex V and the BAT Conclusions for a particular reference period, the tighter limit was applied and in the majority of cases this was from the BAT Conclusions.
- Where AELs are indicative in the BAT Conclusions, these were applied unless adequate justification was provided by the Operator to demonstrate that an alternative limit was more appropriate.

- For gas turbines where the IED specified that limits applied over 70% load and the BAT Conclusions specified that AELs applied when dry low NOx is effective (DLN-E), we have used DLN-E as a default across all monitoring requirements for NOx and CO.

a. LCP Configuration

LCP288 is a 120.5MWth Open Cycle Gas Turbine (OCGT) and is designed to provide electricity to the National Grid at times of high demand (peaking market) and also during periods of instability in the electricity distribution and transmission system. The OCGT is limited to 1,500 hours of operation per annum, refer to section 8 of this document.

Natural gas is burnt as a fuel in the combustion chamber of the gas turbine from where the hot gases expand through the gas turbine to generate electricity via a single electrical generator.

b. Setting permit limits

The plant was put into operation before the IED came into force and therefore the existing limits in the permit are from Part 1 of IED Annex V applicable to existing plant.

The ELVs and AELs are based on the following operating regime:

- <1,500 hours operation

The Operator's Regulation 61 response was based on unlimited hours operation; however this is not BAT, refer to section 8 of this document.

The following tables outline the limits that have been incorporated into the permit for LCP288, where these were derived from and the reference periods at which they apply. The emission limits refer to concentrations, expressed as mass of emitted substance per volume of flue-gas under the following standard conditions:

- dry gas at a temperature of 273.15 K;
- pressure of 101.3 kPa; and
- 15% volume reference oxygen concentration in the flue gases.

The emission limits and monitoring requirements have been incorporated into Schedule 3 of the permit.

NOx limits (mg/Nm ³)							
Averaging	IED (Annex V Part 1) – Existing plant	Current permit limits	BREF (Table 24 BAT-c)	Expected permit limits	Basis	Limits apply	Monitoring
Annual	None	None	50	Note 1	BREF	DLN effective to baseload	Continuous
Monthly	50	50	None	50	IED	DLN effective to baseload	
Daily	55	55	55	55 Note 3	BREF	DLN effective to baseload	
95 th %ile of hourly means	100	60	None	60 Note 2	IED (no backsliding)	DLN effective to baseload	
<p>Note 1: Yearly average BAT AELs do not apply to existing plants operated < 1,500 hours/year.</p> <p>Note 2: Existing permit limits which are tighter than the IED ELV and/or the BATAEL and are therefore retained under the principle of 'no backsliding'.</p> <p>Note 3: This limit also applies to MSUL/MSDL to baseload.</p>							

CO limits (mg/Nm ³)							
Averaging	IED (Annex V Part 1) – Existing plant	Current permit limits	BREF (Table 24 BAT-c)	Expected permit limits	Basis	Limits apply	Monitoring
Annual	None	None	40	Note 1	BREF	DLN effective to baseload	Continuous
Monthly	None	50	None	50 Note 2	IED	DLN effective to baseload	
Daily	None	50	None	50 Notes 2 and 3	IED	DLN effective to baseload	
95 th %ile of hourly means	200	50	None	50 Note 2	IED (no backsliding)	DLN effective to baseload	
<p>Note 1: Yearly average BAT AELs do not apply to existing plants operated < 1,500 hours/year.</p> <p>Note 2: Existing permit limits are retained under the principle of 'no backsliding'.</p> <p>Note 3: This limit also applies to MSUL/MSDL to baseload.</p>							

4.2 The energy efficiency levels associated with the Best Available Techniques Conclusions

An energy efficiency level associated with the best available techniques (BAT-AEEL) refers to the ratio between the combustion unit's net energy output(s) and the combustion unit's fuel/feedstock energy input at actual unit design. The net energy output(s) is determined at the combustion unit boundaries, including auxiliary systems (e.g. flue-gas treatment systems), and for the unit operated at full load.

The existing permit has no restriction on operating hours and the Regulation 61 response was submitted based on unlimited operational hours. We have introduced a limit on operating hours in Open Cycle Mode for the LCP in line with our guidance 'BAT for Balancing Plant' (refer to section 8 of this document) as we do not consider this mode of operation as BAT for plant operating over 1,500 hours/year.

Table 23 of the LCP BAT Conclusions specifies that the BAT AEELs for this type of plant are not applicable as the plant will operate for <1,500 hours/year. Whilst the BAT AEELs do not apply to this plant, we have included the information provided by the Operator.

The table below sets out the BAT AEELs specified in the LCP BAT Conclusions for LCP operating >1,500 hours/year and the energy efficiency levels confirmed through the Regulation 61 notice response. Although not applicable, we consider this plant is BAT in relation to the AEELs.

BAT AEELs (%)			Plant efficiency (%)		
Net electrical efficiency	Net total fuel utilisation	Net mechanical efficiency	Net electrical efficiency	Net total fuel utilisation	Net mechanical efficiency
LCP288 OCGT >50MWth					
33 – 41.5	None	None	41.5 ± 1.1	NA	NA

We have however included a process monitoring requirement in table S3.2 of the consolidated variation notice. This is required to demonstrate that efficiency levels are maintained following any significant overhauls of equipment in order to fulfil the requirement of BAT Conclusion 2. If the plant operates for <500 hours/year we have specified that the assessment of efficiency can be based on calculation. This is because we will not require plant to fire up with the sole purpose of carrying out an assessment of efficiency.

5 Decision checklist regarding relevant BAT Conclusions

BAT Conclusions for LCP were published by the European Commission on 17 August 2017. There are 75 BAT Conclusions. Only the BAT Conclusions relevant to the particular fuel type used on site have been replicated below.

This annex provides a record of decisions made in relation to each relevant BAT Conclusion applicable to the installation. This annex should be read in conjunction with the consolidated variation notice.

The conditions in the permit through which the relevant BAT Conclusions are implemented include but are not limited to the following:

BAT Conclusion requirement topic	Permit condition(s)	Permit table(s)
Environmental Management System	1.1.1	S1.2
BAT AELs	3.1.1 and 3.5.1	S3.1a
Monitoring	2.3, 3.5 and 3.6	S1.2, S1.4, S1.5, S3.1a
Energy efficiency	1.2 and 2.3	S3.2
Noise	2.3 and 3.4	S1.2
Other operating techniques	2.3	S1.2

The overall status of compliance with the BAT Conclusion is indicated in the table as:

- NA Not applicable
- CC Currently compliant
- FC Compliant in the future (within 4 years of publication of BAT Conclusions)
- NC Not compliant
- PC Partially compliant

BAT C No.	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
General			
1	<p>In order to improve the overall environmental performance, BAT is to implement and adhere to an environmental management system (EMS) that incorporates all of the following features:</p> <ul style="list-style-type: none"> i. commitment of the management, including senior management; ii. definition of an environmental policy that includes the continuous improvement of the installation by the management; iii. planning and establishing the necessary procedures, objectives and targets, in conjunction with financial planning and investment; iv. implementation of procedures <ul style="list-style-type: none"> (a) Structure and responsibility (b) Training (c) Communication (d) Employee involvement (e) Documentation (f) Efficient process control (g) Maintenance programmes (h) Emergency preparedness and response (i) Safeguarding compliance with environmental legislation v. checking performance and taking corrective action, paying particular attention to: <ul style="list-style-type: none"> (a) monitoring and measurement (see also the Reference Document on the General Principles of Monitoring) (b) corrective and preventive action (c) maintenance of records (d) independent (where practicable) internal and external auditing in order to determine whether or not the EMS conforms to planned arrangements and has been properly implemented and maintained; vi. review of the EMS and its continuing suitability, adequacy and effectiveness by senior management; vii. following the development of cleaner technologies; viii. consideration for the environmental impacts from the eventual decommissioning of the installation at the stage of designing a new plant, and throughout its operating life; viii. consideration for the environmental impacts from the eventual decommissioning of the installation at the stage of designing a new plant, and throughout its operating life; ix. application of sectoral benchmarking on a regular basis. 	FC	<p>In their response to our further information request received 14 April 2020 they confirm that:</p> <p>There was a change in ownership in 2019 when the company name was changed to Whitetower Energy Limited.</p> <p>From 01 June 2020 the site operations and therefore the EMS will be provided by the new operations and maintenance (O & M) provider, NAES Power Solutions Limited. NAES have an EMS that is very similar to ISO 14001 but it is not certified.</p> <p>In their response to our further information request received 30 April 2020 they confirm that:</p> <p>The existing RWE EMS is compliant with ISO 14001. This EMS is currently in compliance with features i through to xvi of this BAT Conclusion. Once they have transferred to the NAES systems 01 June 2020, they will transition to the NAES environmental systems throughout 2020/21. They expect to be fully compliant with this BAT Conclusion in 2021.</p> <p>We do not agree with the Operator's stated compliance of CC and have changed the status to FC. We do not consider it necessary to set an improvement condition as we will track progress via compliance.</p>

