Permitting Decisions- Variation (substantial)

We have decided to grant the variation for North Killingholme Power Project operated by UNIPER UK LIMITED.

The variation number is EPR/FP3838EB/V004.

The permit was issued on 26/05/2026.

The variation is required to increase the thermal input capacity of the Combined Cycle Gas Turbine (CCGT) from 800 MWth to 900 MWth, varying the permitted Section 1.1 Part A(1)(a) listed activity.

The land associated with the gasification plant (which was never authorised to operate) is also removed by this variation, with the subsequent partial surrender (EPR/FP3838EB/S005) of land in the northern section of the installation associated with this plant.

The installation listed activity comprises:

- 900 MWth CCGT (Large Combustion Plant (LCP470));
- 8.5 MWth natural gas fired auxiliary boiler;
- two natural gas fired Joules Thomson (JT) heaters, each at 3 MWth; and
- 1.5 MWth emergency diesel generator.

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

Purpose of this document

This decision document provides a record of the decision-making process. It

- highlights key issues in the determination
- summarises the decision making process in the decision considerations section to show how the main relevant factors have been taken into account
- explains why we have also made an Environment Agency initiated variation
- shows how we have considered the consultation responses

Unless the decision document specifies otherwise, we have accepted the applicant's proposals.

Read the permitting decisions in conjunction with the environmental permit and the variation notice.

Key issues of the decision

The installation's environmental impact

Regulated activities can present different types of risk to the environment, these include noise and vibration, accidents, fugitive emissions to air and water; as well as point source releases to air, discharges to ground or groundwater, global warming potential and generation of waste and other environmental impacts. Consideration may also have to be given to the effect of emissions being subsequently deposited onto land (where there are ecological receptors). The key factors relevant to this determination are discussed in this and other sections of this document.

For an installation of this kind, the principal emissions are those to air and water, although we also consider those to land.

The next sections of this document explain how we have approached the critical issue of assessing the likely impact of the emissions to air and water from the installation on human health and the environment.

1 Emissions to air assessment methodology

1.1 Application of Environment Agency web guide for air emissions risk assessment

A methodology for risk assessment of point source emissions to air, which we use to assess the risk of applications we receive for permits/variations, is set out in our web guide and has the following steps:

- Describe emissions and receptors
- Calculate process contributions
- Screen out insignificant emissions that do not warrant further investigation
- Decide if detailed air modelling is needed
- Assess emissions against relevant standards
- Summarise the effects of emissions

The methodology uses a concept of "process contribution (PC)", which is the estimated concentration of emitted substances after dispersion into the receiving environmental media at the point where the magnitude of the concentration is greatest. The guidance provides a simple method of calculating PC primarily for screening purposes and for estimating PCs where environmental consequences are relatively low. It is based on using dispersion factors. These factors assume worst case dispersion conditions with no allowance made for thermal or momentum plume rise and so the PCs calculated are likely to be an overestimate

of the actual maximum concentrations. More accurate calculation of PCs can be achieved by mathematical dispersion models, which take into account relevant parameters of the release and surrounding conditions, including local meteorology.

1.2 Use of Air Dispersion Modelling

For LCP applications, we usually require the applicant to submit a full air dispersion model as part of their application, for the key pollutants. Air dispersion modelling enables the PC to be predicted at any environmental receptor that might be impacted by the plant.

Once short-term and long-term PCs have been calculated in this way, they are compared with Environmental Quality Standards (EQS).

Where an EU EQS exists, the relevant standard is the EU EQS. Where an EU EQS does not exist, our guidance sets out a National EQS (also referred to as Environmental Assessment Level (EAL)) which has been derived to provide a similar level of protection to human health and the environment as the EU EQS levels.

National EQSs do not have the same legal status as EU EQSs, and there is no explicit requirement to impose stricter conditions than BAT in order to comply with a national EQS. However, national EQSs are a standard for harm and any significant contribution to a breach is likely to be unacceptable.

PCs are considered **insignificant** if:

- the **long-term** process contribution is less than **1%** of the relevant EQS; and
- the **short-term** process contribution is less than **10%** of the relevant EQS.

Where an emission is screened out in this way, we would normally consider that the applicant's proposals for the prevention and control of the emission to be BAT. That is because if the impact of the emission is already insignificant, it follows that any further reduction in this emission will also be insignificant.

However, where an emission cannot be screened out as insignificant, it does not mean it will necessarily be significant.

For those pollutants which do not screen out as insignificant, we determine whether exceedances of the relevant EQS are likely. This is done through detailed audit and review of the applicant's air dispersion modelling taking background concentrations (PC + background concentration = Predicted Environmental Concentration (PEC)) and modelling uncertainties into account. Where an exceedance of an EU EQS is identified, we may require the applicant to go beyond what would normally be considered BAT for the installation or we may refuse the application if the applicant is unable to provide suitable proposals. Whether or not exceedances are considered likely, the application is subject to the requirement to operate in accordance with BAT.

This is not the end of the risk assessment, because we also take into account local factors (for example, particularly sensitive receptors nearby such as Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs) or Special Protection Areas (SPAs). These additional factors may also lead us to include more stringent conditions than BAT.

If, as a result of reviewing of the risk assessment and taking account of any additional techniques that could be applied to limit emissions, we consider that emissions **would cause significant pollution**, we would refuse the application.

2 Assessment of impact on air quality

The applicant's assessment of the impact of air quality is set out in *'*Appendix F – Air Quality Impact Assessment*'* dated 09/02/2026 of the application. The assessment comprises:

- Dispersion modelling of emissions to air from the operation of the installation.
- A study of the impact of emissions on nearby sensitive conservation sites.

This first section deals primarily with the dispersion modelling of emissions to air from the installation and its impact on local air quality. The impact on conservation sites is then considered.

The applicant has assessed the installation's potential emissions to air against the relevant air quality standards, and the potential impact upon human health and local conservation sites. These assessments predict the potential effects on local air quality from the installation's stack emissions using the ADMS (Atmospheric Dispersion Modelling System) dispersion model, which is a commonly used computer model for regulatory dispersion modelling. The model used five years of meteorological data collected from the weather station between 2020 and 2024 at Humberside Airport which is 8.5 km south-west of the installation. The impact of the terrain surrounding the site upon plume dispersion was not considered in the dispersion modelling.

The air impact assessments, and the dispersion modelling upon which they were based, employed the following assumptions:

LCP

- First, they assumed that the emission limit values (ELVs) in the permit would be the maximum permitted by Annex V of the Industrial Emissions Directive (IED). Chapter III of the IED lays out special provisions for LCP and mandatory maximum ELVs are defined in part 2 of Annex V for new plant. In addition to the mandatory IED ELVs, the maximum Associated Emission Levels (AELs) outlined within the LCP Best Available Techniques (BAT) Conclusions were assumed. The uplift was applied for oxides of nitrogen (NO_x), based on the electrical efficiency being greater than 55%. Refer to 'Emission limits' section of this document. These substances are:

- NO_x, expressed as NO_2
- carbon monoxide (CO)

- Second, they assumed that the LCP operates at a worst case of up to 8,760 hours in any given year.

MCP

- Auxiliary boiler and JT heaters operate at a worst case of 500 hours/year at the Medium Combustion Plant Directive (MCPD) NOx limit of 100 mg/m^3 and a CO limit of 80 mg/m^3.
- It was considered that due to the small size of the emergency diesel generator and the low annual running hours it was unlikely to have a discernible impact at the receptor locations so was not considered further in this assessment. However, the applicant provided an assessment using our Simple Calculation of Atmospheric Impact Limits (SCAIL) tool to demonstrate the insignificant impact.

Operational controls complement the emission limits and should generally result in emissions below the maximum allowed; whilst the limits themselves provide headroom to allow for unavoidable process fluctuations. Actual emissions are therefore almost certain to be below emission limits in practice, because any operator who sought to operate its installation continually at the maximum permitted level would almost inevitably breach those limits regularly, simply by virtue of normal fluctuations in plant performance, resulting in enforcement action (including potentially prosecution) being taken. Assessments based on Chapter III/Annex V ELVs or BAT AELs are therefore “worst-case” scenarios.

We are in agreement with this approach. The assumptions underpinning the model have been checked and are reasonably precautionary.

The applicant provided the values from the DEFRA background mapping system as background concentrations for the baseline year of 2023 for the grid squares in which the installation is located. They also provided the background concentration from the CM6 – Killingholme School monitor. The CM6 monitor is considered to be representative of conditions at the installation, and its concentrations are higher than the Defra background values at the installation. As a result, the CM6 2023 background value has been used throughout the assessment for human receptors.

The applicant provided us with the modelled output showing the concentration of key pollutants at a number of specified locations within the surrounding area. The way in which the applicant used dispersion models, its selection of input data, use of background data and the assumptions it made have been reviewed by the Environment Agency to establish the robustness of the applicant’s air impact assessment. The output from the model has then been used to inform further assessment of health impacts and impact on habitats and conservation sites and is included in the relevant sections below.

The applicant’s modelling predictions are summarised in the following sections.

3 The modelled predicted pollutant concentrations – human health

The impact of the installation's PCs at human health receptors has been determined from the maximum model output that occurs anywhere beyond the installation boundary, in the first instance, and where this cannot be screened out under the H1 criteria, impacts at receptor locations are provided.

Where emissions screen out as insignificant, the background pollutant levels are not considered within the assessment in accordance with our H1 screening process.

Pollutant	EQS / EAL (µg/m³)	Process Contribution (PC) (µg/m³)	PC as % of EQS / EAL	PEC (µg/m³) (Background + PC)	PEC as % of EQS
NO_2 Annual	40	1.9 Note 1	4.8	14.9	37.3
NO_2 Hourly mean	200	6.9 Note 2	3.5	-	-
CO hourly	30,000	195.1 Note 1	0.7	-	-
CO 8-hour	10,000	154.4 Note 1	1.5	-	-
Note 1: PC at the point of maximum impact. Note 2: PC at a human health receptor.					

From the table above the following emissions can be screened out as insignificant in that the PC is <1% of the long-term EQS/EAL and <10% of the short-term EAQ/EAL. These are:

- NO_2 hourly mean (at receptors) and CO at the point of maximum impact.

From the table above the annual NO_2 maximum ground level emissions were over 1% of the EQS at 1.9% so background NO_2 levels were considered. The applicant concludes that when taking these into account there is adequate headroom between the PEC and EQS to indicate that it is unlikely that there will be an exceedance of an EQS. The PEC is 37.3% of the EQS.

3.1 Environment Agency assessment – human health

Our review of the applicant's assessment leads us to agree with the applicant's conclusions.

Therefore, we consider the applicant's proposals for preventing and minimising the emissions of these substances to be BAT for the installation subject to the audit of BAT considered later in this document.

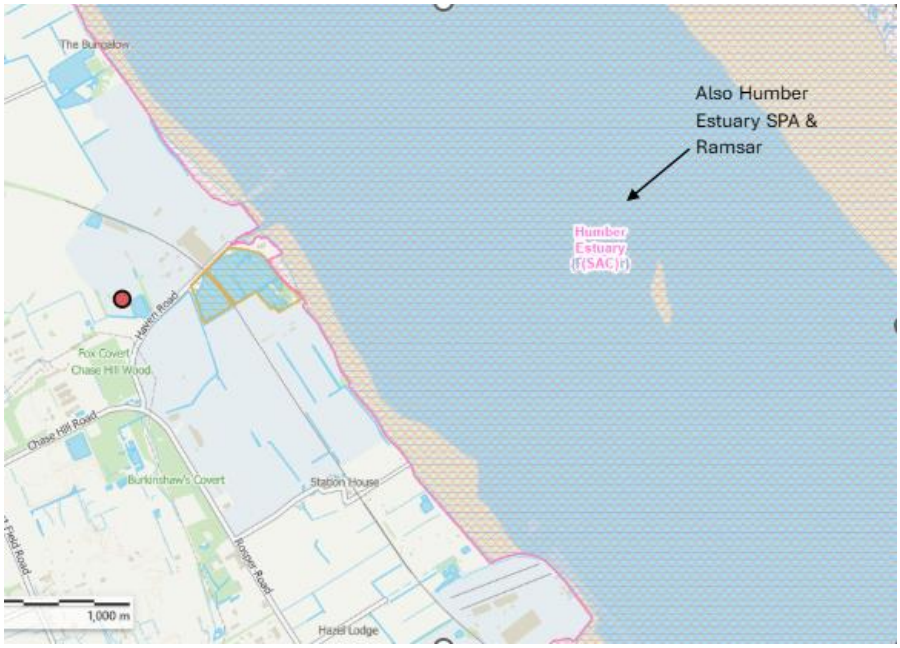
4 Impact on Habitats sites, SSSIs and non-statutory conservation sites

4.1 Habitats sites

The following Special Area of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites are located within 15 km of the installation:

Humber Estuary SAC, SPA, Ramsar

Humber Estuary - SPA salt meadow habitat, SPA, Ramsar



/// Special Area of Conservation (SAC)
● Installation location

4.2 Sites of Special Scientific Interest (SSSIs)

The following SSSIs are located within 15 km of the installation:

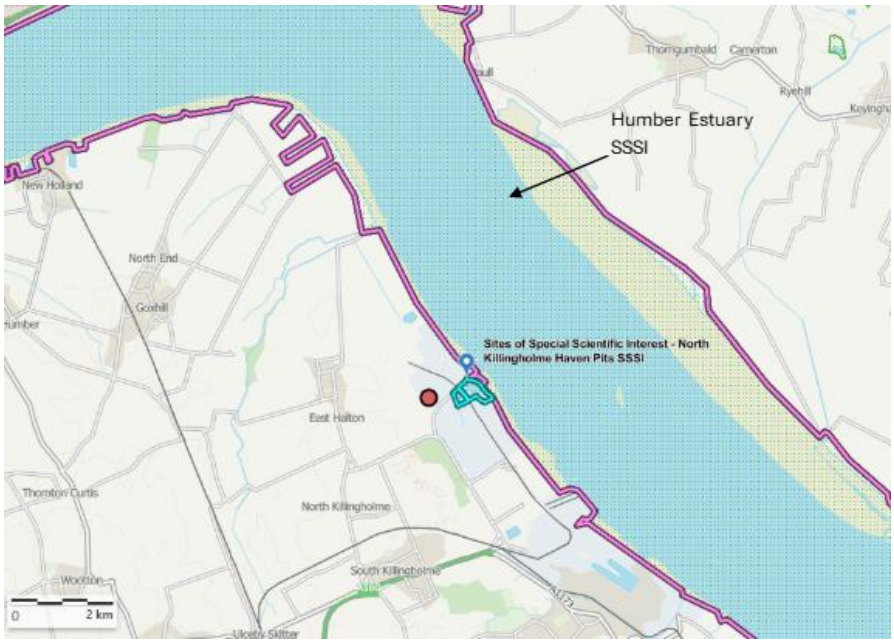
Humber Estuary

Humber Estuary - SPA salt meadow habitat

North Killingholme Haven Pits

Swallow Wold

Wrawby Moor



- Installation location

4.3 Non-statutory local wildlife sites (LWS)

There are 10 non-statutory LWS located within 2 km of the installation. The closest is Halton Marsh Clay Pits 315 m east of the installation.

