

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/EP3333RW
The Operator is: Uniper UK Limited
The Installation is: Taylor's Lane Power Station
This Variation Notice number is: EPR/EP3333RW/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 published on 17th 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 best available techniques (BAT) conclusions ('BAT Conclusions') for large combustion plant 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.

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
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 it 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 1st 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 large combustion plant 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 17th August 2021, which will then ensure that operations meet the revised standard, or
- Justifies why standards will not be met by 17th 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 31 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.

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)
- The review and assessment of the availability of BAT for gas turbines operating <500 hours per year

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.

The LCP(s) on site consist of:

LCP 390: a 280MWth OCGT, a GT pair that vent via flues within a single windshield at emission point A1. The units burn gas oil as a fuel. The GT pair can also fire in half-load or partial load modes

LCP 391: a 280MWth OCGT, a GT pair that vent via flues within a single windshield at emission point A2. The units burn gas oil as a fuel. The GT pair can also fire in half-load or partial load modes.

The plant was put into operation before 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:

- <500 hours non-emergency plant

The following tables outline the limits that have been incorporated into the permit for LCP390 and LCP391, 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% oxygen concentration if flue gases. The emission limits and monitoring requirements have been incorporated into Schedule 3 of the permit.

Under Chapter III gas turbines and gas engines operating for less than 500 hours per year are considered to be emergency plant and therefore were not covered by the emission limits set out in IED Annex V. However, for the purposes of the LCP BAT review, plants operated for emergency use may only be defined as plants which operate for the sole purpose of providing power at a site during an onsite emergency and/or during a black start and which do not provide balancing services or demand side response services. As this site runs commercially on an intermittent basis to support the Grid, it is not considered emergency plant and therefore indicative BAT applies.

We have set the indicative limits requiring validation through emission factors based on the principle that we will not require plant to fire up with the sole purpose of performing an emission measurement, as set out the UK Regulators Interpretation Document.

NOx limits (mg/Nm ³)					
Averaging	IED (Annex V Part 1) - Existing	BREF	Expected permit limits	Basis	Monitoring
Annual	None	None	None	N/A	Concentration by calculation, every 2 years ^{Note 3}
Monthly	None	None	None	N/A	
Daily	None	Note 1	250 ^{Note 2}	Reported emissions <small>Notes 1, 2</small>	
95 th %ile of hr means	None	None	None	N/A	
<p>Note 1: BATc 38 provides an indicative emission level of 250 mg/Nm³ for combustion of gas oil in dual fuel gas turbines operating less than 500 hours per year. However this indicative figure is not strictly applicable to LCP 390 and LCP 391, because the gas turbines are not dual fuel.</p> <p>Note 2: We have set a benchmark emission level at 250 mg/Nm³ based on the emissions reported by the Operator.</p> <p>Note 3: Footnote 2 to BAT conclusion 4 specifies that the monitoring frequency does not apply where plant operation would be for the sole purpose of performing an emission measurement.</p>					

SO₂ limits (mg/Nm³) – indicative in <i>italics</i>					
Averaging	IED (Annex V Part 1) - Existing	BREF	Expected permit limits	Basis	Monitoring
Annual	None	None	None	N/A	Concentration by calculation, every 2 years ^{Notes 1, 2}
Monthly	None	None	None	N/A	
Daily	None	66	66	BREF	
95th %ile of hr means	None	None	None	N/A	
<p>Note 1: Footnote 2 to BAT conclusion 4 specifies that the monitoring frequency does not apply where plant operation would be for the sole purpose of performing an emission measurement.</p> <p>Note 2: Footnote 8 to BAT conclusion 4 specifies that, as an alternative to the continuous measurement, in the case of plants combusting oil with a known sulphur content and where there is no flue- gas desulphurisation system, periodic measurements at least once every three months and/or other procedures ensuring the provision of data of an equivalent scientific quality may be used to determine the SO₂ emissions.</p>					

Dust limits (mg/Nm³) – indicative in <i>italics</i>					
Averaging	IED (Annex V Part 1) - Existing	BREF	Expected permit limits	Basis	Monitoring
Annual	None	None	None	N/A	Concentration by calculation, every 2 years ^{Note 1}
Monthly	None	None	None	N/A	
Daily average or average over the sampling period	None	10	10	BREF	
95th %ile of hr means	None	None	None	N/A	
<p>Note 1: Footnote 2 to BAT conclusion 4 specifies that the monitoring frequency does not apply where plant operation would be for the sole purpose of performing an emission measurement.</p>					

We have specified in the revised permit monitoring and reporting requirements for LCP390 and LCP391 based on calculation of emissions according to the agreed protocol established in JEP Report JEP17EMG02/UTG/18/ERG/CT/773/R 'Maintaining the Emissions Performance of Open Cycle Gas Turbines that operate for less than 500 hours per year', October 2018. This is because we consider footnote 2 to BAT conclusion 4 to be relevant, this footnote specifies that the monitoring frequency does not apply where plant operation would be for the sole purpose of performing an emission measurement.

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.

Table 21 of the BAT Conclusions specifies that the AEELs for this type of plant are not applicable to plant operating less than 1500 hours per year. We have therefore not assessed this operational aspect of the plant for LPC 390 and LCP 391. We have however included a process monitoring requirement in table S3.3 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. For <500 hour plant 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.

4.3 The review and assessment of BAT for gas turbines operating < 500 hours per year

Joint Environmental Programme (JEP) produced a document '*BAT Assessment for Existing Gas and Liquid Fuel Fired OCGTs, CCGTs and Dual-fuel GTs with a Thermal Input Rating of 50MWth or Greater Operating <500 Hours Per Year*' dated October 2018. The content of this document has been agreed in principle by the Environment Agency and we have therefore taken the document into account during our determination of this variation.

In order to prevent or reduce NO_x emissions to air from the combustion of gas oil in gas turbines, BAT is to use one or a combination of the techniques given in BAT 37. The Operator has considered the following techniques as those potentially applicable to gas turbines firing gas oil and operating less than 500 hours per year:

- a. Water/Steam injection;
- b. Use of Dry Low NO_x burners.

The JEP cost benefit analysis (Appendix A to *BAT Assessment for Existing Gas and Liquid Fuel Fired OCGTs, CCGTs and Dual-fuel GTs with a Thermal Input Rating of 50MWth or Greater Operating <500 Hours Per Year*) concludes that retrofitting Dry Low NO_x (DLN) or Wet Low Emissions (WLE) to existing OCGTs firing natural gas or gas oil, and operating for less than 500 hour per year, is not justified from a cost-benefit perspective. Meaning there is insufficient environmental benefit in reducing the already low annual mass emission, when considering the high conversion costs.

The gas turbines are a mix of Olympus 'A' and 'B' rated engines installed in the late 1970's. The Operator has concluded that, as retrofit packages for older Olympus engines are not available, the currently permitted performance along with continued appropriate maintenance, are BAT to prevent or reduce emissions of NOx from these gas turbines.

We agree that the techniques reported under BAT conclusion 37 are not applicable to LCP 390 and LCP 391.

In all cases, the minimum BAT requirements are considered to be: i) the continued compliance with any permit requirements already in place to protect air quality and ii) the demonstration of an appropriate maintenance regime to maintain plant emissions performance.

5 Decision checklist regarding relevant BAT Conclusions

BAT Conclusions for large combustion plant, were published by the European Commission on 17th 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, S3.1a
Energy efficiency	1.2 and 2.3	S3.4
Noise	3.4 and 2.3	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 Concn. Number	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. <p>Etc - see BAT Conclusions</p>	CC	The Operator confirmed that there is an EMS certified to ISO 14001 in place that the certification is consistent with the requirements of BAT 1.

BAT Concn. Number	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>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 BAT-AEELs are not applicable to plant operating <1500 hours.</p> <p>There have been no performance tests carried out at Taylors Lane due to limited running of the plant. The Operator provided confirmation of the name plate efficiency, which we consider adequate for this plant. The manual for the plant states a station thermal efficiency figure of 26.2% at normal peak rating.</p> <p>A process monitoring requirement has been set in table S3.3 which requires energy efficiency monitoring after an overhaul.</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="322 1114 1491 1284"> <thead> <tr> <th data-bbox="322 1114 685 1145">Stream</th> <th data-bbox="685 1114 1122 1145">Parameter(s)</th> <th data-bbox="1122 1114 1491 1145">Monitoring</th> </tr> </thead> <tbody> <tr> <td data-bbox="322 1145 685 1251" rowspan="3">Flue-gas</td> <td data-bbox="685 1145 1122 1177">Flow</td> <td data-bbox="1122 1145 1491 1177">Periodic or continuous determination</td> </tr> <tr> <td data-bbox="685 1177 1122 1209">Oxygen content, temperature, and pressure</td> <td data-bbox="1122 1177 1491 1209">Periodic or continuous measurement</td> </tr> <tr> <td data-bbox="685 1209 1122 1251">Water vapour content (2)</td> <td data-bbox="1122 1209 1491 1251"></td> </tr> <tr> <td data-bbox="322 1251 685 1284">Waste water from flue-gas treatment</td> <td data-bbox="685 1251 1122 1284">Flow, pH, and temperature</td> <td data-bbox="1122 1251 1491 1284">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 (2)		Waste water from flue-gas treatment	Flow, pH, and temperature	Continuous measurement	NA	<p>We do not require monitoring for these parameters where no periodic or continuous monitoring is specified in the permit.</p> <p>No flue gas treatment is undertaken on site.</p>
Stream	Parameter(s)	Monitoring														
Flue-gas	Flow	Periodic or continuous determination														
	Oxygen content, temperature, and pressure	Periodic or continuous measurement														
	Water vapour content (2)															
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>	CC	<p>OCGTs operating for <500 hours are subject to indicative daily BAT-AELs only. The monitoring</p>													

