Permitting decisions

Bespoke permit

We have decided to grant the permit for Digital Realty Watford operated by Digital Realty (UK) Limited.

The permit number is EPR/HP3136DK.

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 checklist to show how all 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. The introductory note summarises what the permit covers.

Key issues of the decision

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

The combustion plant only operates under limited routine maintenance or in an emergency scenario. The combustion activity comprises 40 diesel fuelled standby generators. 3 of the generators have a thermal input of 4MWth, 3 generators of 3.6 MWth, 3 generators of 3.4 MWth each and 31 generators of 3.2 MWth. The aggregated total combustion capacity on site is 132MWth. Each generator has an exhaust, approximately between 4.4 and 5.5m above ground level.

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 diesel fuel is stored in individual double skinned tanks below the generators. The tanks vary in size from 23,750 litres up to 38,000 litres. Each set of generators are housed within bunded containers. The site is covered in hardstanding and surface water gullies drain into an oil interceptor prior to discharge from site. The fuel tanks are fitted with leakage alarms. There is no sewer connection related to the process. Surface water runoff passes via an oil interceptor to a surface water sewer for the industrial estate.

The standby generators are designed and configured so that in the event of mains failure all the generators will fire up then subsequently ramp down to meet the load demand at the site. All the generators are subject to a testing schedule which is as follows:

1. On Load: Routine quarterly testing of the site: Each data hall is tested with generators at 46% load for a maximum of 30 min quarterly.
2. Load Bank: Annual test that involves each of the 40 generators operating one at a time at 46% load for 1-1.5 hours.

The site is located on Watford Business Park. The National Grid Reference for the site is TQ 508927 194960. The site is approximately 2.25 hectares in size. The surrounding area is a mix of industrial, commercial and residential uses.

There is no sewer connection related to the process.

Air Quality

The primary pollutant of concern to air quality is nitrogen dioxide (NO_2) resulting from the combustion process on site. The Operator has submitted an air dispersion modelling report which assesses the potential impact of emission of NO_2 from the generators on local air quality.

The data centre is not situated in an Air Quality Management Area (AQMA) and there are no AQMAs within 2km of the site.

Our Air Quality Modelling and Assessment Unit (AQMAU) audited the air dispersion modelling and report submitted with the permit application. Both the maintenance testing and emergency scenarios within the modelling were assessed.

Maintenance testing - air quality

The Operator has modelled specific operational scenarios including "On Load" which is routine quarterly testing of the site engines where each data hall is tested with generators at 46% load for a maximum of 30 minutes quarterly. They also modelled "Load Bank" which is an annual test that involves each of the 40 generators operating one at a time at 46% load for 1-1.5 hours. They modelled this scenario per generator.

Human receptors

For the 'On Load' and 'Load Bank' scenarios (i.e. testing scenarios), all long-term (LT) PCs are insignificant[1] compared to Environmental Standard (ES) at human receptors.

All short-term (ST) PCs are either less than the 10% insignificance threshold of any ES or Predicted Environmental Standard (PEC) are below 100% of any ES at human receptors

Ecological receptors

The Operator's predictions conclude insignificant emissions at ecological receptors for all ES except for daily NO_x critical level for the 'On Load' and Emergency scenarios. For the 'On Load' scenario they predict an exceedance of the daily NO_x critical level at Croxley Common Moor Site of Special Scientific Interest (SSSI) and Local Nature Reserve (LNR).

We have audited the Operator's air dispersion modelling and, based on the following, we are a satisfied that the proposals are unlikely to result in a significant impact on the environment.

1) The short term NO_2 process contributions and resulting predicted environmental concentrations have the potential to exceed the environment standard. However, the probability of maximum short term process contributions coinciding with unfavourable meteorological conditions are low. If emergency operations last for less than 24 hours, exceedance of the environment standard is likely to be low (below 5%).

Improvement condition (IC2) specified in the permit will require the operator to produce a report outlining the details of the annual maintenance operating regime after the first year of operation following permit issue to validate the information provided with the permit application and that the scenario modelled was worst case.

2) As described above, generators are scheduled for quarterly 'On Load' testing over a year consists of 2 hours of operation by each generator in data halls 1,2,3,4,6 and 10 and 1 hour of operation of the generators in data hall 7 and 8. Halls 1 – 6 and 10 have 24 engines which results in 48 hours operation per year. Halls 7 and 8 have 16 engines which results in 16 hours operation per year. On load testing therefore only occurs for approximately 64 hours annually. The site will be restricted to these maintenance related operating times in the permit.

3) Nitrogen and acid deposition screen out as insignificant. It is only the nitrogen aerial emissions which do not screen out. The sensitive features of the site are sensitive to activities including the application of manure, fertilisers and lime, the dumping, spreading or discharge of any materials. The Natural England citation and Operations Requiring Consent does not list aerial emissions.

