VIRTUS HoldCo Ltd/Virtus London 12 Ltd

ENVIRONMENTAL PERMIT VARIATION APPLICATION

London 12, 485 Berkshire Avenue, Slough

70114956/LON12
AUGUST 2024

CONFIDENTIAL

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1 INTRODUCTION

WSP UK Ltd has been instructed by Virtus HoldCo Ltd/Virtus London 12 Ltd, (the Operator, hereinafter called Virtus) to prepare an application for a variation to an Environmental Permit (EP reference **EPR/BP3945QX**) for the Virtus Slough Campus, to include London 12 data centre site within the Campus at 14 Liverpool Road, Slough Trading Estate, Slough, SL1 4QZ.

The data centre at the Slough Campus 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 site currently incorporates 31 diesel-fired standby generators across 3 separate buildings. These are referred to as London 3, London 4, and London 10 and are operated independently but are all be grouped together in a single data centre campus under the same management system and management structure under a single permit.

The generators provide power to the site in the event of an emergency situation such as a failure of the electricity transmission network. During such events there is a potential for a delay between fault detection and initial operation of these back-up generators; hence the initial uninterruptible power supply is provided by on-site battery arrays in order to cover this time gap and the consequent loss or reduction in the power supply to the data servers. The total rated thermal input (under standby power operating conditions) of all generators across the Slough Campus is currently 180.5 MWth.

The Environmental Permitting (England and Wales) Regulations 2016 (as amended) (EPR) states:

> "…where two or more appliances with an aggregate rated thermal input of 50 or more megawatts are operated on the same site by the same operator, those appliances must be treated as a single appliance with a rated thermal input of 50 or more megawatts."

The site is therefore an "installation" as defined in Paragraph 1, Part 1, Schedule 1 of the EPR as: "a stationary technical unit where one or more activities are carried on".

The "activities" at the installation are defined in Chapter 1, Schedule 1 of the EPR, under Section 1.1, Combustion Activities.

This document is therefore submitted on behalf of the operator to support the application for a variation to the bespoke Environmental Permit for the site under regulation 20(1) of the EPR, and subject to the requirements of Section 2(1), Part 1, Schedule 5 of the EPR. It describes the operating techniques that will be implemented at the facility with respect to the additional diesel generators and land to ensure that environmental aspects are managed in compliance with the conditions of the Environmental Permit and in line with Best Available Techniques (BAT) requirements.

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. The engines are AVK MTU 20V4000G74F DS3100 emissions optimised 2.47MWe output with a thermal input of 6.337 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.

For the purposes of this application, relevant technical standards in the following documents have been used:

- GOV.UK Develop a management system: environmental permits guidance, 14 January 2019;
- GOV.UK Risk assessments for your environmental permit guidance, 25 March 2021;
- Data Centre FAQ Headline Approach, Environment Agency, dated 15/11/2022 and 03/07/2024;
- Best Available Techniques (BAT) Reference Document for Large Combustion Plants, 2017 and the associated BAT Conclusions (Establishing Best Available Techniques (BAT) Conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for Large Combustion Plants, 31 July 2017);
- Emergency backup diesel engines on installations: best available techniques (BAT) - GOV.UK (www.gov.uk)

2 FORM A SUPPORTING INFORMATION

Applicant:

Virtus HoldCo Ltd / Virtus London 12 Ltd
Registered office: 4th Floor, 20 Balderton Street, London, England, W1K 6TL.
Company Numbers: Virtus HoldCo Ltd 06762600; Virtus London 12 Ltd 12695826.

Director details are provided in Table 2-1 below.

Table 2-1 - Virtus HoldCo Directors

Name	Address	Occupation
Helen Mary Aline Kinsman	4th Floor, 20 Balderton Street, London, England, W1K 6TL	Secretary and Development Director
Daryl Robert Leslie Seaton	4th Floor, 20 Balderton Street, London, England, W1K 6TL	Chief Operating Officer

Table 2-2 - Virtus London 12 Directors

Name	Address	Date of Birth	Occupation
Neil David Cresswell	4th Floor, 20 Balderton Street, London, W1K 6TL	[redacted]	CEO
Jonathan Allen King	4th Floor, 20 Balderton Street, London, W1K 6TL	[redacted]	COO
Lim Yueh Hua Nelson	Centennial Tower, 3 Temasek Avenue 28-01, Singapore 039190, Singapore	[redacted]	CFO
Bruno Lopez	Centennial Tower, 3 Temasek Avenue 28-01, Singapore 039190, Singapore	[redacted]	CEO
Daryl Robert Leslie Seaton	4th Floor, 20 Balderton Street, London, W1K 6TL	[redacted]	CFO

The company structure of Virtus HoldCo Ltd is provided as Appendix A.

3 FORM C2 SUPPORTING INFORMATION

3.1 ABOUT THE SITE

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

3.2 PROPOSED CHANGES

The site consists of a single installation comprising a stationary technical unit (STU) made up of the generator engines and fuel oil storage tanks for emergency use only.

Name	Schedule 1 Ref	Description	Changes Ref
Virtus LON12 (part of Slough Campus)	Section 1.1 A(1)(a)	Burning of any fuel in an appliance with a rated thermal input of 50 or more megawatts (MW)	This document

The individual engine thermal inputs are each less than 15MWth. The plant does not form a Chapter III Combustion Plant under the Industrial Emissions Directive. The Schedule 24 Energy Efficiency measures do not apply to the site because only emergency generators are present.

Due to increasing demand for data centre space, Virtus are adding building a new data centre comprising of 16 back-up generator engines, referred to herein as London 12. The variation to Slough Campus will not change the activity or introduce a new activity however it will extend the existing installation boundary.

The site location is shown within the Slough Trading Estate and adjacent to the Slough Campus as shown below.

3.3 ABILITY AS AN OPERATOR

VIRTUS subscribes to internationally recognised data centre design standards such as the Uptime Institute's Tier III design certification. The basic requirements of this standard include:

- 99.982% uptime of power;
- No more than 1.6 hours of power downtime per year; and,
- N+1 fault tolerant providing at least 72-hour power outage protection.

The generator sets are rated against the ISO8528 definition, and transient load acceptance tests completed to ISO8528 G3. The generators will be ANSI/TIA-942 compliant for Rated-1 through Rated-4 data centres. This section provides additional information in relation to Form C2 3d.

This section has been previously submitted as part of the application documentation for the full Slough campus.

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. Virtus data storage services are managed in accordance with, and certified to, the standards detailed in this 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.'

While Appendix A provides the ownership structure chart for the HoldCo level company, the Management structure for Virtus is shown below in Figure 3-1.

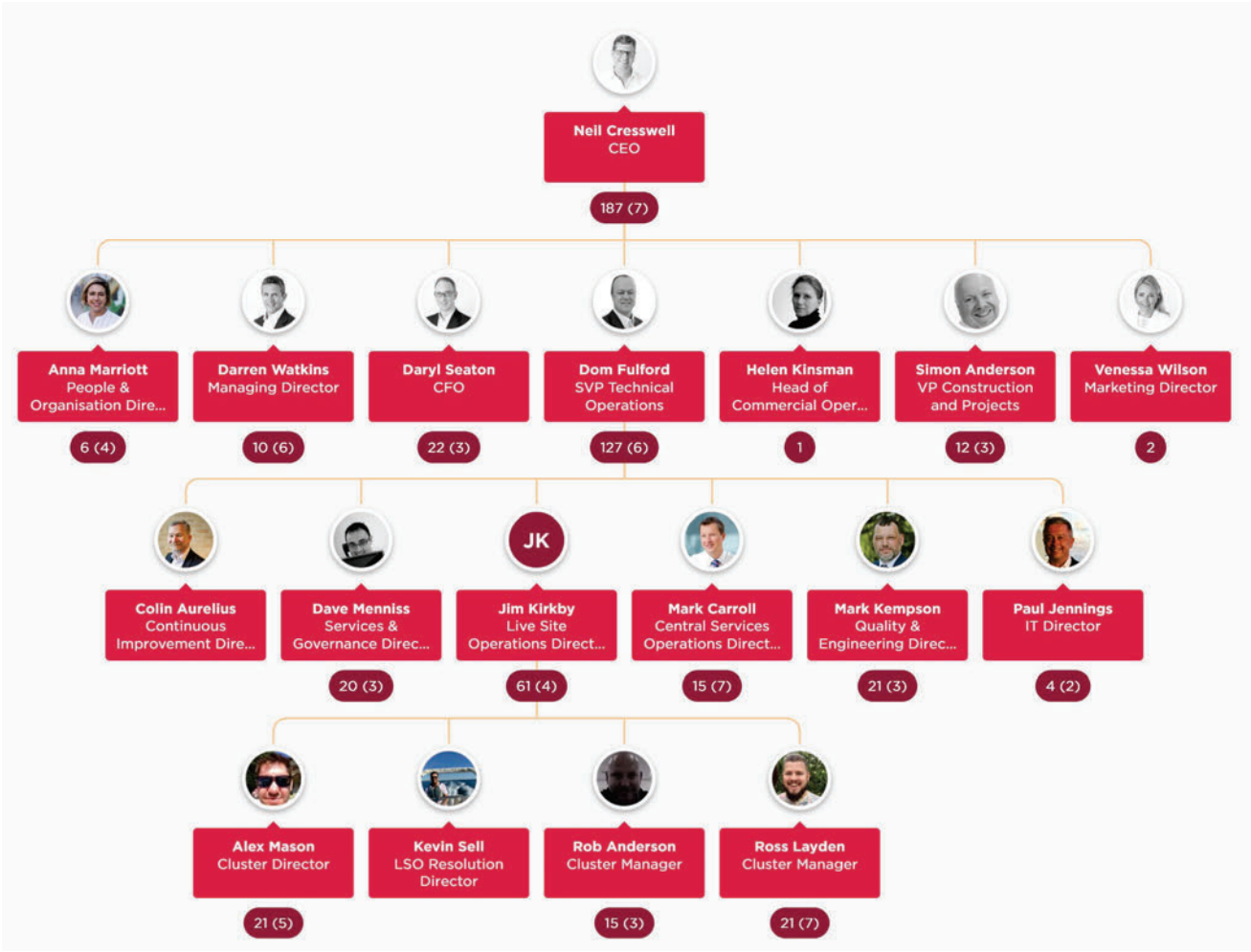


Figure 3-1 - Virtus Management Structure

MANAGEMENT SYSTEMS

The data storage services at the site are managed in accordance with, and certified to, the standards and management systems described extensively in Section 5.3 via an integrated management system for the 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 integrated management system is certified to ISO 14001 for the environmental management component (EMS) and is detailed in the Operations Manual (Chapter 6 Occupational Health & Safety and Environmental (OHSE) Management System). This 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.

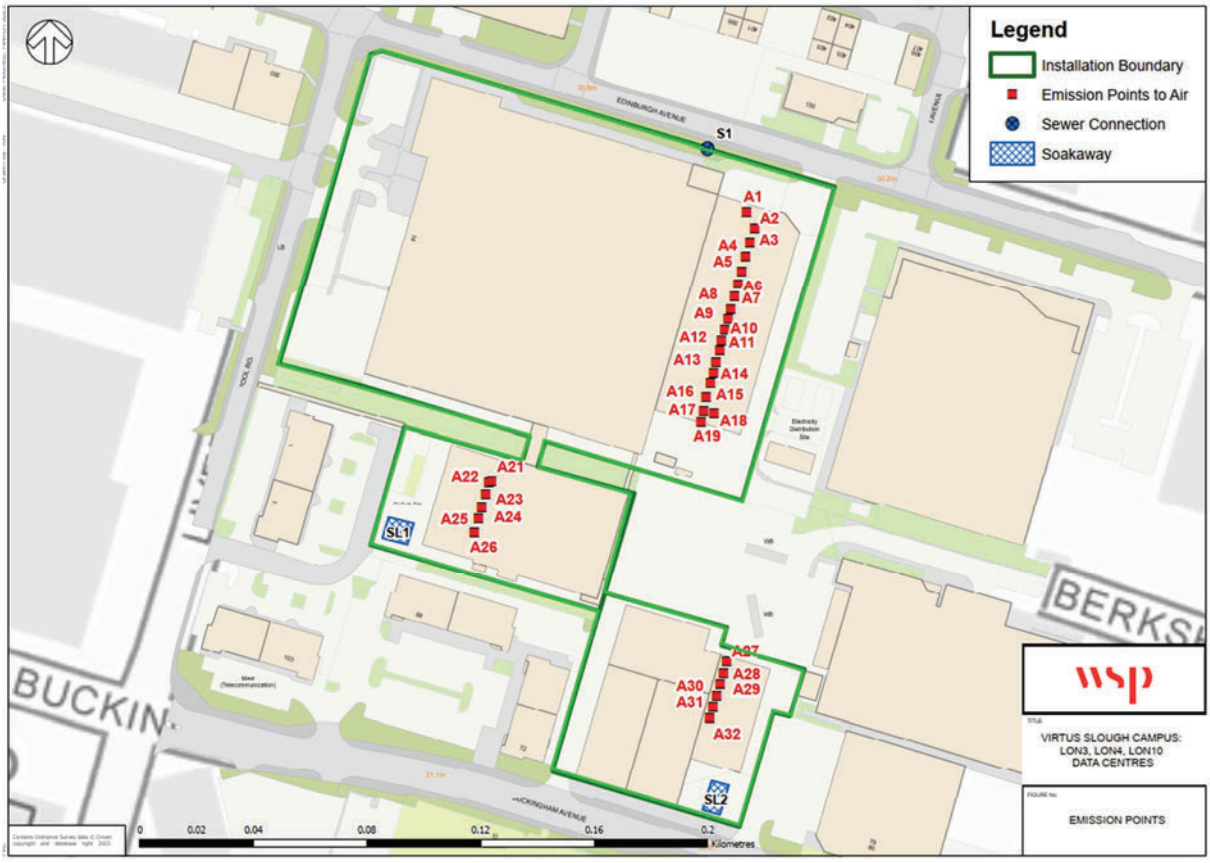
3.4 SUPPORTING INFORMATION

This section provides additional information in relation to Form C2 5.

PLANS

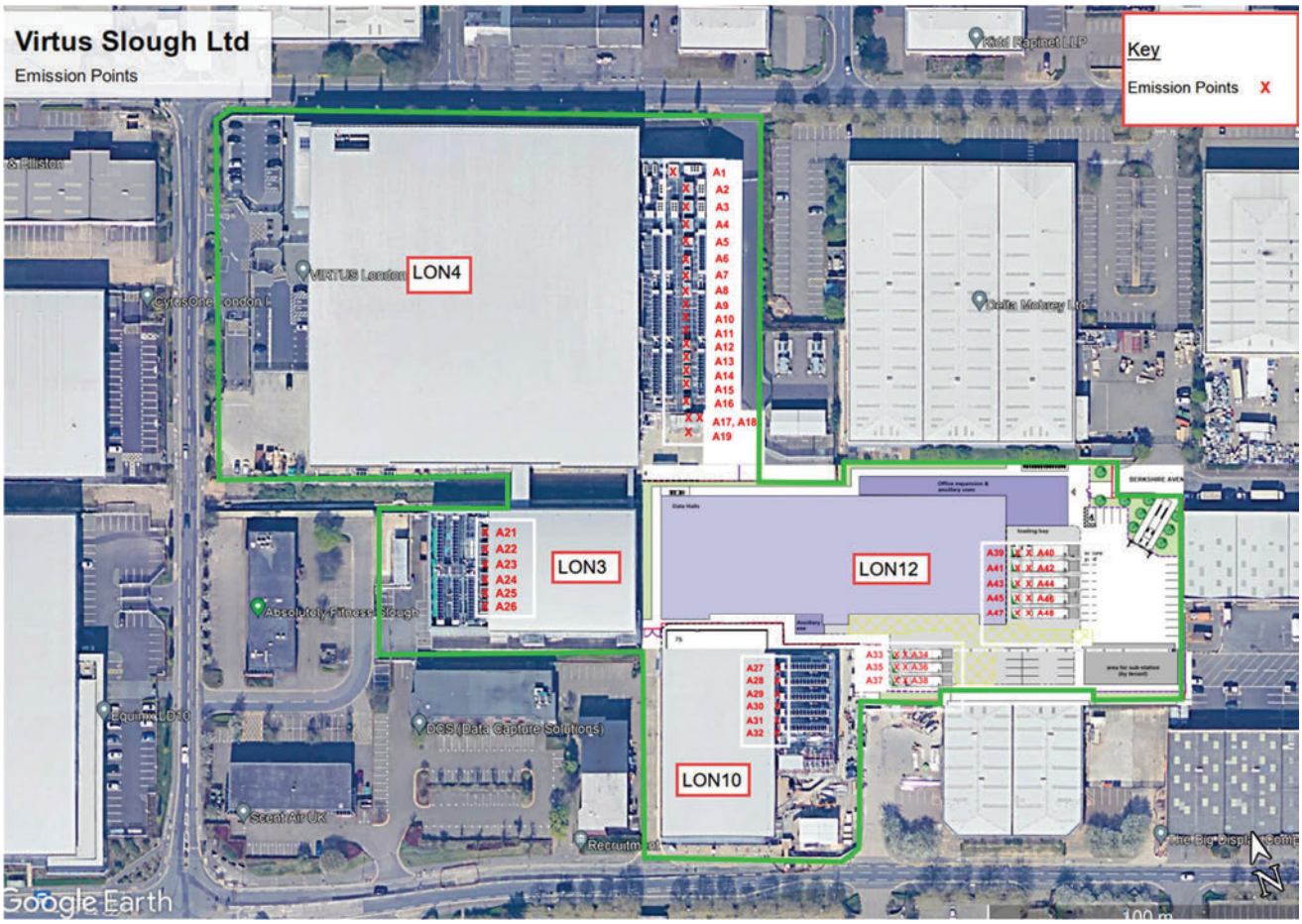
The existing Slough Campus boundary is shown in Figure 3-2 with the additional LON 12 boundary and additional emission points shown in Figure 3-3. The plans are also appended in Appendix C.

Figure 3-2 – Existing Permit Installation Boundary



The extended Installation Boundary and new emission points are shown in Figure 3-3 below.

Figure 3-3 - Proposed Installation Boundary



Detail Map of the new air emissions points shown in Figure 4-1 - LON12 Air Emission Points below.

3.5 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 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.

3.6 ENVIRONMENTAL RISK ASSESSMENT

An environmental risk assessment has been undertaken, reference 70114956/LON12/ERA which forms part of this application.

This has been undertaken in accordance with GOV.UK guidance Risk assessments for your environmental permit and covers the following steps:

- Step One – Identification of Risks
- Step Two – Identification of Receptors
- Step Three – Identification of Pathways between Sources and Receptors
- Step Four – Assessment of Risks
- Step Five – Controls for Risks
- Step Six – Presentation of the Results

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 low risk of nuisance to nearby properties from noise emissions, and a negligible 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 Section 4.2 and in the ERA.

4 FORM C3 SUPPORTING INFORMATION

4.1 LISTED ACTIVITIES

This section supports Form C3.1. The installation activities and directly associated activities are described in Table 4-1.

Table 4-1 - Types of Activities

Installation Name/Activity Reference	Schedule 1 reference	Description Activity	Activity Capacity
AR1 Virtus Slough Campus	Section 1.1 Part A(1)(a) Combustion	Burning any fuel in an appliance with a rated thermal input of 50 or more megawatts	180.51 MWth
Variation to Activity AR1 Virtus Slough Campus LON12	Section 1.1 Part A(1)(a) Combustion	Burning any fuel in an appliance with a rated thermal input of 50 or more megawatts	Additional 16 engines housed in a new facility. 101.44 MWth
Total Proposed Virtus Slough Campus	-	-	47 engines 281.95 MWth
Directly associated activities			
Name of DAA	**Description of the DAA**		
AR2 Storage of raw materials (fuel)	Storage of diesel in belly tanks for each engine, serving the Schedule 1 combustion activity	LON4 x 5 LON4 x 11 LON4 x 3 LON3 x 6 LON10 x 6	33,600 litres each 26,300 litres each 25,000 litres each 23,500 litres each 24,384 litres each **Total: 819,604 litres**
AR3 Surface water drainage	Input to site drainage system until discharge to Thames Water surface sewer (emission point W1) and soakaways via bypass interceptors (emission points W2 and W3)		
Variation to DAA			
AR2 Storage for the proposed additional engines at LON12	Storage of diesel in belly tanks for each engine, serving the Schedule 1 combustion activity	LON12 x 16	31,000 litres each **Total: 496,000 litres**
Total Proposed Virtus Slough Campus	Storage of diesel in belly tanks for each engine, serving the Schedule 1	47 belly tanks	1,315,604 **litres**

	combustion activity		
AR3 Surface water drainage	Input to site drainage system until discharge to Thames Water surface water sewer via full retention separator (emission point W4).		

This variation is to install 16 back-up generator diesel engines to the new London 12 data centre on the already permitted Slough Campus. The data centres are the same mission critical facilities that are designed to supply uninterrupted power to tenant equipment 100% of the time. The standby diesel generators will also be used to ensure service-supporting components and tenant equipment have uninterrupted power.

The function of the additional standby generators is the same as those in the Slough Campus, which is to provide power during an interruption of mains-supplied (utility) power. Tenant equipment (IT Infrastructure such as servers) does not easily tolerate power spikes due to switching from a normal to emergency power supply. When these components lose power (if only for a fraction of a second), a total restart is required. This could allow for system downtimes, start-up issues and loss of in-process information.

This application (including the associated modelling studies and risk assessments) will be prepared on the basis of the full design complement installation numbers of standby generators shown in the Table below.

Data Centre	No. of Installed Generator Sets	Design	Net Power Output kWe each	Current Installed Thermal Input MW (fuel based)	Design Thermal Input MW (fuel based)
LON3	6	6	1,850	28.32	28.32
LON4	5 11 3	5 11 3	2,400 2,200 2,000	36.40 66.44 16.83	36.40 66.44 16.83
LON10	5	6	1,850	27.1	32.52
LON12	0	16	2,470	0	101.44
TOTAL	30	47	-	**175.09**	**281.95**

Thermal inputs stated in the table above have been determined using the more accurate method of specific fuel consumption, engine rated power and fuel properties, as per Annex A of the AMPS guidance.

4.2 EMISSIONS TO AIR, WATER, LAND

This section supports Form Part C3 Question 2 and provides a summary description of the principal release points from the site.

Operational emissions to air from the site will vary depending upon the operational scenario of the engines (specifically the testing regime required by the manufacturers and in some cases also by the data centre clients). The engines will only be operational during periods of emergency back-up situations (i.e. in the event of a power outage from the national grid, or an internal system failure requiring a power stream to come off grid), or during engine testing. There will be no point source emissions to air outside of these periods. Engine test periods are kept to an absolute minimum to avoid burning fuel and generating emissions unnecessarily.

The engines are emissions optimised by design and will be certified to meet NEA Singapore ORDE/ US EPA Tier 2 emissions requirements.

4.2.1 POINT SOURCE EMISSIONS TO AIR

Once all engines are installed, there will be an additional 16 combustion point sources to air for LON12 (see Table 4-2). The LON12 emission points are shown in Figure 4-1 and in Appendix C.

Figure 4-1 - LON12 Air Emission Points

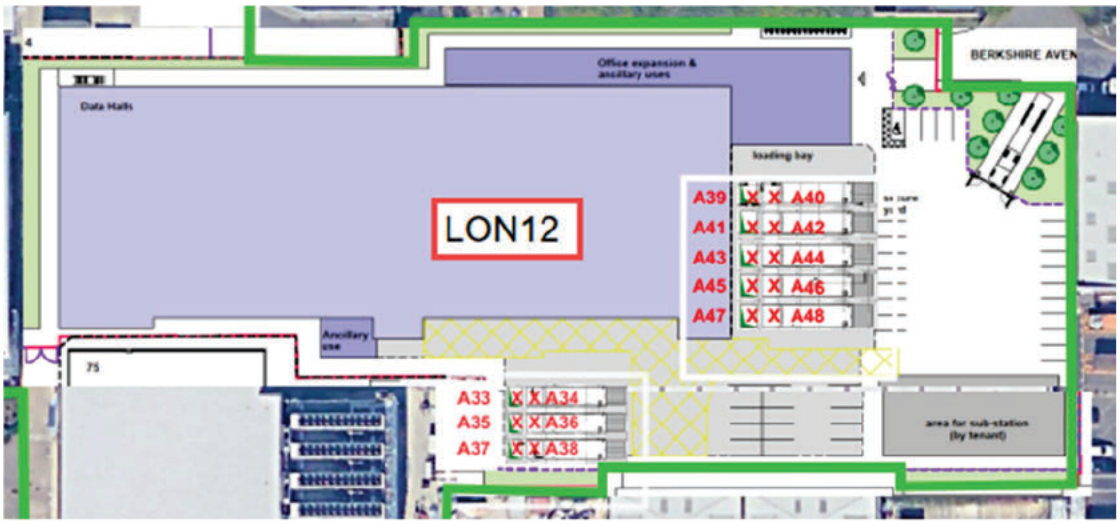


Table 4-2 – LON12 Emission Point Locations

Emission Point	National Grid Reference
A33	SU 95825 81194
A34	SU 95828 81193
A35	SU 95824 81190
A36	SU 95827 81189

A37	SU 95823 81186
A38	SU 95826 81185
A39	SU 95870 81215
A40	SU 95874 81213
A41	SU 95868 81212
A42	SU 95873 81210
A43	SU 95867 81208
A44	SU 95872 81205
A45	SU 95866 81204
A46	SU 95870 81201
A47	SU 95865 81198
A48	SU 95869 81195

Emissions to air are discussed extensively in Operating Techniques and in the Air Dispersion Modelling Report prepared in support of this application.

For the purposes of the Air Emissions Risk Assessment, the EA guidance 'Unclassified, Emissions from generators (Version 1) Guidance on dispersion modelling for oxides of nitrogen assessment from generators' states that where a generator is run on gas oil (diesel) only, NOx is the primary pollutant of concern.

Air Quality Assessment Summary

A summary will be provided in the final Air Quality Assessment Report.

4.2.2 POINT SOURCE EMISSIONS TO WATER

There are no direct discharges to surface waters, or to ground. The drainage system is described in Section 5.9. A new emission point is added at W4 for discharge to Thames Water surface water sewer MH 9252 at OS grid reference SU 95907 81228, illustrated below.

Figure 4-2 - Surface water sewer discharge point W4

The ultimate discharge for surface waters is effectively the same as the existing arrangements at the Slough Campus. LON12's surface water and Slough Trading Estate's surface water discharges to the surface water sewer, namely Salt Hill Stream.

4.2.3 EMISSIONS TO LAND

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

4.2.4 NOISE EMISSIONS

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

4.2.5 WASTE MANAGEMENT

Wastes will be identical to those submitted in the Slough Campus Environmental Permit Application 70092911 Rev 2 dated 14/08/22. consist

5 OPERATING TECHNIQUES

5.1 GENERAL

The variation doesn't make any changes to the general operating techniques of the Slough Campus. LON12 is, as all Virtus Data Centres, built to Uptime Tier III standard which means that there is no interruption to the operation of the computer hardware located in the centre, for example during routine maintenance of power and cooling systems. Virtus currently has a 100% uptime record.

The new engines will operate in the same manner as the existing configuration within the Slough Campus, as N+1 LV Datacentre Continuous (DCC) rated generators with sufficient onsite fuel supply for 48 hours run time at emergency (near full) load.

The generator output specifications are driven by the data centre design. The new mission critical standby packaged MTU DS3100 engines have an output of 2.47 MWe and are mapped in factory to a low emissions (Emissions Optimised – EO) compliant certification. These are described in the Sections below and in the T Clarke Technical Submission of 06/03/2024 and data sheet tables extracted and attached in Appendix D. Other supporting documentation is appended in Appendix D and Appendix E.

The generators are only utilised as back-up emergency provision (on and off-site emergencies) and hence the routine operation is for testing and maintenance only. The testing regime is outlined in Table 5-1 below assuming worst case (longest) test periods of 15 minutes (in reality this will be limited to around 5 minutes). The monthly average test duration over 12 months for each generator under the described scenario is just under 26 minutes.

Table 5-1 - Routine Operational Scenario

Scenario	Load	Total No. of Generator tests in a year	Minutes per year per Generator	Total per year (minutes)
Routine off-load testing per month (11 months)	15 mins @ 0%	Current 31 x 11 = 341 Proposed total 47 x 11 = 517	165	Current total: 5,115 Proposed total: 7,755
On-load test once per year ("12th month")	20 mins @100% 120 mins @ 75%75%	Current 31 x 1 Proposed 47 x 1	140	Current total: 4,340 Proposed total: 6,580
Total minutes overall per annum		564	305	Current total: 9,455 Proposed total: 14,335

The designed total test period *per generator per annum* remains 305 minutes or 5 hours 5 minutes. The total planned test period engine run time at Slough Campus would therefore increase from 157 hours and 35 minutes to 238 hours 55 minutes.

The Air Quality Assessment also considers the required Environment Agency emergency outage which for which the new generator emissions are described further below.

5.2 STANDARDS

Form C.3a Technical Standards

Numerous documents have been submitted for the Slough Park Campus permit application which apply equally to this variation, in particular:

- Management Systems – ISO/IEC 27001:2013; ISO 9001:2015; ISO 14001:2015; ISO50001:2011
- Agency FAQ Data Centre BAT [v21 Draft for TechUK]
- Engines to comply with US EPA Tier 2; TA Luft 2G or environmental equivalence.
- CIRIA 736
- Diesel tanks built to BS799:Part 5 Type J (2010)
- Operations to Uptime Institute Tier III
- Adler & Allan ULSG specification
- OLE Bund Alarm information
- Chapter 6 – OHS&EM manual (submitted previously for Slough Campus)
- Petrol Interceptor cleaning RAMS example (Appendix Z)
- Datasheet MTU D3100

The Uptime Institute requirements are described in the box below.

Note on the Uptime Institute Tiers, I, II and III

Tier I

A Tier I data centre is the basic capacity level with infrastructure to support information technology for an office setting and beyond. The requirements for a Tier I facility include:

- An uninterruptible power supply (UPS) for power sags, outages, and spikes.
- An area for IT systems.
- Dedicated cooling equipment that runs outside office hours.
- An engine generator for power outages.

Tier I protects against disruptions from human error, but not unexpected failure or outage. Redundant equipment includes chillers, pumps, UPS modules, and engine generators. The facility will have to shut down completely for preventive maintenance and repairs, and failure to do so increases the risk of unplanned disruptions and severe consequences from system failure.

Tier II

Tier II facilities cover redundant capacity components for power and cooling that provide better maintenance opportunities and safety against disruptions. These components include:

- Engine generators.
- Energy storage.
- Chillers.
- Cooling units.
- UPS modules.
- Pumps.
- Heat rejection equipment.
- Fuel tanks.
- Fuel cells.

The distribution path of Tier II serves a critical environment, and the components can be removed without shutting it down. Like a Tier I facility, unexpected shutdown of a Tier II data centre will affect the system.

Tier III

A Tier III data centre is concurrently maintainable with redundant components as a key differentiator, with redundant distribution paths to serve the critical environment. Unlike Tier I and Tier II, these facilities require no shutdowns when equipment needs maintenance or replacement. The components of Tier III are added to Tier II components so that any part can be shut down without impacting IT operation.

