

Permitting decisions

Bespoke permit

We have decided to grant the permit for Colt - Welwyn operated by Colt Technology Services.

The permit number is EPR/KP3139DW.

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

Installation:

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 for the burning of any fuel in an appliance with a rated thermal input of 50 or more megawatts (MW).

The electrical power to the data centre halls is provided from the National Grid. The facility uses standby diesel fired generators to supply power to the data centre halls in the event of National Grid outage. No electricity generated will be exported from the installation.

The generators will only operate in the event of power outage or during defined periods for testing and maintenance duties.

The combustion plant, when fully developed, will consist of up to 75 generators with an aggregated thermal capacity of 266.6MW. There were 60 generators on site as of January 2019.

There are two additional generators that are below 1MWth input which supply power for site offices (0.98MWth) and a fire safety sprinkler system (0.3MWth).

Air Quality:

The primary pollutant of concern for emissions to air is nitrogen dioxide (NO₂) resulting from the combustion of diesel in the standby generators. Each individual generator has its own exhaust and therefore emission point to air. The nature of these emission points varies as some are vertical at differing heights, some horizontal and some set at an angle to vertical. This has developed over time as new generators and data halls have been added to increase site capacity. The operator submitted an Air Quality Modelling Report which assessed the potential impact of NO₂ and other pollutants on local air quality.

Our Air Quality Modelling and Assessment Unit (AQMAU) audited the Air Quality Modelling Report submitted with the application. Both the emergency operational and testing/maintenance scenarios were assessed.

The operator modelled the scenarios of:

(1) Maintenance operations:

Monthly test - the generators are tested in turns for a maximum of one hour at site load which is estimated as 15-35% depending on the data hall. These tests are carried out between 08.00 and 18.00 on a Saturday and Sunday most weekends in the calendar year.

Annual test – all generators are tested off load during one week towards the end of the year, often in December. Tests are carried out on weekdays between 08.00 and 18.00 and each generator is tested off load for 15 minutes.

(2) Maintenance operations plus three unplanned outages:

In addition to the testing regimes, the operator added three National Grid outages and emergency generator operation of one hour each.

The operator also carried out a risk assessment which represented the scenario of a prolonged operation of the facility with total electrical grid failure at both sub-stations associated with the site. Such an occurrence was however considered to be highly unlikely. A rolling 72 hour count of the number of hours exceeding 200µg/m³ at each receptor was completed to provide a percentage of the year in which more than 18 exceedances occurred.

All modelled receptors in the vicinity of the site recorded some exceedance of the short term AQS as a result of the site operating continuously, ranging from 7% to 100% of the year.

The modelling and our audit of that monitoring indicated that:

(1) Maintenance operations:

NO₂ concentrations during maintenance operations are expected to meet the annual Air Quality Standard (AQS) of 40µg/m³ at all modelled sensitive locations. The hourly mean NO₂ Predicted Environmental Concentration (PEC) at sensitive residential receptors to the south and south west of the site boundary exceeded the short term AQS of 200µg/m³ more than 18 times a year. The maximum predicted number of exceedances was 34 which related to a commercial unit. Five receptor locations were identified where the short term objective was likely to be exceeded – two of which were residential and three were commercial premises. The annual mean NO₂ objective is predicted to be met at all receptor locations as are the objectives for all other pollutants modelled (PM₁₀, hydrocarbons, carbon monoxide and SO₂).

However our audit of the work indicated that the probability of NO₂ exceedance hours coinciding with the worst meteorological hours during the maintenance scenario is low. We based this conclusion on the quantification of potential exceedances using 100th percentile hourly predictions and the hypergeometric probability distribution of 19 of those exceedance hours occurring during the operational hours of the maintenance scenario.

We are satisfied this methodology described in the section of the guidance on short-term statistical analysis can be applied to evaluate short term impacts in this case from data centre operation.

(2) Maintenance operations plus three unplanned outages:

When three unplanned outages on the worst case meteorological hours were included in the model, the area of predicted exceedance of the short term NO₂ AQS extended to the east and west and the maximum number of hours exceeding the short term objective increased to 36. The number of receptors potentially experiencing an exceedance of the short term objective did not change. NO₂ PEC's were predicted not to exceed the annual mean AQS at all receptor locations.

NO₂ concentrations were not predicted to exceed the long and short term critical level for protection of vegetation at all ecological receptors, except at three local wildlife sites within close proximity to the site. Here NO₂ concentrations were predicted to exceed the maximum 24 hour critical value for vegetation (75µg/m³).

PEC's for PM₁₀, hydrocarbons, carbon monoxide and SO₂ did not exceed the relevant short or long term AQS.