BAT C No.	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement													
	<p>Etc. - see BAT Conclusions</p> <p>Applicability. The scope (e.g. level of detail) and nature of the EMS (e.g. standardised or non-standardised) will generally be related to the nature, scale and complexity of the installation, and the range of environmental impacts it may have.</p>															
2	<p>BAT is to determine the net electrical efficiency and/or the net total fuel utilisation and/or the net mechanical energy efficiency of the gasification, IGCC and/or combustion units by carrying out a performance test at full load (1), according to EN standards, after the commissioning of the unit and after each modification that could significantly affect the net electrical efficiency and/or the net total fuel utilisation and/or the net mechanical energy efficiency of the unit. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.</p>	CC	<p>The Operator confirmed that:</p> <p>Calculations of gas turbine efficiency were provided in the Regulation 60 data submitted 21 July 2015. (Thermal Efficiency - Measurements taken 20 May 2015 (Control systems engineering report, dated 19 July 2015 (Issue 2)).</p> <p>Specific data will be reviewed by the O & M provider and Siemens. Siemens will provide engine performance data.</p> <p>O & M to provide a site efficiency report as a review of historic site data and improvements.</p> <p>We agree with the Operator's stated compliance.</p>													
3	<p>BAT is to monitor key process parameters relevant for emissions to air and water including those given below.</p> <table border="1" data-bbox="297 943 1191 1193"> <thead> <tr> <th data-bbox="297 943 577 975">Stream</th> <th data-bbox="577 943 909 975">Parameter(s)</th> <th data-bbox="909 943 1191 975">Monitoring</th> </tr> </thead> <tbody> <tr> <td data-bbox="297 979 577 1134" rowspan="3">Flue-gas</td> <td data-bbox="577 979 909 1038">Flow</td> <td data-bbox="909 979 1191 1038">Periodic or continuous determination</td> </tr> <tr> <td data-bbox="577 1043 909 1102">Oxygen content, temperature, and pressure</td> <td data-bbox="909 1043 1191 1102">Periodic or continuous measurement</td> </tr> <tr> <td data-bbox="577 1107 909 1134">Water vapour content ⁽³⁾</td> <td data-bbox="909 1107 1191 1134"></td> </tr> <tr> <td data-bbox="297 1139 577 1193">Waste water from flue-gas treatment</td> <td data-bbox="577 1139 909 1193">Flow, pH, and temperature</td> <td data-bbox="909 1139 1191 1193">Continuous measurement</td> </tr> </tbody> </table>	Stream	Parameter(s)	Monitoring	Flue-gas	Flow	Periodic or continuous determination	Oxygen content, temperature, and pressure	Periodic or continuous measurement	Water vapour content ⁽³⁾		Waste water from flue-gas treatment	Flow, pH, and temperature	Continuous measurement	CC	<p>The Operator confirmed that:</p> <p>MCERT installed CEMS systems.</p> <p>The existing permit requires the continuous measurement of oxygen, water vapour and stack gas temperature/pressure.</p> <p>The flow is measured by instruments installed on the gas turbine.</p> <p>We agree with the Operator's stated compliance.</p>
Stream	Parameter(s)	Monitoring														
Flue-gas	Flow	Periodic or continuous determination														
	Oxygen content, temperature, and pressure	Periodic or continuous measurement														
	Water vapour content ⁽³⁾															
Waste water from flue-gas treatment	Flow, pH, and temperature	Continuous measurement														
4	<p>BAT is to monitor emissions to air with at least the frequency given below and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.</p> <table border="1" data-bbox="297 1321 1191 1377"> <thead> <tr> <th data-bbox="297 1321 416 1377">Substance/Parameter</th> <th data-bbox="416 1321 656 1377">Fuel/Process/Type of combustion</th> <th data-bbox="656 1321 775 1377">Combustion</th> <th data-bbox="775 1321 909 1377">Standard(s) ⁽¹⁾</th> <th data-bbox="909 1321 1077 1377">Minimum monitoring</th> <th data-bbox="1077 1321 1191 1377">Monitoring</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Substance/Parameter	Fuel/Process/Type of combustion	Combustion	Standard(s) ⁽¹⁾	Minimum monitoring	Monitoring							CC	<p>The Operator confirmed that:</p> <p>MCERT installed CEMS systems (continuous monitoring).</p> <p>Servicing is carried out to the requirements of EN14181 by the maintenance contractors.</p>	
Substance/Parameter	Fuel/Process/Type of combustion	Combustion	Standard(s) ⁽¹⁾	Minimum monitoring	Monitoring											

BAT C No.	Summary of BAT Conclusion requirement						Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	meter	plant	plant total rated thermal input		frequency ⁽⁶⁾ / ⁽⁷⁾	associated with	<p>The existing permit requires the continuous measurement of NOx and CO.</p> <p>We agree with the Operator's stated compliance.</p>	
NH ₃	—	When SCR and/or SNCR is used	All sizes	Generic EN standards	Continuous ⁽⁶⁾ / ⁽⁷⁾	BAT 7		
NO _x	—	<ul style="list-style-type: none"> Coal and/or lignite including waste co-incineration Solid biomass and/or peat including waste co-incineration HFO- and/or gas-oil-fired boilers and engines Gas-oil-fired gas turbines Natural-gas-fired boilers, engines, and turbines Iron and steel process gases Process fuels from the chemical industry IGCC plants 	All sizes	Generic EN standards	Continuous ⁽⁶⁾ / ⁽⁸⁾	BAT 20 BAT 24 BAT 28 BAT 32 BAT 37 BAT 41 BAT 42 BAT 43 BAT 47 BAT 48 BAT 56 BAT 64 BAT 65 BAT 73		
	—	Combustion plants on offshore platforms	All sizes	EN 14792	Once every year ⁽⁹⁾	BAT 53		
N ₂ O	—	<ul style="list-style-type: none"> Coal and/or lignite in circulating fluidised bed boilers Solid biomass and/or peat in circulating fluidised 	All sizes	EN 21258	Once every year ⁽¹⁰⁾	BAT 20 BAT 24		

BAT C No.	Summary of BAT Conclusion requirement						Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
		bed boilers						
CO	<ul style="list-style-type: none"> — Coal and/or lignite including waste co-incineration — Solid biomass and/or peat including waste co-incineration — HFO- and/or gas-oil-fired boilers and engines — Gas-oil-fired gas turbines — Natural-gas-fired boilers, engines, and turbines — Iron and steel process gases — Process fuels from the chemical industry — IGCC plants 	All sizes	Generic EN standards	Continuous ₍₆₎ (8)	BAT 20 BAT 24 BAT 28 BAT 33 BAT 38 BAT 44 BAT 49 BAT 56 BAT 64 BAT 65 BAT 73			
	<ul style="list-style-type: none"> — Combustion plants on offshore platforms 	All sizes	EN 15058	Once every year ₍₉₎	BAT 54			
SO ₂	<ul style="list-style-type: none"> — Coal and/or lignite incl waste co-incineration — Solid biomass and/or peat incl waste co-incineration — HFO- and/or gas-oil-fired boilers — HFO- and/or gas-oil-fired engines — Gas-oil-fired gas turbines 	All sizes	Generic EN standards and EN 14791	Continuous ₍₆₎ (11) (12)	BAT 21 BAT 25 BAT 29 BAT 34 BAT 39 BAT 50 BAT 57 BAT 66 BAT 67 BAT 74			

BAT C No.	Summary of BAT Conclusion requirement						Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
		<ul style="list-style-type: none"> — Iron and steel process gases — Process fuels from the chemical industry in boilers — IGCC plants 						
	SO ₃	<ul style="list-style-type: none"> — When SCR is used 	All sizes	No EN standard available	Once every year	—		
	Gaseous chlorides, expressed as HCl	<ul style="list-style-type: none"> — Coal and/or lignite — Process fuels from the chemical industry in boilers 	All sizes	EN 1911	Once every three months ₍₆₎ ₍₁₃₎ ₍₁₄₎	BAT 21 BAT 57		
		<ul style="list-style-type: none"> — Solid biomass and/or peat 	All sizes	Generic EN standards	Continuous ₍₁₅₎ ₍₁₆₎	BAT 25		
		<ul style="list-style-type: none"> — Waste co-incineration 	All sizes	Generic EN standards	Continuous ₍₆₎ ₍₁₆₎	BAT 66 BAT 67		
	HF	<ul style="list-style-type: none"> — Coal and/or lignite — Process fuels from the chemical industry in boilers 	All sizes	No EN standard available	Once every three months ₍₆₎ ₍₁₃₎ ₍₁₄₎	BAT 21 BAT 57		
		<ul style="list-style-type: none"> — Solid biomass and/or peat 	All sizes	No EN standard available	Once every year	BAT 25		
		<ul style="list-style-type: none"> — Waste co-incineration 	All sizes	Generic EN standards	Continuous ₍₆₎ ₍₁₆₎	BAT 66 BAT 67		
	Dust	<ul style="list-style-type: none"> — Coal and/or lignite — Solid biomass and/or peat — HFO- and/or gas-oil-fired boilers — Iron and steel process gases — Process fuels from the chemical industry in boilers 	All sizes	Generic EN standards and EN 13284-1 and EN 13284-2	Continuous ₍₆₎ ₍₁₇₎	BAT 22 BAT 26 BAT 30 BAT 35 BAT 39 BAT 51 BAT 58 BAT 75		

BAT C No.	Summary of BAT Conclusion requirement						Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
		<ul style="list-style-type: none"> — IGCC plants — HFO- and/or gas-oil-fired engines — Gas-oil-fired gas turbines 						
		<ul style="list-style-type: none"> — Waste co-incineration 	All sizes	Generic EN standards and EN 13284-2	Continuous	BAT 68 BAT 69		
	Metals and metalloids except mercury (As, Cd, Co, Cr, Cu, Mn, Ni, Pb, Sb, Se, Tl, V, Zn)	<ul style="list-style-type: none"> — Coal and/or lignite — Solid biomass and/or peat — HFO- and/or gas-oil-fired boilers and engines 	All sizes	EN 14385	Once every year ₍₁₈₎	BAT 22 BAT 26 BAT 30		
		<ul style="list-style-type: none"> — Waste co-incineration 	< 300 MW _{th}	EN 14385	Once every six months ₍₁₃₎	BAT 68 BAT 69		
			≥ 300 MW _{th}	EN 14385	Once every three months ₍₁₉₎ ₍₁₃₎			
		<ul style="list-style-type: none"> — IGCC plants 	≥ 100 MW _{th}	EN 14385	Once every year ₍₁₈₎	BAT 75		
	Hg	<ul style="list-style-type: none"> — Coal and/or lignite including waste co-incineration 	< 300 MW _{th}	EN 13211	Once every three months ₍₁₃₎ ₍₂₀₎	BAT 23		
			≥ 300 MW _{th}	Generic EN standards and EN 14884	Continuous ₍₁₆₎ ₍₂₁₎			
		<ul style="list-style-type: none"> — Solid biomass and/or peat 	All sizes	EN 13211	Once every year ₍₂₂₎	BAT 27		
		<ul style="list-style-type: none"> — Waste co-incineration with solid biomass and/or peat 	All sizes	EN 13211	Once every three months ₍₁₃₎	BAT 70		
		<ul style="list-style-type: none"> — IGCC plants 	≥ 100 MW _{th}	EN 13211	Once every year ₍₂₃₎	BAT 75		
	TVOC	<ul style="list-style-type: none"> — HFO- and/or gas-oil-fired engines — Process fuels from chemical industry in boilers 	All sizes	EN 12619	Once every six months ₍₁₃₎	BAT 33 BAT 59		

