

## Permitting Decisions- Variation (substantial)

---

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

The variation number is EPR/PP3003PW/V003.

The variation is to increase the number of emergency standby generators:

From 54, with a total thermal input of approximately 237.6 MWth;

To 70, with a total thermal input of approximately 328.2 MWth

The additional 16 engines will be in Facility SQ19.

An overview of the permitted generators is given in the table below;

Campus	Facility	Full IT Capacity (MW(IT))	Generator Capacities		EPR/PP3003PW/V003	
			Rating (e) (kW)	Rating (th) (kW)	No. of Units	Rating
						(th) (kW)
Spring Park	SQ17	4	1,600	3,956	2	7,912
			1,520	3,301	3	9,903
			1,760	4,381	3	13,143
	P1	4.5	1,000	2,717	10	27,170
	P2	9	1,464	3,656	12	43,872
	HV Gen	24	2,040	5,650	24	135,600
	SQ19	13.5	2,024	5,660	16	90,560
<b>Spring Park</b>		<b>41.5</b>			<b>70</b>	<b>328,160</b>

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

## Purpose of this document

This decision document provides a record of the decision-making process. It

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

Unless the decision document specifies otherwise we have accepted the applicant's proposals.

Read the permitting decisions in conjunction with the environmental permit and the variation notice.

## Key issues of the decision

### Testing regime & operation

The standby generators undergo testing on a rotating basis according to monthly, quarterly, and annual schedules, as specified in customer contracts. While the testing regimes for each facility are consistent, the specific timings vary.

#### Event 1 (a) Standby generator test (no load)

Each bank of standby generators is tested monthly when Event 1 (b) and Event 2 are not being undertaken. This involves simultaneous operation of the bank at 0% of full load for 15-minutes.

#### Event 1 (b) Standby generator test (80% load)

Each bank of standby generators is tested three times per annum. This involves simultaneous operation of the bank at 80% of full load for 15-minutes.

#### Event 2 Annual service test

Each generator is tested once per annum. This involves operation of a single generator at 100% of full load for 2 hours. No other engines are operational during this period.

#### Event 3 Grid outage event.

In the event of a power outage all standby generators would operate until supply is resumed. It has been assumed that operation would occur for a maximum of 72 hours. This is based on the resilience of the grid connections to the site, the

resilience of the on-site systems and the amount of fuel stored on site as part of contractual obligation.

The operator confirmed that the longest grid outage in the last 10 years was 4 hours.

## **Air Quality**

Dispersion modelling was conducted using ADMS-6. Impacts at sensitive receptors were quantified for three separate event scenarios (Event 1b, Event 2, and Event 3), with the results compared to the relevant environmental standard (ES).

Event 1(b) results in higher emissions than Event 1(a) due to the generators operating at a higher load. Therefore, Event 1(b) was the scenario considered throughout the modelling assessment.

We audited the air dispersion modelling and the report submitted with the permit application (*EHS Projects Limited. Air Quality Assessment. Redmore Environmental Limited. Document reference 3650-6r2. May 2023*).

Our audit focused on the impacts from NO<sub>x</sub>, as previous audits have demonstrated that other pollutants pose a low risk during testing, and the environmental risk does not significantly increase from the proposed SQ19 bank.

The predicted levels of NO<sub>x</sub> are considered in detail below.

### **Human health**

#### **Event 1 (b)**

The applicant predicted that the acute exposure guideline level (AEGL-1) for NO<sub>2</sub> would be exceeded at three receptor locations. However, this exceedance would only occur if operations coincide with the worst-case meteorological conditions, which the applicant considers unlikely.

The applicant has not considered the impacts of annual or hourly mean nitrogen monoxide (NO) in their assessment. Given that the NO<sub>2</sub> AEGL-1 is predicted to be exceeded under worst-case meteorological conditions, it is possible that the 1-hour NO ES could also be exceeded. We have considered the impacts of NO in our audit.

#### **Event 2**

The applicant predicted that there would be no exceedances.