No impact was predicted at the Special Area of Conservation, Wormley-Hoddesdonpark Woods (8.6km from Colt) or the Site of Special Scientific Interest, Tewinbury (1.4km from site).

The peak concentrations were predicted to arise adjacent to the generator banks on the south eastern side of the data centre.

The operator noted that scenarios 1 and 2 modelled would be very much worst case situations because:

- The loading of the generators at testing was modelled as 100% when it will be 15-35% at monthly testing and 0% at annual testing;
- The duration of testing operations was modelled at one hour when it will be 15 minutes at annual testing and up to one hour at monthly testing;
- The worst case weather scenario was assumed for the annual testing and periods of emergency outages modelled;
- The worst meteorological year (2016) was used for modelling scenarios out of the five years of data assessed (2012 – 2016, Luton Airport);
- Three hourly outages per year were modelled when, in the ten years of site operation, there have been only three outages in total (all within a two month period in 2014 and linked to the same distribution network operator fault). During this period, less than half the standby generators on site operated at loads of 15-35% for approximately 30 minutes.

Managing emissions:

To address the predicted exceedances in short term NO₂ limits at sensitive receptors the operator will be required to minimise the potential impact of emissions through a staged programme of improvement conditions.

Improvement Condition, IC4, requires the operator to produce an Air Quality Management Plan in conjunction with the Local Authority that outlines response measures to be taken in the event of National Grid failure.

Improvement Condition, IC5, requires the operator to determine the actual emissions produced by the generators during the testing and emergency operation scenarios. The emission rates used in the air quality modelling were derived from the manufacturer's datasheets and do not necessarily reflect the emission rates being delivered by the generators in practice. This is because the generators will be operated at reduced loads during testing (15-35%) and maintenance (0%) rather than at the 100% loading rate from which the emissions used in the air quality modelling were derived. This will therefore be more representative of emission rates in operational practice.

Following this, Improvement Condition, IC6, requires the operator to confirm by monitoring or testing the predicted short term NO₂ concentrations at the sensitive receptors close to the boundary of the site and use these concentrations to revise, if necessary, the air quality management plan produced in response to Improvement Condition, IC4.

Improvement Condition, IC7, then requires the operator to review options for reducing predicted short term NO₂ emissions for both testing/maintenance and emergency operations. The focus on NO₂ in this Improvement Condition is because of the predicted breaches in the air quality modelling report of short-term NO₂ concentration limits. Completion of this Improvement Condition will necessitate the review of the testing regime (duration, number of engines, loading), the generators (compliance with best practice TA-Luft standards) and the infrastructure of the stack emission points (stack height, orientation). The operator should also provide a cost benefit analysis related to the improvements necessary to reduce the NO₂ emissions from the generators (particularly those causing most concern – those with highest emission rates, those with non-vertical or short stacks and those closest to sensitive receptors).

We believe that this is the most appropriate mechanism for driving improvements from the operator in the area of NO₂ emissions and dispersion. This approach of issuing a permit with these improvement conditions while allowing continued operation is justified as our audit of the air dispersion modelling provided in the application indicated that, although there were predicted exceedances of short term NO₂ limits during the routine generator testing/maintenance scenarios, the probability of those NO₂ exceedance hours coinciding with the worst meteorological hours during the maintenance scenario is low.

For the case of emergency operation, Improvement Condition, IC4, requires the operator to produce a Local Air Quality Management Plan in conjunction with the Local Authority outlining their response measures to be taken in the event of National Grid failure.

Protection against Power Outage and Minimisation of Generator Operation:

The operator has put in place multiple measures to minimise the risk of power failure including two separate electrical substations, each of which has two individual sources, Sides "A" and "B", meaning the site has effectively four power supply routes. If one of these were to fail, the site could switch to an alternative unaffected supply reducing the duration of any emergency generator operation. It is expected that the site can make this switch in 30 – 60 minutes which would then be the maximum duration the standby generators would be expected to operate.

The site has also an environmental management system (EMS) accredited to ISO14001 and regular maintenance, testing and inspection regimes are in place to ensure reliable operation of the site including its infrastructure necessary for maintaining National Grid power supply.

Reliability of Power Delivery in Event of National Grid Outage:

There is a built-in redundancy to the number of standby generators present on site to ensure they can always support the site in the event of any power failure. In the case of Colt Welwyn, the built in redundancy is “2n” meaning that there are twice as many generators on site than would be required to deliver full site power load.

Permit Conditions:

The permit will include 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 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 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. Although AQMAU has assessed the risk of the exceedance hours coinciding with worst case meteorological hours as low, improvement conditions are included in the permit to address this.