4.4 The modelled predicted pollutant concentrations at ecological receptors

The applicant's modelling predicted pollutant concentrations at ecological receptors. The table below shows the ground level concentrations at the most impacted ecological receptor (Humber Estuary). Where emissions screen out as insignificant, the background pollutant levels are not considered within the assessment in accordance with our H1 screening process.

Pollutant	EQS / EAL ($\mu g/m^3$)	Back-ground ($\mu g/m^3$)	Process Contribution (PC) ($\mu g/m^3$)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC) ($\mu g/m^3$)	PEC as % EQS / EAL
Direct Impacts Note 1						
NO_x Annual	30	25.3	1.0	3.3	26.3	87.7
NO_x Daily Mean	75	38	18.6	24.8	56.6	75.5
	200 Note 2			9.3		-
Deposition Impacts Note 1						
Nitrogen deposition (kg N/ha/yr)	10	-	0.1	1.0 Note 3	-	-
Acid deposition (Keq/ha/yr)	Min CL Min N: 0.357 Min CL Max N: 2.67 Min CL Max S: 2.31	1.2	<0.01	1.2	-	-
Note 1: Direct impact units are $\mu g/m^3$ and deposition impact units are kgN/ha/yr or Keq/ha/yr.						

Pollutant	EQS / EAL (µg/m³)	Back-ground (µg/m³)	Process Contribution (PC) (µg/m³)	PC as % of EQS / EAL	Predicted Environmental Concentration (PEC) (µg/m³)	PEC as % EQS / EAL
Note 2: The applicant confirmed that the higher critical level is applicable in their response to our further information request received 17/03/2026, see 'Daily mean NOx' below. Note 3: Refer to 'Nitrogen deposition' below for details of a small area of saltmarsh predicted to have PCs up to 2% of the critical load.						

4.4.1 Annual mean NOx

The PCs are below the critical level and can be considered insignificant in that the PC is <1% of the long-term critical level at all ecological sites with the exception of:

Humber Estuary SAC, SPA, Ramsar, SSSI

North Killingholme Haven Pits

They conclude that whilst the results indicate impacts at these receptors cannot be considered as insignificant, there remains considerable headroom between the PEC and the critical level and, considering the numerous worst-case assumptions used in the assessment, they consider that the impacts are not significant.

The contour plot provided in the application shows that the maximum PCs occur over a small area where the existing background concentrations are high.

4.4.2 Daily mean NOx

With the more stringent critical level of 75 µg/m^3, the PCs are below the critical level and can be considered insignificant in that the PC is <10% of the short-term critical level at all ecological sites with the exception of:

Humber Estuary SAC, SPA, Ramsar, SSSI

North Killingholme Haven Pits

They conclude that whilst the results indicate impacts at these receptors cannot be considered insignificant, there remains considerable headroom between the PEC and the critical level and, considering the numerous worst-case assumptions used in the assessment, it can be considered that the impacts are not significant.

Where background sulphur dioxide (SO_2) and ozone levels are low, a less stringent critical level of 200 µg/m^3 can also be considered and the applicant provided evidence to support this in their response received 17/03/2026. Compared to this critical level, the maximum impacts are screened out as insignificant.

The contour plot provided in the application shows that the maximum PCs occur over a very small area directly surrounding the installation. The applicant considers that the PCs are dominated by the emissions from the auxiliary boiler and JT heaters, due to the shorter stack heights associated with these sources. They consider it highly unlikely that either of these sources would be operational continuously for 24 hours, and therefore they consider that the daily NOx results are very conservative.

4.4.3 Nitrogen deposition

The applicant concludes that the PCs are below the critical loads and can be considered insignificant in that the PC is <1% of the long-term critical load at all ecological sites.

However, whilst the presented impacts using the lower critical load for Atlantic saltmarsh are at 1% of the critical load, it was noted that there is a small area of saltmarsh just to the northeast of the installation that was not included as a specific receptor in the Air Quality Impact Assessment. This is identified in the Technical Note, dated 09/02/2026 (additional information for duly making).

The small area of saltmarsh just to the northeast of the installation is mainly Mid-Low and Spartina, and therefore again, the 10kg N/ha/yr critical load for Atlantic upper-mid & mid-low salt marshes is applied to ensure a conservative assessment. This area is predicted to have nitrogen deposition concentrations that would be up to 2% of the 10 kg N/ha/yr critical load, and therefore the potential impacts of nitrogen deposition need to be considered further.

The Humber Estuary SAC and SSSI is designated for supporting numerous Annex I habitats, with H1130 Estuaries and H1140 Mudflats and sandflats not covered by seawater at low tide being the primary reason for the selection of the site. H1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) are present as a qualifying feature, but is not a primary reason for the designation of the site.

Whilst nitrogen inputs have been experimentally demonstrated to have an effect on overall species composition of saltmarsh, it is important to note from the Air Pollution Information System (APIS) that the experimental studies that underlie conclusions regarding the sensitivity of saltmarsh to nitrogen have '… neither used very realistic N doses nor input methods i.e. they have relied on a single large application more representative of agricultural discharge', which is far in excess of anything that would be deposited from the atmosphere. Therefore, APIS indicates that determining which part of the critical load range to use for saltmarsh requires expert judgment. Overall, there is good reason to believe the upper part of the

critical load range (i.e. 20 kgN/ha/yr for Atlantic saltmarsh) may be more appropriate than the lower part (10 kgN/ha/yr) for some saltmarsh communities.

The critical loads on APIS are relatively generic for each habitat type and cover a wide range of deposition rates. They do not (and are not intended to) take account of other influences to which the habitat on a given site may be exposed to. For instance, Natural England's Designated Site Overview for SSSI Unit 97 states that the condition of the site is Unfavourable-Declining, with the reasoning being due to the populations of non-breeding birds having declined by more than 25%. It is considered that this is due to the impacts of bird flu, and not as a consequence of habitat change due to nitrogen deposition.

There is already high background nitrogen deposition at this location (16.7 kgN/ha/yr), which exceeds the lower critical load of 10 kgN/ha/yr for upper saltmarsh. The PC at this location only represents 1.2% of the background nitrogen deposition.

If a conservative approach is taken at this stage, assuming a 10 kg N/ha/yr critical load for the saltmarsh within the area, it is considered there might be potential for an impact on the habitat there. However, since the background nitrogen deposition is already 16.7kg N/ha/yr, the baseline vegetation community there is already subject and adjusted to higher levels of nitrogen. In addition, the affected area represents a very small area of saltmarsh compared to the extent of saltmarsh habitat present throughout the SAC and SSSI.

A contour plot of the nitrogen deposition shows that the extent of the nitrogen deposition impacts over the 1% critical load of 10 kg N/ha/yr are very localised to the installation.

4.4.4 Acid deposition

The applicant concludes that the PCs are below the critical loads and can be considered insignificant in that the PC is <1% of the long-term critical load at all ecological sites with the exception of Chase Hill Wood LWS where the PC is 1.2% of the critical load. They conclude that following our guidance this is acceptable for a LWS.

4.5 Environment Agency assessment – ecological receptors

The applicant used meteorological data from Humberside Airport. Our view is that this is unlikely to be representative of conditions at the installation, which is much closer to the estuary. The wind roses from Humberside Airport appear channelled and influenced by local terrain. We used our own, more representative, meteorological data.

The applicant reports the highest annual NOx PC of 1 µg/m³ at the Humber Estuary, refer to the table above, equivalent to 3.3% of the critical level of 30 µg/m³ and therefore classed as not insignificant. They used a background concentration of 25.3 µg/m³ giving a PEC of 26.3 µg/m³, which is 87.7% of the critical level.

Our modelling checks using the representative meteorological data, indicate marginally higher PCs. These differences are well within modelling uncertainty, so the applicant's reported PCs can reasonably be used.

APIS currently provides a 3-year average background NOx concentration (2020–2022) of 28.4 µg/m³ for this location, which would give a PEC close to the critical level and would normally trigger a more detailed PEC and in-combination assessment. However, the UK Centre for Ecology & Hydrology (UKCEH) confirmed to us on 01/04/2026 that APIS background values were due to be updated imminently. APIS NOx backgrounds are based on Defra Pollution Climate Mapping (PCM) maps, which are currently available up to 2024. Using the most up-to-date data, we have calculated 3-year averages of 23.2 µg/m³ for 2021–2023 and 17.7 µg/m³ for 2022–2024. On this basis, updated PECs are much lower and are likely to be below 70% of the critical level.

We agree with the applicant that daily NOx PCs are not insignificant. However, the PECs are around 75% of the daily critical level of 75 µg/m³ and are not at risk of being exceeded.

We agree that nutrient nitrogen PCs are around 1% of the critical load of 10 kgN/ha/yr (with the exception of the area of saltmarsh located directly to the north of the proposal, see below) and can be considered insignificant, with background nutrient nitrogen deposition already exceeding the critical load.

We also agree that acid deposition PCs are insignificant at less than 1% of the critical load.

4.6 Environment Agency assessment – ecological receptors (habitats sites)

Whilst emissions of NOx did not screen out as insignificant, the PECs for both long-term and short-term were below the critical level and therefore no likely significant effect was concluded. Our checks confirm that the PEC for long and short-term NOx are likely to be <70% and 75% of the critical load respectively, refer to section 4.5 of this document.

For acidification, whilst there are no habitats sensitive to acid deposition identified within the impact area for emissions from the proposal, the results did not exceed the significance threshold and are therefore considered insignificant.

For nitrogen deposition, emissions screened out as insignificant at all receptor locations, with the exception of an area of saltmarsh located directly to the north of the proposal. As this receptor was above the threshold of significance, a likely significant effect was concluded. We carried out an appropriate (in-combination) assessment for the relevant features. River lamprey and sea lamprey were not included as they are not sensitive to atmospheric nutrient deposition.

Whilst several applications with similar emissions were identified that could act in-combination with the proposal, those emissions mostly screened out as insignificant and therefore, in line with our guidance, were excluded from consideration. Saltend Cogeneration Plant (EPR/QP3539/V012) however does have the potential to have a discrete impact upon saltmarsh habitats across the estuary. We undertook the in-combination assessment including the relevant emissions from this application as follows:

- long-term NOx was a maximum of 3.6% on the Humber designations but the significant impacts did not overlap therefore there are no significant emissions to combine, only the potential for discrete impacts. As these impacts (PEC) screened out under the relevant environmental standards, we concluded no likely significant effect in-combination.
- short-term NOx was a maximum of 56.1% of the 75 µg/m^3 standard. Initial screening was done by comparing the PC to the critical level, however, in accordance with our guidance at Air emissions risk assessment for your environmental permit - GOV.UK, at locations where the ozone is below the AOT40 critical level and sulphur dioxide is below the lower critical level of 10 µg/m^3, a higher critical level of 200 µg/m^3 is applicable. Our checks show that for the section of the Humber subject to impacts from this proposal, the higher critical level can be applied and, even if the effect of this permission were added to the calculation above (double the background + the PC from Saltend + the PC from North Killingholme Power Project), the 200 µg/m^3 standard would not be exceeded. This is very conservative as the significant effects from both installations are unlikely to overlap at any one given time due to their locations on opposing sides of the Humber and the prevailing wind direction. We concluded no likely significant effect in-combination.

- For nutrient deposition the conclusion of the Saltend Habitats Risk Assessment was that there is no adverse effect due to inundation and Natural England data suggesting the habitat has been maintained for the assessed features. This essentially formulates the conclusion for the in-combination assessment. The combined impacts are discrete as the isopleths for the emissions do not show an overlap of impacts above the significance criteria.

  Our checks of the saltmarsh mapping confirm the applicant's statement that upper saltmarsh is present in the surrounding area so a critical load of 10 kgN/ha/year should be applied in those locations for all features except *Salicornia and other annuals colonizing mud and sand*, for which the critical load class given is pioneer saltmarsh; there is no pioneer saltmarsh identified in the surrounding area and so that feature is excluded from further consideration.

  At the location of the upper marsh habitat, PCs are 2.0% of the critical load. The background loading in this area is 16.7 kgN/ha/year and therefore the PEC is calculated to be 169% of the critical load.