#### **Event 3**

The applicant predicted exceedances of the 99.79th percentile 1-hour NO<sub>2</sub> ES if Event 3 coincides with the worst-case meteorological conditions. They used a

hypergeometric probability distribution to assess the likelihood of exceedances and predicted that there is less than a 5% chance of an exceedance, which they consider '*unlikely*'.

### **Long Term impacts**

The applicant does not predict exceedances of any long-term ES when considering the total emissions of all events over a year.

### **Ecological assessment**

Using Environment Agency guidance distance criteria, the applicant assessed 13 ecological receptors identified within 10 km for Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites; and 2 km for Sites of Special Scientific Interest (SSSI) and local nature sites. The ecological sites are Bath & Bradford-on-Avon Bats SAC, Box Mine SSSI, Corsham Railway Cutting SSSI, By Brook local wildlife site (LWS), Hungerford Wood LWS, Tilley's Wood LWS, White Wood Box LWS, Hazelbury Fields LWS, Privetts Wood LWS, Hazelbury Common LWS, Kingsmore Wood LWS, Botleaze Wood LWS and Cotties Wood LWS.

The applicant used AQTAG06 guidance to assess impacts against annual and daily mean NO<sub>x</sub> critical levels, as well as nutrient nitrogen and acid deposition critical loads for all events. They selected critical levels and critical load values using data from the APIS website. Our checks confirm that they selected appropriate values.

### **Short-term impacts**

The applicant did not provide numerical predictions for daily mean NO<sub>x</sub> for any event. Therefore, we have modelled our own numerical predictions for daily mean NO<sub>x</sub> in our audit.

### **Event 3**

The applicant predicted exceedances of the daily mean NO<sub>x</sub> critical level of 75 µg/m<sup>3</sup> at all ecological sites if a prolonged Event 3 coincides with the worst-case meteorological conditions. The applicant used a statistical analysis to assess the likelihood of exceedances, assuming 72 hours of outage events per year. They calculated a value of 0.5% at Corsham Railway Cutting SSSI. However, this calculation is not robust because it does not consider more than one exceedance day coinciding with any of the three operational days.

### **Long-term impacts**

The applicant assessed the cumulative impacts of all events over a year. They did not predict exceedances of the annual NO<sub>x</sub> critical level of 30 µg/m<sup>3</sup> and their

nutrient nitrogen and acid deposition PCs are insignificant against the site-specific critical loads at all ecological sites.

### **Environment Agency modelling checks**

- We conducted modelling checks and sensitivity analysis using the consultant's modelling files with ADMS 6. The sensitivity analysis in this audit included:
- Our own meteorological data observed at Lyneham meteorological station for the years 2016-2020.
- Assessment of 1-hour NO impacts
- Calculation of daily mean NO<sub>x</sub> PCs at ecological sites for all events

For both human health and ecological sites, our source attribution analysis indicates that the addition of the SQ19 bank does not significantly increase the existing environmental risk. The maximum short and long-term PCs for all events are predicted to be attributed to the existing HV bank.

### **Human health**

#### **Event 1 (b)**

We predict that the 10-minute NO<sub>2</sub> AEGL-1 will exceed at sensitive human health receptors if Event 1 coincides with the worst-case meteorological conditions. Exceedances are only predicted when the HV bank undergoes 80% loading testing, which occurs for 15 minutes, three times per year. Therefore, it is unlikely that this testing event will coincide with the worst-case meteorological conditions.

We do not predict exceedances of the 1-hour NO ES during Event 1, assuming the HV bank is not tested for more than 15 minutes.

#### **Event 3**

We find that exceedances of the 99.79th percentile 1-hour NO<sub>2</sub> ES are predicted if Event 3 coincides with the worst-case meteorological conditions. Using hypergeometric probability distribution, we calculate that based on 72 hours of operation per year, the likelihood of exceedances is less than 5%, which is unlikely.

We do not predict exceedances of the NO<sub>2</sub> AEGL-1 during Event 3. Despite more active SBGs during Event 3 compared to Event 1, predicted impacts are lower due to lower emission rates from the HV bank, as these SBGs operate at a reduced loading during Event 3

### **Long-term impacts**

We do not predict exceedances of any long-term ES.