5.3 MANAGEMENT SYSTEMS

Virtus' entire process is managed in line with its Operations Manual which incorporates the requirements of the organisations integrated management system. This section describes the management systems and processes which are in place at the installation alongside assessment of how the management system will meet BAT requirements. The management system scope of certification is the "design, build and ongoing operation of mission critical data centre facilities". The standards which Virtus complies with are:

Management System Standards

- ISO/IEC 27001:2013 which specifies the requirements for establishing, implementing, maintaining and continually improving an information security management system. (Alcumus ISOQAR certificate 16390-ISN-001 expiry date 7th May 2027);
- ISO 14001:2015 which 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 (Alcumus ISOQAR certificate 16390-MES-001 expiry date 7th May 2027);
- ISO 9001:2015 which specifies the requirements for establishing, implementing, monitoring, managing and improving quality throughout the organisation (Alcumus ISOQAR certificate 16390-QMS-001 expiry date 7th May 2027);
- ISO 50001:2011 which specifies requirements for establishing, implementing, maintaining and improving an energy management system, whose purpose is to enable an organization to follow a systematic approach in achieving continual improvement of energy performance, including energy efficiency, energy use and consumption (Alcumus ISOQAR certificate 16390-NRG-001 expiry date 7th May 2027); and,
- BS ISO31000:2009 Risk Management

5.3.1 ENVIRONMENTAL MANAGEMENT

Environmental Policy

The ISO 14001 certified EMS is underpinned by an environmental policy wording included as part of an overall Compliance Policy. The Compliance Policy 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 (Data Centres) Ltd. Arrangements 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).

The Policy emphasises commitment to:

- Minimising (and where possible) preventing pollution;
- Improving environmental and energy performance;
- Ensuring robust maintenance regimes are in place;
- Auditing and evaluation of operational policies, processes, staff and controls, communicating findings to senior management; and,
- Communicating and promoting policies, processes and controls to all relevant parties.

Environmental Aspects and 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 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 to drive Power Usage Effectiveness figures which is the ratio of total amount of energy used by a computer data centre facility to the energy delivered to computing equipment.

'Significant' aspects are managed by establishing operational controls, processes, procedures, training and the monitoring of activities via an audit programme. All staff are responsible for working in accordance with procedures relating to environmental compliance.

Integrating environmental aspects in the Risk Management Process ensures that identifying environmental risks together with the environmental aspect evaluation, allows routine management system procedures to manage risks under normal circumstances, and emergency plans to mitigate impacts under abnormal circumstances. Such assessments cover the implications of material storage, oil transfer, surface water drainage and site security.

All significant risks will be referenced in the Business Risk Register.

The process of managing and responding to environmental incidents is incorporated into an overall Incident Management Process (Chapter 2 of the Virtus Operations Manual) controlled via the Virtus Service Management Centre. All incidents are reported to the Compliance Manager, who is responsible for the assessment of actions completed, and for the updating of procedures and escalation to a business continuity plan if necessary.

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. A major diesel spill would initiate a High P2 incident with implementation of the Virtus Incident Management Process and Pollution Incident Response Plans.

Virtus also has an Emergency Preparedness Response Process. The process identifies risks under the headings of operational (environmental), third party (environmental), standards/statutory risk, and risks arising from natural disasters. This is reviewed and updated as necessary once the site is fully installed.

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. In accordance with the IMS:

- All staff have clearly defined roles and responsibilities,
- Records are maintained of the knowledge and skills required for each post,
- Records are maintained of the training and relevant qualifications undertaken by staff to meet the competence requirement of each post,
- Operations are governed by standard operating instructions, and,
- 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.

Review and Audit

The Operator recognises that continuous improvement requires the ongoing reappraisal of EMS and Policy to ensure that they remain effective, in line with developing best practice and relevant to the business as a whole. 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.

5.3.2 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, Emergency Operating Procedures as well as an Operation and Maintenance Manual.

Contractor Management

Virtus' approach to contractor management is detailed in their Operations Manual (Chapter 13). Large areas of operation and maintenance 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.

All planned preventative maintenance (PPM) scheduling is undertaken within the enterprise asset management system IBM Maximo. SFG20 is used as the standard to govern best practice in maintenance and parts replacement schedules.

Using the information controlled and retained in Maximo, the FM Team deploy a scheduling system that provides regulation of Vendors for maintenance and repair works. The system utilised is the proprietary Optimis solution. This solution details the planned maintenance and the Vendor details. Upon completion of the activity, records (such as engineer site reports, maintenance reports, statutory assessment reports) are uploaded to Optimis against the activity for full reconciliation of the activity.

The FM Team schedule maintenance activities as governed by SFG20 and the PPM schedule (Maximo) once vendors are appointed. Vendors have to upload RAMS, competencies and qualifications of operatives and other relevant documentation to the Optimis system prior to arrival on site. The FM Team are responsible for approving RAMS alongside VIRTUS site staff.

All maintenance works are to be completed through Maintenance Operating Procedures or MOPs that intend to:

- Create a safe system of work for the Vendor operatives.
- Ensure maintenance works are carried out in accordance with OEM specifications.
- Associated or linked systems are not impacted in the course of maintenance activities.

Operating Procedures must be followed to maintain the quality control and quality assurance processes and ensure continued service provision. The Operating Procedures are reviewed regularly by the FM Team senior contract staff. Current copies of the MOPs are readily available at each site situated near or on equipment. The FM team also maintain Emergency Operating Manuals and the Emergency Operating Procedure (EOP) which explain emergency functionality, safety routines and procedures needed to establish a status of safe working in equipment and infrastructure for emergency operation.

5.3.3 MANAGEMENT SYSTEM BAT ASSESSMENT

The existing management system will continue to meet BAT, LON12 will be incorporated into the system prior to the site going live in September 2025.

Table 5-2 below identifies relevant BAT requirements for the installation and describes the current / proposed arrangements to meet these. The BAT requirements have been identified from relevant GOV.UK guidance.

Table 5-2 - Indicative BAT Requirements for Management Systems from GOV.UK Guidance

GOV.UK Requirements	Current / Proposed Arrangements	BAT?
As part of the Environmental Management System	As part of the EMS, Virtus maintains all	Yes

guidance available on the GOV.UK website the following should be incorporated: You must include a **Site Infrastructure Plan** which highlights where the activities covered by an Environmental Permit are undertaken. Your plan must also include: ▪ Buildings and other main constructions such as treatment plants, incinerators, storage silos and security fencing; ▪ Storage facilities for hazardous materials like oil and fuel tanks, chemical stores, waste materials; ▪ Locations of items for use in accidents and emergencies; ▪ Entrances and exits to be used by emergency services; ▪ Pollution control points, such as inspection and monitoring points; ▪ Trade effluent or sewage effluent treatment plants; ▪ Effluent discharge points; and ▪ Contaminated land, or land you believe is contaminated. The plan must also demonstrate areas which are vulnerable to pollution from the site. Such as rivers and streams; groundwater sources; residential, commercial or industrial premises; protected wildlife. Your plan must show foul and combined drainage facilities marked in red and surface water drainage facilities in blue. It must also show: ▪ The direction of flow of water in the drain; ▪ The location of discharge points to sewer, watercourse or soakaway; ▪ The location of manhole covers and drains; and, ▪ The location of stop and diverter valves and interceptors. Your plan must show the location of mains water, gas and electricity supplies on your site including: ▪ The mains water stop tap; ▪ Gas and electric isolating valves and switches; and ▪ The routes for gas, electricity and water supplies around the site. If your permit covers a standalone water discharge activity or point source standalone groundwater activity, your site plan must show: ETC – N/A	necessary documents for operational planning and control on a site-specific basis. This includes relevant site infrastructure plans containing the information detailed in the relevant guidance. As a result of this permit variation application being made, site plans including point source emission points, drainage system and discharge points will be incorporated into the EMS. The Environmental Risk Assessment (ERA) included in the full Slough Campus application variation covers this aspect of the requirements and will be incorporated into the Virtus EMS documentation. The installation being permitted is for the combustion of diesel to generate electricity and hence this section is deemed not relevant. N/A as the permit is not for a standalone water discharge activity or point source standalone groundwater activity.	
Site Operations	All significant environmental impacts	Yes

List the operations that will be carried out on your site during start up, normal operation and shut down. For waste, mining waste, and installations, list the wastes that will be produced by each activity or process. List the steps you will take to prevent or minimise risks to the environment from each activity or process and type of waste. [If you are a waste operator you must include a waste storage plan that states: (N/A)] Fire Prevention Plans (FPP) (N/A)	stemming from site operations are incorporated into the existing EMS. These will be reviewed and updated as necessary during the site development and variation application process. All details relating to waste generation and waste minimisation and management are held on Virtus internal environmental systems. This will be reviewed and updated as necessary as part of the permit variation application.	
You will need to produce a Site and Equipment Maintenance Plan detailing how you will maintain the site infrastructure and any machinery.	Virtus and its FM provider utilise IBM Maximo. All plant and equipment installed will be included in the maintenance regimes which are implemented in accordance with manufacturer's recommendations. These documents are described and form part of the Critical Asset Management chapter of the Virtus Operations Manual.	Yes
You will need Contingency Plans to demonstrate how you minimise the impact on the environment of any: ▪ Breakdowns; ▪ Enforced shutdowns; and, ▪ Any other changes in normal operations. A changing climate and how this could affect your operations should also be considered as part of contingency planning.	The Virtus Emergency Preparedness Response Process covers this. The process identifies risks under the headings of operational (environmental), third party (environmental), standards/statutory risk, and risks arising from natural disasters. Note the application is to test generator equipment to ensure it can be safely started in the event of a grid failure. A breakdown of an engine / generator set will result in the shutdown of the generator with minimum environmental impact. Loss or leakage of fuel will be managed through the site emergency procedures.	Yes
You will need an Accident Prevention and Management Plan which details how you would deal with any incidents or events that could result in pollution. This plan must: ▪ Identify any potential accidents or other unexpected incidents which could cause an unexpected change to normal operations. For each potential incident the following must be stated: ▪ Likelihood of the accident happening; ▪ Consequences of the accident happening; ▪ Measures taken to avoid the accident from happening; and ▪ Measures to minimise any impacts if the	The OHSE MS and Emergency Preparedness Response Process details incidents which could occur including spillage, leaks, F-gas release, hazardous waste contamination, etc. All incidents are managed through the Incident Management Process (Chapter 2 of the Ops Manual). Additional Pollution Incident Response Plans are initiated depending on the Incident Category. Response procedures are tested annually.	Yes

accident happens. The plan must say how you will record, investigate and respond to accidents or breaches of your permit. It must also include: ▪ Date last reviewed; ▪ Date of next review; ▪ A list of emergency contacts and how to reach them; ▪ A list of substances stored on site and storage facilities; and, ▪ Forms to record accidents on.		
<u>Contact Information for the Public</u> A noticeboard is to be displayed at the site entrance including the following information: ▪ Permit holder's name; ▪ Emergency contact name and telephone number; ▪ Statement to show the site is permitted by the Environment Agency; ▪ The permit number; and, ▪ EA contact number and incident hotline number.	This is not considered relevant for a data centre operation.	N/A
You need a Complaints Procedure to record: ▪ Any complaints received in relation to the activities covered in your permit; ▪ How complaints are investigated; and, ▪ Any actions taken as a result of complaints.	A complaints procedure will be developed to ensure compliance with the environmental permit condition.	Yes
Include details in the management system on Staff and Resources including: ▪ An explanation of who is responsible for what procedures; ▪ Technical competency records; ▪ A list of roles carried out in relation to activities covered in the permit and by whom; and, ▪ Competency check procedure and training records.	Details on posts, roles & responsibilities are displayed in the Virtus OHSE MS. Competency is addressed in the Awareness chapter in the OHSE MS. Sub-contractors on site are subject to site induction which provides the above awareness.	
<u>Record Keeping</u> Any records required by your permit must be kept. You must keep records to show how your management system is being implemented. Records to be kept include: ▪ Permits issued to the site; ▪ Legal requirements; ▪ Risk assessment; ▪ Management system plans;	All relevant records will be retained in accordance with the requirements.	Yes

▪ Any other plans required by your permit (such as noise); ▪ All operating procedures; ▪ Staff competence and training; ▪ Emissions and any other monitoring undertaken; ▪ Compliance checks, investigation findings and actions taken; ▪ Management reviews and changes made to the management system; and, ▪ Certification audit reports and any actions taken. [Waste Operators must also record the following for each waste delivery to the site:… N/a] If you hold a permit for waste, mining waste or installations, a Site Condition Report is required. This must detail the condition of land or groundwater on the site and be kept updated regularly. The following information is to be included: ▪ Details of historic spills or contamination and responses to these incidents; and, ▪ Evidence of the effectiveness of any measures taken to protect land and groundwater.	A Site Condition Report has been prepared and is submitted with this application for variation.	
A procedure needs to be in place for checking you are complying with permit conditions and management system requirements. The management system is to be reviewed and updated when: ▪ Changes are made to the site, operations, or equipment that affect activities covered by your permit; ▪ If you apply to change / vary your permit; ▪ After an accident, complaint or breach of your permit; and ▪ If a new environmental issue is encountered and new control measures are implemented. Changes made to the management system will be recorded.	The EMS will be reviewed and updated as necessary (currently undertaken on at least an annual basis). The review will consider the permit conditions being applied for and environmental risks from the associated plant and equipment. Any changes will be recorded in the relevant Operations manual documentation.	Yes

5.4 RAW MATERIALS

5.4.1 FUEL CONSUMPTION

The fuel consumption has been calculated for the engine testing scenarios only, on the assumption of off-load tests at 10% load for 15 minutes per test *11 times per year per engine*; on-load tests at 20 minutes at 100% and 120 minutes at 75% load, *once per year per engine*. The new engines at LON12 are added to show the increase. Please note the table has been corrected since the August 2022 submission to show a slight decrease overall for the Slough Campus (not including LON12). The proposed LON12 engines are MTU DS3100 G74F emissions optimised (EO). The density of

the fuel is taken as 839g/l. Fuel consumption rates are taken from the respective manufacturer's data sheets.

Table 5-3 – Estimated Fuel Consumption

Engines	No.	Data Sheet consumption at 10, 75 and 100% load	Total fuel l/y	Tonnes/y
LON4 3516C	8	107.70 437.60 572.50	2369.40 7001.60 1526.67	9.14
LON4 3516C remap	3	96.30 434.70 568.50	794.48 2608.20 568.50	3.33
LON4 3516B	3	82.96 400.38 531.32	684.42 2402.28 531.32	3.04
LON4 XC3300	5	83.88 510.20 686.90	1153.35 5102.00 1144.83	6.21
LON3 MTU G63	6	58.90 339.10 447.50	971.85 4069.20 895.00	4.98
LON10 MTU G84F	6	78.83 381.10 513.30	1300.70 4573.20 1026.60	7.46
Current Slough Campus Total		**Existing LON4, 5 and 9**	**38,723.59**	**32.49**
LON12 new engines MTU G74F	16	86.04* 494.60 633.70	3785.76 15,827.20 3379.73	19.29
Proposed Slough Campus Total	**47**	**Proposed LON4, 5, 9 and 12**	**61,716.28**	**51.78**

*not provided in MTU G74F datasheet, based on an average 10% to 100% fuel ratio for installed MTU engines of 13.58%.

Estimated fuel consumption for the Slough Campus therefore increases from 32.49 tonnes per annum to 51.78 tonnes per annum for routine operations (engine testing). Fuel consumed for routine operations is reported under the UK ETS scheme.

5.4.2 OTHER RAW MATERIALS

The addition of the engines will result in an increase in lubricating oil..

All additional lubricating oil is stored in the engine sump, and to be replenished directly into the engine sump.

There is no oil make up facility on these packages.

5.5 GRID RELIABILITY

There are no changes to the grid reliability section of the Campus application however the information is repeated here for clarity. Aside from the necessary monthly maintenance testing (described elsewhere but typically 5-15 minutes per month (11 times per year) with one longer test annually to a total of just over 5 hours of operation per generating set per year or 0.06% of the year), the generator sets installed shall not be used for any purpose other than providing emergency back-up power generation. No installed generators shall support Short-Term Operating Reserve (STOR) and/or triad management activities during the lifetime of the development.

This represents a situation where there are no anticipated periods where the generating sets are planned to be operated for any significant period of time.

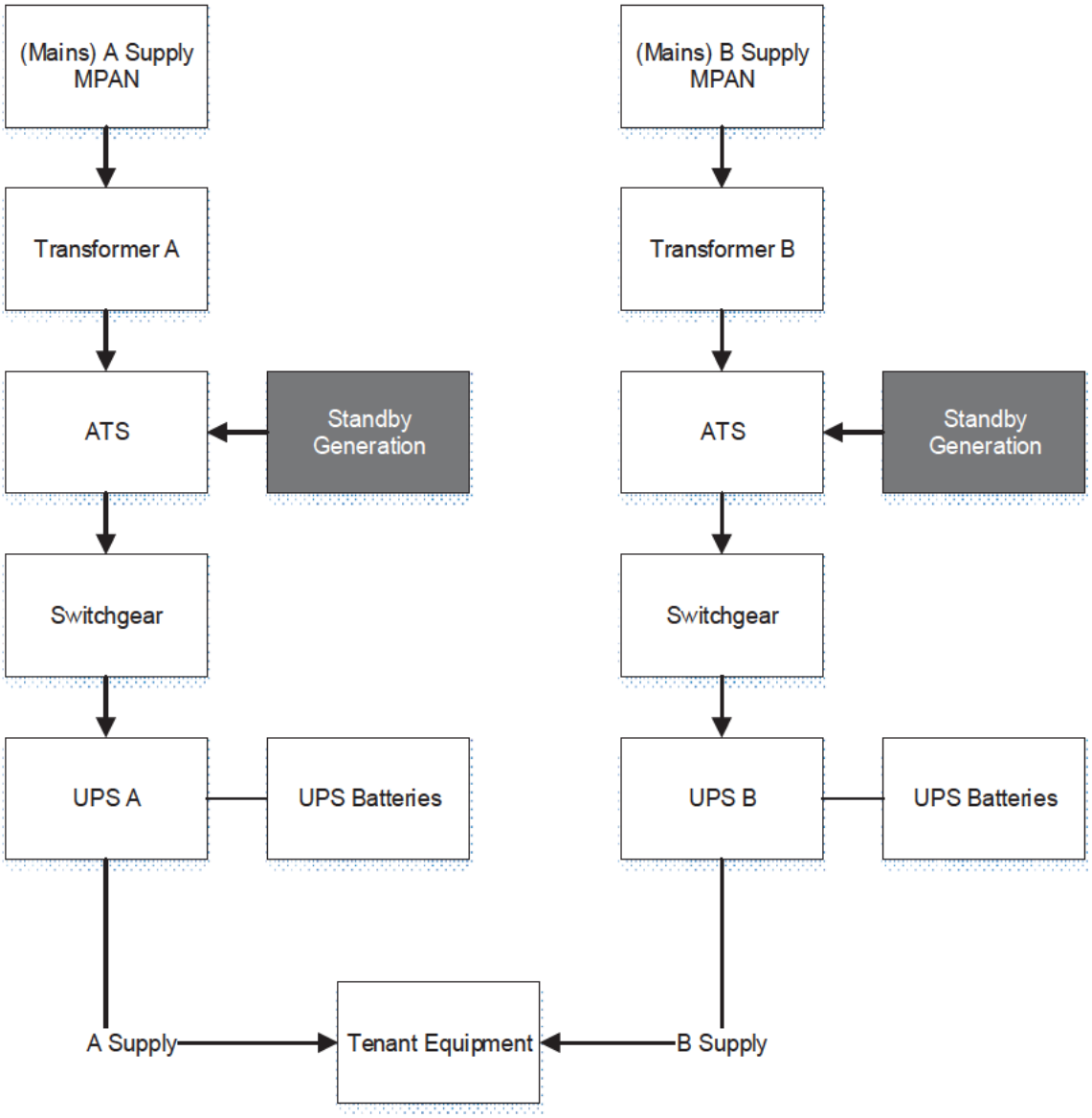
As the operation of the generating sets is considered undesirable, Virtus has designed an incoming power system to the site to ensure that only the most major power interruption events would trigger the need for the generators to be used to support the buildings outside of maintenance activities. The incoming power system to the site will consist of two separate cables from the Slough Heat and Power station, Iver sub-station in Buckinghamshire to the site, and electrical feeder breakers at Iver. Each component in series would make up a power feed to the site, and the system has been designed such that in the event of any one of the main power feeds being accidently or maliciously damaged, undergoing a fault or being shut down for maintenance, the on-site power system could be re-aligned without needing to engage the back-up generating sets.

The power for the installation originates from the Iver grid connection point, owned and run by National Grid, and from the SSE Slough Heat and Power generating station. The only circumstance envisaged by the project engineers where the generators would be used for a period of time would be a power outage directly from Iver or further upstream from this substation. This outage would be a major impact for the entire area, as it would affect a large number of people and businesses over a wide area from Denham to Hayes to Slough. Given the scale of such an impact, it could be reasonably expected that such an outage would be addressed as a matter of top priority by National Grid, and therefore the back-up generating sets would run for as little time as possible.

The simplified schematic below highlights how standby generation for the data centres works. The main components in the power distribution are:

- Utility power – main power source for the facility
- Standby generators – supply power when utility power is not available
- ATS (Automatic Transfer Switch) – routes utility or standby power to switch gear

- Switchgear – routes utility or emergency generator power throughout
- UPS (uninterruptable power supply) – consists of battery bank, charger and inverter.



Grid connection schematics showing the final designed systems can be supplied under Schedule 5 Notice at a later date.

5.6 GENERATOR ENGINES BAT ASSESSMENT

5.6.1 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.

Redundancy operates on a swing engine basis, usually within a power stream group of engines (up to 7 engines). In an emergency related to the power stream, the swing engine therefore acts as back up should one of the engines fail to start. In this instance one engine is assumed to be swing duty.

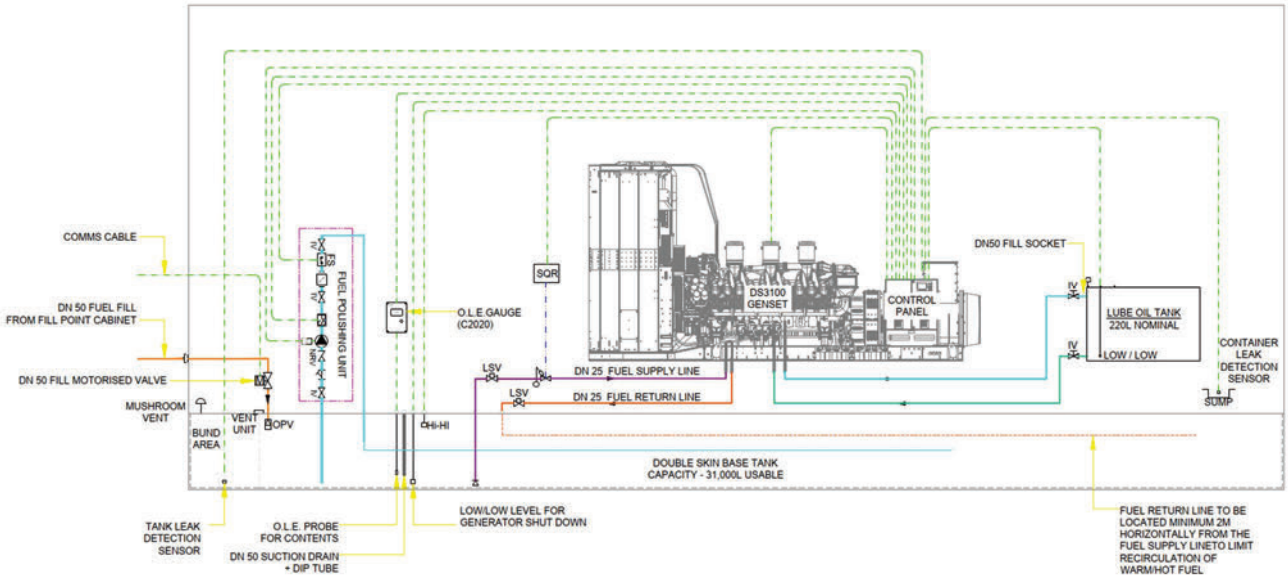
In general emergency generator engines have historically been specified to be low brake specific fuel consumption combustion strategy. However, the choice of engines is also driven by design linked to the data centre design – hence resulting options are limited by availability in the marketplace, with low emissions versions of more engine types being released to market.

Low levels of NOx are achieved in the combustion process by lowering the air temp in the cylinder which requires greater cooling airflow, in turn requiring a larger radiator and increased airflow, increasing the overall physical design dimensions of the acoustic enclosures, increasing fuel consumption and hence overall capital and operating costs. This will impact on competitive viability for the client (primary business being the operation of a Data Centre, not the running of back-up generators). In addition, this will also lead to a reduced load step acceptance figure and response time which is critical to Data Centre designs (Mission Critical standby function of the engines) and the fuel consumption rate will increase, so whilst meeting a level of NOx, other pollutant emissions such as PM, CO and unburned hydrocarbons may increase.

However, the Agency Data Centre FAQ requires engines that are low emission combustion strategy, and hence the LON12 engines will meet this. Emission standards and real-world emissions are discussed further in TA Luft 2g NOx and US EPA Tier 2.

Generator Housing

The generator sets will be delivered to site in purpose built containers, acoustically treated, with combustion exhaust gas flued back in to the vertically discharging engine cooling air. The container layouts are shown below in the supplier (AVK) diagram.



The layout will be across two levels, to minimise footprint (effectively 'double stacked') split between a 'South' wing with 6 engines (3 on lower tier, 3 on upper tier) and a 'North' wing (on the eastern side) with 10 engines (5 on lower tier, 5 on upper tier). This is shown in the drawing extracts below. A3 sized drawings are appended in Appendix E. Figure 5-1 shows the South upper level gantry with 3 generator containers and the three lower level stacks (labelled 'Exhaust') from the generators situated directly underneath.

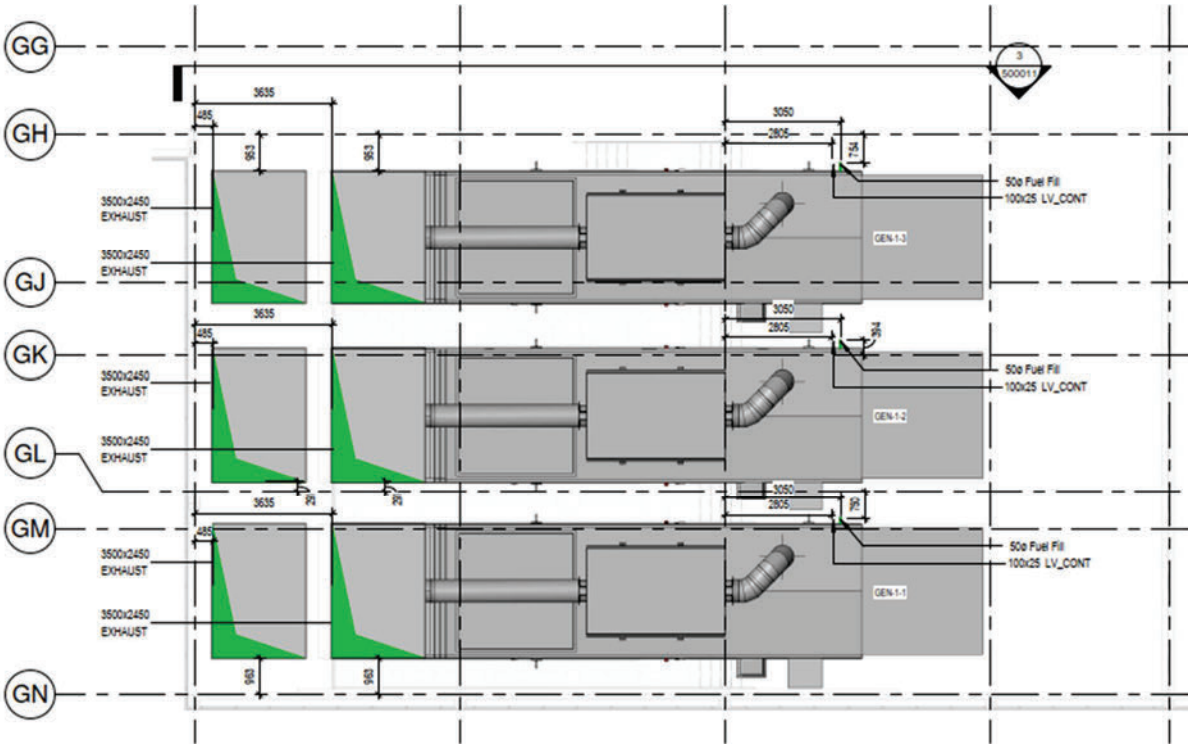


Figure 5-1 – South wing gantry arrangement

Figure 5-2 shows the same arrangement for the North wing gantry upper level. In both cases the combined cooling air and combustion exhaust stack and emission point for each engine is at the western end of each generator.

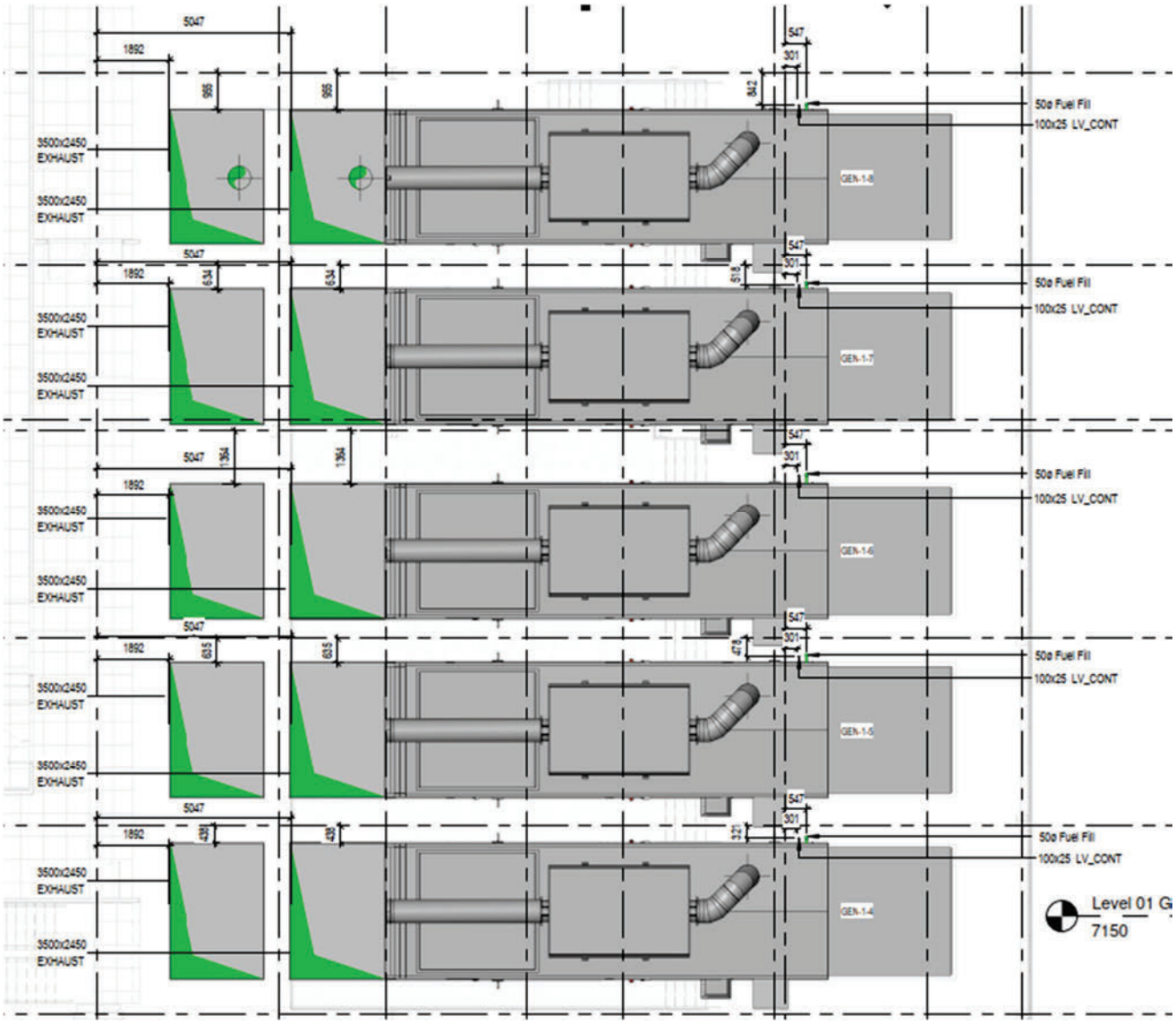


Figure 5-2 - North wing gantry arrangement

5.6.2 SIZE, NUMBER AND CONFIGURATION

The choice and configuration of back up energy plant is driven by the data centre design; each unit is based on strict requirements of a set of servers, cooling plant, the UPS battery system, determining the power supply required, and setting the backup requirement for that array, which is designed to be independently manage-able; and hence the number and choice of suitable engines in the market place is therefore defined by the power required per power stream. Underlying that is the non-negotiable target for the business, which is the Uptime Institute Tier III compliance (see Note in Section 5.2). Smaller numbers of larger capacity machines do not work when the purpose is to match standby to Data Centre power stream design requirements, and within site space constraints, economic and technical viability. Stepping up to a 3MWe unit would mean a huge cost increase on capital equipment of generator and enclosures, fuel tanks, switchgear and associated equipment on site to such a point where this becomes an unviable proposition. The physical size of

the larger engines and associated equipment will restrict the ability to fit the required engine numbers into the space available. Maintenance is simplified by having standard package power trains in use rather than bespoke built larger units. These points are explored further in the box below.

