Application for an environmental permit
Part B3 – New bespoke installation permit

If you are applying for a new bespoke permit for an installation, fill in this part of the form, together with parts A, B2 and F1.

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 go with it.

If you are applying for a permit for an intensive farm do not use this form, but complete application form part B3.5 instead.

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 for?

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 carry out at the installation.

Fill in a separate table for each installation you are applying for. 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: LON1XO Data Centre, Slough: Environmental Permit Ap

1 What activities are you applying for?, 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
LON1XO	Section 1.1 Part	Combustion activities	295 MWth			

Directly associated activities (See note 4) Also note: if the DAA is a Medium Combustion Plant or Specified Generator (MCP/SG) please also fill in part B2.5, (see https://www.gov.uk/government/publications/application-for-an-environmental-permit-part-b25-new-bespoke-medium-combustion-plant-and-specified-generator-permit)		
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, handling and transfer of gas oil (diesel)	Relates only to the storage and use of materials for the use within emergency standby generators.	
For installations that take waste (See note 5 below)	Total storage capacity	
	Annual throughput (tonnes each year)	

1 What activities are you applying for?, 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, schedule 13 and 14 for Local Authority regulated activities, or schedule 25/25B for Medium Combustion Plant or Specified Generators.
2. Use the description from the relevant schedule 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 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

Fill each listed activity 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. If the DAA is a Medium Combustion Plant or Specified Generator (MCP/SG) please fill in the table in appendix 1 question 13.

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 for?, 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	LON1XO			
Point source emissions to air				
Emission point reference and location	Source	Parameter	Quantity	Unit
A1 to A52 (generator exhausts)	Gas oil fuelled	Oxides of	1,998	mg/mN³
	Gas oil fuelled	Carbon	406	mg/mN³
See covering email for discussion	Gas oil fuelled	Hydrocarbons	38	mg/mN³
	Gas oil fuelled	Particulates	32	mg/mN³
Point source emissions to water (other than sewers)				
Emission point reference and location	Source	Parameter	Quantity	Unit
Point source emissions to sewers, effluent treatment plants or other transfers off site				
Emission point reference and location	Source	Parameter	Quantity	Unit
Point source emissions to land				
Emission point reference and location	Source	Parameter	Quantity	Unit

You will also need to complete application form part B6 if your installation includes 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 B2 (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	LON1XO	
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)
Combustion activities including "burning fuel in an appliance with a rated thermal input of	BAT does not apply (Environment Agency guidance, Data Centre FAQ	LON1XO Data Centre, Slough: Environmental

* 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: LON1XO Data Centre, Slough: Environmental Permit Ap

3b General requirements

Fill in a separate Table 4 for each installation.

Table 4 – General requirements

Name of the installation	LON1XO
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 LON1XO Data Centre, Slough: Environr
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 N/A
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 LON1XO Data Centre, Slough: Environr

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		LON1XO		
Capacity (See note 1 below)		1,134,844 L		
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)
Part A(1) (a)	The storage, handling and transfer of gas oil	1,134,844 L	Dependent on er	The storage, handling and transfer of gas oil relates

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

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

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 LON1XO Data Centre, Slough: Environmental Permit Ap

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 ☐

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: LON1XO Data Centre, Slough: Environmental Permit Ap

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

Document reference of the description: N/A

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: LON1XO Data Centre, Slough: Environmental Permit Ap

Yes ☐ Please give the date you entered (or the date you expect to enter) into the agreement (DD/MM/YYYY)

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

Document reference of the proof

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

Document reference of the justification: LON1XO Data Centre, Slough: Environmental Permit Ap

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: LON1XO Data Centre, Slough: Environmental Permit Ap

7 Installations that include a combustion plant (excluding waste incinerators)

7a List all your combustion plant at the site and provide thermal input and operating hours for each

Document reference LON1XO Data Centre, Slough: Environmental Permit Ap

7b Do any of your combustion plants have a net rated thermal input of 1 or more MW and is not an excluded MCP?

No ☑ Go to 7c

Yes ☐ Please fill in the table in appendix 1 question 13

7c Is the aggregated net thermal input of your combustion plant more than 20 MW?

No ☐

Yes ☑ Please go to appendix 1 question 11

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: 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 ☐

Yes ☐ Amount received

Our reference number

£

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	LON1XO		
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	LON1XO				
Parameter	Unit	Fuel 1	Fuel 2	Fuel 3	Fuel 4
Maximum percentage of gross thermal input	%	Typical EN590 g			
Moisture	%				
Ash	% wt/wt dry	<0.01			
Sulphur	% wt/wt dry	<0.1			
Chlorine	% wt/wt dry				
Arsenic	% wt/wt dry				
Cadmium	% wt/wt dry				
Carbon	% wt/wt dry	87			
Chromium	% wt/wt dry				
Copper	% wt/wt dry				
Hydrogen	% wt/wt dry	12.75			
Lead	% wt/wt dry				
Mercury	% wt/wt dry				
Nickel	% wt/wt dry				
Nitrogen	% wt/wt dry	0.01-0.05			
Oxygen	% wt/wt dry				
Vanadium	mg/kg dry				
Zinc	mg/kg dry				
Net calorific value	MJ/kg	45.4			

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	
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?

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

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 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 1 – Specific questions for the combustion sector, continued

12 Does your installation need to be combined heat and power-ready (CHP-ready)?

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

Document reference of this evidence

Yes ☐ Please provide a copy of your CHP-ready assessment

Document reference of the CHP-ready assessment

13 Information to be provided by the operator to the competent authority for each Medium Combustion Plant as identified in Annex I of Medium Combustion Plant Directive (EU/2015/2193)

MCP specific identifier*	commissioned
12-digit grid reference or latitude/longitude	
Rated thermal input (MW) of the MCP	
Type of MCP (diesel engine, gas turbine, other engine or other MCP)	
Type of fuels used: gas oil (diesel), natural gas, gaseous fuels other than natural gas, landfill gas	
Date when the new MCP was first put into operation	
Sector of activity of the MCP or the facility in which it is applied (NACE code)	
Expected number of annual operating hours of the MCP and average load in use	

Where the option of exemption under Article 6(8) is used the operator (as identified on Form A) should sign a declaration here that the MCP will not be operated more than the number of hours referred to in this paragraph	

* identifier – the MCP must be traceable via a serial number or other unique identifier, name plate, manufacturer and or model

NACE code means Nomenclature of Economic Activities and is the European statistical classification of economic activities (http://www.export.gov.il/files/EEN/ListNACEcodes.pdf).

To find out the 12-digit grid reference you can search on the UK Grid Reference Finder website at https://gridreferencefinder.com/

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 SO2 emission monitoring with periodic sulphur dioxide (SO2) 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 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

15 Does your installation need to be combined heat and power-ready (CHP-ready)?

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

Document reference of this evidence

Yes ☐ Please provide a copy of your CHP-ready assessment

Document reference of the CHP-ready assessment

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

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

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 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

Yondr Group Limited

5b Company registration number

12000046

Date of registration (DD/MM/YYYY)

16/05/2019

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

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

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

First name Paul

Last name Hood

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

First name Kavish

Last name Patel

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 Paul

Last name Hood

Address Yondr Group Limited
7th Floor Aldgate House
33 Aldgate High Street
London

Postcode EC3N 1AG

Contact numbers, including the area code

Phone

Fax

Mobile

Email paul.hood@yondrgroup.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

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 Tony

Last name Vine

Address Sweco UK Limited
Grove House
Mansion Gate Drive
Leeds

Postcode LS7 4DN

Contact numbers, including the area code

Phone 0113 307 3065

Fax

Mobile

Email tony.vine@sweco.co.uk

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

Contact name

Title (Mr, Mrs, Miss and so on)

First name

Last name

Address

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)	Mr
First name	Michael
Last name	Innes
Address	Yondr Group Limited
	7th Floor Aldgate House
	33 Aldgate High Street
	London
Postcode	EC3N 1AG

Contact numbers, including the area code

Phone	
Fax	
Mobile	
Email	michael.innes@yondrgroup.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 ☐

Crystal Mark 19101
Clarity approved by Plain English Campaign

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 Paul Hood

Date of birth (DD/MM/YY) [redacted]

Name Kavish Patel

Date of birth (DD/MM/YY) [redacted]

Name

Date of birth (DD/MM/YY)

Document reference

Application for an environmental permit
Part B2 – General – new bespoke permit

Environment Agency

Fill in this part of the form together with parts A and F1 if you are applying for a new bespoke permit. You also need to fill in part B3, B4, B5, B6, or B7 (this depends on what activities you are applying for).

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

You can apply online for: waste operations; medium combustion plant; and specified generator bespoke environmental permits at **https://apply-for-environmental-permit.service.gov.uk/start/start-or-open-saved**

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

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

Contents

1 About the permit

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

EPR/KP3746QZ/A001

1 About the permit, continued

1b Is the permit for a site or for mobile plant?

☐ Mobile plant Now go to **question 1c**

☑ Site Now go to **section 2**

Note: The term 'mobile plant' does not include mobile sheep dipping units.

Mobile plant only

1c Have we told you during pre-application discussions that we believe that a mobile permit is suitable for your activity?

☐ No

☐ Yes

1d Have there been any changes to your proposal since this discussion?

☐ No Now go to **section 3**

☐ Yes You should send us a description of the activity you want to carry out, highlighting the changes you have made since our pre-application discussions

Document reference

Now go to **section 3**

2 About the site (excludes mobile plant)

2a What is the site name, address, postcode and national grid reference?

Site name

LON1XO

Address

Wexham Road, Slough

Postcode

SL2 5DS

National grid reference for the site (for example, ST 12345 67890)

SU 98700 80300

2 About the site (excludes mobile plant), continued

2b What type of regulated facility are you applying for?

Note: if you are applying for more than one regulated facility then go to 2c.

☐ Installation

☐ Waste operation

☐ Mining waste operation

Water discharge activity

☐ Groundwater activity (point source)

☐ Groundwater activity (discharge onto land)

What is the national grid reference for the regulated facility (if only one)?
(See the guidance notes on part B2.)

✔ As in 2a above

☐ Different from that in 2a Please fill in the national grid reference below

National grid reference for the regulated facility

Now go to **question 2d**

2c If you are applying for more than one regulated facility on your site, what are their types and their grid references?

See the guidance notes on part B2.

Regulated facility 1

National grid reference

What is the regulated facility type?

☐ Installation

☐ Waste operation

☐ Mining waste operation

☐ Water discharge activity

☐ Groundwater activity (point source)

☐ Groundwater activity (discharge onto land)

2 About the site (excludes mobile plant), continued

Regulated facility 2

National grid reference

What is the regulated facility type?

- ☐ Installation
- ☐ Waste operation
- ☐ Mining waste operation
- ☐ Water discharge activity
- ☐ Groundwater activity (point source)
- ☐ Groundwater activity (discharge onto land)

Use several copies of this page or separate sheets if you have a long list of regulated facilities. Send them to us with your application form. Tell us below the reference you have given these extra sheets.

Document reference

Now go to **question 2d**

2d Low impact installations (installations only)

Are any of the regulated facilities low impact installations?

- ✔ No
- ☐ Yes If yes, tell us how you meet the conditions for a low impact installation (see the guidance notes on part B2 – 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

2e Treating batteries

Are you planning to treat batteries? (See the guidance notes on part B2.)

- ✔ No
- ☐ Yes Tell us how you will do this, send us a copy of your explanation and tell us below the reference you have given this explanation

Document reference for the explanation

2 About the site (excludes mobile plant), continued

2f Ship recycling

Is your activity covered by the Ship Recycling Regulations 2015? (See the guidance notes on part B2.)

✔ 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

2g Multi-operator installation

If the site is a multi-operator site (that is there is more than one operator of the installation) then fill in the table below the application reference for each of the other permits.

Table 1 – Other permit application references

3 Your ability as an operator

If you are only applying for a standalone water discharge or for a groundwater activity, you only have to fill in **question 3d**.

3a Relevant offences

Applies to all except standalone surface water discharges and groundwater discharges (see the guidance notes on part B2).

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

3 Your ability as an operator, continued

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/YYYY)

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.

Now go to **question 3b**

Please also complete the details in **Appendix 2**.

3b Technical ability

Relevant waste operations only (see the guidance notes on part B2).

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

Please select one of the following:

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

or

☐ We will have a certified Competence Management System within 12 months and have enclosed evidence of the contract with an accredited certification body

3 Your ability as an operator, continued

CIWM/WAMITAB scheme

Your answers below must relate to the person(s) providing technically competent management when the permitted activities start.

Please select **one** of the following:

- I have enclosed a copy of:

  ☐ the relevant qualification certificate/s

  or

  ☐ evidence of deemed competence

  or

  ☐ 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 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

- ☐ The technically competent manager will complete their qualification within four weeks of starting the permitted activities and I have enclosed evidence of their registration with WAMITAB or their EPOC booking as appropriate

- **For medium- and high-risk tier activities other than landfill**

  The technically competent manager will complete the qualification within 12 months and I have enclosed evidence of their registration with WAMITAB and, where relevant, EPOC booking.

  ☐ I understand they must complete either four specified units of the relevant qualification or an EPOC within four weeks of the permitted activities commencing

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

3 Your ability as an operator, continued

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.

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 (or they) (or any relevant person) 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 (all)

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.

For waste and installation permits only: your management system must also explain your resilience to climate change.

You can find guidance on management systems on our website at **https://www.gov.uk/guidance/develop-a-management-system-environmental-permits**

✔ **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)

☐ Green dragon

☐ Own management system

☐ EMAS Global

☐ Other

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

Document reference/s

LON1XO Data Centre, Slough: Environmental Permit A

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

Thames Water

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

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

But not any mobile plant

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 B2.)

Document reference/s of the plans

LON1XO Data Centre, Slough: Environmental Permit A

5 Supporting information, continued

5b Provide the relevant sections of a site condition/baseline report if this applies

See the guidance notes on part B2 for what needs to be marked on the plan.

Document reference of the report

LON1XO Data Centre, Slough: Environmental Permit A

✔ If you are applying for an installation, tick the box to confirm that you have sent in a baseline report

5c Provide a non-technical summary of your application

See the guidance notes on part B2.

Document reference of the summary

LON1XO Data Centre, Slough: Environmental Permit A

5d 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

☐ Yes Provide a fire prevention plan (see the guidance notes on part B2). You need to highlight any changes you have made since your pre-application discussions.

Document reference of the plan

6 Environmental risk assessment

Provide an assessment of the risks each of your proposed regulated facilities poses to the environment. 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 assessments

LON1XO Data Centre, Slough: Environmental Permit A

7 How to contact us

If you have difficulty using 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.

7 How to contact us, continued

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

See the guidance notes on part B2.

Installation reference			
Condition	**Response**		**Do you meet this?**
A – Management techniques	Provide references to show how your application meets A References		☐ Yes ☐ No
B – Aqueous waste	Effluent created m³/day		☐ Yes ☐ No
C – Abatement systems	Provide references to show how your application meets C References		☐ Yes ☐ No
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 Non-hazardous waste Tonnes per year		☐ Yes ☐ No
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? ☐ Yes ☐ No Provide references to show how your application meets G References		☐ Yes ☐ No
H – Noise	Provide references to show how your application meets H References		☐ Yes ☐ No
I – Emissions of polluting substances	Provide references to show how your application meets I References		☐ Yes ☐ No
J – Odours	Provide references to show how your application meets J References		☐ Yes ☐ No
K – History of keeping to the regulations	Say here whether you have been involved in any enforcement action (as described in 'Appendix 1 – Compliance history' section of part B2 guidance 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

Relevant Offences – date of birth information

Please give us the following details

Name

Date of birth (DD/MM/YYYY)

Technical ability – date of birth information

Name

Date of birth (DD/MM/YYYY)

Application for an environmental permit
Part F1 – Charges and declarations

Environment Agency

Fill in this part for all applications for installations, waste operations, mining waste operations, water discharges, point source groundwater discharges and groundwater discharges onto land. 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. 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.**
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It will take less than two hours to fill in this part of the application form.

Contents

Each individual who is applying for their name to appear on the permit must complete the declaration in section 5. You will have to print a separate copy of the declaration page for each additional individual to complete.

1 Working out charges

You must fill in this section.

You have to submit an application fee with your application. You can find out the charge by searching for 'Environment Agency charging scheme and guidance: environmental permits' at www.gov.uk/government/organisations/environment-agency.

Please remember that the charges are revised on 1 April each year and that there is an annual subsistence charge to cover the costs we incur in the ongoing regulation of the permit.