## **Ecological assessment**

### **Event 1 (b)**

We predict exceedances of the daily mean NO<sub>x</sub> critical level of 75 µg/m<sup>3</sup> at Bath & Bradford on Avon Bats SAC and Box Mine SSSI if Event 1 coincides with the worst-case meteorological conditions. We do not predict exceedances of the higher daily mean NO<sub>x</sub> critical level of 200 µg/m<sup>3</sup>. Our analysis of available ozone and SO<sub>2</sub> background data indicates that the higher critical level applies to all ecological sites included in the assessment.

### **Event 3**

We predict that the daily mean NO<sub>x</sub> critical level of 75 µg/m<sup>3</sup> will be exceeded at all ecological sites included in the assessment if a prolonged Event 3 coincides with worst-case meteorological conditions. When applying the higher critical level of 200 µg/m<sup>3</sup>, we predict exceedances at all SACs, SSSIs, as well as White Wood Box LWS, Hazelbury Fields LWS, Privetts Wood LWS, Hazelbury Common LWS, and Kingsmoor Wood LWS.

Overall, we consider the likelihood of exceedances to be low, provided the grid reliability at the facility is high, although we have not reviewed any evidence of historical grid reliability at the facility to support this assumption.

### **Long-term impacts**

We do not predict exceedances of the annual NO<sub>x</sub> critical level of 30 µg/m<sup>3</sup>, and we find that nutrient nitrogen and acid deposition PCs are insignificant against the site-specific critical loads at all ecological sites.

## **Noise**

The engines are run for limited hours during testing, as described in Testing Events 1 to 3.

The applicant's noise monitoring report shows that, considering the noise reduction measures underway and in place, 'Normal Operations' are expected to have No Impact or a Low Adverse Noise Impact at the nearest and most exposed noise-sensitive receptors, when assessed in accordance with BS4142:2014.

The assessments of 'Emergency Generators Backup Operations' and 'Emergency Cooling Backup Operations' indicate a Low to Significant Adverse noise impact when evaluated according to BS4142:2014.

The applicant also extended the Assessment to comply with BS8233:2014/WHO Guidelines. The assessment finds that, in the worst-case scenario where all

emergency power generators from all buildings operate simultaneously, the BS8233:2014/WHO Guidelines for external amenity areas and Indoor Ambient Noise Levels targets are achieved at all nearby properties.

This scenario will not produce a significant adverse noise effect at the nearest noise-sensitive receptors. The assessments of 'Emergency Generators Maintenance Tests Operations' show a Low to No Adverse noise impact when evaluated according to BS4142:2014.

We have assessed the applicant's report and conclude that the installation poses a low risk regarding noise.

### **BAT**

We acknowledge that oil-fired diesel generators are currently a common technology for standby generators in data centres.

The default specification for new generators to minimize air emissions (NO<sub>x</sub>) is 2g TA-Luft (or an equivalent standard) or a NO<sub>x</sub> emission concentration of 2000 mg/m<sup>3</sup>.

The site's generators meet this standard. We agree with the operator that the engines are the Best Available Technique (BAT) for the proposed operation.

### **Protection of Groundwater**

The generators sit in containers on impermeable hard-standing. The surface water drainage system, linked to oil interceptors, protects any unmade ground from potentially polluting surface water runoff.

The fuel containment measures for the existing belly tanks in the original application will also apply to the additional belly tanks in this variation. Key measures include:

- The gas oil belly tanks have an outer tank designed to hold 120% of the inner tank's volume. There are no bulk storage tanks.
- The outer tank extends to provide bunding for the fuel fill points. High and low-level fill alarms are associated with the fill points. Spill kits are available at every set of generators, with at least one wheelie bin kit for every two generators.
- The outer tank has a leak detection float switch linked to a Hytek Tank Alarm, which connects to the generator controller and the facility's Energy Monitoring System.