BAT Concn. Number	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							
Substance/Parameter	Fuel/Process/Type of combustion plant	Combustion plant total rated thermal input	Standard(s) ⁽⁴⁾	Minimum monitoring frequency ⁽⁵⁾	Monitoring associated with	<p>frequencies described in BAT 4 do not apply where plant operation would be for the sole purpose of performing or emission measurement.</p> <p>We have specified monitoring against the indicative AELs through emission factors in table S3.1a.</p> <p>Concentrations of NO_x, CO and SO₂ are calculated every 2 years based on fuel usage and emissions factors, according to the agreed protocol described in JEP Report JEP17EMG02 / UTG/18/ERG/CT/773/R 'Maintaining the Emissions Performance of Open Cycle Gas Turbines that operate for less than 500 hours per year', October 2018.</p> <p>There is no SCR/SNCR on site and therefore no requirement to monitor ammonia or SO₃.</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	— Coal and/or lignite in circulating fluidised bed boilers	All sizes	EN 21258	Once every year ⁽¹⁰⁾	BAT 20 BAT 24										
	— Solid biomass and/or peat in circulating fluidised bed boilers														
CO	— Coal and/or lignite including waste co-incineration	All sizes	Generic EN standards	Continuous ⁽⁶⁾ ⁽⁸⁾	BAT 20 BAT 24 BAT 28 BAT 33 BAT 38 BAT 44										

BAT Concn. Number	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"> — 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 				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 — Iron and steel process gases — Process fuels from the chemical industry in boilers — IGCC plants 	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		
SO ₃		<ul style="list-style-type: none"> — When SCR is used 	All sizes	No EN standard available	Once every year	—		
Gaseous chlorides,		<ul style="list-style-type: none"> — Coal and/or lignite 	All sizes	EN 1911	Once every three months ⁽⁶⁾ ⁽¹³⁾ ⁽¹⁴⁾	BAT 21 BAT 57		

BAT Concn. Number	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
	expressed as HCl	— Process fuels from the chemical industry in boilers						
		— Solid biomass and/or peat	All sizes	Generic EN standards	Continuous ⁽¹⁵⁾ ⁽¹⁶⁾	BAT 25		
		— Waste co-incineration	All sizes	Generic EN standards	Continuous ⁽⁶⁾ ⁽¹⁶⁾	BAT 66 BAT 67		
	HF	— Coal and/or lignite	All sizes	No EN standard available	Once every three months ⁽⁶⁾ ⁽¹³⁾ ⁽¹⁴⁾	BAT 21 BAT 57		
		— Process fuels from the chemical industry in boilers						
		— Solid biomass and/or peat	All sizes	No EN standard available	Once every year	BAT 25		
	Dust	— Coal and/or lignite	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		
		— 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						
		— IGCC plants						
		— HFO- and/or gas-oil-fired engines						
— Gas-oil-fired gas turbines								
— Waste co-incineration	All sizes	Generic EN standards and EN 13284-2	Continuous	BAT 68 BAT 69				
Metals and metalloids except mercury	— Coal and/or lignite	All sizes	EN 14385	Once every year ⁽¹⁸⁾	BAT 22 BAT 26			
	— Solid biomass and/or peat				BAT 30			

BAT Concn. Number	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
	(As, Cd, Co, Cr, Cu, Mn, Ni, Pb, Sb, Se, Ti, V, Zn)	— HFO- and/or gas-oil-fired boilers and engines						
		— 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₎			
	— IGCC plants	≥ 100 MW _{th}	EN 14385	Once every year ₍₁₈₎	BAT 75			
	Hg	— 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₎			
		— Solid biomass and/or peat	All sizes	EN 13211	Once every year ₍₂₂₎	BAT 27		
		— Waste co-incineration with solid biomass and/or peat	All sizes	EN 13211	Once every three months ₍₁₃₎	BAT 70		
		— IGCC plants	≥ 100 MW _{th}	EN 13211	Once every year ₍₂₃₎	BAT 75		
	TVOC	— 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		
			— Waste co-incineration with coal, lignite, solid biomass and/or peat	All sizes	Generic EN standards	Continuous		
	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	All sizes	EN 1948-1, EN 1948-2, EN 1948-3	Once every six months ₍₁₃₎₍₂₅₎	BAT 59 BAT 71		
		— Waste co-incineration						

BAT Concn. Number	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																																																
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="331 475 1491 1225"> <thead> <tr> <th colspan="2">Substance/Parameter</th> <th>Standard(s)</th> <th>Minimum monitoring frequency</th> <th>Monitoring associated with</th> </tr> </thead> <tbody> <tr> <td colspan="2">Total organic carbon (TOC)₍₂₆₎</td> <td>EN 1484</td> <td rowspan="10">Once every month</td> <td rowspan="10">BAT 15</td> </tr> <tr> <td colspan="2">Chemical oxygen demand (COD)₍₂₆₎</td> <td>No EN standard available</td> </tr> <tr> <td colspan="2">Total suspended solids (TSS)</td> <td>EN 872</td> </tr> <tr> <td colspan="2">Fluoride (F⁻)</td> <td>EN ISO 10304-1</td> </tr> <tr> <td colspan="2">Sulphate (SO₄²⁻)</td> <td>EN ISO 10304-1</td> </tr> <tr> <td colspan="2">Sulphide, easily released (S²⁻)</td> <td>No EN standard available</td> </tr> <tr> <td colspan="2">Sulphite (SO₃²⁻)</td> <td>EN ISO 10304-3</td> </tr> <tr> <td rowspan="7">Metals and metalloids</td> <td>As</td> <td rowspan="7">Various EN standards available (e.g. EN ISO 11885 or EN ISO 17294-2)</td> </tr> <tr> <td>Cd</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> </tr> <tr> <td colspan="2">Chloride (Cl⁻)</td> <td>Various EN standards available (e.g. EN ISO 10304-1 or EN ISO 15682)</td> <td>—</td> </tr> <tr> <td colspan="2">Total nitrogen</td> <td>EN 12260</td> <td>—</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 metalloids	As	Various EN standards available (e.g. EN ISO 11885 or EN ISO 17294-2)	Cd	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	—	NA	The site does not carry out flue-gas treatment.
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 metalloids	As	Various EN standards available (e.g. EN ISO 11885 or EN ISO 17294-2)																																																	
	Cd																																																		
	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	—																																																
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" data-bbox="331 1337 1491 1374"> <thead> <tr> <th>Technique</th> <th>Description</th> <th>Applicability</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Technique	Description	Applicability				CC	In order to improve the general environmental performance of the plant at Taylors Lane, regular planned maintenance (b) is carried out according to the																																										
Technique	Description	Applicability																																																	

BAT Concn. Number	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
	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	<p>supplier recommendations. Low sulphur fuel (e) (to meet legal requirements) is also utilised.</p> <p>The combustions units are approximately 40 years old. Due to the nature and age of the plant and the fuels used on the OCGTs the following techniques are not carried out: fuel blending and mixing (a), it does not have an advanced control system (c) and good design of the combustion equipment (d) is generally only applicable to new plant.</p>
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 of the combustion equipment	Good design of furnace, combustion chambers, burners and associated devices	Generally applicable to new 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</p> <p>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	Not applicable - no SCR or SNCR on site.
8	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.			NA	The gas turbines are not fitted with emissions abatement

BAT Concn. Number	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="322 836 1494 1374"> <thead> <tr> <th data-bbox="322 836 712 874">Fuel(s)</th> <th data-bbox="712 836 1494 874">Substances/Parameters subject to characterisation</th> </tr> </thead> <tbody> <tr> <td data-bbox="322 874 712 1075" rowspan="3">Biomass/peat</td> <td data-bbox="712 874 1494 912">— LHV</td> </tr> <tr> <td data-bbox="712 912 1494 951">— moisture</td> </tr> <tr> <td data-bbox="712 951 1494 1075">— Ash — C, Cl, F, N, S, K, Na — Metals and metalloids (As, Cd, Cr, Cu, Hg, Pb, Zn)</td> </tr> <tr> <td data-bbox="322 1075 712 1289" rowspan="4">Coal/lignite</td> <td data-bbox="712 1075 1494 1114">— LHV</td> </tr> <tr> <td data-bbox="712 1114 1494 1152">— Moisture</td> </tr> <tr> <td data-bbox="712 1152 1494 1190">— Volatiles, ash, fixed carbon, C, H, N, O, S</td> </tr> <tr> <td data-bbox="712 1190 1494 1228">— Br, Cl, F</td> </tr> <tr> <td data-bbox="322 1289 712 1374" rowspan="2">HFO</td> <td data-bbox="712 1289 1494 1327">— Ash</td> </tr> <tr> <td data-bbox="712 1327 1494 1374">— C, S, N, Ni, V</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	HFO	— Ash	— C, S, N, Ni, V	CC	<p>The Operator has confirmed that Taylor's Lane meets the relevant sections of the JEP Characterisation of Power Plant Fuels for Compliance with LCP BREF Conclusion BAT 9 (UTG/19/APA/FT/662/R, October 2019).</p> <p>We have referenced the above JEP protocol in Table S1.2 of the consolidated permit. The Operator has also confirmed that the sites EMS will be updated to incorporate the requirements of section 4.5 of the JEP protocol.</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																
	— Br, Cl, F																
HFO	— Ash																
	— C, S, N, Ni, V																

BAT Concn. Number	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="322 384 712 469">Gas oil</td> <td data-bbox="712 384 1491 469"> <ul style="list-style-type: none"> — Ash — N, C, S </td> </tr> <tr> <td data-bbox="322 469 712 553">Natural gas</td> <td data-bbox="712 469 1491 553"> <ul style="list-style-type: none"> — LHV — CH₄, C₂H₆, C₃, C₄+, CO₂, N₂, Wobbe index </td> </tr> <tr> <td data-bbox="322 553 712 638">Process fuels from the chemical industry⁽²⁷⁾</td> <td data-bbox="712 553 1491 638"> <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="322 638 712 708">Iron and steel process gases</td> <td data-bbox="712 638 1491 708"> <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="322 708 712 863">Waste⁽²⁸⁾</td> <td data-bbox="712 708 1491 863"> <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>	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) 		
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) 												
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 events, duration, emissions quantification/estimation) and implementation of corrective actions if necessary. 	CC	<p>The existing site EMS incorporates the key aspects of BAT 10. The site operates a risk based review with the EMS which includes a review of potential impacts of OTNOC.</p> <p>The power station was purpose designed to minimise environmental impact throughout during operational / non-operational conditions. e.g. primary, secondary and tertiary containment measures to prevent emissions to soil or water from incidents.</p>										