  In order to assess the potential for the proposal to cause an adverse effect, the condition of the area was evaluated using information on Natural England's website. The saltmarsh is located in the Humber Estuary SSSI unit 97 which has a condition status of 'unfavourable – declining' (last assessed March 2025). This status is due to continually declining bird populations across the entire estuary. There are no conclusive reasons for this decline, but it is suspected to be due to broadscale population trends. There is no feature-specific assessment for saltmarsh, however the assessments for all bird species state that the extent of the broad habitats used by the species has been maintained. This implies that the current background exceedance of the critical load is not impacting the saltmarsh and it is therefore reasonable to assume that the relatively small increase predicted from the proposal will not lead to any damage.

  It is noted that the predicted emissions were a result of worst-case modelling; in reality, it is highly unlikely that the CCGT plant will operate at full load for 24 hours a day and therefore actual emissions are expected to be lower than those predicted in the modelling. Furthermore, our modelling checks, using more representative meteorological conditions and more up to date background data, showed that the nutrient deposition PCs in this area were likely to be around 1% and can be considered insignificant.

As a final note, though the area of upper marsh is located above the mean high-water mark, it is likely the area is still subjected to occasional tidal inundation which will serve to flush the marsh of any deposited pollutant, and the subsequent nutrient exchange from the tides will render atmospheric deposition redundant.

Due to the above reasoning, it is concluded there would be no adverse effect on the qualifying features in-combination. This conclusion is not dependent on any mitigation measures or conditions.

Therefore, we consider the applicant's proposals for preventing and minimising the emissions of these substances to be BAT for the installation subject to the audit of BAT considered later in this document.

4.7 Environment Agency assessment – ecological receptors (SSSIs)

We conclude that the proposed permission is not likely to damage any of the flora, fauna or geological or physiological features which are of special interest.

- both long and short-term NOx emissions either screen out as insignificant or the PECs are found to be under the critical level. Our checks confirm that the PEC for long and short-term NOx are likely to be <70% and 75% of the critical load respectively, refer to section 4.5 of this document.
- acid deposition screens out as insignificant at all receptor locations.
- for nitrogen deposition, emissions screened out as insignificant at all receptor locations, with the exception of an area of saltmarsh located directly to the north of the proposal. For those receptors that screened out as insignificant, it was concluded that the proposal was not likely to damage the SSSI.

  For our assessment of this area of saltmarsh, refer to section 4.6 of this document.

  Based on this assessment we concluded that the proposal was not likely to damage the Humber Estuary SSSI.

5 Assessment of the impacts from the emergency diesel generator using the SCAIL tool

The applicant assessed the impacts using the Simple Calculation of Atmospheric Impact Limits (SCAIL) tool and included planned testing and maintenance operations as well as an emergency scenario. The results of the assessment indicated that the effects of the planned testing and maintenance activities and the emergency scenario were all screened out as insignificant for all human and ecological receptors.

The applicant screened out the emergency diesel generator from the requirement of detailed modelling. We consider this approach to be appropriate given the negligible contribution of the emissions relative to other sources.

6 Emissions to water

The emissions from W1 will comprise the following streams:

- cooling tower water blow-down (containing small amounts of chemicals added for the conditioning of the cooling water);
- combined effluents from on-site processes used for cooling tower water make-up (this will include HRSG blow-down, RO rejects (from demineralisation treatment plant), effluent from the condenser and treated water from the oil/water separator);
- cooling tower water sediment (comprising a concentrated solution of the solids already present in the raw river water);
- surface water drainage; and
- treated surface water from oil separators.

The existing permit allows for discharge to the Humber Estuary via emission point W1 at TA 1680 2050, refer to the plans in 'The site' section of this document. The pipeline route has been slightly amended to incorporate a small area of land located between Haven Road and Loverose Way.

The applicant was initially proposing a potential alternative location for W1 at TA 1704 1964, approximately 0.9 km to the south of the current W1 location and confirmed that the decision on the W1 location would be made following completion of detailed design.

We confirmed that this alternative W1 location would need to be addressed via a separate variation application due to the significant additional assessments, including thermal plume modelling which we would need to assess and extra consultation requirements.

The applicant provided an updated site plan, refer to 'The site' section of this document, with the release point for the W1 alternative location removed. They also provided an explanatory cover letter formally notifying us that the alternative W1 emission point no longer applies to this variation application. By providing this notification, any reference to the alternative W1 emission point within the submitted application documentation for this variation are disregarded for the purposes of this determination.

We have retained the emission limits and monitoring parameters for emission point W1, consistent with the existing permit.

The emissions from W2 at TA 1575 1955 will comprise uncontaminated surface water drainage from the installation only. The effluent will be discharged from the installation via W2 into Internal Drainage Board (IDB) drains, the existing pond on-site and then to the Humber. We have added this emission point to table S3.2 of the permit and included a requirement for a daily visual inspection for oil and grease to monitor compliance.

Decision considerations

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 decision was taken in accordance with our guidance on confidentiality.

Consultation

The consultation requirements were identified in accordance with the Environmental Permitting (England and Wales) Regulations (2016) and our public participation statement.

We consulted the following organisations:

- Local Authority – Environmental Protection Department
- Local Authority – Planning
- Director of Public Health/UK Health Security Agency (UKHSA)
- Health and Safety Executive (HSE)
- Food Standards Agency (FSA)
- Witham Internal Drainage Board (IDB)
- National Grid

The comments and our responses are summarised in the consultation responses section.

The application was publicised on the GOV.UK website.

The regulated facility

We considered the extent and nature of the facility at the site in accordance with RGN2 ‘Understanding the meaning of regulated facility’ and Appendix 2 of RGN2 ‘Defining the scope of the installation’.

Chapter III of the IED applies to new and existing LCPs which have a total rated thermal input which is greater or equal to 50MW.

The 900 MWth Combined Cycle Gas Turbine (CCGT) on this site consists of an individual combustion unit with a total rated thermal input ≥50MW making it an LCP.

As the LCP plant is not built yet, we have set an improvement condition requiring the applicant to provide the ‘as built’ thermal input within six months of completion of commissioning.

Combustion plant on the installation that do not form part of the LCP and so do not come under chapter III requirements, are still listed within the Section 1.1 Part A(1)(a) activity listed in Schedule 1 of the Environmental Permitting Regulations (EPR). At this installation this includes:

- 8.5 MWth natural gas fired auxiliary boiler;
- two natural gas fired Joules Thomson (JT) heaters, each at 3 MWth; and
- 1.5 MWth emergency diesel generator.

These smaller units are also within the scope of the MCPD and have been listed as MCP in the permit. They will operate for less than 500 hours per year and therefore no emission limits have been specified, refer to ‘Emission limits’ section of this document.

The operator has provided the grid reference for the emission points from the MCPs.

The extent of the facility is defined in the site plan and in the permit. The activities are defined in table S1.1 of the permit.

The site

The operator has provided plans which we consider to be satisfactory.

These show the extent of the site of the facility including the emission points.

The plan is included in the permit.

Existing installation boundary

The installation's location and existing installation boundary are provided in the figure below.

Existing installation boundary and land to be surrendered (partial surrender)

The original permit application included the operation of a gasification plant, which is removed by this variation, subsequently the installation covers a much smaller area. A low-risk partial surrender application (EPR/FP3838EB/S005) was submitted to surrender land in the northern section of the installation as shown in the figure below.

Revised installation boundary including emission point

The revised installation boundary primarily comprises land within the existing installation boundary, although there are some minor changes to the abstraction water and wastewater pipeline routings, due to changes in land ownership since the original permit application. The revised installation boundary is shown in the figure below.

The existing permit allows for discharge to the Humber Estuary via emission point W1. Refer to 'Key issues of the decision' section of this document.

Site condition report

The operator has provided a description of the condition of the site, which we consider to be mainly satisfactory, see below. The decision was taken in accordance with our guidance on site condition reports (SCR) and baseline reporting under the IED.

The revised SCR for the land to be retained (including the additional land associated with pipeline routings) contains all the information required to cover the environmental setting, pollution history and evidence of historic contamination.

Some baseline reference soil data was collected which was included in Annex 1 of the SCR. The site investigation identified that there is some soil contamination present due to the historical use of the site as a gasworks. However, the Exploratory Hole Location Plan is an aerial photograph with no site boundary shown which makes it difficult to determine if the whole site has been covered.

In addition, it would have been useful to have a plan showing the proposed site layout with reference to the soil sampling locations and the potential sources of pollutants such as chemicals oil and diesel. It would be beneficial to the operator that these areas have good baseline data for ongoing monitoring and surrender purposes. If there are areas that have the potential to cause pollution that have no baseline data, it is recommended that this data is gathered.

Consideration should be given to groundwater sampling which has not been undertaken. Whilst it is acknowledged that the underlying chalk principal aquifer is well protected by the drift deposits above, and does not require assessment, the drift deposits can contain groundwater and shallow monitoring wells should be installed.

For the condition of land at permit issue to be meaningful, we require good baseline data with easily reproducible monitoring at the same locations. We have advised the operator what measures they need to take to improve the SCR and have included a pre-operational condition to address this.

Permit condition 3.1.3 also requires periodic monitoring for groundwater and soil, based on a systematic appraisal of the risk of contamination.

Partial surrender

We conclude that the land associated with the low-risk partial surrender EPR/FP3838EB/S005 can be surrendered and the installation boundary amended/reduced accordingly, refer to ‘The site’ section of this document. This conclusion was reached as no construction activities have taken place at the facility since the original permit was issued. Our decision to allow the partial surrender is recorded in the site condition report evaluation template (SCRET), dated 24/02/2026 which is available to view on our public register.

Nature conservation, landscape, heritage and protected species and habitat designations

We have checked the location of the application to assess if it is within the screening distances we consider relevant for impacts on nature conservation, landscape, heritage and protected species and habitat designations. The application is within our screening distances for these designations.

We have assessed the application and its potential to affect sites of nature conservation, landscape, heritage and protected species and habitat designations identified in the nature conservation screening report as part of the permitting process.

We consider that the application will not affect any site of nature conservation, landscape and heritage, and/or protected species or habitats identified, refer to sections 4.6 and 4.7 of this document.

We consulted Natural England on our Habitats Regulation and SSSI assessments, and they agreed with our conclusions. The SSSI assessment did not require formal consultation as our conclusion was ‘not likely to damage’; however, we decided to send this for completeness.

The decision was taken in accordance with our guidance.

Environmental risk

We have reviewed the operator's assessment of the environmental risk from the facility.

The operator’s risk assessment is satisfactory.

We also note that as part of their previous Development Consent Order (DCO), a Flood Risk Assessment (FRA) was submitted which set out the mitigation required for the lifetime of the development. This variation does not change our initial comments regarding flood risk.

Operating techniques

The operating techniques that the applicant must use are specified in table S1.2 of the permit.

As the LCP plant is not built yet, we have set an improvement condition requiring the applicant to provide information to set the minimum start-up and minimum shut-down load (MSUL/MSDL) within one month of completion of commissioning.

General operating techniques

We have reviewed the techniques used by the operator and compared these with the relevant guidance notes which include:

Develop a management system;

Control and monitor emissions for your environmental permit;

LCP BAT Conclusions;

Emergency backup diesel engines on installations: best available techniques (BAT) - GOV.UK; and

Medium combustion plant and specified generator regulations;

and we consider them to represent appropriate techniques for the facility.

Consideration of LCP combustion plant

The applicant has chosen to operate a CCGT plant. CCGT operate with a heat recovery steam generator (HRSG) which increases the efficiency as energy is recovered from the exhaust gases before being discharged to the atmosphere.

We consider that CCGT reflects BAT for the sector. Refer to Annex 1 of this document.

Consideration of LCP emission control measures

We have reviewed the techniques proposed by the applicant and compared these with the LCP BAT Conclusions, refer to Annex 1 of this document. The CCGT will be fitted with dry low NOx burners to minimise emissions of NOx.

Emissions of NOx are either considered insignificant (at discrete receptors) or are considered to have adequate headroom between the PEC and EQS to indicate that an exceedance of the EQS is unlikely.

We consider that the emission limits included in the permit reflect BAT for the LCP. Refer to Annex 1 of this document.

LCP energy efficiency

Consideration of energy efficiency

We have considered energy efficiency in the following ways:

1. The use of energy within, and generated by, the installation which are normal aspects of all EPR permit determinations.
2. The applicability of the combined heat and power ready (CHP-R) guidance to the installation.
3. The extent to which the installation meets the requirement of Article 14(5) of the Energy Efficiency Directive which requires new thermal electricity generation installations with a total thermal input exceeding 20 MW to carry out a cost-benefit assessment to "*assess the cost and benefits of providing for the operation of the installation as a high-efficiency cogeneration installation*".

   Cogeneration means the simultaneous generation in one process of thermal energy and electrical or mechanical energy and is also known as combined heat and power (CHP).

   High-efficiency co-generation is cogeneration which achieves at least 10% savings in primary energy usage compared to the separate generation of heat and power – see Annex II of the Energy Efficiency Directive for detail on how to calculate this.

4. The extent to which the applicant has demonstrated energy efficiency in line with the BAT associated energy efficiency levels (AEELs) set out in the LCP BAT Conclusions.

Use of energy within the installation

The primary considerations of energy efficiency for this site relates to the initial selection of combustion plant as set out above.

Combined Heat and Power Ready

A CHP readiness assessment was originally undertaken by the previous operator, C. Gen Killingholme Limited, in 2013 as part of their permit application. Although the existing permit was issued in 2017, construction of the installation never started.

Due to the extended time period since the previous assessment, we requested the CHP readiness study to be updated with a periodic review of the opportunities to supply heat to realise CHP, in line with the third BAT test. The third BAT test states: 'Once an Environmental Permit has been issued for a new CHP-R plant, the applicant / operator should carry out periodic reviews of opportunities for the supply of heat to realise CHP. Such opportunities may be created both by new heat loads

being built in the vicinity of the plant, and / or be due to changes in policy and financial incentives which improve the economic viability of a heat distribution network for the plant being CHP'.