In the construction of a data centre the stand-by generator selection is based on:

1. Size to support the critical IT loads and their associated supporting infrastructure, such as cooling equipment
    - The optimally/appropriately sized-to-power-stream generator (modular) approach allows for single generators to activate in the event of a single power stream failure instead of a larger generator activating to accommodate a similar failure. If the correctly sized generator is rated to support the power stream's demand load by design, then this configuration will minimise emissions. Larger generators supporting more than one power stream will have increased chance of activating.
2. Flexibility to support isolated power streams in support of N+2 redundancy designs
    - Parallel configurations of smaller engines have the advantage of supporting load sharing and management especially for variable load applications such as a data centre IT loads.
3. Flexibility to support continuous N+1 operation
    - Inclusion of a swing generator set to support N+1 resilience during maintenance. Maintaining a smaller generator supporting a single power stream is more cost effective and more resilient than maintaining a larger generator supporting multiple streams.
4. Market availability and lead up times
    - Small to medium sized generators are more readily available and quicker to procure than larger generators.
5. Initial delivery and installation costs
    - Lower initial install costs for diesel generators
    - Lower weight / kW for diesel generators
6. In-operation costs
    - On line in less than 10 seconds (NFPA[1] requirement under Tier III Uptime) and excellent transient capability. Gas engines have less load pickup (transient) capability and a larger frequency deviation (stability) than diesel generators.
7. Fuel type availability, upkeep costs (such as fuel polishing), storage and supply costs
    - To store quantities of diesel onsite is both more cost effective and safer (COMAH) than storing compressed fuel types. The availability of diesel is such that VIRTUS have retained

[1] National Fire Protection Association, NFPA, publisher of one of many sets of codes to which the operator must comply to obtain the Uptime Institute Tier III classification.

emergency diesel suppliers with a 4-hour delivery SLA.

- Diesel oil can be safely stored on site in quantities allowing for prolonged, emergency use (48-72 hours). Natural gas may be stored on site, but not in the quantities to achieve 48-72 hours without consequence. Customer SLAs typically demand a minimum of 48 hours of site-based emergency power generation. A gas pipeline would be a primary source of supply with a smaller stored amount of compressed gas available for emergency generation. The gas would then be considered a single point of failure if supply was affected. Natural gas is extremely explosive. A leak would possibly result in the entire site and its supporting emergency infrastructure being shut down for safety purposes until repairs are made, especially concerning the proximity to HV/LV transformers and switch rooms.

8. Replacement costs and/or availability of spare parts
    - Defective, larger engines have longer lead times and are more costly to replace.
9. Effective emissions
    - Marginal NOx reductions against increased cost per MW output and increased physical footprint in for larger generators.
    - If the individual engines are greater than 3MWth input and cumulative MWth input is greater than 20MW, then the data centre must enter the UK ETS emissions trading scheme. All diesel-consumption is recorded, and carbon emissions reported to the Environment Agency legalised under a GHG emissions permit.

Table 5-4 below outlines how the type of generators using a diesel fired engine installed at the site meet relevant BAT requirements.

Table 5-4 - BAT Summary for Data Centre Standby Generators

Engine Type or Fuel	Current / Proposed Arrangements	BAT?
Diesel Fired Generators Reciprocating compression ignition engines fired on diesel fuel oil	▪ High response (low start-up duration, 15 seconds) ▪ Good independent performance reliability due to the on-site storage of diesel fuel in sufficient quantities ▪ Fuel managed and controlled by the facility ▪ Fuel oil can be sourced from more than one supplier for delivery to the site ▪ Handles variable loads readily ▪ Large number of moving parts subject to failure requiring regular ongoing maintenance to ensure reliability, however these are readily obtained and replaced, typically included as part of the service agreement with the generator vendor. ▪ Due to the number of moving parts, diesel generators when operated can be noisy and generate vibration. High polluting emissions to air, most notably NOx and particulate matter, which can impact local air quality if operated for prolonged periods of time.	Yes

Gas-Fired Generators Reciprocating engine spark-ignition	▪ Are commercially available for the provision of emergency electricity generation, however do not have as fast a start-up as diesel engines (typically up to 5 minutes to provide 100% load), would compromise DC operations ▪ Fewer moving parts than diesel engines which can be subject to failure, more reliable ▪ The storage of gas on-site as a fuel source will not be possible due to space constraints, significant health and safety risks. Hence reliance on an off-site supply (pipeline) of gas, operated and maintained by others. Any interruption means no emergency back-up generation for the site, which does not meet the resilience requirements of the facility ▪ Less capable in variable load environment (such as the DC) ▪ When compared to diesel generators gas-fired engines produce fewer polluting emissions to air	No. For the purpose of this assessment, gas-fired generators are discounted.
Fuel Oil-Fired Gas Turbines	▪ Relatively good independent performance reliability due to the ability for on-site storage of kerosene fuel, under control of the facility ▪ Multiple fuel suppliers improve flexibility and resilience ▪ For reliability the fuel oil must be stored on-site in sufficient quantities to ensure sufficient supply on interruption to the grid electricity supply. As with gas-fired generators, start-up is not considered to be fast, typically more than 30 seconds ▪ Fewer moving parts than diesel engines which can be subject to failure, and are therefore considered to be more reliable, and operate with less vibration when compared to diesel generators	No
Hydrogen Fuel Cell Generators	▪ Relatively new technology ▪ In the absence of a piped supply of hydrogen in the immediate area which could supply the facility, there would be a need for the on-site storage of hydrogen and the provision of emergency back-up supplies ▪ The storage of hydrogen on-site as a fuel source is not considered possible due to restraints on available space, additionally there are significant health and safety risks associated with such storage	For the purpose of this BAT assessment, fuel cell generators have been discounted.

5.6.3 THE EXHAUST SYSTEM

5.6.4 BAT ASSESSMENT STACK SET UP

The stack set up and height was driven and confirmed by the following:

- The need to operate generators as individual units, i.e., not rely on joint exhaust air flows from other units to assist velocity or buoyancy,
- Planning consent requirements to reduce visibility and retain the stack exits hidden which rise up to provide a designed finish,
- Heights increased above those normally associated with emergency generators for short duration operation (typically venting through top of container to a max of 5m above ground),

- Industry standard data centre solutions packages availability from suppliers,
- Demonstration by ADMS modelling of dispersion of test regime and emergency emissions to be submitted with this variation.

Other options for stack arrangements are limited and would include:

- Ducting flues together – larger structures, longer flues, into common windshields or gantries. This would need additional fanpower and support foundation and would lead to increased visibility, complex ductwork and maintenance; and,
- Ducting flues into a common chimney – complexity of structure and increased fanpower to overcome stack air backpressure. At testing this would lead to loss of flow and velocity if single unit being tested (planning constraint) with subsequent loss of dispersion.

Similar studies have shown (e.g. Centrica Roosecote[2]) that combining stacks does not necessarily lead to improved dispersion *("the potential aggregation of stacks would have minimal effect on both the predicted short term and long term air quality impacts associated with the development"*).

A similar conclusion was drawn at Colt Welwyn[3] and accepted by the Environment Agency: "*The operator has justified its use of a large number of smaller generators rather than installation of fewer larger generators because of the modular nature of the site and potential restriction of its expansion plans as new clients would be less able to modify data hall designs to suit their individual needs. Smaller generators can be more readily added to the site giving greater flexibility as the site expands. The operator has justified not limiting the number of stacks or not grouping stacks into common windshields because that would compromise the "2n" redundancy arrangement as, if one stack was unable to be used, then multiple generators may not be able to operate. In addition, routing stacks to common windshields is problematic due to the geographical location of the generators on site, the amount of pipework and support structures necessary and the overall space constraints on the site due to the fact it was not originally designed as a data centre*."

Following the above arguments, it is considered that for emergency standby generator arrangements with a low likelihood of operating in emergency scenarios, the stack heights (23 m) are entirely appropriate and meet BAT.

5.6.5 ENGINE EMISSIONS STANDARDS

TA Luft 2g NOx and US EPA Tier 2

The standards quoted by the Environment Agency as representing BAT are quoted below from the Data Centre FAQ v21.0, being currently a discussion document, however will be referenced in the text below as potential "future BAT".

[2] http://www.epa.ie/licences/lic_eDMS/090151b280658335.pdf

[3] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/772593/Decision_document.pdf

Table 5-5 – EA FAQ v21 Engine BAT

1.11 Engine Emissions Standards and BAT 1. Generic new diesel plant BAT (as previously) (1.11.1): • emissions optimised 2g-TA Luft or US EPA tier 2 or equivalent – the current status quo BAT 2. Outage Ambient NOx peak limited due to scale or location of standby; or technically where the Peak NOx over short timescales (first few hours) to sensitive receptors could not reasonably be managed via the AQMP: etc 3. Local Authority or regionally designated AQF, AQP, planning requirement (1.11.3) and possibly EA designated clusters (notably Slough Trading Estate): • emissions optimised (2g/US EPA tier2) engines fitted with fast-response (<=10mins) full-SCR abatement achieving better than 90% reduction (to at least an indicative 95mg/m^3 at 15% O2) to all engines 4. ADVISORY BAT "SCR-ready" configurations are included to allow retrospective fitting of SCR abatement if necessary. 1.11.1 New '2g/Tier2' – emission optimised Previous FAQ wording: The minimum appropriate is the 'TA-Luft 2g' or Tier II USEPA with guaranteed emissions: this has requirements for 2000mg/m^3 NOx; 650 mg/m^3 for CO; particulates and dust 130 mg/m^3 and 150 mg/m^3 for hydrocarbons (all at reference conditions and 5% O2). New FAQ wording: 4) So practically for data centres we would ordinarily expect specification sheets provided to EA at permitting to be EPA Tier 2 D1 test cycle (ISO8178-4) figures and/or 2g TA-Luft. This broadly equates to 2000mg/m^3 (+/-10% tolerance) at 5% O2 = 750mg/m^3 (+/-10% tolerance) at 15% O2 being realized between about 67% and 87% of peak load rating. Typically the best match to '2g' being at 75% quoted load rating as the default single point for comparison. * *International standards and spec sheets may base emissions at slightly different reference temperatures and atmospheric pressures in addition to the oxygen standard: it is important to also convert EU/UK 273.15K and 101.3kPa but oxygen reference 5% or 15% is usually the most crucial.*
It should be noted that The Data Centre FAQ references the D1 test cycle, whereas the datasheets (CAT and MTU for Slough Campus) all reference the D2 cycle for compliance with TA Luft, US EPA Tier 2 and Singapore ORDE.

TA Luft 2g

TA Luft 2g as written above however, is not clear as to whether the 2g level required is at a specific load (e.g. 100%), or at all times, or averaged across a load cycle unlike the publicly available US EPA Tier 2 standard. The current draft FAQ wording (above) references the load cycle D1; however all datasheets supplied reference load cycle D2. It is also unclear whether the tolerance proposed by the EA comes for the TA Luft/US EPA standards or is an additional requirement superimposed by the EA.

US EPA Tier 2 / Singapore ORDE

The US EPA requires stationary combustion ignition engines >560 bkW to be certified to Tier 2 equivalent standards for emergency applications & Tier 4 for non-emergency. The regulated limits apply to PM, CO, HC & NOx emissions – for emergency engines >560 bkW the NOx limit is combined with an NMHC limit and expressed as a total of 6.4 g/bkWh. This is the same as the NEA Singapore (Off Road Diesel Engine Emissions) 2012 regulations[4] requirement

The regulated limits are applied as a weighted average of readings taken at the load points defined in the ISO 8178 D2 cycle (10, 25, 50, 75 & 100% load). The weightings differ considerable from the D1 cycle referenced by the EA. This point needs to be stressed as it may cause confusion when EPA Tier-certified engines are used in countries that are unfamiliar with the US EPA requirements. In these situations, there is often an expectation that an engine measured in the field will always produce <6.4 g/bkWh NOx whereas, because of the averaging/weighting calculation, the actual emissions may be over or under the regulatory limit. There is also a "Not-To Exceed" factor, which allows for variations in ambient temperature & altitude etc., so an actual in-field measurement can be substantially more than the 6.4 g/kWh limit, but the engine would still be in compliance with the certification standard. Similar to TA Luft 2G, Tier 2 is a product 'range' certification process based on controlled environment tests on a sample of engines and will not be directly replicable under real world conditions.

In addition the emissions data quoted in the engine datasheets cannot be used to accurately determine an engine's compliance with EPA certification levels as the measurement load points defined in the ISO D2 cycle are at percentages of engine gross power, whereas the load points quoted in the datasheet may be at percentages of the genset's electrical output. A rough calculation can be performed to give an indication but, for a definitive answer, actual certificates are required from the manufacturer (and will be supplied on delivery/commissioning).

The engine supplier will provide the certification in due course with the engines, when they are delivered to the site and subsequently commissioned.

Selective Catalytic Reduction

To achieve lower emissions, the only guaranteed method across the complete range of engines and loads is Selective Catalytic Reduction (SCR). This technique is not applicable to start-up tests (though becomes applicable to a longer on-load test). SCR will only operate when the engine exhaust system is above circa 350 – 400°C, where the level of urea injection is set at expected running loads during commissioning; neither condition is expected to be achieved in a 5 to 10 minute start up test at no load. Over-injection of urea at low loads will also results in ammonia slip, which needs to be considered as an additional environmental impact.

The Environment Agency's draft data centre FAQ Headline Approach (v21.0 for TechUK discussion) states under 1.11.3 TBC Heightened BAT (SCR) etc:

[4] https://sso.agc.gov.sg/SL/EPMA1999-S299-2012

Table 5-6 – EA FAQ v21 BAT and SCR

Emissions optimised (2g/EPA tier2) engines fitted with fast-response (<=10mins) full-SCR abatement achieving better than 90% reduction (to at least an indicative 95mg/m³ at 15% O_2) to all engines shall be used in 1. AQMAs 2. AQ focus areas (AQF) a. Local Authority designated Air Quality Neutral or Air Quality Positive areas b. Regionally designated Air Quality Neutral or Air Quality Positive areas e.g. London plans 3. Possibly EA designated clusters (notably Slough Trading Estate).

Point 3 is acknowledged as potentially requiring the use of SCR once an EA designated cluster is defined in appropriate legal terms and there is a local air quality driver to reduce emissions.

The Air Quality Assessment report will provide the context of air quality designations.

Emissions Monitoring

Test ports have been included in the design of the exhaust flue ductwork prior to discharge to the cooling air stack to allow for MCERTs compliant particulate testing. Emissions testing under the permit will be undertaken on commissioning and at 5 yearly intervals thereafter.

Emissions will be tested for information purposes only, no ELVs will apply, given the emergency duty of the generators. Compliance is in the form of type-certification to the relevant standard, and not by individual engine exhaust point source emissions monitoring.

New Engine Emissions Compliance

The new engines will meet the NEA Singapore ORDE (equal to US EPA Tier 2) standard.

Compliance is shown in Table 5-7.

Table 5-7 – LON12 new engine emissions compliance

Engine Type	Date ordered	2G or Type 2 compliant	Compliance	Completion Date
MTU 20V4000G74F	Aug 2024	US EPA Tier 2 compliant; SCR fitted for on load tests or emergency runs	The engines will be built in factory to meet US EPA Tier 2/NEA Singapore emissions certification.	N/A compliant on delivery

5.7 EMISSIONS TO AIR

Emissions to air from the site will vary depending upon the operational scenario of the engines (specifically the testing regime required by the manufacturers and in some cases also by the data centre clients). The engines will only be operational during periods of emergency back-up situations

(i.e. in the event of a power outage from the national grid, or an internal system failure requiring a power stream to come off grid), or during testing. There will be no point source emissions to air outside of these periods.

For the purposes of the Air Emissions Risk Assessment, the EA guidance 'Unclassified, Emissions from generators (Version 1) Guidance on dispersion modelling for oxides of nitrogen assessment from generators' states that where a generator is run on gas oil only, NOx is the primary pollutant of concern.

The engine data sheet emission values are presented in Appendix D, for various loads; note the data centre power streams are designed with the generator oversized and hence the normal load is typically around 75 to 90% (normal stabilised continuous emergency load after initial battery re-charging). Off-load tests are conducted at nil load, on-load tests are conducted at 100% then 75% load. A nil-load emission level isn't provided by the manufacturer for routine monthly tests. Note the table presents the engine exhaust emissions concentrations and will differ from the modelled emission flow rates which includes a substantial volume of engine enclosure cooling air emitted via the square stack, into which the engine exhausts. The data sheet values will also need to be interpolated to steady state long term emergency operation of the engines which will be determined by the power stream load (the maximum design load for IT, building requirements, cooling system load etc) which is generally designed to be around 75-90% of the engine maximum load capability (100%) and will depend at any point on the tenant fitout. Maximum output is only used for a short period of 20-30 minutes to recharge the UPS battery array.

The required air quality modelling scenarios are determined as:

- The air quality model should be based on the worst extent of the planned testing scenarios of the generators;
- Virtus test 1: each individual generator is powered up once per month for 11 months and run with no load for 5 minutes (but allowing up to 15 minutes worst case in the AQ model); and,
- Virtus test 2: Full service on-load test once annually, connected to a mobile load bank initial maximum load at 100% for 20 minutes followed by normal load of 75% for 120 minutes (one engine generator set at a time).

The operator calculated the average annual emergency operation scenario (assuming an emergency occurs once in every 5 or 6 years for 24 hours based on Ofgem grid operator outage data and on-site outage worst case estimates) which was developed based around initial 20 minute start-up load and 220 minute subsequent stable operation. However, the Agency has over-ridden this operator determined scenario with a 72-hour annual outage required by the FAQ, hence the emergency scenario modelled is:

- Virtus emergency: Environment Agency specification to look at the impact of a 72 hour grid outage.

The Simplified Planning Zone does not apply any further testing restrictions, however best practice and BAT will be followed.

The modelled scenarios are described below as 'operational' and 'emergency'.

5.7.1 OPERATIONAL SCENARIO (TESTING)

The emissions of NOx associated with the generator tests are presented in Table 5-8. The table provides the cumulative totals for the test regime (annual basis) for the 16 engines. The 10% load related emission levels are used for nil-load given the absence of a nil-load figure in the datasheets.

Table 5-8 - Operational Scenario Emissions LON12 new engines

Scenario	Mins / Load	No. of Generators	NOx g/s	NOx g/yr per engine	Cumulative Annual Emission
Routine off-load testing x 11 months	15 mins @ 0% (10% load used)	16	0.71g/s per gen	6,985g per gen set	111,760 g
On-load test once per year	20 mins @ 100% load, 120 mins @ 75% load	16	5.68g/s per gen set 3.06g/s per gen set	6,813g per gen set 22,000g per gen set	461,013 g
Total annual					**572,773 g**

Engine testing hence results in **572.7** kg per year of emissions from LON12. The operational emissions scenario is also presented below for the permitted units at the Slough Campus to determine the overall installation emissions.

Table 5-9 - Operational Scenario Emissions Slough Campus existing engines

Scenario	Mins / Load	Data Centre	No. of gens	NOx g/s	NOx g/yr	Cumulative Annual Emission
Routine off-load testing per month	15 mins @ 0% (10% load used)	LON4	8	'C' - standard 1.1	87,120	231,601 g
		LON4	3	'C' - remap 1.1	32,670	
		LON4	3	'B'** - standard 1.19	35,343*	
		LON4	5	XC3300 0.36	18,018	
		LON3	6	G63 0.38*	22,810*	
		LON10	6***	G84F 0.6	35,640	
Mains Failure test once per year	20 mins @ 100% load, then 120 mins @ 75% load	LON4	8	'C'standard 4.70; 3.42	242,112	1,053,162 g
		LON4	3	'C' remap 4.34; 2.64	72,648	
		LON4	3	'B' ** 4.26; 2.85	76,896	
		LON4	5	XC3300 3.53; 2.47	109,978	
		LON3	6	G63 6.48; 5.40	280,088	
		LON10	6	G84F 5.30 5.40	271,440	

Total Test Emissions						**1.285 tonnes NOx**
Emergency Scenario NOx Emissions						
Emergency 72 hours per year	Modelled at scheduled load average for 72 hours***	LON4 LON4 LON4 LON4 LON3 LON10	31	'C'standard 'C' remap 'B' XC3300 G63 G84F		7.129 t 2.071 t 2.231 t* 3.215 t 8.426 t 8.396 t*
Total 72 hr Emissions						**31.469 Tonnes**

**.Minor correction from August 2022 submission*

*** 'B' emissions by interpolation between two datasheets for local SCAC temperature, the 'B' engines installed are low emissions optimised (datasheets EM2651/2652).*

****Calculation undertaken on one hour at 100% load and 71 hours at 75% load*

The total proposed operational NOx emissions from the combined Slough Campus is therefore **573kg** plus **1285kg** totalling **1858kg.**

5.7.2 EMERGENCY SCENARIO

For the emergency scenario, and in the absence of NOx concentration measurement data at specific load points, likely operational emissions concentrations have been based on emissions data from the engine data sheets, interpolated between data points. The background information to the emergency scenario emissions is based on Load Schedules developed for each unit, hence the emergency scenario consists of an initial period at 100% followed by the scheduled load for each generator, averaged across the main generators (variable between 80-90% load) and separating the swing generators which have a scheduled operating load around 5% load.

Modelling inputs and outputs will be described fully in the accompanying air quality assessment to be submitted with this variation.

5.8 FUEL STORAGE, DELIVERIES AND BAT

5.8.1 STORAGE TANKS

The diesel (ultra-low sulphur gas oil, 10ppm ULSG EN2869:2010 Class A2 see Adler and Allan specification previously provided as part of the site documentation) is stored in steel 'belly' or 'slab' tanks, each one situated under and dedicated to an engine/generator set container.

Photo showing the belly/slab tank in situ at LON5, similar to LON12:

Design:

Drawings are attached in Appendix E. The above ground storage tanks are specified by the supplier AVK and 5mm thick welded steel sheet construction built to BS799: Part 5 Type J (2010), or OFS T200, which is referenced in Environment Agency guidance Storing Oil at a Home or Business. Each generator set is fed via the onboard fuel pump and an internal connection from the base tank through to the canopy.

Secondary Containment:

The Agency guidance states that secondary containment is “a drip tray” or “a bund – outer case which holds the container”, secondary containment does not include ‘double-skinned’ tanks etc “where the tank is surrounded by a second skin for extra strength”.

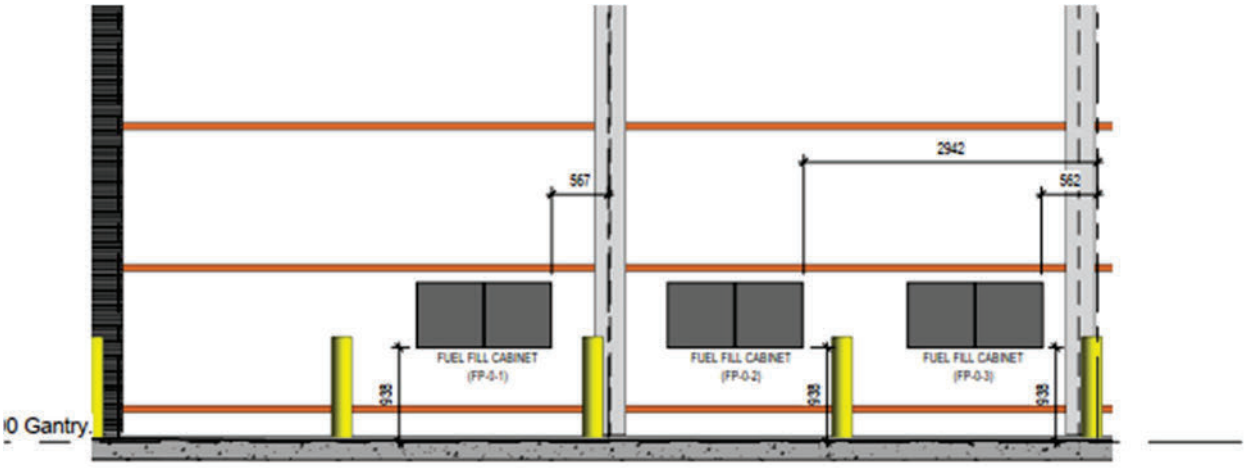
The AVK specification of 6 March 2024 for LON12 uses the term ‘double skinned bunded’. The term ‘double skinned’ is ambiguous in that the design is in fact to BS799: Part 5 which covers the internal Primary tank, fitted within an external tank which provides the bund function, within which the inventory will be prevented from releasing to the environment. This is therefore an integrally bunded design. Should there be any perforation in the Primary tank, the leak will result in the level of liquid levelling out across the primary tank and bund space; and trigger the alarm sensor. The alarm function is provided by a C2020-B8 BLE probe set to alarm if tank inventory is released to the annulus. A data sheet (C2020 I & O Manual) is attached at Appendix E.

All transfer pipes including the delivery point are held within the tank with the obvious exception of the rising pipe to the generator enclosure, and balancing pipework between tanks (which also provides the facility to pump diesel between adjacent tanks if necessary), which are routinely kept closed.

The site slope to drainage system, full retention separator with automatic shut off are therefore tertiary containment measures.

Tank Filling:

There are three delivery points (fill points FP1 toFP3) to the 16 gen-sets contained within specialised fill cabinets with a drip tray. The fill points are remote to the fuel tanks, and protected by bollards as shown in the drawing below:



Procedures for diesel deliveries are included in Virtus management system and defined in the Operations Manual and described in the box below:

A fuel refill request is made by staff which initiates a controlled and safe system of work; a trained member of the FM Team takes a gauge reading and cross references this with a Monthly Log. If necessary cross reference is made to the secondary fuel gauges. Personnel are made aware of the maximum capacity of the generator fuel tanks at each location.

The tanks must not be filled more than 95% of their capacity. The supplier must be given an accurate reading. Any concerns over the accuracy of the readings must be reported to the FM Team Contract Manager or Supervisor and Virtus. The FM Team shall inform both Virtus and site security that fuel delivery is to take place. Where necessary the local area will be appropriately cordoned off using barriers and cones. The tanker and its crew must be supervised at all times, a permit to work process applies. Any 'at risk' drains must be covered to prevent potential loss to the drains and spill kits must be positioned nearby. Any concerns over the quality of the spill kits or drain covers must be reported to FM Team Contract Manager and Virtus. Delivery of fuel will not be carried out until any remedial actions are conducted.

The FM Team must ensure that all combustible materials, flammables and naked lights and mobile phones are removed or switched off within the fuel delivery area and immediate vicinity.

All FM Team employees must ensure that they wear the correct level of PPE.

The FM Team are to obtain delivery receipts/reports indicating the exact amount of fuel delivered to individual fuel storage tanks.

A further procedure exists in the event of a spillage or leakage of fuel; triggering the Pollution Incident Response Plan if required. Virtus operate a Nine Point Fuel / Chemical Spill Procedure which assesses the severity of the spill and associated risks, and initiates the appropriate response in terms of alarms, actions, notifications and records.

Collected spilled oil and absorbent material is disposed of as hazardous waste.

Tank Inspections (Asset Integrity Programme):

Given the protection from impact (described above), and the structural design of the tank system (to BS 799: Part 5), the only remaining method of failure of the tank will be internal corrosion. This is a recent issue due to the increased use of biodiesel in diesel/gas-oil (see specification provided

previously), Fatty Acid Methyl Esters attract water and dissipate it throughout the fuel which can cause acidic pitting of the tank surface internal, as well as the build-up of sludges.

Corrosion is managed/mitigated by:

- Correct specification of the fuel (note the maximum zero Strong Acid Number specification of the Adler and Allan ULSG Fuel specification provided);
- On-site continuous circulation of the diesel through the fuel polishing system to remove water and particulates;
- Quarterly fuel sampling as described in 6.7.9 of Chapter 6 of the OHS&E Manual;
- 5 yearly empty tank inspections; and,
- Visual inspections of the external structures on a daily basis for signs of corrosion, with checks also being carried out as the generator is serviced (minor and major service) by the OEM or OEM approved provider (Ch6, 6.7.9) 6-monthly and annually.

The Chapter 6 OHS&E Manual has been previously submitted as part of the site documentation and can be provided if necessary.

All plant and asset management is controlled in Maximo and referencing SFG20 and other industry standard databases. The level and frequency of inspections and fuel sampling is greater than industry standard. Full detail of the 5-year tests will be provided when available, which will be closer to the commissioning point.

5.9 SITE DRAINAGE

The drainage strategy is contingent on catastrophic failure having been designed out of the diesel storage system. The procedures address potential local spills or overfill, notwithstanding that alarm systems and supervised delivery safe systems of work procedures are in place, as well as protection of 'at risk' drains during deliveries.

The LON12 generator areas and diesel belly tanks are served by a separate drainage system which lead to a SPEL Class 1 Puraceptor Type P080/1C/ESR separator with automatic shut off device once the oil storage level is at maximum. An alarm is also fitted. 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.

The drainage layout drawing referenced is listed below in Table 5-10 and shown in full in Appendix E:

Table 5-10 – Drainage Drawing references

Unit	Drawing
LON12	John Tooke & Partners 3889/601 T1, 09/04/2024

The image below in Figure 5-3 provides the detail for the generator area drainage system.

