

Permitting decisions

Bespoke permit

We have decided to grant the permit for Spring Park Data Centre operated by Ark Data Centres Limited.

The permit number is EPR/PP3003PW.

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

1. The site

Ark Data Centres Limited operates a data centre consisting of 5 units known as SQ17, P1, P2, P3 and P4 located on Westwells Road within the Spring Park industrial estate. Electricity for operation of the data centres is provided by five connections to the National Grid. Due to the need to ensure availability of uninterrupted power supply at all times, the site incorporates 33 diesel-fired standby generators. The total thermal input of the 33 standby generators is 5 generators of 3.9 MWth and 10 generators of 2.7 MWth 12 generators of 3.6MWth and 6 generators of 5.1 MWth (approximately 120MWth in total). The redundancy of the standby generators on site is “N+1”, which means there is one generator more than would be required to provide the total power for the site in event of external power failure.

This facility consists of the following scheduled activity under the Environmental Permitting (England and Wales) Regulations 2016: Section 1.1 A(1) (a): Burning any fuel in an appliance with a rated thermal input of 50 megawatts or more.

Chapter III of the Industrial Emissions Directive (IED) covers the requirements of the previous Large Combustion Plant Directive. The combustion units are not subject to Chapter III as no single unit size is >15 MW thermal input. The activity is therefore regulated under Chapter II of the IED.

For medium combustion plants which are part of an installation covered by Chapter II of Directive 2010/75/EU, the requirements of Article 5 of the MCPD shall be deemed to be fulfilled through compliance with that Directive. In line with Article 6 of the MCPD, this site is a medium combustion plant regulated under Chapter II, the relevant MCPD emissions limits will apply.

2. Best Available techniques (BAT)

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

They considered the following technologies:

- Diesel-fired generators
- Natural gas-fired generators (spark ignition)
- Natural Gas Turbine
- Aero-Derivative

Against the following requirements for data centre plant

- Start-up time
- Reaction to load changes
- Fuel volatility
- Fuel Storage
- Maintenance
- Cost

The Applicant demonstrated that in comparison to other technologies, Diesel engines were more suitable for the criteria set out under data centre guidance and standards. Diesel had the fastest start time, better reaction to load changes, lower risk fuel supply and low maintenance frequencies. Based on this assessment and that diesel generators are presently a commonly used technology for standby generators in data centres, we accept that oil fired diesel generators can be considered BAT.

3. Hours of operation

The Applicant intends to plan their maintenance and proposes operation of 33 generators which will be less than 500 hours. Operation of the generators includes:

- Every month one group of standby generators is tested.
- Annually a full service test is undertaken where one stand-by diesel generator is started and loaded using a load bank. Only one generator is tested per day;
- In the event of main power supply (grid failure).

In 10 years of operation there has been no grid event that has caused all the standby generators to start simultaneously and the maximum number of hours generators have been required to run in an emergency scenario has been 4 hours.

4. Air Quality

The Applicant submitted two air dispersion modelling assessments; report June 2019 and a revised report August 2019. The revised August 2019 report assessed the potential impact of emissions from the generators on local air quality. The pollutants associated with the generators, as provided by the generator manufacturers are nitrogen oxides (NO_x), carbon monoxide (CO), particulate matter (PM₁₀), Sulphur Dioxide (SO₂) and formaldehyde (CH₂O). The assessment therefore focuses on these pollutants. The data centre is not situated in an Air Quality Management Area (AQMA) and there are no AQMAs within 2km of the site.

We audited the air dispersion modelling and report submitted with the permit application. Both the maintenance testing and emergency scenarios within the modelling were assessed.

The Applicant modelled three operational events.

- Event 1 (Engine Test Scenario)
Currently the standby generators are tested on a rotating basis. Every Saturday morning every month, one group of standby generators is tested, which includes running four generators simultaneously to an off-load power for 10 minutes. On the third month, this differs with every Saturday morning one group of standby generators is tested, which includes running four generators simultaneously to an on-load power (up to 80%) for 15 minutes.
- Event 2 (Engine Annual Service Test Scenario)
Annually a full-Service Test is undertaken where one stand-by diesel generator is started, loaded using a load bank. This scenario is usually undertaken over a two-hour period, only one generator is tested per day.
- Event 3. (National Grid Outage Event Scenario)
Operation of all generators in a National Grid outage scenario.

