Permitting Decisions- Bespoke Permit

We have decided to grant the permit for LHR11/12 operated by VDC LHR11 Limited.

The permit number is EPR/YP3329SB.

The permit was granted on 14/08/2024.

The application is for the operation of standby electricity generating combustion plant at two data centres on the same site. The site is located within a predominately mixed industrial and commercial area, known as Park Royal, within the London Borough of Ealing at national grid reference TQ 21147 82397.

The combustion plant comprises:

37 gas oil/ HVO fired Kohler KD3500E derated to 3250 kVA generators operating as standby backup generators each with a thermal input of 6.1 MWth.

The combined net rated thermal input of all gas oil/ HVO backup generators on site is 225.7 MWth (37 x 6.1 MWth standby generators).

Operation of the data centre combustion plant will be regulated as a Section 1.1 Part A (1) (a) activity under the Environmental Permitting (England and Wales) Regulations (EPR) 2016 for the burning of any fuel in an appliance with a rated thermal input of 50 or more megawatts (MW). The aggregated thermal input of the data centres is 225.7 MWth.

The generators will supply emergency power to the data centres in the event of National Grid failure. In non-emergency scenarios, they will be operated only for testing and maintenance purposes to an agreed schedule. They will not provide any electricity themselves to the National Grid and all electricity generated will be used within the data centre.

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:

- summarises the decision making process in the decision considerations section to show how the main relevant factors have been taken into account
- highlights key issues in the determination
- 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.

Key issues of the decision

Nature of the site

The operator applied to permit two data centres – LHR11 and LHR12 at the same location, known as Park Royal, within the London Borough of Ealing. Both data centres will be located on a single site wholly owned and operated by VDC, and will share a common site boundary, drainage network, electrical supply infrastructure, fuel supply systems as well as internal road network. Therefore, it is proposed that the Installation should be permitted as a single site under our data centre guidance as we would clearly regard a company's individual campus or obvious standalone boundary as a single site.

LHR11 is classed as Phase 1: 17 generators are planned to be installed in 2024.

LHR12 is classed as Phase 2: 20 generators are planned to be installed in 2025.

Therefore, the site will have a total of 37 generators. All have been permitted as part of this one application.

Best Available Techniques (BAT) Assessment – Emergency Power Provision on Site

Technology & Fuel

The operator carried out a BAT assessment of the viable technologies and fuel capable of providing emergency power at the data centre.

As outlined in the Environment Agency's 'Data Centre FAQ' document, we accept that gas oil or equivalent fuel generators are presently a commonly used technology for standby generators. Currently gas oil or equivalent fuel generators are the preferred option for the supply of backup power for data centres and are a proven technology for providing reliable resilience of functionality which can be started from cold very quickly.

We have specified the fuel to be burned in the engines to consist of gas oil or equivalent substitute to be agreed in writing with the Environment Agency with a sulphur concentration of 0.001% w/w. We are in the process of developing our position on the use of gas oil substitute fuels such as hydrotreated vegetable oil (HVO), therefore we have required that if any of these fuels are proposed, written agreement is sought by the operator from the Environment Agency's regulatory officer. The operator confirmed that it is anticipated that the units will primarily be run using HVO with a maximum sulphur content of 5mg/kg. Low sulphur gas oil will be used to run the generators if required as an alternative. Email received on 13/06/2024 advising Environment Agency of change of fuel. Operator to use both gas oil and HVO fuel in backup generators. This change was agreed by us on 14/06/2024.

Managing Emissions

Point Source Emissions to Air

Emissions to air from the Installation will principally comprise combustion gases arising from the operation of the generation plant under emergency, testing and maintenance scenarios.

The primary pollutants of concern to air quality from the combustion processes at the Installation are nitrogen dioxide (NO2), carbon monoxide (CO), particulates (PM10), sulphur dioxide (SO_2) and ammonia (NH_3) from the SCR abatement.

The operator has taken measures to minimise emissions from the gas oil or equivalent fuel generators under emergency, testing and maintenance scenarios.

Both the Data Centre FAQ Headline Approach v21 and Emergency backup diesel engines on installations: best available techniques (BAT) - GOV.UK (www.gov.uk) specifies the BAT emissions specification for new gas oil-fired reciprocating engines as emissions optimised to 2g-TA Luft or US EPA Tier 2 or an equivalent. These are the international standards that we have concluded that we will use to infer what BAT is for sites.

The operator has confirmed that the 37 generators to be used at the data centres are emissions optimised to meet the US EPA Tier 2 standard at 75% load. The operator has also included a Selective Catalytic Reduction (SCR) NOx abatement system within the design. The SCR NOx abatement system on the generators will be used to limit the NOx emissions to a maximum of 190 mg/Nm^3 per generator at 15% oxygen, which is the Medium Combustion Plant Directive (MCPD) 2015 limit for new gas oil engines.

We do not consider SO_2 emissions to be a risk from the operation of the Installation as we have included a condition in the permit restricting the fuel to ultra-low sulphur gas oil, resulting in negligible emissions of sulphur. However, the operator has confirmed that the SO_2 emission rate is based on the fuel flow of the engine assuming a maximum sulphur content in the fuel of 5mg/kg (0.0005%) as advised by the supplier; this is consistent with both low sulphur gas oil and HVO.

The ammonia emission rate (due to slip from the use of SCR) is assumed to be equivalent to the BAT upper emission concentration of 15 mg/Nm^3 on a conservative basis.

Aqueous Releases from Site

The Installation has separate foul and surface water drainage systems.

The foul system discharges into the foul public sewer on Chandos Road. The surface water system discharges into the surface water public sewer on Chandos Road. Both of these public sewer systems combine in Victoria Road to become one foul and surface water combined sewer. All the public sewer systems are operated by Thames Water. The combined sewer discharges to Beckton Wastewater Treatment Works and ultimately the River Thames.

Point Source Emissions to Foul Sewer

The operator has confirmed that there will be no process emissions to the public foul sewer system associated with the regulated activity undertaken at the Installation.
Only uncontaminated surface water runoff will be discharged to the public foul sewer from the areas surrounding:

- LHR11 generator building via a 10,000 litre full retention interceptor. The operator confirms that there is no regular discharge anticipated and the drainage provides a capture and containment approach for spills.

- LHR11/12 fuel delivery point via a 45 litre bypass interceptor.

The foul sewer point source discharge point into this connection is referenced as S1 on the Plan in Schedule 7 of the permit.

Point Source Emissions to Surface Water Sewer

The operator has confirmed that there will be no contaminated emissions to the public surface water sewer system associated with the regulated activity undertaken at the Installation.

Only uncontaminated surface water runoff will be discharged to the public surface water sewer from the areas surrounding:

- LHR12 generator gantry area via 10,000 litre full retention interceptor & attenuation tank (soakaway).

The surface water drainage system is routed across the site to a flow attenuation system (soakaways) before being pumped into the public surface water sewer. The surface water point source discharge point into this connection is referenced as SW1 on the Plan in Schedule 7 of the permit.

The surface water discharge (SW1) from the facility operates on a pumped mechanism, allowing the site to be isolated in the event of a spill through isolation of the pump. There is also an automatic drain closure valve installed to prevent spillages from leaving site through the drainage system. The pump system operates automatically based upon levels within the sump. A manual override will be incorporated and will form part of the emergency response procedure at the site, to be implemented by the operations team.