- External balancing pipework interconnects the tanks, allowing them to share fuel if necessary. The pipework is 'pipe-in-pipe' according to the oil storage regulations (2001). Isolation valves and leak detection are fitted.
- Written procedures manage spills and leaks from the belly tanks, pipework, or delivery tankers. These include SOP.04.003 Fuel Transfer Procedure, EOP.04.003 COSSH Spill or Leak, and 14025-D-SP-PCP Spill Fire Water.

The Site Condition Report (SCR) supplied with the application (EPR/PP3003PW/A001) details the site's condition. The SCR considers the land where building SQ19 and the new engines are located.

### **Choice of fuel**

The operator will use either gas oil or HVO as fuel for the engines. The fuel must be gas oil or an equivalent substitute, approved in writing by the Environment Agency. It must have a sulphur concentration of 0.001% w/w.

### **Monitoring requirements**

We require the monitoring of carbon monoxide emissions from emission points Gen 01 to Gen 16 (new MCPs).

The first monitoring must occur within four months of the issue date of this variation or the date when the generators first operate, whichever is later. Subsequent monitoring must occur every 1,500 hours of operation or every five years, whichever comes first.

This monitoring is included in the permit to comply with MCPD requirements, which set the minimum standards for monitoring carbon monoxide emissions, regardless of the plant's reduced operating hours.

We also require the monitoring of NO<sub>x</sub> emissions from emission points Gen 01 to Gen 16 (new MCPs) with the same frequency as carbon monoxide emissions.

We have used our regulatory discretion to set this requirement. We believe that this limited monitoring, conducted alongside carbon monoxide monitoring, is proportionate to the risk posed by NO<sub>x</sub> emissions from the installation.

Considering the limited operating hours of the generators and the absence of emission limits for carbon monoxide and NO<sub>x</sub>, we believe this monitoring can follow the web guide 'Monitoring stack emissions: low risk MCPs and specified generators' published on 4<sup>th</sup> June 2024 February 2021 (formerly TGN M5).



## **Decision considerations**

### **Confidential information**

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

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

### **Identifying confidential information**

We have not identified information provided as part of the application that we consider to be confidential.

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

### **Consultation**

The consultation requirements were identified in accordance with the Environmental Permitting (England and Wales) Regulations (2016) and our public participation statement.

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

The application was publicised on the GOV.UK website.

We consulted the following organisations:

- Health and Safety Executive (HSE)
- Local Authority – Planning – Wiltshire Council
- Local Authority - Environmental Health – Wiltshire Council
- UK Health Security Agency (UKHSA)
- Food Standards Agency

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

### **The site**

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

These show the extent of the site of the facility including the discharge points. No additional land has been added as part of this variation. The plan was updated only to show the additional discharge points from the engines.

The plans show the location of the part of the installation to which this permit applies on that site.

The plan is included in the permit.

## **Nature conservation, landscape, heritage and protected species and habitat designations**

We have checked the location of the application to assess if it is within the screening distances we consider relevant for impacts on nature conservation, landscape, heritage and protected species and habitat designations. The application is within our screening distances for these designations.

We have assessed the application and its potential to affect sites of nature conservation, landscape, heritage and protected species and habitat designations identified in the nature conservation screening report as part of the permitting process.

We consider that the application will not affect any site of nature conservation, landscape and heritage, and/or protected species or habitats identified.

We have not consulted Natural England. A completed Habitats Risk Assessment Level 1 was sent to Natural England for Information Only.

The decision was taken in accordance with our guidance.

## **Environmental risk**

We have reviewed the operator's assessment of the environmental risk from the facility.

The operator's risk assessment is satisfactory.

## **General operating techniques**

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

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

## **Improvement programme**

Based on the information on the application, we consider that we need to include an improvement condition to ensure engines can be appropriately monitored.

IC8

The operator shall submit a monitoring plan for approval by the Environment Agency detailing their proposal for the implementation of the flue gas

monitoring requirements specified in Table S3.1, in line with web guide 'Monitoring stack emissions: low risk MCPs and specified generators' Published 4<sup>th</sup> February 2024 (formerly known as TGN M5). The plan shall include, but not limited to:

- Where the generators are not fitted with sampling ports, a proposal to install them within the shortest practical timeline;

Details of any relevant safety, cost and operational constraints affecting the monitoring regime, in support of any proposed deviation from the testing regime specified in table S3.1.