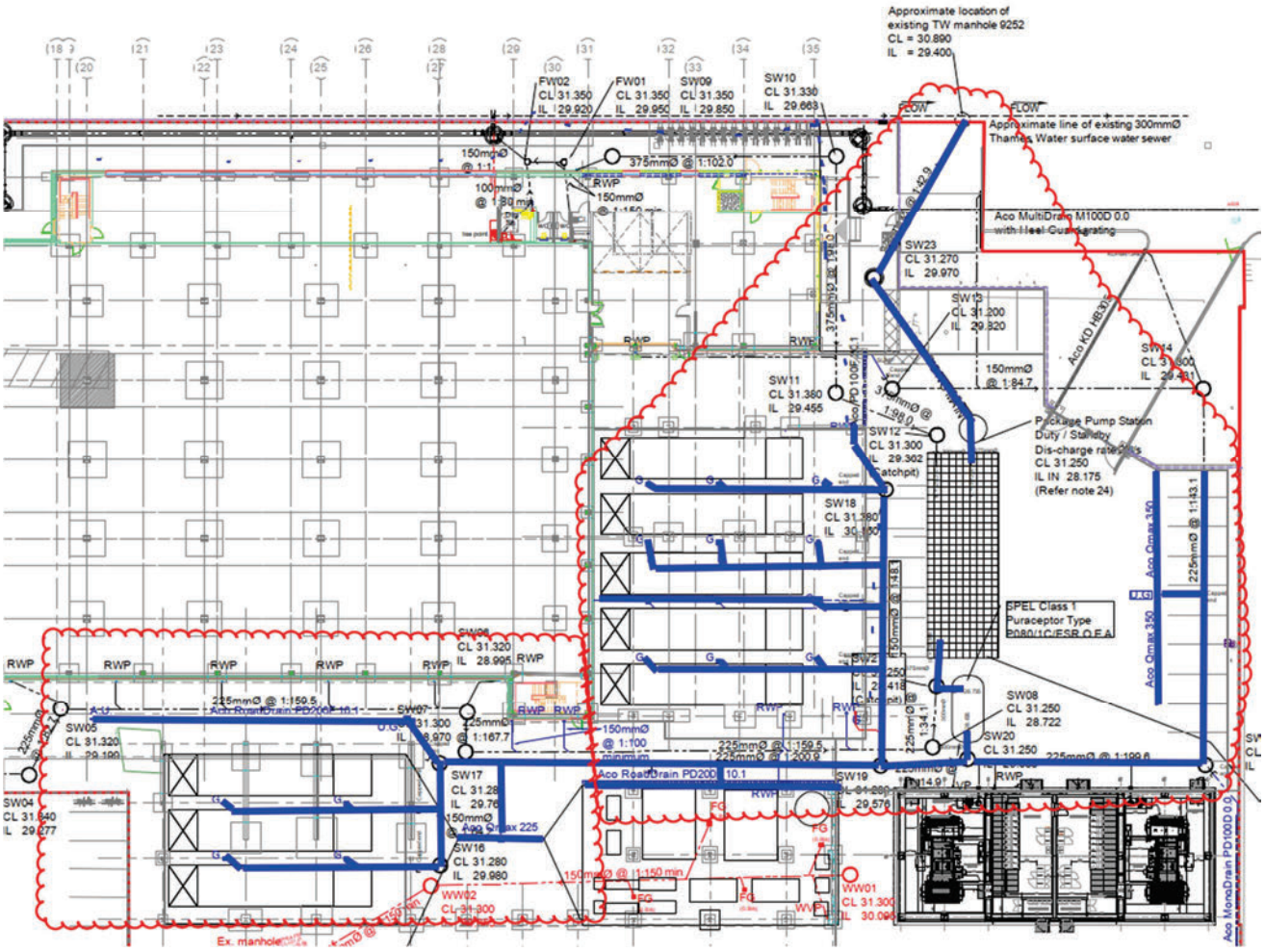


Figure 5-3 – Drainage Arrangement at Generator Areas

Daily asset integrity storage inspections and accompanied observed delivery following strict Virtus procedures will adequately control the risk of any spill or loss. Routine maintenance will be undertaken to remove silt and any hydrocarbons accumulated.

5.10 WASTE DIESEL MANAGEMENT

Waste diesel in quantity will only be produced if fuel polishing measures have failed to sufficiently maintain the quality of the diesel. Virtus processes therefore exist to avoid fuel degradation. It has been confirmed that there has been no waste diesel collected or disposed of, and therefore the 'expected quantities' of waste diesel are nil. However, the process for the collection of waste diesel is as follows:

Upon evidence from quarterly diesel sampling results that diesel is no longer suitable for combustion, the data centre site teams would contact the contracted diesel supplier to remove the unsuitable diesel and replenish the bulk tanks. The removal of waste diesel requires the mandatory on-the-spot completion of a Hazardous Waste Consignment Note with a Part E update to follow. All

waste consignment notes are required to be issued to VIRTUS site management and compliance departments for verification against permits/registered activities.

Diesel Sampling contracted methodology:

Gain access to the top of the diesel tanks and take two samples of diesel, one from the middle of each diesel tank and one from the bottom of the diesel tank.

The diesel tank samples will be sent to a Laboratory and the results will determine the condition of the diesel which will include the following:

1) Density of Diesel@ 15°C

2) Flash Point of Diesel

3) Water Content - ppm

4) % of Fam/Bio Diesel

5) Specific Gravity – g/ml

6) Bacteria TC - cfu

7) Fungus / Mould - cfu

8) Sulphur-ppm

9) Practical Count

10) Supply a diesel sample test report for each generator diesel tank

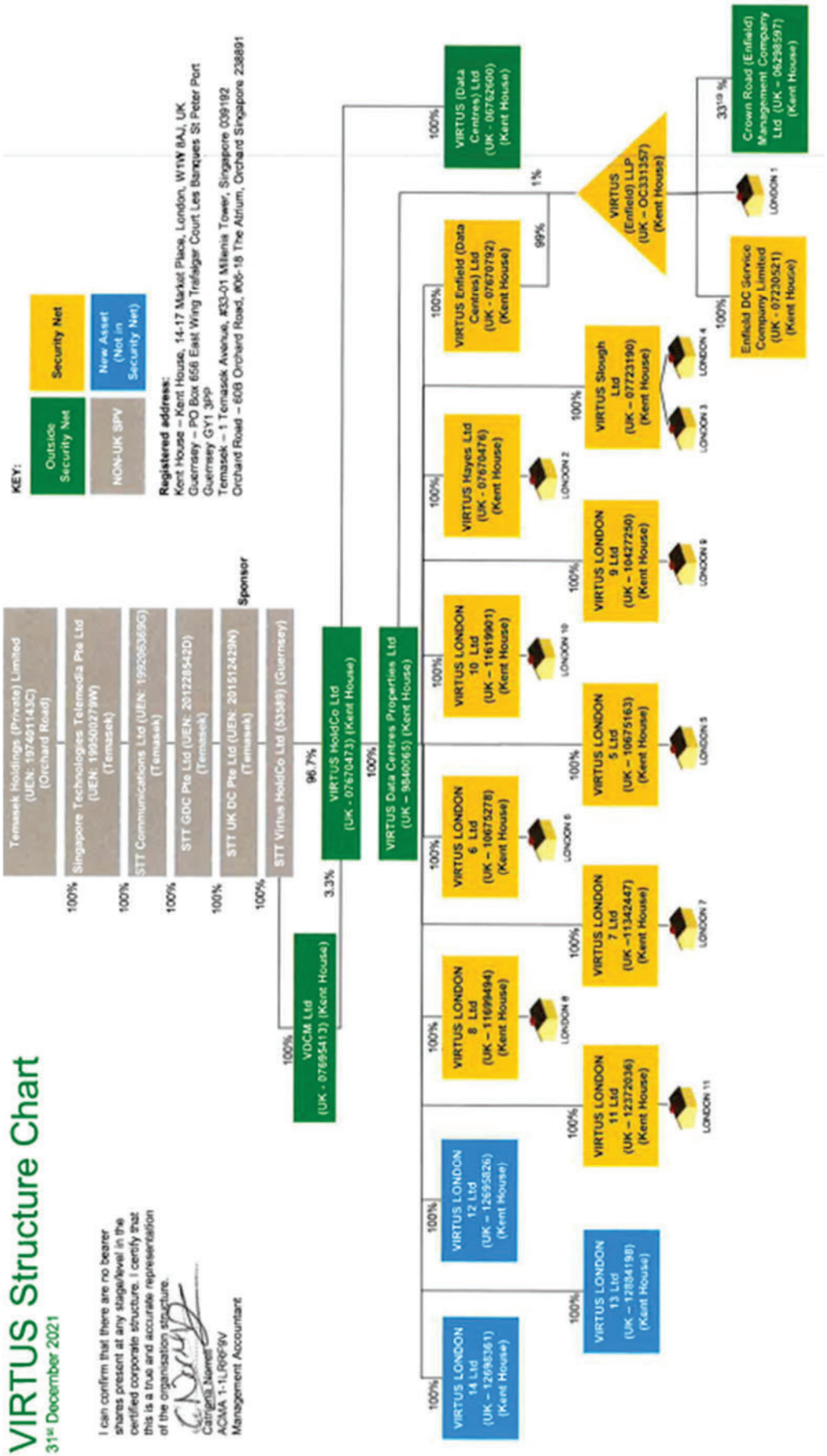
A full method statement is available if required, provided by Power Generation Services Ltd, *METHOD_STATEMENT_0478_VIRTUS DC_GENERATOR DIESEL TESTING 24.09.18*.

Waste diesel will also be contained in filters or expended spill kits and is collected and removed from site by the specialist contractor completing the work (filters) and by contracted waste service providers (spill kits) for disposal. All removals/collections of such wastes are supported by the completion of Hazardous Waste Consignment Notes.

Virtus operate a Duty of Care system described previously which identifies the appropriate contractors for waste removal, ensures correct licensing and permitting of carriers and disposal locations, and undertakes audits to ensure legal compliance. All contractors/subcontractors who have a responsibility to collect or remove waste have their waste credentials registered in the Duty of Care spreadsheet, ensuring that all waste (both hazardous and non-hazardous) is handled in accordance with regulations. Waste oil-filters are currently sent to Slicker Recycling, Kent.

Appendix A

VIRTUS MANAGEMENT


VIRTUS Structure Chart
31st December 2021
I can confirm that there are no bearer shares present at any stage/level in the certified corporate structure. I certify that this is a true and accurate representation of the organisation structure.
Catrena Nunez
ACMA 1-1LR6F9V
Management Accountant
KEY:
Outside Security Net
Security Net
NON-UK SPV
New Asset (Not in Security Net)
Registered address:
Kent House – Kent House, 14-17 Market Place, London, W1W 8AJ, UK
Guernsey – PO Box 656 East Wing Trafalgar Court Les Banques St Peter Port Guernsey GY1 3PP
Temasek – 1 Temasek Avenue, #33-01 Millenia Tower, Singapore 039192
Orchard Road – 60B Orchard Road, #06-18 The Atrium, Orchard Singapore 238891
Sponsor
Temasek Holdings (Private) Limited (UEN: 197401143C) (Orchard Road)
Singapore Technologies Telemedia Pte Ltd (UEN: 199502279W) (Temasek)
STT Communications Ltd (UEN: 199206369G) (Temasek)
STT GDC Pte Ltd (UEN: 201228542D) (Temasek)
STT UK DC Pte Ltd (UEN: 201512429N) (Temasek)
STT Virtus HoldCo Ltd (53589) (Guernsey)
96.7%
3.3%
VDCM Ltd (UK - 07695413) (Kent House)
VIRTUS HoldCo Ltd (UK - 07670473) (Kent House)
VIRTUS Data Centres Properties Ltd (UK – 9840065) (Kent House)
VIRTUS (Data Centres) Ltd (UK - 06762600) (Kent House)
VIRTUS Enfield (Data Centres) Ltd (UK - 07670792) (Kent House)
99%
1%
VIRTUS (Enfield) LLP (UK – OC331357) (Kent House)
Crown Road (Enfield) Management Company Ltd (UK – 06298597) (Kent House)
33.33 %
Enfield DC Service Company Limited (UK - 07230521) (Kent House)
VIRTUS Hayes Ltd (UK - 07670476) (Kent House)
VIRTUS Slough Ltd (UK – 07723190) (Kent House)
VIRTUS LONDON 9 Ltd (UK – 10427250) (Kent House)
VIRTUS LONDON 10 Ltd (UK – 11619901) (Kent House)
VIRTUS LONDON 5 Ltd (UK – 10675163) (Kent House)
VIRTUS LONDON 6 Ltd (UK – 10675278) (Kent House)
VIRTUS LONDON 7 Ltd (UK –11342447) (Kent House)
VIRTUS LONDON 8 Ltd (UK – 11699494) (Kent House)
VIRTUS LONDON 11 Ltd (UK – 12372036) (Kent House)
VIRTUS LONDON 12 Ltd (UK – 12695826) (Kent House)
VIRTUS LONDON 13 Ltd (UK – 12884198) (Kent House)
VIRTUS LONDON 14 Ltd (UK – 12698361) (Kent House)
LONDON 1
LONDON 2
LONDON 3
LONDON 4
LONDON 5
LONDON 6
LONDON 7
LONDON 8
LONDON 9
LONDON 10
LONDON 11
100%

Appendix B

APPLICATION FORMS

Application for an environmental permit Part A – About you

You will need to fill in this part A if you are applying for a new permit, applying to change an existing permit or surrender your permit, or want to transfer an existing permit to yourself. Please check that this is the latest version of the form available from our website.

You can apply online for Waste standard rules environmental permits, bespoke waste permits and bespoke Medium combustion plant permits

Apply online for an environmental permit.

Please read through this form and the guidance notes that came with it.

The form can be:

1) **saved onto a computer and then filled in. Please note that the form follows a logic that means questions will open or stay closed depending on a previous answer. So you may not be able to enter text in some boxes.**
2) **printed off and filled in by hand. Please write clearly in the answer spaces.**

Note: if you believe including information on a public register would not be in the interests of national security you must enclose a letter telling us that you have told the Secretary of State. We will not include the information in the public register unless directed otherwise.

It will take less than one hour to fill in this part of the application form.

Where you see the term 'document reference' on the form, give the document references and send the documents with the application form when you've completed it.

Contents

1 About you

Are you applying as an individual, an organisation of individuals (for example, a partnership), a company (this includes Limited Liability Partnerships) or a public body?

An individual	☐	Now go to section 2 and if you are applying for a new permit or transferring a permit for an installation or waste activity please also fill in Appendix 1
An organisation of individuals (for example, a partnership)	☐	Now go to section 3 and if you are applying for a new permit or transferring a permit for an installation or waste activity please also fill in Appendix 1
A public body	☐	Now go to section 4
A registered company or other corporate body	☑	Now go to section 5 and if you are applying for a new permit or transferring a permit for an installation or waste activity please also fill in Appendix 1

2 Applications from an individual

2a Please give us the following details

Name

Title (Mr, Mrs, Miss and so on) _____

First name _____

Last name _____

Now go to section 6

3 Applications from an organisation of individuals or charity

3a Type of organisation

For example, a charity, a partnership, a group of individuals or a club

3b Details of the organisation or charity

If you are an organisation of individuals, please give the details of the main representative below. If relevant, provide details of other members (please include their title Mr, Mrs and so on) on a separate sheet and tell us the document reference you have given this sheet

Contact name

Title (Mr, Mrs, Miss and so on)

First name

Last name

Now go to question 3c or section 6

3c Details of charity

Full name of charity

This should be the full name of the legal entity not any trading name.

3d Company registration number

If you are registered with Companies House please tell us your registration number

3e Charity Commission number

If you are registered with the Charity Commission please tell us your registration number

Now go to section 6

4 Applications from public bodies

4a Type of public body

For example, NHS trust, local authority, English county council

4b Name of the public body

4c Please give us the following details of the executive

An officer of the public body authorised to sign on your behalf

Name

Title (Mr, Mrs, Miss and so on)

First name

Last name

Position

Now go to section 6

5 Applications from companies or corporate bodies

5a Name of the company

Virtus HoldCo Ltd

5b Company registration number

07670473

Date of registration (DD/MM/YYYY)

15/06/2011

If you are applying as a corporate organisation that is not a limited company, please provide evidence of your status and tell us below the reference you have given the document containing this evidence.

Document reference

5 Applications from companies or corporate bodies, continued

5c Please give details of the directors

If relevant, provide details of other directors and company secretary, if there is one, on a separate sheet and tell us the reference you have given this sheet.

Document reference: 70114956LON12 Supporting Information (Section 2)

Details of company secretary (if relevant) and director/s

Title (Mr, Mrs, Miss and so on)

First name

Last name

Title (Mr, Mrs, Miss and so on)

First name

Last name

Now go to section 6

6 Your address

6a Your main (registered office) address

For companies this is the address on record at Companies House.

Contact name

Title (Mr, Mrs, Miss and so on): Mr

First name: Hussain

Last name: Chaudry

Address: 4th Floor
20 Balderton Street
London
England

Postcode: W1K 6TL

Contact numbers, including the area code

Phone: 02074991300

Fax

Mobile

Email: hussain.chaudry@virtusdcs.com

For an organisation of individuals every partner needs to give us their details, including their title Mr, Mrs and so on. So, if necessary, continue on a separate sheet and tell us below the reference you have given the sheet.

Document reference: N/A

6b Main UK business address (if different from above)

Contact name

Title (Mr, Mrs, Miss and so on)

First name

Last name

Address

Postcode

6 Your address, continued

Contact numbers, including the area code

Phone

Fax

Mobile

Email

Now go to section 7

7 Contact details

7a Who can we contact about your application?

It will help us if there is someone we can contact if we have any questions about your application. The person you name should have the authority to act on your behalf.

Please add a second contact on a separate sheet if this person is not always available.

Document reference of this separate sheet

This can be someone acting as a consultant or an 'agent' for you.

Contact name

Title (Mr, Mrs, Miss and so on) Mr

First name Derek

Last name Schoehuys

Address 110 Queen Street

Glasgow

Postcode G1 3BX

Contact numbers, including the area code

Phone +44 (0)141 418 7317

Fax

Mobile +44 (0)7980 686 512

Email derek.schoehuys@wsp.com cc sion.sleep@wsp.com

7b Who can we contact about your operation (if different from question 7a)?

Contact name

Title (Mr, Mrs, Miss and so on) Mr

First name Hussain

Last name Chaudry

Address as 6a.

Postcode

Contact numbers, including the area code

Phone

Fax

Mobile

Email

7 Contact details, continued

7c Who can we contact about your billing or invoice?

Note: Please provide the name and address that all invoices should be sent to for your subsistence fees.

As in question 7a ☐

As in question 7b ☐

Please give details below if different from question 7a or 7b.

Contact name

Title (Mr, Mrs, Miss and so on)

First name: Virtus Accounts

Last name

Address: 4th Floor
20 Balderton Street
London

Postcode: W1K 6TL

Contact numbers, including the area code

Phone: 02074991300

Fax

Mobile

Email: virtusabbyapinvoices@virtusdcs.com

8 How to contact us

If you need help filling in this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422 549 (Monday to Friday, 8am to 6pm)

Email: enquiries@environment-agency.gov.uk

Website: www.gov.uk/government/organisations/environment-agency

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve it. More information on how to do this is available at: www.gov.uk/government/organisations/environment-agency/about/complaints-procedure.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

9 Where to send your application

For how many copies to send see the guidance note on part A.

For water discharges by email to PSC-WaterQuality@environment-agency.gov.uk

For waste and installations by email to PSC@environment-agency.gov.uk

For flood risk activity permits send 1 copy only to enquiries@environment-agency.gov.uk or to the local Environment Agency office for where the work is proposed to be carried out.

Or

Permitting Support, NPS Sheffield
Quadrant 2
99 Parkway Avenue
Parkway Business Park
Sheffield
S9 4WF

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form?

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

Yes please ☐

No thank you ☐

For Environment Agency use only

Date received (DD/MM/YYYY)

Our reference number

Payment received?

No ☐

Yes ☐ Amount received

£

Appendix 1 – Date of birth information for installation and waste activities (applications for a new permit or transferring a permit) only

Date of birth information in this appendix will not be put onto our Public Register

Are you applying as an individual, an organisation of individuals (for example, a partnership) or a company (this includes Limited Liability Partnerships)?

An individual ☐ Now go to 2

An organisation of individuals (for example, a partnership) ☐ Now go to 3

A registered company or other corporate body ☐ Now go to 4

2 Applications from an individual

Please give us the following details

Name

Date of birth (DD/MM/YY)

3 Applications from an organisation of individuals or charity

Details of the organisation or charity

If you are an organisation of individuals, please give the date of birth details of the main representative below. If relevant, provide details of other members on a separate sheet and tell us the document reference you have given this sheet.

Name

Date of birth (DD/MM/YY)

Document reference

4 Applications from companies or corporate bodies

Name of the company

Please give the date of birth details for all directors and company secretary if there is one. If relevant, provide those details of other directors on a separate sheet and tell us the document reference you have given this sheet.

Details of company secretary (if relevant) and director/s

Name

Date of birth (DD/MM/YY)

Name

Date of birth (DD/MM/YY)

Name

Date of birth (DD/MM/YY)

Document reference

Application for an environmental permit
Part C2 – General – varying a bespoke permit

Environment Agency

Fill in this part of the form, together with part A and the relevant parts of C3 to C7 and part F1 or F2, if you are applying to vary (change) the conditions or any other part of the permit. Please check that this is the latest version of the form available from our website.

You only need to give us details in this application for the parts of the permit that will be affected (for example, if you are adding a new facility or changing existing ones).

Waste operation changing to installation or vice versa?

If your changes mean that a waste operation becomes an installation (or vice versa) you also need to fill in either part C3 (waste to installation) or part C4 (installation to waste).

You do not need to resend any information from your original permit application if it is not affected by your proposed changes.

Please read through this form and the guidance notes that came with it.

The form can be:

1) saved onto a computer and then filled in. Please note that the form follows a logic that means questions will open or stay closed depending on a previous answer. So you may not be able to enter text in some boxes.
2) printed off and filled in by hand. Please write clearly in the answer spaces.

It will take less than two hours to fill in this part of the application form.

Contents

1 About the permit

Note: If you are applying to convert your existing permit to a standard permit or add a standard facility you need to fill out form C1.

1a Discussions before your application

If you have had discussions with us before your application, give us the permit reference or details on a separate sheet. Tell us below the reference you have given this extra sheet.

Permit or document reference

1b Permit number

What is the permit number that this application relates to?

EPR/BP3945QX/A001

1c Site details

What is the name, address and postcode of the site?

Site name

Virtus Slough Campus Data Centres

Address

14 Liverpool Road
Slough Trading Estate
Slough
England

Postcode

SL1 4QZ

2 About your proposed changes

2a Type of variation

What type of variation are you applying for?

Minor technical ☐

Normal variation ☑

Substantial ☐

2 About your proposed changes, continued

2b Changes or additions to existing activities

Please give us brief details in the box below. More detailed information can be given in Table 1 below.

Addition of a Data Centre (Virtus London 12) with associated emergency generation consisting of 16 MTU D3100 generator sets. The engines will be NEA Singapore ORDE compliant which is equivalent to US EPA Tier 2. Surface water drainage around the delivery (fill points) and fuel tanks will run to a dedicated oil and silt separator with full retention capacity, automatic shut off, and alarmed, prior to discharge to storm attenuation tank and then to Thames Water surface water sewer.

Fill in Table 1 with details of all the proposed changes to current activities. In the final column of the table, give us the document reference for the proposed changes and send them to us with your filled in application form.

Fill in a separate table for each activity you are applying to vary or add. Use a separate sheet if you have a long list and send it to us with your application form. Tell us below the reference you have given this document.

Document reference: 70114956/LON12/Supporting Information

You only need to fill in one table for your mining waste operations.

2c Consolidating (combining) or updating existing permits

If your proposed change is to modernise (update) your permit, now answer 2c1; otherwise go to 2d.

If your proposed change is to consolidate (combine) a number of permits, now answer 2c2; otherwise go to 2d.

Note: In both cases we may require additional information from you about, for example, your management system. Therefore we would always advise you to talk to us before you submit any application to modernise or consolidate permits.

2c1 Do you want to have a modern style permit?

No ☑

Yes ☐

2c2 Identify all the permits you want to consolidate (combine) by listing the permit numbers in Table 2 below

Table 2 – Permit numbers

EPR/BP3945QX

2d Treating batteries

2d Are you proposing to treat batteries?

No ☑

Yes ☐ Tell us how you will do this and send us a copy of your explanation and tell us below the reference you have given this explanation

Document reference for the explanation

2e Ship recycling

2e1 Is your activity covered by the Ship Recycling Regulations 2015? (See the guidance notes on part C2.)

No ☑

Yes ☐ Tell us how you will do this. Please send us a copy of your explanation and your facility recycling plan, and tell us below the reference numbers you have given these documents

Document reference for the explanation

Document reference for the facility recycling plan

2e2 Is this a renewal of an existing authorisation covered by the Ship Recycling Regulations 2015?

No ☑

Yes ☐ Tell us the expiry date of your existing authorisation (DD/MM/YYYY)

2 About your proposed changes, continued

Table 1 – Changes to existing activities

Fill in Table 1 with details of all the proposed changes to current activities. In the final column of the table, give us the document reference for the proposed changes and send them to us with your filled in application form.

Name	Installation schedule 1 references	Description of the installation activity	Description of waste operation	Description of the mining waste operations	Description of water discharge activity	Description of groundwater activity	Proposed changes document reference
i.e. name of installation, waste operation, mining waste operation, water discharge activity or groundwater activity							
Example – effluent unique name					Example – treated sewage effluent		
If you do not have enough room, go to the line below or send a separate document and give us the document reference here							
VirtusSloughCampus	1.1A(1)(a)	Burning of any fuel et					70114956/LON12/
							Supporting Information

2 About your proposed changes, continued

2f Low impact installations (installations only)

2f1 Will any changes mean that any of the regulated facilities will become low impact installations?

No ☑ Now go to section 3

Yes ☐ If yes, tell us how you meet the conditions for a low impact installation (see the guidance notes on part C2 – Appendix 1)

Document reference

Tick the box to confirm you have filled in the low impact installation checklist in appendix 1 for each regulated facility ☐

3 Your ability as an operator

If you are applying to add waste installations or waste operations to a permit that has not previously had them, you need to fill in all of section 3.

If you are applying to consolidate (combine) two or more permits or have an updated permit you must fill in question 3d.

This section does not apply for applications to surrender a permit.

3a Relevant offences

Installations and waste operations only (see the guidance notes on part C2).

3a1 Have you, or any other relevant person, been convicted of any relevant offence?

No ☑ Now go to question 3b

Yes ☐ Please give details below

Name of the relevant person

Title (Mr, Mrs, Miss and so on)

First name

Last name

Position held at the time of the offence

Name of the court where the case was dealt with

Date of the conviction (DD/MM/YY)

Offence and penalty set

Date any appeal against the conviction will be heard (DD/MM/YYYY)

If necessary, use a separate sheet to give us details of other relevant offences and tell us below the reference number you have given the extra sheet.

Document reference

Now go to question 3b

Please also complete the details in Appendix 2.

3b Technical ability

Specified waste management activities and waste operations only (see the guidance notes on part C1).

Please indicate which of the two schemes you are using to demonstrate you are technically competent to operate your facility and the evidence you have enclosed to demonstrate this.

ESA/EU skills

I have enclosed a copy of the current Competence Management System certificate ☐

CIWM/WAMITAB scheme

Please select **one** of the following:

- I have enclosed a copy of:
  - the relevant qualification certificate/s ☐

  or
  - evidence of deemed competence ☐

  or

3 Your ability as an operator, continued

- Environment Agency assessment ☐

or

- evidence of nominated manager status under the transitional provisions for previously exempt activities ☐

and, if deemed competent or Agency-assessed, or if there is evidence of a nominated manager, or if the original qualification is over two years old:

I have enclosed a copy of the relevant current continuing competence certificate/s ☐

For each technically competent manager please give the following information. If necessary, use a separate sheet to give us these details and tell us below the document reference you have given the extra sheet.

Title (Mr, Mrs, Miss and so on)

First name

Last name

Phone

Mobile

Email

Please provide the environmental permit number/s and site address for **all** other waste activities that the proposed technically competent manager provides technical competence for, including permits held by other operators. Continue on a separate sheet as required.

Permit number	Site address	Postcode

Document reference

Now go to question 3c

Please also complete the details in Appendix 2.

3c Finances

Installations, waste operations and mining waste operations only (see the guidance notes on part C2).

Please note that if you knowingly or carelessly make a statement that is false or misleading to help you get an environmental permit (for yourself or anyone else), you may be committing an offence under the Environmental Permitting (England and Wales) Regulations 2016.

Do you or any relevant person or a company in which you were a relevant person have current or past bankruptcy or insolvency proceedings against you?

No ☑

Yes ☐ Please give details below, including the required set-up costs (including infrastructure), maintenance and clean up costs for the proposed facility against which a credit check may be assessed

We may want to contact a credit reference agency for a report about your business's finances.

3 Your ability as an operator, continued

Landfill, Category A mining waste facilities and mining waste facilities for hazardous waste only

How do you plan to make financial provision (to operate a landfill or a mining waste facility you need to show us that you are financially capable of meeting the obligations of closure and aftercare)?

Renewable bonds ☐

Cash deposits with the Environment Agency ☐

Other – provide comprehensive details ☐

Document reference

Provide a cost profile and expenditure plan of your estimated costs throughout the aftercare period of your site.

Document plan reference

Now go to question 3d

3d Management systems

You must have an effective, written management system in place that identifies and reduces the risk of pollution. You may show this by using a certified scheme or your own system.

Your permit requires you (as the operator) to ensure that you manage and operate your activities in accordance with a written management system.

You need to be able to explain what happens at each site and which parts of the overall management system apply. For example, at some sites you may need to show you are carrying out additional measures to prevent pollution because they are nearer to sensitive locations than others.

You can find guidance on management systems on our website at www.gov.uk/government/organisations/environment-agency.

Tick this box to confirm that you have read the guidance and that your management system will meet our requirements ☑

What management system will you provide for your regulated facility?

ISO 14001 ☑

BS 8555 (Phases 1–5) ☐

Acorn ☐

Green dragon ☐

Own management system ☐

Please make sure you send us a summary of your management system with your application.

Document reference/s 70114956/LON12/Supporting Information

4 Consultation

Fill in 4a to 4c for installations and waste operations and 4d for installations only.

Could the waste operation or installation involve releasing any substance into any of the following?

4a A sewer managed by a sewerage undertaker?

No ☑

Yes ☐ Please name the sewerage undertaker

4b A harbour managed by a harbour authority?

No ☑

Yes ☐ Please name the harbour authority

4c Directly into relevant territorial waters or coastal waters within the sea fisheries district of a local fisheries committee?

No ☑

Yes ☐ Please name the fisheries committee

4 Consultation, continued

4d Is the installation on a site for which:

4d1 a nuclear site licence is needed under section 1 of the Nuclear Installations Act 1965?

No ☑

Yes ☐

4d2 a policy document for preventing major accidents is needed under regulation 5 of the Control of Major Accident Hazards Regulations 2015, or a safety report is needed under regulation 7 of those Regulations?

No ☑

Yes ☐

5 Supporting information

5a Provide a plan or plans for the site

See the guidance notes on part C2 for what needs to be marked on the plan.

Clearly mark the site boundary or discharge point, or both. Also include site drainage plans, site layout plans, and plant design drawings/process flow diagrams (as required). (See the guidance notes on part C2.)

Document reference/s of the plans: Appendix C of 70114956/LON12/Supporting Information

5b Do any of the variations you plan to make need extra land to be included in the permit?

No ☐

Yes ☑ Please provide a site report for the extra land

Document report reference/s: 70114956/LON12/SCR

5c Provide a non-technical summary of your application

Document reference of the summary: 70114956/LON12/NTS + 70114956-NTS Addendum

5d Risk of fire from sites storing combustible waste

Are you applying for an activity that includes the storage of combustible wastes?

(This applies to all activities excluding standalone water and groundwater discharges.)

No ☑ Go to question 5f

Yes ☐ Go to question 5e

5e Will your variation increase the risk of a fire occurring or increase the environmental risk if a fire occurs?

See the guidance notes on part C2.

No ☐

Yes ☐ Provide a fire prevention plan. You need to highlight any changes you have made since your pre-application discussions

Document reference of the plan:

5f Adding an installation

If you are applying to add an installation, tick the box to confirm that you have sent in a baseline report and provide a reference ☐

Document reference of the report:

6 Environmental risk assessment

If you need one, see the guidance notes on part C2.

Provide an assessment of any additional risks the proposed changes or additions to your regulated facilities poses to the environment as part of your application to vary this permit. The risk assessment must follow the methodology set out in 'Risk assessments for your environmental permit' at https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit or an equivalent method.

Document reference for the assessment: 70114956/LON12/ERA

7 How to contact us

If you need help filling in this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422 549 (Monday to Friday, 8am to 6pm)

Email: enquiries@environment-agency.gov.uk

Website: www.gov.uk/government/organisations/environment-agency

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve it.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form?

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

Yes please ☐

No thank you ☐

For Environment Agency use only

Date received (DD/MM/YYYY)

Our reference number

Payment received?

No ☐

Yes ☐ Amount received

£

Plain English Campaign's Crystal Mark does not apply to appendix 1.