There is no pumped system on the foul network (S1) as this carries domestic effluent from the wider data centre facility. The full retention interceptor provides protection in relation to the generator building and potential loss of containment in this location.

Both drainage systems will be inspected via CCTV survey and will be undertaken on a frequency to be determined as part of the transition to the operations team.

Firewater

The Installation includes containment for firewater within the generator building for LHR11 and a firewater capture system for the LHR12 generator gantry, full retention interceptors capable of retaining 10,000 litres and a pumped transfer to the drainage system which can be isolated in the event of a fire. This provides three layers of protection in relation to the main fire risk at the Installation (emergency generators).

Interceptors

There are three alarmed oil/ water interceptors on site, serving the generator locations and the fuel delivery point.
There are two 10,000 litre full retention interceptors serving the LHR11 generator building and LHR12 generator gantry area drainage, and a 45 litre capacity bypass interceptor serving the fuel offloading area.

A probe is installed with the interceptors, which will alarm when the presence of oil is detected. The alarms are linked to the generator system SCADA for the data centre.

The operator confirms that an investigatory procedure will commence which will include visual investigation of the area served by the interceptor, temporary isolation of the surface water system whilst the source of the trigger is investigated, and arrangement for removal of oil from the interceptor where an event has taken place.

Interceptors will be inspected on a six-monthly basis as recommended by the manufacturer and where required arrangements will be made for removal of silt/oil by a licenced waste contractor.

Point Source Emissions to Land

The operator has confirmed that there will be point source emissions to land from the Installation in the form of soakaways.

The only soakaway serving the permitted area is the southern attenuation tank on LHR12 which captures drainage from the generator gantry area. The soakaway point source discharge point is referenced as SL1 on the Plan in Schedule 7 of the permit.

The soakaway is lined with a geotextile and geomembrane and is protected by an interceptor, the area also includes a firewater retention chamber.

The soakaways include access points which allow for CCTV surveying and jetting to clear blockages and buildup of sediment. The maintenance procedures (including frequency) will be finalised as part of the commissioning process and transition to the operations team for the Installation.

Air Quality

In line with the Environment Agency's guidance (Air emissions risk assessment for your environmental permit - GOV.UK (www.gov.uk)) and the relevant parts of the guidance applicable to the assessment of air dispersion modelling of emissions from generators (Specified generators: dispersion modelling assessment - GOV.UK (www.gov.uk)) the operator submitted detailed air dispersion modelling and impact assessment to assess the predicted impacts on human receptors and ecological sites.

The methodology for risk assessment of point source emissions to air, and the associated definitions, are set out in our guidance Air emissions risk assessment for your environmental permit - GOV.UK (www.gov.uk).

Operator's Assessment of Potential Impact on Air Quality

The operator submitted an Air Emissions Risk Assessment prepared by Ramboll UK Limited (the consultant), which considered the potential impacts of the principal pollutants of concern with respect to emissions to air from low sulphur gas oil/ HVO generators. The consultant has assessed potential impacts at human and ecological receptors for nitrogen oxides (NOx), ammonia (NH_3), sulphur dioxide (SO_2), carbon monoxide (CO), particulate matter (with a diameter less than 10 microns (PM10) and 2.5 microns (PM2.5)) within the defined screening distances.

Human Receptors

They considered 75 discrete human receptor locations, including residential properties, hotels and workplaces.

Ecological Receptors

They considered the following protected European sites:

Special Areas of Conservation (SAC):

- Richmond Park
- Wimbledon Common

They considered the following local sites:

Local Nature Reserves (LNR):

- Wormwood Scrubs

The consultant's assessment of ecological impacts also identified 50 Local Wildlife Sites (LWS) as receptor points.

The data centre is situated in an Air Quality Management Area (AQMA) (Ealing AQMA) declared by the London Borough of Ealing in 2000 for annual mean NO2 and 24-hour PM10.

The consultant assessed **two** scenarios:

Scenario 1: Routine maintenance/ testing - As part of the testing and maintenance regime, the generators will be tested individually, up to 2 hours per month. This equates to 24 hours per year per generator, or 888 hours in total per year for all plant. It has been assumed by the consultant that the single generator stack with the highest process contributions (PCs), 'Stack LHR11_17', runs continuously at 100% load to provide worst-case predictions. Annual mean results have been factored down, to represent a total annual operating time of 888 hours.

Scenario 2: Electrical grid outage of 72 hours - All generators operate concurrently at 100% load across the site for 72 hours (worst case scenario).

They made the following assumptions regarding the maintenance and operational scenarios to ensure a conservative assessment was undertaken, we do not agree with all of their assumptions and have audited their Air Quality Assessment accordingly:

- The consultant used ADMS 6 to predict emissions of NOx from the gas oil generators. They used five years of meteorological data observed at London Heathrow Airport between 2018 and 2022. The airport is located approximately 10 km west of the data centre and is likely to be representative of the modelling domain. *We have conducted sensitivity analysis to the additional years of 2016 and 2017 at Heathrow and meteorological data from the London Weather Centre, which is approximately 15 km northeast of the site. This station shows a slightly different wind profile to those observed at Heathrow and may be more representative of the dispersion site.*

- The consultant applied a surface roughness value of 1.5 m for the dispersion site, representative of large urban areas. This a high surface roughness option in ADMS, representative of areas such as central London. *We have tested sensitivity to a lower surface roughness of 0.7 m, which we consider to be more representative of the site as this falls between the land use types parkland, open suburbia, cities and woodlands as defined by the model inputs.* The consultant applied a surface roughness of 0.5 m for the meteorological site, representative of parkland, open suburbia. *We have tested sensitivity*

to a lower surface roughness of 0.3 m, representative of agricultural areas (max), which we consider to be most similar to Heathrow.

- The consultant has modelled predictions across a 700 m x 700 m grid with a 7 m resolution. The consultant did not include terrain in their assessment. *We agree that the terrain in the vicinity of the site is generally flat and therefore should not noticeably affect modelling results, so have not tested sensitivity to this.*

- The generator stacks are vertical, with a release height of 50 m. Airflow around buildings is often complex and may create zones of strong turbulence (cavity zones) and downward mixing on the lee side, an effect known as building downwash. The consultant chose to include 24 buildings in the model. *We have tested sensitivity to including the main buildings only, to see how this impacts upon dispersion. Our audit has shown that dispersion is good, due to the height of the stacks and facility buildings; building downwash effects are therefore not expected to be substantial, and we have not tested sensitivity to this.*

- The proposed facility is in an AQMA. The consultant has derived the background concentrations for human health receptors from a review of continuous and diffusion tube monitoring sites for the London Borough of Ealing. The consultant has applied an annual background value of 25.4 µg/m^3, which is the mean average of the nearest two diffusion tubes, EA41 (1 Shaftesbury Gardens) and EA43 (165 Wells House Road) for 2022, *which we do not consider appropriate due to the lingering impact of Covid-19 on traffic figures during 2022. We have identified a higher annual mean NO2 concentration of 37 µg/m^3, taken from the John Keble Primary School automatic monitoring site in the London Borough of Brent, which we have applied to our modelling as a conservative background concentration.* The consultant has used the Defra background maps to establish baseline NOx concentrations and APIS to determine the site-specific nitrogen and acid critical loads for the European nature sites. *We agree that APIS is a suitable source of critical load baseline information for ecological sites.*

- The consultant chose a 70% long-term and 35% short-term NOx to NO2 conversion, in line with our guidance. *We have tested sensitivity to a lower short term conversion rate of 15%, which is likely to be reasonably representative at receptors within the first few hundred meters (approximately 500m) from the source, which is where maximum PCs are predicted.*

- The consultant has calculated emission rates based on information provided by the operator and have submitted the technical data sheets for the generators. The operator has confirmed that the generators to be used at the data centres are emissions optimised to meet the US EPA Tier 2 standard at 75% load. The operator has also included a Selective Catalytic Reduction (SCR) NOx abatement system within the design to limit the NOx emissions to 190 mg/Nm^3 at 15% oxygen.