4) The metrological data within the application shows that the protected site is not located downwind of the installation in relation to the prominent wind direction from south west to north east.

5) Reviewing source attribution for this site using the Air Pollution Information System, it states that in this area industrial emissions only contribute a small amount in comparison to other sources such as traffic.

Emergency scenario – air quality

During the emergency operating scenario the air quality modelling does indicate a risk of exceedances for environment standards for short term NO_2. The site hasn't however operated in this mode of operation in the past 5 years and if it were to operate in this mode, the timescale is likely to be short. They will only operate in this mode when the National Grid is off-line. The Operator will put multiple measures in place to minimise the risk of National Grid supply failure including a single serving substation, dual grid connects and management systems for preventing data centre failure.

To further manage and minimise emissions, improvement condition IC4 has been included in the permit which requires the Operator to submit a review of options for reducing predicted short term nitrogen dioxide emissions impacts for the grid failure emergency scenario. In the short term this concern will be addressed through the Air Quality Management Plan required by improvement condition IC1.

The Environment Agency has specified that the Operator shall have a written action plan to manage the prolonged emergency running of the plant. This will include a sensitive receptors list, review of mitigation, assessments of impacts, and evaluation against modelled risk conditions (i.e. occurrence at periods of most concern in the year, possibly ambient air monitoring surveillance at very sensitive receptors). The action plan will include measures 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.

A Schedule 5 notice was issued requesting additional information on potential improvements that could be made on site such as upgrading of generators or increased stack heights to improve dispersion of NO_2. Improvement condition IC4 requires the Operator to expand of their response to this information request and submit a review of options for reducing predicted short term nitrogen dioxide emissions impacts for the grid failure emergency scenario – see section on BAT below for further information.

We have also specified improvement condition IC3 requiring the Operator to determine the actual short term NOx concentrations at the site boundary through monitoring to validate the conclusions reached in the air quality assessment within the application and to inform the air quality management plan.

Permit conditions

The permit will include a maximum 500 hour ‘emergency/standby operational limit’ for any or all the plant producing on-site power under the limits of the combustion activity; and thereby emission limit values ELVs to air (and thus 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 associated but occurring only within the data centre itself.

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 permit application must assess and provide evidence of actual reliability data for the local electricity grid distribution (including data centre internal electrical design) for the Environment Agency to judge the realistic likelihood of the plant needing to operate for prolonged periods in an emergency mode (especially if emissions modelled have the potential to exceed short term air quality standards).

Reporting of standby engine maintenance run hours is required annually and any electrical outages (planned or grid failures regardless of duration) require both immediate notification of the Environment Agency and annual reporting.

Noise

The site will only run engines regularly for maintenance 30 minutes quarterly for each data hall and an annual test for each generator. Prolonged operation will only occur in an emergency situation where the National Grid supply is lost. This however is deemed a low risk and the operator has taken measures as described in this document to reduce the potential for grid failure. The potential for prolonged noise is therefore considered to be low.

To minimise noise from the operation, the generators, chillers, fans and transformers are housed in acoustic containers. The engines also undergo regular maintenance to minimise noise. Although no noise management plan has been requested to date, permit condition 3.4 enables the Environment Agency to request one if considered necessary in the future. We have received no noise complaints regarding this site.

Due to the nature of the site, to ensure noise emissions are prevented during maintenance and emergency operation we have included improvement condition IC5 which requires the Operator to undertake a noise survey and assessment in line with BS4142 2014 during operation of the generators to determine levels of impact. In the event a risk of noise is identified, the operator shall propose measures to minimise the identified noise risk along with timescales for approval. The operator will be required to implement these noise reduction measures within the timescale agreed with the Environment Agency.

BAT

We accept that oil fired diesel generators are presently a commonly used technology for standby generators in data centres. However we requested a BAT assessment detailing the choice of engine, the particular configuration and plant sizing meeting the standby arrangement.

The default generator specification as a minimum for new plant to minimise the impacts of emissions to air (NOx) is 2g TA-Luft (or equivalent standard) or an equivalent NOx emission concentration of 2000mg/m^3. The generator specifications on the site have emissions significantly higher than this. The BAT assessment attributed this to the generators being on site when it was purchased. We do acknowledge that it would not be practicable to require the operator at this stage to upgrade all plant to BAT standards. However upgrade of some plant could be considered as part of the requirement to reduce short term nitrogen dioxide outlined in improvement condition IC4.