4.1 Human receptors

4.1.1 Applicant's assessment

For human receptors the Applicant's revised report dated August 2019 concluded overall there will be no notable discomfort, irritation, or certain asymptomatic non-sensory effects at any of the nearest human receptors. The Applicant has chosen to assess each operational event against the Acute Exposure Guideline Levels (AEGs) and concluded the following:

Event 1

- Concentrations are below the relevant AEGLs. As such, predicted effects at all off-site receptors from Event 1 are unlikely to cause a notable discomfort, irritation, or certain asymptomatic non-sensory effects.
- Concentrations of NO₂ are below the AEGL 1-hour (60min). As such, predicted effects at all receptors from Event 1 are unlikely to cause a notable discomfort, irritation, or certain asymptomatic non-sensory effects.

Event 2

- Concentrations are below the relevant AEGLs. As such, predicted effects at all off-site receptors from Event 2 are unlikely to cause a notable discomfort, irritation, or certain asymptomatic non-sensory effects.
- Concentrations are below the relevant 1-hour AEGL. As such, predicted effects at all receptors from Event 2 are unlikely to cause a notable discomfort, irritation, or certain asymptomatic non-sensory effects.

Event 3

- Predicted 1-hour NO₂ concentrations for Event 3 are likely to meet the Environmental Quality Standard (EQS) at all receptor locations should the generators operate for a 5-day period in an emergency.
- The maximum rolling 8 hour mean for CH₂O exceeds the EQS at all receptor locations considered under Event 3 conditions, these impacts will be short-lived and not long lasting.
- Concentrations of NO₂, CO and CH₂O are below the AEGL 1-hour. As such, predicted effects at all receptors from Event 3 are unlikely to cause a notable discomfort, irritation, or certain asymptomatic non-sensory effects.
- The Applicant confirmed the maximum number of hours these generators have been used in an emergency over the last 10 years, is 4 hours. As such they concluded that the modelling of 120 hours is conservative. If all generators run at 100% load the impacts would remain 'insignificant' after 19 hours of continuous running.

4.1.2 Environment Agency dispersion modelling assessment

We have audited the Applicant's air dispersion modelling and, based on the following, we are satisfied that the proposed emergency generator operating scenarios under Events 1, 2 and 3 are unlikely to result in an exceedance of the long-term and short-term environmental standards at sensitive human health receptor locations.

4.1.2.1 Environment Agency Audit of Applicant's modelling

The Applicant submitted a revised air dispersion modelling report (August 2019) and based on revised emission rates the Applicant has presented their process contributions (PCs) at discrete receptors against AEGLs for Event 1, 2 and 3, and the short-term PCs against relevant Environmental Standards (ES) for Event 3.

Based on these updated predictions, we observed that:

- For Event 1 and 2, they have not provided predictions against the short-term 99.79th percentile ES for NO₂.
- For Event 1, 2 and 3, the Applicant predicts no exceedances of the AEGLs for NO₂, CO, and CH₂O at their discrete receptor locations.

- For Event 3, the predicted short-term NO₂ PCs are 'not insignificant'. The highest predicted hourly short-term NO₂ PC of 249.1 µg/m³ exceeds the ES (i.e. 124.6% of the short term ES).

Although the "rolling 120 hour" short-term NO₂ PCs are 'not insignificant', Predicted Environmental Concentrations (PECs) are not presented. They did not explained what percentiles they calculated to derive these results.

- We had to test the sensitivity to the number of exceedance hours using hypergeometric probability distribution for short-term NO₂.
- They stated that "the maximum rolling 8-hour mean CH₂O exceeds the EQS at all receptor locations considered under Event 3 conditions, these impacts will be short-lived and not long lasting". However, there is no 8 hour mean CH₂O ES but 8-hour CH₂O AEGL.
- The predicted 1-hour CH₂O PCs are 'not insignificant' but PECs are not presented against ES of 100 µg/m³.
- The predicted 8-hour mean CO PCs are 'insignificant'.
- The Applicant did not assess impacts against the ES for nitrogen monoxide (NO ES of 310 µg/m³ annual average and 4400 µg/m³ hourly mean).