- The consultant has stated in their technical note dated 28th March 2024 that the SCR will not be effective for the first 5 to 15 minutes of operation, as the engine will start from a cold state and requires a minimum temperature to function correctly. The consultant did not account for this in their AQA, but within the technical note they have factored their PCs to account for unabated emissions being released during the first 10 minutes of operation within an hourly period. *While this approach is appropriate, they have not fully considered the impact on hourly NO2 exceedances in the technical note. In our audit we*

have uplifted both the testing and emergency emission rates to account for 10 minutes of unabated emissions within 1 hour, as a worst-case.

- The generators will emit NH_3 due to ammonia 'slip' from the SCR. The emission rate has been assumed to be the BAT upper emission concentration of 15 mg/Nm^3, *which we agree is conservative.*

- If emissions from multiple generators are released at the same time within the same stack, the plumes will act as a single plume with combined source characteristics. This is likely to influence plume buoyancy and dispersion. The consultant has combined the LHR11 stacks into four stacks, arranged as "five in one stack and four in three other stacks". *We agree that this is appropriate but note that the consultant has not combined stacks for LHR12; we have tested sensitivity to grouping the LHR12 stacks into five combined stacks for the emergency scenario, to account for the merged plumes. In the case of testing, all generators will be tested individually therefore there will be no risk of plume merging.*

- The consultant has omitted consideration of annual and hourly mean nitrogen monoxide (NO) EALs of 310 µg/m^3 and 4,400 µg/m^3, respectively. They have also not assessed against the annual and hourly mean NH_3 EALs for human health of 180 µg/m^3 and 2,500 µg/m^3, respectively. *We have considered the risks of exceeding these ES in our checks.*

Their conclusions were:

Impact on Human Health Receptors

Scenario 1: Routine maintenance/ testing

Nitrogen Dioxide (NO2)

- Annual Mean - The maximum PCs at all locations are less than 1% of the long-term AQS; the PCs are, therefore, insignificant.

- 1 Hour Mean (100%ile) - The PEC concentrations at the assessed receptor locations all have concentrations less than AEGL-1.

Scenario 2: Electrical grid outage of 72 hours

Nitrogen Dioxide (NO2)

- Annual Mean - The maximum PCs are less than 1% of the long-term AQS; the PCs are, therefore, insignificant.

- 1 Hour Mean (100%ile) - The PEC concentrations at the assessed receptors all have concentrations less than AEGL-1.

PM10

- Daily Mean - The maximum PC is less than 10% of the critical level and therefore insignificant, no further consideration of the PEC is required.

Sulphur Dioxide (SO_2)

- Daily Mean - The maximum PC is below the 10% of the short-term objective and therefore insignificant, no further consideration of the PEC is required.

- 1 Hour Mean - The maximum PC is below the 10% of the short-term objective and therefore insignificant, no further consideration of the PEC is required.

- 15-minute Mean - The maximum PC is below the 10% of the short-term objective and therefore insignificant, no further consideration of the PEC is required.

Carbon Monoxide (CO)

- 1 Hour Mean - The maximum PC is below the 10% of the short-term objective and therefore insignificant, no further consideration of the PEC is required.

- 8 Hour Rolling Mean - The maximum PC is below the 10% of the short-term objective and therefore insignificant, no further consideration of the PEC is required.

Impact on Ecological Receptors

Scenario 1: Routine maintenance/ testing

Nitrogen Oxides (NOx)

- Annual Mean - The maximum predicted PCs at all the assessed ecological sites is well below 1% of the critical level, as such they are insignificant. No further consideration of the PEC is required.

- Daily Mean - The predicted PCs are less than 10% of the critical level for Richmond Park SAC and Wimbledon Common SAC. The predicted PCs at all modelled local nature sites are less than 100%. Short-term concentrations are unlikely to give rise to significant impacts during the testing scenario.

Ammonia (NH_3)

- Annual Mean - The maximum predicted PCs are less than 1% of the critical level for Richmond Park SAC and Wimbledon Common SAC, as such they are insignificant. No further consideration of the PEC is required.

Nitrogen Deposition

- The predicted nitrogen deposition on Broadleaved, Mixed and Yew Woodland habitat and Dry Heaths for Richmond Park SAC, Wimbledon Common SAC and Wormwood Scrubs LNR does not exceed 1% of the critical load for both Woodland and Dry Heath and is therefore insignificant.

Acid Deposition

- The predicted total acid deposition on Broadleaved, Mixed and Yew Woodland habitat and Dry Heaths for Richmond Park SAC, Wimbledon Common SAC and Wormwood

Scrubs LNR is below 1% of the critical load function at all assessed habitats, and therefore no further consideration needs to be given.

Scenario 2: Electrical grid outage of 72 hours

Nitrogen Oxides (NOx)

- Annual Mean - The maximum predicted PCs at all the assessed ecological sites are well below 1% of the critical level, as such they are insignificant.

- Daily Mean - The daily mean PC is below 10% for Richmond Park SAC and Wimbledon Common SAC and is therefore insignificant for these sites. However, the daily mean is over 100% for 14 of the modelled ecological receptors, therefore, potentially significant. There are only 3 sites where the maximum predicted daily mean NOx concentration is above 200µg/m^3.

Ammonia (NH_3)

- Annual Mean - The maximum PCs are less than 1% of the critical level for Richmond Park SAC and Wimbledon Common SAC, and less than 100% for modelled local nature sites. No further consideration of the PEC is required.

Nitrogen Deposition

- The predicted nitrogen deposition on Broadleaved, Mixed and Yew Woodland habitat and Dry Heaths for Richmond Park SAC and Wimbledon Common SAC does not exceed 1% of the critical load and is therefore insignificant.

- Nitrogen deposition was also undertaken for all modelled local nature sites. The maximum contribution to nitrogen deposition is less than 100% of the critical loads at all of the locally designated sites and is therefore insignificant.

Acid Deposition

- The predicted total acid deposition on Broadleaved, Mixed and Yew Woodland habitat and Dry Heaths for Richmond Park SAC and Wimbledon Common SAC is below 1% of the critical load function at all assessed habitats, and therefore no further consideration needs to be given.

- Acid deposition was also undertaken for all modelled local nature sites. The maximum contribution to acid deposition is less than 100% of the critical loads and is therefore insignificant.

