Virtus HoldCo Ltd

ENVIRONMENTAL PERMIT APPLICATION - NON-TECHNICAL SUMMARY

Slough Campus - LON12 Data Centre

70114956/NTS
AUGUST 2024

CONFIDENTIAL

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WSP

1 Capital Quarter
Tyndall Street
Cardiff
CF10 4BZ

Phone: +44 2920 769 200

WSP.com

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NON-TECHNICAL SUMMARY

Virtus HoldCo Ltd is making an application under The Environmental Permitting (England and Wales) Regulations 2016 (as amended) to vary the Virtus Slough Campus permit (**EPR/BP3945QX)**, to add London 12 data centre site. Virtus proposes to install 16 back-up generators to a new data centre, Virtus London 12, taking the total generators in the Slough Campus from 31 to 47.

Once completed LON12 will use ultra-low sulphur gas oil (diesel) fired generators for emergency power only, the routine testing of which is the subject of this application. The generators provide power to the site in the event of an emergency situation such as a failure of the electricity transmission network. The application will comprise a description of operations, control measures and management systems, an environmental risk assessment, an extension site condition report and baseline statement and an air quality impact assessment.

VIRTUS HOLDCO LTD

Virtus has been designing, building and operating data centres since incorporation in 2008. Data centres are mission critical facilities that are designed to supply uninterrupted power to tenant equipment 100% of the time. Virtus customers have global presence and hence provide global services which they must maintain. Virtus are required to deliver the highest levels of resilience and ensure that new technologies are used which do not compromise reliability.

LOCATION

The site is referred to as LON12 and sits within the wider Slough Campus.

The address of the new data centre within the Virtus Slough Campus site is:

Virtus LONDON 12
485 Berkshire Avenue
Slough
SL1 4PL

OS national grid reference: SU 95864 81174

Figure 1 - Site Location

OPERATION

Virtus data storage services are managed in accordance with, and certified to, the standards detailed in the application via an Integrated Management System (IMS) to ensure delivery of quality data centre services, energy and environmental performance, health and safety, and information security. The scope of certification is 'the design, build and ongoing operation of mission critical data centre facilities.'

The data centre uses electricity to operate and is connected to the local electricity transmission network via multiple grid connections; however, given the nature of data centres and their requirement to have an available energy supply at all times, the installation includes generators which will provide power to the site in the event of an emergency situation, e.g. the failure of the electricity transmission network. The likelihood of such an event is considered to be extremely low, based on Virtus experience no such events have occurred in 5 years. The generators are individually tested every month for a short period of time.

The new engines are AVK MTU 20V4000G74F DS3100 emissions optimised 2.47MWe output with a thermal input of 6.337 Megawatt thermal input (MWth) (based on calculations using diesel net calorific value and data sheet fuel consumption). The engines will meet NEA Singapore ORDE which is equivalent to US EPA Tier 2 emissions certification.

The total permitted rated thermal input of all generators across Slough Campus will eventually amount to 281.95 MWth upon commissioning of LON12. The generators are fitted with fuel tanks for an independent fuel supply to allow for 48 hour running; the tanks are purpose built and fitted with level gauges and high level alarms as well as bund alarms.

The proposed Installation Boundary is shown in below in green.