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.

Considerations on Medium Combustion Plant Directive and Specified Generator Regulations:

The diesel generator (0.3MWth input) used for powering the site fire sprinkler system is included as a Directly Associated Activity (DAA) in the permit as the sprinkler system serves equipment included within the installation boundary such as the standby generators. No emission limits apply to the generator as its power rating is <1MWth.

The diesel generator (0.98MWth) that supplies power to administration offices is not included as a DAA as these offices are not within the installation boundary. This generator is not a medium combustion plant as its capacity is <1MWth and neither is it a specified generator as it is not part of a capacity agreement or an agreement to provide balancing services.

BAT Assessment:

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

They considered the following technologies:

- Diesel rotary uninterruptible power supply engines (DRUPS)
- Diesel generators
- Natural gas (piped) fuelled generators (spark ignition engine)
- Natural gas (piped) fuelled generators (gas turbine)
- Liquid petroleum fuelled generators (spark ignition engines)
- Hydrogen fuel cell technology
- Standby gas turbine technology
- Selective catalytic reduction

Against the following considerations:

- Cold start capability
- Already proven as a reliable technology
- Space requirements
- Cost
- Fuel suitability and lifetime of stored fuel
- Air quality impact
- Noise
- Global warming impact
- Releases to land & water
- Fugitive emissions.

The conclusion of the assessment was that diesel generators were considered BAT largely due to the modular nature of the site and the high initial costs of alternative technologies. Diesel generators also have a proven reliability and a very good cold start capability.

We have accepted that diesel fired generators are presently a commonly used technology for standby generators in data centres. Retrofitting abatement techniques onto existing power generation technologies would not normally be expected for standby plant to mitigate the emission of standby/emergency operation.

However, Improvement Condition, IC7, requires the operator to submit a report detailing the results of a review into options for reducing predicted short term NO_x concentrations. This will include a feasibility study (including cost benefit analysis) for potential upgrades to infrastructure such as generators or stacks or changes to operational regimes such as duration and frequency of testing regimes with a view to reducing nitrogen dioxide emissions or increasing dispersion of emissions.

The default generator specification as a minimum for new plant to minimise the impacts of emissions to air (NO_x) is 2g TA-Luft (or equivalent standard) or an equivalent NO_x emission concentration of 2,000mg/m³. The generator specifications on the site have emissions higher than this due to the fact the site has already been operating for over ten years prior to falling under the requirements of the Environmental Permitting Regulations. We accept that it would not be practicable to require the operator at this stage to upgrade all plant to BAT standards. However upgrade of plant and installation of new engines that meet default generator specification will be considered as part of the expansion programme for the site and the permit requires the operator to investigate reduction in short term nitrogen dioxide emissions. This is an integral part of a comprehensive response to Improvement Condition, IC7.

In order to ensure BAT standards are maintained for installation of any further standby generators as part of the site expansion plan outlined in the permit application, a pre-operational condition for future development requires the operator to submit a detailed design report to the Environment Agency prior to installation of any

additional standby generators at the site. The report must demonstrate how the specification of the generator, height and orientation of discharge flue, location of generator and operational programme are designed to minimise NOx emissions and optimise atmospheric dispersion with a view to reducing any impact of short-term NOx emissions on sensitive local receptors. At the time of permit issue (January 2019), the construction works for installation of the additional generators required to complete the site expansion programme (generators 61-75) had commenced.

The operator has justified its use of a large number of smaller generators rather than installation of fewer larger generators because of the modular nature of the site and potential restriction of its expansion plans as new clients would be less able to modify data hall designs to suit their individual needs. Smaller generators can be more readily added to the site giving greater flexibility as the site expands.

The operator has justified not limiting the number of stacks or not grouping stacks into common windshields because that would compromise the “2n” redundancy arrangement as, if one stack was unable to be used, then multiple generators may not be able to operate. In addition, routing stacks to common windshields is problematic due to the geographical location of the generators on site, the amount of pipework and support structures necessary and the overall space constraints on the site due to the fact it was not originally designed as a data centre.

Noise:

The site will operate the generators for testing purposes for set periods each weekend. Prolonged operation outside of weekend periods will only occur in an emergency situation where the National Grid supply is lost. This is deemed a low risk as the reliability of the National Grid power supply is very good and the operator has taken measures to reduce the potential for, and the potential impact of, grid failure. The potential for prolonged noise is therefore considered to be low.

To minimise noise from the site, the operator has taken a number of steps including:

- The walls of ground floor generator rooms are constructed to achieve a specific noise reduction performance;
- Acoustic attenuation is fitted to intake louvres and exhaust flues of ground floor generator rooms;
- A 5m acoustic screen is located around the ground level indirect evaporative cooling units and a 4m acoustic screen is located around those at rooftop level.