The consultant concludes:

- In an emergency scenario the emergency generators can operate up to 1780 hours per year with a 1% probability of exceeding the short term NO2 objective.

- Predicted annual mean NO2 impacts have been factored to 72 hours to represent a maximum emergency scenario.

- Predicted annual mean NO2 at all relevant receptor locations are not significant.

- Impacts at ecological sites are potentially significant during the emergency scenario for daily mean NOx concentrations, however, is it unlikely that the generators would be running for more than 24 hours.

- Impacts during testing are lower than in an emergency scenario and are not significant.

These modelled electrical outages are most probably worst case as the operator stated in their Operations Report that, 'the site is supplied with electricity via two diverse routes and associated infrastructure (e.g., transformers) providing a 2N level of resilience, where N is the power demand of the Installation.'

The operator also carried out further research into National Grid outages in England and stated in their Operations Report that, 'the likelihood of long periods of reliance on the generators to provide power to the site is considered to be highly unlikely given that the National Grid Electricity Transmission System, which serves the site, reportedly achieved an overall reliability of supply of 99.999981% over the period 2022-23.'

Provided power outages continue to be unlikely the risk of an air quality exceedance from emergency operation is low.

Environment Agency review of operator assessment of potential impact on air quality

The consultant has assessed potential impacts at human and ecological receptors for nitrogen oxides (NOx), ammonia (NH_3), sulphur dioxide (SO_2), carbon monoxide (CO) and particulate matter (with a diameter less than 10 microns (PM10) and 2.5 microns (PM2.5)).

We have determined that the risk of exceedance of the SO_2, CO and PM10 Environmental Standards (ES) is de minimis, therefore, have only considered emissions of NOx and NH_3 in our audit.

We have carried out our own audit by means of detailed check modelling and sensitivity analysis on the air quality and habitats assessments presented by the consultant which included:

- Five years of our own meteorological data observed at Heathrow Airport and the London Weather Centre.
- A surface roughness value of 0.7 m for the dispersion site and 0.3 m for the meteorological site.
- Predictions with main buildings included only.
- An alternative background concentration for NO2.
- A lower short-term NOX to NO2 conversion rate.
- Our own emission rates, incorporating 10 minutes of unabated emissions during start-up.
- Combining the stack emissions for LHR12.
- Assessment of the PCs against the NO and NH_3 EALs.

Human Health Assessment

As a result of our checks, although we do not fully agree with the operator's numerical predictions, the outcome of our checks indicates that the consultant's testing and emergency operational scenario predictions are unlikely to make a significant contribution or cause an exceedance of an environmental standard at human health receptors.

We find:

- For both scenarios, all PECs are predicted to be within the relevant long-term ES at all human health receptors. We note that for the testing scenario the PCs were insignificant against both long-and short-term ES at all human health receptor locations. We predict that exceedances of the 10-minute and 1-hour AEGL 1 for NO2, and the hourly EALs for NH_3, NO and NO2 are unlikely for the emergency scenario.

Habitats Assessment

As a result of our checks, although we do not fully agree with the operator's numerical predictions, the outcome of our checks indicates that the consultant's testing scenario predictions are unlikely to make a significant contribution or cause an exceedance of critical loads and levels at any ecological receptor. However, we cannot rule out exceedances of both the daily NOx critical level of 75 µg/m^3 and the alternative daily NOx critical level of 200 µg/m^3 at three Local Wildlife Sites for the emergency scenario. The likelihood of emergency operations taking place is considered low, provided that grid outages are unlikely.

We find:

- For both scenarios, all PECs are predicted to be within the critical levels and loads at all ecological receptors. We note that for the testing scenario the PCs were insignificant against both long-and short-term critical levels and loads at all ecological receptor locations.

- We cannot rule out exceedances of the daily NOx critical level of 75 µg/m^3 at 18 LWS receptor points for the emergency scenario. The higher daily critical level of 200 µg/m^3 may be appropriate to use for these designations. The Silverlink Metro and Dudding Hill Loop Railsides in Ealing LWS, Old Oak Common Sidings Birch Wood LWS and London's Canals LWS are likely to exceed for daily NOx in the emergency scenario, even when considering the use of the higher critical level of 200 µg/m^3.

- We note that the likelihood of emergency operations taking place is a more important factor in considering the risks of daily NOx critical level exceedance, therefore, as the grid reliability in the local area appears to be good, the likelihood of the emergency scenario occurring is expected to be low.

We agree with the consultant's overall conclusions that the site is **unlikely** to cause an exceedance of an ES at human health receptors and is **unlikely** to make a significant contribution to or cause an exceedance of any critical loads and levels at ecological receptors providing the electricity grid remains reliable.

Protection Against Power Outage and Minimisation of Generator Operation

The largest risk of gaseous emissions from the site occurring which could impact human health or ecological receptors would be if the gas oil or equivalent fuel generators had to operate for any significant period of time following a National Grid failure.

To address this scenario and minimise emissions, the operator:

- Has designed the data centres so the generators will be capable of providing an N+1 level of resilience with each of the generators running in standby mode, which is applicable for supplying power to support the maximum electrical demand, including starting and distorted loads for the duration of power interruption of a reliable utility source.

- Utilises uninterruptable power supply (UPS). In the event of a power supply interruption, or variation in supply which is out of tolerance, the immediate power demand of the site will be met via a UPS. The UPS consists of banks of batteries capable of meeting the full load capacity of the site for approximately 10 minutes. The generators are automatically triggered to start once the power supply has been interrupted, providing power within 20 seconds of the failure of the National Grid supply, at which point the UPS would revert to standby.

- Has developed automated systems which detect fluctuations in the electrical supply to the site, where such events could negatively impact the data centres operation then the UPS can be automatically utilised, and generators brought online as required.

- Has designed the data centres so that the status of the supply interruption is constantly monitored, facilitating single or multiple generators to start depending on the severity of the failure in the supply. Once started the generators will remain operational until the mains restoration detection equipment determines that the supply from the National Grid is stable. The return to the National Grid supply is an automated process, with the National Grid and generator supplies being interlocked to ensure that parallel running cannot be achieved. The generators will not synchronise with the mains supply at any time.

- Has designed the data centres so that each generator will be independent in terms of fuel supply, cooling, fire safety, shut down and control, and for resilience reasons there will be no common points of failure between any two sets.

- Has developed multiple electrical feed connections. The electricity supply arrangements for the site include two diverse routes and associated infrastructure (e.g., transformers) providing a 2N level of resilience, where N is the power demand of the Installation.

- A perimeter fence is present along the site boundary and all access points are secured with gates, which will only open for authorised personnel.

- CCTV is present covering all external areas of the Installation, which shall be monitored at all times by site security.

- As part of the security deployment, cameras shall be installed in surrounding areas, including corridors and roadways leading to, or around the Installation to capture and record images of personnel movement.

- A Security team is present at the site on a permanent basis. Regular site surveillance walks are undertaken by the security team.

Operational hours

In order to minimise generator operation, we set operational hour limits for data centres at 500 hours as they are permitted for emergency use only. The limit on the emergency use of 500 hours is for the Installation as a whole i.e. as soon as one generator starts operating the hours count towards the 500 hours.

