

HEMEL HEMPSTEAD DATA CENTRES: ENVIRONMENTAL PERMIT VARIATION HH4 PHASE 2

Non-Technical Summary

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Limited

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1.0 Introduction

SLR Consulting Ltd (SLR) has been instructed by NTT Global Data Centers EMEA UK Limited (NTT) (the Operator) to prepare to vary the environmental permit (EP) for the NTT owned and operated data centre facilities located in Hemel Hempstead, UK (EP reference EPRBP3800PZ).

The current EP relates to the operation of diesel-fired generators at the following NTT data centres:

- Campus data centre, Spring Way, Hemel Hempstead, HP2 7UP (National Grid Reference (NGR) TL 08008 08201);
- Centro data centre, 3 Boundary Way, Hemel Hempstead HP2 7SU (NGR: TL 08132 08443);
- Maylands data centre, 150 Maylands Avenue, Hemel Hempstead, HP2 7DF (NGR: TL 07541 08485); and
- Hemel Hempstead 4 (HH4) data centre (Phase 1 only), Prologis Park, Hemel Hempstead, HP2 7EQ (NGR 08525 07644).

This EP variation application relates to HH4 Phase 2 which will involve the installation and operation of an additional 13 diesel-fired generators. Commissioning of the 13 generators is to be scheduled for end of 2023.

Electricity for operation of the data centres is provided from connections to the local electricity transmission network; however, given the nature of data centres and their requirement to have an available energy supply at all times, the HH4 data centre incorporates the following diesel-fired generators:

- Data centre Phase 1: 15 generators (incorporated under EPRBP3800PZ).
- Data centre Phase 2: 13 generators (the subject of this permit variation application):
 - HH4 01 to HH4 04;
 - HH4 11 to HH4 15; and
 - HH4 21 to HH4 24.

It should be noted that HH4 Phase 2 generators HH4-09 and HH4-23 whilst included in this permit variation application, are future generators to be installed at a later date.

The generators provide power to the data centre in the event of an emergency situation such as a brown- or black-out of the local electricity transmission network where there are fluctuations or loss of the electrical power provided by the network. On occurrence of such an event, there is the potential for a delay between fault detection and initial operation of the generators; on-site battery arrays provide a temporary uninterruptible power supply in order to cover such delays and the potential for a loss/reduction in the power supply to the on-site equipment.

The generators, in accordance with the manufacturer requirements, are subject to planned maintenance and testing. There are currently no agreements in place for the elective generation of electricity for commercial export to the electricity grid and the generators do not operate in Triad avoidance.

The proposed generators to be installed in Phase 2 at HH4 are Kohler T2500 (emissions optimised) each being 4.76MWth (2.0Mwe) (at 100% load).

The total thermal rated input for:

- The 13 generators to be installed as part of HH4 Phase 2 will be 61.88MWth.
- For HH4, with the addition of the Phase 2 generators, will be 133.28MWth.
- For all four Hemel Hempstead data centres will be 327.52MWth.

This non-technical summary (NTS) provides a summary of the activities at the data centres, an explanation of what is being applied for, and a summary of the key technical standards and control measures that will be implemented at the sites.

2.0 Environmental Permit Variation Application

2.1 Environmental Permit Type

This variation seeks to include 13 additional Kohler T2500 generators, to be installed as part of HH4 Phase 2. This will result in a total of 28 generators HH4, increasing the thermal rated input of the HH4 data centre from 71.3MWth to 133.28MWth. The overall thermal rated input for the four data centres will be 327.52MWth (including the HH4 Phase 2 generators).

The generators provide power to the data centre sites in the event of an emergency situation such as a brown-or black-out of the local electricity transmission network where there are fluctuations or loss of the electrical power provided by the network. On occurrence of such an event, there is the potential for a delay between fault detection and initial operation of the generators; on-site battery arrays provide a temporary uninterruptible power supply in order to cover such delays and the potential for a loss/reduction in the power supply to the on-site equipment.

In the event of a worst-case blackout scenario, potentially all the generators in each data centre will be operated to deliver the required IT load. In the event of operational redundancy in case of engine failures or generators under maintenance, the remaining generators will be operated to the required load. The operational capacity of the generators at the time of a blackout or operational redundancy would be dependent on the extent of the specific emergency issue, but this can only be identified at that time. However, it is noted that, without specific physical controls preventing operation of a generator, that the thermal input of all generators is required for determining the capacity of all the sites.