Table 1 – Type of application (fill number of activity being applied for in each column)

Installation	Waste	Mining waste	Medium Combustion Plant (MCP)/Specified Generator (SG)	Water discharge/point source discharge to groundwater	Groundwater spreading onto land
1					

Table 2 – Charge type (A)

Charge activity reference	Charge activity description	What are you applying to do? E.g. new, minor variation, normal variation, substantial variation, surrender, low risk surrender, transfer	Amount
e.g. 1.17.3	e.g. Sect 5.2 landfill for hazardous waste	e.g. transfer	e.g. £5,561
1.10.1	Section 1.1 Part A(1) (a) - Combustion plant - rat	New	£ 19,103.00
Total A			£ 19,103.00

1 Working out charges (you must fill in this section), 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	£1,231	☐
1.19.2	Habitats assessment (except where the application activity is a flood risk 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 emissions risk assessment (intensive farming applications only)	£620	☐
1.19.9	Dust and bio-aerosol management plan (intensive farming applications only)	£620	☐
	Advertising	£500	☐
Total B			

Total charges

Total A plus total B £ 19,103.00

2 Payment

Tick below to show how you have paid.

Cheque ☐

Postal order ☐

Cash ☐ Tick below to confirm you are enclosing cash with the application

Credit or debit card ☐

Electronic transfer (for example, BACS) ☑

Remittance number

Date paid (DD/MM/YYYY) 16/02/2023

How to pay

Paying by cheque, postal order or cash

Cheque details

Cheque made payable to

Cheque number

Amount £

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

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

We do not recommend sending cash through the post. If you cannot avoid this, please use a recorded delivery postal service and enclose your application reference details. Please tick the box below to confirm you are enclosing cash.

I have enclosed cash with my application ☐

2 Payment, continued

Paying by credit or debit card

If you are paying by credit or debit card we can call you. We will destroy your card details once we have processed your payment. We can accept payments by Visa, MasterCard or Maestro card only.

Please call me to arrange payment by debit or debit card ☐

Paying by electronic transfer BACS reference

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 PSCAPP (to reflect that the application is for a permitted activity) 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.

If you are making your payment from outside the United Kingdom, it must be in sterling. Our IBAN number is GB23NWK60708010014411 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		LON1XO
State who is paying (full name and whether this is the agent/ applicant/other)		Yondr Group Limited (Applicant)
Fee paid	£	19,103.00
Date payment sent (DD/MM/YYYY)		16/02/2023

Now read section 3 below

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

3 Privacy notice

The Environment Agency runs the environmental permit application service.

We are the data controller for this service. A data controller determines how and why personal information is processed.

Our personal information charter explains:

- your rights
- what we do with your personal information

We're allowed to process your personal information because we have official authority as the environmental regulator. We need this information to carry out a task in the public interest that is set out in law. As the data controller, when you apply for an environmental permit, we have a legal obligation to process your personal data under the Environmental Permitting Regulations. The second lawful basis for processing your personal data is to comply with this legal obligation.

We need your personal information to process your environmental permit application. If you do not give us this information we cannot issue a permit to you. After we've issued a permit to you, we use your personal information:

- to check that you're complying with your permit
- during any potential enforcement action

What personal information we collect

If you're the individual applicant, director or company secretary of a company applying or a technically competent manager we need your:

- name
- date of birth

3 Privacy notice, continued

- address
- email address

If you're the agent, consultant, employee responsible for the activity or the employee responsible for billing and invoicing we need your:

- name
- address
- email address

If you're the applicant we need details of any:

- convictions
- bankruptcy

We also collect any questions or feedback you leave, including your email address if you contact us.

Your responsibility with other people's personal information

If you've included personal information about other people on your application, you must tell them. You must provide them with a copy of this privacy notice so that they know how their personal information will be used.

What we do with your personal information

We use your personal information to help us decide whether to issue you with a permit.

The information (except dates of birth) is available online on our consultation website during the consultation period. This website is available to everyone so your information may be seen outside the European Economic Area.

After consultation we put all the information (except dates of birth) you give us in your application on our public register.

If you can demonstrate that any information you send us is commercially or industrially confidential, we'll consider withholding that information from our public register.

If you think that the information you'll send us may be a threat to national security you must contact the Secretary Of State before you apply. You must still send us that information with your application. We will not include this information on our public register unless the Secretary of State decides it can be included.

See the environmental permitting guidance for guidance on national security.

We may use your email address to contact you for user research to improve our service. You don't have to take part in the research.

Where your personal information is processed and stored

We store and process your personal information on servers in the UK. We will not host your personal information outside the European Economic Area.

We do not use your personal information to make an automated decision or for automated profiling.

How long we keep your personal information

We keep your personal information while your permit is in use and for 7 years after you surrender your permit. If the permit is for a landfill site, we keep the data for 10 years after surrender.

Removing personal information from the public register

We will remove your personal information from the public register if:

- you withdraw your application
- we refuse your application and the time limit for appealing the decision has expired or an appeal is dismissed
- the information is no longer relevant for public participation purposes under the Environmental Permitting Regulations

Contact

Our Data Protection Team gives independent advice. They monitor how the Environment Agency uses your personal information.

If you have questions or concerns about how we process personal information, or to make a complaint or request relating to data protection, please contact:

Address: Data Protection Team
Environment Agency
Horizon House
Deanery Road
Bristol
BS1 5AH

3 Privacy notice, continued

Email: dataprotection@environment-agency.gov.uk

You can also make a complaint to the Information Commissioner's Office (ICO).

The ICO is the supervisory authority for data protection legislation. The ICO website has a full list of your rights under data protection legislation.

Now read section 4 below

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 via our website at www.gov.uk/government/organisations/environment-agency.

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

Please treat the 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 via our website at www.gov.uk/government/organisations/environment-agency.

You cannot apply for national security via this application.

Now fill in section 5

5 Declaration

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.

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'.

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.

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 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) ☑

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) ☐

5 Declaration, continued

Name

Title (Mr, Mrs, Miss and so on)	Mr
First name	Paul
Last name	Hood
on behalf of (if relevant; for example, a company or organisation and so on)	Yondr Group Limited
Position (if relevant; for example, in a company or organisation and so on)	Director
Today's date (DD/MM/YYYY)	16/02/2023

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.

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 (Mr, Mrs, Miss and so on)	
First name	
Last name	
on behalf of (if relevant; for example, a company or organisation and so on)	
Position (if relevant; for example, in 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, speak to us before you submit your application.

You must do the following:

Complete legibly all parts of this 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. If necessary, continue on a separate sheet. This separate sheet also needs to have a reference number and you should include it in the table below	☑
For new permits 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

Question reference	Document title	Document reference
All forms where relevant	LON1XO Data Centre, Slough: Environmental Perm	65203376-008

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 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, or you would like us to review a decision we have made, please let us know. More information on how to do this is available at: https://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.

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 to:

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

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

Or

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 part A) ☐

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?

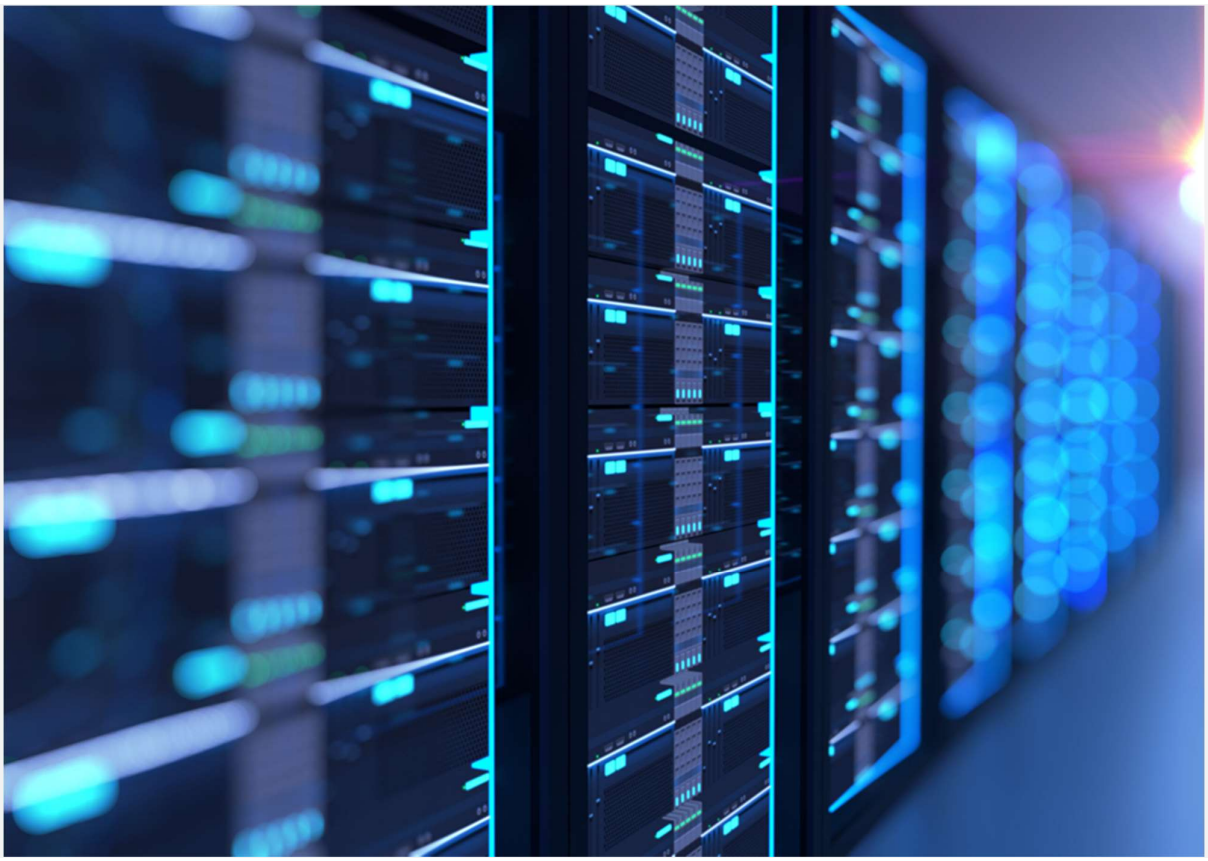
No ☐

Yes ☐ Amount received

£

LON1XO Data Centre, Slough: Environmental Permit Application

Permit Application Supporting Information



SWECO

Change list

Ver:	Date:	Description of the change	Reviewed	Approved by
1	25-01-2023	Draft for discussion	AVK / RED / Sweco	TV
2	16-02-2023	Final	AVK / RED / Sweco	TV
3				

Project Name: LON_1 Data Centre Slough
Project Number: 65203376-008
Client: Yondr Group
Ver: 2
Date: 16/02/2023
Author:
Document Reference: Permit Application Supporting Information

Table of contents

This document and associated appendices form the application for an Environmental Permit (EP) to operate a diesel fired emergency back-up generation installation under the Environmental Permitting Regulations 2016 (as amended). The application is made by Yondr Group Limited which is the legal entity that will be responsible for operating the generating installation.

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

Site Location

The data centre facility is to comprise two buildings A & B located in the central part of the former AkzoNobel Decorative Coatings, Slough Manufacturing Unit located at Wexham Rd, Slough SL2 5DS, National Grid Reference SU 98700 80300. The data centre is currently under construction and has yet to be commissioned and operated.

The area immediately to the north of the proposed data centre is currently unoccupied land. The Grand Union Canal lies beyond this area with residential properties present north of the Canal. To the east lies Uxbridge Road Gas Works with Uxbridge Road and residential properties present beyond.

Immediately to the south, a new residential development is under construction. This is in turn bound by the Railway Line with residential properties present beyond.

Commercial and industrial properties lie beyond Wexham Road to the west.

There are no formal landscape designations (such as Areas of Outstanding Natural Beauty or National Parks close to the Site. The nearest formal landscape designations are located being 13km and 40km respectively.

There are no identified statutory ecological designations within the site or surrounding areas. The closest statutory ecological designations are Black Park Country Park (SSSI) and Wraysbury & Hythe End Gravel Pit (SSSI), which are located approximately 4km to the north and 5km to the south of the site respectively. Tree cover is also very sparse across the Site.

The Site does not lie within an Air Quality Management Area. Further the entirety of the Site is located in a low probability flood risk zone (Flood Zone 1)

The Site is also not located within or adjacent to a Conservation Area.

Operations

Electricity for operation of the data centre will be provided from connections to the local electricity transmission network; however, given the nature of data centres and their requirement to have an available energy supply at all times, generators which will provide emergency power to the data centre in the event of disruption in the grid power supply.

To meet this requirement, the data centre building will be served by 52 emergency back-up generators within a compound, each with an individual associated stack. The proposed installation will consist of 52 x 5.67 MWth reciprocating engines and will operate to provide emergency back-up power to an associated data centre should there be a break in supply from the grid.

The combined net thermal input of the installation is 295 MW. The generators can ‘operate’ during an emergency for up to 500 hours per calendar year. Individual generators would each be test operated, the individual run time being approximately 3 hours per year per generator, significantly less than the maximum permitted of 50 hours per year. [1]

[1] Details of the expected run time are presented in 7.1 BAT Assessment

A maximum volume of 1,134,844 litres of diesel can be stored at the site, although the normal working maximum volume will be just under 860,000 l.

Management Systems

The data centre will be operated in accordance with the following standards, or suitable equivalent standards:

- ISO/IEC 27001:2013 that specifies the requirements for establishing, implementing, maintaining and continually improving an information security management system; and
- ISO9001:2015 that specifies the requirements for establishing, implementing, monitoring, managing and improving quality throughout the organisation.

In addition, an environmental management system (EMS) will be in place. The EMS will place particular importance on:

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

Energy Efficiency

Due to the back-up nature of the installation operation which requires fast, flexible operation; diesel fuelled back-up generators are the chosen technology with other potential options considered such as combined cycle operation not feasible. The plant selected to provide back-up generation have a gross electrical efficiency of approximately 42%.

Raw Materials, Water and Waste

The main raw materials used within the installation will be diesel for fuel and lubrication oil.

No routine water use is required for the installation.

Waste generation from the installation is anticipated to be low and will result primarily from maintenance activities.

Emissions to Water, Land and Groundwater

Surface water run-off from the area where the back-up generators, the fuel receiver station and the fuel road tanker off-loading area will be located will drain via an oil interceptor to the local surface water sewer system. Rainwater run-off from containers, roofs and hardstanding will be directed to the drainage system for the wider data centre site. This drainage system includes an oil interceptor prior to discharge into the local surface water sewer network.

There will be no point source emission to land or groundwater.

Air Emissions Risk Assessment

A detailed air quality risk assessment has been undertaken to investigate the potential for emissions from the generators and the potential impact on air quality by comparison to UK Air Quality Standards and EA

regulatory benchmarks in line with the prevailing guidance. Emissions from the site will vary dependent upon the operational scenario of the engines (e.g. full emergency load, testing).

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

Overall, the risk assessment and modelling exercise concluded that the potential impacts on air quality as a result of routine (testing and maintenance) operation of the generators and under emergency operation will not lead to a significant effect on local air quality.

The data centre operator will develop an Air Quality Emergency Action Plan (AQEAP) which details the management actions to be taken in the event of an emergency outage that could result in the prolonged usage of the generators which could potentially result in adverse impacts on local air quality. The operator will liaise with the Local Authority and the Environment Agency to agree actions to be taken in the event of a prolonged outage situation (>18 hours) and a finalised plan will be incorporated into the site's environmental management system.

Emissions to air will result from the combustion of diesel within the engines which will be released into the atmosphere via dedicated exhaust stacks. There will be no significant sources of odour resulting from the operation of the installation.

A stack height assessment has been carried out to determine the height for the stacks, which has been determined to be 21.95m and the effects on air quality from the installation have been assessed on this basis.

Detailed dispersion modelling has been carried out for both the anticipated testing scenario and emergency use scenario. The predicted emissions at sensitive receptors surrounding the plant are below the required air quality standards. The assessment of air quality effects at nearby ecological sites concluded that the effects are predicted to insignificant at all relevant ecological sites.

Noise

The diesel engines on site are potential sources of noise. The engines are containerised which includes acoustic attenuation. As explained above, for most of the time (apart from emergencies and periodic testing) the engines and plant will not be operating and so will not generate noise.