4.1.2.2 Environment Agency dispersion modelling sensitivity and check modelling

As the Applicant's revised August 2019 report was not entirely satisfactory we carried out detailed check dispersion modelling and sensitivity analysis using ADMS Version 5.2 to Event 1 and 2 (Service test scenarios), and Event 3 (Grid outage scenario).

We also undertook check modelling with sensitivity analysis to our own observations, which included:

- Our own meteorological data.
- Surface roughness.
- Individual generator stacks.
- Our own calculated emission rates and source parameters for all individual diesel generators based on manufacturer's specifications.
- Our own calculation of number of exceedance hours and probability of these exceedances coinciding with worst meteorological conditions for event 3.
- Our worst case 70% long-term and 35% short-term, and the less conservative 15% short-term NO_x to NO₂ conversion.
- Predictions at an additional location of potential human exposure to NO₂, NO, CO and CH₂O against the environmental standards not considered by the Applicant.

Event 1 (test scenario) and Event 2 (annual service test scenario),

We found that:

- There is unlikely to be any exceedance of the long-term and short-term environmental standards at sensitive human health receptor locations.

Event 3 (grid outage event scenario),

We found that:

- There is unlikely to be an exceedance of the long-term and short-term environmental standards at sensitive human health receptor locations.

4.2 Ecological receptors

4.2.1 Applicant's assessment

The Applicant assessed each operational event and concluded that emissions would be insignificant at all ecological receptors.

Event 1 and Event 2

The Applicant assessed event 1 and 2 and concluded the following:

- The annual mean and short term NO_x PC is below the EA criteria for insignificant impacts at all ecological receptors.
- The nitrogen deposition PC is below the EA criteria for insignificant impacts at all ecological receptors.
- The acid deposition PC is below the EA criteria for insignificant impacts at all ecological receptors.

Event 3 - Submission of two reports with different approaches

The Applicant submitted two air dispersion modelling reports during the application process both taking very different approaches when considering impacts to ecological receptors.

June 2019 report

The Applicant submitted an original report June 2019. During our assessment we determined we were not satisfied the emission inputs were representative.

This concluded that for Event 3 which is considered the worst case scenario with all diesel generators operating:

- The Applicant predicted NO_x concentrations for Event 3 below the annual mean EQS of 30µg/m³ at Bath and Bradford upon Avon Bats SAC for all meteorological years. The PCs are below the EA criteria for insignificant impacts (<1% of long term environmental standard).
- Predicted SO₂ concentrations for Event 3 are below the annual mean EQS of 20µg/m³ at all ecological receptor locations for all meteorological years. The PCs are below the EA criteria for insignificant impacts (<10% of short term environmental standard).
- Predicted Nitrogen Deposition PCs are below the EA criteria for insignificant impacts (<1% of critical load) for both the high and low limits at all ecological receptors. It is considered the impact from the operation of the standby generators is insignificant at all ecological receptors.
- The PCs are below the EA criteria for insignificant impacts (<1% of critical level) for the min and max Limit at all ecological receptors. It is considered the impact from the operation of the standby generators is insignificant at all ecological receptors.

August 2019 Report

As the Environment Agency were not satisfied with the June 2019 emissions inputs, the Applicant submitted revised modelling in August 2019. This concluded for Event 3 that NO_x concentrations are below the annual mean EQS of 75µg/m³ at all ecological receptor locations for all meteorological years except for Kingsmoor Wood Local Wildlife Site and Ancient Woodland receptor. As such, predicted effects on daily mean NO_x concentrations from Event 3 are insignificant at all ecological receptors except Kingsmoor Wood. However as stated previously it is unlikely that the emergency operation would last for more than 4 hours.

The August 2019 version of the Applicant's report did not provide updated predictions for SO₂, Nutrient Nitrogen and acid deposition. The Applicant only provided daily NO_x to demonstrate no short term impact.

They stated that

"Given the short-term nature of the emissions the assessment has not been considered for nutrient nitrogen and acid depositions on sensitive habitats as these are based on annual average concentrations".

4.2.2 Environment Agency dispersion modelling assessment

We have audited the Applicant's air dispersion modelling and, based on the following, we are satisfied that the proposed emergency generator operating scenarios under Events 1,2 and 3 are unlikely under the worst case proposal Event 3 (which is the most unlikely scenario) will significantly impact on the protected sites.