BAT C No.	Summary of BAT Conclusion requirement						Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement																						
		— Waste co-incineration with coal, lignite, solid biomass and/or peat	All sizes	Generic EN standards	Continuous	BAT 71																								
	Formaldehyde	— Natural-gas in spark-ignited lean-burn gas and dual fuel engines	All sizes	No EN standard available	Once every year	BAT 45																								
	CH ₄	— Natural-gas-fired engines	All sizes	EN ISO 25139	Once every year ⁽²⁴⁾	BAT 45																								
	PCDD/F	— Process fuels from chemical industry in boilers — Waste co-incineration	All sizes	EN 1948-1, EN 1948-2, EN 1948-3	Once every six months ⁽¹³⁾ ⁽²⁵⁾	BAT 59 BAT 71																								
5	<p>BAT is to monitor emissions to water from flue-gas treatment with at least the frequency given below and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.</p> <table border="1" data-bbox="309 906 1189 1374"> <thead> <tr> <th data-bbox="309 906 562 995">Substance/Parameter</th> <th data-bbox="562 906 837 995">Standard(s)</th> <th data-bbox="837 906 1016 995">Minimum monitoring frequency</th> <th data-bbox="1016 906 1189 995">Monitoring associated with</th> </tr> </thead> <tbody> <tr> <td data-bbox="309 995 562 1054">Total organic carbon (TOC)⁽²⁶⁾</td> <td data-bbox="562 995 837 1054">EN 1484</td> <td data-bbox="837 995 1016 1374" rowspan="8">Once every month</td> <td data-bbox="1016 995 1189 1374" rowspan="8">BAT 15</td> </tr> <tr> <td data-bbox="309 1054 562 1114">Chemical oxygen demand (COD)⁽²⁶⁾</td> <td data-bbox="562 1054 837 1114">No EN standard available</td> </tr> <tr> <td data-bbox="309 1114 562 1173">Total suspended solids (TSS)</td> <td data-bbox="562 1114 837 1173">EN 872</td> </tr> <tr> <td data-bbox="309 1173 562 1232">Fluoride (F⁻)</td> <td data-bbox="562 1173 837 1232">EN ISO 10304-1</td> </tr> <tr> <td data-bbox="309 1232 562 1291">Sulphate (SO₄²⁻)</td> <td data-bbox="562 1232 837 1291">EN ISO 10304-1</td> </tr> <tr> <td data-bbox="309 1291 562 1350">Sulphide, easily released (S²⁻)</td> <td data-bbox="562 1291 837 1350">No EN standard available</td> </tr> <tr> <td data-bbox="309 1350 562 1409">Sulphite (SO₃²⁻)</td> <td data-bbox="562 1350 837 1409">EN ISO 10304-3</td> </tr> <tr> <td data-bbox="309 1409 562 1452">Metals and</td> <td data-bbox="562 1409 837 1452">As Various EN standards</td> </tr> </tbody> </table>						Substance/Parameter	Standard(s)	Minimum monitoring frequency	Monitoring associated with	Total organic carbon (TOC) ⁽²⁶⁾	EN 1484	Once every month	BAT 15	Chemical oxygen demand (COD) ⁽²⁶⁾	No EN standard available	Total suspended solids (TSS)	EN 872	Fluoride (F ⁻)	EN ISO 10304-1	Sulphate (SO ₄ ²⁻)	EN ISO 10304-1	Sulphide, easily released (S ²⁻)	No EN standard available	Sulphite (SO ₃ ²⁻)	EN ISO 10304-3	Metals and	As Various EN standards	NA	<p>The Operator confirmed that this BAT Conclusion is not applicable to the installation, despite stating that they are currently compliant.</p> <p>We have set the status to NA instead of CC.</p> <p>We agree this BAT Conclusion is not applicable to the activities carried out at the installation.</p>
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BAT C No.	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement																					
	<table border="1"> <tr> <td rowspan="6">metalloids</td> <td>Cd</td> <td rowspan="6">available (e.g. EN ISO 11885 or EN ISO 17294-2)</td> <td rowspan="6"></td> </tr> <tr><td>Cr</td></tr> <tr><td>Cu</td></tr> <tr><td>Ni</td></tr> <tr><td>Pb</td></tr> <tr><td>Zn</td></tr> <tr> <td></td> <td>Hg</td> <td>Various EN standards available (e.g. EN ISO 12846 or EN ISO 17852)</td> <td></td> </tr> <tr> <td>Chloride (Cl⁻)</td> <td></td> <td>Various EN standards available (e.g. EN ISO 10304-1 or EN ISO 15682)</td> <td>—</td> </tr> <tr> <td>Total nitrogen</td> <td></td> <td>EN 12260</td> <td>—</td> </tr> </table>	metalloids	Cd	available (e.g. EN ISO 11885 or EN ISO 17294-2)		Cr	Cu	Ni	Pb	Zn		Hg	Various EN standards available (e.g. EN ISO 12846 or EN ISO 17852)		Chloride (Cl ⁻)		Various EN standards available (e.g. EN ISO 10304-1 or EN ISO 15682)	—	Total nitrogen		EN 12260	—		
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Total nitrogen		EN 12260	—																					
6	<p>In order to improve the general environmental performance of combustion plants and to reduce emissions to air of CO and unburnt substances, BAT is to ensure optimised combustion and to use an appropriate combination of the techniques given below.</p> <table border="1"> <thead> <tr> <th>Technique</th> <th>Description</th> <th>Applicability</th> </tr> </thead> <tbody> <tr> <td>a Fuel blending and mixing</td> <td>Ensure stable combustion conditions and/or reduce the emission of pollutants by mixing different qualities of the same fuel type</td> <td rowspan="2">Generally applicable</td> </tr> <tr> <td>b Maintenance of the combustion system</td> <td>Regular planned maintenance according to suppliers' recommendations</td> </tr> <tr> <td>c Advanced control system</td> <td>See description in Section 8.1</td> <td>The applicability to old combustion plants may be constrained by the need to retrofit the combustion system and/or control command system</td> </tr> <tr> <td>d Good design</td> <td>Good design of furnace,</td> <td>Generally applicable to new</td> </tr> </tbody> </table>	Technique	Description	Applicability	a Fuel blending and mixing	Ensure stable combustion conditions and/or reduce the emission of pollutants by mixing different qualities of the same fuel type	Generally applicable	b Maintenance of the combustion system	Regular planned maintenance according to suppliers' recommendations	c Advanced control system	See description in Section 8.1	The applicability to old combustion plants may be constrained by the need to retrofit the combustion system and/or control command system	d Good design	Good design of furnace,	Generally applicable to new	CC	<p>The Operator confirmed that:</p> <p>a) Fuel blending - not applicable</p> <p>b) Maintenance of combustion system - maintenance of the gas turbine is undertaken to maintain environmental performance. This includes camera inspections and combustion tuning, with improvements carried out through a service agreement.</p> <p>c) Advance control system – the gas turbine is controlled with an engine management system which is maintained through a service agreement.</p> <p>d) Good design of combustion equipment – the gas turbine is fitted with a three stage DLN combustion system to provide combustion stability and emissions performance.</p> <p>e) Fuel choice – the gas turbine can only operate on natural gas.</p> <p>We agree with the Operator's stated compliance.</p>							
Technique	Description	Applicability																						
a Fuel blending and mixing	Ensure stable combustion conditions and/or reduce the emission of pollutants by mixing different qualities of the same fuel type	Generally applicable																						
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BAT C No.	Summary of BAT Conclusion requirement			Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
		of the combustion equipment	combustion chambers, burners and associated devices	combustion plants	
	e	Fuel choice	Select or switch totally or partially to another fuel(s) with a better environmental profile (e.g. with low sulphur and/or mercury content) amongst the available fuels, including in start-up situations or when back-up fuels are used	Applicable within the constraints associated with the availability of suitable types of fuel with a better environmental profile as a whole, which may be impacted by the energy policy of the Member State, or by the integrated site's fuel balance in the case of combustion of industrial process fuels. For existing combustion plants, the type of fuel chosen may be limited by the configuration and the design of the plant	
7	<p>In order to reduce emissions of ammonia to air from the use of selective catalytic reduction (SCR) and/or selective non-catalytic reduction (SNCR) for the abatement of NO_x emissions, BAT is to optimise the design and/or operation of SCR and/or SNCR (e.g. optimised reagent to NO_x ratio, homogeneous reagent distribution and optimum size of the reagent drops).</p> <p>BAT-associated emission levels The BAT-associated emission level (BAT-AEL) for emissions of NH₃ to air from the use of SCR and/or SNCR is < 3–10 mg/Nm³ as a yearly average or average over the sampling period. The lower end of the range can be achieved when using SCR and the upper end of the range can be achieved when using SNCR without wet abatement techniques. In the case of plants combusting biomass and operating at variable loads as well as in the case of engines combusting HFO and/or gas oil, the higher end of the BAT-AEL range is 15 mg/Nm³.</p>			NA	<p>The Operator confirmed that this BAT Conclusion is not applicable to the installation, despite stating that they are currently compliant.</p> <p>We have set the status to NA instead of CC.</p> <p>We agree this BAT Conclusion is not applicable to the activities carried out at the installation.</p>
8	<p>In order to prevent or reduce emissions to air during normal operating conditions, BAT is to ensure, by appropriate design, operation and maintenance, that the emission abatement systems are used at optimal capacity and availability.</p>			CC	<p>The Operator confirmed that:</p> <p>Gas turbine servicing and engine tuning is undertaken. No abatement systems are installed. Engines run at full load capacity, therefore most efficient running. They do not run at reduced load.</p> <p>We agree with the Operator's stated compliance.</p>