Appendix 1 – Low impact installation checklist

Installation reference				
Condition	Response			Do you meet this?
A – Management techniques	Provide references to show how your application meets A			Yes ☐ No ☐
	References			
B – Aqueous waste	Effluent created		m^3/day	Yes ☐ No ☐
C – Abatement systems	Provide references to show how your application meets C			Yes ☐ No ☐
	References			
D – Groundwater	Do you plan to release any hazardous substances or non-hazardous pollutants into the ground?		Yes ☐ No ☐	Yes ☐ No ☐
E – Producing waste	Hazardous waste		Tonnes per year	Yes ☐ No ☐
	Non-hazardous waste		Tonnes per year	
F – Using energy	Peak energy consumption		MW	Yes ☐ No ☐
G – Preventing accidents	Do you have appropriate measures to prevent spills and major releases of liquids? (See 'How to comply'.)		Yes ☐ No ☐	Yes ☐ No ☐
	Provide references to show how your application meets G			
	References			
H – Noise	Provide references to show how your application meets H			Yes ☐ No ☐
	References			
I – Emissions of polluting substances	Provide references to show how your application meets I			Yes ☐ No ☐
	References			
J – Odours	Provide references to show how your application meets J			Yes ☐ No ☐
	References			
K – History of keeping to the regulations	Say here whether you have been involved in any enforcement action as described in Compliance History Appendix 1 explanatory notes		Yes ☐ No ☐	

Appendix 2 – Date of birth information for Relevant offences and/or Technical ability questions only

Date of birth information in this appendix will not be put onto our Public Register

Have you filled in the Relevant Offences question?

Yes ☐

No ☐

Have you filled in the Technical ability question?

Yes ☐

No ☐

2 Relevant Offences - date of birth information

Please give us the following details

Name

Date of birth (DD/MM/YY)

3 Technical ability - date of birth information

Name

Date of birth (DD/MM/YY)

Application for an environmental permit Part C2.5 – Variation to a bespoke permit to add or vary a MCP/SG permitted activity at an installation or to vary an existing MCP/SG standalone permit

Environment Agency

Fill in this part of the form, together with parts A and F1 if you are applying to vary (change) an already issued permit.

Please check that this is the latest version of the form available from our website.

You only need to give us details in this application for the parts of the permit that will be affected (for example, if you are adding a new facility or making changes to existing ones).

You do not need to resend any information from your original permit application if it is not affected by your proposed changes.

Please read through this form. The form can be:

1) saved onto a computer and then filled in.
2) printed off and filled in by hand. Please write clearly in the answer spaces.

It will take less than one hour to fill in this part of the application form.

Contents

1 About the permit you wish to vary

1a Discussions before your application

If you have engaged in discussions with us before making this application, please give us the pre application reference number and attach any relevant documentation.

Pre-application reference number

1b What is the reference number of the permit you wish to vary?

EPR/BP3945QX

1c Site details

What is the name, address and postcode of the site?

Site name

LON12 within Virtus Slough Campus Data Centres

Address

Virtus LONDON 12
485 Berkshire Avenue
Slough

Postcode

SL1 4PL

1 About the permit you wish to vary, continued

1d Listed activities

Fill in Table 1 with details of what you are applying to vary.

Table 1 – with example

Listed activities						
Installation/ regulated facility or site name	Schedule-1 (or other) or Schedule 25A/25B references (see note 1)	Description of the activity (see note 2)	Activity capacity (see note 3)	Description of existing activity	Description of proposed change	Document reference of proposed changes
Mike's Crisps	6.8A(1)(d)(ii)	Producing fruit & vegetables	350 tonnes/day	Food and Drink manufacturing unit	Addition of new Medium Combustion Plant	Ref: MCP 1
	section 1,1 A(1)(a)	burning of any fuel in	180.5 MWth			70114956/LON12/
						Supporting Informa

Directly associated activities (see note 4)		
Name of DAA	Description of the DAA (identifying the schedule-1 activity or activities it serves)	
Storage of raw materials	From receipt of raw materials to use within the facility	
Surface Water Drainage	Input to site drainage system until the discharge to Thames Water surface water sewer emission points or soakaway	
For installations that take waste	Total storage capacity (see note 5)	
	Annual throughput (tonnes each year)	

1 About the permit you wish to vary, continued

Notes

1 Quote the section number, part A(1) or A(2) or B, then paragraph and sub-paragraph number as shown in part 2 of schedule 1 to the regulations. For other regulated facilities quote the EPR Schedule that applies, i.e. Schedule 9 for a waste operation. If amending an existing MCP/SG standalone permit, then use Schedule 25A or Schedule 25B as appropriate.

2 Use the description from the schedules of the regulations. Include any extra detail that you think would help to accurately describe what you want to do.

3 By 'capacity', we mean the total incineration capacity (tonnes every hour) for waste incinerators, the total landfill capacity (cubic metres) for landfills, the total treatment capacity (tonnes every day) for waste treatment and the total storage capacity (tonnes) for waste-storage operations, the processing and production capacity for manufacturing operations or the thermal input capacity for combustion activities.

4 Fill this in as a separate line and give an accurate description of any other activities associated with your schedule-1 activities. You cannot have DAAs as part of a mobile plant application or waste/mining waste operation.

5 By 'total storage capacity', we mean the maximum amount of waste (in tonnes) you store on the site at any one time.

1e Type of variation

Tick the box to tell us which type of variation you are applying for:

☐ Minor technical

☑ Normal variation

☐ Substantial

Definitions of these terms are available via: **Environmental permits: when and how you are charged**

1f Changes to existing activities

Provide a brief summary of the changes you are proposing to make in the space below

Addition of a Data Centre with associated emergency generation consisting of 16 MTU D3100 generator sets. The engines will be NEA Singapore ORDE compliant which is equivalent to US EPA Tier 2. Surface water drainage around the delivery (fill points) and fuel tanks will run to a dedicated oil and silt separator with full retention capacity, automatic shut off, and alarmed, prior to discharge to attenuation tank and then to Thames Water surface water sewer.

2 Emissions to air

2a Is your permit variation application for the addition of a new or existing MCP onto your existing IED Installation (ie A1, A2 or Part B)?

☐ No go to question 2b

☑ Yes You need to review the Best Available Techniques assessment for your installation including the additional MCP/SG and any associated fuel storage facilities. This should include a review of the impact of other emissions such as noise.

Provide the document reference number

70114956/LON12/Supporting Information

You also need to fill in Table 2 with details of the emissions that will result from the changes you are proposing to make to your existing activities.

Table 2 – Emissions

Installation or Regulated Facility name	Virtus Slough Campus Data Centres			
Point-source emissions to air resulting from proposed change				
Emission-point reference and location (NGR/Latitude & Longitude)	Source	Parameter	Concentration	Units
See 70114956/LON12/Supporting Inform	ation	NOx	2000	mg/Nm3
Table 4 - 2				

2b Is your permit variation application to add a new MCP(s) and there will now be a total aggregated thermal input of 20MW thermal or more?

☑ No emergency generators not subject to energy efficiency requirements

☐ Yes You must either submit a report which shows how your MCP also meets the requirements of Schedule 24 of the Environmental Permitting Regulations which implement the relevant requirements of the Energy Efficiency Directive (2012/27/EU) (see **Energy efficiency standards for industrial plants to get environmental permits – GOV.UK (www.gov.uk)**) or provide an explanation of why Schedule 24 does not apply in your case

2c Permit variation application for an MCP and/or SG which is not at a current IED installation:

Is your permit application for a MCP and/or SG which is

2c1 A unit greater than or equal to 20MW thermal?

☑ No

☐ Yes

2c2 A unit that burns waste biomass as described in Article 3(18)(b) of the Medium Combustion Plant Directive?

☑ No

☐ Yes

2 Emissions to air, continued

If the answer to either 2c1 or 2c2 is yes you should confirm whether the plant falls under the description of an Environmental Permitting Regulations (EPR) Part B activity as set out below:

2c3 Do any of the MCPs and/or SG on site meet the criteria of a EPR Schedule 1, Part 2, Chapter 1, section 1.1 Part B activity?

☑ No

☐ Yes

2c4 Do any of the MCPs on site meet the criteria of a EPR Schedule 1, Part 2, Chapter 5, section 5.1 Part B activity?

☑ No

☐ Yes

If you have answered yes to either of these questions, then you must complete a Best Available Techniques assessment in line with the relevant Environmental Permitting technical guidance note PG1_1 or PG 1_5 (they are available here: **https://consult.environment-agency.gov.uk/psc/mcp-and-sg-regulations/**).

Provide the document reference number for the assessment

Air emissions risk assessment

2d If your application is to add an MCP only which is standalone, does it require an air emissions risk assessment to assess the risk to habitats?

☑ No the MCP(s) are operting outside of the minimum screening distances to habitats given in the stage 1 table in the guidance.

☐ Yes follow the guidance and submit appropriate supporting assessments and reports according to the risk to air.

See this page for guidance: **https://www.gov.uk/guidance/medium-combustion-plant-apply-for-an-environmental-permit**.

2e Do you want to declare that your existing MCP(s) will meet new MCP emission limit values (ELVs) from the medium combustion plant directive (MCPD) in order to demonstrate a low risk impact to habitats under a stage 1 or 2 air emissions risk assessment? If you do make this voluntary declaration we will include new MCP ELVs in your permit.

☑ No

☐ Yes

2f If your application is to add an SG (which may also be an MCP) which is standalone are you required to carry out dispersion modelling to assess the risk to human health and habitats from proposed emissions to air?

☑ No submit evidence that habitats and human health assessments screen out.

☐ Yes submit a copy of your completed detailed air quality modelling report and modelling input files. Part of IED permit <50 hrs per year ops, AQ assessment prepared

If you have used the Environment Agency's 'Specified Generator Screening Tool' to help make your decision supply a copy of that completed tool with your application.

2 Emissions to air, continued

Where you wish to use a different methodology to assess the environmental impact, that methodology must address the same issues to an equivalent level of detail. The purpose of the environmental risk assessment is to demonstrate that the impacts of your proposals will be acceptable. See this page for guidance: **https://www.gov.uk/guidance/specified-generators-dispersion-modelling-assessment**

2g If your application is to add MCP to your existing IED installation you must submit a revised air emissions risk assessment to demonstrate that modelling is not required, or a modelling report and modelling input files to demonstrate that the impacts of your proposals will be acceptable.

See further guidance: **Air emissions risk assessment for your environmental permit – GOV.UK (www.gov.uk)**

Provide the document reference number for any evidence relating to air emissions risk assessments from questions 2d to 2g

70114956 - Virtus LON12 - AQA Report v1.0

2h Does your application refer to an existing Mining Waste activity?

☑ No

☐ Yes

2h1 If yes, does your application propose a change in how you currently use or dispose of your waste gas?

☐ No

☐ Yes You must submit an amended Waste Management Plan (WMP) which covers the changes in your permitted activity to reflect the operation of your new MCP/SG. (See Appendix 6 in the guidance **https://www.gov.uk/government/publications/mining-waste-operations-epr-614-additional-guidance**)

Document reference of the amended WMP

2i Information for MCP/SG

You must complete this section for all applications.

Complete **combustion plant list spreadsheet** for the MCP/generators making up the SG which are the purpose of this permit variation application.

Provide the document reference number for the combustion plant list spreadsheet

Virtus Slough EPR BP3945QZ A001 2024

3 MCP/SG Emissions Monitoring

3a Where you are applying to vary an IED installation describe the measures you use for monitoring emissions by referring to each emission point in Table 2 above

You should also describe any environmental monitoring. Tell us:

- how often you use these measures
- the methods you use
- the procedures you follow to assess the measures

Document reference

70114956/LON12/Supporting Information

3b Point source emissions to air at IED installations only

3b1 Has the sampling location been designed to meet BS EN 15259 clause 6.2 and 6.3?

☐ No

☑ Yes

Ports are installed for MCP requirements for NOx only

3b2 Are the sample ports large enough for monitoring equipment and positioned in accordance with section 6 and appendix A of BS EN 15259?

☐ No

☑ Yes

3b3 Is access adjacent to the ports large enough to provide sufficient working area, support and clearance for a sample team to work safely with their equipment throughout the duration of the test?

☐ No

☑ Yes

3b4 Are the sample location(s) at least 5 HD from the stack exit

☐ No

☑ Yes

3b5 Are the sample location(s) at least 2 HD upstream from any bend or obstruction?

☐ No

☑ Yes

3b6 Are the sample location(s) at least 5 HD downstream from any bend or obstruction?

☐ No

☐ Yes

3b7 Does the sample plane have a constant cross sectional area?

☐ No

☑ Yes

3b8 If horizontal, is the duct square or rectangular (unless it is less than or equal to 0.35 m in diameter)

☐ No

☐ Yes

3 MCP/SG Emissions Monitoring, continued

3b9 If you have answered 'No' to any of the questions 4b1 to 4b8 above, provide an assessment to how the standards in BS EN 15259 will be met.

Document reference of the assessment

4 Supporting information

4a Provide a non-technical summary of your application to vary your existing permit

Write a non-technical summary that explains your application in non-technical language as much as possible avoiding technical terms, detailed data and scientific discussion. It should include a summary of the regulated facility, a summary of the key technical standards and control measures arising from your risk assessment and how the subject of your application fits with the existing permitted activity(s). If your application is for mobile plant describe the mobility of your plant and how you intend to operate.

Document reference of the summary

70114956/LON12/NTS and NTS addendum

4b If your application is to vary an IED installation or waste operation is the boundary of your existing site being extended to accommodate the addition of a MCP/SG*?

☐ No Submit a copy of the existing site plan showing the location of the new plant

☑ Yes Submit an amended site plan to show the new boundary and where the new plant will be located. If your existing permit relates to an EPR Installation or Waste Operation, also submit an updated site condition report to include the land enclosed by the boundary extension. (See section 5 of the guidance note 'C2' available via **https://www.gov.uk/government/publications/application-for-an-environmental-permit-part-c2-varying-a-bespoke-permit**)

Document reference or references of the plans and Site Condition Report

70114956/LON12/Supporting Information Appendix C

* Does not apply to stand-alone MCP/SG permits

4c Existing MCP 1-5MWth or Tranche A SG requiring compliance by 1st January 2030.

If you are applying to vary your permit to add new plant or existing plant 5-50MWth or amend details of the plant already permitted, you can also ask us to include existing MCP1-5 MWth /SG Tranche A aggregating to less than 5MWth at the same time as part of this application. Relevant plant would be given a post-dated compliance deadline in the permit. Any decision to opt into including existing plant earlier than the regulatory requirement as part of this application is to be made by the operator. You should complete relevant parts of this application to ensure we have details of the existing plant to be permitted under the variation.

Would you like to permit existing MCP/SG at this site as part of this variation?

☑ No

☐ Yes

If yes, note this must not be the sole purpose of your variation application and you must provide all relevant details of the existing plant as part of your application.

5 How to contact us

If you need help filling in this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422549 (Monday to Friday, 8am to 6pm)

Email: **enquiries@environment-agency.gov.uk**

Website: **www.gov.uk/government/organisations/environment-agency**

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve it.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

Application for an environmental permit
Part C3 – Variation to a bespoke installation permit

Environment Agency

Fill in this part of the form, together with part A, part C2 and part F1, if you are applying to vary (change) the conditions or any other part of the permit.

Please check that this is the latest version of the form available from our website.

You only need to give us details in this application for the parts of the permit that will be affected (for example, if you are adding a new facility or making changes to existing ones).

You do not need to resend any information from your original permit application if it is not affected by your proposed changes.

Please read through this form and the guidance notes that go with it.

The form can be:

1) saved onto a computer and then filled in. Please note that the form follows a logic that means questions will open or stay closed depending on a previous answer. So you may not be able to enter text in some boxes.
2) printed off and filled in by hand. Please write clearly in the answer spaces.

It will take less than three hours to fill in this part of the application form.

Contents

1 What activities are you applying to vary?

Fill in Table 1a below with details of all the activities listed in schedule 1 or other references (see note 1) of the Environmental Permitting Regulations (EPR) and all directly associated activities (DAAs) (in separate rows), that you propose to vary.

Note: if you want to add a Medium Combustion Plant or Specified Generator (MCP/SG) to your installation please use part C2.5 instead. If you want to vary an intensive farm permit please use part C3.5 instead.

Fill in a separate table for each installation you are applying to vary. Use a separate sheet if you have a long list and send it to us with your application form. Tell us below the reference you have given the document.

Document reference: 70114956/LON12

1 What activities are you applying to vary?, continued

Table 1a – Types of activities

Schedule 1 listed activities						
Installation name	Schedule 1 or other references (See note 1)	Description of the activity (See note 2)	Activity capacity (See note 3)	Annex I (D codes) and Annex II (R codes) and descriptions	Hazardous waste treatment capacity (if this applies) (See note 3)	Non-hazardous waste treatment capacity (if this applies) (See note 3)
If there are not enough rows, send a separate document and give the document reference number here	Put your main activity first			For installations that take waste only	For installations that take waste only	For installations that take waste only
Virtus Slough Campus	1.1A(1)(a)	Burning of any fuel in an	180.51			

Directly associated activities (See note 4)			
Name of DAA If there are not enough rows, send a separate document and give the document reference number here	Description of the DAA (please identify the schedule 1 activity it serves)		
Storage of raw materials	Storage of diesel in belly tanks for each engine, total 819604 litres		
Surface Water Drainage	Input to site drainage system until the discharge to Thames Water surface water sewer emission points or soakaway W1		
For installations that take waste (See note 5 below)	Total storage capacity		
	Annual throughput (tonnes each year)		

1 What activities are you applying to vary?, continued

Notes

1. Quote the section number, part A1 or A2 or B, then paragraph and sub paragraph number as shown in EPR part 2 of schedule 1.
2. Use the description from schedule 1 of EPR. Include any extra detail that you think would help to accurately describe what you want to do.
3. By 'capacity', we mean:

- the total incineration capacity (tonnes every hour) for waste incinerators
- the total landfill capacity (cubic metres) for landfills
- the total capacity (cubic metres) for the recovery of hazardous waste on land
- the total treatment capacity (tonnes each day) for waste treatment operations
- the total storage capacity (tonnes) for waste storage operations
- the processing and production capacity for manufacturing operations, or
- the thermal input capacity for combustion activities

4. Fill this in as a separate line and give an accurate description of any other activities associated with your schedule 1 activities. You cannot have Directly Associated Activities (DAAs) as part of a mobile plant application.
5. By 'total storage capacity', we mean the maximum amount of waste, in tonnes, you store on the site at any one time.

Types of waste accepted

For those installations that take waste, for each line in Table 1a (including DAAs), fill in a separate document to list those wastes you will accept on to the site for that activity. Give the List of Wastes catalogue code and description (see https://www.gov.uk/government/publications/waste-classification-technical-guidance).

If you need to exclude waste from your activity or facility by restricting the description, quantity, physical nature, hazardous properties, composition or characteristic of the waste, include these in the document. Send it to us with your application form.

Please provide the reference for each document.

You can use Table 1b as a template.

If you want to accept any waste with a code ending in *99*, you must provide more information and a full description of the waste in the document, (for example, detailing the source, nature and composition of the waste). Where you only want to receive specific wastes within a waste code you can provide further details of the waste you want to receive. Where a waste is dual coded you should use both codes for the waste.

Document reference of this extra information

1 What activities are you applying to vary?, continued

Table 1b – Template example – types of waste accepted and restrictions

Waste code	Description of the waste
Example	Example
02 01 08*	Agrochemical waste containing hazardous substances
18 01 03*	Infectious clinical waste, not contaminated with chemicals or medicines – human healthcare (may contain sharps) for alternative treatment
17 05 03*/17 06 05*	Non-hazardous soil from construction or demolition contaminated with fragments of asbestos cement sheet

1c Recovery of hazardous waste on land

Are you applying for a waste recovery activity involving the permanent deposit of inorganic hazardous waste on land for construction or land reclamation?

No ☑ Now go to question 2

Yes ☐

Have you written a waste recovery plan (WRP) that shows that you will use waste to perform the same function as non waste materials you would have used?

No You must write a WRP to support your application.

Yes

Have we advised you during pre-application discussions that we believe the activity is waste recovery?

No

Yes

Have there been any changes to your proposal since the discussions?

No

Yes

Please send us a copy of your current waste recovery plan that complies with our guidance at https://www.gov.uk/government/publications/deposit-for-recovery-operators-environmental-permits/waste-recovery-plans-and-deposit-for-recovery-permits. You need to highlight any changes you may have made since your pre-application discussions.

Document reference

Please note that there is an additional charge for the assessment or re assessment of a waste recovery plan that must be submitted as part of this application. For the charge see https://www.gov.uk/government/publications/environmental-permitting-charges-guidance/environmental-permitting-charges-guidance

2 Point source emissions to air, water and land

Fill in Table 2 below with details of the point source emissions that result from the operating techniques at each of your installations.

Fill in one table for each installation, continuing on a separate sheet if necessary.

Table 2 – Emissions (releases)

Installation name	Virtus Slough Campus			
Point source emissions to air				
Emission point reference and location	Source	Parameter	Quantity	Unit
31 emergency generators A1 to A32	engine	NOx		
Point source emissions to water (other than sewers)				
Emission point reference and location	Source	Parameter	Quantity	Unit
W1 to Thames Water surface water sewer	surface water	n/a		
W2 to soakaway	surface water			
W3 to soakaway	surface water			
Point source emissions to sewers, effluent treatment plants or other transfers off site				
Emission point reference and location	Source	Parameter	Quantity	Unit
as W1				
Point source emissions to land				
Emission point reference and location	Source	Parameter	Quantity	Unit
as W2, W3				

You will also need to complete application form part C6 if your variation includes changing or adding a point source emission(s) to:

- water
- groundwater or
- sewer

Supporting information

3 Operating techniques

3a Technical standards

Fill in Table 3a for each activity at the installation you refer to in Table 1a above and list the 'Best Available Techniques' you are planning to use. If you use the standards set out in the relevant BAT conclusion(s), BAT reference document(s) (BREF) and/or technical guidance(s) (TGN) there is no need to justify using them within your documents in Table 3a.

For Part A(2) activities refer to https://www.gov.uk/government/collections/integrated-pollution-prevention-and-control-sector-guidance-notes and for Part B and Schedule 14 activities see https://www.gov.uk/government/collections/local-air-pollution-prevention-and-control-lappc-process-guidance-notes

You must justify your decisions in a separate document if:

- there is no technical standard
- the technical guidance provides a choice of standards, or
- you plan to use another standard

This justification could include a reference to the Environmental Risk Assessment provided in part C2 (general bespoke permit) of the application form.

For each of the activities listed in Table 1a, the documents in Table 3a should summarise:

- the operations undertaken
- the measures you will use to control the emissions from your process, as identified in your risk assessment or the relevant BAT conclusions, BREF or technical guidance
- how you will meet other standards set out in the relevant BAT conclusions document, BREF or technical guidance

Table 3 – Technical standards

Fill in a separate table for each activity at the installation.

Installation name	Virtus Slough Campus	
Description of the schedule 1 activity or directly associated activity	Best available technique (BATC, BREF or TGN reference) (see footnote below)	Document reference (if appropriate)
S1.1(A)(1)(a) diesel fired emergency generators operating on a test regime	EA Data Centre FAQ BAT for emergency generators v21	70114956/LON12/Supporting Information

* Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control)

In all cases, describe the type of facility or operation you are applying for and provide site infrastructure plans, location plans and process flow diagrams or block diagrams to help describe the operations and processes undertaken. Give the document references you use for each plan, diagram and description.

Document reference 70114956/LON12

3a1 Does your permit (in Table 1.2 Operating Techniques or similar table in the permit) have references to any of your own documents or parts of documents submitted as part of a previous application for this site?

No ☐ Now go to 3b

Yes ☑ Please tell us in a separate document what document references are no longer valid or have been superseded and why

Please also tell us below the reference number you have given the document and send it in with your application

Document reference 70114956/LON12

3b General requirements

Fill in a separate Table 4 for each installation.

Table 4 – General requirements

Name of the installation	
If the technical guidance or your risk assessment shows that emissions of substances not controlled by emission limits are an important issue, send us your plan for managing them	Document reference or references
Where the technical guidance or your risk assessment shows that odours are an important issue, send us your odour management plan	Document reference or references
If the technical guidance or your risk assessment shows that noise or vibration are important issues, send us your noise or vibration management plan (or both)	Document reference or references

For guidance on risk assessments for your environmental permit see https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit

3c Types and amounts of raw materials

Fill in Table 5 for all schedule 1 activities. Fill in a separate table for each installation.

Table 5 – Types and amounts of raw materials

Name of the installation				
Capacity (See note 1 below)				
Schedule 1 activity	Description of raw material and composition	Maximum amount (tonnes) (See note 2 below)	Annual throughput (tonnes each year)	Description of the use of the raw material including any main hazards (include safety data sheets)
S1.1(A)(1)(a) Combustion	combustion	496000 litres	19.29 tonnes	combustion

Notes

1 By 'capacity', we mean the total storage capacity (tonnes) or total treatment capacity (tonnes each day).

2 By 'maximum amount', we mean the maximum amount of raw materials on the site at any one time.

Use a separate sheet if you have a long list of raw materials, and send it to us with your application form. Please also provide the reference of this extra sheet.

Document reference n/a

3d Information for specific sectors

For some of the sectors, we need more information to be able to set appropriate conditions in the permit. This is as well as the information you may provide in sections 5, 6 and 7. For those activities listed below, you must answer the questions in the related document.

Table 6 – Questions for specific sectors

Sector	Appendix
Combustion	See the questions in appendix 1
Chemicals	See the questions in appendix 2
Incinerating waste	See the questions in appendix 3
Landfill and recovery of hazardous waste on land	See the questions in appendix 4

General information

Complete section 4 if you are proposing to change or add an emission point(s).

4 Monitoring

4a Describe the measures you use for monitoring emissions by referring to each emission point in Table 2 above

You should also describe any environmental monitoring. Tell us:

- how often you use these measures
- the methods you use
- the procedures you follow to assess the measures

Document reference: To be submitted in retrospect under Schedule 5 Notice

4b Point source emissions to air only

4b1 Has the sampling location been designed to meet BS EN 15259 clause 6.2 and 6.3?

No ☐
Yes ☑ sample ports are installed for the purpose of MCP momnitoring for NOx gaseous emissions only

4b2 Are the sample ports large enough for monitoring equipment and positioned in accordance with section 6 and appendix A of BS EN 15259?

No ☐
Yes ☑

4b3 Is access adjacent to the ports large enough to provide sufficient working area, support and clearance for a sample team to work safely with their equipment throughout the duration of the test?

No ☐
Yes ☑

4b4 Are the sample location(s) at least 5 HD from the stack exit

No ☐
Yes ☑

4b5 Are the sample location(s) at least 2 HD upstream from any bend or obstruction?

No ☐
Yes ☑

4b6 Are the sample location(s) at least 5 HD downstream from any bend or obstruction?

No ☐
Yes ☑

4b7 Does the sample plane have a constant cross sectional area?

No ☐
Yes ☑

4b8 If horizontal, is the duct square or rectangular (unless it is less than or equal to 0.35 m in diameter)

No ☐
Yes ☑

4b9 If you have answered 'No' to any of the questions 4b1 to 4b8 above, provide an assessment to how the standards in BS EN 15259 will be met.

Document reference of the assessment

5 Environmental impact assessment

5a Have your proposals been the subject of an environmental impact assessment under Council Directive 85/337/EEC of 27 June 1985 [Environmental Impact Assessment] (EIA)?

No ☑ Now go to question 6

Yes ☐ Please provide a copy of the environmental statement and, if the procedure has been completed:

- a copy of the planning permission
- the committee report and decision on the EIA

Document reference of the copy

6 Resource efficiency and climate change

If the site is a landfill or a recovery of hazardous waste on land activity, you only need to fill in this section if the application includes gas engines.

6a Describe the basic measures for improving how energy efficient your activities are

Document reference of the description: emergency use only

6b Provide a breakdown of any changes to the energy your activities use up and create

Document reference of the description: testing of engines for very short periods only

6c Have you entered into, or will you enter into, a climate change levy agreement?

No ☐ Describe the specific measures you use for improving your energy efficiency

Document reference of the description

Yes ☑ Please give the date you entered (or the date you expect to enter) into the agreement (DD/MM/YYYY): 30/09/2025

Please also provide documents that prove you are taking part in the agreement.

Document reference of the proof: DATC/T0072

6d Explain and justify the raw and other materials, other substances and water that you will use

Document reference of the justification: 70114956/LON12 and 70092911_Slough Campus_EPR

6e Describe how you avoid producing waste in line with Council Directive 2008/98/EC on waste

If you produce waste, describe how you recover it. If it is technically and financially impossible to recover the waste, describe how you dispose of it while avoiding or reducing any effect it has on the environment.

Document reference of the description: minor servicing wastes see application supporting docum

7 How to contact us

If you need help filling in this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422 549 (Monday to Friday, 8am to 6pm)

Email: enquiries@environment-agency.gov.uk

Website: https://www.gov.uk/government/organisations/environment-agency

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve it.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form?

We will use your feedback to improve our forms and guidance notes, and to tell the Government how regulations could be made simpler.

Would you like a reply to your feedback?

Yes please ☐

No thank you ☐

Crystal Mark 19107
Clarity approved by Plain English Campaign

For Environment Agency use only

Date received (DD/MM/YYYY)

Payment received?

No ☐

Our reference number

Yes ☐ Amount received

£

Plain English Campaign's Crystal Mark does not apply to appendices 1 to 4.

Appendix 1 – Specific questions for the combustion sector

1 Identify the type of fuel burned in your combustion units (including when your units are started up, shut down and run as normal). If your units are dual fuelled (that is, use two types of fuel), list both the fuels you use

Fill in a separate table for each installation.

Installation reference	Virtus Slough Campus		
Type of fuel	When run as normal	When started up	When shut down
Coal	☐	☐	☐
Gas oil	☑	☑	☑
Heavy fuel oil	☐	☐	☐
Natural gas	☐	☐	☐
WID waste	☐	☐	☐
Biomass (see notes 1 and 2 below)	☐	☐	☐
Biomass (see notes 1 and 2 below)	☐	☐	☐
Biomass (see notes 1 and 2 below)	☐	☐	☐
Biomass (see notes 1 and 2 below)	☐	☐	☐
Biomass (see notes 1 and 2 below)	☐	☐	☐
Landfill gas	☐	☐	☐
Other	☐	☐	☐

Notes

1. Not covered by Industrial Emissions Directive 2010/75/EU.
2. 'Biomass' is referred to The Renewables Obligation Order 2002 (https://www.legislation.gov.uk/uksi/2002/914/contents/made)

Give extra information if it helps to explain the fuel you use.

Document reference

Appendix 1 – Specific questions for the combustion sector, continued

2 Give the composition range of any fuels you are currently allowed to burn in your combustion plant

Fill in a separate table for each installation, continuing on a separate sheet if necessary

Fuel use and analysis					
Installation reference	Virtus Slough Campus Data Centres				
Parameter	Unit	Fuel 1	Fuel 2	Fuel 3	Fuel 4
Maximum percentage of gross thermal input	%				
Moisture	%				
Ash	% wt/wt dry				
Sulphur	% wt/wt dry				
Chlorine	% wt/wt dry				
Arsenic	% wt/wt dry				
Cadmium	% wt/wt dry				
Carbon	% wt/wt dry				
Chromium	% wt/wt dry				
Copper	% wt/wt dry				
Hydrogen	% wt/wt dry				
Lead	% wt/wt dry				
Mercury	% wt/wt dry				
Nickel	% wt/wt dry				
Nitrogen	% wt/wt dry				
Oxygen	% wt/wt dry				
Vanadium	mg/kg dry				
Zinc	mg/kg dry				
Net calorific value	MJ/kg				

Appendix 1 – Specific questions for the combustion sector, continued

3 If NOx factors are necessary for reporting purposes (that is, if you do not need to monitor emissions), please provide the factors associated with burning the relevant fuels

Fill in a separate table for each installation.

Installation reference	
Fuel	NOx factor (kgt^{-1})
Fuel 1	tbc
Fuel 2	
Fuel 3	
Fuel 4	

Note: kgt^{-1} means kilograms of nitrogen oxides released for each tonne of fuel burned.