4.2.2.1 Environment Agency Audit of Applicant's modelling

The Applicant considered twenty ecological receptor locations within the 2 km and 10 km habitat screening distances for Site of Special Scientific Interest (SSSI), European and local nature sites.

We have checked the locations of these receptors and included two more ecological and local nature receptors within the appropriate screening distances. These are as follows:

- Corsham Railway Cutting SSSI, and
- Hazelbury Common LWS.

We have performed sensitivity checks at receptor locations within these additional ecological and local nature receptors.

- When considering the impacts on ecological sites the Applicant has used APIS¹ to identify the feature habitats, background concentrations and relevant critical levels and critical loads. They calculated nutrient nitrogen and acid depositions following AQTAG06 guidance². We have reviewed these values as part of our checks.
- They have not provided the updated predictions at the relevant European and SSSI site locations for annual NO_x critical level, nutrient nitrogen and acid depositions critical loads. They stated that "Given the short-term nature of the emissions the assessment has not been considered for nutrient nitrogen and acid depositions on sensitive habitats as these are based on annual average concentrations". We observe that while their original report had provided these predictions, those numerical predictions were based on unrepresentative emission rates.
- Based on these updated predictions, we observe that:
 - The predicted annual NO_x and SO₂ PCs are all 'insignificant' (less than the 1% significance criteria) against critical level at local nature sites for Event 1 and 2.
 - The predicted annual NO_x PCs are 'not significant' (less than 100% threshold), and the predicted annual SO₂ PCs are 'insignificant' against the critical level at local nature sites for Event 3.
 - They have not presented their predicted daily NO_x PCs against the critical level for Event 1 and 2.
 - The predicted daily NO_x PCs are 'insignificant' (less than the 10% significance criteria) against the critical level at some ecological receptor locations for Event 3.
 - Predictions are 'not significant' at the rest of ecological receptors except at Kingsmoor Wood LWS and AW for Event 3.
 - The highest predicted PC is 'not insignificant' (108.46%) and PEC is significant (140.74%) at Kingsmoor Wood LWS and AW.

¹ Air Pollution Information System (APIS) website. Available at www.apis.ac.uk

² AQTAG06 Technical guidance on detailed modelling approach for an appropriate assessment for emissions to air, March 2014

4.2.2.2 Environment Agency dispersion modelling sensitivity and check modelling

Neither report produced by the Applicant's consultant was satisfactory, we therefore had to carry out detailed check dispersion modelling and sensitivity analysis using ADMS Version 5.2 to Event 1 and 2 (Service test scenarios), and Event 3 (grid outage scenario).

Our own observations included:

- Our own meteorological data
- Surface roughness value
- Individual generator stacks
- Our own calculated emission rates and source parameters for all individual diesel generators based on manufacturer's specifications
- Predictions at ecological receptor locations to NO_x, SO₂, nutrient nitrogen and acid depositions.

Event 1 (test scenario) and Event 2 (annual service test scenario)

We found that:

- For all parameters, the impacts at ecological receptors are insignificant.

Event 3 (grid outage event scenario)

We found that:

- The annual atmospheric NO_x and SO₂ impacts at ecological receptors are unlikely to be significant against the critical levels.
- The nutrient nitrogen and acid deposition impacts are unlikely to be significant at ecological sites against the critical loads.
- There are potential exceedances of daily NO_x critical level at Bath and Bradford upon Avon Bats SAC, Box Mine SSSI, Chapel Plaister Verge LWS, Kingsmoor Wood LWS and Box Hill Common LWS.
- The daily NO_x impacts at the rest of the ecological receptors are unlikely to be significant against the critical levels.

Event 3 further assessment

For the daily NO_x impact for Event 3, we calculated the maximum 1 hourly (100th percentile) emission concentrations at the ecological receptors and averaged them to 4 hours of operation in a day. This a very conservative assumption.

As a result, we can conclude that there is a potential to exceed daily environmental standards at Bath and Bradford upon Avon Bats SAC, Box Mine SSSI, Chapel Plaister Verge LWS, Kingsmoor Wood LWS and Box Hill Common LWS receptor locations if power outage is prolonged for longer than 4 hours in a year. However past operations indicate that the risk of power outage is low, based on the stated 4 hours of operation over the past 10 year (refer to section 5 for further information on reducing emissions from the emergency scenario Event 3).