A detailed noise impact assessment and modelling exercise has been undertaken with noise emission limits confirmed with Slough Borough Council in accordance with relevant planning policy and conditions. This assessment has demonstrated that under normally operating conditions daytime plant rating noise levels are equal to the existing background noise level at the nearest and worst-affected noise sensitive receptor. This is compliant with the planning condition external plant noise criteria are representative of a low impact when taking account the context in accordance with BS 4142.

For emergency operations the predictions presented in the noise impact assessment demonstrate that internal ambient noise levels resulting from data centre operation during a power outage are expected to meet the BS 8233 guideline for levels during the daytime and night time periods when windows are closed.

The design of the data centre and specification for the back-up generators includes for robust acoustic control measures, whilst operations of the installation will be in accordance with rigorous internal processes for equipment inspection and preventative maintenance with the objective of avoiding the use of the emergency generators.

Best Available Techniques

The application has set out the proposed techniques to be operated and these have been considered against BAT and alternatives. The proposed techniques are considered to meet BAT and the operation of the proposed installation is not expected to give rise to significant effects to the environment or human health.

1. Introduction

This document and associated appendices form the application for an Environmental Permit (EP) to operate a diesel fired emergency back-up generation installation under the Environmental Permitting Regulations 2016 (as amended). The application is made by Yondr Group Limited which is the legal entity that will be responsible for operating the generating installation.

The installation includes two separate buildings (Buildings A and B) as shown on the site plans included with this application (**Appendix A**).

Electricity for operation of the data centre will be provided from connections to the local electricity transmission network; however, given the nature of data centres and their requirement to have an available energy supply at all times, generators which will provide emergency power to the data centre in the unlikely event of disruption in the grid power supply.

To meet this requirement, each data centre building (A & B) will be served by 26 emergency back-up generators within a compound on the ground floor. The proposed installation will consist of Rolls Royce MTU DS3300 diesel generating set with MTU 20V4000G34F NOx turbocharged diesel engine and Leroy Somer LSA53.2 L14 / 4p brushless synchronous alternator. The net thermal input of the installation is 147.42 MW per building.

Based on the above, the combined net thermal input of the installation (Buildings A & B) is approximately 295 MW. The generators can 'operate' during an emergency for up to 500 hours per calendar year. Individual generators would each be test operated, the individual run time being approximately 3 hours per year per generator, significantly less than the maximum permitted of 50 hours per year.

A maximum volume of 1,134,844 litres of diesel can be stored at the site, although the normal working maximum volume will be just under 860,000 l.

The engines will be containerised and located within secure area. Diesel will be stored and supplied within integral Diesel Fuel Bulk Belly Tanks (26 per building) each containing 21,747 L Brim-full and 16,551 L Useable diesel mounted below each generator allowing for 24Hrs of storage for each generator set. Each tank/generator is provided with an integral fuel polishing.

There is a total of 26no tanks per building (52no in total) and each building has a 1,500l receiver tank and fuel point for refuelling the entire system. All tanks will be double skinned and comply with the Oil Storage Regulations[2].

The generators will provide power to the data centre in the event of an emergency situation such as a brown- or black-out of the local electricity transmission network where there are fluctuations or loss of the electrical power provided by the network.

The generators, in accordance with the manufacturer requirements, will be subject to planned maintenance and testing. No electricity will be exported from the generating installation. The generators do not operate in Triad avoidance.

1.1 Site Location

The data centre facility is to comprise two buildings A & B located in the central part of the former AkzoNobel Decorative Coatings, Slough Manufacturing Unit located at Wexham Rd, Slough SL2 5DS, National Grid Reference SU 98700 80300. The data centre is currently under construction and has yet to be commissioned and operated.

The area immediately to the north of the proposed data centre is currently unoccupied land. The Grand Union Canal lies beyond this area with residential properties present north of the Canal. To the east lies Uxbridge Road Gas Works with Uxbridge Road and residential properties present beyond.

[2] SI 2001/2954. The Control of Pollution (Oil Storage) (England) Regulations 2001

Immediately to the south, a new residential development is under construction. This is in turn bound by the Railway Line with residential properties present beyond.

Commercial and industrial properties lie beyond Wexham Road to the west.

There are no formal landscape designations (such as Areas of Outstanding Natural Beauty or National Parks close to the Site. The nearest formal landscape designations are located being 13km and 40km respectively.

There are no identified statutory ecological designations within the site or surrounding areas. The closest statutory ecological designations are Black Park Country Park (SSSI) and Wraysbury & Hythe End Gravel Pit (SSSI), which are located approximately 4km to the north and 5km to the south of the site respectively. Tree cover is also very sparse across the Site.

The Site does not lie within an Air Quality Management Area. Further the entirety of the Site is located in a low probability flood risk zone (Flood Zone 1)

The Site is also not located within or adjacent to a Conservation Area.

A site location plan is included in **Appendix A – Drawings**.

1.2 The Applicant

The applicant and operator are Yondr Group Limited (Yondr), with a registered office address at 7th Floor, 33 Aldgate High Street, London, United Kingdom, EC3N 1AG. Yondr are listed on Companies House with registered number 12000046.

The Directors, and their dates of birth, as listed on Companies House are provided in application form part A1.

1.3 Regulated Installation and Applicable Guidance

1.3.1 Pre-application Advice

Basic pre-application advice was obtained from the EA in November 2022. This comprised the provision of a Nature and Heritage Conservation Screening Report (reference EPR/KP3746QZ/A001).

A copy of this screening report in included in the Environmental Risk Assessment (ERA) submitted in support of this permit application.

In addition to the screening report, basic pre-application advice was received in respect of:

- Installation;
- Combustion (Part A) Data Sites;
- Combustion (Part A) Supplementary Data Sites FAQ;
- Noise Impact Assessment, and;
- Noise Management Plan.

The advice set out as part of the pre-application consultation has been taken into account in compiling this application.

1.3.2 Environmental Permit Application

The data centre will comprise in total a rated electrical generating capacity of 63.2 MWe (net, under standby operation of the engines) with an approximate corresponding thermal input of 295 MWth based on 52 engines with a 5.67 MWth capacity.

At an earlier stage in the planning process, the applicant considered development of an expanded data centre facility with a higher capacity to that which forms the subject of this permit application.

To meet this potential outcome, the air quality and noise assessments developed in response to planning requirements and referred to within this permit application included assessment of the impacts from the proposed enlarged facility.

It should be noted that, the current intention is for Yondr to operate the data centre comprising Building A & B as described in this document and illustrated in the site layout drawings (Appendix A).

Beyond the current development, there is currently no plan for the installation of further back-up generators at the data centre in the foreseeable future. At this stage no increase in the on-site electrical load is anticipated.

1.3.2.1 Regulated Activities

The total rated thermal input of the installation will be above 50 MW and therefore it will be regulated under the Environmental Permitting Regulations (England and Wales) 2016 (as amended) ("EPR") Schedule 1, Part 2, Section 1.1 A(1)(a) – burning of any fuel in an appliance with a rated thermal input of 50 or more megawatts.

Each of the engines will each have a net thermal input below 15 MWth. Therefore, although the total combined thermal input of all engines is greater than 50MW, the aggregation rules set out within the Industrial Emissions Directive (IED)[3] do not apply and therefore the installation is not classed as a large combustion plant (LCP). Accordingly, the installation does not fall within Chapter III of the IED and instead is a Chapter II combustion plant. The emission limits relevant to LCPs within the relevant BAT Conclusions do not apply.

Each individual engine will be a medium combustion plant. However, as the total operating hours per year will not exceed 500 hours, they will not be required to comply with the emission limits set out in Schedule 25A EPR.

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

The EA has issued draft guidance titled "Data Centre FAQ Headline Approach"[4] The installation has been assessed against the BAT set out in that draft guidance.

1.3.2.2 Stationary Technical Unit (STU)

Sweco have reviewed the guidance set out in the EA publication 'RGN 2 Understanding the meaning of regulated facility' (April 2019), and in particular A2.5 of RGN 2.

The function of the back-up generators is to deliver electrical supply to the data centre IT in the unlikely and worst case eventuality of a complete failure of the local transmission system. This scenario could require all back up generators to operate. However, redundancy is built into the design to allow for engine failures and periods of maintenance with engines operated to respond to these individual conditions as and when they may arise. Therefore, the operation under emergency conditions of individual back-up generators is linked to the 'availability' of other engines. On this basis and all back-up generators in the data centre are thus considered to be technically connected.

1.3.2.3 Directly Associated Activities (DAA)

Schedule 1, Part 1 Regulation 2(1) of the EP Regulations provides that a DAA is an operation that, in relation to any other activity:

- Has a technical connection with the activity;
- Is carried out on the same site as the activity; and
- Could have an effect on pollution.

[3] Article 29 - https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32010L0075&from=EN

[4] Data Centre FAQ Headline Approach, version 11.0 H.Tee 11/5/20 – Release to Industry

Based on our review of RGN 2 the storage of fuel oil at the data centre is considered to be a DAA of the 'combustion' STU for the data centre.

1.3.2.4 Medium Combustion Plant and Specified Generators

The Medium Combustion Plant Directive (MCPD) was transposed into UK law in early 2018 via the Environmental Permitting (England and Wales) (Amendment) Regulations 2018. In addition to MCPD requirements, these regulations also brought in requirements for Specified Generators (i.e. any combustion plant generating electricity) into UK law.

Sweco have reviewed the relevant legislation and confirm that as the back-up generators are operated for emergency back-up purposes only, they will be considered 'excluded generators' in accordance with EPR 2018. Hence, they will not be required to meet the emission limit values (ELVs) for NOX (190mg/kg).

This opinion is based on:

- the total thermal rated input being >50MWth;
- each back-up generator is <15MWth and are therefore not subject to Chapter III ELVs; and
- each back-up generator is being operated for emergency back-up purposes only, and for the purpose of testing are each operated for no more than 50 hours per year.

1.4 Structure of the Permit Application

This Chapter provides an introduction to the proposed site activities. The following Chapters provide further details and supporting information including:

Chapter 2 Application Forms (Parts A, B2, B3 and F1);

Chapter 3 Proposed Management Practices and Operating Techniques;

Chapter 4 Operations;

Chapter 5 Emissions and Monitoring;

Chapter 6 Impact Assessment, and;

Chapter 7 Best Available Techniques.

2. Application Forms (Parts A, B2, B3 and F1)

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

Yondr Group Limited

5b Company registration number

12000046

Date of registration (DD/MM/YYYY)

16/05/2019

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

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

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

First name Paul

Last name Hood

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

First name Kavish

Last name Patel

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 Paul

Last name Hood

Address Yondr Group Limited
7th Floor Aldgate House
33 Aldgate High Street
London

Postcode EC3N 1AG

Contact numbers, including the area code

Phone

Fax

Mobile

Email paul.hood@yondrgroup.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

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 Tony

Last name Vine

Address Sweco UK Limited
Grove House
Mansion Gate Drive
Leeds

Postcode LS7 4DN

Contact numbers, including the area code

Phone 0113 307 3065

Fax

Mobile

Email tony.vine@sweco.co.uk

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

Contact name

Title (Mr, Mrs, Miss and so on)

First name

Last name

Address

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)	Mr
First name	Michael
Last name	Innes
Address	Yondr Group Limited
	7th Floor Aldgate House
	33 Aldgate High Street
	London
Postcode	EC3N 1AG
Contact numbers, including the area code	
Phone	
Fax	
Mobile	
Email	michael.innes@yondrgroup.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 ☐

Crystal Mark 19101
Clarity approved by Plain English Campaign

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 Paul Hood

Date of birth (DD/MM/YY) [redacted]

Name

Date of birth (DD/MM/YY) [redacted]

Name

Date of birth (DD/MM/YY)

Document reference

Application for an environmental permit
Part B2 – General – new bespoke permit

Environment Agency

Fill in this part of the form together with parts A and F1 if you are applying for a new bespoke permit. You also need to fill in part B3, B4, B5, B6, or B7 (this depends on what activities you are applying for).

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

You can apply online for: waste operations; medium combustion plant; and specified generator bespoke environmental permits at **https://apply-for-environmental-permit.service.gov.uk/start/start-or-open-saved**

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

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

Contents

1 About the permit

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

EPR/KP3746QZ/A001

1 About the permit, continued

1b Is the permit for a site or for mobile plant?

☐ Mobile plant Now go to **question 1c**

☑ Site Now go to **section 2**

Note: The term 'mobile plant' does not include mobile sheep dipping units.

Mobile plant only

1c Have we told you during pre-application discussions that we believe that a mobile permit is suitable for your activity?

☐ No

☐ Yes

1d Have there been any changes to your proposal since this discussion?

☐ No Now go to **section 3**

☐ Yes You should send us a description of the activity you want to carry out, highlighting the changes you have made since our pre-application discussions

Document reference

Now go to **section 3**

2 About the site (excludes mobile plant)

2a What is the site name, address, postcode and national grid reference?

Site name

LON1XO

Address

Wexham Road, Slough

Postcode

SL2 5DS

National grid reference for the site (for example, ST 12345 67890)

SU 98700 80300

2 About the site (excludes mobile plant), continued

2b What type of regulated facility are you applying for?

Note: if you are applying for more than one regulated facility then go to 2c.

- ☐ Installation
- ☐ Waste operation
- ☐ Mining waste operation
- ☐ Water discharge activity
- ☐ Groundwater activity (point source)
- ☐ Groundwater activity (discharge onto land)

What is the national grid reference for the regulated facility (if only one)?
(See the guidance notes on part B2.)

- ☑ As in 2a above
- ☐ Different from that in 2a Please fill in the national grid reference below

National grid reference for the regulated facility

Now go to **question 2d**

2c If you are applying for more than one regulated facility on your site, what are their types and their grid references?

See the guidance notes on part B2.

Regulated facility 1

National grid reference

What is the regulated facility type?

- ☐ Installation
- ☐ Waste operation
- ☐ Mining waste operation
- ☐ Water discharge activity
- ☐ Groundwater activity (point source)
- ☐ Groundwater activity (discharge onto land)

2 About the site (excludes mobile plant), continued

Regulated facility 2

National grid reference

What is the regulated facility type?

- ☐ Installation
- ☐ Waste operation
- ☐ Mining waste operation
- ☐ Water discharge activity
- ☐ Groundwater activity (point source)
- ☐ Groundwater activity (discharge onto land)

Use several copies of this page or separate sheets if you have a long list of regulated facilities. Send them to us with your application form. Tell us below the reference you have given these extra sheets.

Document reference

Now go to **question 2d**

2d Low impact installations (installations only)

Are any of the regulated facilities low impact installations?

- ☑ No
- ☐ Yes If yes, tell us how you meet the conditions for a low impact installation (see the guidance notes on part B2 – 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

2e Treating batteries

Are you planning to treat batteries? (See the guidance notes on part B2.)

- ☑ No
- ☐ Yes Tell us how you will do this, send us a copy of your explanation and tell us below the reference you have given this explanation

Document reference for the explanation

2 About the site (excludes mobile plant), continued

2f Ship recycling

Is your activity covered by the Ship Recycling Regulations 2015? (See the guidance notes on part B2.)

☑ 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

2g Multi-operator installation

If the site is a multi-operator site (that is there is more than one operator of the installation) then fill in the table below the application reference for each of the other permits.

Table 1 – Other permit application references

3 Your ability as an operator

If you are only applying for a standalone water discharge or for a groundwater activity, you only have to fill in **question 3d**.

3a Relevant offences

Applies to all except standalone surface water discharges and groundwater discharges (see the guidance notes on part B2).

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

3 Your ability as an operator, continued

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/YYYY)

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.

Now go to **question 3b**

Please also complete the details in **Appendix 2**.

3b Technical ability

Relevant waste operations only (see the guidance notes on part B2).

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

Please select one of the following:

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

or

☐ We will have a certified Competence Management System within 12 months and have enclosed evidence of the contract with an accredited certification body

3 Your ability as an operator, continued

CIWM/WAMITAB scheme

Your answers below must relate to the person(s) providing technically competent management when the permitted activities start.

Please select **one** of the following:

- I have enclosed a copy of:

  ☐ the relevant qualification certificate/s

  or

  ☐ evidence of deemed competence

  or

  ☐ 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 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

- ☐ The technically competent manager will complete their qualification within four weeks of starting the permitted activities and I have enclosed evidence of their registration with WAMITAB or their EPOC booking as appropriate

- **For medium- and high-risk tier activities other than landfill**

  The technically competent manager will complete the qualification within 12 months and I have enclosed evidence of their registration with WAMITAB and, where relevant, EPOC booking.

  ☐ I understand they must complete either four specified units of the relevant qualification or an EPOC within four weeks of the permitted activities commencing

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

3 Your ability as an operator, continued

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.