BAT C No.	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement												
9	<p>In order to improve the general environmental performance of combustion and/or gasification plants and to reduce emissions to air, BAT is to include the following elements in the quality assurance/quality control programmes for all the fuels used, as part of the environmental management system (see BAT 1):</p> <ul style="list-style-type: none"> (i) Initial full characterisation of the fuel used including at least the parameters listed below and in accordance with EN standards. ISO, national or other international standards may be used provided they ensure the provision of data of an equivalent scientific quality; (ii) Regular testing of the fuel quality to check that it is consistent with the initial characterisation and according to the plant design specifications. The frequency of testing and the parameters chosen from the table below are based on the variability of the fuel and an assessment of the relevance of pollutant releases (e.g. concentration in fuel, flue-gas treatment employed); (iii) Subsequent adjustment of the plant settings as and when needed and practicable (e.g. integration of the fuel characterisation and control in the advanced control system (see description in Section 8.1)). <p>Description Initial characterisation and regular testing of the fuel can be performed by the operator and/or the fuel supplier. If performed by the supplier, the full results are provided to the operator in the form of a product (fuel) supplier specification and/or guarantee.</p> <table border="1" data-bbox="297 885 1189 1364"> <thead> <tr> <th data-bbox="297 885 600 922">Fuel(s)</th> <th data-bbox="600 885 1189 922">Substances/Parameters subject to characterisation</th> </tr> </thead> <tbody> <tr> <td data-bbox="297 922 600 1129" rowspan="3">Biomass/peat</td> <td data-bbox="600 922 1189 959">— LHV</td> </tr> <tr> <td data-bbox="600 959 1189 1002">— moisture</td> </tr> <tr> <td data-bbox="600 1002 1189 1129">— Ash — C, Cl, F, N, S, K, Na — Metals and metalloids (As, Cd, Cr, Cu, Hg, Pb, Zn)</td> </tr> <tr> <td data-bbox="297 1129 600 1364" rowspan="4">Coal/lignite</td> <td data-bbox="600 1129 1189 1166">— LHV</td> </tr> <tr> <td data-bbox="600 1166 1189 1203">— Moisture</td> </tr> <tr> <td data-bbox="600 1203 1189 1246">— Volatiles, ash, fixed carbon, C, H, N, O, S</td> </tr> <tr> <td data-bbox="600 1246 1189 1283">— Br, Cl, F</td> </tr> <tr> <td data-bbox="600 1283 1189 1364">— Metals and metalloids (As, Cd, Co, Cr, Cu, Hg, Mn, Ni, Pb, Sb, Ti, V, Zn)</td> </tr> </tbody> </table>	Fuel(s)	Substances/Parameters subject to characterisation	Biomass/peat	— LHV	— moisture	— Ash — C, Cl, F, N, S, K, Na — Metals and metalloids (As, Cd, Cr, Cu, Hg, Pb, Zn)	Coal/lignite	— LHV	— Moisture	— Volatiles, ash, fixed carbon, C, H, N, O, S	— Br, Cl, F	— Metals and metalloids (As, Cd, Co, Cr, Cu, Hg, Mn, Ni, Pb, Sb, Ti, V, Zn)	CC	<p>The Operator confirmed that:</p> <ul style="list-style-type: none"> i) and ii) All fuel gas is supplied through the national gas networks. National inventory data is used for quality measurement. There are no alternative fuels for the gas turbine. iii) Gas turbine engine tuning is carried out by the OEM service provider. <p>We consider that for plants which burn natural gas from the National Grid as a fuel that it is not necessary for the Operator to replicate the testing carried out by the National Grid.</p> <p>We agree with the Operator's stated compliance.</p>
Fuel(s)	Substances/Parameters subject to characterisation														
Biomass/peat	— LHV														
	— moisture														
	— Ash — C, Cl, F, N, S, K, Na — Metals and metalloids (As, Cd, Cr, Cu, Hg, Pb, Zn)														
Coal/lignite	— LHV														
	— Moisture														
	— Volatiles, ash, fixed carbon, C, H, N, O, S														
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BAT C No.	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement												
	<table border="1"> <tr> <td data-bbox="297 331 600 411">HFO</td> <td data-bbox="600 331 1193 411"> <ul style="list-style-type: none"> — Ash — C, S, N, Ni, V </td> </tr> <tr> <td data-bbox="297 411 600 496">Gas oil</td> <td data-bbox="600 411 1193 496"> <ul style="list-style-type: none"> — Ash — N, C, S </td> </tr> <tr> <td data-bbox="297 496 600 580">Natural gas</td> <td data-bbox="600 496 1193 580"> <ul style="list-style-type: none"> — LHV — CH₄, C₂H₆, C₃, C₄₊, CO₂, N₂, Wobbe index </td> </tr> <tr> <td data-bbox="297 580 600 687">Process fuels from the chemical industry⁽²⁷⁾</td> <td data-bbox="600 580 1193 687"> <ul style="list-style-type: none"> — Br, C, Cl, F, H, N, O, S — Metals and metalloids (As, Cd, Co, Cr, Cu, Hg, Mn, Ni, Pb, Sb, Tl, V, Zn) </td> </tr> <tr> <td data-bbox="297 687 600 762">Iron and steel process gases</td> <td data-bbox="600 687 1193 762"> <ul style="list-style-type: none"> — LHV, CH₄ (for COG), C_xH_y (for COG), CO₂, H₂, N₂, total sulphur, dust, Wobbe index </td> </tr> <tr> <td data-bbox="297 762 600 943">Waste⁽²⁸⁾</td> <td data-bbox="600 762 1193 943"> <ul style="list-style-type: none"> — LHV — Moisture — Volatiles, ash, Br, C, Cl, F, H, N, O, S — Metals and metalloids (As, Cd, Co, Cr, Cu, Hg, Mn, Ni, Pb, Sb, Tl, V, Zn) </td> </tr> </table>	HFO	<ul style="list-style-type: none"> — Ash — C, S, N, Ni, V 	Gas oil	<ul style="list-style-type: none"> — Ash — N, C, S 	Natural gas	<ul style="list-style-type: none"> — LHV — CH₄, C₂H₆, C₃, C₄₊, CO₂, N₂, Wobbe index 	Process fuels from the chemical industry ⁽²⁷⁾	<ul style="list-style-type: none"> — Br, C, Cl, F, H, N, O, S — Metals and metalloids (As, Cd, Co, Cr, Cu, Hg, Mn, Ni, Pb, Sb, Tl, V, Zn) 	Iron and steel process gases	<ul style="list-style-type: none"> — LHV, CH₄ (for COG), C_xH_y (for COG), CO₂, H₂, N₂, total sulphur, dust, Wobbe index 	Waste ⁽²⁸⁾	<ul style="list-style-type: none"> — LHV — Moisture — Volatiles, ash, Br, C, Cl, F, H, N, O, S — Metals and metalloids (As, Cd, Co, Cr, Cu, Hg, Mn, Ni, Pb, Sb, Tl, V, Zn) 		
HFO	<ul style="list-style-type: none"> — Ash — C, S, N, Ni, V 														
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Waste ⁽²⁸⁾	<ul style="list-style-type: none"> — LHV — Moisture — Volatiles, ash, Br, C, Cl, F, H, N, O, S — Metals and metalloids (As, Cd, Co, Cr, Cu, Hg, Mn, Ni, Pb, Sb, Tl, V, Zn) 														
10	<p>In order to reduce emissions to air and/or to water during other than normal operating conditions (OTNOC), BAT is to set up and implement a management plan as part of the environmental management system (see BAT 1), commensurate with the relevance of potential pollutant releases, that includes the following elements:</p> <ul style="list-style-type: none"> — appropriate design of the systems considered relevant in causing OTNOC that may have an impact on emissions to air, water and/or soil (e.g. low-load design concepts for reducing the minimum start-up and shutdown loads for stable generation in gas turbines), — set-up and implementation of a specific preventive maintenance plan for these relevant systems, — review and recording of emissions caused by OTNOC and associated circumstances and implementation of corrective actions if necessary, — periodic assessment of the overall emissions during OTNOC (e.g. frequency of 	CC	<p>The Operator confirmed that:</p> <p>The gas turbine is operated to keep start-up times to a minimum. Engine testing is kept to minimum durations.</p> <p>The energy supply contracts are for peaking operations, which reduces operational hours.</p> <p>The engine is shut-down for investigation in the event of abnormal emissions.</p> <p>We agree with the Operator's stated compliance.</p>												

BAT C No.	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement															
	events, duration, emissions quantification/estimation) and implementation of corrective actions if necessary.																	
11	<p>BAT is to appropriately monitor emissions to air and/or to water during OTNOC.</p> <p>Description The monitoring can be carried out by direct measurement of emissions or by monitoring of surrogate parameters if this proves to be of equal or better scientific quality than the direct measurement of emissions. Emissions during start-up and shutdown (SU/SD) may be assessed based on a detailed emission measurement carried out for a typical SU/SD procedure at least once every year, and using the results of this measurement to estimate the emissions for each and every SU/SD throughout the year.</p>	CC	<p>The Operator confirmed that:</p> <p>The plant is not operated when the CEMS is out of service. There is no alternative method of analysis available.</p> <p>We agree with the Operator's stated compliance.</p>															
12	<p>In order to increase the energy efficiency of combustion, gasification and/or IGCC units operated $\geq 1\,500$ h/yr, BAT is to use an appropriate combination of the techniques given below.</p> <table border="1" data-bbox="297 762 1193 1385"> <thead> <tr> <th data-bbox="297 762 499 799">Technique</th> <th data-bbox="499 762 864 799">Description</th> <th data-bbox="864 762 1193 799">Applicability</th> </tr> </thead> <tbody> <tr> <td data-bbox="297 799 499 932">a. Combustion optimisation</td> <td data-bbox="499 799 864 932">See description in Section 8.2. Optimising the combustion minimises the content of unburnt substances in the flue-gases and in solid combustion residues</td> <td data-bbox="864 799 1193 1331" rowspan="4">Generally applicable</td> </tr> <tr> <td data-bbox="297 932 499 1114">b. Optimisation of the working medium conditions</td> <td data-bbox="499 932 864 1114">Operate at the highest possible pressure and temperature of the working medium gas or steam, within the constraints associated with, for example, the control of NO_x emissions or the characteristics of energy demanded</td> </tr> <tr> <td data-bbox="297 1114 499 1246">c. Optimisation of the steam cycle</td> <td data-bbox="499 1114 864 1246">Operate with lower turbine exhaust pressure by utilisation of the lowest possible temperature of the condenser cooling water, within the design conditions</td> </tr> <tr> <td data-bbox="297 1246 499 1331">d. Minimisation of energy consumption</td> <td data-bbox="499 1246 864 1331">Minimising the internal energy consumption (e.g. greater efficiency of the feed-water pump)</td> </tr> <tr> <td data-bbox="297 1331 499 1385">e. Preheating of combustion air</td> <td data-bbox="499 1331 864 1385">Reuse of part of the heat recovered from the combustion flue-gas to</td> <td data-bbox="864 1331 1193 1385">Generally applicable within the constraints related to the need to</td> </tr> </tbody> </table>	Technique	Description	Applicability	a. Combustion optimisation	See description in Section 8.2. Optimising the combustion minimises the content of unburnt substances in the flue-gases and in solid combustion residues	Generally applicable	b. Optimisation of the working medium conditions	Operate at the highest possible pressure and temperature of the working medium gas or steam, within the constraints associated with, for example, the control of NO _x emissions or the characteristics of energy demanded	c. Optimisation of the steam cycle	Operate with lower turbine exhaust pressure by utilisation of the lowest possible temperature of the condenser cooling water, within the design conditions	d. Minimisation of energy consumption	Minimising the internal energy consumption (e.g. greater efficiency of the feed-water pump)	e. Preheating of combustion air	Reuse of part of the heat recovered from the combustion flue-gas to	Generally applicable within the constraints related to the need to	CC	<p>The Operator confirmed that:</p> <p>a) Combustion optimisation - gas turbine performance is monitored by the O & M provider who recommend any actions to maintain / improve performance.</p> <p>b) Optimisation of working medium conditions – the gas turbine engine is controlled with an engine management system which is maintained through a service agreement.</p> <p>d) Minimisation of energy consumption - routine checks of the fuel usage are carried out to compare historic data to measure gas turbine performance technically and commercially.</p> <p>f) Fuel preheating - fuel gas is heated prior to delivery to the gas turbine.</p> <p>p) Minimisation of heat loss - gas fuel pipe-work is insulated after the gas heater.</p> <p>q) Advanced materials – the gas turbine is engineered from aero derivative based technology and uses the same materials and technologies.</p> <p>The site operates in open cycle mode only and is not capable of</p>
Technique	Description	Applicability																
a. Combustion optimisation	See description in Section 8.2. Optimising the combustion minimises the content of unburnt substances in the flue-gases and in solid combustion residues	Generally applicable																
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BAT C No.	Summary of BAT Conclusion requirement			Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
			preheat the air used in combustion	control NO _x emissions	CCGT/ CHP operations so some techniques do not apply. NA: c, e, g to o, r and s We agree with the Operator's stated compliance.
	f.	Fuel preheating	Preheating of fuel using recovered heat	Generally applicable within the constraints associated with the boiler design and the need to control NO _x emissions	
	g.	Advanced control system	See description in Section 8.2. Computerised control of the main combustion parameters enables the combustion efficiency to be improved	Generally applicable to new units. The applicability to old units may be constrained by the need to retrofit the combustion system and/or control command system	
	h.	Feed-water preheating using recovered heat	Preheat water coming out of the steam condenser with recovered heat, before reusing it in the boiler	Only applicable to steam circuits and not to hot boilers. Applicability to existing units may be limited due to constraints associated with the plant configuration and the amount of recoverable heat	
	i.	Heat recovery by cogeneration (CHP)	Recovery of heat (mainly from the steam system) for producing hot water/steam to be used in industrial processes/activities or in a public network for district heating. Additional heat recovery is possible from: <ul style="list-style-type: none"> — flue-gas — grate cooling — circulating fluidised bed 	Applicable within the constraints associated with the local heat and power demand. The applicability may be limited in the case of gas compressors with an unpredictable operational heat profile	
	j.	CHP readiness	See description in Section 8.2.	Only applicable to new units where there is a realistic potential for the future use of heat in the vicinity of the unit	
	k.	Flue-gas condenser	See description in Section 8.2.	Generally applicable to CHP units provided there is enough demand for low-temperature heat	
	l.	Heat accumulation	Heat accumulation storage in CHP mode	Only applicable to CHP plants. The applicability may be limited in the case of low heat load	