5. Emissions management

Retrofitting 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 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 2000mg/m³.

To ensure emissions are minimised the Applicant has demonstrated that:

- Multiple measures are in place to minimise the risk of National Grid supply failure including multiple grid connection and management systems for preventing data centre failure (see section 6 on uptime).
- Ark Date Centres Limited operates the management systems aligned and certified to the following standards;
 - ISO 9001:2015 – Quality Management System
 - ISO 27001: 2013 – Information Security Management System
 - ISO 22301:2012 – Business Continuity Management System
 - ISO 14001:2015 – Environmental Management System
 - ISO 50001:2011 – Energy Management System
- The site has moved from using a low voltage (LV) standby generating solution to a high voltage (HV) standby generating solution. This has resulted in a 31% reduction in installed generation capacity. This reduction in capacity leads, by its nature, to reduced fuel storage requirements, along with reduced air and noise pollution potential.
- In 10 years of operation there has been no grid event that has caused all the standby generators to start simultaneously. Over the same period there has been one on site power failure, during a thunder storm that impacted Module 1 of P1 causing the 3 standby generators associated with this module to start.

Further to this the Environment Agency has specified in IC 1 that the Operator shall have a written air quality action plan to manage the prolonged emergency running of the plant. This will include a sensitive receptors list, review of mitigation and evaluation against modelled risk conditions. 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.

6. Uptime

In addition to the above ISO standards and best practice, Ark Data Centres Limited operate in line with the principles of the Uptime Institute, an industry assessment of the maintenance and operation of Data Centres. They are deployed to meet the requirements of a Tier III concurrently maintainable facility (as defined by the Uptime Institute).

With regards to security, the site is accredited to ISO27001, the information security management system standard. This is to help ensure that the site maintains its assets in a manner to reduce the risk of unplanned downtime, and subsequent standby generator operation, due to issues such as security breaches. The site also has security infrastructure and a 24-hour on-site security presence.

The operator will put multiple measures in place to minimise the risk of failure including:

- Five supplies to Spring Park are operated as two concurrently maintainable supply systems.
- Data centres SQ17, P1 and P2 are supplied via two 40MVA supplies both (A and B) from the SEE Norrington Primary Substation, capable of supplying 40MVA on a single supply. This means that the emergency standby generator will only start if both the grid supplies fail.
- Data centres P3 and P4 are supplied via three 24MVA supplies (A, B and C) from SSE Norrington primary substation, capable of supplying 48MVA via any two of the three supplies. The standby generator will only start if two of the three grid supplies fail.
- For all emergency generators to start simultaneously three of the five supplies to site need to fail simultaneously.

7. Protection of groundwater through containment measures

The Ark distributed fuel storage system adopted by the Applicant has a number of benefits over the more traditional bulk storage systems:

- It stores some 30% less fuel than equivalent bulk storage systems for 72 hours of operating resilience.
- As the fuel is deployed in smaller segregated units that are only connected “if required”, fuel contamination or major leaks are confined to single small tanks rather than a large one. This significantly reduces the risk of contamination and leakage risks further.

7.1 Fuel Containment

- Fuel is deployed in small segregated units, each generator set has a double skinned belly tank manufactured to BS 799: Part 5 Type J (2010) and meets all requirements as set out in Oil Storage Regulations (2001).
- Diesel tanks are sized to meet the operating requirement of the standby generator. They have secondary containment in the form of an outer tank which is sized to hold the volume of the inner tank (brimful) plus 20%.
- All fuel fill points are bunded.
- Each set of three tanks is interconnected such that they can supply all three standby generators, at full load for 72 hours. Where belly tanks are interconnected (SQ17, P1 and P2), the pipework is ‘Pipe-in-Pipe’ with isolation valves contained within an enclosure complete with leak detection located on each tank.
- Tanks are kept isolated unless fuel needs to be transferred between tanks to minimise leaks via interconnecting pipework.
- The tanks contain a leak detection float switch that is linked to the tank alarm located within the fill point cabinet. The alarm in the fill point cabinet is fed back to the generator controller and then into the facility Energy Monitoring System.
- Each set of generators is housed within bunded containers with sufficient capacity to contain a complete loss of fluids held within the generator/engine.
- 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 to manage access, and vehicle movements are minimal.
- Spill Kits are distributed at every set of generators, minimum 1 wheelie bin kit for every two generators.