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 (or they) (or any relevant person) 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 (all)

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.

For waste and installation permits only: your management system must also explain your resilience to climate change.

You can find guidance on management systems on our website at **https://www.gov.uk/guidance/develop-a-management-system-environmental-permits**

- ☑ **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)
- ☐ Green dragon
- ☐ Own management system
- ☐ EMAS Global
- ☐ Other

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

Document reference/s

LON1XO Data Centre, Slough: Environmental Permit A

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

Thames Water

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

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

But not any mobile plant

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 B2.)

Document reference/s of the plans

LON1XO Data Centre, Slough: Environmental Permit A

5 Supporting information, continued

5b Provide the relevant sections of a site condition/baseline report if this applies

See the guidance notes on part B2 for what needs to be marked on the plan.

Document reference of the report

LON1XO Data Centre, Slough: Environmental Permit A

☑ If you are applying for an installation, tick the box to confirm that you have sent in a baseline report

5c Provide a non-technical summary of your application

See the guidance notes on part B2.

Document reference of the summary

LON1XO Data Centre, Slough: Environmental Permit A

5d 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

☐ Yes Provide a fire prevention plan (see the guidance notes on part B2). You need to highlight any changes you have made since your pre-application discussions.

Document reference of the plan

6 Environmental risk assessment

Provide an assessment of the risks each of your proposed regulated facilities poses to the environment. 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 assessments

LON1XO Data Centre, Slough: Environmental Permit A

7 How to contact us

If you have difficulty using 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.

7 How to contact us, continued

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

See the guidance notes on part B2.

Installation reference			
Condition	**Response**		**Do you meet this?**
A – Management techniques	Provide references to show how your application meets A References		☐ Yes ☐ No
B – Aqueous waste	Effluent created m³/day		☐ Yes ☐ No
C – Abatement systems	Provide references to show how your application meets C References		☐ Yes ☐ No
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 Non-hazardous waste Tonnes per year		☐ Yes ☐ No
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? ☐ Yes ☐ No Provide references to show how your application meets G References		☐ Yes ☐ No
H – Noise	Provide references to show how your application meets H References		☐ Yes ☐ No
I – Emissions of polluting substances	Provide references to show how your application meets I References		☐ Yes ☐ No
J – Odours	Provide references to show how your application meets J References		☐ Yes ☐ No
K – History of keeping to the regulations	Say here whether you have been involved in any enforcement action (as described in 'Appendix 1 – Compliance history' section of part B2 guidance 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?

- [x] Yes
- [ ] No

Have you filled in the Technical ability question?

- [ ] Yes
- [x] No

Relevant Offences – date of birth information

Please give us the following details

Name

Date of birth (DD/MM/YYYY)

Technical ability – date of birth information

Name

Date of birth (DD/MM/YYYY)

Application for an environmental permit
Part B3 – New bespoke installation permit

If you are applying for a new bespoke permit for an installation, fill in this part of the form, together with parts A, B2 and F1.

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 go with it.

If you are applying for a permit for an intensive farm do not use this form, but complete application form part B3.5 instead.

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 for?

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 carry out at the installation.

Fill in a separate table for each installation you are applying for. 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: LON1XO Data Centre, Slough: Environmental Permit Ap

1 What activities are you applying for?, 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
LON1XO	Section 1.1 Part A	Combustion activities	295 MWth			

Directly associated activities (See note 4) Also note: if the DAA is a Medium Combustion Plant or Specified Generator (MCP/SG) please also fill in part B2.5, (see https://www.gov.uk/government/publications/application-for-an-environmental-permit-part-b25-new-bespoke-medium-combustion-plant-and-specified-generator-permit)		
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, handling and transfer of gas oil (diesel)	Relates only to the storage and use of materials for the use within emergency standby generators.	
For installations that take waste (See note 5 below)	Total storage capacity	
	Annual throughput (tonnes each year)	

1 What activities are you applying for?, 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, schedule 13 and 14 for Local Authority regulated activities, or schedule 25/25B for Medium Combustion Plant or Specified Generators.
2. Use the description from the relevant schedule 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 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

Fill each listed activity 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. If the DAA is a Medium Combustion Plant or Specified Generator (MCP/SG) please fill in the table in appendix 1 question 13.

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 for?, 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	LON1XO			
Point source emissions to air				
Emission point reference and location	Source	Parameter	Quantity	Unit
A1 to A52 (generator exhausts)	Gas oil fuelled	Oxides of	1,998	mg/mN³
	Gas oil fuelled	Carbon	406	mg/mN³
See covering email for discussion	Gas oil fuelled	Hydrocarbons	38	mg/mN³
	Gas oil fuelled	Particulates	32	mg/mN³
Point source emissions to water (other than sewers)				
Emission point reference and location	Source	Parameter	Quantity	Unit
Point source emissions to sewers, effluent treatment plants or other transfers off site				
Emission point reference and location	Source	Parameter	Quantity	Unit
Point source emissions to land				
Emission point reference and location	Source	Parameter	Quantity	Unit

You will also need to complete application form part B6 if your installation includes 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 B2 (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	LON1XO	
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)
Combustion activities including "burning fuel in an appliance with a rated thermal input of	BAT does not apply (Environment Agency guidance, Data Centre FAQ	LON1XO Data Centre, Slough: Environmental

* 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: LON1XO Data Centre, Slough: Environmental Permit Ap

3b General requirements

Fill in a separate Table 4 for each installation.

Table 4 – General requirements

Name of the installation	LON1XO
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 LON1XO Data Centre, Slough: Environr
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 N/A
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 LON1XO Data Centre, Slough: Environr

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		LON1XO		
Capacity (See note 1 below)		1,134,844 L		
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)
Part A(1) (a)	The storage, handling and transfer of gas oil	1,134,844 L	Dependent on er	The storage, handling and transfer of gas oil relates

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

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

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 LON1XO Data Centre, Slough: Environmental Permit Ap

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 ☐

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: LON1XO Data Centre, Slough: Environmental Permit Ap

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

Document reference of the description: N/A

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: LON1XO Data Centre, Slough: Environmental Permit Ap

Yes ☐ Please give the date you entered (or the date you expect to enter) into the agreement (DD/MM/YYYY)

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

Document reference of the proof

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

Document reference of the justification: LON1XO Data Centre, Slough: Environmental Permit Ap

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: LON1XO Data Centre, Slough: Environmental Permit Ap

7 Installations that include a combustion plant (excluding waste incinerators)

7a List all your combustion plant at the site and provide thermal input and operating hours for each

Document reference LON1XO Data Centre, Slough: Environmental Permit Ap

7b Do any of your combustion plants have a net rated thermal input of 1 or more MW and is not an excluded MCP?

No ☑ Go to 7c

Yes ☐ Please fill in the table in appendix 1 question 13

7c Is the aggregated net thermal input of your combustion plant more than 20 MW?

No ☐

Yes ☑ Please go to appendix 1 question 11

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: 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	LON1XO		
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	LON1XO				
Parameter	Unit	Fuel 1	Fuel 2	Fuel 3	Fuel 4
Maximum percentage of gross thermal input	%	Typical EN590 g			
Moisture	%				
Ash	% wt/wt dry	<0.01			
Sulphur	% wt/wt dry	<0.1			
Chlorine	% wt/wt dry				
Arsenic	% wt/wt dry				
Cadmium	% wt/wt dry				
Carbon	% wt/wt dry	87			
Chromium	% wt/wt dry				
Copper	% wt/wt dry				
Hydrogen	% wt/wt dry	12.75			
Lead	% wt/wt dry				
Mercury	% wt/wt dry				
Nickel	% wt/wt dry				
Nitrogen	% wt/wt dry	0.01-0.05			
Oxygen	% wt/wt dry				
Vanadium	mg/kg dry				
Zinc	mg/kg dry				
Net calorific value	MJ/kg	45.4			

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	
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?

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

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 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 1 – Specific questions for the combustion sector, continued

12 Does your installation need to be combined heat and power-ready (CHP-ready)?

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

Document reference of this evidence

Yes ☐ Please provide a copy of your CHP-ready assessment

Document reference of the CHP-ready assessment

13 Information to be provided by the operator to the competent authority for each Medium Combustion Plant as identified in Annex I of Medium Combustion Plant Directive (EU/2015/2193)

MCP specific identifier*	commissioned
12-digit grid reference or latitude/longitude	
Rated thermal input (MW) of the MCP	
Type of MCP (diesel engine, gas turbine, other engine or other MCP)	
Type of fuels used: gas oil (diesel), natural gas, gaseous fuels other than natural gas, landfill gas	
Date when the new MCP was first put into operation	
Sector of activity of the MCP or the facility in which it is applied (NACE code)	
Expected number of annual operating hours of the MCP and average load in use	

Where the option of exemption under Article 6(8) is used the operator (as identified on Form A) should sign a declaration here that the MCP will not be operated more than the number of hours referred to in this paragraph	

* identifier – the MCP must be traceable via a serial number or other unique identifier, name plate, manufacturer and or model

NACE code means Nomenclature of Economic Activities and is the European statistical classification of economic activities (http://www.export.gov.il/files/EEN/ListNACEcodes.pdf).

To find out the 12-digit grid reference you can search on the UK Grid Reference Finder website at https://gridreferencefinder.com/

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 SO2 emission monitoring with periodic sulphur dioxide (SO2) 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 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

15 Does your installation need to be combined heat and power-ready (CHP-ready)?

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

Document reference of this evidence

Yes ☐ Please provide a copy of your CHP-ready assessment

Document reference of the CHP-ready assessment

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

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

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

Environment Agency

Fill in this part for all applications for installations, waste operations, mining waste operations, water discharges, point source groundwater discharges and groundwater discharges onto land. 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. 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

Each individual who is applying for their name to appear on the permit must complete the declaration in section 5. You will have to print a separate copy of the declaration page for each additional individual to complete.

1 Working out charges

You must fill in this section.

You have to submit an application fee with your application. You can find out the charge by searching for 'Environment Agency charging scheme and guidance: environmental permits' at www.gov.uk/government/organisations/environment-agency.

Please remember that the charges are revised on 1 April each year and that there is an annual subsistence charge to cover the costs we incur in the ongoing regulation of the permit.

Table 1 – Type of application (fill number of activity being applied for in each column)

Installation	Waste	Mining waste	Medium Combustion Plant (MCP)/Specified Generator (SG)	Water discharge/point source discharge to groundwater	Groundwater spreading onto land
1					

Table 2 – Charge type (A)

Charge activity reference	Charge activity description	What are you applying to do? E.g. new, minor variation, normal variation, substantial variation, surrender, low risk surrender, transfer	Amount
e.g. 1.17.3	e.g. Sect 5.2 landfill for hazardous waste	e.g. transfer	e.g. £5,561
1.10.1	Section 1.1 Part A(1) (a) - Combustion plant - rat	New	£ 19,103.00
Total A			£ 19,103.00

1 Working out charges (you must fill in this section), 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	£1,231	☐
1.19.2	Habitats assessment (except where the application activity is a flood risk 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 emissions risk assessment (intensive farming applications only)	£620	☐
1.19.9	Dust and bio-aerosol management plan (intensive farming applications only)	£620	☐
	Advertising	£500	☐
Total B			

Total charges

Total A plus total B £ 19,103.00

2 Payment

Tick below to show how you have paid.

Cheque ☐

Postal order ☐

Cash ☐ Tick below to confirm you are enclosing cash with the application

Credit or debit card ☐

Electronic transfer (for example, BACS) ☑

Remittance number

Date paid (DD/MM/YYYY) 16/02/2023

How to pay

Paying by cheque, postal order or cash

Cheque details

Cheque made payable to

Cheque number

Amount £

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

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

We do not recommend sending cash through the post. If you cannot avoid this, please use a recorded delivery postal service and enclose your application reference details. Please tick the box below to confirm you are enclosing cash.

I have enclosed cash with my application ☐

2 Payment, continued

Paying by credit or debit card

If you are paying by credit or debit card we can call you. We will destroy your card details once we have processed your payment. We can accept payments by Visa, MasterCard or Maestro card only.

Please call me to arrange payment by debit or debit card ☐

Paying by electronic transfer BACS reference

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 PSCAPP (to reflect that the application is for a permitted activity) 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.

If you are making your payment from outside the United Kingdom, it must be in sterling. Our IBAN number is GB23NWK60708010014411 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: LON1XO

State who is paying (full name and whether this is the agent/ applicant/other): Yondr Group Limited (Applicant)

Fee paid: £ 19,103.00

Date payment sent (DD/MM/YYYY): 16/02/2023

Now read section 3 below

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

3 Privacy notice

The Environment Agency runs the environmental permit application service.

We are the data controller for this service. A data controller determines how and why personal information is processed.

Our personal information charter explains:

- your rights
- what we do with your personal information

We're allowed to process your personal information because we have official authority as the environmental regulator. We need this information to carry out a task in the public interest that is set out in law. As the data controller, when you apply for an environmental permit, we have a legal obligation to process your personal data under the Environmental Permitting Regulations. The second lawful basis for processing your personal data is to comply with this legal obligation.

We need your personal information to process your environmental permit application. If you do not give us this information we cannot issue a permit to you. After we've issued a permit to you, we use your personal information:

- to check that you're complying with your permit
- during any potential enforcement action

What personal information we collect

If you're the individual applicant, director or company secretary of a company applying or a technically competent manager we need your:

- name
- date of birth

3 Privacy notice, continued

- address
- email address

If you're the agent, consultant, employee responsible for the activity or the employee responsible for billing and invoicing we need your:

- name
- address
- email address

If you're the applicant we need details of any:

- convictions
- bankruptcy

We also collect any questions or feedback you leave, including your email address if you contact us.

Your responsibility with other people's personal information

If you've included personal information about other people on your application, you must tell them. You must provide them with a copy of this privacy notice so that they know how their personal information will be used.

What we do with your personal information

We use your personal information to help us decide whether to issue you with a permit.

The information (except dates of birth) is available online on our consultation website during the consultation period. This website is available to everyone so your information may be seen outside the European Economic Area.

After consultation we put all the information (except dates of birth) you give us in your application on our public register.

If you can demonstrate that any information you send us is commercially or industrially confidential, we'll consider withholding that information from our public register.

If you think that the information you'll send us may be a threat to national security you must contact the Secretary Of State before you apply. You must still send us that information with your application. We will not include this information on our public register unless the Secretary of State decides it can be included.

See the environmental permitting guidance for guidance on national security.

We may use your email address to contact you for user research to improve our service. You don't have to take part in the research.

Where your personal information is processed and stored

We store and process your personal information on servers in the UK. We will not host your personal information outside the European Economic Area.

We do not use your personal information to make an automated decision or for automated profiling.

How long we keep your personal information

We keep your personal information while your permit is in use and for 7 years after you surrender your permit. If the permit is for a landfill site, we keep the data for 10 years after surrender.

Removing personal information from the public register

We will remove your personal information from the public register if:

- you withdraw your application
- we refuse your application and the time limit for appealing the decision has expired or an appeal is dismissed
- the information is no longer relevant for public participation purposes under the Environmental Permitting Regulations

Contact

Our Data Protection Team gives independent advice. They monitor how the Environment Agency uses your personal information.

If you have questions or concerns about how we process personal information, or to make a complaint or request relating to data protection, please contact:

Address: Data Protection Team
Environment Agency
Horizon House
Deanery Road
Bristol
BS1 5AH

3 Privacy notice, continued

Email: dataprotection@environment-agency.gov.uk

You can also make a complaint to the Information Commissioner's Office (ICO).

The ICO is the supervisory authority for data protection legislation. The ICO website has a full list of your rights under data protection legislation.

Now read section 4 below

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 via our website at www.gov.uk/government/organisations/environment-agency.

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

Please treat the 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 via our website at www.gov.uk/government/organisations/environment-agency.

You cannot apply for national security via this application.

Now fill in section 5

5 Declaration

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.

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'.

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.

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 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) ☑

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) ☐

5 Declaration, continued

Name

Title (Mr, Mrs, Miss and so on)	Mr
First name	Paul
Last name	Hood
on behalf of (if relevant; for example, a company or organisation and so on)	Yondr Group Limited
Position (if relevant; for example, in a company or organisation and so on)	Director
Today's date (DD/MM/YYYY)	16/02/2023

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.

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 (Mr, Mrs, Miss and so on)	
First name	
Last name	
on behalf of (if relevant; for example, a company or organisation and so on)	
Position (if relevant; for example, in 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, speak to us before you submit your application.