BAT C No.	Summary of BAT Conclusion requirement			Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
				demand	
	m.	Wet stack	See description in Section 8.2.	Generally applicable to new and existing units fitted with wet FGD	
	n.	Cooling tower discharge	The release of emissions to air through a cooling tower and not via a dedicated stack	Only applicable to units fitted with wet FGD where reheating of the flue-gas is necessary before release, and where the unit cooling system is a cooling tower	
	o.	Fuel pre-drying	The reduction of fuel moisture content before combustion to improve combustion conditions	Applicable to the combustion of biomass and/or peat within the constraints associated with spontaneous combustion risks (e.g. the moisture content of peat is kept above 40 % throughout the delivery chain). The retrofit of existing plants may be restricted by the extra calorific value that can be obtained from the drying operation and by the limited retrofit possibilities offered by some boiler designs or plant configurations	
	p.	Minimisation of heat losses	Minimising residual heat losses, e.g. those that occur via the slag or those that can be reduced by insulating radiating sources	Only applicable to solid-fuel-fired combustion units and to gasification/IGCC units	
	q.	Advanced materials	Use of advanced materials proven to be capable of withstanding high operating temperatures and pressures and thus to achieve increased steam/combustion process efficiencies	Only applicable to new plants	
	r.	Steam turbine upgrades	This includes techniques such as increasing the temperature and pressure of medium-pressure steam, addition of a low-pressure turbine, and modifications to the geometry of the turbine rotor blades	The applicability may be restricted by demand, steam conditions and/or limited plant lifetime	
	s.	Supercritical	Use of a steam circuit, including	Only applicable to new units of	

BAT C No.	Summary of BAT Conclusion requirement			Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
		and ultra-supercritical steam conditions	steam reheating systems, in which steam can reach pressures above 220,6 bar and temperatures above 374 °C in the case of supercritical conditions, and above 250 – 300 bar and temperatures above 580 – 600 °C in the case of ultra-supercritical conditions	≥ 600 MW _{th} operated > 4 000 h/yr. Not applicable when the purpose of the unit is to produce low steam temperatures and/or pressures in process industries. Not applicable to gas turbines and engines generating steam in CHP mode. For units combusting biomass, the applicability may be constrained by high-temperature corrosion in the case of certain biomasses	
13	In order to reduce water usage and the volume of contaminated waste water discharged, BAT is to use one or both of the techniques given below.			NA	<p>The Operator confirmed that this BAT Conclusion is not applicable to the installation, despite stating that they are currently compliant.</p> <p>There is no water supply to the site for the installation. Water used is for domestic facilities.</p> <p>We have set the status to NA instead of CC.</p> <p>We agree this BAT Conclusion is not applicable to the activities carried out at the installation.</p>
14	<p>In order to prevent the contamination of uncontaminated waste water and to reduce emissions to water, BAT is to segregate waste water streams and to treat them separately, depending on the pollutant content.</p> <p>Description Waste water streams that are typically segregated and treated include surface run-off water, cooling water, and waste water from flue-gas treatment.</p> <p>Applicability The applicability may be restricted in the case of existing plants due to the configuration of the drainage systems.</p>			NA	<p>The Operator confirmed that this BAT Conclusion is not applicable to the installation, despite stating that they are currently compliant.</p> <p>Contents of rain water / plant blind sumps are removed and tankered off site as required. This equates to approximately three tonnes per year.</p> <p>We have set the status to NA instead of CC.</p>