The 2013 CHP readiness assessment made a number of recommendations to maximise the potential for any identified and additional future CHP opportunities to be realised. These included ongoing consultation with local businesses and ensuring that the installation was designed and built with the appropriate provisions to allow for the future implementation of CHP (i.e. is built to be CHP-Ready for the selected heat load(s)).

Although this application identified a small number of theoretical CHP opportunities in the search area, the consultation found no interest in a heat connection. The applicant concluded that there were no feasible heat off taker opportunities (considering both technical and economic feasibility). District heating or process CHP was not proposed to be installed from the outset of commercial operation of the installation.

They concluded that the installation will be designed to be CHP-R, including a connection point, in accordance with the BAT Tests of the CHP-R Guidance. However, in order to maximise the potential for any identified and additional future CHP opportunities to be realised, they confirmed that they will:

a) carry out regular reviews to determine if there have been sufficient changes in circumstances (e.g. due to changes in policy and/ or financial incentives that make it more economically viable) to warrant new technical and economic assessments; and

b) ensure that the installation is designed and built with the appropriate provisions which will allow for the future implementation of CHP (i.e. is built to be CHP-R).

Our CHP Ready Guidance, dated February 2013, considers that BAT for energy efficiency for new combustion power plant is the use of CHP in circumstances where there are technically and economically viable opportunities for the supply of heat from the outset. We are satisfied that at this stage; there are no technically and economically viable opportunities for the supply of heat from the outset.

We are satisfied that the applicant meets the requirements of Article 14(5) of the Energy Efficiency Directive.

Permit condition 1.2.2 requires the operator to carry out a review the viability of CHP implementation at least every four years and a pre-operational condition requires this review to be carried out where more than four years have elapsed since the date of the Combined Heat and Power Readiness Assessment, provided as Appendix E of variation application EPR/FP3838EB/V004, dated 26 November 2025 and the commencement of commissioning.

Permit conditions concerning energy efficiency

The operator is required to report energy usage and energy generated under condition 4.2 and table S4.2 in Schedule 4 of the permit. This will enable us to monitor energy efficiency at the installation and take action if at any stage the energy efficiency is less than proposed.

There are no site-specific considerations that require the imposition of standards beyond indicative BAT, and so we accept that the applicant's proposals represent BAT for this installation.

Compliance with energy BAT AEELs set out in LCP BAT Conclusions

An energy efficiency level associated with the 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 and for the unit operated at full load.

The applicant confirmed that the anticipated electrical efficiency of the CCGT plant will be greater than 59%, which is compliant with the required BAT AEEL range of 57 – 60.5% for CCGTs having a thermal input of >600 MWth.

We consider this plant is BAT in relation to the AEELs.

Storage and containment

The applicant confirmed that all chemical storage areas will be bunded (the bunding will be impermeable and have 110% capacity of the largest container or 25% of the total aggregatde volume of all containers within the shared bund in accordance with the CIRIA c736 Guidance on Secondary Containment Systems). All chemicals will be stored in accordance with their COSHH guidelines.

Diesel storage and containment arrangements for the emergency generator were not finalised at the time of the application. We have set a pre-operational condition requiring the operator to submit this information.

We are satisfied that the pre-operational condition will ensure that diesel storage and containment arrangements will be BAT for the installation.

Choice of Cooling System

The applicant confirmed that the operation of the CCGT will require continuous cooling during operation. Cooling water will be sourced from an abstraction point from the Humber Estuary. The abstraction licence (reference 4/29/09/*T/0132) has an abstraction limit of 1,650 m^3/h for cooling water. Following abstraction, the cooling water will be transferred to a settling pond to remove suspended solids. Once the water has settled it will be subject to water treatment within a cooling water conditioning plant which will include acid dosing, hardness stabiliser dosing

and biocide dosing. Once treated, the cooling water will be sent to the cooling towers for use. The water will be used within hybrid cooling towers which operate by utilising the high latent heat of evaporation for water to dissipate the heat load.

Where practical, efforts will be made to recover wastewater streams to serve as cooling water make-up or as feed for the demineralisation water treatment plant in order to reduce emissions to water. This will include HRSG blowdown, Reverse Osmosis (RO) rejects (from demineralisation treatment plant), effluent from the condenser and treated water from the oil/water separator. Once the cooling water has been utilised, the removed suspended solids will be reintroduced to the cooling water and discharged via emission point W1. Refer to 'Key issues of the decision' section of this document.

There was no BAT assessment of cooling options provided with the application; however, a full assessment was provided with the original application. We concluded that the hybrid cooling towers were BAT for the original application.

The applicant confirmed in their response to our further information request received 17/03/2026, that the assumptions and conclusions for the BAT assessment of cooling options provided with the original application remain valid.

It has been calculated that once through cooling would require 20,160 m^3/hour or 483,840 m^3/day of water, which is lower than that detailed in the original assessment (which stated 15 m^3/s or 1.3 million m^3/day), however it is considered that this is around 15 times more water than would be required for the proposed hybrid cooling towers. It is therefore considered that due to the water availability issues of the Humber, and the potential thermal plume impacts of once-through cooling into a designated SPA/ SAC site, it would present potential significant impacts on the Humber.

The water requirements for hybrid cooling have been estimated as 1,307 m^3/hr, which can be fulfilled by the current abstraction licence, which allows for an abstraction of 1,650 m^3/hr.

Air-cooled condensers have been discounted due to cost, footprint, potential for noise issues, and due to the negative influence on the overall plant efficiency.

The conclusion therefore remains that the utilisation of hybrid cooling towers represents the ideal balance between operating efficiency penalties, the potential environmental impacts and the operation of neighbouring facilities in the area and are thus BAT for the installation, as illustrated by the table below.

Cooling Option	Once Through	Wet Cooling Tower	Hybrid Cooling Tower	Air Cooled Condenser
Generation Efficiency	Best	Average	Average	Worst
Water Demand	Worst	Average	Best	N/A
Noise	Best	Average	Average	Worst
Pollutant Emission to Air	N/A	Average	Best	Average
Impact on Local water bodies	Worst	Best	Best	N/A
Capital Cost	Worst	Best	Average	Average
Operating cost	Best	Average	Average	Best
Plume Formation	N/A	Average	Best	N/A
Space requirement	Best	Average	Average	Worst

We are satisfied that this cooling option remains BAT for the installation.

LCP BAT Conclusions

We have reviewed the permit application against the revised BAT Conclusions for the LCP sector published 31/07/2017.

The applicant considered the following BAT Conclusions:

BAT Conclusions 1 to 17, which are applicable to all sites; and

BAT Conclusions 40 to 44, which are applicable to plant combusting gaseous fuels (but excluding those relating to iron and steel and chemical industries). The response to each is set out in Annex 1 of this document.

The BAT AELs for emissions of NOx have been included in table S3.1 of the permit. For emissions of CO, we have set a limit higher than the indicative BAT limit, refer to 'Emission limits' section of this document.

Meeting the requirements of the BAT Conclusions

Annex 1 provides a record of decisions made in relation to each relevant BAT Conclusion considered potentially applicable to the installation. This table should be read in conjunction with the permit.

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 conditions	Permit tables
Environmental Management System	1.1.1	S1.2
BAT AELs	3.1.1 and 3.5.1	S3.1
Monitoring	2.3, 3.5 and 3.6	S1.2 S1.5 (MSUL / MSDL) S1.6 (DLN effective) S3.1
Energy efficiency	1.2 and 2.3	S4.2
Noise	2.3 and 3.4	S1.2
Other operating techniques	1.2	S1.2

The overall status of compliance with the BAT conclusion is indicated in the table in Annex 1 as:

NA Not applicable
CC Currently compliant
PC Partially compliant

The operating techniques that the applicant must use are specified in table S1.2 in the permit.

Operating techniques for emissions that do not screen out as insignificant

Emissions of NO_2 (annual) at human health receptors and NOx (annual and daily) and nitrogen deposition at ecological receptors cannot be screened out as insignificant. We have assessed whether the proposed techniques are BAT. Refer to Annex 1 of this document.

The proposed techniques/emission levels for emissions that do not screen out as insignificant are in line with the techniques and benchmark levels contained in the technical guidance and we consider them to represent appropriate techniques for the facility. The permit conditions enable compliance with relevant BAT reference

documents (BREFs) and the LCP BAT Conclusions, and ELVs deliver compliance with BAT AELs.

Operating techniques for emissions that screen out as insignificant

Emissions of NO_2 (hourly) and carbon monoxide at human health receptors and acid deposition at ecological receptors have been screened out as insignificant, and so we agree that the applicant's proposed techniques are BAT for the installation.

We consider that the emission limits included in the installation permit reflect the BAT for the sector.

National Air Pollution Control Programme

We have considered the National Air Pollution Control Programme as required by the National Emissions Ceilings Regulations 2018. By setting ELVs in line with technical guidance we are minimising emissions to air. This will aid the delivery of national air quality targets. We do not consider that we need to include any additional conditions in this permit.

Noise and vibration management

We reviewed the information provided in accordance with our guidance on noise assessment and control.

In terms of noise emissions, we conclude that the application can be considered low risk.

Based on the information provided, we completed the Noise Assessment Tool (NAT) which concluded that a Noise Impact Assessment (NIA) and Noise Management Plan (NMP) were not required.

We also considered the following points to determine our position:

- the site is located in an industrialised area, likely to have high sound emissions;
- noise sensitive receptors are over 1 km away from the installation; and
- BS 4142 assessment has been undertaken against relatively low background sound levels (31 dB L_{A90}).

We concluded that a NMP was required as the levels predicted were based on mitigation measures being implemented.

Due to the project being in the early design stage we have addressed the requirement for a NMP with a pre-operational condition requiring submission following the detailed design stage.

The approved NMP will be incorporated into the operating techniques, table S1.2.

Changes to the permit conditions due to an Environment Agency initiated variation

We have varied the permit as stated in the variation notice.

Raw materials

We have specified limits and controls on the use of the gas oil fuel.

Pre-operational conditions

Based on the information in the application, we consider that we need to include pre-operational conditions.

Ref.	Pre-operational measure	existing/new justification
PO1	**Burning of fuel** The operator shall notify the Environment Agency at least 14 days prior to fuel being burned on the installation for the first time.	existing retained
PO2	**Full detailed design details** Following the completion of the detailed engineering design, and at least six months prior to construction, the operator shall submit a written report to the Environment Agency providing full detailed design details for the site (including drainage). The operator shall undertake a review of the variation application EPR/FP3838EB/V004 against the final plans for the installation, prior to construction, to: • ensure that the final proposals will meet the requirements for BAT; • the application still accurately reflects the final design and operating proposals; • provide an updated site layout plan, detailing the precise and accurate location of plant and all emission points.	existing retained Added 'Following the completion of the detailed engineering design, and at least six months prior to construction', to ensure that finalised plans can be reviewed prior to construction and updated to

	The operator shall submit the findings of this review within the written report to the Environment Agency for approval in writing by the Environment Agency.	include reference to this variation application.
PO3	**CHP assessment** Prior to undertaking commissioning of the plant the applicant will submit, to the environment agency, a reviewed and revised Combined Heat and Power Assessment in line with the Environment Agency's latest Guidance (CHP Ready Guidance for Combustion and Energy from Waste Power Plants, V1.0 February 2013), for written acceptance and approval from the Environment Agency.	existing replaced The applicant proposed that the CHP assessment submitted as Appendix E of this variation addressed the requirements of this condition. We have replaced this condition with PO8, which is consistent with the current LCP permit template and required where the applicant has not committed to implementing a CHP scheme. This decision was taken to accommodate any changes that may affect the conclusions of the assessment between the submission of this application and commissioning of the installation.

PO4	**Monitoring location** Confirm compliance with BS EN 15259 in respect of monitoring location and stack gas velocity profile for emission point A1.	existing replaced We have replaced this condition with IC7, which is consistent with the current LCP permit template. Compliance can only be confirmed once commissioning has started.
PO5	**Site closure plan** A site closure plan will be submitted to the Environment Agency in order to outline the proposals for the decommissioning of the Project and the reinstatement of the Operations Area.	existing no longer applies This is no longer required, with the SCR and permit condition 3.1.3 implementing the necessary requirements throughout the operational and closure phases of the installation. Refer to 'Site condition report' section of this document.

PO6	**Emergency diesel generator specification** Following the completion of the detailed engineering design, and at least six months prior to the commencement of commissioning operations, the operator shall submit a summary report to the Environment Agency for assessment and written approval, for the emergency diesel generator specified in table S1.1 of the permit. The summary report shall confirm the diesel storage and containment arrangements and the technical specification for the emergency diesel generator, which includes: • provision of the engine specification sheet; • the engine plant meets the BAT requirements of emission optimised standards and complies with our guidance at Emergency backup diesel engines on installations: best available techniques (BAT) - GOV.UK. • in the event of any deviations, the permit application still accurately reflects the operating techniques notably for noise, fuel and engine oil storage; • that the environmental assessment still reflects the predicted impacts of the emissions and final stack arrangements; that the commissioning plan of the plant is covered within the site's permitted regular testing regime, thereby minimising durations and impacts.	new Diesel storage and containment arrangements for the emergency generator were not finalised at the time of the application. To provide the necessary requirements to confirm that the technical specification meets the BAT requirements. The engine specification sheet could not be provided at the application stage due to the project being in the early design stage.

PO7	**Noise Management Plan (NMP)** Following the completion of the detailed engineering design, and at least six months prior to the commencement of commissioning operations, the operator shall submit a NMP to the Environment Agency for assessment and written approval. The NMP shall be undertaken in accordance with our guidance at **Noise and vibration management: environmental permits - GOV.UK** and shall include: • any specific noise control measures to be implemented with associated attenuation levels; • description of on-site processes that will ensure impacts do not increase on site; and • actions to be taken if noise is detected outside optimum process parameters. The operator shall not begin the commissioning operations, including any associated activities, prior to obtaining written approval by the Environment Agency to the NMP.	new Due to the project being in the early design stage, a NMP is required once the final design is known - refer to 'Noise and vibration management' section of this document.
PO8	**Heat recovery** Prior to the commencement of commissioning, the operator shall submit a written report Note 1 to the Environment Agency for assessment and written approval on heat recovery options. The report shall include: • a comprehensive review of the options available for utilising the heat generated by the combustion process in order to ensure that it is recovered as far as practicable; • the review shall detail any identified proposals for improving the recovery and utilisation of waste heat and shall provide a timetable for their implementation.	new Refer to PO3 above.