4 Will your combustion plant be subject to Chapter III of the Industrial Emissions Directive 2010/75/EU?

No ☑ Now fill in application form part F

Yes ☐

5 What is your plant? N/A

an existing one ☐ A plant licensed before 1 July 1987

a new one ☐ A plant licensed on or after 1 July 1987 but before 27 November 2002, or a plant for which an application was made before 27 November 2002 and which was put into operation before 27 November 2003

a new-new one ☐ A plant for which an application was made on or after 27 November 2002 If you run more than one type of plant or a number of the same type of plant on your installation, please list them in the table below

6 If you run more than one type of plant or a number of the same type of plant on your installation, please list them in the table below

Fill in a separate table for each installation.

Installation reference	
Type of plant	Number within installation
Existing	
New	
New-new	
Gas turbine (group A)	
Gas turbine (group B)	

Appendix 1 – Specific questions for the combustion sector, continued

7 If you run an existing plant, have you submitted a declaration for the 'limited life derogation' set out in Article 33 of Chapter III of the Industrial Emissions Directive?

No ☐ Now go to question 9

Yes ☐

8 Have you subsequently withdrawn your declaration?

No ☐

Yes ☐

9 List the existing large combustion plants (LCPs) which have annual mass allowances under the National Emission Reduction Plan (NERP), and those with emission limit values (ELVs) under the LCPD

Installation reference	
LCPs under NERP	LCPs with ELVs

10 Do you meet the monitoring requirements of Chapter III of the Industrial Emissions Directive?

No ☐

Yes ☐ Document reference

11 Are you substantially refurbishing an existing installation according to the meaning given in Article 14 of the Energy Efficiency Directive?

No ☐

Yes ☐ Now go to question 12

12 Have you carried out a cost–benefit assessment (CBA) of opportunities for cogeneration (combined heat and power) or district heating under Article 14 of the Energy Efficiency Directive?

No ☐ Please provide supporting evidence of why a CBA is not required (for example, an agreement from us)

Document reference of this evidence

Yes ☐ Please submit a copy of your CBA

Document reference of the CBA

Appendix 2 – Specific questions for the chemical sector

1 Please provide a technical description of your activities

- The description should be enough to allow us to understand:
- the process
- the main plant and equipment used for each process
- all reactions, including significant side reactions (that is, the chemistry of the process)
- the material mass flows (including by products and side streams) and the temperatures and pressures in major vessels
- the all emission control systems (both hardware and management systems), for situations which could involve releasing a significant amount of emissions – particularly the main reactions and how they are controlled
- a comparison of the indicative BATs and benchmark emission levels standards: technical guidance notes (TGNs) (see https://www.gov.uk/government/collections/technical-guidance-for-regulated-industry-sectors-environmental-permitting); additional guidance 'The production of large volume organic chemicals' (EPR 4.01); 'Speciality organic chemicals sector' (EPR 4.02); 'Inorganic chemicals sector' (EPR 4.03); and best available techniques reference documents (BREFs) for the chemical sector

Document reference

2 If you are applying for a multi-purpose plant, do you have a multi-product protocol in place to control the changes?

No ☐

Yes ☐ Provide a copy of your protocol to accompany this application

Document reference

3 Does Chapter V of the Industrial Emissions Directive (IED) apply to your activities?

No ☐

Yes ☐ Fill in the following

3a List the activities which are controlled under the IED

Installation reference	
Activities	

3b Describe how the list of activities in question 3a above meets the requirements of the IED

Document reference

Appendix 3 – Specific questions for the waste incineration sector

If you are proposing to accept clinical waste, please complete your answer to question 3a 'Technical standards' with reference to relevant parts of our healthcare waste appropriate measures guidance (see https://www.gov.uk/guidance/healthcare-waste-appropriate-measures-for-permitted-facilities)

1a Do you run incineration plants as defined by Chapter IV of the Industrial Emissions Directive (IED)?

No ☐ You do not need to answer any other questions in this appendix

Yes ☐ IED applies

1b Are you subject to IED as

An incinerator? ☐

A co-incinerator? ☐

2 Do any of the installations contain more than one incineration line?

No ☐ Now go to question 4

Yes ☐

3 How many incineration lines are there within each installation?

Fill in a separate table for each installation.

Installation reference		
Number of incineration lines within the installation		
Reference identifiers for each line		

You must provide the information we ask for in questions 4, 5 and 6 below in separate documents. The information must at least include all the details set out in section 2 ('Key Issues') of S5.01 'Incineration of waste: additional guidance' (under the sub heading 'European legislation and your application for an EP Permit'). See https://www.gov.uk/government/collections/technical-guidance-for-regulated-industry-sectors-environmental-permitting.

You must answer questions 7 to 13 on the form below.

4 Describe how the plant is designed, equipped and will be run to make sure it meets the requirements of IED, taking into account the categories of waste which will be incinerated

Document reference

5 Describe how the heat created during the incineration and co-incineration process is recovered as far as possible (for example, through combined heat and power, creating process steam or district heating)

Document reference

Appendix 3 – Specific questions for the waste incineration sector, continued

6 Describe how you will limit the amount and harmful effects of residues and describe how they will be recycled where this is appropriate

Document reference

For each line identified in question 3, answer questions 7 to 13 below

Question 3 identifier, if necessary

7 Do you want to take advantage of the Article 45 (1)(f) allowance (see below) if the particulates, CO or TOC continuous emission monitors (CEM) fail?

No ☐

Yes ☐ This allows 'abnormal operation' of the incineration plant under certain circumstances when the CEM for releases to air have failed. Annex VI, Part 3(2) sets maximum half hourly average release levels for particulates (150 mg/m3), CO (normal ELV) and TOC (normal ELV) during abnormal operation.

Describe the other system you use to show you keep to the requirements of Article 13(4) (for example, using another CEM, providing a portable CEM to insert if the main CEM fails, and so on).

8 Do you want to replace continuous HF emission monitoring with periodic hydrogen fluoride (HF) emission monitoring by relying on continuous hydrogen chloride (HCl) monitoring as allowed by IED Annex VI, Part 6 (2.3)?

Under this you do not have to continuously monitor emissions for hydrogen fluoride if you control hydrogen chloride and keep it to a level below the HCl ELVs.

No ☐

Yes ☐ Please give your reasons for doing this

Appendix 3 – Specific questions for the waste incineration sector, continued

9 Do you want to replace continuous water vapour monitoring with pre-analysis drying of exhaust gas samples, as allowed by IED Annex VI, Part 6 (2.4)?

Under this you do not have to continuously monitor the amount of water vapour in the air released if the sampled exhaust gas is dried before the emissions are analysed.

No ☐

Yes ☐ Please give your reasons for doing this

10 Do you want to replace continuous hydrogen chloride (HCl) emission monitoring with periodic HCl emission monitoring, as allowed by IED Annex VI, Part 6 (2.5), first paragraph?

Under this you do not have to continuously monitor emissions for hydrogen chloride if you can prove that the emissions from this pollutant will never be higher than the ELVs allowed.

No ☐

Yes ☐ Please give your reasons for doing this

Appendix 3 – Specific questions for the waste incineration sector, continued

11 Do you want to replace continuous HF emission monitoring with periodic HF emission monitoring, as allowed by IED Annex VI, Part 6 (2.5), first paragraph?

Under this you do not have to continuously monitor emissions for hydrogen fluoride if you can prove that the emissions from this pollutant will never be higher than the ELVs allowed.

No ☐

Yes ☐ Please give your reasons for doing this

12 Do you want to replace continuous SO_2 emission monitoring with periodic sulphur dioxide (SO_2) emission monitoring, as allowed by IED Annex VI, Part 6 (2.5), first paragraph?

Under this you do not have to continuously monitor emissions for sulphur dioxide if you can prove that the emissions from this pollutant will never be higher than the ELVs allowed.

No ☐

Yes ☐ Please give your reasons for doing this

Appendix 3 – Specific questions for the waste incineration sector, continued

13 If your plant uses fluidised bed technology, do you want to apply for a derogation of the CO WID ELV to a maximum of 100 mg/m³ as an hourly average, as allowed by IED Annex VI, Part 3?

No ☐

Does not apply ☐

Yes ☐ Please give your reasons for doing this

14 Are you substantially refurbishing an existing installation according to the meaning given in Article 14 of the Energy Efficiency Directive?

No ☐

Yes ☐ Please go to question 15

Document reference of the CHP-ready assessment

15 Have you carried out a cost–benefit assessment (CBA) of opportunities for cogeneration (combined heat and power) or district heating under Article 14 of the Energy Efficiency Directive?

No ☐ Please provide supporting evidence of why a CBA is not required (for example, an agreement from us)

Document reference of this evidence

Yes ☐ Please submit a copy of your CBA

Document reference of the CBA

Appendix 4 – Specific questions for the landfill sector and recovery of hazardous waste on land activities

1. For the landfill sector, provide your Environmental Setting and Installation Design (ESID) report and any other risk assessments to control emissions.

For recovery of hazardous waste on land activities, provide your Environmental Setting and Site Design (ESSD) report and any other risk assessments to control emissions

Document reference

2. For recovery of hazardous waste on land activities, provide your Waste Acceptance Procedures (including Waste Acceptance Criteria)

Document reference

Refer to our guidance at
https://www.gov.uk/government/publications/deposit-for-recovery-operators-environmental-permits/waste-acceptance-procedures-for-deposit-for-recovery

3. Provide your hydrogeological risk assessment (HRA) for the site

Document reference

4. Provide your outline engineering plan for the site

Document reference

5. Provide your stability risk assessment (SRA) for the site

Document reference

6. Provide your landfill gas risk assessment (LFGRA) for the site

Document reference

We have developed guidance on these assessments and their reports which can be found at
https://www.gov.uk/government/collections/environmental-permitting-landfill-sector-technical-guidance

7. For recovery of hazardous waste on land activities, have you completed a monitoring plan for the site?

No ☐ Please refer to the section of your ESSD that explains why this is unnecessary for your site

Document reference of this evidence

Yes ☐ Document reference

8. Have you completed a proposed plan for closing the site and your procedures for looking after the site once it has closed?

No ☐ If you have answered 'no' for recovery of hazardous waste on land activities, refer to the section of your ESSD that explains why this is unnecessary for your site

Document reference of this evidence

Yes ☐ For landfill you must provide a closure and aftercare plan

Document reference

Application for an environmental permit Part F1 – Charges and declarations

We recommend you use an Adobe Acrobat product to complete the form. You may not be able to complete the form using different software, such as the PDF reader built into your internet browser

Fill in this part for all applications for:

- installations (excluding new permit and variation applications for intensive farming. Use application form Part B3.5 or C3.5 instead)
- waste operations
- mining waste operations
- medium combustion plant
- specified generators
- water discharges (excluding treated domestic sewage effluent discharges of up to 15 cubic metres (15m^3) a day into ground or up to 20 cubic metres (20m^3) a day to surface water)
- groundwater activities (excluding small discharges of 15m^3 per day or less if using Part B6.5 OR existing small discharges to Source Protection Zone1 if using Part B6.6)

Please check that this is the latest version of the form available from our website.

Please read through this form and the guidance notes that came with it.

The form can be:

1) saved onto a computer and then filled in.

2) printed off and filled in by hand. Please write clearly in the answer spaces.

We anticipate it will take less than 3 hours to fill in this form if you have all the necessary information available.

Contents

1 Working out charges

You must fill out this section for all applications except for waste mobile plant and Part B surrender notifications.

You have to submit an application fee with your application. For guidance on the fee and how to pay your charges, please see our charging guidance (**https://www.gov.uk/government/publications/environmental-permitting-charges-guidance**) and the current charging scheme **https://www.gov.uk/government/publications/environmental-permits-and-abstraction-licences-tables-of-charges**. You can also contact us for pre-application advice to help work out the charges.

Please note that there is an annual subsistence charge to cover the costs we incur in the ongoing regulation of the permit.

Table 1 – Type and number of facilities being applied for

For example, if you are submitting one installation application, enter the number one into the first column.

Installation	Waste	Mining waste	Medium Combustion Plant (MCP)/ Specified Generator (SG)	Water discharge	Groundwater activity
1					

Table 2 – General application charge (A)

Charge activity reference from the charging scheme tables	Charge activity description from the charging scheme tables	What are you applying for? For example, a new permit, minor variation, normal variation, substantial variation, surrender, low risk surrender, transfer	Amount
e.g. 1.17.3	e.g. Section 5.2 – landfill for hazardous waste	e.g. transfer application	e.g. £5,561
1.10.1	Section 1.1 Combustion Plant >50MWth	Normal variation	£17,193
Total A			£17,193

1 Working out charges, continued

Table 3 – Additional assessment charges (B)

Part 1.19 Charges for plans and assessments			Tick appropriate
Reference	Plan or assessment	Charge	
1.19.1	Waste recovery plan or variation or revision of a waste recovery plan.	£1,231	☐
1.19.2	Habitats assessment (except where the application activity is a flood risk activity, water discharge or groundwater activity).	£779	☐
1.19.3	Fire prevention plan (except where the application activity is a farming installation).	£1,241	☐
1.19.4	Pests management plan (except where the application activity is a farming installation).	£1,241	☐
1.19.5	Emissions management plan (except where the application activity is a farming installation).	£1,241	☐
1.19.6	Odour management plan (except where the application activity is a farming installation).	£1,246	☐
1.19.7	Noise and vibration management plan (except where the application activity is a farming installation).	£1,246	☐
1.19.8	Ammonia modelling assessment	£620	☐
1.19.9	Dust and bio-aerosol management plan.	£620	☐
1.19.10	Habitats assessment for discharges to water and groundwater activities.	£2,035	☐
1.19.11	Specific Substances Assessment for a water discharge activity to surface water.	£3,774	☐
1.19.12	Specific Substances Assessment for a groundwater activity.	£1,546	☐
1.19.13	Advertising	£500	☐
Total B			0

Total charges

Add the total charges from Table 1 to the total charges from Table 2 (total A plus total B)

£17,193

2 Payment

You must fill out this section for all applications except for waste mobile plant and Part B surrender notifications.

Tick below to show how you have paid.

☐ Cheque

☐ Credit or debit card

☑ Electronic transfer (for example, BACS)

Cheques

You should make cheques payable to 'Environment Agency' and make sure they have 'A/c Payee' written across them if it is not already printed on.

2 Payment, continued

Please write the name of your company and application reference number on the back of your cheque. We will not accept cheques with a future date on them.

Credit/debit cards

If you are paying by credit or with debit card we will call you. We can accept payments by Visa, MasterCard or Maestro card only.

☐ Call me to arrange payment by debit or credit card

Electronic transfer BACS

If you choose to pay by electronic transfer, you will need to use the following information to make your payment:

Company name	Environment Agency
Company address	SSCL (Environment Agency), PO Box 797, Newport Gwent, NP10 8FZ
Bank	RBS/NatWest
Address	London Corporate Service Centre, CPB Services, 2nd Floor, 280 Bishopsgate, London EC2M 4RB
Sort code	60-70-80
Account number	10014411
Account name	EA RECEIPTS
Payment reference number	PSCAPPXXXXXYYY

You need to create your own reference number. It should begin with PSCAPPWASTE (Waste), PSCAPPINST (Installation), PSCAPPWQ (Water Quality) (to reflect the facility type) and it should include the first five letters of the company name (replacing the X's in the above reference number) and a unique numerical identifier (replacing the Y's in the above reference number). The reference number that you supply will appear on our bank statements.

You should also email your payment details and reference number to **ea_fsc_ar@gov.sscl.com**.

If you are making your payment from outside the United Kingdom, it must be in sterling. Our IBAN number is GB23NWBK60708010014411 and our SWIFTBIC number is NWBKGB2L.

If you do not quote your reference number, there may be a delay in processing your payment and application.

Provide a unique reference number for the application, i.e. do not only use the company name only

PSCAPPINSTVIRTU112

State who is paying (full name and whether this is the agent/applicant/other)

Virtus HoldCo Ltd

Fee paid

£ 17,193

Date payment sent (DD/MM/YYYY)

31/08/2024 and 24/10/2024

3 Privacy notice

The Environment Agency runs the environmental permit application service.

See **https://www.gov.uk/guidance/environmental-permits-privacy-notice** for how we use your personal information in services to support environmental permitting.

4 Confidentiality and national security

Confidentiality

We will normally put all the information in your application on a public register of environmental information. However, we may not include certain information in the public register if this is in the interests of national security, or because the information is confidential.

You can ask for information to be made confidential by enclosing a letter with your application giving your reasons. If we agree with your request, we will tell you and not include the information in the public register. If we do not agree with your request, we will let you know how to appeal against our decision, or you can withdraw your application. You can find guidance on confidentiality in 'Environmental permitting guidance: core guidance', published by Defra and available at **https://www.gov.uk/government/publications/environmental-permitting-guidance-core-guidance--2**.

Only tick the box below if you wish to claim confidentiality for parts of your application

☐ Please treat the specified information in my application as confidential

National security

You can tell the Secretary of State that you believe including information on a public register would not be in the interests of national security. You must enclose a letter with your application telling us that you have told the Secretary of State and you must still include the information in your application. We will not include the information in the public register unless the Secretary of State decides that it should be included.

You can find guidance on national security in 'Environmental permitting guidance: core guidance', published by Defra and available at **https://www.gov.uk/government/publications/environmental-permitting-guidance-core-guidance--2**

You cannot apply for national security via this application.

Now fill in section 5

5 Declaration

If you knowingly or recklessly make a statement that is false or misleading to help you get an environmental permit (for yourself or anyone else), you may be committing an offence under the Environmental Permitting (England and Wales) Regulations 2016.

A relevant person should make the declaration (see the guidance notes on part F1). An agent acting on behalf of an applicant is NOT a relevant person.

Each individual (or individual trustee) who is applying for their name to appear on the permit must complete this declaration. You will have to print a separate copy of this page for each additional individual to complete.

If you are transferring all or part of your permit, both you and the person receiving the permit must make the declaration. You must fill in the declaration directly below; the person receiving the permit must fill in the declaration under the heading 'For transfers only'.

5 Declaration, continued

Note: we will issue a letter to both current and new holders to confirm the transfer. If you are changing address we will need to send this letter to your new address; therefore please tell us your new address in a separate letter.

If you are unable to trace one or more of the current permit holders please see below under the transfers declaration.

I declare that the information in this application is true to the best of my knowledge and belief. I understand that this application may be refused or approval withdrawn if I give false or incomplete information.

If you deliberately make a statement that is false or misleading in order to get approval you may be prosecuted.

- [x] Tick this box to confirm that you understand and agree with the declaration above, then fill in the details below (you do not have to provide a signature as well)
- [ ] I confirm that my standard facility will fully meet the rules that I have applied for (this only applies if the application includes standard facilities)
- [ ] Tick this box if you do not want us to use information from any ecological survey that you have supplied with your application (for further information please see the guidance notes on part F1)

Name

Title

Mr

First name

Neil

Last name

Creswell

on behalf of (if relevant; for example, a company or organisation and so on)

Virtus London 12 Ltd and Virtus HoldCo Ltd

Position (if relevant; for example, a company or organisation and so on)

CEO

Today's date (DD/MM/YYYY)

31/08/2024

For transfers only – declaration for person receiving the permit

A relevant person should make the declaration (see the guidance notes on part F1). An agent acting on behalf of an applicant is NOT a relevant person.

I declare that the information in this application to transfer an environmental permit to me is true to the best of my knowledge and belief. I understand that this application may be refused or approval withdrawn if I give false or incomplete information.

Note: If you cannot trace a person or persons holding the permit you may be able to transfer the permit without their declaration as above. Please contact us to discuss this and supply evidence in your application to confirm you are unable to trace one or all of the permit holders.

If you deliberately make a statement that is false or misleading in order to get approval you may be prosecuted.

5 Declaration, continued

☐ Tick this box to confirm that you understand and agree with the declaration above, then fill in the details below (you do not have to provide a signature as well)

Name

Title

First name

Last name

on behalf of (if relevant; for example, a company or organisation and so on)

Position (if relevant; for example, a company or organisation and so on)

Today's date (DD/MM/YYYY)

Now go to section 6

6 Application checklist

You must fill in this section.

If your application is not complete, we will return it to you. If you aren't sure about what you need to send, contact us before you submit your application. For further information on pre-application advice, see **https://www.gov.uk/guidance/get-advice-before-you-apply-for-an-environmental-permit.**

You must do the following:

☑ Complete legibly all parts of the application form that are relevant to you and your activities

☑ Identify relevant supporting information in the form and send it with the application

☑ List all the documents you are sending in the table below.

☑ For new permit applications or any changes to the site plan, provide a plan that meets the standards given in the guidance note on part F1

☑ Provide a supporting letter for any claim that information is confidential

☑ Get the declaration completed by a relevant person (not an agent)

☑ Send the correct fee

6 Application checklist, continued

Continue on an extra sheet if necessary.

Question reference	Document title	Document reference
All Questions	Environmental Permit Variation Application	70114956/LON12/Supporting Information
	Site Condition Report	70114956/LON12/SCR
	Environmental Risk Assessment	70114956/LON12/ERA
	Non - Technical Summary	70114956/LON12/NTS

Document reference

7 How to contact us

If you have difficulty filling in this form, please contact the person who sent it to you or contact us as shown below.

General enquiries: 03708 506 506 (Monday to Friday, 8am to 6pm)

Textphone: 03702 422549 (Monday to Friday, 8am to 6pm)

Email: **enquiries@environment-agency.gov.uk**

Website: **www.gov.uk/government/organisations/environment-agency**

If you are happy with our service, please tell us. It helps us to identify good practice and encourages our staff. If you're not happy with our service, please tell us how we can improve.

Please tell us if you need information in a different language or format (for example, in large print) so we can keep in touch with you more easily.

8 Where to send your application

For how many copies to send see the guidance note on part F1.

Please send your filled in application form and supporting documents to:

For water discharges and groundwater activities by email to
PSC-WaterQuality@environment-agency.gov.uk

For waste, installations, medium combustion plant and specified generators by email to
PSC@environment-agency.gov.uk

For large electronic documents (too large for email attachment) you can upload your applications to file sharing sites and send us a link to download the documents. Alternatively, you can send more than one email with documents attached.

Or by post to:

Permitting Support, NPS Sheffield
Quadrant 2
99 Parkway Avenue
Parkway Business Park
Sheffield
S9 4WF

Do you want all information to be sent to you by email?

☐ Please tick this box if you wish to have all communication about this application sent via email (we will use the details provided in the Part A form).

Feedback

(You don't have to answer this part of the form, but it will help us improve our forms if you do.)

We want to make our forms easy to fill in and our guidance notes easy to understand. Please use the space below to give us any comments you may have about this form or the guidance notes that came with it.

How long did it take you to fill in this form?

We will use your feedback to improve our forms and guidance notes.

Would you like a reply to your feedback?

☐ Yes please

☐ No thank you

For Environment Agency use only

Date received (DD/MM/YYYY)

Our reference number

Payment received?

☐ No

☐ Yes

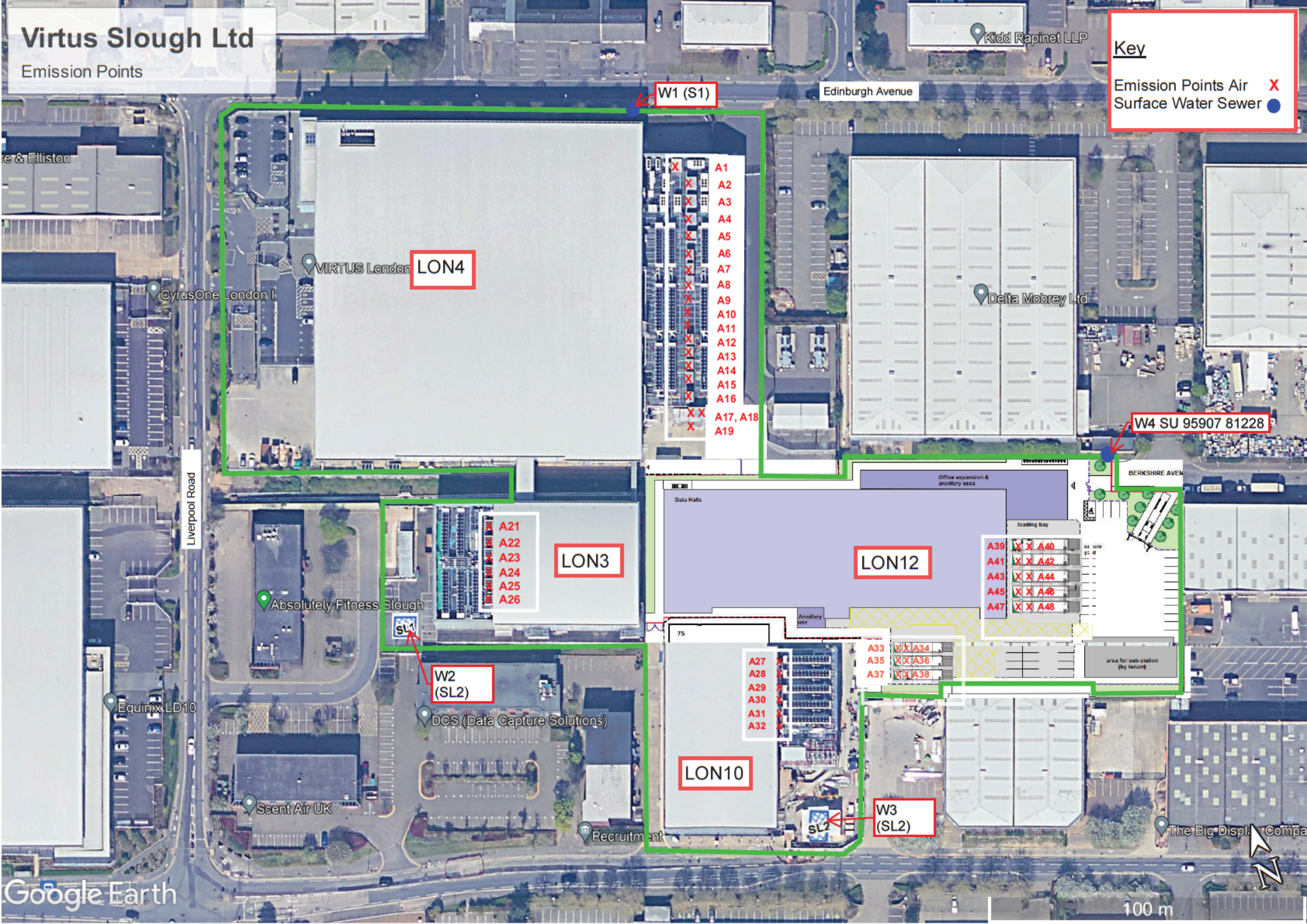
Amount received (£)

Appendix C

INSTALLATION BOUNDARY AND EMISSION POINTS

Virtus Slough Ltd

Emission Points



Appendix D

ENGINE DATA SHEET

Diesel Generator Set

mtu 20V4000 DS3100

380V – 11 kV/50 Hz/standby power/NEA (ORDE) optimized 20V4000G74F/water charge air cooling

Optional equipment and finishing shown. Standard may vary.

Product highlights

Benefits
- Low fuel consumption
- Optimized system integration ability
- High reliability
- High availability of power
- Long maintenance intervals

Support
- Global product support offered

Standards
- Engine-generator set is designed and manufactured in facilities certified to standards ISO 2008:9001 and ISO 2004:14001
- Generator set complies to ISO 8528
- Generator meets NEMA MG1, BS 5000, ISO, DIN EN and IEC standards
- NFPA 110

Power rating
- System ratings: 3080 kVA - 3180 kVA
- Accepts rated load in one step per NFPA 110*
- Generator set complies to G3 according to ISO 8528-5
- Generator set exceeds load steps according to ISO 8528-5*

Performance assurance certification (PAC)
- Engine-generator set tested to ISO 8528-5 for transient response
- 85% load factor
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

Complete range of accessories available
- Control panel
- Power panel
- Circuit breaker/power distribution
- Fuel system
- Fuel connections with shut-off valve mounted to base frame
- Starting/charging system
- Exhaust system
- Mechanical and electrical driven radiators
- Medium and oversized voltage alternators

Emissions
- NEA (ORDE) optimized

Certifications
- CE certification option
- Unit certificate acc. to VDE-AR-N 4110

* Changes to the standard parameter sets (alternator-regulator and genset-controller) are necessary

A Rolls-Royce solution

Application data [1)]

Engine	
Manufacturer	*mtu*
Model	20V4000G74F
Type	4-cycle
Arrangement	20V
Displacement: l	95.4
Bore: mm	170
Stroke: mm	210
Compression ratio	16.4
Rated speed: rpm	1500
Engine governor	ECU 9
Max power: kWm	2670
Air cleaner	dry

Fuel system	
Maximum fuel lift: m	5
Total fuel flow: l/min	27

Fuel consumption [2)]	l/hr	g/kwh
At 100% of power rating:	633.7	197
At 75% of power rating:	494.6	205
At 50% of power rating:	345.8	215

Liquid capacity (lubrication)	
Total oil system capacity: l	390
Engine jacket water capacity: l	205
Intercooler coolant capacity: l	50

Combustion air requirements	
Combustion air volume: m^3/s	2.6
Max. air intake restriction: mbar	50

Cooling/radiator system	
Coolant flow rate (HT circuit): m^3/hr	80
Coolant flow rate (LT circuit): m^3/hr	32.5
Heat rejection to coolant: kW	1030
Heat radiated to charge air cooling: kW	490
Heat radiated to ambient: kW	105
Fan power for electr. radiator (40°C): kW	70

Exhaust system	
Exhaust gas temp. (after turbocharger): °C	550
Exhaust gas volume: m^3/s	8.6
Maximum allowable back pressure: mbar	85
Minimum allowable back pressure: mbar	30

Standard and optional features

System ratings (kW/kVA)

Generator model	Voltage	NEA (ORDE) optimized					
		without radiator			with mechanical radiator		
		kWel	kVA*	AMPS	kWel	kVA*	AMPS
Leroy Somer LSA53.2 M9 (Low voltage Leroy Somer standard)	380 V	2512	3140	4771	2472	3090	4695
	400 V	2512	3140	4532	2472	3090	4460
	415 V	2512	3140	4368	2472	3090	4299
Marathon 1030FDL7094 (Low voltage Marathon)	380 V	2536	3170	4816	2464	3080	4680
	400 V	2536	3170	4576	2464	3080	4446
	415 V	2536	3170	4410	2464	3080	4285
Marathon 1030FDH7101 (Medium volt. marathon)	11 kV	2536	3170	166	2472	3090	162
Leroy Somer LSA53.2 ZL14 (Medium volt. Leroy Somer)	11 kV	2544	3180	167	2472	3090	162

* cos phi = 0.8

1 All data refers only to the engine and is based on ISO standard conditions (25°C and 100m above sea level).

2 Values referenced are in accordance with ISO 3046-1. Conversion calculated with fuel density of 0.83 g/ml. All fuel consumption values refer to rated engine power.