You must do the following:

Complete legibly all parts of this 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. If necessary, continue on a separate sheet. This separate sheet also needs to have a reference number and you should include it in the table below	☑
For new permits 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

Question reference	Document title	Document reference
All forms where relevant	LON1XO Data Centre, Slough: Environmental Perm	65203376-008

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 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, or you would like us to review a decision we have made, please let us know. More information on how to do this is available at: https://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.

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 to:

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

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

Or

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 part A) ☐

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

£

3. Proposed Management Practices and Operating Techniques

3.1 General

The data storage services at the data centre site will be managed in accordance with the following standards, or suitable equivalent standards:

- ISO/IEC 27001:2013 that specifies the requirements for establishing, implementing, maintaining and continually improving an information security management system.
- ISO9001:2015 that specifies the requirements for establishing, implementing, monitoring, managing and improving quality throughout the organisation.

3.2 Environmental Management System

Yondr Group Limited at Aldgate House, 33 Aldgate High Street, London, EC3N 1AG has been registered to ISO 14001:2015 for Project management for design and development for scalable technology real estate, research and development for implementation into scalable technology real estate and asset management including operational and maintenance support to scalable technology real estate.

Yondr policy documentation includes the Yondr Environmental Construction Requirements which sets out the requirements for all Yondr construction projects, and provides instruction for Yondr project staff, delivery partners, contractors and subcontractors working on Yondr projects.

Yondr are committed to fulfilling sustainability and environmental compliance obligations and to take every reasonable measure to conduct business activities responsibly.

Yondr's policy objective is to minimise any negative impact and, where possible, provide positive enhancements to the environment.

3.2.1 Data Centre EMS

Building on existing policy and procedures, an environmental management system (EMS) will be established on site and will cover those elements requiring environmental permitting.

Yondr commit to continually improve their management systems to enhance environmental performance and minimise the impact of our activities on the environment, with the intention to remain compliant and certified to ISO 14001.

Hence, the intention will be to extend certification of existing EMS under ISO 14001 standard in due course.

The EMS will include the policies, management principles, organisational structure, responsibilities, standards/ procedures, process controls and resources in place to manage environmental protection across all aspects of the business.

In reflection of this intention Yondr have:

a. senior leadership commitment to continual improvement,

b. established environmental policies, procedures and processes to drive and monitor compliance with applicable regulations,

c. a process and team that conducts internal compliance audits to assess environmental aspects and impacts of our data centre facilities, and

d. supplier code of conduct and contractual requirements that specify environmental compliance requirements and monitoring practices for suppliers.

The EMS will place particular importance on:

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

The EMS will be underpinned by Yondr's environmental policy. All staff and external contractors will be made aware of the environmental policy as part of the induction training and a copy will be made available on site.

A system of keeping all relevant records including, but not limited to, the following will be developed and implemented prior to commissioning:

- Records of incidents, accidents and emergencies including details of follow-up;
- Monitoring records, including those required by the environmental permit, and;
- Any other record to be kept as part of the permit.

Systems will be developed and implemented for undertaking audits, reporting of environmental performance, objectives, targets and programmes for future improvements.

3.3 Operations and Maintenance

Management systems will be put in place to ensure that those operations which have the potential to give rise to significant environmental effects are controlled. These systems will cover periods where the generators are not running as well as testing and emergency operation scenarios and start-up and shutdown of the installation.

Planned maintenance routines will be established to ensure all key plant components which have the potential to affect the environmental performance of the installation remain in good working order. Maintenance routines will draw on manufacturer's recommendations, modified as appropriate by operational experience during the lifetime of the installation. Maintenance will be carried out by contractors in accordance with the operator's maintenance requirements.

3.4 Monitoring, Control and Change Management

The primary mechanism that will ensure operational control to minimise adverse environmental risks will be the aspect and impacts register. Processes and procedures will address each significant aspect and generate the information and data necessary to monitor adequately the environmental performance of the data centre and develop an understanding of performance so as to identify faults, opportunities for improvement and to optimise maintenance routines.

The EMS will provide for the controlled implementation of changes which may have environmental implications, to ensure any environmental risks posed by a proposed change will be adequately managed.

Change control will include consideration of the proposed change requirement, identification of the potential environmental implications, measures required to minimise the potential environmental impacts and the responsibility for resolution and a timescale. Change control will include consideration of:

- Legal obligations;
- Results of routine monitoring activities;
- Changing commercial circumstances;
- Improvement targets;

- Review of the environmental aspects, which will include risks from climate change;
- Complaints or suggestions from the public;
- Staff suggestions; and
- Non-compliances.

3.5 Competence and Training

Environmental training will be provided; this will be for both general awareness and job-specific training.

The site will be managed by a sufficient number of staff, who have the competencies to operate the site. In accordance with the EMS:

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

Each individual's knowledge and skills will be 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 will be identified, prioritised and planned.

Training records will be maintained and training needs regularly reviewed.

All contractors will be given appropriate training prior to the commencement of any works or services. Contractors will in turn be responsible for training their own personnel and providing records of such training back to the operator. This will include all maintenance staff carrying out routine maintenance at the installation.

Training will ensure that all staff are aware of relevant elements of the EMS, including relevant operational procedures and the requirements of the environmental permit when issued. Induction procedures will be established for the identification and provision of training and updated knowledge for all personnel engaged in activities affecting environmental performance.

Records of relevant training will be stored and maintained. As a minimum, records will include details relating to the date, type of training and training provider.

3.6 Organisation

The operator will document in the EMS the structure and responsibility within the organisation. Senior management will have overall responsibility for the provision and maintenance of an effective EMS Policy and improvement programme and will ensure that the requirements of the EMS are addressed in all management and business decisions.

The back-up emergency generators will be monitored from an onsite control room. Routine checks and inspections of the generators and permitted area of the facility will be undertaken daily. The plant will be available for 24 hours a day, 365 days per year, subject to the limit on operating hours for each generator emergency back-up generation up to a maximum 500 hours in any one year. It is expected that in reality the operational hours will be well below this.

3.7 Accident Management

A fire strategy has been developed for the data centre which includes aspects specific to the permitted activities. The approach set out in the fire strategy demonstrates a level of fire safety equal to or greater than

the general standard implied by compliance with the recommendations in BS9999[5]. This level of safety therefore satisfies the functional requirements of Part B of the Building Regulations[6].

An Accident Management Plan (AMP) will be established prior to commencing operation of the proposed installation. The AMP will detail those actions required in the event of an emergency or accident/incident. This will include small incidents such as minor spills and leaks and complaints, as well as major incidents such as fire and major spills. In particular, a system for recording and allocating appropriate follow-up for accidents, incidents and non-conformances will be established prior to operation.

In respect of the back-up generators, the following provisions are made:

- Generators will be provided with fire suppression in their respective containers.
- Walls that are within 6m of any external fuel tanks to be provided with at least 120 minute fire resistance.
- The gantry containing the back-up generators on the ground floor, have a structural fire resistance of 15 minutes.
- The fuel storage exceeds 3500 litres and is located outside so is not controlled by the Building Regulations. However, guidance is taken from BS 5401-2[7] and bulk fuel storage will be separated from the building.
- Back-up generators are housed within containers and are provided with water-mist automatic suppression systems.
- To ensure fire hose coverage of the back-up generator area fire main outlets should be provided to the gantry areas in addition to the firefighting shafts.

The installation is monitored via an onsite control room. Routine daily inspections and maintenance will be carried out by a suitably qualified member of staff and subcontractors.

These systems will link to the site security office where personnel will alert relevant employees and call the Fire and Rescue Service to attend if necessary.

Each generator is enclosed within a minimum 2mm thick metal container and is provided with a watermist fire suppression system. Upon detection of a fire within the container the fuel will be cut off by a thermal fusible link and gravity drop valve and dumping of fuel by gravity from fuel storage tank associated with the generator to fuel tank outside of the building. As the plant is expected to be well maintained and taking account of the fire suppression, fuel dumping and housing of the generators it is considered that the generators do not require any additional fire resistance other than that provided by the metal housing.

To support this application, an initial Environmental Risk Assessment (ERA) is provided in **Appendix B**, which includes an assessment of potential accident risks. This will be reviewed prior to commencing operation and maintained as part of the AMP throughout the operational life of the installation.

As part of the design process, hazards will be identified and reviewed with a view to minimising safety, health and environmental risks.

The following will also be developed:

A Disaster Recovery Plan to counteract potential interruptions to its business activities and to protect critical business processes from the effects of major failures of information systems or disasters. Risk assessments will be undertaken to ensure that the Disaster Recovery Plan has appropriate controls in place; and

A Business Continuity Plan (BCP), which will detail emergency/accident procedures and incident management responsibilities, including management of significant pollution incidents and fire. The plan will include contact numbers for key company personnel and emergency services.

[5] Building Regulations, Approved Document B– Volume 2, Fire Safety: Buildings other than dwelling houses, 2019 edition
[6] Building Regulations 2010 (as amended)
[7] BS 5410-2:2018. Code of practice for liquid fuel firing. Non-domestic installations

3.8 Site Security

A security gatehouse with associated vehicle and pedestrian controlled entry systems is to be located at the main entrance to the site. The site will be staffed by security personnel at this entrance 24 hours a day.

The site security has been established by a Securus SR1 / CLD Fencing System around the perimeter and is supported by the AXIS Perimeter Defender Perimeter Intrusion Detection System (PIDS) mounted on poles mounted around the site that include fixed thermal cameras, Pan/Tilt/Zoom cameras and public address speakers to manage potential breach attempts. In addition, dedicated fixed cameras have been included in certain key areas to monitor potential areas of concern along the eastern area of the fenceline. A Security Guardhouse has been established for site entry that includes an LPS 1175 Platinum SR1 Bi-Fold Gate for managing entry/egress to/from the site. The perimeter fence will include key areas for access to the site by emergency vehicles.

3.9 Energy Efficiency

The following section provides information on energy consumption and basic energy efficiency measures, for the installation.

There is no defined BAT associated with energy efficiency levels relevant to emergency diesel engines such as those proposed at the installation. The efficiency sits above indicative efficiencies stated in the provisional EA guidance for data centres using diesel engines (noting these efficiencies are identified for the purpose of calculating thermal input). Methods for maintaining efficient operations throughout the life of the installation are set out below.

3.9.1 Energy Efficiency

Due to the back-up nature of the installation operation which requires fast, flexible operation; combined cycle operation is not a feasible option and is considered unavailable on this basis. The diesel emergency back-up reciprocating engines proposed to be installed will have an electrical efficiency of circa 42%.

3.9.1.1 Climate Change Agreement

The operator will not be a participant to a Climate Change Agreement (CAA). Energy management techniques will be implemented via the operator's EMS.

3.9.1.2 Energy Efficiency Directive (EED)

The EED exempts "those peak load and back-up electricity generating installations which are planned to operate under 1,500 operating hours per year as a rolling average over a period of five years".

Based on the planned maintenance and testing schedule, in total the back-up generators at the data centre will be operated for less than the 1,500 hour threshold. For the purpose of this permit application, the data centre is therefore exempt from the EED requirements and an assessment of energy efficiency in accordance with the Reference Document on Best Available Techniques for Energy Efficiency, February 2009 is not required.

3.9.1.3 Energy Management

The management of energy will form an integral part of the EMS. Energy use will likely form one of the key environmental aspects, and within the EMS measurement and reduction targets will likely be established.

Minimising energy use and developing good housekeeping techniques will form part of staff training.

3.9.1.4 Measures for the Improvement of Energy Efficiency

The back-up generators will be subject to regular maintenance and inspection that will include ensuring the engines are optimised to minimise the heat rate (energy consumption) whilst maintaining the relevant emissions standards.

Energy recovery is not reasonably practicable for engines with such small anticipated operational hours, however, as part of the EMS, assessment of the data centre's energy usage will be undertaken with a view to identifying measures to reduce energy consumption, where possible.

3.9.1.5 Energy Usage

Operation of the back-up generators will be for emergency back-up.

Energy consumption associated with diesel delivered to the installation for the purpose of generating electricity and therefore is technically not consumed by the installation, it is simply converted to electrical output. A minimal amount of electricity will be associated with the parasitic load during operation, for start-up and shutdown periods and during non-running hours. Compared to usage associated with diesel to generate energy the energy consumption of the installation is considered insignificant.

The approximate efficiencies of the back-up generators (under the provision of 'standby' power) at the data centre is based on the manufacturer's specification and performance data for the following generator:

- MTU DS3300 diesel generating set with MTU 20V4000G34F NOx turbocharged diesel engine and Leroy Somer LSA53.2 L14 / 4p brushless synchronous alternator.

The overall efficiency of the site, under this scenario and generating 63MWe, will be approximately 42%.

A copy of the specification for these generators is included in **Appendix C**.

3.9.2 Energy Management Policy

Energy management will form an integral part of the permitted installation's management. Measures will be in place to minimise energy use as far as possible. Training programmes will be in place to ensure that operational and maintenance staff are aware of relevant procedures for ensuring energy efficiency.

Efficiency parameters will be monitored, and a commissioning test will be carried out, at full load after commissioning and after each modification that could significantly affect the net electrical efficiency, net total fuel utilisation, and/or net mechanical efficiency of the generators. On-site electricity usage will be minimised as far as possible within the constraints of the process optimisation.

3.9.3 Building Services

Energy requirements for the installation will be low with minimal lighting requirements. Energy efficient lighting will be used where possible.

3.10 Efficient Use of Raw Materials

Raw material requirements for the installation will be limited in number. The main materials used within the installation will be diesel for fuel and lubrication oil.

Diesel has been selected due to the ability to store sufficient volumes on site to ensure security of supply. Other fuels have been considered but do not currently provide the same level of security of supply. Natural gas could not be stored in sufficient volumes and would be reliant on the National Transmission System, a contract for uninterruptable supply would be excessively costly given the infrequency of use. Due to the limited hours of operation, any potential benefits from the lower impacts associated with emissions from natural gas are reduced.

No other additional chemicals will be stored at the installation.

The generator units are provided with an engine driven pump to circulate jacket water through the radiator. The lubricating oil shall be circulated through a radiator (where appropriate).

A mixture of water and antifreeze is applied to the engine cooling water system. The mixture is added at the concentration stipulated by the manufacturer and comprises ES Compleat PG Premix, a Propylene glycol based coolant supplied by Cummins Filtration.

The raw materials to be used at the site are:

- Diesel fuel oil: each back up generator will require (when providing 'standby' power):
    - MTU DS3300 diesel generating set (5.67MWth): up to 690 litres per hour (at 100% load), at 75% of Power Rating is 510.2 l/hr and at 50%, 335.5 l/hr.
- Lubricating oil: to be used in the engines and other mechanical equipment. Occasional top up or replacement will be required during scheduled or forced maintenance periods only. The lubricating oil for the back-up generators will be stored within the engines and manually topped up during servicing by an appointed service contractor.
- Transformer oil: transformer oil (free of polychlorinated biphenyls (PCBs)) will be used in oil-cooled transformers at the data centre. Occasional top up or replacement will be required.

Transformers oils will not be stored on-site by the operator; the oils will be brought to site and topped up/replaced during scheduled or forced maintenance periods only.

The BAT objective with regard to raw materials is achieved by the appropriate design, operation and maintenance of the back-up generators to ensure the lowest possible consumption rate of fuel; by the selection of least hazardous materials; and by the provision of appropriate storage methods.

The engines are designed for the combustion of diesel fuel oil, this being the fuel recommended/specified by the engine manufacturers. The diesel fuel will have a low sulphur content.

In addition, the lubricating and transformer oils may have alternatives, however the type of oils used are limited to those recommended/specified by the engine manufacturers.

3.11 Water Use

A Closed Cycle Cooling Water (CCCW) system will be installed which has no associated process discharge under normal operation. The back up generators are air cooled via water-filled, fan-assisted radiators.

The water-cooling system has drain points at low points in the engine cooling water system. A mixture of water and antifreeze is applied to the engine cooling water system. The generating set is supplied with a set mounted two-circuit type radiator assembly complete with expansion tank & cap and mechanically driven cooling fan. The radiator coolant capacity is 557 litres, and the coolant type is Glycol-Ethylene 50/50.

The area containing the coolers and CCCW circulating pumps will be within the engine containers so the risk of accidental discharge of process waters to controlled waters is minimised.

No fire-fighting water will be stored, details of fire detection and suppression systems are provided in Section 3.6 and fire management procedures will be included within the AMP.