	The proposals shall be implemented in accordance with the Environment Agency's written approval. Note 1: This report is only required where more than four years have elapsed since the date of the Combined Heat and Power Readiness Assessment, provided as Appendix E of variation application EPR/FP3838EB/V004, dated 26 November 2025.	
PO9	**Site Condition Report (SCR) – baseline for soil and groundwater** Prior to the commencement of commissioning, the operator shall submit a written report on the baseline conditions of soil and groundwater at the installation to the Environment Agency for assessment and written approval. The report shall contain: • soil & groundwater baseline monitoring results; • updated SCR; • the information necessary to determine the state of soil and groundwater contamination so as to make a quantified comparison with the state upon definitive cessation of activities provided for in Article 22(3) of the IED; and the information, supplementary to that already provided in the application SCR, needed to meet the information requirements of Article 22(2) of the IED.	new Refer to 'Site condition report' section of this document.

PO10	**Commissioning plan** Prior to the commencement of commissioning, the operator shall submit to the Environment Agency, and obtain the Environment Agency's written approval to it, a written commissioning plan, including timelines for completion, for approval by the Environment Agency. The commissioning plan shall include the expected emissions to the environment during the different stages of commissioning, the expected durations of commissioning activities and the actions to be taken to protect the environment and report to the Environment Agency in the event that actual emissions exceed expected emissions. Commissioning shall be carried out in accordance with the commissioning plan as approved.	new added consistent with other permits in this sector

Improvement programme

Based on the information on the application, we consider that we need to include an improvement programme.

Ref.	Improvement programme	Existing/new justification
IC1	**MSUL and MSDL** The operator shall submit a report in writing to the Environment Agency for assessment and written approval. The report shall define and provide a written justification of the "minimum start up load (MSUL)" and "minimum shut-down load (MSDL)", for each unit within the LCP as required by the Implementing Decision 2012/249/EU in terms of: i. the output load (i.e. electricity, heat or power generated) (MW); and 1. ii. this output load as a percentage of the rated thermal output of the combustion plant (%). and / or	existing retained Added 'and written approval' consistent with our current LCP permit template.

Ref.	Improvement programme	Existing/new justification
	at least three criteria or equivalent operational parameters that suit the technical characteristics of the plant, which can be met at the end of start-up or start of shut-down as detailed in Article (9) 2012/249/EU.	
IC2	**Net rated thermal input** The operator shall provide a report in writing to the Environment Agency for assessment and written approval which provides the net rated thermal input for LCP470. The net rated thermal input is the 'as built' value unless the plant has been modified significantly resulting in an improvement of the plant efficiency or output that increases the rated thermal input (which typically requires a performance test to demonstrate that guaranteed improvements have been realised). Evidence to support this figure, in order of preference, shall be in the form of: a) performance test results* during contractual guarantee testing or at commissioning (quoting the specified standards or test codes); b) performance test results after a significant modification (quoting the specified standards or test codes); c) manufacturer's contractual guarantee value; d) published reference data, e.g., Gas Turbine World Performance Specifications (published annually); e) design data, e.g., nameplate rating of a boiler or design documentation for a burner system; f) operational efficiency data as verified and used for heat accountancy purposes; g) data provided as part of Due Diligence during acquisition. *Performance test results shall be used if these are available.	existing retained Added 'for assessment and written approval' consistent with our current LCP permit template.

Ref.	Improvement programme	Existing/new justification
IC3	**Environmental Management System** The operator shall submit a written report to the Environment Agency on the implementation of its Environmental Management System (EMS) for this installation. The EMS will include a full accident risk assessment and management plan which will be made available for review and approval (in writing) by the Environment Agency.	existing retained Removed 'and the progress made in the certification of the system by an external body or if appropriate submit a schedule by which the EMS will be certified.' The applicant has a long-established EMS which is accredited to ISO 14001:2015, with the certificate provided in Appendix J of the application (10726747, expiry 10 December 2028). The applicant confirmed that their operational sites within the UK have a shared certificate which meet the requirements of the standard by working to central system procedures as well as site specific/local procedures.

Ref.	Improvement programme	Existing/new justification
IC4	**Commissioning** The operator shall submit a written report to the Environment Agency on the commissioning of the installation. The report shall summarise the results of the commissioning programme, the environmental performance of the plant as installed against the design parameters set out in the Application and any significant changes to the information provided in the variation application EPR/FP3838EB/V004. The report shall also include a review of the performance of the facility against the conditions of this permit and details of procedures developed during commissioning for achieving and demonstrating compliance with permit conditions.	existing retained Added 'for assessment and written approval' consistent with our current LCP permit template and updated to include reference to this variation application.
IC5	**Dry low NOx** The operator shall submit a written report to the Environment Agency for assessment and written approval to define when dry low NOx operation is effective. The report shall include: • an output load or operational parameters to justify when the dry low NO_x operation is effective; and • the NO_x profile through effective dry low NO_x to 70% and then to full load.	new Added consistent with current LCP permit template. Required for new gas turbine sites where the final specifications of the plant have not been confirmed and therefore the DLN effective parameters are not known prior to permit issue.

Ref.	Improvement programme	Existing/new justification
IC6	**NOx and CO emissions** The operator shall submit a written report to the Environment Agency for assessment and written approval on their proposed achievable emission limit values (ELVs) for oxides of nitrogen (NOx) and carbon monoxide (CO) from emission point A1 as follows: a) <u>Daily mean from MSUL to baseload (NOx and CO)</u> ELVs shall be expressed as a daily mean of validated hourly averages from minimum start-up load (MSUL) to baseload, supported by a summary of emissions data. b) <u>Annual mean (CO)</u> Additionally for CO, ELVs shall be expressed as an annual mean of validated hourly averages. If the proposed ELV deviates from the indicative BAT AEL for CO of 30 mg/m^3 then an associated BAT justification will need to be included in the written report.	new Added consistent with current LCP permit template. Required for new gas turbine sites where the final specifications of the plant have not been confirmed and therefore an appropriate ELV for MSUL to baseload is not confirmed prior to permit issue. The annual AEL for CO from the BAT Conclusions is indicative. At this stage the applicant did not have adequate information to demonstrate whether the selected plant can meet the CO AEL. This part of the improvement condition specifies that the operator is required to propose an achievable ELV for CO and justify any deviation from indicative BAT.

Ref.	Improvement programme	Existing/new justification
IC7	**Monitoring location** The operator shall submit a written report to the Environment Agency for assessment and written approval on the assessment of air emissions monitoring location for emission point A1 during commissioning of the installation. The report shall include: • whether the air monitoring location meet the requirements of BS EN 15259 and supporting Method Implementation Document (MID); • the results and conclusions of the assessment including where necessary proposals for improvements to meet the requirements; and • where notified in writing by the Environment Agency that the requirements are not met, the operator shall submit proposals or further proposals for rectifying this in accordance with the timescale in the notification. The proposals shall be implemented in accordance with the Environment Agency's written approval.	new This replaces PO4, see 'Pre-operational conditions' section of this document.

Emission limits

LCP

Chapter III of the IED lays out special provisions for LCP and mandatory ELVs are defined in part 2 of Annex V for new plant, however it is worth noting that BAT requirements may lead to the application of lower ELVs than these mandatory values. Mandatory ELVs cannot be exceeded even if a site-specific assessment can be used to justify emission levels higher than BAT.

Although these limits are designed to be stringent, and to provide a high level of environmental protection, they do not necessarily reflect what can be achieved by new plant. Article 14(3) of the IED says that BAT Conclusions shall be the reference for setting the permit conditions, so it may be possible and desirable to

achieve emissions below the limits referenced in Chapter III. The BAT Conclusions and a revised BREF for LCP were published in July 2017 so BAT AELs are specified alongside Chapter III limits from the IED within the permit.

ELVs based on BAT have been added for NOx and CO (with the exception of the indicative annual CO limit, see below).

The applicant has proposed limits in line with part 2 of annex V of the IED and BAT AELs set out within the BAT Conclusions for LCP. As discussed in the 'Key issues of the decision' section of this document, emissions at these limits will not cause significant pollution. Consequently, we have accepted the proposed limits and incorporated them into table 3.1 of the permit. Annex V of the IED is a backstop and these limits are included where there is no tighter limit specified within the BAT Conclusions.

The BAT Conclusions specify that the AELs will apply when dry low NOx (DLN) is effective. We have specified an improvement condition requiring the operator to define an output load or operational parameters and provide a written justification for when the dry low NO_x operation is effective. The report shall also include the NO_x profile through effective dry low NO_x to 70% and then to full load. This is required for new gas turbine sites where the final specifications of the plant have not been confirmed and therefore the DLN effective parameters are not known prior to permit issue.

We have also specified an improvement condition requiring the operator to propose achievable ELVs for NOx and CO expressed as a daily mean of validated hourly averages from minimum start-up load (MSUL) to baseload. This is required for new gas turbine sites where the final specifications of the plant have not been confirmed and therefore an appropriate ELV for MSUL to baseload is not confirmed prior to permit issue.

The annual AEL for CO from the BAT Conclusions is indicative, which means that it is not mandatory and as such there is no mechanism in place to formerly derogate from this limit. At this stage the applicant did not have adequate information to demonstrate whether the selected plant can meet the CO AEL (refer to BAT Conclusion 44 in Annex 1 of this document). The aforementioned improvement condition also requires the operator to propose an achievable ELV for CO expressed as an annual mean of validated hourly averages. If the proposed ELV deviates from the indicative BAT AEL for CO of 30 mg/m^3 then an associated BAT justification will need to be submitted with the written report.

Parameter	Reference Period	Annex V Part 2 mg/m^3	BAT AEL	Permit limit mg/m^3
NO_x	Yearly average	-	30 (32.2 Note 1)	32.2 Note 1
	Monthly averages	50	-	50
	Daily average or average over the sampling period	55	40	42.9 Note 2
	95%ile of hourly averages	100	-	100
CO	Yearly average	-	30 (32.2 Note 1)	100 Note 3
	Monthly averages	100	-	100
	Daily average or average over the sampling period	110	-	110
	95%ile of hourly averages	200	-	200

Note 1: As the net electrical efficiency (EE) of the CCGT is greater than 55%, the EE uplift has been applied to the higher end of the BAT AEL range, i.e. for the annual average NOx/CO BAT AEL = 30 mg/Nm^3 x 59 / 55. The EE uplift limit shall only apply when the net EE of the CCGT is 59%.

Note 2: As the net EE of the CCGT is greater than 55%, the EE uplift has been applied to the higher end of the BAT AEL range, i.e. for the daily BAT AEL = 40 mg/Nm^3 x 59 / 55. The EE uplift limit shall only apply when the net EE of the CCGT is 59%.

Note 3: Limit proposed by the applicant, to be reviewed in accordance with improvement condition IC6.

Regarding the uplifted limits, the applicant's response to BAT Conclusion 2 in Annex 1 of this document confirms that the CCGT aims to have a net efficiency of 59%. Whilst these uplifted limits are included in the permit, there is a note to the table confirming that the net EE uplift limit shall only apply when the net EE of the CCGT is 59% (i.e. BAT AEL = 30 mg/Nm^3 x 59 / 55 (uplift)).

We are satisfied that emissions at the permitted limits would ensure a high level of protection for human health and the environment.

MCPs

We have decided that emission limits are not required in the permit.

The MCPs operate for less than 500 hours per year and a declaration for exemption under Article 6(3) or 6(8) of the MCPD has been signed.

Monitoring

LCP

We have decided that continuous flow monitoring should be added for the LCP, using the method detailed.

Standards for assessment of the monitoring location and for measurement of oxygen, water vapour, temperature and pressure are already included in the permit.

There is already a row in table S3.1 which requires the operator to confirm compliance with BS EN 15259 in respect of monitoring location and stack gas velocity profile in the event there is a significant operational change (such as a change of fuel type) to the LCP.

These monitoring requirements have been included in order for the operator to demonstrate compliance with the emission limits specified in the permit. The operator will carry out monitoring in accordance with the relevant methods specified in the permit.

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.

MCPs

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.

The operator will carry out monitoring in accordance with the relevant methods specified in the permit.

We made these decisions in accordance with MCP and SG technical guidance.

Medium Combustion Plant guidance: https://www.gov.uk/guidance/medium-combustion-plant-and-specified-generator-permits-how-to-comply

Specified Generator Guidance https://www.gov.uk/guidance/medium-combustion-plant-and-specified-generator-permits-how-to-comply

Reporting

LCP

We have retained the quarterly reporting period for NOx and CO emissions.

We have retained the six-monthly reporting period for sulphur dioxide emissions. For natural gas fired gas turbines concentrations are reported on the basis of the fuel sulphur content without continuous or periodic monitoring since only trace quantities of sulphur are present in UK natural gas.

We continue not to require any reporting of dust emissions on the basis that for gas turbines, dust emissions will always be reported as zero. This is because natural gas is an ash-free fuel and high efficiency combustion in the gas turbine does not generate additional particulate matter. The fuel gas is always filtered and, in the case of gas turbines, the inlet air is also filtered resulting in a lower dust concentration in the flue than in the surrounding air.

MCPs

We have added reporting in the permit for the MCPs.

We made these decisions in accordance with MCP and SG technical guidance.