The operator provided a noise assessment of site operation to accompany the permit application. Although they based this assessment on the principles of BS4142:2014, it was largely a noise assessment focused on planning requirements and did not address the entirety of noise sources expected when the site is fully operational with its maximum complement of generators. We are satisfied however on a risk-based approach for permitting purposes that the operator has demonstrated that systems are in place on site to manage and minimise noise. There is no history of noise complaints relating to the operation of this site.

However to ensure noise emissions are prevented during maintenance and emergency operation we have included improvement condition IC3 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.

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.

Containment and Prevention of Pollution to Ground and Groundwater:

Tanks/Bunds/Pipework and Containment:

It is a requirement of the clients, whose data is being protected by Colt Welwyn, that there is sufficient fuel on site to provide approximately 72 hours of generator operation at site load. This is supplied by a number of fuel storage tanks located across the installation:

- Bulk tanks which are located away from the generators in a centralised area near the site car park;
- Day tanks which are smaller tanks (<1,000 litres capacity) located inside a sealed generator container and fed from the main site tanks;
- "Belly" or "Skid" tanks which are tanks located under the generators;
- Adjacent bulk tanks which are bulk tanks located near, but separate from, individual generators.

Generators either have their own dedicated tank or share tanks with other generators.

As of August 2018, there were 42 bulk tanks on-site with capacities ranging from 10,000 litres to 64,000 litres. A further 10 bulk tanks are to be installed as a result of planned expansion of site operational capability. In addition, there were two smaller bulk tanks (928 litres and 250 litres capacity) which are used to supply fuel to the generators providing power for the administration building and the fire safety sprinkler system. These smaller tanks are located within permanently sealed structures.

Generators are contained in sealed containers capable of holding the contents of the generators themselves and the contents of any day tanks located within the generator container. The bulk tanks also have secondary containment in the form of an outer tank that can hold 110% capacity of the inner tank. Tank fill points and ancillary pipework are located inside the tank bund and above drip trays to capture small leaks or spillages.

Leak detection is in place for bulk tanks, bunds and interconnecting pipework. This is routinely checked to confirm its effectiveness. The fuel tank alarm system is designed to detect and warn of tank overfill, high/low tank liquid level and tank bund leak with visual and audible warnings sounding at a remote data monitoring centre on site. A Planned Preventive Maintenance (PPM) regime is in place onsite that involves checking the tanks and associated pipework for leaks and if there are any signs that the tank/bund integrity is compromised. Spill kits are located close to diesel storage tanks across the site and are operated by trained personnel in accordance with a documented emergency response procedure.

Refuelling activities are carried out by a third-party fuel delivery company supported by Colt Technology Services staff in accordance with a documented fuel delivery procedure. During this operation, all fill points are in view when refuelling and overfill alarms are in use.

Because of the sensitive data stored on site, security is very important and all fuel tanks and generators are located within a perimeter fence. The site is certified to the international information security standard, ISO 27001. Tanks and generators that are on site traffic routes have crash barriers provided to protect them from potential vehicle collision.

Surface Infrastructure and Drainage:

The site is covered in good quality hardstanding that reduces the potential for any leak of diesel or other materials to reach underlying soils or groundwater. The site has a number of oil/water interceptors located in drains which can capture any diesel or oil lost to the drains before they are discharged off-site.

The site also has a downstream defender pollution control device in place (an advanced hydrodynamic vortex separator) that, according to manufacturer's data, is designed for effective and reliable removal of fine particles, oils and other floatable debris from surface water run-off. However, the location of this device in the site drainage system does not ensure all discharges pass through this device before discharge off-site. In addition, the site has installed a sustainable drainage system (SuDS) based on four underground tanks to provide reduction in the surface water flows from site. However this system is designed to only serve Catchment Area C on site and diesel storage tanks are also located in areas of site remote from Catchment Area C.

Because of these constraints, we do not accept that the operator has sufficiently demonstrated use of these interceptors, pollution control device and SuDS systems represents appropriate tertiary containment for the site and have included an Improvement Condition, IC8, requiring the operator to carry out a review of the site's tertiary containment against relevant industry standards. The operator must identify and address any deviations from these standards. This will require the operator to demonstrate that the existing tertiary containment system is in accordance with the industry standard for a data centre as a number of features of the current site surface water system have been developed at different stages of the site life with different occupiers and for differing purposes.