7.2 Surfacing, drainage tertiary containment

Surface water is managed at the site through number of different methods including discharge to Westwells Road public sewer, soakaways and an infiltration pond.

- Runoff from the roofs of all four data centre buildings and external areas to P1, P3 and P4 is disposed of through attenuation and soakaway.
- Hard standing areas surrounding P2 drain to Westwells Road public sewer via petrol interceptor.
- Hard standing area surrounding standby generation plant will connect to Westwells Road public sewer via petrol interceptor.
- The Applicant has confirmed that they have oil interceptors installed on the drainage system surrounding the fuel tank/fill points.

The Applicant stated that the geology of the site is fissured limestone strata, therefore free draining. It is therefore very important that there are no diesel leaks on site that can drain directly into groundwater. The most vulnerable areas on site for potential drainage would be the site soakaways and infiltration pond.

The site drainage plans suggests that some of the runoff from areas from building SQ17 and P1 where generators are located do not pass through an interceptor prior to discharge to soak away or infiltration pond.

To manage these risk the Applicant has demonstrated that they will prevent spillage through robust diesel storage, handling and distribution systems with internal and external inspection and maintenances systems to ensure the risk of diesel leaks and spills are low (refer to fuel containment section 7.1 above).

7.3 Environment Agency Assessment of drainage and containment

We have reviewed the Applicant's secondary containment proposals and based on the Applicant's proposals as summarised above in section 7.1, we are satisfied that the site's secondary containment is adequate to manage the risk posed.

We are not satisfied that the tertiary containment and drainage are in a suitable state and that their design entirely meets the requirements of the industry standards. To ensure contaminated drainage does not have an adverse impact, we have included improvement conditions within the permit.

We have included improvement condition IC2 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.

We have also included IC3 in the permit which requires the operator to review their use and location of the site soakaways and infiltration ponds which are free draining to ground. They must review the measures in place to protect these features in the event of a diesel spill and implemented the finding of their review as agreed with the Environment Agency.

8. 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 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.

9. Noise

The Applicant has identified that the risk of impact from noise is low and that measures are in place to minimise noise. These include

- Large backup electricity generators associated with main power failure for all buildings are installed at ground level, within individual high performance acoustically attenuated enclosures and with silenced exhausts.
- The engines also undergo regular maintenance to minimise noise.
- 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 Applicant 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.

9.1 Applicant’s noise assessment

The applicant assessed the following scenarios.

‘Normal Operation’ - assesses acoustic impact of plant which will normally be running, such as the internal plant rooms with associated ventilation inlet and outlet louvers at the buildings’ facades.

The ‘Emergency Backup’ scenario assesses the acoustic impact of the extremely unlikely event of roof-mounted air cooled condensing units associated with emergency cooling system operation and ground level backup electricity generators operation associated with main power failure occurring simultaneously.

9.2 Applicant’s conclusions

The Applicant’s report concluded that the ‘normal operations’ are not expected to have an adverse noise impact at the nearest and most exposed noise-sensitive receptors, when assessed in accordance with BS4142:2014.

The Applicant’s report concluded that ‘combined backup and emergency operation’ would have a significant adverse noise impact when assessed in accordance with BS4142:2014. However, taking into account the emergency and very occasional occurrence of this scenario, it is considered appropriate to extend the Assessment to comply with BS8233:2014/WHO Guidelines. This Assessment has found that in the worst-case scenario of all emergency plant from all buildings operating at the same time, the BS8233:2014/WHO Guidelines at external amenity areas are generally achieved. The Indoor Ambient Noise Levels targets are slightly exceeded at some properties, but they would remain within the +5 dB at which ‘reasonable’ acoustic conditions can be expected. Only at one detached property to the south is the target for good acoustic conditions exceeded by a larger margin (+6 dB), which is only +1 dB above the ‘reasonable’ acoustic conditions target.

Based on the absolute worst-case scenario assessed (the extremely unlikely event of all emergency cooling plant and all standby generators operating at the same time), and the minimal exceedance of the WHO/S8233 targets in one case, their assessment concluded that the ‘emergency operation’ of the plant will not produce a significant adverse noise effect at the nearest sensitive receptors.