The operational hours on the site will be monitored and reported as follows:

- Emergency operation limited to 500 hours for the Installation via permit condition 2.3.3.
- Maintenance and testing regime limited to <50 hours per stack, linked to operating techniques table S1.2.

Containment and Prevention of Pollution to Ground, Surface water and Groundwater

Fuel Storage, Distribution and Containment

The operator has demonstrated that there are robust systems in place for the containment of fuel.

Fuel Storage - Day (Belly) Tanks

Gas oil or equivalent fuel will be stored at the site in day (belly) tanks. The day tanks will be located adjacent to each generator set providing the generators with a minimum of 1-hour fuel storage capacity.

Fuel storage - There are 37-day tanks on site and each stores approximately 1,000 litres of fuel. Therefore, there is a total of 37,000 litres of fuel (37 generators @ 1,000 litres = 37,000 litres) stored in the day tanks.

Fuel Storage - Below Ground Bulk Storage Tanks

Gas oil or equivalent fuel will also be stored at the site in 4 below ground bulk storage tanks providing 24-hours fuel storage capacity for all 37 generator units at the Installation.

Fuel storage - There are 4 below ground bulk storage tanks and each stores 90,000 litres of fuel. Therefore, there is a total of 360,000 litres of fuel (4 bulk storage tanks @ 90,000 litres = 360,000 litres) stored in the below ground bulk storage tanks.

The total capacity for fuel storage on this site is 397,000 litres. This is considered by the operator to represent sufficient capacity to enable the operation of all generators at the site at full load for a maximum period of 24-hours without the need to refuel (providing redundancy of N+1).

Containment Protection - Day (Belly) Tanks

The generator sets are present inside a generator building for LHR11 (17 generators) and within dedicated acoustic enclosures on a gantry for LHR12 (20 generators). No drainage exists within the structures accommodating the generator units.

Each generator will be provided with a day tank containing sufficient fuel for the units to operate for a minimum of one hour at 100% load, with each tank operating independently. Each day tank will be contstructed from mild steel and be located adjacent to the generator it serves, with fuel being transferred from the tanks to the generating sets using pumps located within tank.

The independent day tanks will be fed from the below ground bulk tanks located externally to the generator buildings, via the fuel pump located within a dedicated pump room within each generator building. Each of the day tanks will permanently be plumbed into the bulk fuel storage system.

The day tanks will have the following protection measures to ensure no loss of containment:

- Constructed from mild steel to BS 799-5:2010 with a secondary containment (integrally bunded) capacity of 110% of the capacity of the primary storage container.
- Located internally in the generator building/container, limiting exposure to the elements and reducing the risk of corrosion.
- Automatic leak detection with bund alarms to detect any failure in the primary containment structure. The bund alarms will be linked to the SCADA system which monitors the generators and associated equipment.
- Level detectors linked to the SCADA system showing actual tank contents.
- A common overfill and drain line connected to an external dump tank for LHR11 only.

- The drain line shall feature a fusible link valve arrangement to allow the fuel to quickly drain to the dump tank in the event of an emergency.
- The generator containers and fill points are kept locked.
- All generator sets have fire detection systems present within the generator containers, which when triggered activate fuel cut off valves.
- Fire detection and sprinkler systems shall be provided throughout the Installation, including the generator building.
- Spill kits will be present in fuel storage areas to minimise the impacts of any spillage.
- Drip trays shall be provided underneath the fuel pumps in case of a leakage.
- All site infrastructure will be maintained regularly. Day tanks will be inspected as part of the wider generator inspection and maintenance programme.
- All operational areas of the Installation will comprise concrete flooring.

Containment Protection - Fuel Dump Tank

One 20,000 litre below ground fuel dump tank will be located at the Installation which will receive fuel released from the generators in the event of a malfunction. There is only one external dump tank on the Installation, and this serves LHR11 only.

The fuel dump tank will comprise of a double skinned horizontal cylindrical below ground storage tank.

The dump tank will have the following protection measures to ensure no loss of containment:

- Designed to BS EN 12285-1 standards, and is double skinned (secondary containment) with a capacity of 110% of the capacity of the primary storage container.
- Provide sufficient capacity to hold the total volume of fuel stored within the generator day tanks.
- Constructed of steel coated in a polyurethane resin to EN 12285-1 standards, for underground storage of flammable liquids. Skin materials for main tank body and the double skin certified to EN 10025 - 2:2004.
- Level monitoring and leak detection system capturing over-and under-pressure scenarios linked to the generator system SCADA.
- The dump tank is anchored to a concrete base, providing tertiary protection.
- All site infrastructure will be maintained regularly. The fuel dump tank will be inspected and maintained in accordance with the care and maintenance instructions provided by manufacturers.

The operator confirms that if fuel does enter the fuel dump tank it will be offloaded to a tanker for transfer back into the fuel system, subject to checks on suitability. If the fuel is not suitable for reuse it will be removed offsite by a licenced waste contractor.

Containment Protection - Below Ground Bulk Storage Tanks

There will also be 4 below ground bulk storage tanks on site for gas oil or equivalent fuel, which will automatically fill the individual belly tanks associated with each generator.

The bulk tanks shall have three access hatches, one for inspection, one for the tank vent and secondary fill point connections to allow for the delivery of fuel oil to each tank from a road tanker and one for the submersible turbine pumps which shall transfer fuel to the generator building.

The below ground bulk storage tanks will have the following protection measures to ensure no loss of containment:

- Constructed to EN 12285-1 standards, for underground storage of flammable liquids. Skin materials for main tank body and the double skin are certified to EN 10025 - 2:2004.

- Double skinned, each having a minimum secondary containment system capacity of 110% of the primary storage container.
- The tanks will be connected to a central filling station. They will be filled from a security cabinet housing the tank fill points, level gauges and overfill alarms. The security cabinet shall have spillage containment and be fitted with a lockable roller shutter, or a similar secure access door. The fill point cabinet will be located on a concrete foundation plinth adjacent to a vehicle hard standing.
- Overfill protection devices, which will close the fill point once the storage capacity is reached to prevent a spillage.
- Level and leak detection monitors are linked to the generator system SCADA. The level alarms will trigger if the high-level, low-level or bund alarms are triggered.
- The tanks are designed in accordance with BS EM 12285-1, and the surface of the tanks are corrosion protected in accordance with EN ISO 12944 (Corrosion Class C3 (Medium) / Durability: Very High (>25 years)) and applying a protective paint layer consisting of zinc rich rust inhibiting primer, epoxy intermediate and polyurethane finish.
- The tanks have an inspection hatch for inspection on a regular basis to identify defects.
- All material storage containers will be provided with suitable and adequate containment measures, in line with the requirements of CIRIA 736.
- Protection slabs shall be installed to protect underground utilities, including underground storage tanks and the petrol/ oil separator, from high loading vehicles on site.
- Spill kits will be present in fuel storage areas to minimise the impacts of any spillage.
- Drip trays shall be provided underneath the fuel pumps in case of a leakage.
- All site infrastructure will be maintained regularly. Inspection and maintenance of the tanks will be in accordance with the care and maintenance instructions provided by manufacturers.
- All operational areas of the Installation will comprise concrete flooring.