BAT Concn. Number	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																								
11	<p>BAT is to appropriately monitor emissions to air and/or to water during OTNOC.</p> <p>Description</p> <p>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 requirements described in BAT 11 should not apply where plant operation would be for the sole purpose of performing emissions measurement.</p> <p>A visual inspection of surface water is carried out twice a day for visible oil and grease.</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="320 730 1494 1345"> <thead> <tr> <th data-bbox="320 730 577 767">Technique</th> <th data-bbox="577 730 1059 767">Description</th> <th data-bbox="1059 730 1494 767">Applicability</th> </tr> </thead> <tbody> <tr> <td data-bbox="320 767 365 879">a.</td> <td data-bbox="365 767 577 879">Combustion optimisation</td> <td data-bbox="577 767 1059 879">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="1059 767 1494 1177" rowspan="4">Generally applicable</td> </tr> <tr> <td data-bbox="320 879 365 1011">b.</td> <td data-bbox="365 879 577 1011">Optimisation of the working medium conditions</td> <td data-bbox="577 879 1059 1011">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="320 1011 365 1123">c.</td> <td data-bbox="365 1011 577 1123">Optimisation of the steam cycle</td> <td data-bbox="577 1011 1059 1123">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="320 1123 365 1177">d.</td> <td data-bbox="365 1123 577 1177">Minimisation of energy consumption</td> <td data-bbox="577 1123 1059 1177">Minimising the internal energy consumption (e.g. greater efficiency of the feed-water pump)</td> </tr> <tr> <td data-bbox="320 1177 365 1262">e.</td> <td data-bbox="365 1177 577 1262">Preheating of combustion air</td> <td data-bbox="577 1177 1059 1262">Reuse of part of the heat recovered from the combustion flue-gas to preheat the air used in combustion</td> <td data-bbox="1059 1177 1494 1262">Generally applicable within the constraints related to the need to control NO_x emissions</td> </tr> <tr> <td data-bbox="320 1262 365 1345">f.</td> <td data-bbox="365 1262 577 1345">Fuel preheating</td> <td data-bbox="577 1262 1059 1345">Preheating of fuel using recovered heat</td> <td data-bbox="1059 1262 1494 1345">Generally applicable within the constraints associated with the boiler design and the need to control NO_x emissions</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 preheat the air used in combustion	Generally applicable within the constraints related to the need to control NO _x emissions	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	NA	Not applicable - Only applicable to plant which operates more than 1500 hours per year.
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 preheat the air used in combustion	Generally applicable within the constraints related to the need to control NO _x emissions																								
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																								

BAT Concn. Number	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
	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 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		

BAT Concn. Number	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	
				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 and ultra-supercritical steam conditions	Use of a steam circuit, including 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	Only applicable to new units of $\geq 600 \text{ MW}_{\text{th}}$ operated $> 4\,000 \text{ h/yr}$. 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.			CC	There is no scope for water recycling, there is no steam or cooling circuit for this plant and therefore no use of water in the process.	
Technique		Description				Applicability
a.	Water recycling	Residual aqueous streams, including run-off water, from the plant are reused for other purposes. The degree of	Not applicable to waste water from cooling systems when water treatment chemicals			

BAT Concn. Number	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																					
		recycling is limited by the quality requirements of the recipient water stream and the water balance of the plant	and/or high concentrations of salts from seawater are present		Dry bottom ash handling is not applicable to the installation, as this applies only to plants using solid fuel.																						
	b. Dry bottom ash handling	Dry, hot bottom ash falls from the furnace onto a mechanical conveyor system and is cooled down by ambient air. No water is used in the process.	Only applicable to plants combusting solid fuels. There may be technical restrictions that prevent retrofitting to existing combustion plants																								
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>				CC	The only water discharge from the installation is surface water runoff. This is discharged to Mitchell Brook via discharge points W1, W2 and W3. W1 discharges via an interceptor.																					
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="322 916 1496 1378"> <thead> <tr> <th data-bbox="322 916 712 975">Technique</th> <th data-bbox="723 916 1023 975">Typical pollutants prevented/abated</th> <th data-bbox="1034 916 1496 975">Applicability</th> </tr> </thead> <tbody> <tr> <td colspan="3" data-bbox="322 979 1496 1007" style="text-align: center;">Primary techniques</td> </tr> <tr> <td data-bbox="322 1011 712 1098">a. Optimised combustion (see BAT 6) and flue-gas treatment systems (e.g. SCR/SNCR, see BAT 7)</td> <td data-bbox="723 1011 1023 1098">Organic compounds, ammonia (NH₃)</td> <td data-bbox="1034 1011 1496 1098">Generally applicable</td> </tr> <tr> <td colspan="3" data-bbox="322 1102 1496 1129" style="text-align: center;">Secondary techniques ⁽²⁹⁾</td> </tr> <tr> <td data-bbox="322 1134 712 1193">b. Adsorption on activated carbon</td> <td data-bbox="723 1134 1023 1193">Organic compounds, mercury (Hg)</td> <td data-bbox="1034 1134 1496 1193">Generally applicable</td> </tr> <tr> <td data-bbox="322 1198 712 1321">c. Aerobic biological treatment</td> <td data-bbox="723 1198 1023 1321">Biodegradable organic compounds, ammonium (NH₄⁺)</td> <td data-bbox="1034 1198 1496 1321">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="322 1326 712 1383">d. Anoxic/anaerobic biological treatment</td> <td data-bbox="723 1326 1023 1383">Mercury (Hg), nitrate (NO₃⁻), nitrite (NO₂⁻)</td> <td data-bbox="1034 1326 1496 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	NA	Not applicable- no flue-gas treatment
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																									

BAT Concn. Number	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																																													
	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																																															
	k.	Oxidation	Sulphide (S ²⁻), sulphite (SO ₃ ²⁻)	Generally applicable																																															
	l.	Precipitation	Metals and metalloids, sulphate (SO ₄ ²⁻), fluoride (F ⁻)	Generally applicable																																															
	m.	Sedimentation	Suspended solids	Generally applicable																																															
	n.	Stripping	Ammonia (NH ₃)	Generally applicable																																															
	<p>The BAT-AELs refer to direct discharges to a receiving water body at the point where the emission leaves the installation.</p> <p style="text-align: center;">BAT-AELs for direct discharges to a receiving water body from flue-gas treatment</p> <table border="1" data-bbox="322 890 1491 1382"> <thead> <tr> <th colspan="2" data-bbox="322 890 976 927">Substance/Parameter</th> <th data-bbox="987 890 1491 927">BAT-AELs</th> </tr> <tr> <th colspan="2" data-bbox="322 930 976 967"></th> <th data-bbox="987 930 1491 967">Daily average</th> </tr> </thead> <tbody> <tr> <td data-bbox="322 970 976 995">Total organic carbon (TOC)</td> <td data-bbox="981 970 987 995"></td> <td data-bbox="987 970 1491 995">20–50 mg/l ⁽³⁰⁾ ⁽³¹⁾ ⁽³²⁾</td> </tr> <tr> <td data-bbox="322 999 976 1024">Chemical oxygen demand (COD)</td> <td data-bbox="981 999 987 1024"></td> <td data-bbox="987 999 1491 1024">60–150 mg/l ⁽³⁰⁾ ⁽³¹⁾ ⁽³²⁾</td> </tr> <tr> <td data-bbox="322 1027 976 1053">Total suspended solids (TSS)</td> <td data-bbox="981 1027 987 1053"></td> <td data-bbox="987 1027 1491 1053">10–30 mg/l</td> </tr> <tr> <td data-bbox="322 1056 976 1082">Fluoride (F⁻)</td> <td data-bbox="981 1056 987 1082"></td> <td data-bbox="987 1056 1491 1082">10–25 mg/l ⁽³²⁾</td> </tr> <tr> <td data-bbox="322 1085 976 1110">Sulphate (SO₄²⁻)</td> <td data-bbox="981 1085 987 1110"></td> <td data-bbox="987 1085 1491 1110">1,3–2,0 g/l ⁽³²⁾ ⁽³³⁾ ⁽³⁴⁾ ⁽³⁵⁾</td> </tr> <tr> <td data-bbox="322 1114 976 1139">Sulphide (S²⁻), easily released</td> <td data-bbox="981 1114 987 1139"></td> <td data-bbox="987 1114 1491 1139">0,1–0,2 mg/l ⁽³²⁾</td> </tr> <tr> <td data-bbox="322 1142 976 1168">Sulphite (SO₃²⁻)</td> <td data-bbox="981 1142 987 1168"></td> <td data-bbox="987 1142 1491 1168">1–20 mg/l ⁽³²⁾</td> </tr> <tr> <td data-bbox="322 1171 976 1197">Metals and metalloids</td> <td data-bbox="981 1171 987 1197"></td> <td data-bbox="987 1171 1491 1197"></td> </tr> <tr> <td data-bbox="322 1200 976 1225"></td> <td data-bbox="981 1200 987 1225">As</td> <td data-bbox="987 1200 1491 1225">10–50 µg/l</td> </tr> <tr> <td data-bbox="322 1228 976 1254"></td> <td data-bbox="981 1228 987 1254">Cd</td> <td data-bbox="987 1228 1491 1254">2–5 µg/l</td> </tr> <tr> <td data-bbox="322 1257 976 1283"></td> <td data-bbox="981 1257 987 1283">Cr</td> <td data-bbox="987 1257 1491 1283">10–50 µg/l</td> </tr> <tr> <td data-bbox="322 1286 976 1311"></td> <td data-bbox="981 1286 987 1311">Cu</td> <td data-bbox="987 1286 1491 1311">10–50 µg/l</td> </tr> <tr> <td data-bbox="322 1315 976 1340"></td> <td data-bbox="981 1315 987 1340">Hg</td> <td data-bbox="987 1315 1491 1340">0,2–3 µg/l</td> </tr> </tbody> </table>						Substance/Parameter		BAT-AELs			Daily average	Total organic carbon (TOC)		20–50 mg/l ⁽³⁰⁾ ⁽³¹⁾ ⁽³²⁾	Chemical oxygen demand (COD)		60–150 mg/l ⁽³⁰⁾ ⁽³¹⁾ ⁽³²⁾	Total suspended solids (TSS)		10–30 mg/l	Fluoride (F ⁻)		10–25 mg/l ⁽³²⁾	Sulphate (SO ₄ ²⁻)		1,3–2,0 g/l ⁽³²⁾ ⁽³³⁾ ⁽³⁴⁾ ⁽³⁵⁾	Sulphide (S ²⁻), easily released		0,1–0,2 mg/l ⁽³²⁾	Sulphite (SO ₃ ²⁻)		1–20 mg/l ⁽³²⁾	Metals and metalloids				As	10–50 µg/l		Cd	2–5 µg/l		Cr	10–50 µg/l		Cu	10–50 µg/l		Hg	0,2–3 µg/l
Substance/Parameter		BAT-AELs																																																	
		Daily average																																																	
Total organic carbon (TOC)		20–50 mg/l ⁽³⁰⁾ ⁽³¹⁾ ⁽³²⁾																																																	
Chemical oxygen demand (COD)		60–150 mg/l ⁽³⁰⁾ ⁽³¹⁾ ⁽³²⁾																																																	
Total suspended solids (TSS)		10–30 mg/l																																																	
Fluoride (F ⁻)		10–25 mg/l ⁽³²⁾																																																	
Sulphate (SO ₄ ²⁻)		1,3–2,0 g/l ⁽³²⁾ ⁽³³⁾ ⁽³⁴⁾ ⁽³⁵⁾																																																	
Sulphide (S ²⁻), easily released		0,1–0,2 mg/l ⁽³²⁾																																																	
Sulphite (SO ₃ ²⁻)		1–20 mg/l ⁽³²⁾																																																	
Metals and metalloids																																																			
	As	10–50 µg/l																																																	
	Cd	2–5 µg/l																																																	
	Cr	10–50 µg/l																																																	
	Cu	10–50 µg/l																																																	
	Hg	0,2–3 µg/l																																																	