Therefore, the activities at the site are permitted in accordance with Schedule 1 of the Environmental Permitting (England and Wales) Regulations 2016, specifically Chapter 1, Schedule 1, Section 1.1 (Combustion Activities):

- Category 1.1 A(1)(a) burning any fuel in an appliance with a rated thermal input of 50 or more megawatts.

In addition to the generators, the storage of fuel oil (diesel) in storage tanks is undertaken which is considered to be a 'directly associated activity'.

Under the current EP, the Installation comprises the four data centre sites, with the generators and associated diesel storage arrangements on each data centre being considered an independent stationary technical unit (STU).

2.2 Variation Contents

The variation application comprises the following elements:

- Application forms (Parts A, C2, C3 and F1)
- Non-technical Summary
- Site Condition Report
- Best Available Techniques and Operating Techniques
- Environmental Risk Assessment
- Air Emissions Risk Assessment
- Noise Risk Assessment.

The following drawings accompany this Environmental Permit application:

- Drawing 001 – Site Location

- Drawing 002 – Site Layout and Emissions Points –HH4 Data centre
- Drawings 003A and B – Site Setting

2.3 Operating Techniques

The HH4 Phase 2 generators are designed and operated in accordance with the relevant sections of the following guidance:

- Develop a management system: environmental permits guidance, August 2021;
- Risk assessments for your environmental permit guidance, March 2021;
- Best Available Techniques: environmental permits, February 2016;
- Specified generator: comply with permit conditions, July 2019; and
- Data Centre FAQ Headline Approach, DRAFT version 11.0 H.Tee 11/5/20 – Release to Industry.

2.3.1 Specified generator: comply with permit conditions, July 2019. Management Systems

The HH4 data centre is operated in accordance with the following standards:

- ISO/IEC 27001:2013 that specifies the requirements for establishing, implementing, maintaining and continually improving an information security management system;
- ISO 14001:2015 that specifies the requirements for an environmental management system to enable an organization to develop and implement a policy and objectives which take into account legal requirements and other requirements to which the organization subscribes, and information about significant environmental aspects; and
- ISO9001:2015 that specifies the requirements for establishing, implementing, monitoring, managing and improving quality throughout the organisation.

NTT has an overall ISO Integrated Management Systems Manual (QM22) under which all the aforementioned ISO certified management systems are included; specific requirements for each of the ISO management systems are contained within the relevant NTT ISO system manual.

The EMS places particular importance on:

- Reducing risks to the environment to a level that is as low as reasonably practicable using best available techniques;
- Integrating EMS responsibilities within line management;
- A commitment to personnel environmental awareness and competence;
- The ongoing monitoring and review of environmental performance; and
- A commitment to working to achieve continuous improvement in environmental performance.

A summary of the EMS is detailed in the site's Operating Techniques document (SLR reference: 410.05391.00011 BATOT) submitted with this variation application.

2.4 Site Condition Report

A Site Condition Report (SCR) (SLR Ref: 410.05391.00011 SCR) has been prepared in accordance with the Environment Agency's H5 Guidance Note on SCR¹. The objective of the SCR is to record and describe the condition of the land at the site at the time of the permit application. The SCR will provide a point of reference and baseline environmental data so that when the permit is surrendered it can be demonstrated that there has been no deterioration in the condition of the land as a result of the proposed operations, and ensure that the condition of the land is in a 'satisfactory state' on surrender of the permit.

Sections 1 to 3 of the EA's SCR template have been completed in the preparation of this document, which comprises the following:

- Site details;
- Condition of the land at permit issue;
 - geology;
 - hydrogeology;
 - hydrology;
- Pollution history;
- Evidence of historic contamination; and
- Permitted activities.

Section 4 to 7 of the SCR template will be maintained during the life of the permit and Sections 8 to 10 will be completed and submitted in support of the application to surrender the permit.

Baseline soil and groundwater reference data for HH4 data centre is provided in the SCR.

2.5 Environmental Risk Assessment

An Environmental Risk Assessment (ERA) (SLR reference: 410.05391.00011 ERA) has been undertaken in accordance with the Environment Agency (EA) Risk assessments for your environmental permit², and is included with the EP application. The ERA is a simple assessment of the risks to the environment and human health from accidents, noise and fugitive emissions that may be associated with the proposed operations at the site. The aim of the assessment is to identify any significant risks and demonstrate that the risk of pollution or harm will be acceptable by taking the appropriate measures to manage these risks.

The ERA has assessed the potential risks from operation of the Phase 2 generators at HH4 based on the balance between the probabilities of exposure and the magnitude of the consequences of those exposures.

It is noted that the NTT data centres have not, to date, experienced a black- or brown-out scenario of the local transmission system that has required the use of all the generators.