BAT C No.	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement																																							
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15	<p>In order to reduce emissions to water from flue-gas treatment, BAT is to use an appropriate combination of the techniques given below, and to use secondary techniques as close as possible to the source in order to avoid dilution.</p> <table border="1" data-bbox="300 485 1191 1383"> <thead> <tr> <th data-bbox="300 485 600 544">Technique</th> <th data-bbox="600 485 837 544">Typical pollutants prevented/abated</th> <th data-bbox="837 485 1191 544">Applicability</th> </tr> </thead> <tbody> <tr> <td colspan="3" data-bbox="300 544 1191 579" style="text-align: center;">Primary techniques</td> </tr> <tr> <td data-bbox="300 579 600 691">a. Optimised combustion (see BAT 6) and flue-gas treatment systems (e.g. SCR/SNCR, see BAT 7)</td> <td data-bbox="600 579 837 691">Organic compounds, ammonia (NH₃)</td> <td data-bbox="837 579 1191 691">Generally applicable</td> </tr> <tr> <td colspan="3" data-bbox="300 691 1191 726" style="text-align: center;">Secondary techniques ⁽²⁹⁾</td> </tr> <tr> <td data-bbox="300 726 600 785">b. Adsorption on activated carbon</td> <td data-bbox="600 726 837 785">Organic compounds, mercury (Hg)</td> <td data-bbox="837 726 1191 785">Generally applicable</td> </tr> <tr> <td data-bbox="300 785 600 970">c. Aerobic biological treatment</td> <td data-bbox="600 785 837 970">Biodegradable organic compounds, ammonium (NH₄⁺)</td> <td data-bbox="837 785 1191 970">Generally applicable for the treatment of organic compounds. Aerobic biological treatment of ammonium (NH₄⁺) may not be applicable in the case of high chloride concentrations (i.e. around 10 g/l)</td> </tr> <tr> <td data-bbox="300 970 600 1029">d. Anoxic/anaerobic biological treatment</td> <td data-bbox="600 970 837 1029">Mercury (Hg), nitrate (NO₃⁻), nitrite (NO₂⁻)</td> <td data-bbox="837 970 1191 1029">Generally applicable</td> </tr> <tr> <td data-bbox="300 1029 600 1088">e. Coagulation and flocculation</td> <td data-bbox="600 1029 837 1088">Suspended solids</td> <td data-bbox="837 1029 1191 1088">Generally applicable</td> </tr> <tr> <td data-bbox="300 1088 600 1171">f. Crystallisation</td> <td data-bbox="600 1088 837 1171">Metals and metalloids, sulphate (SO₄²⁻), fluoride (F⁻)</td> <td data-bbox="837 1088 1191 1171">Generally applicable</td> </tr> <tr> <td data-bbox="300 1171 600 1254">g. Filtration (e.g. sand filtration, microfiltration, ultrafiltration)</td> <td data-bbox="600 1171 837 1254">Suspended solids, metals</td> <td data-bbox="837 1171 1191 1254">Generally applicable</td> </tr> <tr> <td data-bbox="300 1254 600 1313">h. Flotation</td> <td data-bbox="600 1254 837 1313">Suspended solids, free oil</td> <td data-bbox="837 1254 1191 1313">Generally applicable</td> </tr> <tr> <td data-bbox="300 1313 600 1348">i. Ion exchange</td> <td data-bbox="600 1313 837 1348">Metals</td> <td data-bbox="837 1313 1191 1348">Generally applicable</td> </tr> <tr> <td data-bbox="300 1348 600 1383">j. Neutralisation</td> <td data-bbox="600 1348 837 1383">Acids, alkalis</td> <td data-bbox="837 1348 1191 1383">Generally applicable</td> </tr> </tbody> </table>	Technique	Typical pollutants prevented/abated	Applicability	Primary techniques			a. Optimised combustion (see BAT 6) and flue-gas treatment systems (e.g. SCR/SNCR, see BAT 7)	Organic compounds, ammonia (NH ₃)	Generally applicable	Secondary techniques ⁽²⁹⁾			b. Adsorption on activated carbon	Organic compounds, mercury (Hg)	Generally applicable	c. Aerobic biological treatment	Biodegradable organic compounds, ammonium (NH ₄ ⁺)	Generally applicable for the treatment of organic compounds. Aerobic biological treatment of ammonium (NH ₄ ⁺) may not be applicable in the case of high chloride concentrations (i.e. around 10 g/l)	d. Anoxic/anaerobic biological treatment	Mercury (Hg), nitrate (NO ₃ ⁻), nitrite (NO ₂ ⁻)	Generally applicable	e. Coagulation and flocculation	Suspended solids	Generally applicable	f. Crystallisation	Metals and metalloids, sulphate (SO ₄ ²⁻), fluoride (F ⁻)	Generally applicable	g. Filtration (e.g. sand filtration, microfiltration, ultrafiltration)	Suspended solids, metals	Generally applicable	h. Flotation	Suspended solids, free oil	Generally applicable	i. Ion exchange	Metals	Generally applicable	j. Neutralisation	Acids, alkalis	Generally applicable	NA	<p>The Operator confirmed that this BAT Conclusion is not applicable to the installation, despite stating that they are currently compliant.</p> <p>We have set the status to NA instead of CC.</p> <p>We agree this BAT Conclusion is not applicable to the activities carried out at the installation.</p>
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16	<p>In order to reduce the quantity of waste sent for disposal from the combustion and/or gasification process and abatement techniques, BAT is to organise operations so as to maximise, in order of priority and taking into account life-cycle thinking:</p> <p>(a) waste prevention, e.g. maximise the proportion of residues which arise as by-products;</p> <p>(b) waste preparation for reuse, e.g. according to the specific requested quality criteria;</p> <p>(c) waste recycling;</p> <p>(d) other waste recovery (e.g. energy recovery),</p> <p>by implementing an appropriate combination of techniques such as:</p> <table border="1" data-bbox="297 655 1189 1366"> <thead> <tr> <th data-bbox="297 655 495 687">Technique</th> <th data-bbox="495 655 887 687">Description</th> <th data-bbox="887 655 1189 687">Applicability</th> </tr> </thead> <tbody> <tr> <td data-bbox="297 687 495 895">a</td> <td data-bbox="495 687 887 895">Generation of gypsum as a by-product</td> <td data-bbox="887 687 1189 895">Quality optimisation of the calcium-based reaction residues generated by the wet FGD so that they can be used as a substitute for mined gypsum (e.g. as raw material in the plasterboard industry). The quality of limestone used in the wet FGD influences the purity of the gypsum produced</td> </tr> <tr> <td data-bbox="297 895 495 1102">b</td> <td data-bbox="495 895 887 1102">Recycling or recovery of residues in the construction sector</td> <td data-bbox="887 895 1189 1102">Recycling or recovery of residues (e.g. from semi-dry desulphurisation processes, fly ash, bottom ash) as a construction material (e.g. in road building, to replace sand in concrete production, or in the cement industry)</td> </tr> <tr> <td data-bbox="297 1102 495 1238">c</td> <td data-bbox="495 1102 887 1238">Energy recovery by using waste in the fuel mix</td> <td data-bbox="887 1102 1189 1238">The residual energy content of carbon-rich ash and sludges generated by the combustion of coal, lignite, heavy fuel oil, peat or biomass can be recovered for example by mixing with the fuel</td> </tr> <tr> <td data-bbox="297 1238 495 1366">d</td> <td data-bbox="495 1238 887 1366">Preparation of spent catalyst for reuse</td> <td data-bbox="887 1238 1189 1366">Preparation of catalyst for reuse (e.g. up to four times for SCR catalysts) restores some or all of the original performance, extending the service life of the catalyst to several decades.</td> </tr> </tbody> </table>	Technique	Description	Applicability	a	Generation of gypsum as a by-product	Quality optimisation of the calcium-based reaction residues generated by the wet FGD so that they can be used as a substitute for mined gypsum (e.g. as raw material in the plasterboard industry). The quality of limestone used in the wet FGD influences the purity of the gypsum produced	b	Recycling or recovery of residues in the construction sector	Recycling or recovery of residues (e.g. from semi-dry desulphurisation processes, fly ash, bottom ash) as a construction material (e.g. in road building, to replace sand in concrete production, or in the cement industry)	c	Energy recovery by using waste in the fuel mix	The residual energy content of carbon-rich ash and sludges generated by the combustion of coal, lignite, heavy fuel oil, peat or biomass can be recovered for example by mixing with the fuel	d	Preparation of spent catalyst for reuse	Preparation of catalyst for reuse (e.g. up to four times for SCR catalysts) restores some or all of the original performance, extending the service life of the catalyst to several decades.	CC	<p>The Operator confirmed that:</p> <p>Disposal of waste where possible is via recycling processes with contractors. Volumes of waste are very low due to activity levels on site.</p> <p>We agree with the Operator's stated compliance.</p>
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		Preparation of spent catalyst for reuse is integrated in a catalyst management scheme	NH ₃ emissions																										
17	In order to reduce noise emissions, BAT is to use one or a combination of the techniques given below.			CC	<p>The Operator confirmed that:</p> <p>Maintaining site noise prevention devices / sound proofing.</p> <p>Low levels of operating hours during the year.</p> <p>Regular maintenance of plant.</p> <p>The plant is as design and operated remotely with no new plant items requiring new noise assessments.</p> <p>O & M plan noise surveys to check against historic levels.</p> <p>We agree with the Operator's stated compliance.</p>																								
<table border="1"> <thead> <tr> <th data-bbox="300 488 331 520"></th> <th data-bbox="331 488 501 520">Technique</th> <th data-bbox="501 488 882 520">Description</th> <th data-bbox="882 488 1196 520">Applicability</th> </tr> </thead> <tbody> <tr> <td data-bbox="300 520 331 863">a</td> <td data-bbox="331 520 501 863">Operational measures</td> <td data-bbox="501 520 882 863"> These include: <ul style="list-style-type: none"> — improved inspection and maintenance of equipment — closing of doors and windows of enclosed areas, if possible — equipment operated by experienced staff — avoidance of noisy activities at night, if possible — provisions for noise control during maintenance activities </td> <td data-bbox="882 520 1196 863">Generally applicable</td> </tr> <tr> <td data-bbox="300 863 331 919">b</td> <td data-bbox="331 863 501 919">Low-noise equipment</td> <td data-bbox="501 863 882 919">This potentially includes compressors, pumps and disks</td> <td data-bbox="882 863 1196 919">Generally applicable when the equipment is new or replaced</td> </tr> <tr> <td data-bbox="300 919 331 1054">c</td> <td data-bbox="331 919 501 1054">Noise attenuation</td> <td data-bbox="501 919 882 1054">Noise propagation can be reduced by inserting obstacles between the emitter and the receiver. Appropriate obstacles include protection walls, embankments and buildings</td> <td data-bbox="882 919 1196 1054">Generally applicable to new plants. In the case of existing plants, the insertion of obstacles may be restricted by lack of space</td> </tr> <tr> <td data-bbox="300 1054 331 1238">d</td> <td data-bbox="331 1054 501 1238">Noise-control equipment</td> <td data-bbox="501 1054 882 1238"> This includes: <ul style="list-style-type: none"> — noise-reducers — equipment insulation — enclosure of noisy equipment — soundproofing of buildings </td> <td data-bbox="882 1054 1196 1238">The applicability may be restricted by lack of space</td> </tr> <tr> <td data-bbox="300 1238 331 1353">e</td> <td data-bbox="331 1238 501 1353">Appropriate location of equipment and buildings</td> <td data-bbox="501 1238 882 1353">Noise levels can be reduced by increasing the distance between the emitter and the receiver and by using buildings as noise screens</td> <td data-bbox="882 1238 1196 1353">Generally applicable to new plant</td> </tr> </tbody> </table>							Technique	Description	Applicability	a	Operational measures	These include: <ul style="list-style-type: none"> — improved inspection and maintenance of equipment — closing of doors and windows of enclosed areas, if possible — equipment operated by experienced staff — avoidance of noisy activities at night, if possible — provisions for noise control during maintenance activities 	Generally applicable	b	Low-noise equipment	This potentially includes compressors, pumps and disks	Generally applicable when the equipment is new or replaced	c	Noise attenuation	Noise propagation can be reduced by inserting obstacles between the emitter and the receiver. Appropriate obstacles include protection walls, embankments and buildings	Generally applicable to new plants. In the case of existing plants, the insertion of obstacles may be restricted by lack of space	d	Noise-control equipment	This includes: <ul style="list-style-type: none"> — noise-reducers — equipment insulation — enclosure of noisy equipment — soundproofing of buildings 	The applicability may be restricted by lack of space	e	Appropriate location of equipment and buildings	Noise levels can be reduced by increasing the distance between the emitter and the receiver and by using buildings as noise screens	Generally applicable to new plant
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BAT C No.	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement																																							
<p>BAT Conclusions 18 to 23 for the combustion of coal and/or lignite (solid fuels only) BAT Conclusions 24 to 27 for the combustion of solid biomass and/or peat (solid fuels only) BAT Conclusions 28 to 30 for the combustion of HFO and/or gas-oil in boilers (liquid fuels only) BAT Conclusions 31 to 35 for the combustion of HFO and/or gas-oil in engines (liquid fuels only) BAT Conclusions 36 to 39 for the combustion of gas oil in gas turbines (liquid fuels only) These BAT Conclusions are not applicable to the activities carried out at the installation.</p>																																										
Combustion of gaseous fuels																																										
40	<p>In order to increase the energy efficiency of natural gas combustion, BAT is to use an appropriate combination of the techniques given in BAT 12 and below.</p> <table border="1" data-bbox="297 611 1193 959"> <thead> <tr> <th data-bbox="297 611 443 679">Technique</th> <th data-bbox="443 611 616 679">Description</th> <th data-bbox="616 611 1193 679">Applicability</th> </tr> </thead> <tbody> <tr> <td data-bbox="297 679 443 959">a Combined cycle</td> <td data-bbox="443 679 616 959">See description in Section 8.2</td> <td data-bbox="616 679 1193 959"> Generally applicable to new gas turbines and engines except when operated < 1 500 h/yr. Applicable to existing gas turbines and engines within the constraints associated with the steam cycle design and the space availability. Not applicable to existing gas turbines and engines operated < 1 500 h/yr. Not applicable to mechanical drive gas turbines operated in discontinuous mode with extended load variations and frequent start-ups and shutdowns. Not applicable to boilers </td> </tr> </tbody> </table> <p>BAT-associated energy efficiency levels (BAT-AEELs) for the combustion of natural gas</p> <table border="1" data-bbox="297 1015 1193 1353"> <thead> <tr> <th data-bbox="297 1015 510 1177" rowspan="3">Type of combustion unit</th> <th colspan="5" data-bbox="510 1015 1193 1050">BAT-AEELs ⁽¹³⁶⁾ ⁽¹³⁷⁾</th> </tr> <tr> <th colspan="2" data-bbox="510 1050 712 1114">Net electrical efficiency (%)</th> <th data-bbox="712 1050 920 1177" rowspan="2">Net total fuel utilisation (%) ⁽¹³⁸⁾ ⁽¹³⁹⁾</th> <th colspan="2" data-bbox="920 1050 1193 1114">Net mechanical energy efficiency (%) ⁽¹³⁹⁾ ⁽¹⁴⁰⁾</th> </tr> <tr> <th data-bbox="510 1114 600 1177">New unit</th> <th data-bbox="600 1114 712 1177">Existing unit</th> <th data-bbox="920 1114 1032 1177">New unit</th> <th data-bbox="1032 1114 1193 1177">Existing unit</th> </tr> </thead> <tbody> <tr> <td data-bbox="297 1177 510 1241">Gas engine</td> <td data-bbox="510 1177 600 1241">39,5–44 ⁽¹⁴¹⁾</td> <td data-bbox="600 1177 712 1241">35–44 ⁽¹⁴¹⁾</td> <td data-bbox="712 1177 920 1241">56–85 ⁽¹⁴¹⁾</td> <td colspan="2" data-bbox="920 1177 1193 1241">No BAT-AEEL.</td> </tr> <tr> <td data-bbox="297 1241 510 1294">Gas-fired boiler</td> <td data-bbox="510 1241 600 1294">39–42,5</td> <td data-bbox="600 1241 712 1294">38–40</td> <td data-bbox="712 1241 920 1294">78–95</td> <td colspan="2" data-bbox="920 1241 1193 1294">No BAT-AEEL.</td> </tr> <tr> <td data-bbox="297 1294 510 1353">Open cycle gas turbine, ≥ 50 MWth</td> <td data-bbox="510 1294 600 1353">36–41,5</td> <td data-bbox="600 1294 712 1353">33–41,5</td> <td data-bbox="712 1294 920 1353">No BAT-AEEL</td> <td data-bbox="920 1294 1032 1353">36,5–41</td> <td data-bbox="1032 1294 1193 1353">33,5–41</td> </tr> </tbody> </table>	Technique	Description	Applicability	a Combined cycle	See description in Section 8.2	Generally applicable to new gas turbines and engines except when operated < 1 500 h/yr. Applicable to existing gas turbines and engines within the constraints associated with the steam cycle design and the space availability. Not applicable to existing gas turbines and engines operated < 1 500 h/yr. Not applicable to mechanical drive gas turbines operated in discontinuous mode with extended load variations and frequent start-ups and shutdowns. Not applicable to boilers	Type of combustion unit	BAT-AEELs ⁽¹³⁶⁾ ⁽¹³⁷⁾					Net electrical efficiency (%)		Net total fuel utilisation (%) ⁽¹³⁸⁾ ⁽¹³⁹⁾	Net mechanical energy efficiency (%) ⁽¹³⁹⁾ ⁽¹⁴⁰⁾		New unit	Existing unit	New unit	Existing unit	Gas engine	39,5–44 ⁽¹⁴¹⁾	35–44 ⁽¹⁴¹⁾	56–85 ⁽¹⁴¹⁾	No BAT-AEEL.		Gas-fired boiler	39–42,5	38–40	78–95	No BAT-AEEL.		Open cycle gas turbine, ≥ 50 MWth	36–41,5	33–41,5	No BAT-AEEL	36,5–41	33,5–41	CC	<p>The Operator confirmed that:</p> <p>Thermal Efficiency - Measurements taken 20 May 2015 (Control systems engineering report, dated 19 July 2015 (Issue 2) submitted to the Environment Agency 21 July 2015).</p> <p>Total gas fuel mass flow rate is 3990pph + 8219pph + 6692pph (3 stage combustion)</p> <p>= 2.38 ± 0.05 Kg/sec.</p> <p>Total energy input = 110.3 ± 2.6MW (LHV).</p> <p>Generator Power (Gross) is 45.85 ± 0.5 MWe</p> <p>Thermal Efficiency = 41.5 ± 1.1%</p> <p>At 50 MWe the thermal input to the site can be expressed as 100/η x 50</p> <p>= 120.5 ± 2.6 MW.</p> <p>The overall uncertainty of the total energy input is pessimistically based on ± 3% of point individual fuel mass flow accuracy (3 stage combustion), and ± 0.5 MW gas fuel LHV variation.</p> <p>We confirm that the net mechanical energy efficiency is not applicable to the installation, with notes 4 and 5 to the table as follows:</p>
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CCGT, 50–600 MW _{th}	53–58,5	46–54	No BAT-AEEL	No BAT-AEEL																			
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41	<p>In order to prevent or reduce NO_x emissions to air from the combustion of natural gas in boilers, BAT is to use one or a combination of the techniques given below.</p> <table border="1" data-bbox="297 707 1193 1185"> <thead> <tr> <th>Technique</th> <th>Description</th> <th>Applicability</th> </tr> </thead> <tbody> <tr> <td>a . Air and/or fuel staging</td> <td>See descriptions in Section 8.3. Air staging is often associated with low-NO_x burners</td> <td rowspan="3">Generally applicable</td> </tr> <tr> <td>b . Flue-gas recirculation</td> <td rowspan="2">See description in Section 8.3</td> </tr> <tr> <td>c . Low-NO_x burners (LNB)</td> </tr> <tr> <td>d . Advanced control system</td> <td>See description in Section 8.3. This technique is often used in combination with other techniques or may be used alone for combustion plants operated < 500 h/yr</td> <td>The applicability to old combustion plants may be constrained by the need to retrofit the combustion system and/or control command system</td> </tr> <tr> <td>e . Reduction of the combustion air temperature</td> <td>See description in Section 8.3</td> <td>Generally applicable within the constraints associated with the process needs</td> </tr> </tbody> </table>	Technique	Description	Applicability	a . Air and/or fuel staging	See descriptions in Section 8.3. Air staging is often associated with low-NO _x burners	Generally applicable	b . Flue-gas recirculation	See description in Section 8.3	c . Low-NO _x burners (LNB)	d . Advanced control system	See description in Section 8.3. This technique is often used in combination with other techniques or may be used alone for combustion plants operated < 500 h/yr	The applicability to old combustion plants may be constrained by the need to retrofit the combustion system and/or control command system	e . Reduction of the combustion air temperature	See description in Section 8.3	Generally applicable within the constraints associated with the process needs	NA	<p>The Operator confirmed that this BAT Conclusion is not applicable to the installation, despite stating that they are currently compliant.</p> <p>We have set the status to NA instead of CC.</p> <p>We agree this BAT Conclusion is not applicable to the activities carried out at the installation.</p>					
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BAT C No.	Summary of BAT Conclusion requirement			Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement															
	f. Selective non-catalytic reduction (SNCR)		Not applicable to combustion plants operated < 500 h/yr with highly variable boiler loads. The applicability may be limited in the case of combustion plants operated between 500 h/yr and 1 500 h/yr with highly variable boiler loads																	
	g. Selective catalytic reduction (SCR)		Not applicable to combustion plants operated < 500 h/yr. Not generally applicable to combustion plants of < 100 MW _{th} . There may be technical and economic restrictions for retrofitting existing combustion plants operated between 500 h/yr and 1 500 h/yr																	
42	In order to prevent or reduce NO _x emissions to air from the combustion of natural gas in gas turbines, BAT is to use one or a combination of the techniques given below.			CC	<p>The Operator confirmed that:</p> <p>a) Advanced control system – the gas turbine is controlled with an engine management system which is maintained through a service agreement.</p> <p>c) Dry low-NO_x burners – the gas turbine has a DLN combustion system.</p> <p>d) Low-load design concept – the gas turbine is not capable at operations at low load.</p> <p>NA: b, e and f</p> <p>Dry low NO_x load point:</p> <p>i. The output load @ 35MWe or ii. This output load @70% Thermal</p> <p>Applicable NO_x BAT AELs - table 24 of this BAT Conclusion.</p>															
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BAT C No.	Summary of BAT Conclusion requirement			Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
		combustion stages			<p>Yearly average BAT AELs do not apply to existing plants operated < 1,500 hours/year.</p> <p>Daily Average 25 - 55 mg/Nm³</p> <p>Refer to section 4.1 of this document for the setting of limits.</p> <p>We agree with the Operator's stated compliance.</p>
43		In order to prevent or reduce NO _x emissions to air from the combustion of natural gas in engines, BAT is to use one or a combination of the techniques given below.			<p>NA</p> <p>The Operator confirmed that this BAT Conclusion is not applicable to the installation, despite stating that they are currently compliant.</p> <p>We have set the status to NA instead of CC.</p> <p>We agree this BAT Conclusion is not applicable to the activities carried out at the installation.</p>