BAT Concn. Number	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="880 384 981 416">Ni</td> <td data-bbox="987 384 1494 416">10–50 µg/l</td> </tr> <tr> <td data-bbox="880 421 981 453">Pb</td> <td data-bbox="987 421 1494 453">10–20 µg/l</td> </tr> <tr> <td data-bbox="880 458 981 489">Zn</td> <td data-bbox="987 458 1494 489">50–200 µg/l</td> </tr> </table>	Ni	10–50 µg/l	Pb	10–20 µg/l	Zn	50–200 µg/l											
Ni	10–50 µg/l																	
Pb	10–20 µg/l																	
Zn	50–200 µg/l																	
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"> <thead> <tr> <th data-bbox="322 778 573 810">Technique</th> <th data-bbox="580 778 1077 810">Description</th> <th data-bbox="1084 778 1494 810">Applicability</th> </tr> </thead> <tbody> <tr> <td data-bbox="322 815 573 970">a. Generation of gypsum as a by-product</td> <td data-bbox="580 815 1077 970">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> <td data-bbox="1084 815 1494 970">Generally applicable within the constraints associated with the required gypsum quality, the health requirements associated to each specific use, and by the market conditions</td> </tr> <tr> <td data-bbox="322 975 573 1102">b. Recycling or recovery of residues in the construction sector</td> <td data-bbox="580 975 1077 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> <td data-bbox="1084 975 1494 1102">Generally applicable within the constraints associated with the required material quality (e.g. physical properties, content of harmful substances) associated to each specific use, and by the market conditions</td> </tr> <tr> <td data-bbox="322 1107 573 1209">c. Energy recovery by using waste in the fuel mix</td> <td data-bbox="580 1107 1077 1209">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> <td data-bbox="1084 1107 1494 1209">Generally applicable where plants can accept waste in the fuel mix and are technically able to feed the fuels into the combustion chamber</td> </tr> <tr> <td data-bbox="322 1214 573 1369">d. Preparation of spent catalyst for reuse</td> <td data-bbox="580 1214 1077 1369">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. Preparation of spent catalyst for reuse is integrated in a catalyst management scheme</td> <td data-bbox="1084 1214 1494 1369">The applicability may be limited by the mechanical condition of the catalyst and the required performance with respect to controlling NO_x and NH₃ emissions</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	Generally applicable within the constraints associated with the required gypsum quality, the health requirements associated to each specific use, and by the market conditions	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)	Generally applicable within the constraints associated with the required material quality (e.g. physical properties, content of harmful substances) associated to each specific use, and by the market conditions	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	Generally applicable where plants can accept waste in the fuel mix and are technically able to feed the fuels into the combustion chamber	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. Preparation of spent catalyst for reuse is integrated in a catalyst management scheme	The applicability may be limited by the mechanical condition of the catalyst and the required performance with respect to controlling NO _x and NH ₃ emissions	CC	<p>There are no wastes arising from the combustion process.</p> <p>The waste hierarchy is applied when disposing of other waste streams which arise as part of site operations.</p>
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	Generally applicable within the constraints associated with the required gypsum quality, the health requirements associated to each specific use, and by the market conditions																
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)	Generally applicable within the constraints associated with the required material quality (e.g. physical properties, content of harmful substances) associated to each specific use, and by the market conditions																
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	Generally applicable where plants can accept waste in the fuel mix and are technically able to feed the fuels into the combustion chamber																
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. Preparation of spent catalyst for reuse is integrated in a catalyst management scheme	The applicability may be limited by the mechanical condition of the catalyst and the required performance with respect to controlling NO _x and NH ₃ emissions																

BAT Concn. Number	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																								
17	<p>In order to reduce noise emissions, BAT is to use one or a combination of the techniques given below.</p> <table border="1" data-bbox="322 411 1496 1200"> <thead> <tr> <th data-bbox="322 411 360 448"></th> <th data-bbox="360 411 584 448">Technique</th> <th data-bbox="584 411 1099 448">Description</th> <th data-bbox="1099 411 1496 448">Applicability</th> </tr> </thead> <tbody> <tr> <td data-bbox="322 448 360 762">a.</td> <td data-bbox="360 448 584 762">Operational measures</td> <td data-bbox="584 448 1099 762"> 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="1099 448 1496 762">Generally applicable</td> </tr> <tr> <td data-bbox="322 762 360 826">b.</td> <td data-bbox="360 762 584 826">Low-noise equipment</td> <td data-bbox="584 762 1099 826">This potentially includes compressors, pumps and disks</td> <td data-bbox="1099 762 1496 826">Generally applicable when the equipment is new or replaced</td> </tr> <tr> <td data-bbox="322 826 360 935">c.</td> <td data-bbox="360 826 584 935">Noise attenuation</td> <td data-bbox="584 826 1099 935">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="1099 826 1496 935">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="322 935 360 1118">d.</td> <td data-bbox="360 935 584 1118">Noise-control equipment</td> <td data-bbox="584 935 1099 1118"> This includes: <ul style="list-style-type: none"> — noise-reducers — equipment insulation — enclosure of noisy equipment — soundproofing of buildings </td> <td data-bbox="1099 935 1496 1118">The applicability may be restricted by lack of space</td> </tr> <tr> <td data-bbox="322 1118 360 1200">e.</td> <td data-bbox="360 1118 584 1200">Appropriate location of equipment and buildings</td> <td data-bbox="584 1118 1099 1200">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="1099 1118 1496 1200">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	CC	<p>The Operator has confirmed that the following operational measures are employed at the site in order to reduce noise emissions:</p> <ul style="list-style-type: none"> • Inspection and maintenance of equipment; • closing of doors and windows of enclosed areas where possible; • equipment operated by experienced staff. • Noise reducing insulation is fitted on equipment where possible; and • noisy equipment is enclosed in buildings <p>The Operator undertakes regular environmental noise surveys. They confirm that no noise issues have been raised and the site have not received any complaints from neighbours.</p>
	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																								
Combustion of liquid fuels																											
Table 13	BAT-associated energy efficiency levels (BAT-AEELs) for HFO and/or gas oil combustion in boilers <table border="1" data-bbox="322 1289 1496 1326" style="width: 100%; margin-top: 5px;"> <thead> <tr> <th data-bbox="322 1289 786 1326">Type of combustion unit</th> <th data-bbox="786 1289 1496 1326">BAT-AEELs (%) (100)</th> </tr> </thead> <tbody> <tr> <td style="height: 20px;"> </td> <td> </td> </tr> </tbody> </table>		Type of combustion unit	BAT-AEELs (%) (100)			NA	Not applicable to gas turbines.																			
Type of combustion unit	BAT-AEELs (%) (100)																										

BAT Concn. Number	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		
		Net electrical efficiency (%)		Net total fuel utilisation (%) ⁽¹⁰¹⁾				
		New unit	Existing unit	New unit	Existing unit			
	HFO- and/or gas-oil-fired boiler	> 36,4	35,6–37,4	80–96	80–96			
28	In order to prevent or reduce NO _x emissions to air while limiting CO emissions to air from the combustion of HFO and/or gas oil in boilers, BAT is to use one or a combination of the techniques given below.				NA	Not applicable to gas turbines.		
	Technique		Description		Applicability			
	a.	Air staging	See descriptions in Section 8.3		Generally applicable			
	b.	Fuel staging						
	c.	Flue-gas recirculation						
	d.	Low-NO _x burners (LNB)						
	e.	Water/steam addition			Applicable within the constraints of water availability			
	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)	See descriptions in Section 8.3		Not applicable to combustion plants operated < 500 h/yr. There may be technical and economic restrictions for retrofitting existing combustion plants operated between 500 h/yr and 1 500 h/yr. Not generally applicable to combustion plants of < 100 MW _{th}			
	h.	Advanced control system			Generally applicable to new combustion plants. The applicability to old combustion plants may be constrained by the need to retrofit the combustion system and/or control command system			