The site drainage plan is currently based on information provided from plans generated by the previous site operator updated by information obtained from more recent site visits associated with this permit application. It is essentially only an indicative site plan. An improvement condition, IC9, has been included in the permit requiring the operator to confirm the exact locations of all site drainage in a new updated site drainage plan. The improvement condition also requires the operator to assess the oil interceptors present on site to ensure all discharge from site is initially directed to one of these interceptors.

Very limited information was supplied in the permit application on what the condition of the site would be at permit issue. This is addressed through improvement condition, IC1, which has been included in the permit requiring the operator to submit to the Environment Agency for agreement proposals for a more detailed baseline soil and groundwater investigation and IC2 which requires the operator to submit to the Environment Agency a report outlining the outcome of this baseline investigation.

Installation Boundary:

The operator's installation boundary encompasses only the combustion activities onsite and their supporting activities (standby generators, diesel storage and distribution) as these are the activities which fall under the Environmental Permitting Regulations and are of environmental concern. The data centre data halls have not been included in the permit boundary as they are not activities which are required to be permitted and are not of environmental concern.

We are satisfied that the appropriate aspects of the installation are included in the permitted boundary and agreed with the operator that other buildings such as substations, associated battery room, main data halls, secondary data halls, chillers and offices could be excluded from the installation boundary.

We were not satisfied that all the risks of pollution such as loss of containment from diesel storage tanks, distribution pipework and fuel delivery vehicles were included in the boundary. We have therefore requested the operator revise their site plan to include the site roadways and surface infrastructure within the boundary. A satisfactory revised plan was provided and incorporated into the permit

This approach is consistent with the inclusion of Improvement Condition, IC9, in the permit which requires the operator to develop an updated and accurate drainage plan for the entire site. Including the roadways within the installation also allowed the surface water point releases offsite, S1, S2 and S3, to be included within the installation boundary.

Improvement Conditions:

IC1: As limited information on existing ground conditions was submitted in the permit application, the operator shall submit to the Environment Agency for approval a proposal for a baseline soil and groundwater investigation (to include any potential on-going monitoring requirements) for the entire site.

IC2: To demonstrate that the proposal for baseline soil and groundwater investigation has been completed and the data produced is sufficient to define the condition of the site, the operator shall submit to the Environment Agency for review and approval, a baseline report detailing the outcome of the soil and groundwater investigation proposed in IC1.

IC3: The noise assessment submitted with the permit application requires some additional work to appropriately address all potential noise sources and scenarios on site, the operator shall undertake a noise assessment against the requirements of BS4142:2014 during routine operation of the site including all periods of testing and maintenance proposed. A report shall be submitted to the Environment Agency that includes any measures proposed to minimise or abate noise with appropriate timescales.

IC4: To ensure that the operator has defined response measures to be taken in the event of National Grid power failure, the operator shall, in conjunction with the local authority, produce an Air Quality Management Plan outlining actions to be taken in the event of electrical grid failure.

IC5: As the air quality modelling submitted in the application was based on worst-case scenarios with manufacturer's emission data from equipment specification reports not representative operational data, the operator shall carry out physical monitoring of the emissions from the generators at their operational loads during testing, maintenance and emergency operation and use these data in producing and submitting a revised air dispersion modelling report.

IC6: To compare nitrogen dioxide concentrations produced during operation with those predicted from the air quality modelling, the operator shall confirm the short-term nitrogen dioxide concentrations predicted in proximity to the generators, at site boundary and at local sensitive receptors by monitoring or testing of actual ambient levels.

IC7: In order to determine if improvements are required to the site infrastructure or operation to reduce the impact of short-term nitrogen dioxide emissions, the operator shall, using data from IC5 & IC6, carry out a feasibility study (including cost benefit analysis) of options for minimising this impact through either reducing emissions or increasing dispersion. This should encompass all the permitted facility, including generators and infrastructure to be commissioned as part of site expansion programmes and consider upgrades of generators, changes to stack heights/orientations and review of generator testing and maintenance regimes.

IC8: To ensure sufficient sealed drainage and containment is in place on site in accordance with CIRIA guidance, the operator shall carry out a review of the tertiary containment system on site that serves diesel storage tanks proposing, with timescales, any improvements necessary.

IC9: As the site drainage plan presented in the permit application is largely indicative in nature based on historic drawings and more recent site inspections, the operator shall revise and submit to the Environment Agency for approval, an updated and comprehensive site drainage plan that demonstrates all surface water discharges pass via an interceptor before discharge from site.