## **Emission limits**

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

## **Monitoring**

We have decided that monitoring should be added for the following parameters, using the methods detailed and to the frequencies specified:

- Oxides of Nitrogen (NO and NO<sub>2</sub> expressed as NO<sub>2</sub>)
- Carbon monoxide

See Key Issues section for further details.

## **Reporting**

We have added reporting in the permit for the following parameters:

- Oxides of Nitrogen (NO and NO<sub>2</sub> expressed as NO<sub>2</sub>)
- Carbon Monoxide

See Key Issues section for further details.

## **Management system**

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

The decision was taken in accordance with the guidance on operator competence and how to develop a management system for environmental permits.

## **Growth duty**

We have considered our duty to have regard to the desirability of promoting economic growth set out in section 108(1) of the Deregulation Act 2015 and the guidance issued under section 110 of that Act in deciding whether to grant this permit variation.

Paragraph 1.3 of the guidance says:

“The primary role of regulators, in delivering regulation, is to achieve the regulatory outcomes for which they are responsible. For a number of regulators, these regulatory outcomes include an explicit reference to development or growth. The growth duty establishes economic growth as a factor that all specified regulators should have regard to, alongside the delivery of the protections set out in the relevant legislation.”

We have addressed the legislative requirements and environmental standards to be set for this operation in the body of the decision document above. The guidance is clear at paragraph 1.5 that the growth duty does not legitimise non-compliance and its purpose is not to achieve or pursue economic growth at the expense of necessary protections.

We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution. This also promotes growth amongst legitimate operators because the standards applied to the operator are consistent across businesses in this sector and have been set to achieve the required legislative standards.

## **Consultation Responses**

The following summarises the responses to consultation with other organisations, our notice on GOV.UK for the public and the way in which we have considered these in the determination process.

No responses were received from:

- Health and Safety Executive (HSE)
- Local Authority – Planning – Wiltshire Council
- Local Authority - Environmental Health – Wiltshire Council
- Food Standards Agency

# Responses from organisations listed in the consultation section

Response received from: UKHSA

Brief summary of issues raised:

## 1. Dispersion Modelling:

- The modelling did not include potential short-term emissions of particulate matter (PM10), making it difficult to assess the human health impact.

## 2. Formaldehyde Emissions:

- Formaldehyde emissions were modelled, but the rationale is unclear. Background benzene concentrations were used as a surrogate, but the original Air Quality Detailed Modelling Assessment was not provided.

## 3. NO<sub>2</sub> Emission Exceedances:

- The applicant reported NO<sub>2</sub> emission exceedances during routine testing. The addition of 16 generators to an existing 54-generator site raises concerns about cumulative impacts.

## 4. Sensitive Locations:

- Air quality modelling should consider the closest sensitive locations, such as Westwells Playground and nearby residential properties, which are closer than the identified receptor.

## 5. Power Outage Scenario:

- In the event of a power outage, exceedances of NO<sub>2</sub> and CH<sub>2</sub>O were identified. The applicant plans to notify the closest receptor (68 Westwells) to take precautions, but UKHSA suggests extending this alert to neighbouring properties.

## 6. Missing Information:

- The permit variation application did not include an updated Accident Management Plan or complaints procedures. The Environment Agency should ensure these documents are available

**Summary of actions taken:**

We have reviewed the comments made and provided the information below.

We have audited the applicant's emissions modelling twice before. NO<sub>x</sub> is the main pollutant of concern, and older engines are the most significant source of NO<sub>x</sub>.

The new engines in this variation do not significantly increase NO<sub>x</sub> impact.

The modelling includes the closest receptor, listed as R1. Short-term NO<sub>x</sub> impact decreases rapidly with distance. We assessed the Air Quality Modelling Plan and found it appropriate for the installation.

The installation operates under a third-party certified ISO 14001 management system and an EPR permit. Both ISO14001 and the EPR permit require the operator to have procedures in place to manage complaints.

The operator updated their accident management plan to include the new SQ19 area.