BAT Concn. Number	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	
	i. Fuel choice		Applicable within the constraints associated with the availability of different types of fuel, which may be impacted by the energy policy of the Member State				
BAT-associated emission levels (BAT-AELs) for NO_x emissions to air from the combustion of HFO and/or gas oil in boilers							
Combustion plant total rated thermal input (MW_{th})		BAT-AELs (mg/Nm³)					
		Yearly average		Daily average or average over the sampling period			
		New plant	Existing plant ⁽¹⁰²⁾	New plant	Existing plant ⁽¹⁰³⁾		
< 100		75–200	150–270	100–215	210–330 ⁽¹⁰⁴⁾		
≥ 100		45–75	45–100 ⁽¹⁰⁵⁾	85–100	85–110 ⁽¹⁰⁶⁾ ⁽¹⁰⁷⁾		
<p>As an indication, the yearly average CO emission levels will generally be:</p> <ul style="list-style-type: none"> — 10–30 mg/Nm³ for existing combustion plants of < 100 MW_{th} operated ≥ 1 500 h/yr, or new combustion plants of <100 MW_{th}, — 10–20mg/Nm³ for existing combustion plants of ≥ 100 MW_{th} operated ≥ 1 500 h/yr, or new combustion plants of ≥ 100 MW_{th}. 							
29	In order to prevent or reduce SO _x , HCl and HF emissions to air from the combustion of HFO and/or gas oil in boilers, BAT is to use one or a combination of the techniques given below.				NA	Not applicable to gas turbines.	
Technique		Description	Applicability				
a.	Duct sorbent injection (DSI)	See description in Section 8.4	Generally applicable				
b.	Spray dry absorber (SDA)						
c.	Flue-gas condenser						
d.	Wet flue-gas desulphurisation (wet FGD)						

BAT Concn. Number	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="315 381 353 480"></td> <td data-bbox="353 381 595 480"></td> <td data-bbox="595 381 808 480"></td> <td data-bbox="808 381 1496 480">There may be technical and economic restrictions for retrofitting existing combustion plants operated between 500 h/yr and 1 500 h/yr</td> </tr> <tr> <td data-bbox="315 480 353 655">e.</td> <td data-bbox="353 480 595 655">Seawater FGD</td> <td data-bbox="595 480 808 655"></td> <td data-bbox="808 480 1496 655">There may be technical and economic restrictions for applying the technique to combustion plants of < 300 MW_{th}. Not applicable to combustion plants operated < 500 h/yr. There may be technical and economic restrictions for retrofitting existing combustion plants operated between 500 h/yr and 1 500 h/yr</td> </tr> <tr> <td data-bbox="315 655 353 751">f.</td> <td data-bbox="353 655 595 751">Fuel choice</td> <td data-bbox="595 655 808 751"></td> <td data-bbox="808 655 1496 751">Applicable within the constraints associated with the availability of different types of fuel, which may be impacted by the energy policy of the Member State</td> </tr> </table>				There may be technical and economic restrictions for retrofitting existing combustion plants operated between 500 h/yr and 1 500 h/yr	e.	Seawater FGD		There may be technical and economic restrictions for applying the technique to combustion plants of < 300 MW _{th} . Not applicable to combustion plants operated < 500 h/yr. There may be technical and economic restrictions for retrofitting existing combustion plants operated between 500 h/yr and 1 500 h/yr	f.	Fuel choice		Applicable within the constraints associated with the availability of different types of fuel, which may be impacted by the energy policy of the Member State																
			There may be technical and economic restrictions for retrofitting existing combustion plants operated between 500 h/yr and 1 500 h/yr																										
e.	Seawater FGD		There may be technical and economic restrictions for applying the technique to combustion plants of < 300 MW _{th} . Not applicable to combustion plants operated < 500 h/yr. There may be technical and economic restrictions for retrofitting existing combustion plants operated between 500 h/yr and 1 500 h/yr																										
f.	Fuel choice		Applicable within the constraints associated with the availability of different types of fuel, which may be impacted by the energy policy of the Member State																										
30	<p align="center">BAT-associated emission levels (BAT-AELs) for SO₂ emissions to air from the combustion of HFO and/or gas oil in boilers</p> <table border="1"> <thead> <tr> <th data-bbox="315 831 712 1002" rowspan="3">Combustion plant total rated thermal input (MW_{th})</th> <th colspan="4" data-bbox="712 831 1496 874">BAT-AELs for SO₂ (mg/Nm³)</th> </tr> <tr> <th colspan="2" data-bbox="712 874 1032 938">Yearly average</th> <th colspan="2" data-bbox="1032 874 1496 938">Daily average or average over the sampling period</th> </tr> <tr> <th data-bbox="712 938 831 1002">New plant</th> <th data-bbox="831 938 1032 1002">Existing plant ⁽¹⁰⁸⁾</th> <th data-bbox="1032 938 1211 1002">New plant</th> <th data-bbox="1211 938 1496 1002">Existing plant ⁽¹⁰⁹⁾</th> </tr> </thead> <tbody> <tr> <td data-bbox="315 1002 712 1038">< 300</td> <td data-bbox="712 1002 831 1038">50–175</td> <td data-bbox="831 1002 1032 1038">50–175</td> <td data-bbox="1032 1002 1211 1038">150–200</td> <td data-bbox="1211 1002 1496 1038">150–200 ⁽¹¹⁰⁾</td> </tr> <tr> <td data-bbox="315 1038 712 1075">≥ 300</td> <td data-bbox="712 1038 831 1075">35–50</td> <td data-bbox="831 1038 1032 1075">50–110</td> <td data-bbox="1032 1038 1211 1075">50–120</td> <td data-bbox="1211 1038 1496 1075">150–165 ⁽¹¹¹⁾ ⁽¹¹²⁾</td> </tr> </tbody> </table>				Combustion plant total rated thermal input (MW _{th})	BAT-AELs for SO ₂ (mg/Nm ³)				Yearly average		Daily average or average over the sampling period		New plant	Existing plant ⁽¹⁰⁸⁾	New plant	Existing plant ⁽¹⁰⁹⁾	< 300	50–175	50–175	150–200	150–200 ⁽¹¹⁰⁾	≥ 300	35–50	50–110	50–120	150–165 ⁽¹¹¹⁾ ⁽¹¹²⁾	NA	Not applicable to gas turbines.
Combustion plant total rated thermal input (MW _{th})	BAT-AELs for SO ₂ (mg/Nm ³)																												
	Yearly average		Daily average or average over the sampling period																										
	New plant	Existing plant ⁽¹⁰⁸⁾	New plant	Existing plant ⁽¹⁰⁹⁾																									
< 300	50–175	50–175	150–200	150–200 ⁽¹¹⁰⁾																									
≥ 300	35–50	50–110	50–120	150–165 ⁽¹¹¹⁾ ⁽¹¹²⁾																									
	<p>In order to reduce dust and particulate-bound metal emissions to air from the combustion of HFO and/or gas oil in boilers, BAT is to use one or a combination of the techniques given below.</p> <table border="1"> <thead> <tr> <th data-bbox="315 1155 607 1193">Technique</th> <th data-bbox="607 1155 936 1193">Description</th> <th data-bbox="936 1155 1496 1193">Applicability</th> </tr> </thead> <tbody> <tr> <td data-bbox="315 1193 353 1257">a.</td> <td data-bbox="353 1193 607 1257">Electrostatic precipitator (ESP)</td> <td data-bbox="607 1193 936 1257" rowspan="3">See description in Section 8.5.</td> <td data-bbox="936 1193 1496 1364" rowspan="3">Generally applicable</td> </tr> <tr> <td data-bbox="315 1257 353 1294">b.</td> <td data-bbox="353 1257 607 1294">Bag filter</td> </tr> <tr> <td data-bbox="315 1294 353 1364">c.</td> <td data-bbox="353 1294 607 1364">Multicyclones</td> </tr> </tbody> </table>				Technique	Description	Applicability	a.	Electrostatic precipitator (ESP)	See description in Section 8.5.	Generally applicable	b.	Bag filter	c.	Multicyclones														
Technique	Description	Applicability																											
a.	Electrostatic precipitator (ESP)	See description in Section 8.5.	Generally applicable																										
b.	Bag filter																												
c.	Multicyclones																												