Retrofit abatement techniques for existing installations for engine emissions such as selective catalytic reduction (SCR) would not normally be expected for standby plant to mitigate the emissions for standby/emergency operation. The Operator confirmed that they will carry out further investigation into reductions in short term NOx and may consider options such as changes to operational control of the plant, modifications to the flue gas dispersion or installation of NO_x reduction equipment. Options such as these will need to be considered further through the response to improvement condition IC4.

The operator will put multiple measures in place to minimise the risk of failure including a single serving substation, dual grid connects and management systems for preventing data centre failure. The site only operates under limited routine maintenance or in an emergency scenario.

Protection of groundwater through effective containment measures

Each set of generators is housed within bunded containers with sufficient capacity to contain a complete loss of fluids held within the generator / engine. Associated diesel tanks also have secondary containment in the form of an outer tank with 110% capacity of the inner tank. Leak detection alarms are installed within the tanks and all fuel fill points are bunded. The generator and diesel tanks are served by a preventative maintenance programme and spill prevention kits are located in the plant areas. Because of the nature of the site there is sufficient security and CCTV in place to manage access, and vehicle movements are minimal. Crash barriers are also provided around tanks to prevent impact.
The operator has confirmed that they have oil interceptors installed on the drainage system surrounding the fuel tank/fill points. We are not satisfied this represent appropriate tertiary containment in line with appropriate industry standards.

Based on the operator's proposal as summarised above, we are satisfied that the site's secondary containment is adequate to manage the risk posed. However we are not satisfied that the tertiary system meets the requirements of the industry standards. We have therefore included improvement condition IC6 in the permit which requires the operator to carry out a review of the site's tertiary containment system in line with relevant industry standards. The operator will then be required to implement the recommendations of the review in order to bring the tertiary containment in line with relevant industry standard. This is to ensure, in the event the secondary containment which serves the oil and diesel storage tanks or the sites distribution pipe work fails, that there is another element of containment. This will hold liquid spills to prevent pollution and allow time to deploy addition spill measures if an incident escalates.

Systematic appraisal for managing, recording, reviewing and remediating pollution incidents

The conditions of the permit include the requirement to carry out periodic monitoring of groundwater at least once every five years and soil at least once every ten years. As this is an established site there is the potential for the installation of boreholes to act as pathways for contaminant migration and installing them within the concreted area containing the generators could compromise the protection offered. Due to the potential risk of compromising containment onsite though the installation of monitoring infrastructure, the Operator has undertaken a systematic appraisal of the risk of contamination which they will review throughout the life of the permit using the management systems they have onsite. The Operator has demonstrated that there are sufficient controls in place at the site to ensure that pollution is effectively contained, the risk managed and pollution incidents prevented. Any incidents will be accurately recorded, improvements acted upon and if needed, followed up of suitable remediation methods.

Digital Realty Watford have a certified ISO 14001 Environmental Management System (EMS) which includes a diesel emergency response plan as part of the emergency response plan and incident reporting requirements for the site. They have outlined the potential sources of pollution on site and outlined the infrastructure at the site designed to contain spills reducing any risk to underlying soils and groundwater. Any major spillage incident has to be recorded under the incident reporting process. In addition, any major diesel or chemical spill event would follow the emergency response plan. Incidents will be reviewed post event. As part of the annual EMS audit on site, any corrective actions from incidents are reviewed and closed out. The site will collect evidence of any pollution incidents from the incident reporting process. If there are no pollution incidents recorded on site, this is an indication of no risk to the land or underlying groundwater.

The systematic appraisal will come in the form of ongoing monitoring of any pollution incidents on site through the incident process, record-keeping and the annual EMS audit on site. Continued good site operational management and maintenance will also form part of the appraisal process. If the maintenance of the oil interceptor, readiness of the spill kits and appropriate chemical storage are all adhered to, then there will be a low risk of potential contamination. The incident monitoring and internal audits of the EMS on site will pick up any potential risk to the groundwater. If there is a significant pollution incident which triggers the use of the diesel or other emergency response plans, then the incident will be risk assessed to see if there is a potential impact to the surrounding environment, which may result in on-site testing if required.

We have reviewed the Operator's proposals and we are satisfied that their proposals for systematic appraisal will ensure an appropriate system in place to manage, record, review and remediate pollution incidents throughout the lifetime of the permit.