BAT C No.	Summary of BAT Conclusion requirement			Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement																																										
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44	<p>In order to prevent or reduce CO emissions to air from the combustion of natural gas, BAT is to ensure optimised combustion and/or to use oxidation catalysts. Description - See descriptions in Section 8.3. BAT-associated emission levels (BAT-AELs) for NO_x emissions to air from the combustion of natural gas in gas turbines</p> <table border="1" data-bbox="300 695 1191 863"> <thead> <tr> <th rowspan="2">Type of combustion plant</th> <th rowspan="2">Combustion plant total rated thermal input (MW_{th})</th> <th colspan="2">BAT-AELs (mg/Nm³) ⁽¹⁴²⁾ ⁽¹⁴³⁾</th> </tr> <tr> <th>Yearly average ⁽¹⁴⁴⁾ ⁽¹⁴⁵⁾</th> <th>Daily average or average over the sampling period</th> </tr> </thead> <tbody> <tr> <td colspan="4" style="text-align: center;">Open-cycle gas turbines (OCGTs) ⁽¹⁴⁶⁾ ⁽¹⁴⁷⁾</td> </tr> <tr> <td>New OCGT</td> <td>≥ 50</td> <td>15–35</td> <td>25–50</td> </tr> <tr> <td>Existing OCGT (excluding turbines for mechanical drive applications) — All but plants operated < 500 h/yr</td> <td>≥ 50</td> <td>15–50</td> <td>25–55 ⁽¹⁴⁸⁾</td> </tr> <tr> <td colspan="4" style="text-align: center;">Combined-cycle gas turbines (CCGTs) ⁽¹⁴⁶⁾ ⁽¹⁴⁹⁾</td> </tr> <tr> <td>New CCGT</td> <td>≥ 50</td> <td>10–30</td> <td>15–40</td> </tr> <tr> <td>Existing CCGT with a net total fuel utilisation of < 75 %</td> <td>≥ 600</td> <td>10–40</td> <td>18–50</td> </tr> <tr> <td>Existing CCGT with a net total fuel utilisation of ≥ 75 %</td> <td>≥ 600</td> <td>10–50</td> <td>18–55 ⁽¹⁵⁰⁾</td> </tr> <tr> <td>Existing CCGT with a net total fuel utilisation of < 75 %</td> <td>50–600</td> <td>10–45</td> <td>35–55</td> </tr> <tr> <td>Existing CCGT with a net total fuel utilisation of ≥ 75 %</td> <td>50–600</td> <td>25–50 ⁽¹⁵¹⁾</td> <td>35–55 ⁽¹⁵²⁾</td> </tr> </tbody> </table>			Type of combustion plant	Combustion plant total rated thermal input (MW _{th})	BAT-AELs (mg/Nm ³) ⁽¹⁴²⁾ ⁽¹⁴³⁾		Yearly average ⁽¹⁴⁴⁾ ⁽¹⁴⁵⁾	Daily average or average over the sampling period	Open-cycle gas turbines (OCGTs) ⁽¹⁴⁶⁾ ⁽¹⁴⁷⁾				New OCGT	≥ 50	15–35	25–50	Existing OCGT (excluding turbines for mechanical drive applications) — All but plants operated < 500 h/yr	≥ 50	15–50	25–55 ⁽¹⁴⁸⁾	Combined-cycle gas turbines (CCGTs) ⁽¹⁴⁶⁾ ⁽¹⁴⁹⁾				New CCGT	≥ 50	10–30	15–40	Existing CCGT with a net total fuel utilisation of < 75 %	≥ 600	10–40	18–50	Existing CCGT with a net total fuel utilisation of ≥ 75 %	≥ 600	10–50	18–55 ⁽¹⁵⁰⁾	Existing CCGT with a net total fuel utilisation of < 75 %	50–600	10–45	35–55	Existing CCGT with a net total fuel utilisation of ≥ 75 %	50–600	25–50 ⁽¹⁵¹⁾	35–55 ⁽¹⁵²⁾	CC	<p>The Operator confirmed that:</p> <p>Historic engine CO emissions are below ELVs as required in the permit. This is a characteristic of this type of gas turbine.</p> <p>They confirm that they would be compliant with a CO ELV of 40 mg/Nm³. However, as we have introduced a restriction on operating hours for the OCGT to <1,500 hours per year, the yearly BAT AEL for NO_x and the yearly indicative emission limit for CO are not applicable.</p> <p>Refer to section 4.1 of this document for the setting of limits.</p> <p>We agree with the Operator's stated compliance.</p>
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BAT C No.	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement																											
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45	<p>In order to reduce non-methane volatile organic compounds (NMVOC) and methane (CH₄) emissions to air from the combustion of natural gas in spark-ignited lean-burn gas engines, BAT is to ensure optimised combustion and/or to use oxidation catalysts.</p> <p>Description</p> <p>See descriptions in Section 8.3. Oxidation catalysts are not effective at reducing the emissions of saturated hydrocarbons containing less than four carbon atoms.</p> <p>BAT-associated emission levels (BAT-AELs) for formaldehyde and CH₄ emissions to air from the combustion of natural gas in a spark-ignited lean-burn gas engine</p> <table border="1" data-bbox="300 871 1191 1094"> <thead> <tr> <th rowspan="4">Combustion plant total rated thermal input (MW_{th})</th> <th colspan="3">BAT-AELs (mg/Nm³)</th> </tr> <tr> <th>Formaldehyde</th> <th colspan="2">CH₄</th> </tr> <tr> <th colspan="3">Average over the sampling period</th> </tr> <tr> <th>New or existing plant</th> <th>New plant</th> <th>Existing plant</th> </tr> </thead> <tbody> <tr> <td>≥ 50</td> <td>5–15 ⁽¹⁶²⁾</td> <td>215–500 ⁽¹⁶³⁾</td> <td>215–560 ⁽¹⁶²⁾ ⁽¹⁶³⁾</td> </tr> </tbody> </table>	Combustion plant total rated thermal input (MW _{th})	BAT-AELs (mg/Nm ³)			Formaldehyde	CH ₄		Average over the sampling period			New or existing plant	New plant	Existing plant	≥ 50	5–15 ⁽¹⁶²⁾	215–500 ⁽¹⁶³⁾	215–560 ⁽¹⁶²⁾ ⁽¹⁶³⁾	NA	<p>The Operator confirmed that this BAT Conclusion is not applicable to the installation, despite stating that they are currently compliant.</p> <p>We have set the status to NA instead of CC.</p> <p>We agree this BAT Conclusion is not applicable to the activities carried out at the installation.</p>
Combustion plant total rated thermal input (MW _{th})	BAT-AELs (mg/Nm ³)																			
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	Average over the sampling period																			
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<p>BAT Conclusions 46 to 51 for iron and steel process gases.</p> <p>BAT Conclusions 52 to 54 for offshore platforms.</p> <p>BAT Conclusions 55 to 59 for chemical process gases.</p> <p>BAT Conclusions 60 to 71 for co-incineration.</p> <p>BAT Conclusions 72 to 75 for gasification.</p> <p>These BAT Conclusions are not applicable to the activities carried out at the installation.</p>																				