Medium Combustion Plant guidance: https://www.gov.uk/guidance/medium-combustion-plant-and-specified-generator-permits-how-to-comply

Specified Generator Guidance https://www.gov.uk/guidance/medium-combustion-plant-and-specified-generator-permits-how-to-comply

Management system

We are not aware of any reason to consider that the operator will not have the management system to enable them to comply with the permit conditions.

The decision was taken in accordance with the guidance on operator competence and how to develop a management system for environmental permits.

Growth duty

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 variation.

Paragraph 1.3 of the guidance says:

“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.”

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.

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.

Consultation Responses

The following summarises the responses to consultation with other organisations, our notice on GOV.UK for the public and the way in which we have considered these in the determination process.

Responses from organisations listed in the consultation section

Response received from UK Health Security Agency, Environmental Public Health Practitioner, dated 10/03/2026.

Brief summary of issues raised:

That the applicant has not yet determined the disposal route for sanitary water from the site. They recommend that we are satisfied with the route which is chosen for this discharge.

Summary of actions taken:

The disposal route for the sanitary water from welfare facilities is not a consideration for installation permits. The permit considers the wastewaters associated with the installation, i.e. activities listed in table S1.1 of the permit. If the decision is to discharge the sanitary water via emission point W1, the release will need to comply with the limits set in table S3.2 of the permit. A separate EPR permit will be required for this discharge.

Permitting Decisions- Variation (substantial)

Annex 1

BAT Concn. No.	Summary of BAT Conclusion requirement	Status NA/ CC / PC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
General			
1	**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:** 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 (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: (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;	CC	The applicant confirmed that the installation will be operated under the Uniper central ISO14001:2015 accredited EMS, with site-specific procedures specific to the installation. The EMS comprises an environmental policy and all other relevant management documents. The site-specific procedures will define the roles and responsibilities for applicable site personnel. The EMS will include all elements listed under this BAT Conclusion as required under ISO14001:2015. We are satisfied that the applicant meets the requirements of this BAT Conclusion.

BAT Concn. No.	Summary of BAT Conclusion requirement	Status NA/ CC / PC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	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. Etc - see BAT Conclusions **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.		
2	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.	CC	The applicant confirmed that periodic operational performance tests measuring the load, fuel used, and power output will be undertaken in accordance with applicable BS EN standards. The CCGT aims to have a net efficiency of 59%. We are satisfied that the applicant meets the requirements of this BAT Conclusion.

<table>
<tr><th>BAT Concn. No.</th><th>Summary of BAT Conclusion requirement</th><th>Status NA/ CC / PC</th><th>Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement</th></tr>
<tr><td>3</td><td>BAT is to monitor key process parameters relevant for emissions to air and water including those given below.

<table><tr><th>Stream</th><th>Parameter(s)</th><th>Monitoring</th></tr><tr><td>Flue-gas</td><td>Flow</td><td>Periodic or continuous determination</td></tr><tr><td></td><td>Oxygen content, temperature, and pressure</td><td>Periodic or continuous measurement</td></tr><tr><td></td><td>Water vapour content (3)</td><td></td></tr><tr><td>Waste water from flue-gas treatment</td><td>Flow, pH, and temperature</td><td>Continuous measurement</td></tr></table></td><td>CC</td><td>The applicant confirmed that flue gas flow from the CCGT will be calculated in accordance with ISO 16911-2:2013.

All parameters will be monitored in accordance with BS EN14181.

All monitoring equipment on site will be MCERTS certified and will be regularly maintained and calibrated to ensure accurate measurements are recorded.

Continuous monitoring of emissions to wastewater will be carried out for flow, pH and temperature, and as required under the permit.

We are satisfied that the applicant meets the requirements of this BAT Conclusion.</td></tr>
</table>

<table>
<tr><th>BAT Concn. No.</th><th>Summary of BAT Conclusion requirement</th><th>Status NA/ CC / PC</th><th>Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement</th></tr>
<tr><td>4</td><td>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.
<table>
<tr><th>Substance/Parameter</th><th>Fuel/Process/Type of combustion plant</th><th>Combustion plant total rated thermal input</th><th>Standard(s) [4]</th><th>Minimum monitoring frequency [5]</th><th>Monitoring associated with</th></tr>
<tr><td>NH_3</td><td>— When SCR and/or SNCR is used</td><td>All sizes</td><td>Generic EN standards</td><td>Continuous [6] [7]</td><td>BAT 7</td></tr>
<tr><td>NO_X</td><td>— Natural-gas-fired boilers, engines, and turbines</td><td>All sizes</td><td>Generic EN standards</td><td>Continuous [6] [8]</td><td>BAT 42
BAT 43
BAT 44</td></tr>
<tr><td>CO</td><td>— Natural-gas-fired boilers, engines, and turbines</td><td>All sizes</td><td>Generic EN standards</td><td>Continuous [6] [8]</td><td>BAT 44</td></tr>
</table></td><td>CC</td><td>The applicant confirmed that the flue gases from the CCGT will be monitored using MCERTS certified CEMs in accordance with BS EN 14181. This system will continuously monitor NOx and CO.

SCR is not proposed, so monitoring of ammonia (NH_3) is not required.

Further details on the monitoring of emissions to air to be carried out at the installation are provided in Section 6.2 of the Main Supporting Document.

We are satisfied that the applicant meets the requirements of this BAT Conclusion.</td></tr>
</table>

<table>
<tr><th>BAT Concn. No.</th><th>Summary of BAT Conclusion requirement</th><th>Status NA/ CC / PC</th><th>Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement</th></tr>
<tr><td>5</td><td>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.
<table>
<tr><th colspan="2">Substance/Parameter</th><th>Standard(s)</th><th>Minimum monitoring frequency</th><th>Monitoring associated with</th></tr>
<tr><td colspan="2">Total organic carbon (TOC) (26)</td><td>EN 1484</td><td rowspan="12">Once every month</td><td rowspan="11">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 (SO_4^{2-})</td><td>EN ISO 10304-1</td></tr>
<tr><td colspan="2">Sulphide, easily released (S^{2-})</td><td>No EN standard available</td></tr>
<tr><td colspan="2">Sulphite (SO_3^{2-})</td><td>EN ISO 10304-3</td></tr>
<tr><td rowspan="8">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>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>
</table></td><td>NA</td><td>The applicant confirmed that there will be no emissions to water from flue-gas treatment.

We are satisfied that the requirements of this BAT Conclusion are not applicable to the installation.</td></tr>
</table>

<table>
<tr><th>BAT Concn. No.</th><th>Summary of BAT Conclusion requirement</th><th>Status NA/ CC / PC</th><th>Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement</th></tr>
<tr><td>6</td><td>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.
<table>
<tr><th colspan="2">Technique</th><th>Description</th><th>Applicability</th></tr>
<tr><td>a.</td><td>Fuel blending and mixing</td><td>Ensure stable combustion conditions and/or reduce the emission of pollutants by mixing different qualities of the same fuel type</td><td rowspan="2">Generally applicable</td></tr>
<tr><td>b.</td><td>Maintenance of the combustion system</td><td>Regular planned maintenance according to suppliers' recommendations</td></tr>
<tr><td>c.</td><td>Advanced control system</td><td>See description in Section 8.1</td><td>The applicability to old combustion plants may be constrained by the need to retrofit the combustion system and/or control command system</td></tr>
<tr><td>d.</td><td>Good design of the combustion equipment</td><td>Good design of furnace, combustion chambers, burners and associated devices</td><td>Generally applicable to new combustion plants</td></tr>
<tr><td>e.</td><td>Fuel choice</td><td>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</td><td>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.</td></tr>
</table></td><td>CC</td><td>The applicant confirmed that:

Performance tests measuring the load, fuel used, and power output to calculate overall efficiencies will be undertaken in accordance with applicable BS EN standards and site procedures.

All plant and equipment at the installation will be regularly maintained, including the combustion system, by qualified maintenance staff or contractors, as per site procedures.

The installation’s operations will be monitored and operated by suitably trained site personnel and managed via a Distributed Control System (DCS) to continuously monitor the operation of the plant and equipment at the site. Any non-conformance or deviation in normal operating parameters will be identified by the DCS to allow operators to take action to avoid a breach of permitted emission levels.</td></tr>
</table>

BAT Concn. No.	Summary of BAT Conclusion requirement	Status NA/ CC / PC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	For existing combustion plants, the type of fuel chosen may be limited by the configuration and the design of the plant		The CCGT plant will be a new high efficiency F-class unit offering leading performance in its class and compliant with all relevant and most recent regulatory requirements, in addition to design features to optimise performance in terms of emissions and efficiency. The installation will have a contractual agreement to receive natural gas from the National Transmission System (NTS), ensuring compliance with nationally specified quality criteria. Input gas streams will be controlled and monitored through online measurement systems. We are satisfied that the applicant meets the requirements of this BAT Conclusion.

BAT Concn. No.	Summary of BAT Conclusion requirement	Status NA/ CC / PC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
7	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). **BAT-associated emission levels** The BAT-associated emission level (BAT-AEL) for emissions of NH_3 to air from the use of SCR and/or SNCR is < 3–10 mg/Nm^3 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/Nm^3.	NA	The applicant confirmed that it is considered that the BAT AELs for NOx can be met without the requirement for secondary abatement in the form of SCR, and therefore there will be no associated ammonia emissions. We are satisfied that the requirements of this BAT Conclusion are not applicable to the installation.
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 applicant confirmed that it is considered that the BAT AELs will be achieved through the use of primary combustion controls and that no emissions abatement systems are required. We are satisfied that the requirements of this BAT Conclusion are not applicable to the installation.

Commented [A1]: Tbc following assessment of the impacts on habitats

<table>
<tr><th>BAT Concn. No.</th><th>Summary of BAT Conclusion requirement</th><th>Status NA/ CC / PC</th><th>Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement</th></tr>
<tr><td>9</td><td>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):
(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)).
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.
<table>
<tr><th>Fuel(s)</th><th>Substances/Parameters subject to characterisation</th></tr>
<tr><td>Natural gas</td><td>— LHV
— CH_4, C_2H_6, C_3, C_4+, CO_2, N_2, Wobbe index</td></tr>
</table></td><td>CC</td><td>The applicant confirmed that a contractual agreement to receive natural gas from the NTS will be in place, which will include the requirement for the gas to comply with specified quality criteria. Equipment such as a gas chromatograph (GC) will be put in place to periodically test the quality of the fuel if required and the parameters listed under this BAT Conclusion for natural gas will be recorded. The Joint Environmental Programme (JEP) Report ‘Characterisation of Power Plant Fuels for Compliance with LCP BREF Conclusion BAT 9’ was produced to assist operators of LCP to comply with BAT. The installation will implement the requirements through the EMS.

We are satisfied that the applicant meets the requirements of this BAT Conclusion.</td></tr>
</table>

10	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: — 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	The applicant confirmed that the plant and associated control systems will be designed to minimise the potential for OTNOC events to occur. In addition, the Uniper EMS procedure GMI-SHE049 Environmental Reporting, details how sites should address OTNOC in relation to this BAT Conclusion via their environmental aspects and impacts assessment. The installation will be operated using a DCS to continuously monitor the operation of the plant and equipment at the site. Any non-conformance or deviation in normal operating parameters is expected to be identified by the automated control system to allow operators to take action to avoid OTNOC events. Site operators will be trained to monitor plant operation and take appropriate action(s) in the event of a potential OTNOC event being identified. Start-up and shut-down procedures will be put in place with the aim to minimise the time during which the plant is operating at non-optimal conditions and operators shall be trained in the appropriate actions required

BAT Concn. No.	Summary of BAT Conclusion requirement	Status NA/ CC / PC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
			should the potential for an OTNOC event be identified. All plant and equipment at the installation will be regularly maintained including those systems provided to minimise the potential for OTNOC conditions to occur. Appropriate procedures will also be put in place to review any OTNOC events with periodic assessment of associated aspects. The records of OTNOC events will be retained on site. We are satisfied that the applicant meets the requirements of this BAT Conclusion.

BAT Concn. No.	Summary of BAT Conclusion requirement	Status NA/ CC / PC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
11	BAT is to appropriately monitor emissions to air and/or to water during OTNOC. ***Description*** The monitoring can be carried out by direct measurement of emissions or by monitoring of surrogate parameters if this proves to be of equal or better scientific quality than the direct measurement of emissions. Emissions during start-up and shutdown (SU/SD) may be assessed based on a detailed emission measurement carried out for a typical SU/SD procedure at least once every year, and using the results of this measurement to estimate the emissions for each and every SU/SD throughout the year.	CC	The applicant confirmed that the flue gases from the CCGT will be monitored using MCERTS certified CEMs in accordance with BS EN 14181. This system will capture emissions data during all operating conditions, including OTNOC situations, and can be used to inform subsequent incident investigation. We are satisfied that the applicant meets the requirements of this BAT Conclusion.

<table>
<tr>
<td>12</td>
<td>In order to increase the energy efficiency of combustion, gasification and/or IGCC units operated ≥ 1 500 h/yr, BAT is to use an appropriate combination of the techniques given below.
<table>
<tr><th colspan="2">Technique</th><th>Description</th><th>Applicability</th></tr>
<tr><td>a.</td><td>Combustion optimisation</td><td>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>Generally applicable</td></tr>
<tr><td>b.</td><td>Optimisation of the working medium conditions</td><td>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><td></td></tr>
<tr><td>c.</td><td>Optimisation of the steam cycle</td><td>Operate with lower turbine exhaust pressure by utilisation of the lowest possible temperature of the condenser cooling water, within the design conditions</td><td></td></tr>
<tr><td>d.</td><td>Minimisation of energy consumption</td><td>Minimising the internal energy consumption (e.g. greater efficiency of the feed-water pump)</td><td></td></tr>
<tr><td>e.</td><td>Preheating of combustion air</td><td>Reuse of part of the heat recovered from the combustion flue-gas to preheat the air used in combustion</td><td>Generally applicable within the constraints related to the need to control NO_X emissions</td></tr>
<tr><td>f.</td><td>Fuel preheating</td><td>Preheating of fuel using recovered heat</td><td>Generally applicable within the constraints associated with the boiler design and the need to control NO_X emissions</td></tr>
<tr><td>g.</td><td>Advanced control system</td><td>See description in Section 8.2.
Computerised control of the main combustion parameters enables the combustion efficiency to be improved</td><td>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</td></tr>
<tr><td>h.</td><td>Feed-water preheating using recovered heat</td><td>Preheat water coming out of the steam condenser with recovered heat, before reusing it in the boiler</td><td>Only applicable to steam circuits and not to hot boilers.
Applicability to existing units may be limited due to constraints associated with the plant</td></tr>
</table>
</td>
<td>CC</td>
<td>The applicant confirmed that the anticipated electrical efficiency of the CCGT plant will be greater than 59%, which is within the required BAT AEEL range of 57 – 60.5% for CCGTs having a thermal input of >600 MWth.