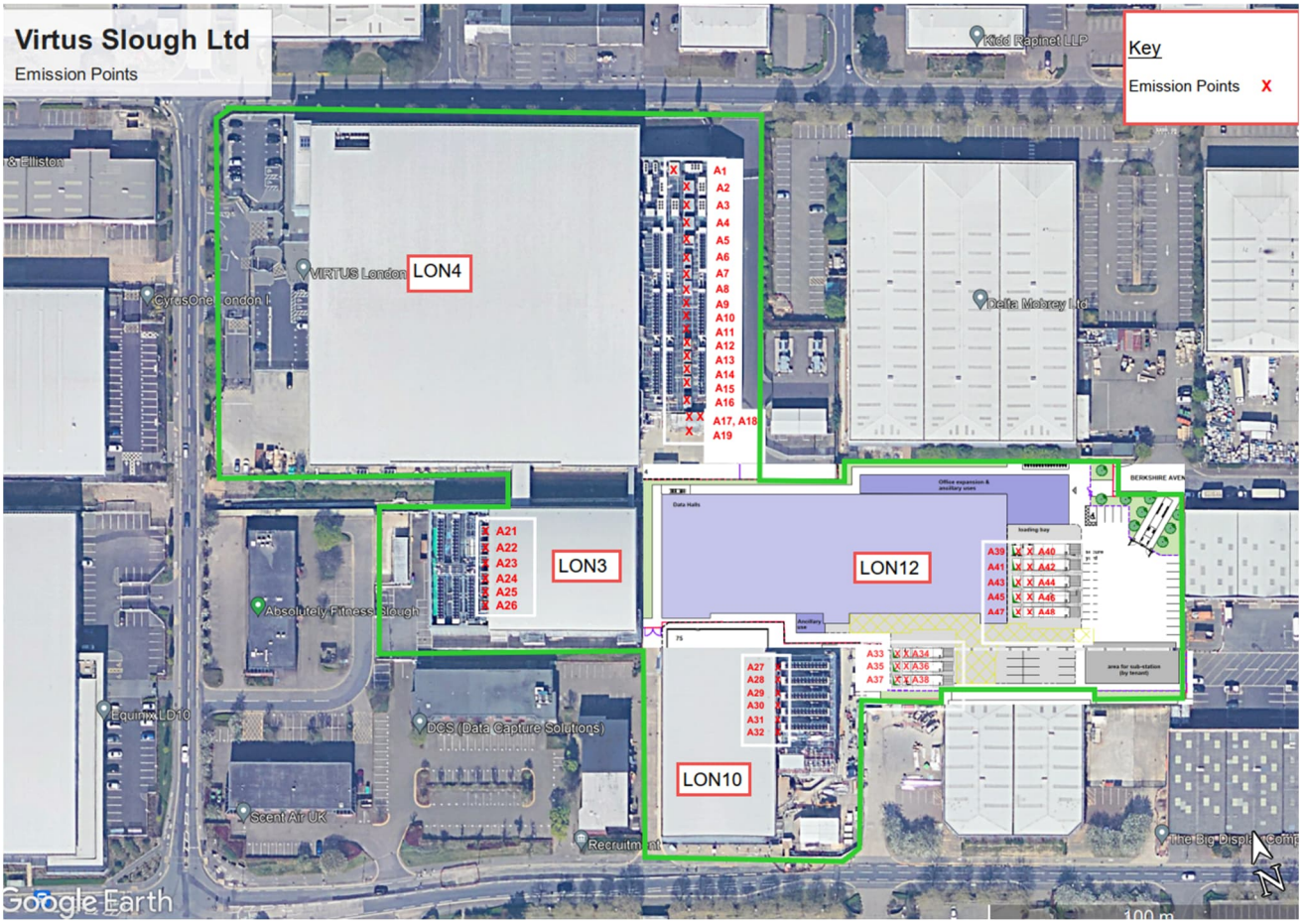

Figure 2 - Proposed Site Boundary

SITE CONDITION REPORT

A Site Condition Report (SCR) has been developed and forms part of this application, reference 70114956/LON12/SCR. The SCR provides information on the current and previous condition of the land and groundwater at the LON12 site. This will be a 'live' document and will be updated during the lifetime of the installation and used to inform the surrender SCR at the time of installation closure.

The report describes historical activities on the site as well as remediation works undertaken and references extensive geo-environmental assessments undertaken during 4th-26th April 2022 and March 4th - December 19th 2023, the latter of which contains the chemical analytical results of soil,

leachate and groundwater sampling which provides the site baseline data. The SCR only relates to the additional land being added as part of this variation.

ENVIRONMENTAL RISK ASSESSMENT

An environmental risk assessment (ERA) has been undertaken, as part of the application, in accordance with GOV.UK guidance Risk assessments for your environmental permit.

Odour, noise, fugitive emissions, visible emissions, discharges and accidental releases from the installation are all considered in the ERA. There are not considered to be any significant risks to the environment from the testing of the generators. There is a very low risk of nuisance to nearby properties from noise emissions, and insignificant risk of land / water pollution in the event of any leaks or spills of diesel required for the generators. Appropriate mitigation and emergency response procedures will be in place and are detailed in the application.

EMISSIONS TO AIR

Once all the new engines are installed, there will be 16 additional point sources to air (numbered A33 to A48). Air quality modelling is being undertaken to determine the impact of the generator testing on local air quality and will be submitted at a later date and form part of this application.

Emissions from the site will vary dependent upon the operational scenario of the engines (specifically the testing regime). The engines will only be operational during routine testing. There will be no point source emissions to air outside of these periods.

The primary pollutant of concern is NO_x. In the absence of NO_x concentration measurement data, likely operational emission concentrations have been based on emissions data from the manufacturer's data sheets adjusted for each scenario. The tests are staggered and multiple generators are not tested at the same time, each generator is tested 12 times per year.