3.12 Avoidance, Recovery and Disposal of Wastes

It is anticipated that waste generation during operation of the facility will be very low, primarily resulting from maintenance activities. Waste generation will be from the following limited sources:

- Used engine air intake filters; and used lubricating oils.

All contractors carrying out maintenance on the plant will be responsible for the management of wastes generated from their immediate activities – which are removed from the site by the vendor upon completion of

maintenance. The operator will be supplied with copies of records of waste removed from the site and associated recovery/disposal routes.

The permit requirements in relation to waste minimisation will be complied with and the operator will aim to minimise raw material consumption and therefore prevent the generation of waste.

3.13 Adaptation to Climate Change Risk Assessment (CCRA)

Environment Agency (EA) guidance Adapting to Climate Change was withdrawn on 31 August 2022. As a result of this the EA has removed the requirement to consider climate change adaptation from the permit application process.

In place of this, operators are required to integrate climate change adaptation into the environmental management system.

The site management plan will be developed to include an assessment of the risks to the installation associated with Climate Change over the expected period of operation.

Reference will be made to the climate change risk assessment examples for the relevant industry sector, in this case:

- Combustion power: examples for your adapting to climate change risk assessment, October 2021[8].

The CCRA will address potential risks that may occur in the event of predicted changes to the climate in order to allow forward planning in respect of potential risks associated with climate change to ensure that measures are in place to ensure business resilience and continuity.

[8] https://www.gov.uk/guidance/adapting-to-climate-change-risk-assessment-for-your-environmental-permit

4. Operations

4.1 Overview of Installation

A description of the installation is presented in Section 1 – Introduction. The following sections provide additional comments and details regarding the site operations.

The engines will be containerised and within a fenced secure compound. Across the fully configured data centre, the generators will be configured for resilience with one redundant unit per four, i.e each group of four generators will be able to tolerate a single generator failure and retain support to its load. This can be expressed 6(N+1) where N=3. The separate Facilities Block is supported by two generators, each of which could support the full load in the event of failure to the other, N+N configuration.

Drawings showing the site layout are presented in **Appendix A.**

4.2 Fuel and Raw Material Supply, Storage and Handling Resilience

Diesel will be stored and supplied within 26no integral Diesel Fuel Bulk Belly Tanks (Per Building) containing 21,747 L Brim-full and 16,551 L Useable diesel mounted below each generator allowing for 24Hrs of storage for each generator set. Each tank/generator is provided with an integral fuel polishing facility.

There is a total of 26no tanks per building (52no in total) and each building has a 1,500l receiver tank and fuel point for refuelling the entire system.

The table below summaries the generator and fuel system installations:

	Building A		Building B	
No. of Diesel Generators	26No.	24No. 2400kW (N=18) Data Hall 2No. 2400kW (N=1) Facility	26No.	24No. 2400kW (N=18) Data Hall 2No. 2400kW (N=1) Facility
Generator break tank capacity	21,747L Brimful and 16,551L Useable		21,747L Brimful and 16,551L Useable	
Receiver Tank PLC (Fuel System)	1No. 1,500 litres		1No. 1,500 litres	

Based on the above, a total maximum of 1,133,844 (Brimful) litres of diesel can be stored at the data centre.

4.2.1 Bulk Fuel Storage Tank

The fuel storage for each of the two Data Halls (Buildings A & B) consists of 52no 16,551 Litre (effective volume) double-walled generator belly tanks. Each of the fuel storage tanks is equipped with leak detection sensor which will set off an alarm on the generator control panel, relevant tank control panel and at the master control panels.

The fill operator can monitor the fuel level in the selected belly tank as it is being filled and can cease the fill operation when the required fuel level has been reached. If the operator fails to cease the fill operation the tank would fill until the belly tanks HiHi float switch is activated which would cease the fill operation with a warning light / sounder at the fill cabinet. An overfill prevention valve is fitted to each fill line on each belly tank as a final measure to prevent overfilling the belly tanks.

4.2.2 Bulk tank fuel polishing

Each belly tank is maintained by an automatic fuel polishing system with an integrated pump and filter assembly mounted within the generator canopy. The fuel polisher consists of a 10micron filter and water separator. The fuel is extracted from the belly tank and fed through the filter/separator unit by an electrical pump designed to pump 50l/min.

The fuel polisher is powered and controlled from a dedicated fuel polisher control panel which is subsequently linked to the generator control panel. Should the leak detection float switches detect a leak, the fuel polisher will cease operation and report a leak alarm on the generator control panel.

A pressure transducer monitors the flow of liquid from the pump and can signal a blocked polisher filter when the pressure rises above a pre-described level. This will cease operation and declare a blocked filter alarm. Should the bulk tank level be too low indicated by the Low/Low alarm, the polisher will not operate to prevent air being drawn into the pipework. The polisher is designed to polish the fuel within the belly tank only.

The fuel within the receiver tanks does not form part of the system polishing cycle. The fuel within the receiver tanks gets polished when the tank is replenished with polished fuel or when its fuel is transferred to a belly tank.

Whilst the generators are running, they pull fuel from the belly tank, pass it through the set mounted 2-micron fuel filter with any unused fuel being passed back to the belly tank.

The fuel polisher is programmed to operate at pre-defined (user settable) intervals.

Operation

Auto Mode

As supplied the control panel will automatically start the polishing sequence to run for 10 hours per week in order to cycle the full tank volume. The relay clock operates with time and date. The pump operating time and interval can be manually set by the operator via the control panel.

Manual Mode

The fuel polishing pump can be started manually by pressing and holding the right arrow button on the door screen for 3 seconds. Manual mode can be stopped by briefly pressing the left arrow button on the door screen.

Faults

The following faults will cause a common alarm which will be displayed as a fault on the door of the panel:

- Pump overload tripped or in the OFF position.
- Filter blockage sensed by the differential pressure switch.
- Water in the filter
- Leak detected
- Emergency Stop activated
- No flow

There are additional status alarms for:

- System in Automatic
- System in Manual

All alarms are latching and require a manual reset. The generator control panel shall present these alarms to the SCADA RTU for use on the EpMS network.

Indications

The screen displays all alarms and gives a visual indication of the status of the equipment. All alarms are also indicated by a flashing red lamp on the panel door and the common alarm terminals changing state. The common alarm terminals are volt free and fail safe to open on any alarm. There is also a green lamp to indicate that there is power to the control panel. Additional alarms are transmitted via a MODBUS interface. The generator control panel shall present these alarms to the SCADA RTU for use on the EpMS network.

Filter

A differential pressure switch across the main filter element shall alarm to the control panel when a filter change is required.

4.2.3 Fuel Transfer Pump & Receiver Tank

Each building is provided with a double skin 1,500 litre bunded fuel oil receiver tank each connected to one of the 2 no. fill points (1no per building) via double skinned pipework.

Each receiver tank contains a cabinet complete that houses the duplex transfer pumps which have been selected to match the expected flow rate from the fuel fill tankers output. Operation of the pumps is monitored by a pulse flow meter and flow switch located in the outlet pipework as well as contactor trip signals. Should a pump fail by either failing to provide flow or by electrical trip, an alarm shall be triggered on the generator control panel. The pumps will operate until the receiver tank reaches low level; at which time they will shut down to prevent air being drawn into the pipe network.

A pressure relief valve and bypass line that dumps back into the receiver tank are included on the transfer pumps combined outlet to control the maximum pressure within the fuel system. The bypass line can be used to test the operation of the pumps without the requirement of sending excess fuel to the day tank.

Once the fuel fill operator has connected their hose to fill cabinet and selected which of the individual belly tanks to fill from the touch screen panel in the fill cabinet, they shall commence the fill operation. Fuel flows from the connection point in the fuel fill cabinet into receiver tank.

The receiver tank has multiple float switches that indicate the receiver tanks fuel level of LoLo, 40% full, 60% full, 80% full and HiHi. Once the 40% float switch is activated (indicating sufficient fuel in tank), one of the transfer pumps begins to operate at low speed to pump fuel to the selected tank via the fuel header and the open motorised valve. When the fuel level within the receiver tank reaches 60% the pump shall increase filling speed. When the fuel level in the receiver tank reaches 80% full the fuel pumps run at full speed to outpace the fill tankers flow rate and begin to drain the receiver tank. The pump speed then decreases in line with the above as the fuel level hits 60% etc. If the fuel level falls below the LoLo float switch the fill operation shall cease as there is insufficient fuel within the receiver tanks.

If the fuel level was to continue increasing above the 80% float switch then the HiHi float switch would activate and cease the fill operation with a warning light / sounder at the fill cabinet.

If the fuel transfer pump failed to operate, function would automatically switch to the identical transfer pump in the duplex system to continue the fill operation from fuel fill system.

The fill operator can monitor the fuel level in the selected belly tank as it is being filled and can cease the fill operation when the required fuel level has been reached. If the operator fails to cease the fill operation the tank would fill until the belly tanks HiHi float switch is activated which would cease the fill operation with a warning light / sounder at the fill cabinet. An overfill prevention valve is fitted to each fill line on each belly tank as a final measure to prevent overfilling the belly tanks.

The operator can then close the motorised valve on the filled belly tank. Select a different belly tank on the fill cabinet touchscreen and begin the new fill procedure in the same way.

The receiver tanks are double skinned with the internal tank venting to the outer skin where it then vents to atmosphere. Leak detection float switches are provided within the outer skins to detect any inner skin leaks or over-filling to send alarms to the generator control panel and the fill point control panels. The generator control panel shall present these alarms to the SCADA RTU for use on the EpMS. Leak detect float switches are also fitted in the receiver tank pump cabinets. If any spillage is detected in this location an alarm shall sound at the fill point cabinet to alert the fill operator who should cease filling.

Each receiver tank comes complete with an OLE C2020 contents gauge which shall provide detailed fuel level information to the fill point.

4.2.4 Generator Fuel Lift Pump

A fuel lift pump is provided on each generating set to draw the fuel up from the belly tank. The pump is sized to ensure that sufficient fuel delivery is maintained for generator starting only. Once running the generator is able to draw fuel up to 3m without the need for the lift pump allowing for continuous running of the generating set at 100% standby rating at all fuel levels within the belly tank. The generator shall draw and return fuel directly from the belly tank via single skinned pipework located within the bunded canopy. The maximum fuel lift capability of the pump is 5m. The Generator fuel pump sits approximately 1m above the fuel suction line on the belly tank.

4.2.5 Leak detection

Individual vacuum leak detection systems shall be installed within the long runs on fuel fill headers to provide indication if a leak has occurred on the inner pipe that is being contained by the outer pipe.

Normal operation

The vacuum leak detector is connected to the interstitial space via the suction and measuring line. The vacuum generated by the pump is measured and controlled by a pressure sensor. When the operating vacuum (pump OFF) has been reached, the pump is switched off. Due to slight, unavoidable leaks in the leak detection system, the vacuum begins to fall slowly. When the switching value for “pump ON” has been reached, the pump is switched on and the interstitial space evacuated until the operating vacuum (pump OFF) has been reached again. During normal operation the vacuum moves between the switching value pump OFF and the switching value pump ON, with the pump running for a short time and then switching off for a longer time, depending on the tightness and temperature fluctuations in the complete system.

Air leak

If an air leak occurs (in the outer or inner wall, above the liquid level) the vacuum pump switches on in order to re-establish the operating pressure. If the air flow leaking into the pipe exceeds the limited feed flow of the pump, the pump remains on continuously. Increasing leak rates lead to a further increase in pressure until the switching value for alarm ON has been reached. An optical and audible alarm signal is triggered. If solenoid valves are closed, the pump stops.

Liquid leak

In the case of a liquid leak, liquid enters the interstitial space and collects at the lowest point of the interstitial space.

The incoming liquid leads to the vacuum dropping, the pump is switched on and evacuates the interstitial space until operating pressure has been reached. This process is repeated until the liquid stop valve in the suction line closes. Due to the vacuum still present in the measuring line, further leak liquid is sucked into the interstitial space, the measuring pipe and into a pressure compensating vessel. This leads to reduction of the vacuum until the pressure has reached the “alarm ON” level. The optical and audible alarm signal is triggered. Solenoid valves close and the pump stops.

4.2.6 Faults and Alarms

Fire Alarm

Located above the generator is an electro thermal link (E.T.L.) wired back to the set mounted generator control panel. An SQR triggers the fire valve which is in the generator supply line to drop. The following logic sequence triggers if the ETL is triggered; Signal sent to the control panel, signal to the SQR, SQR drops fire valve and the fuel supply to the generators is shut off.

Fire scenario on the generator with the set running:

- Electro thermal link detects elevated temperature, indicative of a fire
- Generator “Fire” indicated on generator controller.
- The SQR drops the fire valves shutting off supply line

- Generator stops

Fault Monitoring

The table below summarises the measures to be provided for monitoring faults and triggering alarms as part of the accident management plan.

FAULT	EFFECT	ALARM
Fuel filter differential pressure switches triggered	Alarm on BMS	Level 3
Fuel pressure relief valves flow switch triggered	Alarm on BMS	Critical
Any bulk storage tank level rises above [95] %	Alarm on BMS	Critical
Any bulk storage tank level rises above [85] %	Alarm on BMS	Level 1
Any bulk storage tank level falls below [50] %	Alarm on BMS	Level 1
Any bulk storage tank level falls below [25] %	Alarm on BMS	Critical
Mismatch in valve command and feedback position	Alarm on BMS	Critical
Any pump fails	Alarm on BMS	Critical
Any fuel delivery pump skids fail	Alarm on BMS	Critical
Fuel polishing system common fault	Alarm on BMS	Level 1
One day tank level below [15]%	Alarm on BMS	Level 1
Two or more-day tank level below [15]%	Alarm on BMS	Critical
Drain tank level below [10]%	Alarm on BMS	Critical
Drain tank level above [95]%	Alarm on BMS	Level 1

4.3 Fuel Fill Station – Fuel Filling

Each building is provided with its own independent fill point cabinets each which shall supply all 26no. belly tanks via pipe in pipe up to their connections to the motorised valves located on each belly tank. These valves connect to individual overfill protection valves and are located within the bunded generator canopies providing an N+1 system. The overfill prevention valves prevent the tanks from being filled beyond their brim-full value of 21,747 l.

Each fuel fill cabinet shall consist of a manual isolation valve (complete with drip tray), non-return valve and fuel fill control panel which shall display the current fuel level of all belly tanks and both receiver tanks.

The fill operator shall connect the tanker to the single connection point in fill cabinet. The touchscreen on the fill cabinet displays the current fuel level for all belly tanks and the receiver tank. The operator selects which of the belly tanks they wish to fill from the touch screen and opens the associated motorised valve via the touch interface. Once open the operator can commence the fill operation. The OLE gauge from the corresponding tank shall provide a signal to the fuel fill control panel (and therefore the fuel fill operator) indicating the current fuel level within the tank. Once filling is complete the operator shall use the touchscreen to close the motorised valve and can either select a new belly tank to fill or disconnect their tanker hose to cease the fill operation.

4.4 Combustion of Fuel and Power Generation

The design of the installation provides for a reliable diesel generator system comprising of individual containerised generating sets with each one operating as a standby power for each power stream. The power streams will be arranged in a distributed redundant configuration without the need for the generators to operate in parallel on a common bus.

Each engine will have an air intake system, combustion chamber, an exhaust system and an electrical generator, together with common auxiliary plant.

The generators shall be located externally within individual weatherproof acoustic enclosures complete with all ancillary systems such as 24hr belly tank, exhaust flues, air exhaust attenuation, cooling radiators and fans, lighting, small power, heating and fire suppression devices.

Generator enclosures shall be arranged to draw air in at the building end and discharge air horizontally at the gantry edge with exhaust gases vertically discharged.

The generators will be mounted in adjoining pairs. The enclosures and exhaust systems shall, in the main, achieve attenuation to 72dB (A) at 1m the exhaust.

Dual redundant starter and battery systems shall be provided for each generator engine.

Generators shall accommodate dynamic load management in operation to maximise the load on the engines.

4.4.1 Combustion

Combustion will take place within up to 52 compression ignition reciprocating engines.

Within the engines, diesel and combustion air are ignited by means of compressing the air to elevate temperature. As the burning mixture of fuel and air expands, a piston is pushed transferring energy released from combustion to an engine flywheel, from which a connected alternator is used to generate electricity.

Each engine will have a dedicated exhaust stack (26 no per Building) each discharge above roof level. The stacks will be designated as release points A1 – A52. (See site layout drawings in **Appendix A**).