Standard and optional features

Engine

- ■ 4-cycle
- ■ Standard single stage air filter
- ■ Oil drain extension & shut-off valve
- ■ Closed crankcase ventilation
- ■ Governor-electronic isochronous
- ■ Common rail fuel injection
- ■ NEA (ORDE) optimized engine

Generator

- ■ 4 pole three-phase synchronous generator
- ■ Brushless, self-excited, self-regulating, self-ventilated
- ■ Digital voltage regulator
- ■ Anti condensation heater
- ■ Stator winding Y-connected, accessible neutral (brought out)
- ■ Protection IP23
- ■ Insulation class H, utilization acc. to H
- ■ Radio suppression EN 55011, group 1, cl. B
- ■ Short circuit capability 3xIn for 10sec
- ■ Winding and bearing RTDs (without monitoring)
- ■ Excitation by AREP
- ■ Mounting of CT´s: 2 core CT´s
- ■ Winding pitch: 2/3 winding
- ■ Voltage setpoint adjustment ± 10%
- ■ Meets NEMA MG-1, BS 5000, IEC 60034-1, VDE 0530, DIN EN 12601, AS 1359 and ISO 8528-3 requirements
- ■ Leroy Somer low voltage generator
- □ Marathon low voltage generator
- □ Oversized generator
- □ Medium voltage generator

Cooling system

- ■ Jacket water pump
- ■ Thermostat(s)
- ■ Water charge air cooling
- □ Mechanical radiator
- □ Electrical driven front-end cooler
- □ Jacket water heater

Control panel

- ■ Unit cabling with coded plugs for easy connection of customer-specific controls (V0)
- □ Pre-wired control cabinet for easy application of customized controller (V1+)
- □ Island operation (V2)
- □ Automatic mains failure operation with ATS (V3a)
- □ Automatic mains failure operation incl. control of generator and mains breaker (V3b)
- □ Island parallel operation of multiple gensets (V4)
- □ Automatic mains failure operation with short (< 10s) mains parallel overlap synchronization (V5)
- □ Mains parallel operation of a single genset (V6)
- □ Mains parallel operation of multiple gensets (V7)
- □ Basler controller
- □ Deif controller
- □ Complete system metering
- ■ Digital metering
- ■ Engine parameters
- ■ Generator protection functions
- ■ Engine protection
- ■ SAE J1939 engine ECU communications
- ■ Parametrization software
- ■ Multilingual capability
- ■ Multiple programmable contact inputs
- ■ Multiple contact outputs
- ■ Event recording
- □ IP 54 front panel rating with integrated gasket
- □ Different expansion modules
- □ Remote annunciator
- □ Daytank control
- □ Generator winding temperature monitoring
- □ Generator bearing temperature monitoring
- □ Modbus TCP-IP

Connectivity

The engine system automatically collects and transfers engine data to the manufacturer from time to time. The data is used by the manufacturer for the purposes of product development and improvement as well as service optimization. Users can log in or register via https://mtu-go.com and also gain insight into the data.

■ Represents standard features
□ Represents optional features

Standard and optional features

Power panel

- ☐ Supply electrical driven radiator from 45kW – 75kW

Circuit breaker/power distribution

- ☐ 3-pole circuit breaker
- ☐ 4-pole circuit breaker
- ☐ Electrical-actuated circuit breaker
- ☐ Base frame mounted GCB, pre-wired with generator, ready for commissioning

Fuel system

- ■ Flexible fuel connectors mounted to base frame
- ☐ Fuel filter with water separator
- ☐ Fuel filter with water separator heavy-duty
- ☐ Switchable fuel filter with water separator
- ☐ Switchable fuel filter with water separator heavy-duty
- ☐ Seperate fuel cooler
- ☐ Fuel cooler integrated into cooling equipment

Starting/charging system

- ■ 24V starter
- ☐ Redundant starting system
- ☐ Starter batteries, cables, rack, disconnect switch (lockable)
- ☐ Battery charger
- ☐ Alternator

Mounting system

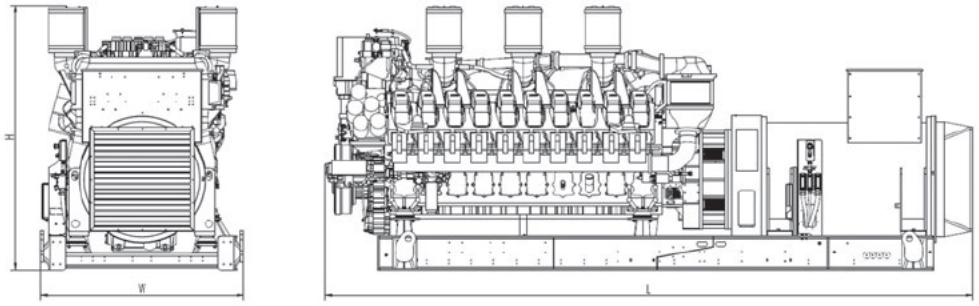
- ■ Welded base frame
- ■ Resilient engine and generator mounting
- ■ Modular base frame design
- ☐ Base frame mounting on foundation/base plate with using clamping brackets

Exhaust system

- ☐ Exhaust bellows with connection flange
- ☐ Exhaust silencer with 10 dB(A) sound attenuation
- ☐ Exhaust silencer with 30 dB(A) sound attenuation
- ☐ Exhaust silencer with 40 dB(A) sound attenuation
- ☐ Y-connection-pipe

■ Represents standard features
☐ Represents optional features

Weights and dimensions



Drawing above for illustration purposes only, based on a standard open power 400 Volt engine-generator set. Lengths may vary with other voltages. Do not use for installation design. See website for unit specific template drawings.

System	Dimensions (LxWxH)	Weight (dry/less tank)
Open power unit (OPU)	5760 x 1810 x 2348 mm	16920 kg

Weights and dimensions are based on open power units and are estimates only. Consult the factory for accurate weights and dimensions for your specific engine-generator set.

Sound data

— Consult your local ***mtu*** distributor for sound data.

Emissions data

— Consult your local ***mtu*** distributor for emissions data.

Rating definitions and conditions

— Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. No overload capability for this rating. Ratings are in accordance with ISO 8528-1, ISO-3046-1, BS 5514 and AS 2789. Average load factor: ≤ 85%. Operating hours/year: max. 500.
— Consult your local ***mtu*** distributor for derating information.

Subject to change. | 3237861 | Edition 02/22 | BMC 2022-03.

Contents

	Genset	Marine	O & G	Rail	C & I
Application	X				
Engine model	20V4000G74F				
Rated power [kW]	2670				
Rated speed [rpm]	1500				
Application Group	3D				
Legislative body	NEA Singapore for ORDE				
Test cycle	D2				
Data Set No.	XZ59654100932				
Data Set Basis	NEA Singapore for ORDE				
Fuel sulphur content [ppm]	5				

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Engine model
20V4000G74F

Title
Emission data sheet

Description of Revision	Frequency

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General Disclaimers (valid for Measured and NTE values)

Please note that these data are physical and/or technical values only referring to and representing a normative defined operating condition. Any change in operating time and conditions will have impact on physical values and engine behavior, which must be considered and assessed within the complete propulsion system especially in regard to emission compliance and product safety.

Measurements listed in this EDS are representative of the listed engine rating at the time of testing. These measurements and results can change according to instrumentation, boundary condition, and engine to engine variability. In addition - changes to the engine family hard or software may occur which could result in changes to some of the listed values.

Emissions data measurement procedures are conducted according to applicable rules and standards as per “Emission Stage/Optimization”. Potential deviations from these procedures are documented internally.

The listed emission values relate to the corresponding certification data. Seller doesn´t take any responsibility or liability neither out or in connection with the contract nor on any other basis
- beyond these specified operating conditions of the engine
- and for any installation/modification of the entire propulsion system by the customer itself or any third party
and the customer will indemnify MTU on first demand for any third party claim out or in connection with this.

Seller reserves the right to amend specifications and information without notice and without obligation or liability. No liability for any errors, facts or opinions is accepted. Customers must satisfy themselves as to the suitability of this product for their application. No responsibility for any loss as a result of any person placing reliance on any material contained in this data sheet will be accepted.

Seller reserves all rights in the information contained in this data sheet. It shall not be reproduced, made available to a third party or otherwise used in any way whatsoever.

When applicable, emission values are measured after combined exhaust streams.

Measured Emissions data is based on single operating points and thus cannot be used to compare to regulations which use values based on a weighted cycle.

Field emission test data are not guaranteed to these levels. Actual field test results may vary due to test site conditions, installation, fuel specification, test procedures, and instrumentation. Over time deterioration may occur which may have an impact on emission levels.

The SO2 emission rates comprehend exclusively the SO2 content as found in the fuel source, oil consumption effects are not included. Variation of sulfur content in the fuel changes only the stated SO2 emissions, cross sensitivity to other emissions (e.g. particulates) is not possible.

All values based on metric units, inaccuracies for non metric values can occur, values are not binding.

Specific to gas engines: The listed emission values are based on gas composition at the time of certification measurement. Gas composition is as displayed in the EDS-document. Carbon dioxide and methane concentrations have direct influence on the corresponding displayed carbon dioxide and methane emissions.

EAT Specific Disclaimers (valid for EDS values)

NH3 emissions levels measured with AVL SESAM i60/ 4 FT Multi Component Exhaust Measurement System (FTIR) including EPA 40 CFR 1065 legislation compliant automated checks for linearity.
Generators or engines with exhaust after-treatment systems require a stabilization period of approximately 1 hour to ensure stable temperatures across SCR prior to performing an emissions test. Performing emissions measurements before a stable temperature has been achieved can result in inconsistent emission values. NOx Values only applicable if temperatures across SCR reached for DEF Dosing.

NTE Disclaimers (valid for NTE calculated values)

Calculated not to exceed values (NTE) are not proven by tests and therefore the accuracy is not guaranteed.

All emission data shown in chapters Emission Data Sheet, Not to Exceed Values, and Type Approval were gathered from a corresponding certification engine under test conditions shown above and complying to corresponding TEN data.

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Engine model
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Title
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Engine data

	Genset	Marine	O & G	Rail	C & I
Application	X				
Engine model	20V4000G74F				
Application Group	3D				
Legislative body	NEA Singapore for ORDE				
Test cycle	D2				
Fuel sulphur content [ppm]	5				
mg/mN^3 values base on residual oxygen value of [%]	5				

Engine raw emissions*

Cycle point	[-]	n1	n2	n3	n4	n5
Power	kW	2670	2002	1335	667	267
Power relative	[-]	1	0.75	0.5	0.25	0.1
Engine torque	Nm	16998	12748	8499	4249	1700
Engine torque relative	[-]	1	0.75	0.5	0.25	0.1
Engine speed	1/min	1500	1500	1500	1500	1500
Engine speed relative	[-]	1	1	1	1	1
Eff. mean pressure	bar	22.39	16.79	11.19	5.6	2.24
Ambient air pressure	bar	0.97	0.97	0.97	0.97	0.97
Air pressure at humidity measurement position	bar	0.97	0.97	0.97	0.97	0.97
Air temperature at humidity measurement position	grdC	24.5	24.6	24.2	23.7	22.6
Intake air temperature	grdC	24.5	24.6	24.2	23.7	22.6
Hydrocarbon (HC) (5% O2)	ppm	80	96	136	273	777
Carbon monoxide (CO) (5% O2)	ppm	135	162	205	380	862
Filter smoke number	FSN	0.17	0.31	0.65	0.8	0.14
Exhaust pressure at AMA measurement position	mbar	84	58	30	12	6
Exhaust temperature after ETC	grdC	528.1	497.8	462.7	365.9	223.9

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Exhaust back pressure after ETC (static)	mbar	84	58	30	12	6
NOX concentration corr. (5% O2)	ppm	1234	863	653	694	1118
Exhaust mass flow wet	kg/h	12872.3	11018.5	8524.6	5859.2	4657.8
Exhaust volume flow (norm)	m3/s	2.76	2.36	1.83	1.26	1
NOX mass flow	kg/h	20.44	11	5.79	3.26	2.54
CO mass flow	kg/h	1.24	1.16	1.03	1.02	1.15
HC1 mass flow	kg/h	0.4	0.37	0.36	0.39	0.53
NMHC mass flow	kg/h	0.39	0.36	0.36	0.38	0.52
NOX+HC1 mass flow	kg/h	20.84	11.37	6.15	3.65	3.07
NOX+NMHC mass flow	kg/h	20.83	11.36	6.14	3.64	3.06
O2 mass flow	kg/h	1039	1044	916	785	794
CO2 mass flow	kg/h	1652	1278	894	479	233
PM mass flow	kg/h	0.113	0.094	0.129	0.161	0.206
NOX-Emissions specific	g/kWh	7.65	5.49	4.33	4.89	9.52
CO-Emissions specific	g/kWh	0.46	0.58	0.77	1.53	4.29
HC1-Emissions specific	g/kWh	0.15	0.18	0.27	0.58	2
NMHC-Emissions specific	g/kWh	0.15	0.18	0.27	0.57	1.96
NOX+HC1-Emissions specific	g/kWh	7.8	5.68	4.61	5.47	11.51
NOX+NMHC-Emissions specific	g/kWh	7.8	5.67	4.6	5.46	11.47
CO2-Emissions specific	g/kWh	618.7	638.3	669.8	717.2	871.2
PM-Emissions specific (Meas.)	g/kWh	0.042	0.047	0.097	0.241	0.77
Exhaust volume flow dry (based on 5% O2)	m3/s	2.05	1.59	1.11	0.6	0.3
NOX-Emissions (based on 5% O2)	mg/m3N	2751	1907	1435	1507	2390
	ppmV	1460.2	1012.97	761	797.66	1260.83
NOX+HC1-Emissions (based on 5% O2)	mg/m3N	2805	1972	1526	1686	2891

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Engine model
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NOX+NMHC-Emissions (based on 5% O2)	mg/m3N	2804	1971	1524	1683	2881
CO2-Emissions (based on 5% O2)	mg/m3N	224171	223768	223275	222139	218788
CO-Emissions (based on 5% O2)	mg/m3N	168.2	203.1	256.4	474.6	1077.5
HC1-Emissions (based on 5% O2)	mg/m3N	54.5	64.7	90.8	179.8	500.4
PM-Emissions (based on 5% O2)	mg/m3N	15.2	16.3	32.2	74.7	193.3
Carbon dioxide (CO2)	%	9.3	8.3	7.5	5.7	3.4
Oxygen (O2)	%	8	9.3	10.5	12.9	16.1
Exhaust volume flow (real)	m3/s	7.788	6.578	4.993	3.036	1.889
NOX correctionfactor	[-]	1.008	1.01	1.007	1.005	1
Dry-wet correction factor	[-]	0.913	0.92	0.927	0.941	0.961
NMHC-Emissions (based on 5% O2)	mg/m3N	53.4	63.4	89	176.2	490.4

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Emissionstage basis
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Engine data

	Genset	Marine	O & G	Rail	C & I
Application	X				
Engine model	20V4000G74F				
Application Group	3D				
Legislative body	NEA Singapore for ORDE				
Test cycle	D2				
Fuel sulphur content [ppm]	5				
mg/mN^3 values base on residual oxygen value of [%]	5				

Not to exceed emission values*

Cycle point	[-]	n1	n2	n3	n4	n5
Power	kW	2670	2002	1335	667	267
Power relative	[-]	1	0.75	0.5	0.25	0.1
Engine speed	1/min	1500	1500	1500	1500	1500
Engine speed relative	[-]	1	1	1	1	1
Hydrocarbon (HC) (5% O2)	ppm	137	164	258	547	2252
Carbon monoxide (CO) (5% O2)	ppm	229	276	390	760	1724
NOX concentration corr. (5% O2)	ppm	1604	1122	848	1042	2125
NOX mass flow	kg/h	26.57	14.3	7.52	4.89	4.83
CO mass flow	kg/h	2.11	1.97	1.95	2.05	2.29
HC1 mass flow	kg/h	0.68	0.63	0.69	0.78	1.55
NMHC mass flow	kg/h	0.67	0.62	0.68	0.76	
NOX+HC1 mass flow	kg/h	27.25	14.93	8.21	5.67	6.37
NOX+NMHC mass flow	kg/h	27.24	14.92	8.2	5.66	
PM mass flow	kg/h	0.169	0.15	0.194	0.242	0.761
NOX-Emissions specific	g/kWh	9.95	7.14	5.63	7.33	18.08
CO-Emissions specific	g/kWh	0.79	0.99	1.46	3.07	8.58
HC1-Emissions specific	g/kWh	0.26	0.31	0.52	1.16	5.79
NMHC-Emissions specific	g/kWh	0.25	0.31	0.51	1.14	

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NOX+HC1-Emissions specific	g/kWh	10.21	7.46	6.15	8.5	23.87
NOX+NMHC-Emissions specific	g/kWh	10.2	7.45	6.14	8.47	
PM-Emissions specific (Meas.)	g/kWh	0.063	0.074	0.145	0.362	2.848
NOX-Emissions (based on 5% O2)	mg/m3N	3576	2479	1865	2260	4541
	ppmV	1898.27	1316.86	989.3	1196.5	2395.58
NOX+HC1-Emissions (based on 5% O2)	mg/m3N	3669	2589	2038	2620	5992
NOX+NMHC-Emissions (based on 5% O2)	mg/m3N	3667	2587	2034	2612	
CO-Emissions (based on 5% O2)	mg/m3N	285.9	345.2	487.2	949.2	2154.9
HC1-Emissions (based on 5% O2)	mg/m3N	92.6	110	172.5	359.7	1451.3
PM-Emissions (based on 5% O2)	mg/m3N	22.9	26.1	48.3	112.1	715.2
NMHC-Emissions (based on 5% O2)	mg/m3N	90.8	107.8	169.1	352.5	

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Cycle information for NEA Singapore for ORDE

	Genset	Marine	O & G	Rail	C & I
Application	X				
Engine model	20V4000G74F				
Serial-number	528102893				
Application Group	3D				
Legislative body	NEA Singapore for ORDE				
Test cycle	D2				
Data Set No.	XZ59654100932				
Test-Report-Number	2751-22.06.2023				
Test location	P210				
Date of test	02.07.2013				
Tester	MTU a Rolls-Royce Solution				
Date of EDS	22.06.2023				

Engine cycle emissions*

Emission	Unit	Cycle value	NEA Singapore for ORDE-Limit
CO cycle value	g/kWh	0.858	3.5
NOX+NMHC cycle value	g/kWh	5.647	6.4
Particulate (measurement) cycle value	g/kWh	0.108	0.2

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Appendix E

DRAWINGS AND SPECIFICATIONS

AVK

THE POWER PEOPLE

C2020

1.0% TANK GAUGE.

Features:

Continuous reading 1% Tank Gauge

High & Low Local Alarm (option -A kit)

Bund Alarm Circuit (Float supplied seperately)

Output 4-20 mA as standard

Local Calibration settings

Push Button Back light for 1 hour

Flashing Backlight when in Alarm

IP65 Weatherproof Enclosure.

Easy Installation

Lower sensor into tank, tighten nut, and join 3 wires, plug in and set-up.

A Tank fitting is supplied to fit into a 1" threaded Socket or a special 30 mm bored hole fitting is available, providing an IP65 seal.

The Hydrostatic Tank sensor comes with 7 meters of cable on a 3 meter probe and 10 meters on a 5 and 10 meter probe.(This can be extended by using an extention kit up to 100 meters)

Standard probe suits tanks from **0.3** up to **3.5 meters high for fuel oils**, and up to **2.8 meters high for water based products** (higher tank options available, C25, C27)

Power requirements/ Options
The Unit operates from 12 to 24 VDC and

Typical Applications

GASOIL , DIESEL, KEROSENE, ADBLUE

LUBE OIL, COOKING OIL, GEAR OIL

WATER, ANTI-FREEZE, WINDSCREEN WASH

ANY TANK SHAPE

Input tank sizes on simple screen,

Rectangular,
Horizontal with elliptical ends, or flat ends.
Vertical cylindrical flat base

Base Models

C2020-0-C23 – Gauge Kit with 3.00 M Probe
C2020-A-C23 = Gauge Kit std 3.00 M Probe + High/Low Alarm
C2020-A-C25 – Gauge Kit with 5.00 M Probe + High/Low Alarm
C2020-A-C27 – Gauge Kit with 10.0 M Probe + High/Low Alarm

Options

B8 – Bund Alarm Probe
OJ – Tank fitting expanding type for 30 mm bored hole.
EK– 10 meter extension kit

See also "420-WWW" web logger attachment.

C2020 I & O MANUAL Revision 07

Firmware v4 **2018**
OLE (UK) LTD TEL 01243 267 930

1. Standard Kit = Sensor, Display & Tank connector.

AC Mains power supplies are available for 100 vac to 250 vac.
Power supply to the standard unit is 12 to 28 vdc.
Options include:
"TANK-KIT" which includes an IP67 junction box assembly, multiple entry, a 1" BSPT tank connection, and a 30 mm expanding tank connection. (See 4 below)
"C2020-M1" mounting kit, (See section 3)
"C2020-B8" bund alarm probe.

Tank connection may be one of two methods.

1/ Top entry by way of an existing free connection. The minimum size we need is 1" BSPT or NPT.

Bund Alarm float switch use the ame tank fittings

2/ Where no free access is available, the OLE 30 mm expanding seal is ideal.
Cold Bore tank top with a hole cutter 30 mm clearance hole. (zone 2 / safe area only) Insert the expanding fitting and tighten, ensuring the O-ring makes a suitable seal on the tank surface. (This fitting is suitable for Tank Testing up to 10psi / 0.7bar)

2. Probe installation. Top of Tank.

** Make sure the probe you have is right for the tank.

Measure the depth of the tank, Caution, If it is more than 3 meters, the standard C22 probe will not be suitable. Install the probe onto the bottom of the tank in water based products, or suspended 50 mm above the bottom in Fuel oils and lubricants, to avoid the possible water interface areas. (This may avoid possible water / sludge affects on the probe sensor).
Tighten the Cable gland to suspend the sensor. Either run the remaining cable direct to the Gauge unit or **If using a junction box assembly**, (TANK-KIT) ensure this is mounted to avoid water ingress.

If cutting the sensor cable, strip back 200 mm of outer sheath to ensure free and easy termination without pulling on the cables.

Cut the vent tube to around 30 mm long, and cut the conductors to 200 mm long. If the cable is to be extended. This should be twisted screened pairs, back to the display. (Max cable length with Voltage sensor is 100 meters) The junction boxes need a small vent hole drilled (0.5mm). This allows atmospheric pressure equalisation if you are not joining with OLE Vented cable (Available per meter) Silica gel packs to be fitted to absorb any moisture.
C code Sensor wiring = BROWN = Volt Sensor 5vdc GREEN = Volt sensor SIG **WHITE** = Volt sensor 0v
A code Sensor wiring = BROWN = mA Sensor +V GREEN = mA Sensor SIG (**WHITE** = NOT USED)

Sensors should exceed tank height and product. Specific gravity must be considered here.

STD Sensors & Cable L

Voltage sensor
C22 =0-2.55 Meter
(Cable is 6 M long)
C23 = 0-3 Meter 7M
C25 = 0-5 Meter 10M
C27 =0-10 Meter 15M

Optional Milliamp Sensors
Model.Range.Cable L
A12 =0-3.0 Meter 10M
A14 =0-5.0 Meter 10M
A16 =0-10 Meter 10M
A18 =0-20 Meter 20M
A20 =0-30 Meter 30M

C2020 is for Zone 2 and Safe area applications only

CAUTION: Do not damage the outer sheath of the sensor. This may cause liquid to enter the cable and damage the transmitter circuit.

To test the Voltage Sensor Output. Measure with a multi-meter set to 20 volt DC range, across the GREEN and WHITE sensor connections. The sensor should read between 0.45V and 0.55V when out of the tank, and between 0.45 and 4.6V when in the tank with product present. If the gauge can not see the sensor, the display will say so.

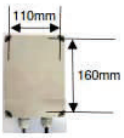
To test the Milliamp sensor, Open the Green wire from the board and measure milliamps in series with this green wire. Never test across the two terminals

3. Display mounting.

The displays may be mounted on walls or panels by utilising the displays own mount holes. These will retain the IP66 integrity. Allen Cap or Cross Head M4 is ideal for this. (Hole positions are shown on back moulding)

The universal mount bracket available from OLE allows for wall mounting as well as 2" pipe mounting, and 3" pipe mounting. The design allows for either Single display mount, or power box and single display mount. or Single display and T3100 remote monitor, or a Dual display. (Code C2020-M1)

4 mount holes external to case seals. M4 Bolt set included



4. Features The C2020 comes in 2 forms.

C2020-O is a standard Gauge with no Alarms
C2020-A = Gauge with **High and Low Alarm**
The Alarm is set between 0 and 100% (one contact)

Additional Options
C2020-B8 = **Bund** Alarm Probe option
The Bund Alarm is a mechanical Switch Float. This is fail safe, opening to Alarm. The Bund alarm comes with 6 meters cable and a 1" BSPT Tank connector. The standard gauge is supplied with a Link wire where the Bund Alarm would be connected. Remove this link and connect the 2 wire sensor. (Red / Green) (This is not polarity sensitive)

C2020-4-20OUT - Milliamp Output
This is proportional to 0 litres = 4 mA and 100% litres = 20 mA

TANK-KIT, Junction Box and Extra fittings.

5. Operation

The C2020 is very simple to operate. There is a Scroll button, which shows Tank Capacity and Ullage space.
This will show for 5 seconds before reverting to the standard display.
There is an Alarm / Test-Mute button. Press to test the alarm (If fitted). This self resets in 5 seconds.

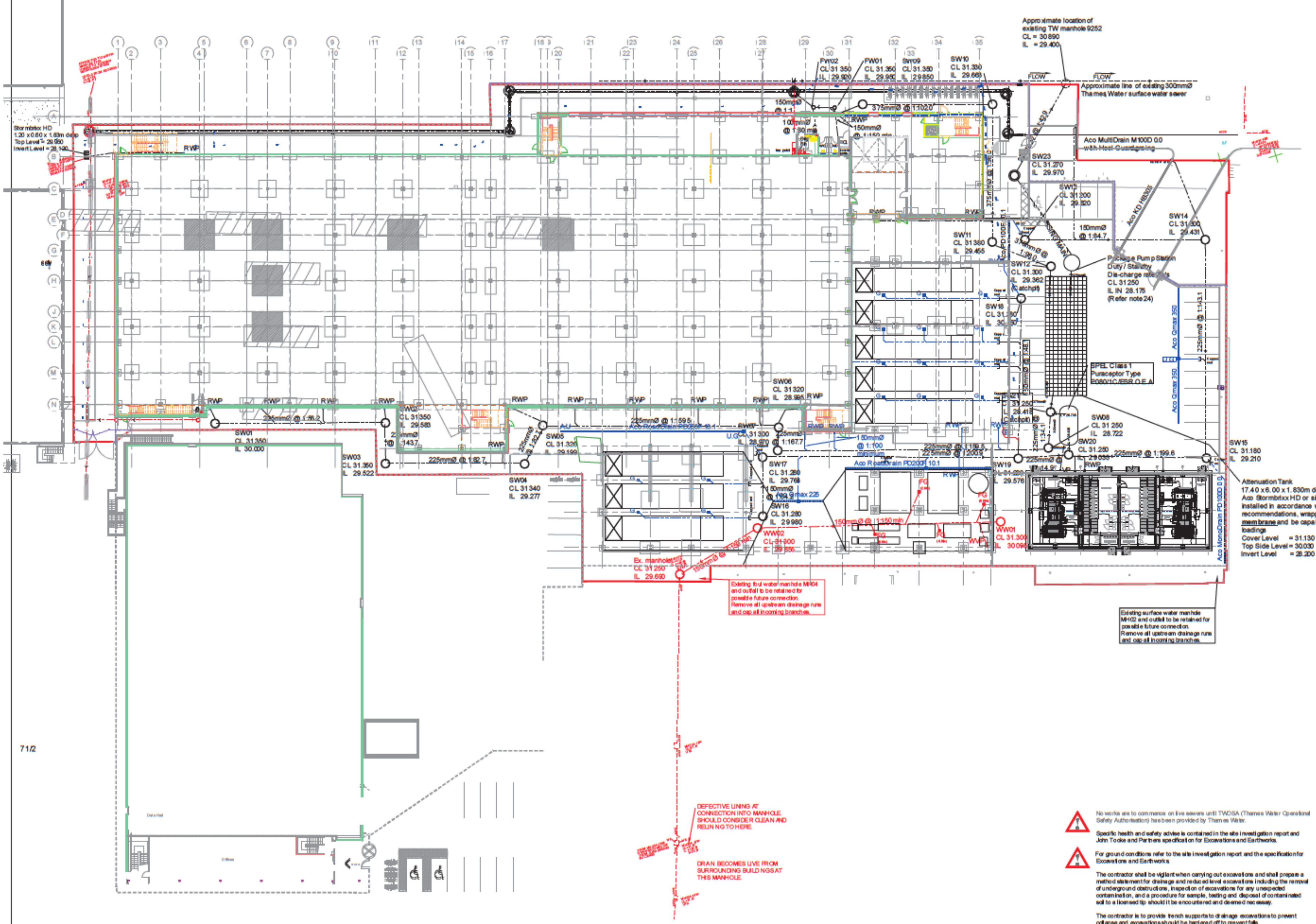
If an alarm has been 'Muted' the Alarm symbol shows a crossed out image. If a Bund Alarm is incorporated, this shows as a 'B' on screen

If the TEST feature is X Cycle Gauge Power = Reset

H = High Alarm, L = Low Alarm
B = Bund Alarm

Calibration: See the separate sheet for calibration set-up.
A Jumper needs to be installed in the "CAL" position and then the various settings screens can be adjusted.

Note: The sensor settings screens are factory set and should not need changing, but can be adjusted to improve accuracy



DRAINAGE NOTES

1) This drawing is to be read in conjunction with all relevant Architects and Engineers drawings and specifications.

2) Any discrepancies in dimensions or details, or between these drawings should be drawn to the attention of the Architect and/or the Engineer in writing for clarification.

3) The contractor is to verify locations, invert levels and diameter of existing drainage at tie-in points prior to the commencement of any site works.

4) All drainage works are to be installed in accordance with BS8301/BS.EN752.

5) Reference is to be made to the specification documents for materials and installation details.

6) This drawing is to be used for drainage information only.

7) Refer to Architects drawings for building and drainage setting out.

8) For foundation details see drawing number 3889/——

9) Refer to site investigation report for ground conditions.

10) All excavations in excess of one metre deep are to have trench supports.

11) Trench excavations to be kept dry at all times.

12) For manhole and drainage installation details see standard drawing numbers SD5—etc.

13) All foul water drainage to be 100Ø @ 1:40 min. unless noted otherwise.
All waste water drainage to be 100Ø @ 1:100 min. unless noted otherwise.
All surface water drainage to be 150Ø @ 1:150 min. unless noted otherwise.

14) All foul and surface water drainage is to be laid with level soffits unless noted otherwise.

15) Backdrop invert levels refer to invert level at rodding eye.

16) All drainage with less than 1.2m cover is to be fitted with a concrete surround.

17) All invert levels are to the outgoing pipe unless noted otherwise.

18) All redundant drainage is to be grubbed-up or sealed to the satisfaction of the local authority.

19) All drainage is to be fitted with access points immediately above finish floor / ground level.

20) For details of pop-ups and vent pipes see Services Engineers drawings and for setting out see Architects drawings.

Key

- Proposed Foul Water drainage network
- Existing Foul Water drainage network
- Existing Foul Water drainage network to be grubbed-up. See Note 19.
- Proposed Surface Water drainage network
- Existing Surface Water drainage network
- Existing Surface Water drainage network to be grubbed-up. See Note 19.
- Surface Water Rising Main.
- Surface Water drainage by others
- G — Denotes 600 x 300mmØ gully by others
- G — Denotes 600 x 300mmØ gully
- UG — Universal gully.
- KDHB612RE — Half batter gully unit KDHB612RE
- SUMP — Sump unit

Waste Water Drainage Manhole Schedule

Manhole reference	Cover level (m)	Invert level (m)	Manhole depth (mm)	Internal dimensions (mm)	Construction	Cover size	Cover Ref BS EN 124	Manhole Type Reference	Comments
WW01	31.300	30.095	1205	1200Ø	Precast concrete ring	600x600	Class D 400	5	
WW02	31.300	29.855	1445	1200Ø	Precast concrete ring	600x600	Class D 400	5	

No works are to commence on live sewers until TWOSA (Thames Water Operational Safety Authorisation) has been provided by Thames Water.

Specific health and safety advise is contained in the site investigation report and John Tooke and Partners specification for Excavations and Earthworks.

For ground conditions refer to the site investigation report and the specification for Excavations and Earthworks.

The contractor shall be vigilant when carrying out excavations and shall prepare a method statement for drainage and reduced level excavations including the removal of underground obstructions, inspection of excavations for any unexpected contamination, and a procedure for sample, testing and disposal of contaminated soil to a licensed tip should it be encountered and deemed necessary.

The contractor is to provide trench supports to drainage excavations to prevent collapse and excavations should be barriered off to prevent falls.