Containment Protection - Tanker Unloading Bay

The general process of delivery of gas oil or equivalent fuel comprises attaching a flexible hose to the fill points and pumping fuel from the road tanker into the storage tanks using a pump mounted on the delivery vehicle.

The tanker unloading bay will have the following protection measures to ensure no loss of containment:

- Impermeable concrete hardstanding.
- All deliveries of fuel take place in areas of hardstanding coated with an impermeable non-slip coating resistant to hydrocarbons.
- Harstanding is bound by slot drainage leading to a below ground 45 litre capacity bypass interceptor with alarm in case of spillages or loss of containment from the road tanker, this then connects into the site foul drainage system.
- All deliveries of fuel will be attended to identify any issues during delivery.
- The operator will establish formal refuelling and spill response procedures as part of the environmental management system.
- The unloading bay consists of class 1 forecourt containment design.
- Deliveries of fuel are expected to be infrequent since the generators are only to be used for emergency operations.
- Spill kits will be provided in refuelling areas.
- Drip trays shall be provided underneath the fuel pumps in case of a leakage.
- All site infrastructure will be maintained regularly, including site drainage systems, to ensure that in case of rainfall, the surface water run-off is drained promptly.

The operator confirms that there are temporary measures in place to prevent a major spillage of fuel overwhelming the tanker unloading bay by-pass interceptor and escaping into the environment which include use of a 9,750 litre capacity PVC tanker bund, to be applied as part of the tanker delivery procedure. These allow the tanker to drive onto the bund, which is then fixed in position around the tanker prior to offloading of gas oil/ HVO. The proposed capacity provides containment for loss of a full compartment from a tanker delivery.

The operator recognises that a suitable long-term solution is required and confirms that a permanent engineered solution is under review. This includes options to apply a shutoff valve downstream of the interceptor at the point it enters the wider site foul network, and then contain within the delivery area either through a sleeping policeman arrangement or through provision of mobile berms during delivery. This requires a review of ground levels and containment options.

We have added Improvement Condition (IC3) for the operator to submit a proposal for approval for a long-term containment solution for the tanker unloading bay and Improvement Condition (IC4) for the proposal once approved to be implemented.

Containment Protection - Pipework

The pipework on site will have the following protection measures to ensure no loss of containment:

- All below ground pipework is double walled HDPE and come complete with leak detection and interstitial monitoring linked to the generator SCADA.
- The operators response to a leak in the pipework is expected to include closing off the relevant pipework or halting the fuel transfer process to prevent further loss.
- All above ground pipework and where the pipework is exposed and has potential to be in contact with flames or hazardous products will be single walled and metallic.
- Pipework between the external bulk storage tanks and generator building fuel pump room shall be contained within a pipe box.
- The minimum cover to the top of the below ground pipework shall be 600mm below finished pavement level in order to provide protection from external loads. Protection slabs shall be installed to protect underground utilities, including underground storage tanks and the petrol/ oil separator, from high loading vehicles on site.
- All site infrastructure will be maintained regularly. The leak detection system will be checked and tested in line with the manufacturer's specifications.

Raw Material Storage, Distribution and Containment

As well as gas oil or HVO, the raw materials associated with the operation of the generator plant are:

- Lubricant Oil
- Glycol Solution (Coolant)
- Urea Solution (AdBlue or similar)

Lubricant Oil and Glycol Solution (Coolant)

Lubricating oils and glycol coolants are both present within the generator sets. These substances are maintained at the optimal level for the operation of the generator sets by the operators nominated maintenance contractor. There is no routine storage of lubricant or coolant at the Installation other than within the generator plant.

As the lubrication oil and the coolant are located within the generator plant, secondary containment is provided by the generator container. The generator container is designed to

provide adequate secondary containment for coolant and lubrication oil held within the generator set.

Urea Solution (AdBlue or similar)

Containment Protection - Day Tanks

Adjacent to each generator is an integrally bunded (110%) mild steel day tank, containing fuel for the operation of the specific generator, and a similar sized stainless steel bunded tank containing SCR reagent (AdBlue or similar).

The day tanks for urea will have the following protection measures to ensure no loss of containment:

- Designed to BS799-5:2010 and bund to BS EN 10025.
- The tanks have capacity of 1,137 litres, whilst the bund has a capacity of 1,516 litres.

Containment Protection - Above Ground Storage Tank

For LHR11 a 10,000 litre above-ground stainless steel tank for urea (AdBlue) will be installed within a bunded container unit providing storage to supply the bunded SCR reagent day tanks on each of the generators.

The above-ground tank for urea will have the following protection measures to ensure no loss of containment:

- Designed to BS79905:2010 and bunded to BS EN 10025. Tank is located in a bunded container. The bund has a capacity of 110% containment.
- The bund includes a leak detection sensor which is connected to the generator system SCADA.
- All material storage containers will be provided with suitable and adequate containment measures, in line with the requirements of CIRIA 736. The tank will be inspected as part of the routine generator area inspections.

Containment Protection - Underground Storage Tank

For LHR12 a 10,000 litre underground steel tank for urea (AdBlue) will be installed providing storage to supply the bunded SCR reagent day tanks on each of the generators.

The underground tank for urea will have the following protection measures to ensure no loss of containment:

- Designed to BS EN 12285-1 standards, and is double skinned (secondary containment) with a capacity of 110% of the capacity of the primary storage container.
- Provide sufficient capacity to hold the total volume of urea stored within the SCR reagent day tanks.
- Constructed of steel coated in a polyurethane resin to EN 12285-1 standards, for underground storage of flammable liquids. Skin materials for main tank body and the double skin certified to EN 10025 - 2:2004.
- Level monitoring and leak detection system capturing over-and under-pressure scenarios linked to the generator system SCADA.
- The urea tank is anchored to a concrete base, providing tertiary protection.
- All site infrastructure will be maintained regularly. The urea tank will be inspected and maintained in accordance with the care and maintenance instructions provided by manufacturers.

Tertiary Containment

Tertiary containment includes:

- All operational areas of the Installation will comprise of impermeable concrete flooring with site drainage.
- Site drainage via alarmed interceptors before discharge.
- Pumped drainage system.
- All site infrastructure will be maintained regularly, including site drainage systems, to ensure that in case of rainfall, the surface water run-off is drained promptly.
- Spillage procedures.

Noise

Noise is not a significant aspect of data centre permitting (noting that it is only the standby generators and associated gas oil or equivalent fuel supply systems that are permitted – not the operation of the data centre itself). The site will only run the generators regularly as part of the testing regimes described earlier, occurring during daytime hours. Overnight operation of the generators will only occur in an emergency situation. As this is a new Installation it is not possible to consider the likelihood of overnight operation by examining the frequency of historical outages, but the potential for prolonged power outages in the area is considered to be low.

However, the operator has carried out a Noise Impact Assessment and submitted a Noise Management Plan (NMP) for the operation of the Kohler KD3500E generators at the data centre.

Operator's assessment of potential noise impact:

The operator submitted a Noise Impact Assessment prepared by Ramboll UK Limited (the consultant), which considered the potential impacts of noise emissions on the nearest residential Noise Sensitive Receptors (NSRs) with respect to the operation of Kohler KD3500E generators.