Virtus will apply Best Available Techniques in relation to the testing to ensure that impacts are minimised by for example spreading the tests throughout the year, avoiding peak traffic periods, and not testing engines simultaneously.

1.1.1.1 Air Quality Assessment Summary

A summary of the atmospheric dispersion model is not yet available.

The latest iteration of ADMS will be used for quantifying the impact of emissions from the generators on oxides of nitrogen (NOx, NO_2) concentrations. ADMS uses detailed information regarding the pollutant releases, building effects and local meteorological conditions to predict pollutant concentrations. Background data will be obtained from local council Annual Air Quality Status Reports and from Defra's uk-air.defra.gov website. The models will run assuming all year round operation and then scaled for actual operating periods to obtain process contributions. Statistical analysis will then be undertaken on the results.

Scenarios will be considered for monthly testing only and for a mains failure duration of 72 hours.

The results of the assessment for human receptors will show whether there will be exceedances of the annual mean NO_2 Air Quality Standards objectives at locations where the objectives would apply, and the likely increase in concentrations.

Human receptor locations as well as ecological sites will be considered in the assessment.

EMISSIONS TO WATER

There are no proposed emissions to surface water. Surface water drainage for each unit is based on isolating the small engine compound and fuel storage areas with individual contained systems that can be managed easily. The compounds contain the generator arrays and gantries supporting the cooling plant with an additional concrete pedestal/base laid on the surface with integrated drainage channel to allow surface (rain) water to reach the underground drainage system.

The LON12 compound discharges via a SPEL Class 1 Puraceptor oil and silt separator with full retention capacity and automatic shut off device in the event of a spill. Discharge from the separator is to a storm water attenuation tank where it joins other rain water streams and then via a pumping chamber and rising main to manhole TW 9252, of the Thames Water surface water sewer system.

POINT SOURCE EMISSIONS TO LAND

There are no proposed point source emissions to land from the installation activities.

NOISE EMISSIONS

A summary of noise emissions is not yet available.

The Slough Campus noise impact assessment is being updated and will be submitted in support of this application.

MANAGEMENT SYSTEMS

All Virtus' data centre operations are managed in line with their Operations Manual which incorporates the requirements of the IMS (Chapter 6 Occupational Health & Safety and Environmental (OHSE) Management System). Overall responsibility for the IMS lies with the Senior Management Team of Virtus HoldCo Ltd.

The environmental management system (EMS) includes an integrated policy (Compliance Policy), management principles, organisational structure, responsibilities, standards/ procedures, process controls and resources which are in place to manage environmental protection across all aspects of the business.

Environmental Policy

The ISO 14001 certified EMS is underpinned by an Environmental Policy which is included as part of an overall Compliance Policy. This defines Virtus' commitment to continual improvement and to developing objectives and targets aimed at preventing pollution and improving environmental performance. The Policy is reviewed annually by the Senior Management Team of Virtus HoldCo Ltd. Arrangements, such as inductions, tool box talks and noticeboards, are in place to ensure that all employees are aware of the Policy and its contents and that the Policy is made available to company stakeholders, including contractors who undertake much of the onsite work around the generators (maintenance, deliveries, etc).

Environmental Aspects & Risk Management

Virtus ensures that internal and external issues relevant to the provision of services, energy & environmental aspects, information security, strategic direction, and in maintaining compliance are captured, evaluated and mitigated through a Risk Management System compliant with the requirements of BS ISO31000:2009 Risk Management.

A Risk Evaluation Register controlled under the Risk Management Process (Chapter 4 of the Operations Manual) is implemented. This register details environmental aspects and risks associated with the organisation's activities, including a significance rating for each aspect. Environmental risks are evaluated in order to identify opportunities for continual improvement. This is undertaken alongside a regular energy performance review, a key aspect to identify opportunities to improve environmental performance. The energy review is used in particular to drive Power Usage Effectiveness figures which is the ratio of total amount of energy used by a computer data center facility to the energy delivered to computing equipment.

'Significant' aspects are managed by establishing operational controls, process, procedures, training and the monitoring of activities via an audit programme which covers both site-level and organisation-level activities. All staff are responsible for working in accordance with procedures relating to environmental compliance.

The Operator has identified and documented a list of likely environmental incidents and developed controls around these.

A spill response procedure is in place with spill kits deployed strategically on site.

1.1.1.2 Training

Environmental training relates to both general awareness and job-specific training. The site is managed by a sufficient number of staff, who are competent to operate the site.