There will be computerised control of the main combustion parameters to enable the combustion efficiency to be improved as standard.

a. Combustion optimisation, optimisation of the working medium and the steam cycle are all inherent in the CCGT plant design.

b-d. A holistic review of all on site energy consumers will be conducted to ensure maximum efficiency of the plant and minimisation of parasitic loads, to maximise energy efficiency.

e and f. Preheating of combustion air is inherent in the CCGT plant design and fuel preheating will be explored.

g-s. A holistic review of all on site energy consumers will be conducted to ensure maximum efficiency of the plant and</td>
</tr>
</table>

				configuration and the amount of recoverable heat		minimisation of parasitic loads, to maximise energy efficiency. We are satisfied that the applicant meets the requirements of this BAT Conclusion.
	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: — 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 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		

BAT Concn. No.	Summary of BAT Conclusion requirement				Status NA/ CC / PC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
				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 ≥ 600 MW_{th} operated > 4 000 h/yr. Not applicable when the purpose of the unit is to produce low steam temperatures and/or pressures in process industries. Not applicable to gas turbines and engines generating steam in CHP mode. For units combusting biomass, the applicability may be constrained by high-temperature corrosion in the case of certain biomasses		

<table>
<tr><th>BAT Concn. No.</th><th>Summary of BAT Conclusion requirement</th><th>Status NA/ CC / PC</th><th>Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement</th></tr>
<tr><td>13</td><td>In order to reduce water usage and the volume of contaminated wastewater discharged, BAT is to use one or both of the techniques given below.

<table><tr><th colspan="2">Technique</th><th>Description</th><th>Applicability</th></tr><tr><td>a.</td><td>Water recycling</td><td>Residual aqueous streams, including run-off water, from the plant are reused for other purposes. The degree of recycling is limited by the quality requirements of the recipient water stream and the water balance of the plant</td><td>Not applicable to waste water from cooling systems when water treatment chemicals and/or high concentrations of salts from seawater are present</td></tr><tr><td>b.</td><td>Dry bottom ash handling</td><td>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.</td><td>Only applicable to plants combusting solid fuels.

There may be technical restrictions that prevent retrofitting to existing combustion plants</td></tr></table></td><td>CC</td><td>The applicant confirmed that the installation will be serviced by a closed-loop cooling system with hybrid cooling towers, where the majority of the cooling water will be recycled. There will be some evaporative losses and blow-down - typically four cycles of concentration, meaning that the ratio of mineral concentration in the source water to that in the circulating water that must be maintained. It would not be possible to reuse the blow-down in the LCP due to the build-up of contaminants over time in the recirculated water. As a hybrid cooling system, the amount of water used is lower than that for fully wet cooling system. As such, only a nominal amount of water treatment chemicals is expected to be used, primarily for prevention of scaling, corrosion, and biofouling.

Where practical, efforts will be made to recover wastewater streams to serve as cooling water make-up or as feed for the demineralisation system to reduce</td></tr>
</table>

BAT Concn. No.	Summary of BAT Conclusion requirement	Status NA/ CC / PC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
			wastewater discharge. This will include HRSG blowdown, RO rejects (from demineralisation) and treated water from the oil/ water separator. The volumes of surface water run-off are extremely low in comparison to overall water usage on site and opportunities for reuse on site are limited due to the water quality requirements for on-site processes. CCGTs do not produce any ash from the combustion process; therefore, the techniques for dry bottom ash handling are not applicable. We are satisfied that the applicant meets the requirements of this BAT Conclusion.

BAT Concn. No.	Summary of BAT Conclusion requirement	Status NA/ CC / PC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
14	In order to prevent the contamination of uncontaminated wastewater and to reduce emissions to water, BAT is to segregate waste water streams and to treat them separately, depending on the pollutant content. ***Description*** Waste water streams that are typically segregated and treated include surface run-off water, cooling water, and waste water from flue-gas treatment. ***Applicability*** The applicability may be restricted in the case of existing plants due to the configuration of the drainage systems.	CC	The applicant confirmed that separate drainage and sump systems are included in the design to segregate uncontaminated surface run-off water from contaminated process water and potentially contaminated run-off surface water. Contaminated water will be treated in an on-site waste-water treatment facility and recycled- and reused within the process as far as reasonably possible, with the surplus discharged to the outfall at emission point W1. We are satisfied that the applicant meets the requirements of this BAT Conclusion.

<table>
<tr>
<td>15</td>
<td>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.
<table>
<tr><th colspan="2">Technique</th><th>Typical pollutants prevented/abated</th><th>Applicability</th></tr>
<tr><td colspan="4">Primary techniques</td></tr>
<tr><td>a.</td><td>Optimised combustion (see BAT 6) and flue-gas treatment systems (e.g. SCR/SNCR, see BAT 7)</td><td>Organic compounds, ammonia (NH_3)</td><td>Generally applicable</td></tr>
<tr><td colspan="4">Secondary techniques [29]</td></tr>
<tr><td>b.</td><td>Adsorption on activated carbon</td><td>Organic compounds, mercury (Hg)</td><td>Generally applicable</td></tr>
<tr><td>c.</td><td>Aerobic biological treatment</td><td>Biodegradable organic compounds, ammonium (NH_4^+)</td><td>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)</td></tr>
<tr><td>d.</td><td>Anoxic/anaerobic biological treatment</td><td>Mercury (Hg), nitrate (NO_3^-), nitrite (NO_2^-)</td><td>Generally applicable</td></tr>
<tr><td>e.</td><td>Coagulation and flocculation</td><td>Suspended solids</td><td>Generally applicable</td></tr>
<tr><td>f.</td><td>Crystallisation</td><td>Metals and metalloids, sulphate (SO_4^{2-}), fluoride (F^-)</td><td>Generally applicable</td></tr>
<tr><td>g.</td><td>Filtration (e.g. sand filtration, microfiltration, ultrafiltration)</td><td>Suspended solids, metals</td><td>Generally applicable</td></tr>
<tr><td>h.</td><td>Flotation</td><td>Suspended solids, free oil</td><td>Generally applicable</td></tr>
<tr><td>i.</td><td>Ion exchange</td><td>Metals</td><td>Generally applicable</td></tr>
<tr><td>j.</td><td>Neutralisation</td><td>Acids, alkalis</td><td>Generally applicable</td></tr>
<tr><td>k.</td><td>Oxidation</td><td>Sulphide (S^{2-}), sulphite (SO_3^{2-})</td><td>Generally applicable</td></tr>
<tr><td>l.</td><td>Precipitation</td><td>Metals and metalloids, sulphate (SO_4^{2-}), fluoride (F^-)</td><td>Generally applicable</td></tr>
<tr><td>m.</td><td>Sedimentation</td><td>Suspended solids</td><td>Generally applicable</td></tr>
<tr><td>n.</td><td>Stripping</td><td>Ammonia (NH_3)</td><td>Generally applicable</td></tr>
</table>
The BAT-AELs refer to direct discharges to a receiving water body at the point where the emission leaves the installation.
BAT-AELs for direct discharges to a receiving water body from flue-gas treatment
<table>
<tr><th>Substance/Parameter</th><th>BAT-AELs</th></tr>
<tr><th></th><th>Daily average</th></tr>
</table>
</td>
<td>NA</td>
<td>The applicant confirmed that the need for flue gas treatment is minimised by primary combustion controls identified in BAT Conclusion 6, therefore there are no emissions to water from flue-gas treatment.

We are satisfied that the requirements of this BAT Conclusion are not applicable to the installation.</td>
</tr>
</table>

BAT Concn. No.	Summary of BAT Conclusion requirement			Status NA/ CC / PC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	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		
		Ni	10–50 µg/l		
		Pb	10–20 µg/l		
		Zn	50–200 µg/l		

<table>
<tr>
<td>16</td>
<td>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:

(a) waste prevention, e.g. maximise the proportion of residues which arise as by-products;

(b) waste preparation for reuse, e.g. according to the specific requested quality criteria;

(c) waste recycling;

(d) other waste recovery (e.g. energy recovery),

by implementing an appropriate combination of techniques such as:

<table>
<tr><th colspan="2">Technique</th><th>Description</th><th>Applicability</th></tr>
<tr><td>a.</td><td>Generation of gypsum as a by-product</td><td>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>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>b.</td><td>Recycling or recovery of residues in the construction sector</td><td>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>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>c.</td><td>Energy recovery by using waste in the fuel mix</td><td>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>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>
</table>
</td>
<td>CC</td>
<td>The applicant confirmed that all waste generated will be managed in accordance with Uniper’s EMS document GMI-SHE043 (Management of Waste).

Uniper have a centrally coordinated waste management contract in place for all their sites, ensuring waste is managed with implementation of the waste hierarchy as a priority. Uniper’s primary objective is not to produce waste in the first place and where it is produced, to reuse and recycle as much as possible.

A waste working group within Uniper UK meet regularly with their waste broker to identify the most sustainable options (such as reuse or recycling) for waste materials generated by their operations. Initiatives vary by site and waste stream. Where possible, successful initiatives are rolled out across the wider Uniper fleet.

Landfill remains a last resort, and since 2022 Uniper has sent less than 0.05% of its waste directly to landfill.</td>
</tr>
</table>

BAT Concn. No.	Summary of BAT Conclusion requirement	Status NA/ CC / PC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	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		We are satisfied that the applicant meets the requirements of this BAT Conclusion.
17	In order to reduce noise emissions, BAT is to use one or a combination of the techniques given below. **Technique** / **Description** / **Applicability** a. Operational measures — These include: — 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	CC	The applicant confirmed that: a. The site will have a maintenance schedule in place to ensure optimum operation of all plant and equipment. The GT, HRSG and steam turbine (ST) will be situated within a building, and all outdoor equipment will have noise attenuation enclosures, where required. Any maintenance work that is likely to cause significant noise that poses a nuisance risk will be undertaken during daylight hours, where feasible. b. The installation will be a new plant, and all equipment will be selected to avoid noise impacts either via inherent design qualities, or where a noise risk

BAT Concn. No.	Summary of BAT Conclusion requirement	Status NA/ CC / PC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	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: — 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		exists, via the installation of noise attenuation measures. c-e. All equipment being installed is new and mitigation will be in place where necessary to ensure levels of noise below applicable lowest observed adverse effect level (LOAELs), so that residual effects are expected to be not significant. We are satisfied that the applicant meets the requirements of this BAT Conclusion. Also refer to the 'Noise and vibration management' section of this document.
18 - 39	BAT Conclusions 18 – 27 are associated with the combustion of solid fuels only and therefore are not applicable to the installation. BAT Conclusions 28 – 39 are associated with the combustion of liquid fuels only and therefore are not applicable to the installation.	NA	We are satisfied that the requirements of these BAT Conclusions are not applicable to the installation.

<table>
<tr><th>BAT Concn. No.</th><th>Summary of BAT Conclusion requirement</th><th>Status NA/ CC / PC</th><th>Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement</th></tr>
<tr><td colspan="4">Combustion of gaseous fuels</td></tr>
<tr><td>40</td><td>In order to increase the energy efficiency of natural gas combustion, BAT is to use an appropriate combination of the techniques given in BAT 12 and below.
<table>
<tr><th colspan="2">Technique</th><th>Description</th><th>Applicability</th></tr>
<tr><td>a.</td><td>Combined cycle</td><td>See description in Section 8.2</td><td>Generally applicable to new gas turbines and engines except when operated < 1 500 h/yr.
Applicable to existing gas turbines and engines within the constraints associated with the steam cycle design and the space availability.
Not applicable to existing gas turbines and engines operated < 1 500 h/yr.
Not applicable to mechanical drive gas turbines operated in discontinuous mode with extended load variations and frequent start-ups and shutdowns.
Not applicable to boilers</td></tr>
</table>
BAT-associated energy efficiency levels (BAT-AEELs) for the combustion of natural gas
<table>
<tr><th rowspan="2">Type of combustion unit</th><th colspan="4">BAT-AEELs ([136]) ([137])</th></tr>
<tr><th colspan="2">Net electrical efficiency (%)</th><th>Net total fuel utilisation (%) ([138]) ([139])</th><th colspan="2">Net mechanical energy efficiency (%) ([139]) ([140])</th></tr>
<tr><th>New unit</th><th>Existing unit</th><th></th><th>New unit</th><th>Existing unit</th></tr>
<tr><td>Gas engine</td><td>39,5–44 ([141])</td><td>35–44 ([141])</td><td>56–85 ([141])</td><td colspan="2">No BAT-AEEL.</td></tr>
<tr><td>Gas-fired boiler</td><td>39–42,5</td><td>38–40</td><td>78–95</td><td colspan="2">No BAT-AEEL.</td></tr>
<tr><td>Open cycle gas turbine, ≥ 50 MWth</td><td>36–41,5</td><td>33–41,5</td><td>No BAT-AEEL</td><td>36,5–41</td><td>33,5–41</td></tr>
<tr><td colspan="6">Combined cycle gas turbine (CCGT)</td></tr>
<tr><td>CCGT, 50–600 MW_{th}</td><td>53–58,5</td><td>46–54</td><td>No BAT-AEEL</td><td colspan="2">No BAT-AEEL</td></tr>
<tr><td>CCGT, ≥ 600 MW_{th}</td><td>57–60,5</td><td>50–60</td><td>No BAT-AEEL</td><td colspan="2">No BAT-AEEL</td></tr>
<tr><td>CHP CCGT, 50–600 MW_{th}</td><td>53–58,5</td><td>46–54</td><td>65–95</td><td colspan="2">No BAT-AEEL</td></tr>
<tr><td>CHP CCGT, ≥ 600 MW_{th}</td><td>57–60,5</td><td>50–60</td><td>65–95</td><td colspan="2">No BAT-AEEL</td></tr>
</table></td><td>CC</td><td>The applicant confirmed that the anticipated electrical efficiency of the CCGT plant will be greater than 59%, which is compliant with the required BAT-AEEL range of 57 – 60.5% for CCGTs having a thermal input of >600 MWth.