9.3 Environment Agency noise assessment audit

We have audited the Applicant's acoustic modelling report and, based on the following, we are satisfied that the proposed emergency generator operating scenarios 'Normal Operation' and 'Emergency Backup' scenarios are unlikely to result in a significant impact on sensitive receptors.

Our audit determined that the proposal was low risk. For normal operations, with the only sound emitted coming from the building ventilation louvres, the BS4142 numerical impacts at all local receptors (night and day) will be low (below 0 dBA). As emergency backup conditions will be short term and an unlikely scenario lasting worst case for a few days at most, we are satisfied that this scenario is unlikely to result in a significant impact.

We are therefore satisfied that a noise management plan is not required at present however permit condition 3.4 enables the Environment Agency to request one if considered necessary in the future.

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	<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> <p>Local Authority Environmental Health</p> <p>Health and Safety Executive</p> <p>Sewerage authority</p> <p>Public Health England</p> <p>Director of Public Health</p> <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	
The regulated facility	<p>We considered the extent and nature of the facility/facilities at the site in accordance with RGN2 'Understanding the meaning of regulated facility', Appendix 2 of RGN 2 'Defining the scope of the installation'.</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	The operator has provided a description of the condition of the site, which we consider is satisfactory. The decision was taken in accordance with our guidance on site condition reports and baseline reporting under the Industrial Emissions Directive.

Aspect considered	Decision
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>The following operational controls and conditions have been placed on the permit to protect the following SAC and SSSI and local wildlife sites:</p> <ul style="list-style-type: none"> • Restrictions on operational hours (emergency plant) • Improvement conditions (see key issues) <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, however we have included improvement conditions to ensure additional considerations of risk relating to emissions to air are considered on an ongoing basis.</p> <p>See key issues section above.</p>
Operating techniques	
General operating techniques	<p>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.</p> <p>The operating techniques that the applicant must use are specified in table S1.2 in the environmental permit.</p>
Operating techniques for emissions that do not screen out as insignificant	<p>Emissions of nitrogen dioxide (NO₂) cannot be screened out as insignificant.</p> <p>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 (refer to key issues section).</p>
Operating techniques for emissions that screen out as insignificant.	<p>Emissions of PM₁₀, CO, CH₂O, and SO₂ have been screened out as insignificant, and so we agree that the applicant's proposed techniques are BAT for the installation.</p> <p>We consider that the emission limits included in the installation permit reflect the BAT for the sector.</p>
Permit conditions	
Improvement programme	<p>Based on the information on the application, we consider that we need to impose an improvement programme.</p> <p>See key issues</p> <p>We have not inserted improvement conditions relating to further NO_x and BAT assessment in this case because we are satisfied:</p>

Aspect considered	Decision
	<ul style="list-style-type: none"> • It is unlikely environmental standards will be breached • The air quality modelling assessment is sufficient to determine air quality impacts. Therefore further validation of predictions in the application is not required • We have determined that the site specifics including location, distance from receptors and site generation equipment set up do not warrant the inclusion of these conditions • The air quality plan required by improvement conditions IC1 is sufficient to ensure the site has appropriate measures in place to minimise the impact of emissions in the event of a grid failure.
Emission limits	We have decided that emission limits are not required in the permit. See <u>key issues</u> section 8 of this document.
Monitoring	<p>We have decided that monitoring should be carried out for the parameters listed in the permit, using the methods detailed and to the frequencies specified.</p> <p>These monitoring requirements have been imposed in order to ensure no loss of diesel off-site in surface water discharges.</p>
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 permits.</p>
Relevant convictions	<p>The Case Management System and National Enforcement Database 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</p>

Aspect considered	Decision
	<p>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
Wessex Water
Brief summary of issues raised
No comments as these proposals do not appear to affect their infrastructures.
Summary of actions taken or show how this has been covered
No further action taken.

Response received from
PHE
Brief summary of issues raised
Raised no significant concerns regarding risk to health of the local population from this proposed activity, providing that the application take all appropriate measures o prevent or control pollution in accordance with the relevant sector technical standard or industry best practice.
Summary of actions taken or show how this has been covered
No further action taken.