Decision checklist

Aspect considered	Decision
Receipt of application	
Confidential information	A claim for commercial or industrial confidentiality has been made. The applicant made a claim for commercial confidentiality on a number of aspects of the application including:

Aspect considered	Decision
	<ul style="list-style-type: none"> - Site address; - Site drawings; - Staff contact details; - Power and fuel supply to site; - Generator information; - Historical incidences of power failures; - Air quality modelling files. <p>We accepted only the claim for commercial confidence on staff contact details. We have excluded staff contact details (telephone numbers and email addresses).</p> <p>We consider that the inclusion of the remaining relevant information, for which confidentiality was claimed, on the public register would not prejudice the applicant's interests to an unreasonable degree. The reasons for this are given in the notice of determination for the claim.</p> <p>The decision was taken in accordance with our guidance on confidentiality.</p>
Identifying confidential information	We have not identified information provided as part of the application that we consider to be confidential.
Consultation	
Consultation	<p>The consultation requirements were identified in accordance with the Environmental Permitting Regulations and our public participation statement.</p> <p>The application was publicised on the GOV.UK website.</p> <p>We consulted the following organisations:</p> <ul style="list-style-type: none"> - Welwyn Hatfield Borough Council Planning Department; - Welwyn Hatfield Borough Council Environmental Health Department; - Public Health England; - Director of Public Health (Hertfordshire County Council); - Hertfordshire Fire & Rescue Service; - Health & Safety Executive; - Food Standards Agency; - Thames Water Utilities Limited. <p>The comments and our responses are summarised in the consultation section.</p>
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	

Aspect considered	Decision
The regulated facility	<p>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.</p> <p>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.</p>
The site	
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	<p>The operator has provided a description of the condition of the site, which we consider is not satisfactory. The decision was taken in accordance with our guidance on site condition reports and baseline reporting under the Industrial Emissions Directive.</p> <p>We have advised the operator what measures they need to take to improve the site condition report. An Improvement Condition has been included within the permit outlining the actions that the operator must take.</p>
Biodiversity, heritage, landscape and nature conservation	<p>The application is within the relevant distance criteria of a site of heritage, landscape or nature conservation, and/or protected species or habitat.</p> <p>We have assessed the application and its potential to affect all known sites of nature conservation, landscape and heritage and/or protected species or habitats identified in the nature conservation screening report as part of the permitting process.</p> <p>We consider that the application will not affect any sites of nature conservation, landscape and heritage, and/or protected species or habitats identified.</p> <p>Further information is included in the Key Issues Section of this document.</p> <p>We have consulted Natural England on our Habitats Regulations and SSSI assessments, and taken their comments into account in the permitting decision.</p>
Environmental risk assessment	
Environmental risk	<p>We have reviewed the operator's assessment of the environmental risk from the facility.</p> <p>The operator's risk assessment is satisfactory.</p> <p>We have included in the permit improvement conditions relating to the management of risk relating to emissions to air and the containment of diesel on site.</p>
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.

Aspect considered	Decision
	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	<p>Emissions of nitrogen dioxide (NO₂) cannot be screened out as insignificant. We have assessed whether the proposed techniques are BAT.</p> <p>We agree with the applicant that the use of diesel generators to supply power to site in the event of National Grid outage is BAT when compared with alternative power generation techniques such as spark ignition engines, gas turbines, hydrogen fuel cells or selective catalytic reduction.</p> <p>We have imposed an improvement condition requiring the operator to assess improvements in existing systems (generators and emission locations) for future generators to be installed to increase capacity at the site.</p>
Noise management	<p>We have reviewed the noise management plan in accordance with our guidance on noise assessment and control.</p> <p>We consider that the noise management plan is not satisfactory as it did not address potential noise from all the proposed standby generators planned to be present when the site is at full capacity.</p> <p>We consider that the activities carried out at the site have the potential to cause noise and/or vibration that might cause pollution outside the site and consider it appropriate to impose specific measures. We have included a specific improvement condition requiring the operator to carry out an additional noise survey. During the permit determination process, the operator has already commissioned that survey and a report is awaited. See the Key Issues Section of this document for further details.</p>
Permit conditions	
Pre-operational conditions	<p>Based on the information in the application, we consider that we need to impose a pre-operational condition for future development.</p> <p>Further information is included in the Key Issues Section of this document.</p>
Improvement programme	<p>Based on the information on the application, we consider that we need to impose an improvement programme.</p> <p>Further information is included in the Key Issues Section of this document.</p>
Emission limits	We have decided that emission limits are not required in the permit.
Reporting	We have specified reporting in the permit to ensure the site is operated to the standards specified in the operating techniques (including prevention of oil and grease in surface water discharged from site) and to ensure the operator informs us of any operation of the facility in emergency mode.
Operator competence	
Management system	<p>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.</p> <p>The decision was taken in accordance with the guidance on operator competence and how to develop a management system for environmental</p>