BAT Concn. Number	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="315 381 353 480"></td> <td data-bbox="353 381 607 480"></td> <td data-bbox="607 381 938 480">Multicyclones can be used in combination with other dedusting techniques</td> <td colspan="2" data-bbox="938 381 1496 627" rowspan="2"></td> </tr> <tr> <td data-bbox="315 480 353 627">d.</td> <td data-bbox="353 480 607 627">Dry or semi-dry FGD system</td> <td data-bbox="607 480 938 627">See descriptions in Section 8.5. The technique is mainly used for SO_x, HCl and/or HF control</td> </tr> <tr> <td data-bbox="315 627 353 778">e.</td> <td data-bbox="353 627 607 778">Wet flue-gas desulphurisation (wet FGD)</td> <td data-bbox="607 627 938 778">See description in Section 8.5. The technique is mainly used for SO_x, HCl and/or HF control</td> <td colspan="2" data-bbox="938 627 1496 778">See applicability in BAT 29</td> </tr> <tr> <td data-bbox="315 778 353 898">f.</td> <td data-bbox="353 778 607 898">Fuel choice</td> <td data-bbox="607 778 938 898">See description in Section 8.5</td> <td colspan="2" data-bbox="938 778 1496 898">Applicable within the constraints associated with the availability of different types of fuel, which may be impacted by the energy policy of the Member State</td> </tr> </table>			Multicyclones can be used in combination with other dedusting techniques			d.	Dry or semi-dry FGD system	See descriptions in Section 8.5. The technique is mainly used for SO _x , HCl and/or HF control	e.	Wet flue-gas desulphurisation (wet FGD)	See description in Section 8.5. The technique is mainly used for SO _x , HCl and/or HF control	See applicability in BAT 29		f.	Fuel choice	See description in Section 8.5	Applicable within the constraints associated with the availability of different types of fuel, which may be impacted by the energy policy of the Member State		<p align="center">BAT-associated emission levels (BAT-AELs) for dust emissions to air from the combustion of HFO and/or gas oil in boilers</p> <table border="1"> <thead> <tr> <th rowspan="3">Combustion plant total rated thermal input (MW_{th})</th> <th colspan="4">BAT-AELs for dust (mg/Nm³)</th> </tr> <tr> <th colspan="2">Yearly average</th> <th colspan="2">Daily average or average over the sampling period</th> </tr> <tr> <th>New plant</th> <th>Existing plant ⁽¹¹³⁾</th> <th>New plant</th> <th>Existing plant ⁽¹¹⁴⁾</th> </tr> </thead> <tbody> <tr> <td>< 300</td> <td>2-10</td> <td>2-20</td> <td>7-18</td> <td>7-22 ⁽¹¹⁵⁾</td> </tr> <tr> <td>≥ 300</td> <td>2-5</td> <td>2-10</td> <td>7-10</td> <td>7-11 ⁽¹¹⁶⁾</td> </tr> </tbody> </table>	Combustion plant total rated thermal input (MW _{th})	BAT-AELs for dust (mg/Nm ³)				Yearly average		Daily average or average over the sampling period		New plant	Existing plant ⁽¹¹³⁾	New plant	Existing plant ⁽¹¹⁴⁾	< 300	2-10	2-20	7-18	7-22 ⁽¹¹⁵⁾	≥ 300	2-5	2-10	7-10	7-11 ⁽¹¹⁶⁾		
		Multicyclones can be used in combination with other dedusting techniques																																											
d.	Dry or semi-dry FGD system	See descriptions in Section 8.5. The technique is mainly used for SO _x , HCl and/or HF control																																											
e.	Wet flue-gas desulphurisation (wet FGD)	See description in Section 8.5. The technique is mainly used for SO _x , HCl and/or HF control	See applicability in BAT 29																																										
f.	Fuel choice	See description in Section 8.5	Applicable within the constraints associated with the availability of different types of fuel, which may be impacted by the energy policy of the Member State																																										
Combustion plant total rated thermal input (MW _{th})	BAT-AELs for dust (mg/Nm ³)																																												
	Yearly average		Daily average or average over the sampling period																																										
	New plant	Existing plant ⁽¹¹³⁾	New plant	Existing plant ⁽¹¹⁴⁾																																									
< 300	2-10	2-20	7-18	7-22 ⁽¹¹⁵⁾																																									
≥ 300	2-5	2-10	7-10	7-11 ⁽¹¹⁶⁾																																									
31	In order to increase the energy efficiency of HFO and/or gas oil combustion in reciprocating engines, BAT is to use an appropriate combination of the techniques given in BAT 12 and below.				NA	Not applicable to gas turbines.																																							
	<table border="1"> <thead> <tr> <th>Technique</th> <th>Description</th> <th>Applicability</th> </tr> </thead> <tbody> <tr> <td data-bbox="315 1318 353 1374">a.</td> <td data-bbox="353 1318 506 1374">Combined cycle</td> <td data-bbox="506 1318 1503 1374">See description in Section 8.2</td> </tr> <tr> <td></td> <td></td> <td data-bbox="757 1318 1503 1374">Generally applicable to new units operated ≥ 1 500 h/yr.</td> </tr> </tbody> </table>				Technique	Description	Applicability	a.	Combined cycle	See description in Section 8.2			Generally applicable to new units operated ≥ 1 500 h/yr.																																
Technique	Description	Applicability																																											
a.	Combined cycle	See description in Section 8.2																																											
		Generally applicable to new units operated ≥ 1 500 h/yr.																																											

BAT Concn. Number	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="320 384 353 469"></td> <td data-bbox="353 384 506 469"></td> <td data-bbox="506 384 1494 469">Applicable to existing units within the constraints associated with the steam cycle design and the space availability. Not applicable to existing units operated < 1 500 h/yr</td> </tr> <tr> <td colspan="3" data-bbox="320 496 1494 555" style="text-align: center;">BAT-associated energy efficiency levels (BAT-AEELs) for the combustion of HFO and/or gas oil in reciprocating engines</td> </tr> <tr> <td colspan="2" data-bbox="320 555 1102 655" style="text-align: center;">Type of combustion unit</td> <td data-bbox="1102 555 1494 655" style="text-align: center;">BAT-AEELs ⁽¹¹⁹⁾</td> </tr> <tr> <td colspan="2" data-bbox="320 655 1102 691"></td> <td data-bbox="1102 655 1494 691" style="text-align: center;">Net electrical efficiency (%) ⁽¹²⁰⁾</td> </tr> <tr> <td colspan="2" data-bbox="320 691 1102 726"></td> <td data-bbox="1102 691 1494 726" style="text-align: center;">New unit Existing unit</td> </tr> <tr> <td colspan="2" data-bbox="320 726 1102 761">HFO- and/or gas-oil-fired reciprocating engine — single cycle</td> <td data-bbox="1102 726 1494 761" style="text-align: center;">41,5–44,5 ⁽¹²¹⁾ 38,3–44,5 ⁽¹²¹⁾</td> </tr> <tr> <td colspan="2" data-bbox="320 761 1102 796">HFO- and/or gas-oil-fired reciprocating engine — combined cycle</td> <td data-bbox="1102 761 1494 796" style="text-align: center;">> 48 ⁽¹²²⁾ No BAT-AEEL</td> </tr> </table>			Applicable to existing units within the constraints associated with the steam cycle design and the space availability. Not applicable to existing units operated < 1 500 h/yr	BAT-associated energy efficiency levels (BAT-AEELs) for the combustion of HFO and/or gas oil in reciprocating engines			Type of combustion unit		BAT-AEELs ⁽¹¹⁹⁾			Net electrical efficiency (%) ⁽¹²⁰⁾			New unit Existing unit	HFO- and/or gas-oil-fired reciprocating engine — single cycle		41,5–44,5 ⁽¹²¹⁾ 38,3–44,5 ⁽¹²¹⁾	HFO- and/or gas-oil-fired reciprocating engine — combined cycle		> 48 ⁽¹²²⁾ No BAT-AEEL		
		Applicable to existing units within the constraints associated with the steam cycle design and the space availability. Not applicable to existing units operated < 1 500 h/yr																						
BAT-associated energy efficiency levels (BAT-AEELs) for the combustion of HFO and/or gas oil in reciprocating engines																								
Type of combustion unit		BAT-AEELs ⁽¹¹⁹⁾																						
		Net electrical efficiency (%) ⁽¹²⁰⁾																						
		New unit Existing unit																						
HFO- and/or gas-oil-fired reciprocating engine — single cycle		41,5–44,5 ⁽¹²¹⁾ 38,3–44,5 ⁽¹²¹⁾																						
HFO- and/or gas-oil-fired reciprocating engine — combined cycle		> 48 ⁽¹²²⁾ No BAT-AEEL																						
32	<p>In order to prevent or reduce NO_x emissions to air from the combustion of HFO and/or gas oil in reciprocating engines, BAT is to use one or a combination of the techniques given below.</p> <table border="1"> <thead> <tr> <th data-bbox="320 799 353 834"></th> <th data-bbox="353 799 636 834">Technique</th> <th data-bbox="636 799 857 834">Description</th> <th data-bbox="857 799 1494 834">Applicability</th> </tr> </thead> <tbody> <tr> <td data-bbox="320 834 353 895">a.</td> <td data-bbox="353 834 636 895">Low-NO_x combustion concept in diesel engines</td> <td data-bbox="636 834 857 895" rowspan="4">See descriptions in Section 8.3</td> <td data-bbox="857 834 1494 895">Generally applicable</td> </tr> <tr> <td data-bbox="320 895 353 956">b.</td> <td data-bbox="353 895 636 956">Exhaust-gas recirculation (EGR)</td> <td data-bbox="857 895 1494 956">Not applicable to four-stroke engines</td> </tr> <tr> <td data-bbox="320 956 353 1038">c.</td> <td data-bbox="353 956 636 1038">Water/steam addition</td> <td data-bbox="857 956 1494 1038">Applicable within the constraints of water availability. The applicability may be limited where no retrofit package is available</td> </tr> <tr> <td data-bbox="320 1038 353 1195">d.</td> <td data-bbox="353 1038 636 1195">Selective catalytic reduction (SCR)</td> <td data-bbox="857 1038 1494 1195">Not applicable to combustion plants operated < 500 h/yr. There may be technical and economic restrictions for retrofitting existing combustion plants operated between 500 h/yr and 1 500 h/yr. Retrofitting existing combustion plants may be constrained by the availability of sufficient space</td> </tr> </tbody> </table>		Technique	Description	Applicability	a.	Low-NO _x combustion concept in diesel engines	See descriptions in Section 8.3	Generally applicable	b.	Exhaust-gas recirculation (EGR)	Not applicable to four-stroke engines	c.	Water/steam addition	Applicable within the constraints of water availability. The applicability may be limited where no retrofit package is available	d.	Selective catalytic reduction (SCR)	Not applicable to combustion plants operated < 500 h/yr. There may be technical and economic restrictions for retrofitting existing combustion plants operated between 500 h/yr and 1 500 h/yr. Retrofitting existing combustion plants may be constrained by the availability of sufficient space	NA	Not applicable to gas turbines.				
	Technique	Description	Applicability																					
a.	Low-NO _x combustion concept in diesel engines	See descriptions in Section 8.3	Generally applicable																					
b.	Exhaust-gas recirculation (EGR)		Not applicable to four-stroke engines																					
c.	Water/steam addition		Applicable within the constraints of water availability. The applicability may be limited where no retrofit package is available																					
d.	Selective catalytic reduction (SCR)		Not applicable to combustion plants operated < 500 h/yr. There may be technical and economic restrictions for retrofitting existing combustion plants operated between 500 h/yr and 1 500 h/yr. Retrofitting existing combustion plants may be constrained by the availability of sufficient space																					
33	<p>In order to prevent or reduce emissions of CO and volatile organic compounds to air from the combustion of HFO and/or gas oil in reciprocating engines, BAT is to use one or both of the techniques given below.</p> <table border="1"> <thead> <tr> <th data-bbox="320 1267 353 1302"></th> <th data-bbox="353 1267 607 1302">Technique</th> <th data-bbox="607 1267 902 1302">Description</th> <th data-bbox="902 1267 1494 1302">Applicability</th> </tr> </thead> <tbody> <tr> <td data-bbox="320 1302 353 1337">a.</td> <td data-bbox="353 1302 607 1337">Combustion optimisation</td> <td data-bbox="607 1302 902 1337"></td> <td data-bbox="902 1302 1494 1337">Generally applicable</td> </tr> </tbody> </table>		Technique	Description	Applicability	a.	Combustion optimisation		Generally applicable	NA	Not applicable to gas turbines.													
	Technique	Description	Applicability																					
a.	Combustion optimisation		Generally applicable																					