6 Review and assessment of derogation requests made by the operator in relation to BAT Conclusions which include an associated emission level (AEL) value

The IED enables a competent authority to allow derogations from BAT AELs stated in BAT Conclusions under specific circumstances as detailed under Article 15(4):

By way of derogation from paragraph 3, and without prejudice to Article 18, the competent authority may, in specific cases, set less strict emission limit values. Such a derogation may apply only where an assessment shows that the achievement of emission levels associated with the best available techniques as described in BAT conclusions would lead to disproportionately higher costs compared to the environmental benefits due to:

(a) the geographical location or the local environmental conditions of the installation concerned; or

(b) the technical characteristics of the installation concerned.

The Operator did not make any such request.

7 Emissions to water

There are no emissions to water from the installation.

8 Additional IED Chapter II requirements:

Permit condition/table	Justification
2.3.7, 4.2.2 and tables S1.1 and S4.3	<p>We have introduced a limit on operating hours in open cycle mode for the LCP in line with our guidance 'BAT for Balancing Plant' (see below) as we do not consider this mode of operation as BAT for plant operating over 1,500 hours/year.</p> <p>We have amended the reporting requirements in the permit. We have added in a reporting requirement for operating hours to be reported over a five year rolling average to demonstrate compliance with the less than 1,500 hours/year operational limit.</p> <p>The OCGTs in the permits have previously operated with no restriction on hours. However, we are not satisfied that there is sufficient evidence available to demonstrate that OCGTs represent BAT for plants operating for more than 1,500 hours/year. Therefore, we have specified 1,500 hours as a limit on operational hours in the permit.</p> <p>Article 11 of the IED 2010/75/EU states that BAT are applied. BAT requires the use of the most effective and advanced techniques to prevent or minimise emissions and impacts on the environment.</p> <p>Relevant guidance that we have drawn on, for BAT, includes the Department of Energy and Climate Change '<i>Developing best available techniques (BAT) for combustion plants operating in the balancing market</i>' and Chapter III of IED and the BAT Conclusions, all of which specifically identify two categories of combustion plant operating in the balancing market as peaking plant: those that operate less than 500 hours and those that operate from 500 hours up to 1,500 hours. Within these documents no other categories of operational regimes are recognised other than base load operation.</p> <p>Furthermore, draft Environment Agency guidance '<i>BAT guidance for >50 MWth gas and liquid fuel combustion plant exporting electricity under commercial arrangements for <1,500 hours per annum</i>' consolidates our position on the above and stipulates that combustion plants operating in a single cycle, will be limited to 1,500 hours per annum on a rolling average.</p>

	<p>OCGTs operating as peaking plant are classed as fast start, lower efficiency and would generally have higher emissions of oxides of nitrogen (NOx) per megawatt hour of energy produced than would be expected for natural gas fired base load plant. Therefore, OCGTs are better suited to fast reserve running for short periods of time in comparison to base load plants which are more appropriate for steady state running operations.</p> <p>The use of fast start combined cycle gas turbines (CCGT) aero derivative, gas turbine combined heat and power (GT-CHP) or a large gas engine with combined heat and power would be considered to be a more favourable alternative, in terms of energy efficiency, than the proposal presented in this Regulation 61 response.</p> <p>The National Emissions Ceiling Directive (NECD) sets national targets for reductions in pollutants including NOx. Restrictions on plants with higher NOx intensity directly contributes to achieving the NECD targets.</p> <p>For this reason the variation restricts the hours of operation of the plant to no more than 1,500 hours/year as a rolling average over a five year period and with operation of the turbine in any individual year limited to a maximum of 2,250 hours.</p>
2.3.8 and IP4 in table S1.3	<p>In the event of a black out National Grid would call on combustion plant to operate and may require them to do so outside their permitted conditions. We have dedicated black start plant and they are permitted to run as such but this scenario is relevant to the rest of the LCP which could be called depending on the circumstances.</p> <p>A risk assessment will be carried out by Energy UK/Joint Environmental Programme on behalf of LCP connected to the National Transmission System. Air emissions modelling will be based on generic black start scenarios to establish whether they have the potential to have a local impact on the environment or not (on a national basis). If the modelling demonstrates that no significant impacts are likely, the plant can operate under condition 2.3.8. This condition allows the hourly ELVs for plants operating under a black start instruction to be discounted for the purpose of reporting. We would also require there to be a procedure in place for minimisation of emissions in the case of a black start event and for reporting in the event of a black start. This modelling and the procedures have not been agreed in advance of the issue of the permit review and therefore a condition linking back to an improvement condition has been included in the permit.</p>

S1.3	IP3 status changed to complete.
Schedule 6 Interpretation	Deleted the definition for “background concentration” which isn’t applicable to the installation.
	Added definition for “baseload” operation.
	Added definition for “daily average”.
	Deleted definition for “Mid-merit” which is no longer applicable as the plant is limited to 1,500 hours/year. Mid-merit definition was for combustion plant operating between 1,500 and 4,000 hours/year.
	Amended reference conditions definitions to remove those not applicable to the facility.
Installation name	Changed from Seal Sands OCGT Power Station to Viking Plant.

9 Review and assessment of changes that are not part of the BAT Conclusions derived permit review.

This document should be read in conjunction with the application, supporting information and notice.

Aspect considered	Decision
Receipt of application	
Confidential information	A claim for commercial or industrial confidentiality has not been made.
Identifying confidential information	We have not identified information provided as part of the application that we consider to be confidential.
The site	
Extent of the site of the facility	The Operator has provided a plan which we consider is satisfactory, showing the extent of the site of the facility The plan is included in the permit.
Biodiversity, heritage, landscape and nature conservation	The application is within the relevant distance criteria of a site of heritage, landscape or nature conservation, and/or protected species or habitat. A full assessment of the application and its potential to affect the site(s)/species/habitat has not been carried out as part of the permit review process. We consider that the review will not affect the features of the site(s)/species/habitat as the conditions will provide at

Aspect considered	Decision
	<p>least the same level of protection as those in the previous permit and in some cases will provide a higher level of protection to those in the previous permit.</p> <p>We have not consulted Natural England on the application. The decision was taken in accordance with our guidance.</p>
Operating techniques	
General operating techniques	<p>We have reviewed the techniques used by the Operator where they are relevant to the BAT Conclusions and compared these with the relevant guidance notes.</p> <p>The permit conditions ensure compliance with the relevant BREF, BAT Conclusions. The ELVs deliver compliance with the BAT AELs.</p>
Permit conditions	
Updating permit conditions during consolidation	<p>We have updated permit conditions to those in the current generic permit template as part of permit consolidation. The conditions will provide at least the same level of protection as those in the previous permit and in some cases will provide a higher level of protection to those in the previous permit.</p>
Changes to the permit conditions due to an Environment Agency initiated variation	<p>We have varied the permit as stated in the variation notice.</p>
Improvement programme	<p>Based on the information in the Regulation 61 response, we consider that we need to impose an improvement programme. The reasons for this are explained in section 8 of this document.</p>
Emission limits	<p>We have decided that emission limits should be set for the parameters listed in the permit.</p> <p>These are described in the relevant BAT Conclusions in sections 4.1 and 5 of this document.</p> <p>It is considered that the ELVs described above will</p>

Aspect considered	Decision
	ensure that significant pollution of the environment is prevented and a high level of protection for the environment is secured.
Monitoring	<p>We have decided that monitoring should be carried out for the parameters listed in the permit, using the methods detailed and to the frequencies specified.</p> <p>These are described in the relevant BAT Conclusions in section 5 of this document.</p> <p>Table S3.2 Process monitoring requirements was added to include the requirement to monitor energy efficiency after overhauls on site in line with BAT Conclusion 2.</p> <p>Based on the information in the application we are satisfied that the Operator’s techniques, personnel and equipment have either MCERTS certification or MCERTS accreditation as appropriate.</p>
Reporting	<p>We have specified reporting in the permit for the following parameters:</p> <ul style="list-style-type: none"> • Nitrogen dioxide • Carbon monoxide • Sulphur dioxide <p>These are described in the relevant BAT Conclusions in section 5 of this document.</p>
Operator competence	
Management system	There is no known reason to consider that the Operator will not have the management system to enable them to comply with the permit conditions.
Growth Duty	
Section 108 Deregulation Act 2015 – Growth duty	<p>We have considered our duty to have regard to the desirability of promoting economic growth set out in section 108(1) of the Deregulation Act 2015 and the guidance issued under section 110 of that Act in deciding whether to grant this permit.</p> <p>Paragraph 1.3 of the guidance says: “The primary role of regulators, in delivering</p>

Aspect considered	Decision
	<p>regulation, is to achieve the regulatory outcomes for which they are responsible. For a number of regulators, these regulatory outcomes include an explicit reference to development or growth. The growth duty establishes economic growth as a factor that all specified regulators should have regard to, alongside the delivery of the protections set out in the relevant legislation.”</p> <p>We have addressed the legislative requirements and environmental standards to be set for this operation in the body of the decision document above. The guidance is clear at paragraph 1.5 that the growth duty does not legitimise non-compliance and its purpose is not to achieve or pursue economic growth at the expense of necessary protections.</p> <p>We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution. This also promotes growth amongst legitimate Operators because the standards applied to the Operator are consistent across businesses in this sector and have been set to achieve the required legislative standards.</p>