4.5 Resilience Configuration

The new generator installation shall deliver N resilience with the system design being distributed redundant to create a N+1 resilience. The associated control systems; all ancillary electrical supplies; the local fuel storage for each generator and associated power and control systems are to be of an N configuration. The generator starting system shall be of a 2N design. The generator system arrangement shall be concurrently maintainable.

The engines will be containerised and within a fenced secure compound. Across the fully configured data centre, the generators will be configured for resilience with one redundant unit per four, i.e each group of four generators will be able to tolerate a single generator failure and retain support to its load. This can be expressed 6(N+1) where N=3. The separate Facilities Block is supported by two generators, each of which could support the full load in the event of failure to the other, N+N configuration.

4.6 Generator Control Panel

Each generator shall have an associated control panel which is located alongside the generator assembly. A proprietary intelligent generator control unit shall be used to monitor and control the generator, also to provide indication of generator status, alarms and event logging analysis.

The control panel shall also contain all the necessary relays for starting/stopping of the generator, associated LV breaker control, earth fault protection (for load banking) and loss of excitation. However, all control and operation is via the upstream LV Switchboard.

The generator control panel shall control the alternator over-temperature protection to prevent damage due to heating caused by harmonic currents. The power system will be designed to limit current THD to 5% as far as possible. This protection is therefore a back-up against the THD exceeding the design target.

The control panel shall incorporate water and fuel leak detection within the generator enclosure and signal an alarm to the PMS should either of these events occur.

4.7 Cooling Systems within the Generators

The back-up generators are equipped with a high-capacity radiator for cooling the engine with a heavy-duty cooling fan arrangement. The generator units are provided with an engine driven pump to circulate jacket water through the radiator.

A thermostatically controlled ‘stand still’ heater is fitted to aid cold starting.

The water-cooling system has drain points at low points in the engine cooling water system. A mixture of water and antifreeze is applied to the engine cooling water system. The generating set is supplied with a set mounted two-circuit type radiator assembly complete with expansion tank & cap and mechanically driven cooling fan. The radiator coolant capacity is 557 litres, and the coolant type is Glycol-Ethylene 50/50.

4.8 Engine Lubrication

The engines are provided with a high-capacity lube oil system comprising positive displacement pumps, adjustable regulators, and replaceable element filters to maintain full pressure regulation to the main bearing, con rods, camshaft bearings, turbo charger(s) valve and timing gear. The system includes an oil cooler, and be provided with suitable valves to allow draining of the system

Occasional top up or replacement of lubricating oil will be required during scheduled or forced maintenance periods only. A small volume of spent lube oil will be generated and form part of the expected waste generation associated with the installation.

4.9 Filtration System

Each engine shall be fitted with heavy-duty dry type air filters with replacement elements. The engine shall be complete with fuel and lubricating oil filters with replaceable elements.

A small quantity of used engine air intake filters will be generated as waste for disposal.

4.10 Air Supply/Exhaust System

4.10.1 Cleaner

An air cleaner and silencer as recommended by the engine manufacturer will be installed and located and mounted as recommended by the engine manufacturer for each engine as appropriate.

4.10.2 Exhaust

An exhaust system of suitable size, configuration and material in accordance with engine manufacturer’s recommendations is connected to the exhaust outlet of the engine to a silencer(s). The type and quantity of silencers shall meet the requirements of engine manufacturer and the acoustic performance requirements.

The generators are to be fitted with diesel particulate filters to minimise smoke and particulate emission on start-up and operation.

The engine start-up system will be managed and adjustable such that the engine can be optimised between start-up smoke and particulates and the need for the engines to come online as quickly as possible.

The silencers are to be located on top of the generator enclosure, if additional silencers are deemed necessary; they can be located vertically adjacent to the discharge attenuator. The flue discharge arrangements take into account the need to comply with the air dispersion model for discharging flue gases.

The exhaust system including silencers includes for a flexible connection mounted at the engine exhaust outlet and the discharge end of the exhaust line shall be protected against entry of precipitation. Piping within reach of personnel shall be protected by screening or suitable lagging. All exhaust piping will be gas tight.

4.11 Exhaust Emissions

Exhaust emissions will be in accordance with the engine manufacturer's standard for emissions optimised engines and to suit the requirements of the Industrial Emissions Directive (2010/75/EU). The minimum standard will be TA-Luft 2g or EPA Tier II as required by the EA guidance[9]. Further discussion is presented in Sections 5.1 and 6.1.

4.12 Engine Protective Devices

As part of the accident management plan, the following engine protective devices shall be provided:

- Combination alarm and shutdown system for high water/oil temperature and/or low oil pressure.
- Engine under/over-speed automatic shutdown device
- Engine under/over voltage
- Restricted earth fault
- Alternator excitation loss
- Engine failed to start indicator light (overcrank)
- Alarm for low coolant level
- Engine overload (via alternator)
- Fire valve operated
- Reverse power

In the event of a fire in any generator enclosure there is a heat activated fuel supply isolation valve. On operation, this shall signal the generator control panel to shut down the generator. The generator will not try to start if this valve is closed. Each generator enclosure is provided with fire detection devices.

4.13 Fuel Oil Transfer System & Storage

A double skinned bulk fuel storage tank shall be provided per generator set, mounted to the underside of the enclosure and shall be new, unused and shall not be galvanised. The tanks shall be sized to store a minimum of 24 hours fuel storage (21,747L Brim-full and 16,551L Useable).

Fuel quality shall be maintained through the use of proprietary fuel polishing units dedicated to each generator to maintain quality and efficiency in order to minimise raw material use, reduce the need for replacement of dirty fuel and ensure a high level of system reliance.

4.14 Start up and Shut down Procedures

The installation will be capable of rapid start up when generation is required and a controlled shut down after use. The expected definitions of the start-up and shut-down periods are given below:

As per the EA guidance[10], the engines are regarded as having minimal start-up and shut-down periods and the operational hours start on the first fuel ignition.

[9] Data Centre FAQ Headline Approach, version 11.0 H.Tee 11/5/20 – Release to Industry

[10] Data Centre FAQ Headline Approach, version 11.0 H.Tee 11/5/20 – Release to Industry

4.15 Commissioning

A commissioning plan for the generators will be developed for the installation to outline the commissioning and associated monitoring activities and will be agreed with the EA prior to any commissioning activities taking place.

The time required for commissioning of the back-up generators is not included in the annual planned maintenance and testing schedule as detailed in section 7.1.1.

4.16 Operating Regime

During planned maintenance and testing the back-up generators will each be operated for less than 50 hours per year.

The planned maintenance and testing regime for the back-up generators is scheduled to ensure that the impact on air quality as a result of the diesel combustion emissions is minimised.

The planned operating regime for the back-up generators (i.e. testing and maintenance) at the data centre is presented below:

The diesel generators shall only be used in the event of a power supply outage, and in accordance with the following diesel generator testing regime:

- Monthly testing for each generator for a duration of 15 minutes at no load, equating to 3 hours per generator / year; and
- 6 monthly testing for a duration of 6 hours with the maximum number of generators being tested at any one time being 2 (one generator offload and generator one at load). This equates to a further run time of 24 hours over the course of a year.

The testing shall only be carried out during the daytime (07:00-23:00). The diesel generators shall only be used in accordance with the above details.

Based on the above the overall operational hours for planned maintenance and testing per year for all back-up generators will be 186 hours.

The scheduled maintenance and testing regime for each back-up generator will be significantly below the 50-hour testing regime for back-up generators which are used purely for a stand-by emergency role as stated in the EA Data Centre FAQ Headline Approach, version 11.0 H.Tee 11/5/20 – Release to Industry.

Routine testing and maintenance of the generators will be completed by suitably experienced and trained data centre facilities management staff and an appointed subcontractor, if required. During maintenance and testing data centre facilities management staff and the subcontractor, if relevant, will:

- Take measurements of wind speed and wind direction at the Site to compare with the modelled data from Heathrow Met Station (see also Section 6.1.1) and to assist in identification of most sensitive receptors during testing and emergency operations.
- Visually check for smoke from back-up generators exhausts. If any black, or white smoke, is noted this will be reported for further investigation.
- Ensure that the generators are operated for the minimal amount of time to complete the required maintenance requirement/test (maintenance and testing of the generators will be completed in accordance with manufacturer requirements to ensure optimal performance and efficient combustion); this approach minimises both diesel fuel consumption by the generators and generation of combustion emissions to air.

Furthermore, to limit the generation of emissions to air, the routine testing and maintenance regime ensures that a limited number of generators are subject to planned maintenance and testing at any one time.

Planned preventative maintenance (PPM) and the testing regime at the data centre will be managed in accordance with the above schedule and manufacturers recommendations via a PPM system.

5. Emissions and Monitoring

5.1 Emissions to Air

Emissions to air from the installation will result from exhaust gases generated from combustion of diesel within the engines.

Each of the 52 engines will require its own stack. For plant maintenance there are operational and safety advantages in providing separate stacks as maintenance on one engine will not prevent the operation of the remaining engines. This will allow electricity generation at any time, a significant advantage for a plant designed to provide emergency back-up power at short notice. A combined stack would also have visual impact as it may have a higher exit height compared to individual stacks. Furthermore, the footprint of the plant is such that there is insufficient space to accommodate a combined stack structure in one location.

The 5.67 MWth engines chosen for the installation are manufactured by Rolls Royce and comprise MTU DS3300 diesel generating set with MTU 20V4000G34F NOx turbocharged diesel engine and Leroy Somer LSA53.2 L14 / 4p brushless synchronous alternator. These comply with the required emissions standards within 'TA-Luft 2g' or Tier II USEPA as required by the EA guidance[11].

Each of the exhaust stacks will be 21.95 m in height. The locations of these emissions points are illustrated on the site layout drawing. The stacks are designated release points A1 – A52.

An Air Quality Assessment has been completed the findings of which are presented in Appendix D.

5.2 Emissions to Land

There will be no emissions to land associated with operation of the installation. A Site Condition Report (SCR) has been prepared for the site and is included in Appendix E.

5.3 Emissions to Surface Waters and Sewer

Rainwater run-off from containers, roofs and hardstanding will be discharged to surface water drainage.

This will be directed to the drainage system for the wider data centre site. This drainage system will include oil interceptors prior to discharge into the local surface water network.

5.3.1 Emissions to Sewer

The data centre has separate foul and surface water drainage systems. The drainage to foul sewer will consist of sanitary foul water (sinks, toilets, cleaning water, etc.); operation of the data centre will not result in the generation of trade effluent.

There are collection gullies located within the gantry area for fuel runoff and washdown within the plant area where the back-up generators will be located. All run-off from this area will drain to the on-site surface water drainage system prior to off-site discharge via a full retention interceptor connecting to the existing surface water sewer system which joins the wider municipal system at a connection at Uxbridge Road.

5.3.2 Emissions to Water

The surface water drainage system at the data centre will accept surface water runoff from the area where the back-up generators, the fuel receiver station and the fuel road tanker off-loading area will be located, along with runoff from the building roof area and other hard surfaced areas of the wider site.

Surface water run-off collected will drain via an oil interceptor (9,600 litre capacity Class 1 full retention interceptor).

[11] Data Centre FAQ Headline Approach, version 11.0 H.Tee 11/5/20 – Release to Industry

Following the interceptor, the surface water runoff will drain into the existing surface water drainage system serving the wider site area. The surface water point source discharge point into this connection is referenced as SW1, the location of which is indicated on the drainage plan for the data centre provided in Appendix A.

The interceptor will be fitted with an automatic closure device which will activate on detection of diesel; this device will be activated by its integral detection mechanism. The system will also be fitted with a wired interface to the building's Building Management System (BMS). An audible alarm system for oil levels will be also installed which will connect to the data centre BMS. In the event of an unplanned release of diesel, the closure device will automatically isolate the interceptor preventing the discharge of diesel contaminated surface water runoff to the wider surface water sewer and the alarm will notify key data centre staff of the issue, via the BMS.

The interceptor will be emptied at least annually and subject to regular inspection and integrity testing.

Procedures will be developed and included within the site's environmental management system (EMS) for the management of surface water runoff and for the management and maintenance of the interceptor; relevant staff will be suitably trained in these procedures.

5.4 Emissions to Groundwater

The facility will not include any point source emissions to ground or groundwater.

5.5 Fugitive Emissions

Significant fugitive emissions, odours and noise are not anticipated in respect of operation of the data centre back-up generators either during testing or during full emergency operation.

Management systems will be in place at the facility to ensure that the risk from fugitive emissions to air is minimised, for example through regular inspection and maintenance of plant. Protection systems will include automatically triggered safe plant emergency shutdown in the event of major faults in equipment. Scheduled maintenance of diesel tanks will be incorporated into the EMS, to minimise the risk of fugitive emissions of fumes to air.

It is anticipated that fugitive emissions of odour will not be significant for the facility. Diesel will be contained within vented tanks and therefore would only be a potential source of odour if a spill were to occur. Procedures will be incorporated within the EMS to ensure the potential for spills is minimised and they are dealt with swiftly should they occur.

Diesel has a low potential for evaporation and therefore fugitive emissions from tank vents is not considered likely. Top up of the tanks will be infrequent due to the nature of the use of the engines and therefore fugitive emissions during top-ups will be minimal.

No powders or other dry materials will be used or stored at the installation and therefore fugitive emissions of dust are unlikely to occur.

The data centre operator will maintain procedures for diesel delivery and for spill response, and relevant operating personnel will be provided with spill response training. Additionally, the requirement for regular inspections of the data centre site will be included in the site's EMS and maintenance procedures.

5.6 Noise and Vibration

An assessment of the noise impacts from the facility has been included within Appendix F and a summary of its conclusions is provided in 6.3 of this document.

A summary of the Policy, Standards and guidance documents used to inform the acoustic design of the scheme can be found below:

- National Planning Policy Framework

- Noise Policy Statement for England
- Planning Practice Guidance – Noise
- British Standard 8233:2014 – Guidance on Sound Insulation and Noise Reduction in Buildings
- British Standard 4142:2014 – Method for Rating and Assessing Industrial and Commercial Sound
- British Standard 5228:2009 – Code of Practice for Noise and Vibration Control on Construction and Open Sites
- Local Authority Requirements – Slough Borough Council.

The main sources of noise from the facility would be those associated with external plant, including the chillers and generators. No significant vibration impacts are anticipated to result from operation of the facility. Each chiller will be within an acoustic enclosure, and each engine will be fully containerised which will reduce the noise emitted.

The aspects of acoustics that are considered in this assessment are as follows:

- Normally Operating Plant and Operational Noise. The noise impact assessment is undertaken in accordance with BS 4142, based on the criteria presented in the grant of planning consent.
- Emergency Plant. The predicted emergency noise levels have been assessed and are compared against the BS 8233 residential guidelines for internal noise.
- Construction Noise and Vibration. Guidance in BS 5228:2009+A1:2014 has been used to provide limiting criteria for construction noise.

Noise predictions have been carried out in the noise-modelling suite Cadna/A, in accordance with the ISO 9613 prediction methodology. The predicted noise levels at the nearest noise-sensitive receptors have then been assessed against the limiting criteria presented in Planning Condition 12 of the outline planning consent (P/00072/096). The following scenarios have been assessed:

- Normal Operation – Daytime
- Normal Operation – Night time
- Emergency Operation – Power Failure
- Emergency Operation – Transformer Failure

The outcomes of the assessment identify that the installation would not have any significant adverse impacts on the nearest noise-sensitive receptors providing that plant is constructed and operated in accordance with the proposed plant noise control strategies, which are detailed in the noise impact assessment report.

As the back-up generators will be operated intermittently for maintenance and testing purposes only, and for emergency back-up purposes in the unlikely event of brown or black out scenarios, significant adverse impacts are not expected as a result of operation at the proposed data centre.

5.7 Monitoring and Reporting of Emissions

5.7.1 Emissions to Air

Due to the classification of the plant as emergency back-up generators with an annual limit of 500 hours operation, there are no relevant emission limit values (ELVs) and therefore routine monitoring of emissions to air is not required.

5.7.2 Emissions to water and land

Water discharges will result from rainwater surface run-off from roofs, roads and hard standing. Rainwater collected will be directed to a class 1 oil interceptor (outside the permit boundary) prior to discharge into the

surface water drainage system for the wider data centre site. No monitoring of surface water run-off is proposed.

There will be no discharges to land from the facility.

Routine monitoring of soils and groundwater will be undertaken as part of the operational requirements of the installation every 10 years and 5 years respectively unless otherwise agreed with the EA.

