

Permitting Decisions- Variation

We have decided to grant the variation for Equinix Powergate operated by Equinix (UK) Limited.

The variation number is EPR/TP3500PB/V002.

The variation is for the addition of 7 new diesel generators on the PG2 section of the site. Each individual generator is a Medium Combustion Plant (MCP) having a thermal input of approximately 5.71 MWth. The total thermal input of the site is now approximately 172 MWth.

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
- 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 site is located on Powergate Business Park in North West London. The National Grid Reference for the site is TQ 21070 82738. The surrounding area is a mix of industrial, commercial and residential uses.

The site is an existing data centre which consists of a Section 1.1 Part A(1)(a) activity under the Environmental Permitting (England and Wales) Regulations 2016 (as amended) for the burning of any fuel in an appliance with a rated thermal input of 50 or more megawatts (MW).

The combustion plant only operate during limited routine maintenance or in an emergency scenario. The emergency combustion activity now comprises 29 diesel fuelled standby generators; in September 2020, 22 standby generators were permitted and this variation allows for an additional 7.

The site consists of two data halls – PG1 and PG2:

- PG1 was built in 2008, and consists of 8 generators each approximately 5.7 MWth (aggregated to approximately 46 MWth). This has not changed with this variation.
- PG2 was built in 2012 and now consists of 21 generators: 13 generators (including 7 new) each approximately 5.7 MWth, and 8 generators each approximately 6.4 MWth, (aggregated to approximately 126 MWth).

Each generator has a stack between 5 and 17 metres in height.

Electrical power is provided to the data centre from the National Grid. However, in the event of a failure in the electrical supply, the Operator will utilise the generators to maintain the electrical supply. The generators will be used solely for the purpose of generating power for the facility. No electricity will be exported from the installation. The standby generators are designed and configured so that in the event of a mains failure all the generators will fire up then subsequently ramp down to meet the load at the site. All the generators are subject to a maintenance testing schedule.

The generators run on diesel fuel.

Most generators have individual double skinned day tanks. There are:

- 7 day tanks in PG1 (no change with this variation); and
- 17 day tanks in PG2 (7 of these are new).

All of the 7 new day tanks in PG2, located in the vicinity of each new generator, have approximately 1,000 litres capacity, are double skinned (self banded to 110% volume) and are fitted with leak detection alarms.

There are 11 bulk fuel tanks, each with a 43,000 litre capacity, on site:

- 1 bulk fuel tank in PG1, located inside the building (no change with this variation); and
- 10 bulk fuel tanks in PG2 (6 of these are new), located to the north of PG2.

The new bulk fuel tanks are located adjacent to those already permitted in PG2 and within a concrete bund. All bulk fuel tanks are double skinned.

All fuel tanks on site are fitted with leak detection and level alarms.

The site is covered in hardstanding. Oil tanks are bunded to prevent oil entering surface water drains. Any water collected in external bunds is tested prior to release to rain water drains. Any oil or oily water is collected from the bunds by vacuum truck and disposed of or recycled by an appropriate waste disposal company.

The overarching testing regime remains as originally permitted, with fortnightly start-up tests, quarterly black building tests and an annual load bank test. However, there have been some changes to the groupings of generators to incorporate the new generators on site. In summary:

1. Start-up test (fortnightly): Each generator is operated for 5 minutes, one after the other with no electrical load (NOx emissions 30% of maximum). This takes approximately 3 hours overall (72 hours total per year). Due to the increase in number of generators with this variation the start-up test takes approximately 30-40 minutes longer than before.
2. Black Building test (3 times a year, every 3 months): Groups of 1 to 13 generators are operated simultaneously for an hour at 60% electrical load. Previously groups of up to 6 engines were run together.
3. Load Bank test (annually, on the occasion that the black building test doesn't occur): Each engine is operated one after the other for an hour at 100% load.

The Operator confirmed that, as a result of the site's internal electrical configuration, the 7 new generators are being added to Test Group 8 (now comprising 13 generators in total). The 6 generators in the existing Group 8 form part of a high voltage (HV) network, which is the same network that the 7 new generators are added to. The test runs all the generators of the network at the same time to simulate a loss of power. When this HV network is shut off in a building load test, all generators fed by the network will turn on. Therefore there is no practicable alternative to the setup for the building load test Group 8.

Air quality

The Operator reviewed and updated the air quality assessment that was submitted as part of the original Environmental Permit application reflecting:

- The addition of the 7 new generators; and
- The changes in the testing regime (as described above).