Overall, with measures in place to manage potential risks, no significant environmental risks have been identified at the sites.

2.6 Air Emissions Risk Assessment

A detailed air quality risk assessment (SLR Ref: 410.05391.00011 AERA, v0.1, April 2022) has been undertaken to assess the potential impacts of combustion emissions from the generators on air quality by comparison to UK

¹ EA Guidance; Site Condition Report – guidance and templates, Version 3, May 2013.

² <https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit>

Air Quality Standards and EA regulatory benchmarks (e.g. Environmental Assessment Levels) in line with the prevailing guidance. Emissions from the site will vary depending on the operational scenario of the engines.

The generators will each operate for less than 500 hours per annum and will therefore not be subject to emissions limit values (ELV) for the substances listed in Annex V of Directive 2010/75/EU on industrial emissions (Industrial Emissions Directive, IED).

Overall, the risk assessment concluded that potential impacts on air quality as a result of routine (testing and maintenance) operations and commissioning of the generators are insignificant. The assessment of potential impacts on air quality as a result of an assumed 36-hour 'electrical grid outage' occurrence concluded that it cannot be concluded that there will be no likely significant effects on identified sensitive receptors. It is however recognised that such a prolonged emergency scenario is highly unlikely.

In accordance with the current EP, NTT is required to develop an Air Quality Emergency Action Plan (AQEAP) which details the management actions to be taken in the event of an emergency outage that could result in the prolonged usage of the generators which could potentially result in adverse impacts on local air quality. This AQEAP will include the HH4 Phase 2 generators. NTT will liaise with the Local Authority and the Environment Agency to agree actions to be taken in the event of a prolonged outage situation (>18 hours) and the finalised plan will be incorporated into the site's environmental management system.

2.7 Key Technical Standards

HH4 is designed to provide maximum reliability of the electrical power supply to the systems on-site that are critical for continuous operation of the site as a data centre.

The operational techniques that will be in place to manage the activities at HH4 can be summarised as follows:

- The generators will be operated for emergency back-up purposes (other than for planned maintenance and testing) which will only commence in the event that electricity is not available from the local transmission network (e.g. brown- or black-out) or if there is an internal failure of power supply.
- The planned maintenance and testing regime for the generators at all four Hemel data centres, is scheduled so that:
 - testing and maintenance is completed at one data centre at a time; and
 - for each data centre no more than 2 generators are tested each day.

This staggered regime ensures that the impact on air quality as a result of the diesel combustion emissions is minimised. The HH4 Phase 2 generators will be included in this testing regime.

- The scheduled maintenance and testing regime for each generator is substantially below the 50-hour testing regime for generators which are used purely for a stand-by emergency role as stated in the EA Data centre FAQ (v. 11).
- The generators will not be operated on an 'elective' basis as an alternative source of electricity, this includes for Triad avoidance.
- With regard to engine selection, considering that the requirement for the generators is to provide emergency/standby power for the data centres, diesel engines have been determined as BAT.
- The Operator will notify the EA:
 - In advance of planned outage/maintenance of the local transmission system that is expected to exceed 18 continuous hours and/or requires operation of more than one generator at the site; and
 - Upon an incident of unplanned continuous outage that exceeds 18 hours and/or requires operation of more than one generator.

Each HH4 Phase 2 generator will have a dedicated stack to aid the dispersion of the engine flue gases. These stacks will be vertical and located on the roofs of the generator container units. The stacks will terminate just below the roof height level.