The consultant included the following sources of noise generation:

- 17No. chillers at LHR11 (not regulated)
- 20No. chillers at LHR12 (not regulated)
- 4No. ventilation systems at LHR11 (not regulated)
- 1No. air source heat pump at LHR11/LHR12 (not regulated)
- 2No. condensers at LHR12 (not regulated)
- 2No. emergency smoke extractor fans (not regulated)
- 17No. emergency generators at LHR11
- 17no. exhausts in 5no. generator exhaust stacks at LHR11
- 20No. emergency generators at LHR12
- 20no. generator exhaust stacks at LHR12

The consultant included the following sources of noise mitigation:

- Generators located inside acoustic structures, with attenuators implemented as required.
- Plant selected to ensure the required noise emission limits are achieved by the generators.
- Regular maintenance of the generators to ensure optimum operation of the units.
- Application of operational controls such as scheduling generator testing during normal working hours only and not during night-time.

The consultant considered 4 residential receptors.

The consultant assessed three scenarios:

- Normal operations (24 hours)
- Emergency standby operations
- Single generator testing

Their conclusions were:

- In all scenarios calculations of plant noise indicate that plant noise limits, which have been set based on the typical background noise levels at the nearest sensitive receptors, can be met with the proposed plant selections and scheme of attenuation proposed.

- The levels predicted are expected to result in No Observed Adverse Effect Level (NOAEL) and a Negligible to Minor impact on nearby receptors during normal operation and a Lowest Observed Adverse Effect Level (LOAEL) during temporary emergency conditions, with a Moderate impact.

- Changes in road traffic noise levels are not expected to give rise to any significant effects.

Environment Agency review of operator's assessment of potential noise impacts

We have carried out our own audit by means of detailed check modelling and sensitivity analysis on the Noise Impact Assessment (NIA) presented by the consultant.

In this assessment we only assessed the permitted activity of the backup generators. The consultant states that the levels predicted are expected to result in No Observed Adverse Effect Level (NOAEL) and a Negligible to Minor impact on nearby receptors during normal operation and a Lowest Observed Adverse Effect Level (LOAEL) during temporary emergency conditions, with a Moderate impact.

As a result of our checks, we find slightly higher rating levels compared to the consultant. The main reason for the differences are:

- Moving receivers to the most affected areas of nearby residential facades.
- Removing a barrier modelled outside of the site boundary.
- Slightly increasing source levels for the LHR11 building air intake.
- Assessing impacts to slightly lower background sound levels than the consultant, marginally increasing predicted impacts.

We find numerically below adverse impacts in accordance with the BS41421 method. We have considered the context for the site to generally be favourable primarily due to the short operating time of the sources in addition to the site being located in an inner-city industrial area with high residual sound levels and a small number of nearby noise sensitive receptors. We therefore consider that permitted generator testing operations can be downgraded to a low impact in context.

The predicted impact is contingent on mitigation being provided to the generators to achieve the consultant's sound pressure level limits for:

- LHR11 of 65dB (A) at 1m (from each exhaust/ intake air louvre). Noise from the generators has been calculated within the generator building and the air intake and exhaust louvres specified to achieve 65dB(A)@1m based on this internal reverberant level.
- LHR12 of 65dB (A) at 1m. These generators are in proprietary enclosures rated to achieve 65dB(A)@1m in all directions and from the exhaust flue.

Although we do not fully agree with the consultant's numerical predictions, we agree with the consultant's overall conclusions that the sound emissions from the gas oil or equivalent fuel generators on site are likely to be low impact.

Based on our assessment, the key point is that the generators rely upon the mitigation targets indicated in the Noise Management Plan to achieve low impacts. Therefore, the Noise Management Plan has been incorporated into Table S1.2 of the permit.

Permit Conditions

The Permit condition 2.3.3 limits emergency operation to 500 hours/ annum.

Table S1.2 incorporates the maintenance and testing regime, which is less than 50 hours/ generator.

Emission limit values (ELVs) to air are not applicable to MCPs operating less than 500 hours per year.

Emergency operation includes those unplanned hours required to come off grid to make emergency repair of electrical infrastructure associated but occurring only within the data centre itself. The Environment Agency expects planned testing and generator operations to be organised to minimise occasions and durations (subject to client requirements).

Each individual standby generator that is a new Medium Combustion Plant (MCP) is required to have stack monitoring for carbon monoxide (CO) and NOx, refer to monitoring section below.

Table S1.1 of the permit prevents any electricity produced at the Installation from being exported to the National Grid.

Table S1.2 incorporates operational and management procedures reflecting the outcomes of the air quality modelling by minimising the duration of testing, the duration and frequency of whole site tests and planning off-grid maintenance days and most importantly times/ days to avoid adding to any high ambient pollutant background levels.

The permit application has assessed and provided evidence of the reliability of the local electricity grid distribution allowing us to judge that the realistic likelihood of the plant needing to operate for prolonged periods in an emergency mode is very low.

Tables S4.2 and S4.3 require annual reporting of standby engine maintenance run and any electrical outages (planned or grid failures regardless of duration) require both immediate notification to the Environment Agency and annual reporting.

Table S2.1 restricts the fuel to ultra-low sulphur gas oil or equivalent substitute as agreed in writing with the Environment Agency.

Decision considerations

Confidential information

A claim for commercial or industrial confidentiality has not been made.

The decision was taken in accordance with our guidance on confidentiality.

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.

The application was publicised on the GOV.UK website.

We consulted the following organisations:

- Local Authority - Environmental Protection Department (Air Quality Specialist)
- Local Authority - Planning Department
- Health and Safety Executive
- Sewerage Authority
- Director of Public Health & UK Health Security Agency (HSA) (formerly Public Health England (PHE))

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

Operator

We are satisfied that the applicant (now the operator) is the person who will have control over the operation of the facility after the grant of the permit. The decision was taken in accordance with our guidance on legal operator for environmental permits.

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’, Appendix 2 of RGN2 ‘Defining the scope of the installation’, Appendix 1 of RGN 2 ‘Interpretation of Schedule 1’.

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.

See key issues for more discussion on the nature of the site.

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 discharge points.

The plan is included in the permit.

Site condition report

The operator has provided a description of the condition of the site, which we consider is satisfactory.

The decision was taken in accordance with our guidance on site condition reports and baseline reporting under the Industrial Emissions Directive.

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.

We have not consulted Natural England.

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.

General operating techniques

We have reviewed the techniques used by the operator and compared these with the relevant guidance notes and we consider them to represent appropriate techniques for the facility.

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

Operating techniques for emissions that screen out as insignificant

Emissions of nitrogen oxides (NOx), ammonia (NH_3), sulphur dioxide (SO_2), carbon monoxide (CO) and particulate matter (with a diameter less than 10 microns (PM10) and 2.5 microns (PM2.5)) have been screened out as insignificant, and so we agree that the operator’s proposed techniques are Best Available Techniques (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 emission limit values 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 have reviewed the noise management plan in accordance with our guidance on noise assessment and control.

We consider that the noise management plan is satisfactory, and we approve this plan.

We have approved the noise management plan as we consider it to be appropriate measures based on information available to us at the current time. The operator should not take our approval of this plan to mean that the measures in the plan are considered to cover every circumstance throughout the life of the permit.