The air dispersion modelling report assesses the potential impact of emissions of nitrogen dioxide (NO₂) and particulates (PM₁₀) from the generators on local air quality. The primary pollutant of concern to air quality is (NO₂), resulting from the combustion process on site. SO₂ is not considered to be an issue as all fuel used is ultra-low sulphur diesel, leading to negligible impacts; the fuel type is specified in the permit in Table S2.1.

The data centre is situated in an Air Quality Management Area (AQMA) in the borough of Ealing. There are a further 3 AQMAs within 2 km as follows; Brent Borough 350 metres to the North, Hammersmith and Fulham 500 metres to the East, Kensington and Chelsea 1.9 kilometres to the East. The London Borough of Ealing were consulted; their comments and our responses are shown in the consultation section.

We audited the updated air dispersion modelling report submitted for this variation against the original air quality assessment and report submitted as part of the original Environmental Permit application (determined in September 2020). Our overall conclusions of the updated report remain the same as those for the original permit application. We agree with the Operator that predictions for the three testing regimes and emergency operations are unlikely to cause an exceedance of the Environmental Standard for human receptors for NO₂ and PM₁₀.

The modelling showed that the NO₂ Process Contribution (PC) exceeds 100% of the short-term human health Environmental Standard and therefore further investigation was required to look at the actual likelihood of the process resulting in a breach of the standard. The Operator completed statistical analysis to determine the likelihood of the worst predicted emissions coinciding with the worst meteorological years, and subsequently causing a breach of the short-term Environmental Standard. The results indicate that it is highly unlikely the process will result in an exceedance and we agree with this conclusion.

For the emergency operating scenario, the air quality modelling does indicate a potential risk to human receptors from NO₂ based on the worst case scenario. Although, given that the site has operated for approximately 8 years in its current format without being required to initiate its emergency mode, this is considered to be unlikely.

There is potential for the PC to exceed 100% of the short-term NO_x ecological Environmental Quality Standards (EQSs) at a number of ecological receptor locations in the Silverlink Metro and Dudding Hill Loop railsides in Ealing Local Wildlife Site (LWS), Wesley Playing Fields LWS and London Canals LWS. However, the site has operated for approximately 8 years in its current format without being required to initiate its emergency mode, so this is considered to be unlikely.

In order to address the potential issues from short term impacts of NO₂ emissions, we made the decision to impose Improvement Conditions during the determination for the original Environmental Permit application. These Improvement Conditions are still relevant and will now also include the new generators alongside those originally permitted. In summary:

- Improvement conditions IC01, IC02 and IC03 require the Operator to carry out feasibility studies into retro-fitting abatement measures, installing vertically discharging stacks and 2g engines for those currently not at this specification.
- Improvement condition IC04 requires the Operator to verify the predicted short term nitrogen dioxide emissions at the boundary of the site.
- Improvement condition IC05 requires the Operator to submit a review of options for reducing predicted short term NO₂ emission impacts.
- Improvement condition IC06 requires the Operator to submit a report outlining the details of the annual maintenance operating regime following the first year of operation following permitting.
- Improvement condition IC07 requires the submission of an Air Quality Management Plan, including management of the issue of prolonged emergency running of the plant.

Permit conditions

The permit includes a maximum 500 hours per annum 'emergency/standby operational limit' for any or all the plant producing on-site power under the limits of the combustion activity. Therefore emission limit values (ELVs) to air and engine emissions monitoring are not required within the permit. Emergency hours' operation includes those unplanned hours required to come off grid to make emergency repair of electrical infrastructure.

Each individual generator with its own discharge stack, can be maintained, tested and used in a planned way for up to 500 hours per calendar year each without ELVs or associated monitoring under the Industrial Emissions Directive (IED) and Medium Combustion Plant Directive (MCPD). The Environment Agency expects planned testing and generator operations to be organised to minimise occasions and durations (subject to client requirements).

The permit has a limit on the activity to exclude voluntary 'elective power operation' such as demand side response (i.e. on-site use) or grid short term operating reserve (STOR) (i.e. off-site export of electricity) and Frequency Control by Demand Management (FCDM) for grid support. This is primarily to differentiate data centres from 'diesel arrays' that voluntarily operate within the balancing market and importantly provide a clear way to demonstrate minimisation of emissions to air as 'emergency plant'.

Operational and management procedures should reflect the outcomes of the air quality modelling by minimising the duration of testing, phasing engines into subgroups, avoiding whole site tests and planning off-grid maintenance days and most importantly times/days to avoid adding to "at risk" high ambient pollutant background levels.