We are satisfied that the applicant meets the requirements of this BAT Conclusion.</td></tr>
</table>

<table>
<tr><th>BAT Concn. No.</th><th>Summary of BAT Conclusion requirement</th><th>Status NA/ CC / PC</th><th>Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement</th></tr>
<tr><td>41</td><td>In order to prevent or reduce NO_X emissions to air from the combustion of natural gas in boilers, BAT is to use one or a combination of the techniques given below.
<table>
<tr><th colspan="2">Technique</th><th>Description</th><th>Applicability</th></tr>
<tr><td>a.</td><td>Air and/or fuel staging</td><td>See descriptions in Section 8.3.

Air staging is often associated with low-NO_X burners</td><td>Generally applicable</td></tr>
<tr><td>b.</td><td>Flue-gas recirculation</td><td rowspan="2">See description in Section 8.3</td><td rowspan="2"></td></tr>
<tr><td>c.</td><td>Low-NO_X burners (LNB)</td></tr>
<tr><td>d.</td><td>Advanced control system</td><td>See description in Section 8.3.
This technique is often used in combination with other techniques or may be used alone for combustion plants operated < 500 h/yr</td><td>The applicability to old combustion plants may be constrained by the need to retrofit the combustion system and/or control command system</td></tr>
<tr><td>e.</td><td>Reduction of the combustion air temperature</td><td rowspan="2">See description in Section 8.3</td><td>Generally applicable within the constraints associated with the process needs</td></tr>
<tr><td>f.</td><td>Selective non–catalytic reduction (SNCR)</td><td>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</td></tr>
</table></td><td>NA</td><td>The applicant confirmed that this BAT Conclusion is only applicable to boilers and therefore not applicable to the installation.

We are satisfied that the requirements of these BAT Conclusions are not applicable to the installation.</td></tr>
</table>

BAT Concn. No.	Summary of BAT Conclusion requirement	Status NA/ CC / PC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	g. Selective catalytic reduction (SCR) — Not applicable to combustion plants operated < 500 h/yr. Not generally applicable to combustion plants of < 100 MW_{th}. There may be technical and economic restrictions for retrofitting existing combustion plants operated between 500 h/yr and 1 500 h/yr		
42	In order to prevent or reduce NO_X emissions to air from the combustion of natural gas in gas turbines, BAT is to use one or a combination of the techniques given below. a. Advanced control system — See description in Section 8.3. This technique is often used in combination with other techniques or may be used alone for combustion plants operated < 500 h/yr — The applicability to old combustion plants may be constrained by the need to retrofit the combustion system and/or control command system b. Water/steam addition — See description in Section 8.3 — The applicability may be limited due to water availability c. Dry Low-NO_X burners (DLN) — The applicability may be limited in the case of turbines where a retrofit package is not available or when water/steam addition systems are installed d. Low-load design concept — Adaptation of the process control and related equipment to maintain good combustion efficiency when the demand in energy varies, e.g. by improving the inlet airflow control capability or by splitting the combustion process into decoupled combustion stages — The applicability may be limited by the gas turbine design	CC	The applicant confirmed that: a. Operation of the CCGT unit will be controlled by trained site operatives using a DCS, which will be used to control the operation of the plant and also record data on the plant performance, which can also be used by the operations team to identify potential issues. b. Water/ steam addition for NOx control is not applied as the plant will have Dry Low-NOx burners (DLN). c. The CCGT will have DLN burners in place to ensure minimum emissions of NOx. d. Not applicable as this is limited by the turbine design. Operational

BAT Concn. No.	Summary of BAT Conclusion requirement				Status NA/ CC / PC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	e.	Low-NO_X burners (LNB)	See description in Section 8.3	Generally applicable to supplementary firing for heat recovery steam generators (HRSGs) in the case of combined-cycle gas turbine (CCGT) combustion plants		efficiency characteristics of the plant vary according to the load. No supplementary firing is undertaken in the HRSGs. e. The CCGT will have DLN burners in place to ensure minimum emissions of NOx. f. It is considered that the NOx BAT AELs can be met with primary measures alone, and therefore SCR does not need to be installed. We are satisfied that the applicant meets the requirements of this BAT Conclusion.
	f.	Selective catalytic reduction (SCR)		Not applicable in the case of combustion plants operated < 500 h/yr. Not generally applicable to existing combustion plants of < 100 MW_{th}. Retrofitting existing combustion plants may be constrained by the availability of sufficient space. There may be technical and economic restrictions for retrofitting existing combustion plants operated between 500 h/yr and 1 500 h/yr		

<table>
<tr><th>BAT Concn. No.</th><th>Summary of BAT Conclusion requirement</th><th>Status NA/ CC / PC</th><th>Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement</th></tr>
<tr><td>43</td><td>In order to prevent or reduce NO_X emissions to air from the combustion of natural gas in engines, BAT is to use one or a combination of the techniques given below.
<table>
<tr><th colspan="2">Technique</th><th>Description</th><th>Applicability</th></tr>
<tr><td>a.</td><td>Advanced control system</td><td>See description in Section 8.3.
This technique is often used in combination with other techniques or may be used alone for combustion plants operated < 500 h/yr</td><td>The applicability to old combustion plants may be constrained by the need to retrofit the combustion system and/or control command system</td></tr>
<tr><td>b.</td><td>Lean-burn concept</td><td>See description in Section 8.3.
Generally used in combination with SCR</td><td>Only applicable to new gas-fired engines</td></tr>
<tr><td>c.</td><td>Advanced lean-burn concept</td><td rowspan="2">See descriptions in Section 8.3</td><td>Only applicable to new spark plug ignited engines</td></tr>
<tr><td>d.</td><td>Selective catalytic reduction (SCR)</td><td>Retrofitting existing combustion plants may be constrained by the availability of sufficient space.
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>
</table></td><td>NA</td><td>The applicant confirmed that this only applicable to natural gas engines and therefore not applicable to the Installation.

We are satisfied that the requirements of these BAT Conclusions are not applicable to the installation.</td></tr>
</table>

44	In order to prevent or reduce CO emissions to air from the combustion of natural gas, BAT is to ensure optimised combustion and/or to use oxidation catalysts. ***Description* - See descriptions in Section 8.3.** **BAT-associated emission levels (BAT-AELs) for NO_X emissions to air from the combustion of natural gas in gas turbines**	PC	The applicant confirmed that optimised combustion will ensure CO emissions meet the required emission limits. They go on to confirm that performance is to be confirmed following commencement of operation and a limit of 100 mg/m^3 is proposed in the Main Supporting Document. In their response to our further information request received 17/03/2026 they confirm that: The technology selected for the CCGT is established and proven high efficiency technology that is fully compliant with LCP BAT requirements when operating at full load during periods of stable operation. There is some concern over the ability of the CCGT to achieve the indicative annual CO BAT AEL of 5-30 mg/Nm^3, due to the potentially limited operational hours and reduced loads associated with the planned dispatchable power generation mode of operation for the installation. Whilst it is considered that such annual emission concentrations may be achievable for CCGTs when operating at baseload, it is considered that dispatchable CCGTs, where long

Type of combustion plant	Combustion plant total rated thermal input (MW_{th})	BAT-AELs (mg/Nm^3) (142) (143)	
		Yearly average (144) (145)	Daily average or average over the sampling period
Open-cycle gas turbines (OCGTs) (146) (147)			
New OCGT	≥ 50	15–35	25–50
Existing OCGT (excluding turbines for mechanical drive applications) — All but plants operated < 500 h/yr	≥ 50	15–50	25–55 (148)
Combined-cycle gas turbines (CCGTs) (146) (149)			
New CCGT	≥ 50	10–30	15–40
Existing CCGT with a net total fuel utilisation of < 75 %	≥ 600	10–40	18–50
Existing CCGT with a net total fuel utilisation of ≥ 75 %	≥ 600	10–50	18–55 (150)
Existing CCGT with a net total fuel utilisation of < 75 %	50–600	10–45	35–55
Existing CCGT with a net total fuel utilisation of ≥ 75 %	50–600	25–50 (151)	35–55 (152)
Open- and combined-cycle gas turbines			
Gas turbine put into operation no later than 27 November 2003, or existing gas turbine for emergency use and operated < 500 h/yr	≥ 50	No BAT-AEL	60–140 (153) (154)
Existing gas turbine for mechanical drive applications — All but plants operated < 500 h/yr	≥ 50	15–50 (155)	25–55 (156)

As an indication, the yearly average CO emission levels for each type of existing combustion plant operated ≥ 1 500 h/yr and for each type of new combustion plant will generally be as follows:

— New OCGT of ≥ 50 MW_{th}: < 5–40 mg/Nm^3. For plants with a net electrical efficiency (EE) greater than 39 %, a correction factor may be applied to the higher end of this range, corresponding to [higher end] × EE/39, where EE is the net electrical energy efficiency or net mechanical energy efficiency of the plant determined at ISO baseload conditions.

— Existing OCGT of ≥ 50 MW_{th} (excluding turbines for mechanical drive applications): < 5–40 mg/Nm^3. The higher end of this range will generally be 80 mg/Nm^3 in the case of existing plants that cannot be fitted with dry techniques for NO_X reduction, or 50 mg/Nm^3 for plants that operate at low load.

— New CCGT of ≥ 50 MW_{th}: < 5–30 mg/Nm^3. For plants with a net electrical efficiency (EE) greater than 55 %, a correction factor may be applied to the higher end of the range, corresponding to [higher end] × EE/55, where EE is the net electrical energy efficiency of the plant determined at ISO baseload conditions.

— Existing CCGT of ≥ 50 MW_{th}: < 5–30 mg/Nm^3. The higher end of this range will generally be 50 mg/Nm^3 for plants that operate at low load.

— Existing gas turbines of ≥ 50 MW_{th} for mechanical drive applications: < 5–40 mg/Nm^3. The higher end of the range will generally be 50 mg/Nm^3 when plants operate at low load.

In the case of a gas turbine equipped with DLN burners, these indicative levels correspond to when the DLN operation is effective.

BAT-associated emission levels (BAT-AELs) for NO_X emissions to air from the combustion of natural gas in boilers and engines

Type of combustion plant	BAT-AELs (mg/Nm^3)			
	Yearly average (157)		Daily average or average over the sampling period	
	New plant	Existing plant (158)	New plant	Existing plant (159)
Boiler	10–60	50–100	30–85	85–110
Engine (160)	20–75	20–100	55–85	55–110 (161)

As an indication, the yearly average CO emission levels will generally be:

— < 5–40 mg/Nm^3 for existing boilers operated ≥ 1 500 h/yr,

— < 5–15 mg/Nm^3 for new boilers,

— 30–100 mg/Nm^3 for existing engines operated ≥ 1 500 h/yr and for new engines.

periods of operation at stable operational loads are unlikely to occur, were not within the scope of the LCP BAT Conclusions.

They propose that rather than setting an ELV within the permit that may not be achievable due to the anticipated operational mode of the CCGT, a more appropriate approach would be to include an improvement condition requiring the operator to propose a suitable annual average ELV for CO either following commissioning or several months of operation.

For CO emissions the applicant does not anticipate that they can meet the indicative yearly average emission level, so we conclude that the applicant does not meet this element of the BAT Conclusion. Also refer to 'Emission limits' section of this document.

For NOx the CCGT is expected to achieve the stated BAT AELs without the SCR with energy efficiency uplifts applied as appropriate on confirmation of the CCGT supplier post Front End Engineering Design (FEED).

Whilst it is recognised that SCR could be applied to reduce NOx

			emissions towards the lower end of the BAT AEL range, this would result in an emission of ammonia, due to the potential for ammonia slip to occur. Ammonia contributes to nitrogen deposition on habitat receptors, with a deposition rate that is significantly greater than that of NO_2, and therefore it is considered that any emission of ammonia (even at the lower end of the BAT-AEL range of 3 – 10 mg/m^3) would increase the nitrogen deposition impacts more than any reduction in the NOx impacts would achieve. It is therefore considered that if SCR were applied, nitrogen deposition impacts at the closest habitat receptors would increase above the 1% threshold for determining insignificance at these receptors. As the predicted impacts of NO_2 at human health receptors and NOx at habitat receptors are considered to be either insignificant or not significant, it is not considered that there is any driver to reduce the NOx emissions below the upper end of the associated BAT AEL range. For NOx emissions we are satisfied that the applicant meets

BAT Concn. No.	Summary of BAT Conclusion requirement	Status NA/ CC / PC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
			the requirements of this BAT Conclusion. Overall, we conclude that they are partially compliant with the requirements of this BAT Conclusion.
45 - 75	The remaining BAT Conclusions 45 – 75 are not applicable to the installation.	NA	We are satisfied that the requirements of these BAT Conclusions are not applicable to the installation.