Aspect considered	Decision
	permits.
Relevant convictions	<p>The Case Management System has been checked to ensure that all relevant convictions have been declared.</p> <p>No relevant convictions were found. The operator satisfies the criteria in our guidance on operator competence.</p>
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	<p>We have considered our duty to have regard to the desirability of promoting economic growth set out in section 108(1) of the Deregulation Act 2015 and the guidance issued under section 110 of that Act in deciding whether to grant this permit.</p> <p>Paragraph 1.3 of the guidance says:</p> <p>“The primary role of regulators, in delivering regulation, is to achieve the regulatory outcomes for which they are responsible. For a number of regulators, these regulatory outcomes include an explicit reference to development or growth. The growth duty establishes economic growth as a factor that all specified regulators should have regard to, alongside the delivery of the protections set out in the relevant legislation.”</p> <p>We have addressed the legislative requirements and environmental standards to be set for this operation in the body of the decision document above. The guidance is clear at paragraph 1.5 that the growth duty does not legitimise non-compliance and its purpose is not to achieve or pursue economic growth at the expense of necessary protections.</p> <p>We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution. This also promotes growth amongst legitimate operators because the standards applied to the operator are consistent across businesses in this sector and have been set to achieve the required legislative standards.</p>

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
<p>The consultee raised issues in a response letter dated 30th August 2018 over the potential impact on health from predicted exceedances of the short term air quality standards for NO₂ and the management of fire risks at the facility:</p> <ul style="list-style-type: none"> - <i>“The air quality modelling report included as part of this application gives 3 scenarios for which the emission of pollutants has been modelled. All of these are highly pessimistic and represent the worst case once the facility has reached its full permitted capacity. The latter two scenarios include the estimation of emissions where the diesel generators run to supply power in an outage, only 3 of which have occurred in 10 years of operation. The first scenario represents normal operation in which the generators are maintained and tested each weekend. In all scenarios the one hour mean NO₂ air quality objective is anticipated to be exceeded over 18 times.”</i> - <i>“While predicted breaches in the one hour mean NO₂ objective may be justifiable in the case of a rare emergency, we would at least expect the non-emergency operation through the agreed maintenance schedule to be compliant. The modelled emissions are in some cases so far above the objective that we cannot simply assume that a more realistic scenario would give compliance. From the scenarios modelled the hourly mean NO₂ concentrations represent unacceptable contributions to local air quality and subsequently have a potential to impact on the public health of nearby receptors.”</i> - <i>“It is recognised that the air quality report acknowledges that the scenarios are highly pessimistic and suggests that modelling could be re-run with actual monitoring data in the 12 months following the granting of the Environmental Permit. However, in order for us to adequately assess the likely risk and impact on public health we would need further modelled assessment of emissions during routine non-emergency testing of the generators. As the generators are to be run through the maintenance programme every weekend, it would be pertinent to obtain actual monitoring data to inform the source term and to re-run the model at the earliest opportunity. Without such information we have to base our public health assessment on the worst case scenario concentrations provided and therefore we have concerns in relation to the potential impact on local air quality and public health of the nearby receptors.”</i> - <i>“Additionally we note that fire risk has not been considered as part of the application, despite large quantities of diesel kept above ground on site. We recommend that any Environmental Permit issued for this site should contain conditions to ensure adequate risk assessment, including an accident management plan are undertaken.”</i> <p>Further comments were received from the consultee on 10th October 2018 highlighting the potential to limit the installation of further diesel generators until such a time as the improvement conditions had been satisfactorily met.</p>
Summary of actions taken or show how this has been covered
<p>We have discussed with the consultee that the facility is an existing and operational site which now requires permitting because of the extent of its combustion activities. Our ability to require improvements from the operator are limited until the permit is issued. Once issued, we can, through improvement conditions, require the operator to improve operation and reduce emissions or enhance dispersion. Improvement Conditions have been included in the permit requiring the operator to:</p> <ul style="list-style-type: none"> - Produce an Air Quality Management Plan in conjunction with the local authority outlining

measures to be taken in the event of National Grid failure;

- Carry out analysis of emissions from generators at site loads during testing, maintenance and emergency scenarios and use this data to reassess the atmospheric dispersion modelling to produce a more realistic prediction of air quality around the site rather than the worst case scenario presented in the application;
- Confirm the short term nitrogen dioxide levels predicted in the reassessed air dispersion modelling.

Using this information, the operator is required to investigate how to reduce nitrogen dioxide emissions or improve atmospheric dispersion by changes to the generator testing regimes, stack height or stack orientation.