The application has assessed and provided evidence of the actual reliability of the local electricity grid distribution allowing the Environment Agency to judge that the realistic likelihood of the plant needing to operate for prolonged periods in an emergency mode is low. However, the atmospheric dispersion modelling provided in the application, albeit at very much worst case scenario, has predicted that the emissions of NO₂ from operation of the generators for solely testing purposes over weekends may itself have the potential to exceed short term air quality standards. Improvement conditions included in the permit to address this in the original application remain relevant (see above). Reporting of standby engine maintenance run hours is required annually and any electrical outages (both those planned and those resulting from grid failures regardless of duration) require both immediate notification to the Environment Agency and annual reporting.

Noise

The Operator reviewed and updated the Noise Management Plan and Noise Impact Assessment as part of the variation application. The site will only run the engines regularly as part of the testing regime described earlier, and for less than 200 hours in any year. This occurs during daytime hours at the weekend, and is not classed as part of normal operations. Prolonged operation will only occur in an emergency situation where the National Grid supply is lost. This has not occurred in the time that the site has been operational (since 2008). As such this is deemed a low risk and the potential for prolonged noise is therefore considered to be low.

The Operator has taken measures to minimise noise emissions:

- PG1 generators are located within acoustic containers (no change with this variation);
- PG2 generators are located:

- within the PG2 building (4 new; 14 existing);
- within acoustic containers to the north of the PG2 building (3 new).

Due to the nature of the operation it is considered low risk so a detailed assessment of the submitted noise report has not been completed. Permit condition 3.4.2 enables the Environment Agency to request a revised Noise Management Plan if considered necessary in the future.

Best Available Techniques (BAT)

We accept that oil-fired diesel generators are presently a commonly used technology for standby generators in data centres. The Operator reviewed and updated the BAT assessment submitted as part of the original Environmental Permit application, detailing the choice of technology for the 7 new generators in their standby arrangement.

The default generator specification as a minimum for new plant to minimise the impacts of emissions to air of NO_x is 2g TA-Luft (or equivalent standard) or an equivalent NO_x emission concentration of 2000 mg/m³. The 7 new generators have emissions higher than this. The BAT assessment attributes this to the generators being chosen to reflect local and global investment and acquisition decisions made at the time to provide the appropriate power capacity, reliability and serviceability for emergency power generation. They were purchased in 2018 and installed during May – November 2019. We acknowledge the additional plant is a retrospective install and that it would not be practicable to require the Operator at this stage to upgrade the plant to BAT. However, these newly installed generators will be considered as part of the requirement to reduce short term nitrogen dioxide levels (improvement condition IC05) and included in the feasibility study specified in improvement condition IC03. The Operator has agreed with this approach.

Further to this, the retrofit of abatement techniques such as selective catalytic reduction (SCR) would not normally be expected for standby plant to mitigate the emissions for standby/emergency operation. However, the Operator will carry out further investigations into reductions in short term NO_x emissions and may consider options such as changes to the operational control of the plant, modifications to the flue gas dispersion or installation of NO_x reduction equipment. Options such as these should be considered further through the responses to improvement conditions IC01, 02, 03 and 05, for the newly installed generators permitted through this variation.

In order to minimise the need for emergency operation, each building has two separate substation feeds. This dual substation supply means that if emergency repair of some electrical infrastructure is required, the site will generally be able to remain connected to the national grid. To address short term fluctuations, brown-outs or black-outs, the site has uninterruptable power supplies. This can

supply power for six minutes, until the generators kick in. There have been no periods of off-grid operation since PG1 opened in 2008, and PG2 in 2012.

Protection of Groundwater

There are no fugitive emissions to land or groundwater from the data centre. The generators are located in all cases over hard-standing or concrete flooring. Externally, the Site consists of hard standing in good condition. Diesel, hazardous waste and hazardous materials storage is bunded and/or indoors, such that any source of potential contamination is prevented from discharge to land.

Bulk fuel tanks are fully-bunded to 110% of their volume. The day tanks are double skinned (self-bunded) with leak detection alarms. The majority are under cover and not subject to rainwater incursion. Those that are outside have a means of removing rainwater from the bund that does not penetrate the bund wall. Any oil and oily water will be removed using a vacuum pump, and recycled or disposed of using an appropriate waste disposal company.

The Operator has emergency response procedures in place in the event of a release of oil or diesel, processes for the planning for such eventualities and checklists to audit the response in case such an event occurs.

Rainwater is kept separate from any areas in which there may be any potential contaminants and is allowed to run off to the surface water drainage serving the trading estate.

Drainage drawings are provided in the variation application (Appendix H; received 12/01/2021).

Details of the existing condition of the Site in relation to the new generators can be found in the Site Condition Report supplied with the variation application (Appendix F; received 12/01/2021).

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.

The application was publicised on the GOV.UK website.

We consulted the following organisations:

Public Health England/Director of Public Health

The Local Authority

The comments and our responses are summarised in the [consultation responses](#) section.