- The HH4 Phase 2 generators will be housed within proprietary steel container units located in the external yard areas. Beneath the floor of the container units for each generator will be a belly tank which automatically supplies diesel to the generators.
- The generator belly tanks will be designed to British Standard BS799 Part 5 1987 (Oil Burning Equipment. Specification for Oil Storage Tanks), which stipulates a requirement for 110% containment. The belly tanks will be certified to this standard. The belly tanks are therefore considered to comply with the Oil Storage Regulations.
- The belly tanks will be filled directly from refuelling vehicles (the fuel being delivered by NTT appointed fuel supplier). Fuel will be delivered directly to the belly tanks via fill points which are located on the generator container units, these will be positioned in lockable cabinets which are designed with drip trays.
- The belly tanks will each have the following protection measures:
 - Secondary containment which will be alarmed to detect any releases of diesel into the bund;
 - Fill points located in a lockable cabinet provided with a drip tray designed to capture any minor spillages from the fill point during fuel delivery, which will be integral to the generator container unit. The tank fill point cabinets will remain locked when not in use;
 - Tank level gauge;
 - High and low level alarms connected to the BMS and the generator container units;
 - A pressure delivery over-fill prevention valve;
 - Leak detection alarms connected to the BMS;
 - The generator sets will have pressure relief valves to prevent over pressurisation of diesel supplied from the belly tanks; and.
 - To minimise the risk of corrosion all pipework is painted or is constructed of corrosion resistant material.
- Any minor spillages of diesel will be cleaned up using proprietary spill kits. Any oil contaminated materials will then be stored in suitable bunded containers in a waste storage area on the site prior to off-site disposal by NTT approved waste contractor. Any major spillages/leaks of oil will be transferred to suitable containers or directly to road tanker for off-site treatment/disposal by a suitably licensed waste contractor. The management of spills will be undertaken in accordance with the site's spill procedures.
- NTT has a preventative maintenance system, which defines the required checks for storage tanks and associated infrastructure. Preventative maintenance is managed and completed by the facilities management personnel. The facility is manned 24 hours a day by facilities management personnel.
- Emergency generator operation and planned maintenance and testing is controlled by the Building Management System (BMS).
- Emission of water from the HH4 data centre plant area i.e. the area where the generators and associated diesel storage are to be located, is limited to surface water runoff. All run-off from this area will drain to the on-site surface water drainage system via a full retention oil interceptor (with an alarm to indicate the presence of oil) and a below ground stormwater attenuation tank (700m³) prior to off-site discharge

into the Thames Water surface water sewer via the permitted discharge point HH4-SW1. The interceptor will be emptied, cleaned and maintained at least annually by an appointed specialist contractor.

- Fluorinated gases (F-gases) are used at HH4 data centre in the e refrigeration systems for chiller units and air conditioning units. The equipment is subject to regular maintenance and leak testing and these requirements are included in the site's preventative maintenance system. Maintenance and testing is undertaken by NTT approved external specialist contractor. NTT maintains an F-gas register for each data centre.
- Significant fugitive emissions, odours and noise are not considered likely with respect to operation of the HH4 Phase 2 generators and measures will be employed to prevent such emissions.
- The Noise Assessment, presented in this variation application, concluded that the generators at the four NTT Hemel Hempstead data centres, including HH4 Phase 2, would result in a low impact and that action to minimise noise is a low priority.
- The management of energy is an integral part of the ISO14001 environmental management system. The organisation also has a climate change agreement for which monitoring of energy consumption and continuous improvement is required.
- The correct design, operation and maintenance of the generators will ensure the lowest possible consumption rate of fuel.
- Operation of the generators will not produce significant amounts of waste. Waste oil will be generated at the HH4 data centre as a result of generator maintenance. Generator maintenance is undertaken by an appointed third-party specialist who is responsible for the off-site disposal of this waste. No waste oil is stored at HH4.
- In accordance with the EMS, procedures will be in place for the regular inspection and maintenance of storage areas and associated infrastructure. Any accidents or incidents and the action taken to rectify these, will be recorded.

3.0 Conclusion

The overall conclusion from the studies undertaken as part of the application is that there is unlikely to be a significant environmental impact as a result of the additional of 13 Kohler T2500 generators at HH4. NTT is fully committed to ensuring the highest standards are met and will undertake its activities in a manner consistent with best industry practices.

EUROPEAN OFFICES

AYLESBURY

T: +44 (0)1844 337380

BELFAST

belfast@slrconsulting.com

BIRMINGHAM

T: +44 (0)121 2895610

BONN

T: +49 (0)176 60374618

BRADFORD-ON-AVON

T: +44 (0)1225 309400

BRISTOL

T: +44 (0)117 9064280

CARDIFF

T: +44 (0)2920 491010

CHELMSFORD

T: +44 (0)1245 392170

DUBLIN

T: +353 (0)1 296 4667

EDINBURGH

T: +44 (0)131 335 6830

EXETER

T: +44 (0)1392 490152

FRANKFURT

frankfurt@slrconsulting.com

GRENOBLE

T: +33 (0)6 23 37 14 14

LEEDS

T: +44 (0)113 5120293

LONDON

T: +44 (0)203 8056418

MAIDSTONE

T: +44 (0)1622 609242

MANCHESTER

T: +44 (0)161 8727564

NEWCASTLE UPON TYNE

newcastle@slrconsulting.com

NOTTINGHAM

T: +44 (0)115 9647280

SHEFFIELD

T: +44 (0)114 2455153

SHREWSBURY

T: +44 (0)1743 239250

STIRLING

T: +44 (0)1786 239900

WORCESTER

T: +44 (0)1905 751310