Decision checklist

Aspect considered	Decision
Receipt of application	
Confidential information	A claim for commercial or industrial confidentiality has not been made.
Identifying confidential information	We have not identified information provided as part of the application that we consider to be confidential.
Consultation	
Consultation	The consultation requirements were identified in accordance with the Environmental Permitting Regulations and our public participation statement. The application was publicised on the GOV.UK website. We consulted the following organisations: • Local Authority Environmental Health Department • Health and Safety Executive • Public Health England • Director of Public Health • Thames Water Utilities Limited The comments and our responses are summarised in the consultation section.
Operator	
Control of the facility	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 facility	
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 RGN 2 'Defining the scope of the installation', Appendix 1 of RGN 2 'Interpretation of Schedule 1', guidance on waste recovery plans and permits. 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	

Aspect considered	Decision
Extent of the site of the facility	The operator has provided a plan which we consider is satisfactory, showing the extent of the site of the facility. The plan is included in the permit.
Site condition report	The operator has provided a description of the condition of the site, which we consider is satisfactory. Based on the site condition report, we consider that appropriate pollution prevention measures are in place and that the pollution of land and water is unlikely. The decision was taken in accordance with our guidance on site condition reports.
Biodiversity, heritage, landscape and nature conservation	The application is within the relevant distance criteria of a site of heritage, landscape or nature conservation, and/or protected species or habitat. See key issues section for additional information. We have consulted Natural England who confirmed they are satisfied that, subject to the imposition of the conditions by the Environment Agency and the operations being undertaken in strict accordance with the submitted proposals and the conditions set out by the Environment Agency, these proposals will avoid adverse effects upon the interest features for which the SSSI is notified. The decision was taken in accordance with our guidance.
Environmental risk assessment	
Environmental risk	We have reviewed the operator's assessment of the environmental risk from the facility. The operator's risk assessment is satisfactory, however we have included improvement conditions to ensure additional considerations of risk relating to emissions to air are considered on an ongoing basis. See key issues section above.
Operating techniques	
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.
Permit conditions	
Improvement programme	Based on the information on the application, we consider that we need to impose an improvement programme. See key issue for details.
Emission limits	We have decided that emission limits are not required in the permit.
Reporting	We have specified reporting in the permit to ensure that the installation is being operated in line with that specified in the operating techniques and to ensure that we are notified immediately in the instance that the site is ever operated in emergency scenario mode.

Aspect considered	Decision
Operator competence	
Management system	There is no known reason to consider that the operator will not have the management system to enable it to comply with the permit conditions. The decision was taken in accordance with the guidance on operator competence and how to develop a management system for environmental permits.
Relevant convictions	The Case Management System has been checked 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	
Section 108 Deregulation Act 2015 – 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

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
Public Health England
Brief summary of issues raised
• Environmental Permit issued for this site should contain conditions to ensure that the following potential emissions do not impact upon public health: products of combustion (e.g. nitrogen dioxide, particulate matter and sulphur dioxide) from the backup diesel generators used on site as a result of grid power failures or routine testing. • We note that the modelling indicates that there could be exceedances of the short term nitrogen dioxide air quality standards in the 120 hour shutdown scenario. Although such a scenario is considered unlikely, the EA may wish to assess whether measures to limit nitrogen dioxide emissions from the generators have been fully considered by the applicant to limit any potential impacts on local air quality. • In addition, the applicant has provided limited details on any fire prevention/management plan and how accidents associated with the site combustion activities and fuel storage would be handled. In relation to potential risk to public health, we recommend that the Environment Agency also consult the following relevant organisation(s) in relation to their areas of expertise: o the local authority for matters relating to impact upon human health of contaminated land, noise, odour, dust and other nuisance emissions; o the Food Standards Agency, where there is the potential for deposition on land used for the growing of food crops or animal rearing; o the Director of Public Health for matters relating to wider public health impacts. Any additional information obtained by the Environment Agency in relation to these comments should be sent to PHE for consideration. Such information could affect the comments made in this response.
Summary of actions taken or show how this has been covered
The Operator provided an air dispersion modelling report to demonstrate the potential air quality risks associated with the maintenance and operation of standby generators. We have audited their air quality modelling and agree with the conclusions. The modelling identified the potential for exceedances of the air quality standard. However as maintenance only takes place for a small proportion of the year and the emergency scenario will only occur if the National Grid supply is interrupted, we are therefore satisfied the risk of impact on air quality is low. The Operator has outlined how they intend to manage their operation to minimise the likelihood of National Grid service failure and to minimise the running of engines during maintenance. To ensure the site minimises its potential impact on the environment, we have included improvement conditions in the permit which require the Operator to review and manage their emissions and to work to further improve the impact of the emergency scenario. Specific detail of the site operating techniques and permit conditions are outlined in the key issues section of this document. The Operator has identified that they have a fire detection system where there are heat sources onsite. There is also a sprinkler system in the halls. The generators are housed within containers, are regularly maintained, do not run for long hours and are located outside the building with spaces between each unit. We have reviewed the measures to manage fire from the generators and we are satisfied that appropriate

measures are in place to minimise the risk of fire, detect fire and suppress fires onsite in line with the requirements of our guidance

We have consulted the relevant authorities on this application in line with our working together agreements.