The contractor shall prepare a method statement for connections to existing sewers including working in confined spaces.

The position of existing underground services shall be determined prior to commencement of work on site.

The site investigation report did not identify any significant contamination or evidence of the presence of Asbestos containing materials. The Contractor should refer to notes above regarding unexpected contamination.

Working in confined spaces.

Y1218-JTP-ZZ-ZZ-DP-S-0601

FOR COMMENT

REV	AMENDMENTS	DATE
T1	Issued for comment	09/04/2024

DATE April 2024

Virtus London 12
485 Berkshire Avenue, Slough.

SCALE 1:200 @ A0

DRAWN BY S.M.

External Works
Proposed Drainage Layout

DRG No
3889 / 601 T1

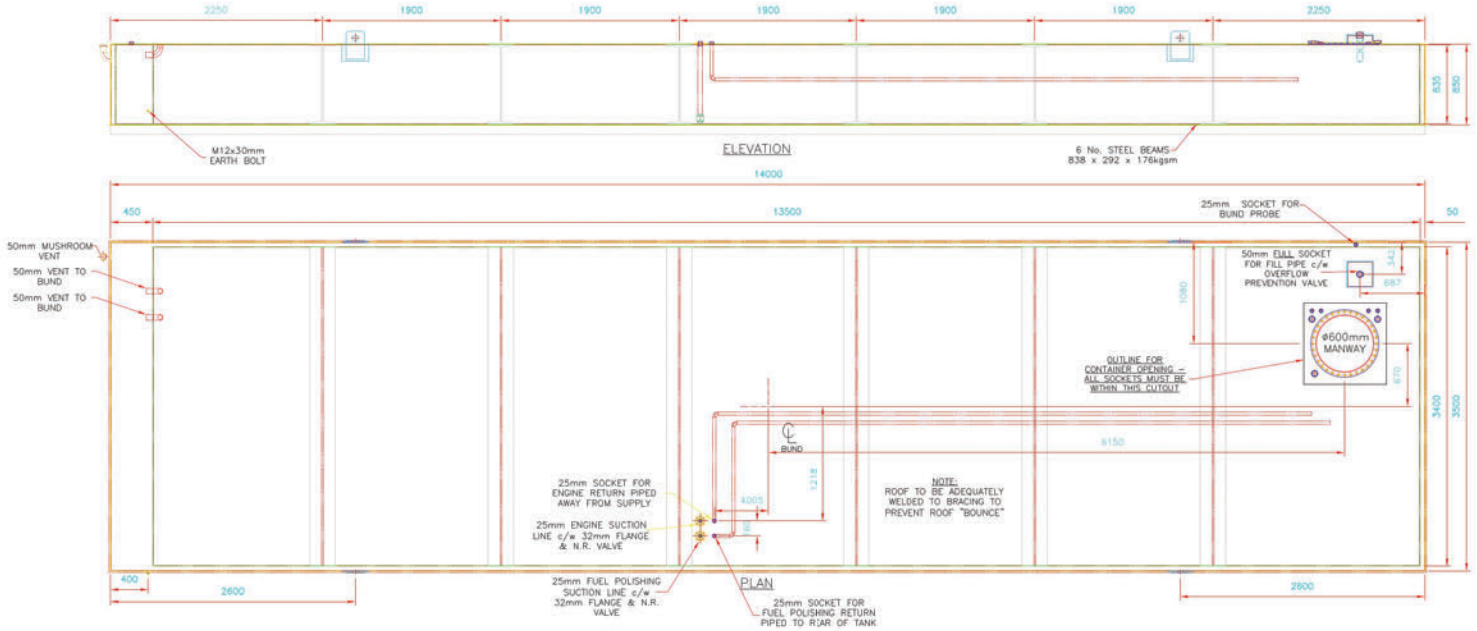
WORK IN PROGRESS 24/06/2024

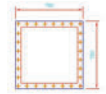
JOHN TOOKE & PARTNERS
CONSULTING ENGINEERS
Ground Floor, The Old Oast, Coldharbour Lane,
Aylesford, Kent, ME20 7NS
Telephone 01622 868750

KEY PLAN

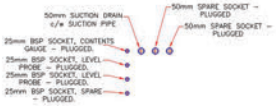
NOTES

1. THROUGHOUT IS DESIGN IN CONJUNCTION WITH THE RELEVANT SPECIFICATION / CONSULANTS DRAWINGS AND SHOULD BE READ IN CONJUNCTION WITH THEM.
2. FOR PLANT AND EQUIPMENT DETAILS REFER TO THE RELEVANT TECHNICAL SUBMISSIONS.
3. DO NOT SCALE FROM THIS DRAWING.
4. ALL DIMENSIONS IN MILLIMETRES.





MANWAY DETAILS
(SCALE – 1 : 30)



TANK TOP PENETRATIONS
(SCALE – 1 : 30)

NOTES
1. TANK TO BE MANUFACTURED i.a.w. BS 799 Pt 5 Type J.
2. TANK TO BE MANUFACTURED FROM 5mm THICK STEEL TO S275JR BS EN 10025:2004.
3. TANK FINISH :–
   3.1. ELECTRIC WIRE BRUSH (WHERE NECESSARY) & DEGREASE.
   3.2. 1 COAT PRIMER.
   3.3. 2 COATS OF AIR DRYING ENAMEL.
   3.3.1. COLOUR – TBC.
   3.4. AVERAGE PAINT THICKNESS (DFT) – 70µm.
4. TANK BASE & BEARERS
   4.1. 2 COATS BITUMEN PAINT
   4.2. NOMINAL THICKNESS 50µm
5. TANK CAPACITY – 31,000 Ltr NOMINAL, 38,326 Ltr BRIMFUL.

NOTES (CONTINUED)
6. WEIGHT – 14.0 Tonnes (DRY), 49.0 Tonnes (WET).
7. WELDING TO BE CARRIED OUT i.a.w. BS EN 1011-1:2009 WITH REFERENCE TO BS EN 1011-2:2001.
8. WELDING SYMBOLS USED ARE i.a.w. BS EN ISO 2553:2013
9. INSPECTION & TESTING TO BE CARRIED OUT i.a.w. BS EN 1011-1:2009.
10. TESTING
   10.1. DESIGN PRESSURE – 0.15 Bar
   10.2. TANK – 0.2 Bar.
   10.3. BUND – 0.1 Bar MAX. TEST PRESSURE.
   10.4. ISSUE TEST CERTIFICATE ON SUCCESSFUL COMPLETION.
11. CABLE TIE BARS TO BE INSTALLED AS STANDARD WHEN PUMPS AND/OR INSTRUMENTS ARE INSTALLED OUT WITH / WITHIN BUND.

Rev	Date	Description	By
P01.01	03.05.24	APPROVAL	AJH

1st Angle Projection

Do Not Scale
All Dimensions in mm
Unless Otherwise Stated

AVK THE POWER PEOPLE
Power Systems House,
Maidenhead Office Park,
Berkshire, SL6 3YE
Tel:01628 503900 Fax:01628 503909

Customer: T-CLARKE

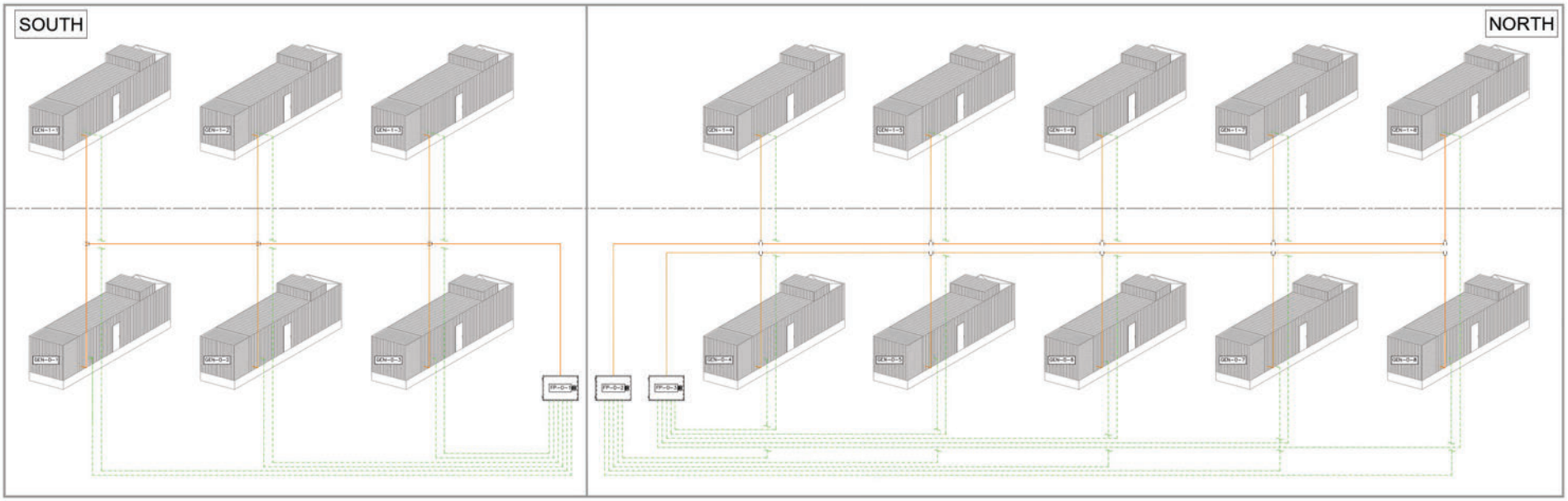
Title: VIRTUS LONDON12

Title: BELLY TANK GA

Drawn	Date	Rev
AJH	03.05.24	P01
Checked	Date	Rev
DD	03.05.24	A0

Job No: 500004

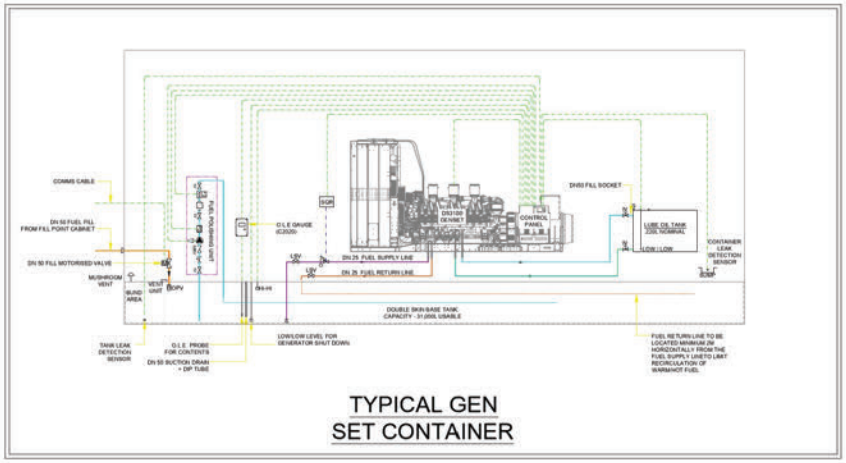
Drawing No: LON12-AVK-ZZ-GA-DR-X-500004 | Rev: P01.01



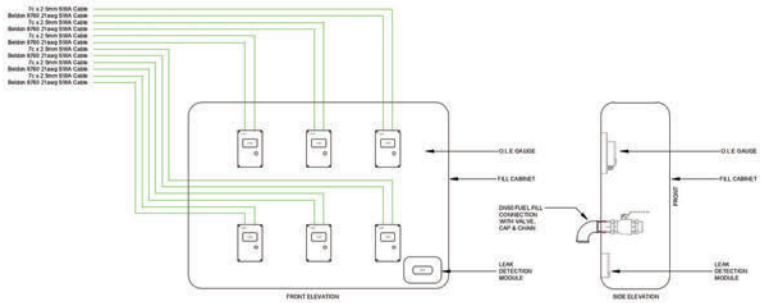
KEY PLAN:

LEGEND

- SIGNAL LINE
- LUBE OIL LINE
- SPILL RETURN LINE
- FUEL RETURN LINE
- FUEL SUPPLY LINE
- FILL LINE (PIPE IN PIPE)
- ISOLATION VALVE (N.C)
- ISOLATION VALVE (N.O)
- MOTORISED VALVE
- STRAINER
- FLEX CONNECTION
- PUMP
- PRESSURE SWITCH
- PRESSURE RELEASE VALVE
- GAUGE
- OVER FILL PREVENTION VALVE
- LOCK SHIELD VALVE
- NON RETURN VALVE
- FIRE SAFETY VALVE



TYPICAL GEN SET CONTAINER



TYPICAL FUEL FILL CABINET LAOUT

P01	25.05.25	APPROVAL	AJH
Iss.	Date	Change	By

3rd Angle Projection | Do Not Scale | All Dimensions in MM Unless Otherwise Stated

AVK THE POWER PEOPLE

Power Systems House
1-3 Malvern Road,
Maidenhead, Berkshire,
SL6 7RE.

Tel:01628 503900
www.avk-seg.co.uk
sales@avk-seg.co.uk

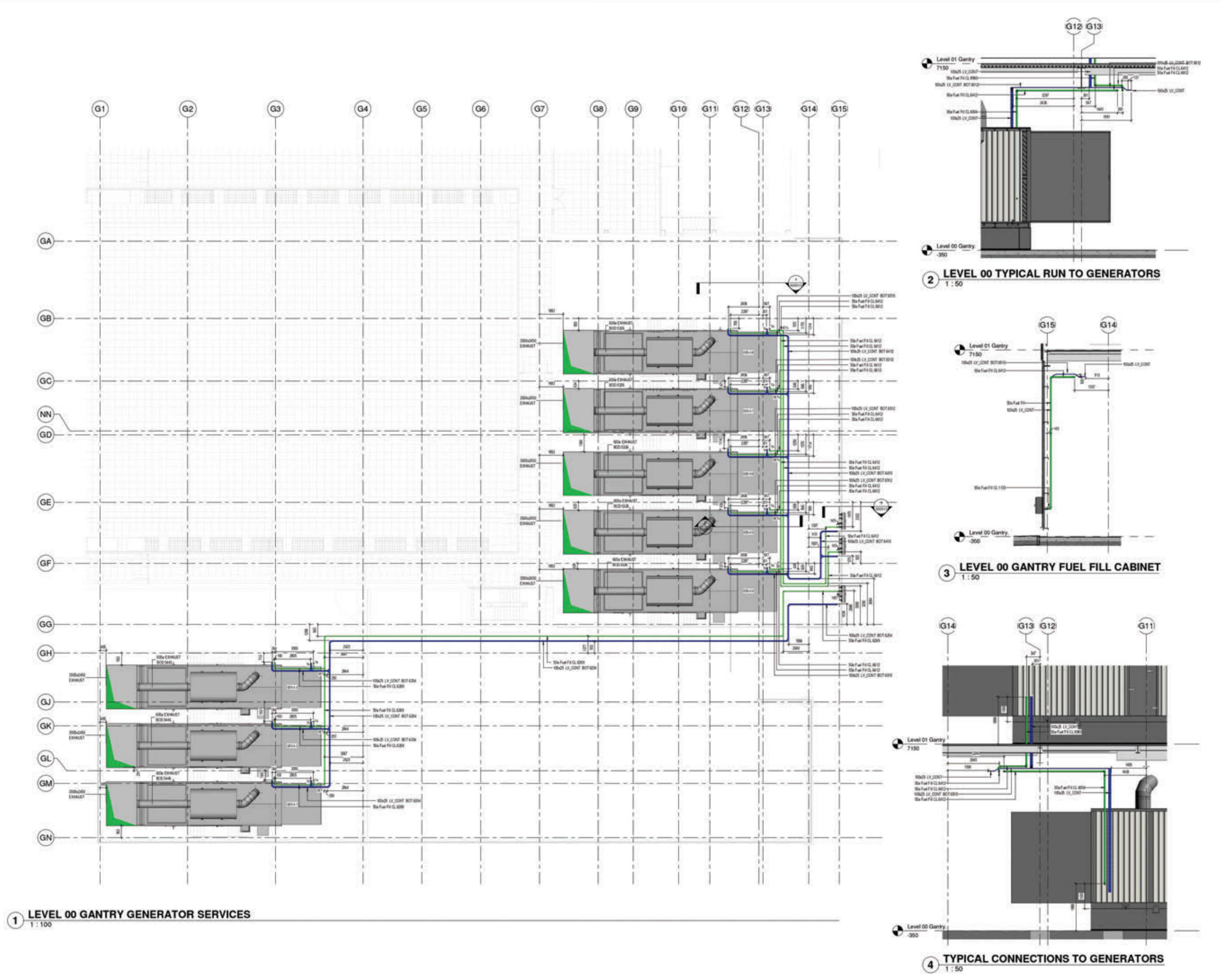
Customer: T-CLARKE

Site: VIRTUS LONDON12

Title: FUEL CONTROL SCHEMATIC

Drawn	Date	Scale
AJH	25.04.25	N.T.S.
Checked	Date	Sheet Size
DO	25.04.25	A1

Drawing No: LON12-AVK-ZZ-GA-SC-X-500009 | Rev: P01



1 LEVEL 00 GANTRY GENERATOR SERVICES
1 : 100

2 LEVEL 00 TYPICAL RUN TO GENERATORS
1 : 50

3 LEVEL 00 GANTRY FUEL FILL CABINET
1 : 50

4 TYPICAL CONNECTIONS TO GENERATORS
1 : 50

APPROVAL

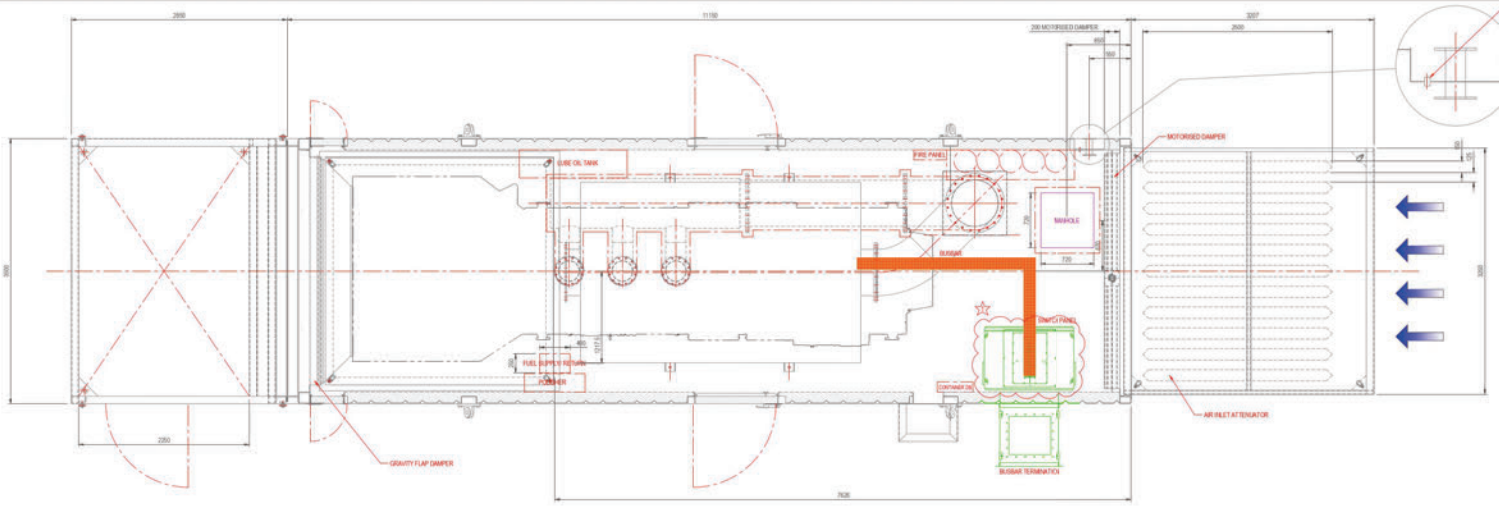
AVK
THE POWER PEOPLE

T-CLARKE

VIRTUS LONDON12

LEVEL 00
FUEL FILL SERVICES

LON12-AVK-ZZ-GA-DR-500010



GENERAL FABRICATING TOLERANCES IN ACCORDANCE WITH ISO 2768-c

0.5 up to 3 ±0.2	over 3 up to 6 ±0.3
over 6 up to 30 ±0.5	over 30 up to 120 ±0.8
over 120 up to 400 ±1.2	over 400 up to 1000 ±2
over 1000 up to 2000 ±3	over 2000 ±4

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED

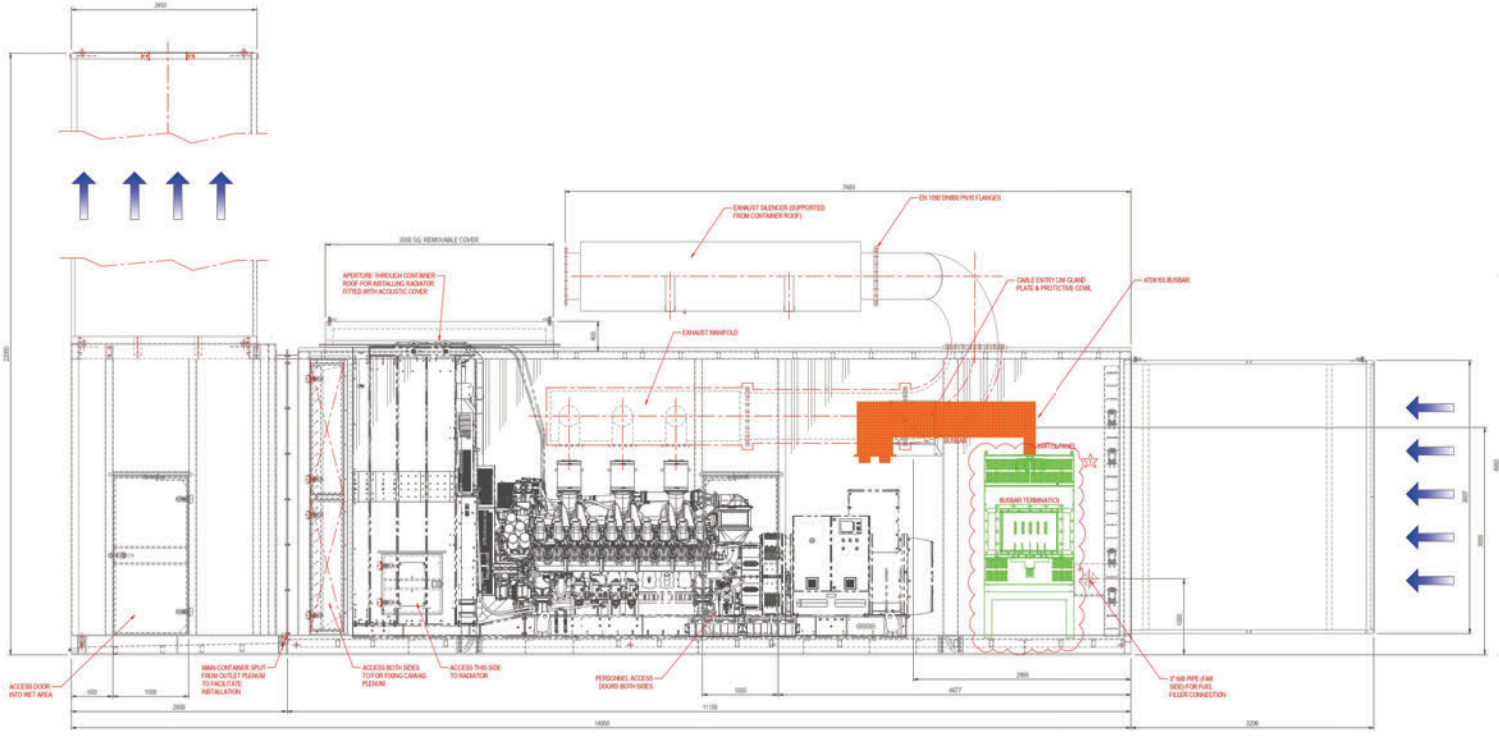
KEY PLAN

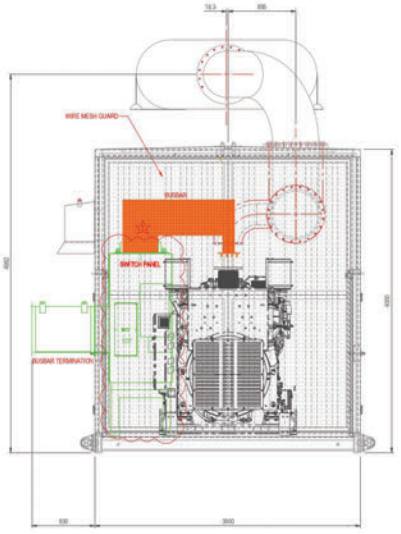
NOTES

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE RELEVANT SPECIFICATION, FLOOR LAYOUT DRAWINGS AND SERVICES SCHEMATIC DRAWINGS
2. FOR PLANT AND EQUIPMENT DETAILS REFER TO THE RELEVANT TECHNICAL SUBMISSIONS
3. DO NOT SCALE FROM THIS DRAWING
4. ALL DIMENSIONS IN MILLIMETRES

STAR NOTES

☆ PANEL GA TO BE FINALISED





Rev	Date	Change	By
		FIRST ISSUED FOR APPROVAL	AJH

3rd Angle Projection — Do Not Scale — All Dimensions in mm Unless Otherwise Stated

AVK THE POWER PEOPLE
Power Systems House,
Malvern Road, Maidenhead,
Berkshire, SL6 7RE.
Tel 01628 503800 Fax 01628 503849

Customer: T-CLARKE

Title: VIRTUS LONDON12

Title: CONTAINER GA

Drawn	Date	Scale
AJH	02.05.24	N/A
Checked	Date	Size
DD	02.05.24	A0

Job No: 506003

Drawing No: LON12-AVK-ZZ-GA-DR-X-500003 Rev: P01.01

KEY PLAN

NOTES

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE RELEVANT SPECIFICATION, FLOOR LAYOUT DRAWINGS AND SERVICES DRAWINGS.
2. FOR PLANT AND EQUIPMENT DETAILS REFER TO THE RELEVANT TECHNICAL SUBMISSIONS.
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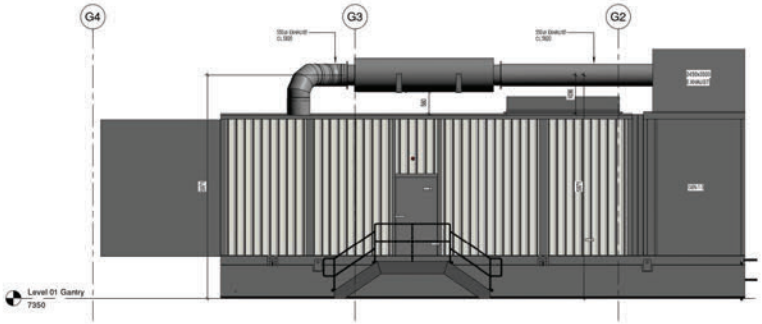
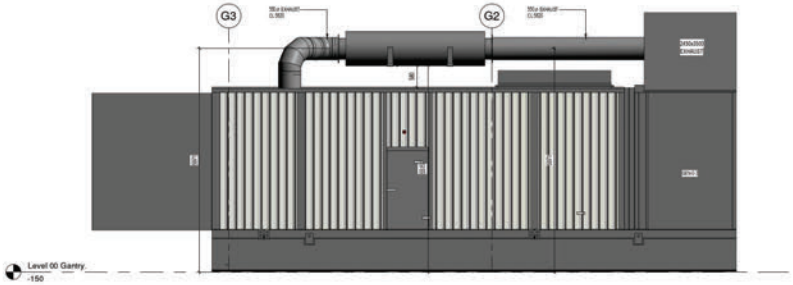
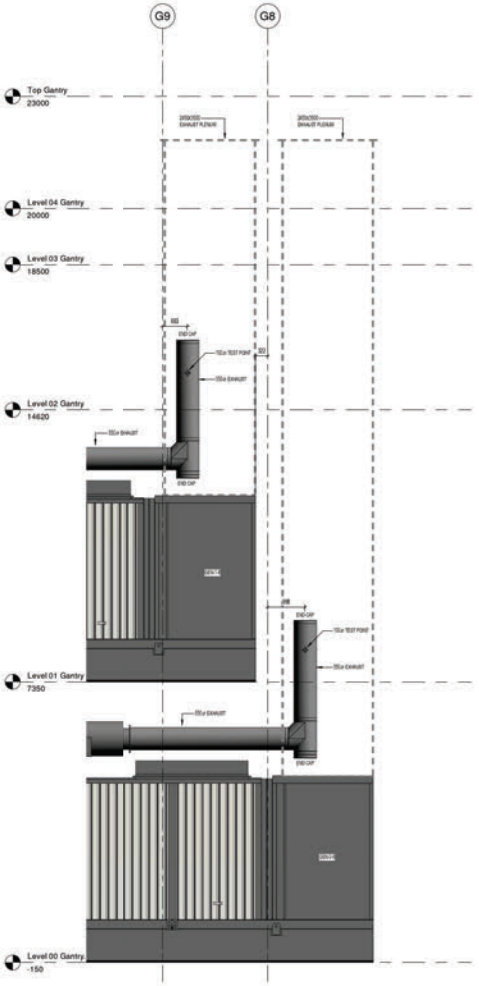


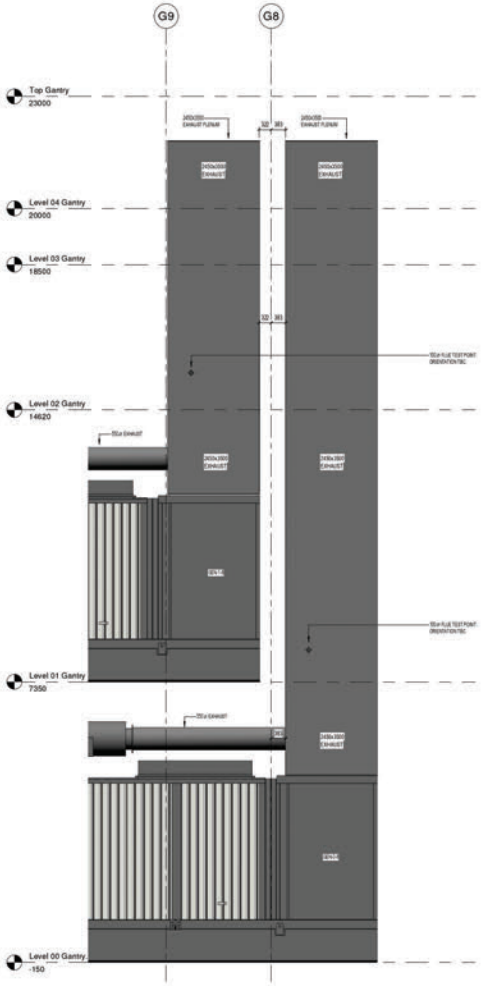
3 **LEVEL 01 TYPICAL GENERATOR FLUE**
1 : 50



2 **LEVEL 00 TYPICAL GENERATOR FLUE**
1 : 50



1 **TYPICAL FLUE DUCTWORK WITHIN PLENUM**
1 : 50



4 **TYPICAL PLENUM DUCTWORK TO ATMOSPHERE**
1 : 50

001	08.05.24	CONSTRUCTION	ALR
Rev	yy.mm.dd	APPROVAL	Auth
Rev.	Date	Change	By

3rd Angle Projection — Do Not Scale. All Dimensions in mm Unless Otherwise Stated

Status: CONSTRUCTION

AVK
THE POWER PEOPLE
Power Systems House,
Malvern Road, Maidenhead,
Berkshire. SL6 7RE
Tel 01628 502800 Fax 01628 503999

Customer: T-CLARKE

Site: VIRTUS LONDON12

Title: GENERATOR FLUES LAYOUT

Drawn	Date	Scale
AJH	06/03/24	1 : 50
Checked	Date	Sheet Size
DD	06/03/24	A0

AVK Ref: 500006

Drawing No.: LON12-AVK-ZZ-GA-DR-X-500006 Rev: C01

1 Capital Quarter
Tyndall Street
Cardiff
CF10 4BZ

wsp.com