A Pre-Operational Measure has been included in the permit requiring the operator to submit a detailed design report to the Environment Agency prior to installation of any new generators that will address the generator type, emission levels, stack height and orientation in order to ensure that emissions are reduced and/or air dispersion is enhanced.

We are satisfied that the issue of predicted levels of nitrogen dioxide exceeding short-term exposure limits can be addressed through improvement conditions as our audit of the air dispersion modelling submitted in the application found that, although exceedances of short term nitrogen dioxide limits at local receptors were predicted during periods of routine generator maintenance, the probability of these exceedance hours coinciding with worst meteorological hours during maintenance scenarios was low.

The site has a fire suppression system in place across the site as is the case for any facility in the datacentre.

Response received from
Director of Public Health, Hertfordshire County Council
Brief summary of issues raised
The comments raised by Public Health England (PHE) were shared with the Director of Public Health (DPH) as PHE specifically requested that we consult DPH (although we had already commenced this process). DPH indicated that, based on the conclusions of the air dispersion modelling report, they had concerns on potential impact on local air quality and believed that actual monitoring data might be required to allow a more realistic view on local impact. DPH also requested that further information be sought on the noise levels produced by the generators in the individual testing regimes proposed.
Summary of actions taken or show how this has been covered
Improvement Conditions have been included in the permit requiring the operator to: <ul style="list-style-type: none">- Produce an Air Quality Management Plan in conjunction with the local authority outlining measures to be taken in the event of National Grid failure;- Carry out analysis of emissions from generators at site loads during testing, maintenance and emergency scenarios and use this data to reassess the atmospheric dispersion modelling to produce a more realistic prediction of air quality around the site rather than the worst case scenario presented in the application;- Confirm the short term nitrogen dioxide levels predicted in the reassessed air dispersion modelling. Using this information, the operator is required to investigate how to reduce NO₂ emissions or improve atmospheric dispersion by changes to the generator testing regimes, stack height or stack orientation. A Pre-Operational Measure has been included in the permit requiring the operator to submit a detailed design report to the Environment Agency prior to installation of any new generators that will address the generator type, emission levels, stack height and orientation in order to ensure that emissions are reduced and/or air dispersion is enhanced. We are satisfied that the issue of predicted levels of NO ₂ exceeding short-term exposure limits can be addressed through improvement conditions as our audit of the air dispersion modelling submitted in the application found that, although exceedances of short term NO ₂ limits at local receptors were predicted during periods of routine generator maintenance, the probability of the NO ₂ exceedance hours coinciding with worst meteorological hours during maintenance scenarios was low.

An Improvement Condition is also included in the permit for the operator to submit a more detailed noise assessment of the operation of the site (including generators) along with a review of whether any further noise abatement measures are required and a timescale for their implementation.

Response received from
Natural England
Brief summary of issues raised
Consultee noted that the application was within the distance criteria for it to affect Tewinbury Site of Special Scientific Interest (SSSI). They were satisfied, based on the factors noted by the Environment Agency in the Formal Notice, that the operations, if undertaken in strict adherence to the submitted proposals, would avoid adverse effects upon the interest features for which the SSSI is notified. These factors included: <ul style="list-style-type: none">- The limited number of Grid failures that would trigger operation of the emergency generators;- The resilience level of 2n, meaning only half the generators were required to operate in a loss of National Grid power scenario;- The conservative assumptions on generator loading, duration of operation and meteorological conditions used by the applicant in the air dispersion modelling;- The potential for optimisation of generators and emission stacks to improve air dispersion.
Summary of actions taken or show how this has been covered
We have inserted Improvement Condition, IC7, requiring the operator to investigate how to reduce nitrogen dioxide emissions or improve atmospheric dispersion by changes to the generator testing regimes, stack height or stack orientation.

Response received from
Welwyn Hatfield Borough Council (incorporating Planning & Environmental Health Departments)
Brief summary of issues raised
Consultee noted that the Council was not aware of any noise or amenity issues at the site and there were currently no enforcement issues at the property. The Council therefore had no comments to make on the application.
Summary of actions taken or show how this has been covered
Improvement Condition, IC3, to undertake a noise assessment using BS 4142:2014 guidelines during periods of generator testing, maintenance and emergency scenarios and submit to the Environment Agency for approval a report including proposals for further noise control and abatement if required.

Response received from
Hertfordshire Fire & Rescue Service
Brief summary of issues raised
The consultee stated they had no comments to make in relation to this application.
Summary of actions taken or show how this has been covered
No further action.

No representations received from:

- Food Standards Agency
- Health & Safety Executive
- Thames Water Utilities Limited