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.

The site

The operator has provided a plan which we consider to be satisfactory.

This shows the extent of the site of the facility including the emission 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.

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.

Conditions included in the original permit to protect the Local Wildlife Sites are applicable to the additional generators applied for in this variation. This is discussed in the key issues section.

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.

The assessment shows that, applying the conservative criteria in our guidance on environmental risk assessment all emissions may be screened out as environmentally insignificant with the exception of short term emission of NO₂ during testing and emergency operation.

Conditions included in the original permit to protect the Local Wildlife Sites are applicable to the additional generators applied for in this variation. This is discussed in the key issues section.

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 applicant must use are specified in table S1.2 in the environmental permit.

Operating techniques for emissions that do not screen out as insignificant

Emissions of NO₂ cannot be screened out as insignificant. We have assessed whether the proposed techniques are Best Available Techniques (BAT).

The proposed techniques/ emission levels for emissions that do not screen out as insignificant depart from the techniques and benchmark levels contained in the technical guidance. We have considered the operator's justification for departure from the guidance.

The default generator specification as a minimum for new plant to minimise the impacts of emissions to air of NO_x is 2g TA-Luft (or equivalent standard) or an equivalent NO_x emission concentration of 2000 mg/m³. The 7 new generators have emissions higher than this. We have therefore included additional requirements. The newly installed generators will be considered as part of the requirement to reduce short term nitrogen dioxide levels (improvement condition IC05) and included in the feasibility study specified in improvement condition IC03. See key issues section.

Operating techniques for emissions that screen out as insignificant

Emissions of PM₁₀ have been screened out as insignificant, and so we agree that the applicant'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 management

See key issues section.

Updating permit conditions during consolidation

We have updated permit conditions to those in the current generic permit template as part of permit consolidation. The conditions will provide the same level of protection as those in the previous permit.

Raw materials

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

Improvement programme

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

The scope of the existing improvement conditions have been expanded to include the 7 new generators covered by this variation.

See key issues section.

Emission limits

No emission limits have been added, amended or deleted as a result of this variation.

Monitoring

Monitoring has not changed as a result of this variation.

Reporting

Reporting requirements have not changed as a result of this variation.

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.

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 London Borough of Ealing.

Brief summary of issues raised:

1. Concerns raised regarding the air quality dispersion modelling around:
 - a. the use of DEFRA background mapping levels rather than results from NO₂ diffusion monitoring tubes in the area; and
 - b. exceedances predicted during black building tests and annual tests, due to proximity to the Park Royal air quality focus area (AQFA) and

encouragement of further mitigation or control measures to be implemented.

2. Concern raised regarding risk to climate change, with no calculation of CO₂ and Green House Gas (GHG) emissions; consultee considers that damage caused to local environment in Ealing should be assessed in accordance with DEFRA guidance.

Summary of actions taken:

1. Air quality:
 - a. We have compared the local AQMA monitoring data with the DEFRA background data used and found them to be comparable. We consider that the conclusions to the air modelling would be the same if the local AQMA monitoring data was used.
 - b. The operator will complete a series of Improvement Conditions to address the exceedances predicted during black building tests and annual tests. See key issues section for further information.
2. The Operator has considered emissions to air of pollutants we would expect them to within the air quality impact assessment. No further action is required. Also, it is BAT to minimise operation of the generators, in doing so GHG emissions are also minimised.

Response received from: Public Health England, Centre for Radiation, Chemical and Environmental Hazards

Brief summary of issues raised:

1. Concern raised:
 - a. regarding fugitive emissions to air of backup generators when they are activated for prolonged periods of time; and
 - b. that the Air Quality Standard for NO₂ of 200 ug/m³ is predicted to be exceeded, which could have potential acute health impacts for vulnerable receptors.
2. Request for a review of the need for the applicant to provide a written action plan to manage the issue for prolonged emergency running of the generators at the site and ensure we are satisfied that the applicant has measures in place during any emergency power generation scenario to prevent exceedance of the NO₂ air quality standards or short-term impact on vulnerable receptors.

Summary of actions taken:

1. Air quality:

- a. The generators are for use in an emergency only, when power from the National Grid is down. There have been no periods of off-grid operation since PG1 opened in 2008, and PG2 in 2012. Prolonged use is very unlikely.
 - b. The operator will complete a series of Improvement Conditions to address the exceedances predicted during black building tests and annual tests. See key issues section for further information.
2. Improvement condition IC07, already present within the permit based on the original application, requires the operator to produce an Air Quality Management Plan in conjunction with the Local Authority. IC07 is relevant to this variation application and the operator has agreed that the new generators will be considered alongside those originally permitted.