The operator should keep the plans under constant review and revise them annually or if necessary, sooner if there have been complaints arising from operations on site or if circumstances change. This is in accordance with our guidance 'Control and monitor emissions for your environmental permit'.

The plan has been incorporated into the operating techniques S1.2.

Raw materials

We have specified limits and controls on the use of raw materials and fuels.

Pre-operational conditions

Based on the information in the application, we consider that we need to include pre-operational conditions. The following pre-operational conditions have been included in the permit:

1 - Commissioning
The operator shall submit a commissioning plan to the Environment Agency for approval. The plan shall provide timescales for the commissioning of the gas oil/ HVO generators and shall demonstrate that the commissioning of the gas oil/ HVO generators is covered within the site's permitted regular testing regime, thereby minimising durations and impacts.

We have included this pre-operational condition as the risk assessment submitted with the application does not cover the commissioning phase.

2 - Containment
The operator shall undertake a review of all bunds and secondary containment at the site and submit a written report to the Environment Agency for assessment and written approval.

We have included this pre-operational condition to satisfy ourselves that the fuel tank bunding and secondary containment is fit for purpose.

Improvement programme

Based on the information in the application, we consider that we need to include an improvement programme. The following improvement conditions (ICs) have been included in the permit:

IC1 - Air Quality Management Plan (AQMP)
We have specified that the operator shall have a written action Air Quality Management Plan (AQMP) to manage the risks for prolonged emergency running of the plant and limit the duration of an outage event to less than 50 hours, as far as possible. This needs to be proportionate to the level of risk at the receptors. The operator is expected to work with the Local Authority to develop this plan to ensure local factors are fully considered.

IC 2 - Monitoring plan - flue gas monitoring requirements
We have specified that the operator shall have a written monitoring plan to ensure that they comply with the monitoring requirements of the permit.

IC3 - Tanker Unloading Bay - Proposal
We have specified that the operator submit a proposal for approval for a long-term containment solution for the tanker unloading bay.

We have included this improvement condition to ensure that the operator has a permanent tanker unloading bay that is fit for purpose which will contain any spillages and/or leaks during fuel delivery, preventing contamination to the environment.

IC4 - Tanker Unloading Bay - Installation
We have specified that the operator submit evidence of the installation of the long-term containment solution for the tanker unloading bay.

We have included this improvement condition to ensure that the operator has a permanent tanker unloading bay that is fit for purpose which will contain any spillages and/or leaks during fuel delivery, preventing contamination to the environment.

IC5 - Performance of SCR systems

The operator shall submit a report to the Environment Agency for approval. The report shall provide information on the specification and suitability of the NOx sensors and urea solution dosing to the SCR systems. It will also contain evidence of the calibration of the NOx sensors and verification of the levels of unabated and abated NOx emissions upstream and downstream of the SCR system and whether the NOx system is achieving the NOx abatement performance stated in the application.

We have included this improvement condition to satisfy ourselves that the NOx abatement system is fit for purpose.

Emission Limits

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

As the plant is limited to less than 500 hours of emergency operation by permit condition 2.3.3 and less than 50 hours for maintenance and testing in permit table S1.2, air emission limits are not applicable.

Monitoring

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. In particular:

We have specified monitoring of emissions of carbon monoxide from emission points LHR11: A1-A17 and LHR12: A18-A37 (new MCP), with a minimum frequency of once every 1500 hours of operation or every five years (whichever comes first). This monitoring has been included in the permit in order to comply with the requirements of the Medium Combustion Plant Directive (MCPD), which specifies the minimum requirements for monitoring of carbon monoxide emissions, regardless of the reduced operating hours of the plant.

We have also specified monitoring of emissions of nitrogen oxides (NOx) from emission points LHR11: A1-A17 and LHR12: A18-A37 (new MCP), with the same frequency specified for the monitoring of carbon monoxide emissions. In setting out this requirement, we have applied our regulatory discretion, as we consider that this limited monitoring, to happen in concurrence with the carbon monoxide monitoring, is proportionate to the risk associated with the emissions of NOx from the Installation.

Taking into account the limited hours of operation of the engines operating at the Installation, and the fact that we are not setting emission limits for NOx and carbon monoxide, we consider this monitoring can be carried out in line with web guide ‘Monitoring stack emissions: low risk MCPs and specified generators’ Published 20 March 2024 (formerly known as TGN M5).

We have set an improvement condition (IC2) requesting the operator to submit a monitoring plan for approval by the Environment Agency detailing the operator’s proposal for the implementation of the flue gas monitoring requirements specified in the permit.

For new MCP, we have set a requirement for the first monitoring to happen within 4 months of the issue date of the permit or the date when each new MCP is first put into operation, whichever is later (permit condition 3.5.2) unless otherwise agreed under Improvement Condition 2.

We have also specified continuous process monitoring of levels of nitrogen oxides (NOx) from emission points LHR11: A1-A17 and LHR12: A18-A37 because these generators are fitted with SCR, hence we consider this monitoring necessary to ensure the effective operations of the abatement system, to prevent excessive ammonia slip and to dose the right amount of urea solution. Because this monitoring is not specified to assess compliance with emission limits, we are satisfied that it will not require certification to MCERTS standards.

Reporting

We have specified reporting in the permit to ensure the site is operated to the standards specified in the Operating Techniques including the reporting of emissions to air and SCR abatement efficiency.

We have specified reporting to ensure the operator notifies us of any operation of the stand-by generators in emergency mode in response to national grid power outage.

Management System

We are not aware of any reason to consider that the operator will not have the management system to enable it 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.

Previous performance

We have assessed operator competence. There is no known reason to consider the operator will not comply with the permit conditions.

We have checked our systems to ensure that all relevant convictions have been declared.

No relevant convictions were found. The operator satisfies the criteria in our guidance on operator competence.

Financial competence

There is no known reason to consider that the operator will not be financially able to comply with the permit conditions.

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.

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 HSA.

Brief summary of issues raised:

Recommendation that when considering appropriate permit conditions:

1. The Environment Agency takes into account that the operator has presented data about various air pollutants inconsistently. Recommendation that the Environment Agency may wish to enquire to the operator as to what the rational is to how data tables about various air pollutants are presented, to ensure that model outputs are representative of the actual conditions.

2. The Environment Agency requests that the operator provides more detailed information about the predicted process contribution (PC) of nitrogen dioxide 1 hour means for all relevant operating conditions. i.e., the tables of results only show the predicted environmental concentration.
3. The Environment Agency considers the overall cumulative impact for all permitted combustion activities in the local area as there are often other similar activities on the same sites, which have the potential to increase levels of air pollution if operated simultaneously.

Summary of actions taken:

With regard to appropriate permit conditions concerning the operator's Air Quality Assessment the following applies:

- As described in more detail in the Air Quality Section above, we audited the operator's air quality assessment, including undertaking detailed check modelling and completing sensitivity analysis.

- We agree with the consultant's overall conclusions that the site is unlikely to cause an exceedance of an ES at human health receptors and is unlikely to make a significant contribution to or cause an exceedance of any critical loads and levels at ecological receptors providing the electricity grid remains reliable.

Updated response received from UK HSA following confirmation that we have taken the above actions:

- UK HSA has no significant concerns regarding the risk to the health of the local population from the Installation.