BAT Concn. Number	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		
	b. Oxidation catalysts	See descriptions in Section 8.3	Not applicable to combustion plants operated < 500 h/yr. The applicability may be limited by the sulphur content of the fuel					
	BAT-associated emission levels (BAT-AELs) for NO_x emissions to air from the combustion of HFO and/or gas oil in reciprocating engines							
	Combustion plant total rated thermal input (MW_{th})		BAT-AELs (mg/Nm³)					
			Yearly average		Daily average or average over the sampling period			
			New plant	Existing plant ⁽¹²³⁾	New plant	Existing plant ⁽¹²⁴⁾ ⁽¹²⁵⁾		
	≥ 50		115–190 ⁽¹²⁶⁾	125–625	145–300	150–750		
	<p>As an indication, for existing combustion plants burning only HFO and operated ≥ 1 500 h/yr or new combustion plants burning only HFO,</p> <ul style="list-style-type: none"> — the yearly average CO emission levels will generally be 50–175 mg/Nm³, — the average over the sampling period for TVOC emission levels will generally be 10–40 mg/Nm³. 							
34	In order to prevent or reduce SO _x , HCl and HF emissions to air from the combustion of HFO and/or gas oil in reciprocating engines, BAT is to use one or a combination of the techniques given below.				NA	Not applicable to gas turbines.		
	Technique		Description	Applicability				
	a.	Fuel choice	See descriptions in Section 8.4	Applicable within the constraints associated with the availability of different types of fuel, which may be impacted by the energy policy of the Member State				
	b.	Duct sorbent injection (DSI)		There may be technical restrictions in the case of existing combustion plants Not applicable to combustion plants operated < 500 h/yr				
	c.	Wet flue-gas desulphurisation (wet FGD)		There may be technical and economic restrictions for applying the technique to combustion plants of < 300 MW _{th} . Not applicable to combustion plants operated < 500 h/yr. There may be technical and economic restrictions for retrofitting existing combustion plants operated between 500 h/yr and 1 500 h/yr				

BAT Concn. Number	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 align="center">BAT-associated emission levels (BAT-AELs) for SO₂ emissions to air from the combustion of HFO and/or gas oil in reciprocating engines</p> <table border="1"> <thead> <tr> <th rowspan="3">Combustion plant total rated thermal input (MW_{th})</th> <th colspan="4">BAT-AELs for SO₂ (mg/Nm³)</th> </tr> <tr> <th colspan="2">Yearly average</th> <th colspan="2">Daily average or average over the sampling period</th> </tr> <tr> <th>New plant</th> <th>Existing plant ⁽¹²⁷⁾</th> <th>New plant</th> <th>Existing plant ⁽¹²⁸⁾</th> </tr> </thead> <tbody> <tr> <td>All sizes</td> <td>45–100</td> <td>100–200 ⁽¹²⁹⁾</td> <td>60–110</td> <td>105–235 ⁽¹²⁹⁾</td> </tr> </tbody> </table>	Combustion plant total rated thermal input (MW _{th})	BAT-AELs for SO ₂ (mg/Nm ³)				Yearly average		Daily average or average over the sampling period		New plant	Existing plant ⁽¹²⁷⁾	New plant	Existing plant ⁽¹²⁸⁾	All sizes	45–100	100–200 ⁽¹²⁹⁾	60–110	105–235 ⁽¹²⁹⁾											
Combustion plant total rated thermal input (MW _{th})	BAT-AELs for SO ₂ (mg/Nm ³)																													
	Yearly average		Daily average or average over the sampling period																											
	New plant	Existing plant ⁽¹²⁷⁾	New plant	Existing plant ⁽¹²⁸⁾																										
All sizes	45–100	100–200 ⁽¹²⁹⁾	60–110	105–235 ⁽¹²⁹⁾																										
35	<p>In order to prevent or reduce dust and particulate-bound metal emissions from the combustion of HFO and/or gas oil in reciprocating engines, BAT is to use one or a 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 choice</td> <td rowspan="3">See descriptions in Section 8.5</td> <td>Applicable within the constraints associated with the availability of different types of fuel, which may be impacted by the energy policy of the Member State</td> </tr> <tr> <td>b. Electrostatic precipitator (ESP)</td> <td rowspan="2">Not applicable to combustion plants operated < 500 h/yr</td> </tr> <tr> <td>c. Bag filter</td> </tr> </tbody> </table> <p align="center">BAT-associated emission levels (BAT-AELs) for dust emissions to air from the combustion of HFO and/or gas oil in reciprocating engines</p> <table border="1"> <thead> <tr> <th rowspan="3">Combustion plant total rated thermal input (MW_{th})</th> <th colspan="4">BAT-AELs for dust (mg/Nm³)</th> </tr> <tr> <th colspan="2">Yearly average</th> <th colspan="2">Daily average or average over the sampling period</th> </tr> <tr> <th>New plant</th> <th>Existing plant ⁽¹³⁰⁾</th> <th>New plant</th> <th>Existing plant ⁽¹³¹⁾</th> </tr> </thead> <tbody> <tr> <td>≥ 50</td> <td>5–10</td> <td>5–35</td> <td>10–20</td> <td>10–45</td> </tr> </tbody> </table>	Technique	Description	Applicability	a. Fuel choice	See descriptions in Section 8.5	Applicable within the constraints associated with the availability of different types of fuel, which may be impacted by the energy policy of the Member State	b. Electrostatic precipitator (ESP)	Not applicable to combustion plants operated < 500 h/yr	c. Bag filter	Combustion plant total rated thermal input (MW _{th})	BAT-AELs for dust (mg/Nm ³)				Yearly average		Daily average or average over the sampling period		New plant	Existing plant ⁽¹³⁰⁾	New plant	Existing plant ⁽¹³¹⁾	≥ 50	5–10	5–35	10–20	10–45	NA	Not applicable to gas turbines.
Technique	Description	Applicability																												
a. Fuel choice	See descriptions in Section 8.5	Applicable within the constraints associated with the availability of different types of fuel, which may be impacted by the energy policy of the Member State																												
b. Electrostatic precipitator (ESP)		Not applicable to combustion plants operated < 500 h/yr																												
c. Bag filter																														
Combustion plant total rated thermal input (MW _{th})	BAT-AELs for dust (mg/Nm ³)																													
	Yearly average		Daily average or average over the sampling period																											
	New plant	Existing plant ⁽¹³⁰⁾	New plant	Existing plant ⁽¹³¹⁾																										
≥ 50	5–10	5–35	10–20	10–45																										
36	<p>In order to increase the energy efficiency of gas oil combustion in gas turbines, BAT is to use an appropriate combination of the techniques given in BAT 12 and below.</p> <table border="1"> <thead> <tr> <th>Technique</th> <th>Description</th> <th>Applicability</th> </tr> </thead> <tbody> <tr> <td>a. Combined cycle</td> <td>See description in Section 8.2</td> <td>Generally applicable to new units operated ≥ 1 500 h/yr. Applicable to existing units within the constraints associated with the steam cycle design and the space availability.</td> </tr> </tbody> </table>	Technique	Description	Applicability	a. Combined cycle	See description in Section 8.2	Generally applicable to new units operated ≥ 1 500 h/yr. Applicable to existing units within the constraints associated with the steam cycle design and the space availability.	CC	The techniques given in BAT 12 are not applicable to plant which operates less than 1500 hours per year.																					
Technique	Description	Applicability																												
a. Combined cycle	See description in Section 8.2	Generally applicable to new units operated ≥ 1 500 h/yr. Applicable to existing units within the constraints associated with the steam cycle design and the space availability.																												

BAT Concn. Number	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></td> <td></td> <td>Not applicable to existing units operated < 1 500 h/yr</td> </tr> <tr> <td colspan="3" style="text-align: center;">BAT-associated energy efficiency levels (BAT-AEELs) for gas-oil-fired gas turbines</td> </tr> <tr> <th rowspan="3">Type of combustion unit</th> <th colspan="2">BAT-AEELs ⁽¹³²⁾</th> </tr> <tr> <th colspan="2">Net electrical efficiency (%), ⁽¹³³⁾</th> </tr> <tr> <th>New unit</th> <th>Existing unit</th> </tr> <tr> <td>Gas-oil-fired open-cycle gas turbine</td> <td>> 33</td> <td>25–35,7</td> </tr> <tr> <td>Gas-oil-fired combined cycle gas turbine</td> <td>> 40</td> <td>33–44</td> </tr> </table>			Not applicable to existing units operated < 1 500 h/yr	BAT-associated energy efficiency levels (BAT-AEELs) for gas-oil-fired gas turbines			Type of combustion unit	BAT-AEELs ⁽¹³²⁾		Net electrical efficiency (%), ⁽¹³³⁾		New unit	Existing unit	Gas-oil-fired open-cycle gas turbine	> 33	25–35,7	Gas-oil-fired combined cycle gas turbine	> 40	33–44		<p>The gas turbines at the facility are open cycle, operated for less than 500 hours, therefore the techniques specified in BAT 36 are not applicable.</p> <p>OCGT operating <500 hours per year and therefore BAT-AEELs are not applicable. The Regulation 61 response confirms that the efficiency is 26.2% for the GTs.</p> <p>A process monitoring requirement has been set in table S3.3 which requires energy efficiency monitoring after an overhaul.</p>
		Not applicable to existing units operated < 1 500 h/yr																				
BAT-associated energy efficiency levels (BAT-AEELs) for gas-oil-fired gas turbines																						
Type of combustion unit	BAT-AEELs ⁽¹³²⁾																					
	Net electrical efficiency (%), ⁽¹³³⁾																					
	New unit	Existing unit																				
Gas-oil-fired open-cycle gas turbine	> 33	25–35,7																				
Gas-oil-fired combined cycle gas turbine	> 40	33–44																				
37	<p>In order to prevent or reduce NO_x emissions to air from the combustion of gas oil in gas turbines, BAT is to use one or a 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. Water/steam addition</td> <td rowspan="3">See description in Section 8.3</td> <td>The applicability may be limited due to water availability</td> </tr> <tr> <td>b. Low-NO_x burners (LNB)</td> <td>Only applicable to turbine models for which low-NO_x burners are available on the market</td> </tr> <tr> <td>c. Selective catalytic reduction (SCR)</td> <td>Not applicable to combustion plants operated < 500 h/yr. There may be technical and economic restrictions for retrofitting existing combustion plants operated between 500 h/yr and 1 500 h/yr. Retrofitting existing combustion plants may be constrained by the availability of sufficient space</td> </tr> </tbody> </table>	Technique	Description	Applicability	a. Water/steam addition	See description in Section 8.3	The applicability may be limited due to water availability	b. Low-NO _x burners (LNB)	Only applicable to turbine models for which low-NO _x burners are available on the market	c. Selective catalytic reduction (SCR)	Not applicable to combustion plants operated < 500 h/yr. There may be technical and economic restrictions for retrofitting existing combustion plants operated between 500 h/yr and 1 500 h/yr. Retrofitting existing combustion plants may be constrained by the availability of sufficient space	CC	<p>We consider that the techniques described by this BAT conclusion are not applicable to the OCGTs because:</p> <ul style="list-style-type: none"> - They operate less than 500 hours per year; - There are currently no NO_x emission reduction options available; - Selective catalytic reduction (SCR) is not applicable to combustion plants operated less than 500 hour year. <p>In making this assessment, we have considered the reference technical information available within the Joint Environmental Programme (JEP) report</p>									
Technique	Description	Applicability																				
a. Water/steam addition	See description in Section 8.3	The applicability may be limited due to water availability																				
b. Low-NO _x burners (LNB)		Only applicable to turbine models for which low-NO _x burners are available on the market																				
c. Selective catalytic reduction (SCR)		Not applicable to combustion plants operated < 500 h/yr. There may be technical and economic restrictions for retrofitting existing combustion plants operated between 500 h/yr and 1 500 h/yr. Retrofitting existing combustion plants may be constrained by the availability of sufficient space																				