Each individual's knowledge and skills are assessed and matched against the needs of the job position.

Additional experience and/or training requirements necessary to enable an individual to undertake their assigned role are identified, prioritised and planned.

Training records are maintained and training needs regularly reviewed.

All contractors and sub-contractors are given appropriate training prior to the commencement of any works or services.

Onsite training of personnel involved in the operation of the engines is undertaken by the suppliers. The training is both classroom and onsite practical and each trainee is issued with a training manual.

1.1.1.3 Review and Audit

An annual management review examines the EMS to ensure that it remains appropriate and effective at controlling environmental performance and to identify any areas where opportunities exist for improvement.

The EMS and site activities are internally audited at least annually. Internal audits are carried out by site staff with suitable audit experience and / or training.

Where corrective action is identified as being required, through audit (or otherwise), which for example involves modifications to plant and equipment, the implementation of such changes will be managed via the EMS change management process.

CRITICAL ASSET MANAGEMENT

Virtus identify and manage critical assets comprising of physical, non-computing systems such as power, cooling and life safety systems under a critical asset management process.

It identifies areas of criticality and ensures appropriate levels of planned preventative maintenance, Standard Operating Procedures, and Emergency Operating Procedures as well as an Operation and Maintenance Manual.

1.1.1.4 Contractor Management

Virtus' approach to contractor management is detailed in their Operations Manual (Chapter 13). Large areas of operation and maintenance, including the data centres at Slough, are contracted to a Facilities Management (FM) Team, Optimum Group Services; who are specialists in Data Centre maintenance. Other assets are maintained and tested by the vendors – including the engines and generator sets.

The management systems are considered to represent Best Available Technique for the installation.

ENGINE AND SET UP CHOICE

The diesel-powered stand-by electrical generator sets to be installed for LON12 data centre installation are typical fit-for-purpose vendor-supplied units, having the following (or similar/equivalent) characteristics:

- Prime mover: V16 or V20, four-stroke water-cooled diesel, low emissions set up;
- Set arrangement: Containerised with close coupled radiator; and,
- Standby rating: 2.47 MWe at 1,500 revolutions per minute, 400 volts, 50 Hertz.

The Uptime Institute regards electricity from utility service providers as an unreliable source of power. Therefore, Tier III data centre specifications require that the data centre must have alternative power generation as a backup for the utility power supply that is in the control of the data centre owner; standby diesel generators are still considered the tried and tested, reliable available technology with the following logic:

- they can accept significant load steps after a power outage, so they can be quickly brought online to take over from a UPS system;
- Shorter start up time compared to gas fired generator and gas turbine systems;
- Fuel is stored on site ensuring local control is retained (48 hour supply to all generators);
- The site retains full local control of power outage protection (exempt from utility supply failures);
- The storage of diesel is considerably safer than the storage of alternative fuels;
- The storage of enough alternative fuels to satisfy the Tier 3 24-hour power outage protection requirements requires significant space and considerable Health & Safety controls;
- The Storage of the fuel is required to match the redundancy levels that the system is designed for (therefore a single storage will not be sufficient);
- The availability of diesel and diesel suppliers readily extends emergency operations to support tenant equipment;
- The technology is mature;
- The technology is the most cost-effective technique considering commissioning, availability of spare parts, fuel, servicing and end of life decommissioning.

FUEL STORAGE

Fuel is stored in above ground 'belly-tanks', or end tanks, one per generator, with sufficient fuel for a 48 hour outage, tank size of 31,000 litres per tank.

The fuel tanks installed will be double skinned steel tanks built to appropriate standards. Each will be fitted with a level probe and overfill valve (preventing overfill), and a High / Low alarm.

There are three locked fill point cabinets with drip tray all above the Puraceptor protected hardstanding apron area, with bollards to prevent vehicle impact. Industry standard digital tank gauges are fitted on all tanks with low and high trigger points. Bund alarms are fitted to detect inner tank leaks.

Fuel polishing is undertaken to properly maintain fuel during long periods of storage and non-use. This is to ensure that the fuel supply is not wasted and managed sustainably. Fuel polishing is undertaken by a fuel polishing unit which is fixed to the tank. The unit contains a filter separator element which is used to remove particulate contaminant and water from diesel fuels and hydrocarbon fuels.

Procedures for fuel oil deliveries are included in Virtus management system and defined in the Operations Manual.

1 Capital Quarter
Tyndall Street
Cardiff
CF10 4BZ

wsp.com