BAT Concn. Number	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														
			UTG/18/PMP/774/R. Further details are discussed in the key issues section.														
38	<p>In order to prevent or reduce CO emissions to air from the combustion of gas oil in gas turbines, BAT is to use one or a combination of the techniques given below.</p> <table border="1" data-bbox="331 571 1491 751"> <thead> <tr> <th data-bbox="331 571 367 603"></th> <th data-bbox="367 571 589 603">Technique</th> <th data-bbox="589 571 837 603">Description</th> <th data-bbox="837 571 1491 603">Applicability</th> </tr> </thead> <tbody> <tr> <td data-bbox="331 603 367 667">a.</td> <td data-bbox="367 603 589 667">Combustion optimisation</td> <td data-bbox="589 603 837 667" rowspan="2">See description in Section 8.3</td> <td data-bbox="837 603 1491 667">Generally applicable</td> </tr> <tr> <td data-bbox="331 667 367 751">b.</td> <td data-bbox="367 667 589 751">Oxidation catalysts</td> <td data-bbox="837 667 1491 751">Not applicable to combustion plants operated < 500 h/yr. Retrofitting existing combustion plants may be constrained by the availability of sufficient space</td> </tr> </tbody> </table> <p>As an indication, the emission level for NO_x emissions to air from the combustion of gas oil in dual fuel gas turbines for emergency use operated < 500 h/yr will generally be 145–250 mg/Nm³ as a daily average or average over the sampling period.</p>		Technique	Description	Applicability	a.	Combustion optimisation	See description in Section 8.3	Generally applicable	b.	Oxidation catalysts	Not applicable to combustion plants operated < 500 h/yr. Retrofitting existing combustion plants may be constrained by the availability of sufficient space	CC	<p>Oxidation catalysts are not applicable to combustion plants operated < 500 h/yr.</p> <p>BATc 38 provides an indicative emission level of 250 mg/Nm³ for combustion of gas oil in dual fuel gas turbines operating less than 500 hours per year. This indicative figure is not strictly applicable to LCP 390 and LCP 391, because the gas turbines are not dual fuel. However, we have set a benchmark emission level at 250 mg/Nm³ based on the emissions reported by the Operator.</p>			
	Technique	Description	Applicability														
a.	Combustion optimisation	See description in Section 8.3	Generally applicable														
b.	Oxidation catalysts		Not applicable to combustion plants operated < 500 h/yr. Retrofitting existing combustion plants may be constrained by the availability of sufficient space														
39	<p>In order to prevent or reduce SO_x and dust emissions to air from the combustion of gas oil in gas turbines, BAT is to use the technique given below.</p> <table border="1" data-bbox="322 1145 1496 1238"> <thead> <tr> <th data-bbox="322 1145 358 1177"></th> <th data-bbox="358 1145 474 1177">Technique</th> <th data-bbox="474 1145 703 1177">Description</th> <th data-bbox="703 1145 1496 1177">Applicability</th> </tr> </thead> <tbody> <tr> <td data-bbox="322 1177 358 1238">a.</td> <td data-bbox="358 1177 474 1238">Fuel choice</td> <td data-bbox="474 1177 703 1238">See description in Section 8.4</td> <td data-bbox="703 1177 1496 1238">Applicable within the constraints associated with the availability of different types of fuel, which may be impacted by the energy policy of the Member State</td> </tr> </tbody> </table> <p>BAT-associated emission levels for SO₂ and dust emissions to air from the combustion of gas oil in gas turbines, including dual fuel gas turbines</p> <table border="1" data-bbox="322 1295 1496 1366"> <thead> <tr> <th data-bbox="322 1295 528 1327"></th> <th colspan="2" data-bbox="528 1295 1496 1327">BAT-AELs (mg/Nm³)</th> </tr> </thead> <tbody> <tr> <td data-bbox="322 1327 528 1366"></td> <td data-bbox="528 1327 1012 1366">SO₂</td> <td data-bbox="1012 1327 1496 1366">Dust</td> </tr> </tbody> </table>		Technique	Description	Applicability	a.	Fuel choice	See description in Section 8.4	Applicable within the constraints associated with the availability of different types of fuel, which may be impacted by the energy policy of the Member State		BAT-AELs (mg/Nm ³)			SO ₂	Dust	CC	<p>Low sulphur fuel is utilised.</p> <p>The <u>yearly</u> BAT-AELs for SO₂ and dust are not applicable to existing plants operating for less than 1500 hours per year.</p> <p>Footnote 2 Table 22 in BAT 39 states that <u>daily</u> average BAT-AELs for SO₂ and dust are</p>
	Technique	Description	Applicability														
a.	Fuel choice	See description in Section 8.4	Applicable within the constraints associated with the availability of different types of fuel, which may be impacted by the energy policy of the Member State														
	BAT-AELs (mg/Nm ³)																
	SO ₂	Dust															

BAT Concn. Number	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
	Type of combustion plant	Yearly average ⁽¹³⁴⁾	Daily average or average over the sampling period ⁽¹³⁵⁾	Yearly average ⁽¹³⁴⁾	Daily average or average over the sampling period ⁽¹³⁵⁾		
	New and existing plants	35–60	50–66	2–5	2–10		<p>indicative for existing plants operated less than 500 hours per year. The operator has confirmed that the plant can achieve the BAT AELS for SO₂ and Dust.</p> <p>The indicative BAT-AEL requirement for SO₂ is satisfied for gas oil by restricting the sulphur content of the fuel to 0.1%, by mass, in line with the Sulphur Content of Liquid Fuels Regulations.</p> <p>The indicative BAT-AEL for dust is satisfied by restricting the maximum ash content of gas oil to 0.01% by mass.</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.

As part of their Regulation 61 Note response, the operator has not requested a derogation from compliance with any AEL values.

7. Emissions to Water

The consolidated permit incorporates the three current discharges to controlled waters identified as W1 to W3 to Mitchell Brook.

There are no BAT AELs specified in the BAT Conclusions for this type of plant. There are also no additional treatment options identified as BAT for the installation. We have therefore not carried out any additional assessment of the emissions to water as part of this review.

8 Additional IED Chapter II requirements:

Energy efficiency

The BAT for balancing plant guidance (Working draft, 2018) sets out additional restrictions on hours for <1500 hour non-emergency plant which are low efficiency. Table 1 of the guidance sets out categories for LCP peaking plant. The LCP at Taylor's Lane Power Station falls into category B because it's NO_x emissions are below 500 mg/m³ and its efficiency, at 26.2%, is above that set out in table 2 of the guidance for this type of plant and fuel (25.7%). Table 1 therefore confirms that there are no additional restrictions applied to the hours of operation.

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	
Biodiversity, heritage, landscape and nature conservation	<p>The application is within the relevant distance criteria of a site of heritage, landscape or nature conservation, and/or protected species or habitat.</p> <p>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 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.</p>
Permit conditions	
Updating permit conditions during consolidation	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.
Changes to the permit conditions due to an	We have varied the permit as stated in the variation notice.

Aspect considered	Decision
Environment Agency initiated variation	
Use of conditions other than those from the template	We have retained condition 3.5.5 relating to the need for MCERTS. However, this condition has been updated to correct the reference of condition 3.5.3.
Improvement programme	<p>Based on the information on the application, we consider that we need to impose an improvement programme.</p> <p>We have imposed an improvement programme to ensure that:</p> <ul style="list-style-type: none"> • the operator will have a plan in place to ensure that the fuel is characterised in line with BAT 9. <p>We have also removed the completed improvement conditions from the permit.</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 Section 5 of this document.</p> <p>It is considered that the ELVs/equivalent parameters or technical measures described above will ensure that significant pollution of the environment is prevented and a high level of protection for the environment is secured.</p>
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 S3.3 Process monitoring requirements was amended to include the requirement to monitor energy efficiency after overhauls on site in line with BAT2.</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 • Dust <p>These are described in the relevant BAT Conclusions in Section 5 of this document.</p>

Aspect considered	Decision
Operator competence	
Management system	There is no known reason to consider that the operator will not have the management system to enable it 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:</p> <p>“The primary role of regulators, in delivering 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>