5.8 Process Monitoring

Key process monitoring will be carried out to monitor the permitted facilities plant performance including water usage, energy consumption (diesel and electricity), hours of operation and power generated. These performance parameters will be reported on an annual basis.

The plant performance and equipment will be continually monitored, and a system will be in place to optimise performance.

6. Impact Assessment

To support this application a number of environmental assessments have been performed. The full details of these assessments are appended to this application and a reference to the full assessment is given where relevant for the environmental issues detailed below.

6.1 Emissions to Air

An air quality assessment (AQA) has been undertaken to support this application and full details of the assessment are reported in Appendix D – Air Quality Assessment.

The AQA report was submitted in April 2021 for the discharge of planning condition 17 of the consent P/00072/096. A reassessment was undertaken due to changes in design parameters such as generator emissions and exit height. Full details of these changes are provided in Table 1 of Sweco's technical letter Revised Emissions Parameters and Modelling Results, dated 12th October 2022, also included in Appendix D.

At the time of development of the AQA a number of different manufacturers/suppliers of back-up generators were subject to consideration. As a representative emitter, the input parameters used in this assessment were based on Caterpillar's CAT3516E generators.

The supplier of the engines for this site has since been chosen based on a competitive tender with Rolls Royce MTU DS3300 diesel generating set with MTU 20V4000G34F NOx turbocharged diesel engine and Leroy Somer LSA53.2 L14 / 4p brushless synchronous alternator engines selected.

The AQA was undertaken to assess the air emissions associated with the proposed installation of two 30MWe IT data centre buildings with associated substation and mechanical yard, forming this permit application. Each building (A & B) includes three storeys of data halls and facility support (offices and ancillary space), and a four-storey external gantry where most of the external plant will be located.

At the time of completion of the AQA, the possibility of deployment of further data centre use on the remaining commercial plot to the north of Building B was under consideration and is included in the AQA.

For the avoidance of doubt there are no current plans to develop additional data centre facilities and this permit application relates to the relevant regulated activities as applied to Building A & B.

However, the inclusion of potential future data centre capacity is considered to reflect a worst-case approach for atmospheric emissions from the entire site, which have been modelled to identify if the total emission burden could potentially exceed the relevant AQAL at sensitive receptors.

The AQA assesses the air emissions from the operation of the data centre development and further determines the impacts of the proposed development in respect of the traffic related emissions and construction phase dust impacts that were already assessed as part of the planning process.

6.1.1 Assessment of Emissions

The scope of the impact assessment for stack emissions from the Proposed Development has been determined in the following way:

- Review of air quality data for the area surrounding the Site, including data from local authority monitoring from Slough Borough Council (SBC), the Defra Air Quality Information Resource (UK-AIR) and the Critical Load tool within APIS;
- Desk study to confirm the location of nearby areas that may be sensitive to changes in local air quality, and;
- Review of emission parameters for the Proposed Development and dispersion modelling using the Breeze AERMOD 8 dispersion model (version 16216r) to predict ground-level concentrations of pollutants at sensitive human and habitat receptor locations.

Specifically, the approach to modelling emissions from the exhaust stack has involved the following key elements:

- Establishing the background Ambient Concentration (AC) from consideration of Air Quality Review & Assessment findings and assessment of existing local air quality through a review of available air quality monitoring and Defra background map data in the vicinity of the proposed site;
- Quantitative assessment of the operational effects on local air quality from the proposed stack emissions utilising a “new generation” Gaussian dispersion model, AERMOD 8, and;
- Assessment of Process Contributions (PC) from the facility in isolation, and assessment of resultant Predicted Environmental Concentrations (PEC) at the identified sensitive human and ecological receptors, taking into account cumulative impacts through incorporation of the AC.

The dispersion modelling has been based on five years (2016-2020) of hourly sequential meteorological data to take account of inter-annual variability and reduce the effect of any atypical conditions.

For effective dispersion modelling hourly meteorological parameters need to be measured, typically including wind speed, wind direction, cloud cover and temperature amongst others. There are only a limited number of sites where the required meteorological measurements are made. Data from the meteorological station at Heathrow Airport has been used for the assessment, which is the most representative data currently available for the study area.

6.1.2 Design Basis for the Assessment

Two dispersion model scenarios have been assessed which represent the proposed layout and design details for development across the entire commercial area (beyond the RM boundary) for DC use. Emissions to air have been modelled based on a total of 88 No. flues 2m above the roofline of the adjacent plant building. The inclusion of potential additional deployment of data centre capacity includes for additional emissions from a further 36 back-up generators additional to the 52 required for the proposed installation (Building A & B).

Manufacturer emission limits have been assumed for the purposes of the modelling assessment and the Proposed Development is assumed to be operating at full load, with all generators operating concurrently.

The below two scenarios have been modelled. These have been agreed with SBC.

1. **Most Likely Scenario**

- Monthly testing for a duration of 15 minutes at no load totalling to 3 hours/year; and,
- 6 monthly testing for a duration of 6 hours – totalling to 12 hours/year.

2. **Worst Case Scenario**

- Monthly testing for a duration of 15 minutes at full load totalling to 3 hours/year; and,
- 6 monthly testing for a duration of 6 hours – totalling to 12 hours/year.
- Emergency operation of 88 generators operating for a maximum duration of 92 hours/year.

The period of 92 hours used in the modelling for emergency operation is a highly conservative estimate and is considered a worst-case given the grid security as described in section 6.3 below. Such events are triggered by utility (grid) power outages or critical (and unplanned/emergency) maintenance of the power infrastructure system.

Modelling of emissions from all point sources in each scenario was undertaken across a receptor grid measuring 3 km by 3 km centred on the Proposed Development site, with a grid spacing of 30m. Pollutant concentrations were also modelled at discrete receptors, each representative of façades of existing local receptors with relevant human exposure at a height of 1.5 m (representative of average breathing height). Both grid and discrete receptor modelling enabled the impact from the Proposed Development operation to be modelled at sensitive human receptors and at the relevant ecological sites in the study area.

Emissions from the facility have been assessed against relevant Air Quality Assessment Levels (AQALs).

Oxides of nitrogen (NO_x) emitted to atmosphere as a result of combustion will consist largely of nitric oxide (NO), a relatively innocuous substance. Once released into the atmosphere, NO is oxidised to NO_2. The proportion of NO converted to NO_2 depends on several factors including wind speed, distance from the source, solar irradiation and the availability of oxidants, such as ozone (O_3). A conversion ratio of 70% NO_x:NO_2 has been assumed for comparison of predicted concentrations with the long-term AQAL for NO_2. A conversion ratio of 35% has been utilised for the assessment of short-term impacts, as recommended by Environment Agency guidance[12].

In addition to assessment of NO_2 emissions, assessment of PM_{10} emissions at human receptors along with nitrogen deposition and acid deposition at relevant ecological receptors is also undertaken. The detailed inputs, results and conclusions are summarised in Appendix D – Air Quality Assessment.

6.1.3 Impacts during 'Most-Likely' Scenario

This section summarises the model results and operational impacts during the 'Most-Likely' scenario.

This section summarises the model results and operational impacts during the 'Most-Likely' scenario.

Air Quality Parameter / Scenario	Modelling Results	Impact
NO_2 Annual Mean Concentrations at Existing Receptors	Assessment predicts an increase in NO_2 concentrations at many of the modelled existing receptors in the 2026 operational phase during the 'Most-Likely' scenario. The impact descriptors are predicted to be 'Negligible' at all receptors.	The air quality impact of the Proposed Development on annual mean NO_2 concentrations was assessed as 'not significant'.
NO_2 Concentrations at Future Receptor Locations within the Proposed Residential Development to the South	Annual mean concentrations for NO_2 are not expected to exceed the relevant AQAL at any relevant receptor location during the 'worst case' scenario.	No new exceedances of the any AQALs have been predicted at the identified future residential receptor locations.
Operational Phase Impacts on PM_{10} Annual Mean Concentrations at Existing Receptors	The assessment predicts an increase in PM_{10} concentrations at many of the modelled existing receptors in the 2026 operational phase during the 'Most-Likely' scenario. The impact descriptors are predicted to be 'Negligible' at all receptors.	Based on the results of the modelling assessment the air quality impact of the Proposed Development on annual mean PM_{10} concentrations are predicted to be 'not significant'.
PM_{10} Concentrations at Future Receptor Locations within the Proposed Residential Development to the South	Regarding the future receptors to the south of the Proposed Development, the annual mean concentrations for PM_{10} are not expected to exceed the relevant AQAL at any relevant receptor location during the 'worst case' scenario.	No new exceedances of the any AQALs have been predicted at the identified future residential receptor locations.
Impacts of the Proposed Development on Ecological Receptors	The maximum annual mean NO_x PC is predicted to be below 1% of the critical level at the SPA and the SSSI.	The impact of the Proposed Development operating is predicted to be 'insignificant'.

6.1.4 Impacts during 'worst case' Scenario

This section summarises the model results and operational impacts during the 'Worst Case' scenario.

Air Quality Parameter / Scenario	Modelling Results	Conclusion / Impact
Operational Phase Impacts on NO_2 Annual Mean Concentrations at Existing Receptors	The impact descriptors are predicted to be 'Negligible or Slight Adverse' at all receptors except R2 and R20 ('Moderate Adverse').	Due to the worst case nature of this scenario, the overall air quality impact of the Proposed Development on annual mean NO_2 concentrations is assessed to be 'not significant'.
NO_2 Concentrations at Future Receptor Locations within the	Regarding the future receptors to the south of the Proposed Development, the annual mean concentrations for NO_2 are not expected to exceed	No new exceedances of the any AQALs have been predicted at the

[12] AQMAU, Conversion Rates for NO_x and NO_2

Proposed Residential Development to the South	the relevant AQAL at any relevant receptor location during the 'worst case' scenario.	identified future residential receptor locations.
Operational Phase Impacts on PM_{10} Annual Mean Concentrations at Existing Receptors	The impact descriptors are predicted to be 'Negligible' at all receptors.	It is considered that the air quality impact of the Proposed Development on annual mean PM_{10} concentrations is 'not significant'.
PM_{10} Concentrations at Future Receptor Locations within the Proposed Residential Development to the South	The annual mean concentrations for PM_{10} are not expected to exceed the relevant AQAL at any relevant receptor location during the 'worst case' scenario.	No new exceedances of the any AQALs have been predicted at the identified future residential receptor locations.
Impacts of the Proposed Development on Ecological Receptors	The maximum annual mean NO_x PC is predicted to be below 1% of the critical level at the SPA and the SSSI.	The impact of the Proposed Development operating would be 'insignificant' when compared to the criteria.

Based on the results of the remodelling appraisal, the impact of atmospheric emissions from the operation of emergency generators at the proposed development are unchanged from the original full air quality impact assessment undertaken April 2021.

Therefore, the operations of the proposed generators as per the above would not lead to a significant effect on local air quality.

6.1.5 Stack Height Determination

The stack height determination considers ground level concentrations over the averaging periods relevant to the air quality assessment, together with the full range of all likely meteorological conditions using five years of hourly sequential meteorological data from Heathrow Airport. The modelling included stack heights assessed at 21.95 m above ground level in accordance with the design of the installation.

The stack heights have been selected through iterative dispersion modelling during the early stages of design development to ensure that the impact is acceptable at relevant sensitive receptor locations during both modelled scenarios of the generators within the Proposed Development. During the iterative modelling process, several combination of options were assessed along with stack heights. The options included within the iterative modelling process are shown below and the final design represents best available technology (BAT) for the Proposed Development.

- Stack height (i.e. the exit point);
- Exit velocity (for stack designs);
- Generator emissions (different types of engines); and,
- Volume of stack emissions.

The operation of the generators will be limited to the 'Worst-Case' scenarios, as below:

- Monthly testing for a duration of 15 minutes at full load totalling to 3 hours/year; and,
- 6 monthly testing for a duration of 6 hours – totalling to 12 hours/year.
- Emergency operation of 88 generators operating for a maximum duration of 92 hours/year.

As set out in Section 7.1.1 maintenance of the engines in accordance with an approved service schedule will ensure that emissions remain within manufacturers stated limits.

Based on the information available from Ofgem20, the Site is connected to connected to a reliable DNO network (SSE) and the actual average minutes lost per customer per year is 51.4 minutes (See also Section 7.7).

No further mitigation measures are required.

6.2 Emissions to Water and Sewer

Rainwater run-off from containers, roofs and hardstanding will be discharged to surface water drainage. This will be directed to the drainage system for the wider data centre site. This drainage system includes an oil interceptor prior to discharge into the local surface water network.

There are collection gullies located within the gantry area for fuel runoff and washdown within the plant area where the back-up generators will be located. All run-off from this area will drain to the on-site surface water drainage system prior to off-site discharge via a full retention interceptor connecting to the existing surface water sewer system which joins the wider municipal system at a connection at Uxbridge Road.

6.3 Noise and Vibration

A Noise Impact Assessment (NIA) to support the application for the Environmental Permit (EP) is included as Appendix F. This provides details of the assessment of noise impacts from the operation of the installation. The outcomes of the assessment identify that the proposed development is likely to be acceptable from a noise perspective, providing that plant is constructed and operated in accordance with the proposed plant noise control strategies (see section 6.3.3 below).

The assessment has concluded that the operation of the installation is compliant with the relevant external noise planning condition imposed by Slough Borough Council and has acceptable noise emissions given the likely frequency of operation and hence complies with the requirements of the Environmental Permitting Regulations.

Noise predictions have been carried out in the noise-modelling suite Cadna/A, in accordance with the ISO 9613 prediction methodology. The predicted noise levels at the nearest noise-sensitive receptors have then been assessed against the limiting criteria presented under planning. The following scenarios have been assessed:

- Normal Operation – Daytime
- Normal Operation – Night time
- Emergency Operation – Power Failure
- Emergency Operation – Transformer Failure

Additionally, operational noise levels have been predicted for HGV deliveries and car parking. The predicted noise levels were assessed against the operational noise requirements set out under planning.

For the purposes of the environmental permit application, only the daytime normal operation and emergency power failure operations comprise assessment of the proposed generators. The daytime operation includes generator testing, and the power failure operation includes all generators running simultaneously to maintain power to the data halls.

6.3.1 Noise Assessment Criteria

A number of policy, standards and guidance documents have been used to inform the acoustic design of the scheme and develop noise assessment criteria. These include:

- National Planning Policy Framework;
- Noise Policy Statement for England;
- Planning Practice Guidance – Noise;
- British Standard 8233:2014 – Guidance on Sound Insulation and Noise Reduction in Buildings;
- British Standard 4142:2014 – Method for Rating and Assessing Industrial and Commercial Sound;

- British Standard 5228:2009 – Code of Practice for Noise and Vibration Control on Construction and Open Sites, and;
- Local Authority Requirements – Slough Borough Council.

6.3.1.1 Normally Operating Plant and Operational Noise

The noise impact assessment was undertaken based on the criteria presented under the grant of planning permission. The design criteria and operational parameters of the data centre were required to meet the following:

a) The scheme demonstrates:

   i. how the overall sound rating level from normally operating plant will not exceed 2dB(A) above the background noise levels at existing noise sensitive receptors; and

   ii. how noise levels from normal external operations will not exceed 55 dB $L_{Aeq(1\ hr)}$ during the daytime (07:00 – 23:00); or 45 dB $L_{Aeq(1\ hr)}$ during the night-time (23:00 – 07:00); or 60 dB $L_{Amax(15\ mins)}$ during the night-time (23:00 – 07:00) as determined by measurement or calculation at free field locations representing facades of dwellings at existing noise sensitive receptors.

b) Cumulative noise from the operational use of the commercial development will not exceed 2dB(A) above background noise levels at noise sensitive receptors. Noise levels from external operations will not exceed 55 dB $L_{Aeq(1\ hr)}$ during the daytime (07:00 – 23:00); or 45 dB $L_{Aeq(1\ hr)}$ during the night-time (23:00 – 07:00); or 60 dB $L_{Amax(15\ mins)}$ during the night-time (23:00 – 07:00) as determined by measurement or calculation at free field locations representing facades of existing noise sensitive receptors.

The assessment was made in accordance with BS 4142:2014+A1:2019 and BS8233:2014 Guidance on Sound Insulation and Noise Reduction in Buildings. The approved noise mitigation scheme will be fully implemented in the construction and operation of the development and thereafter retained indefinitely.

The acoustic performance specification for external plant which operates under normal conditions, which includes the generators under test conditions, has been developed to ensure that the limiting criteria set out under planning are achieved.

6.3.1.2 Emergency Operation

The planning condition does not set out noise criteria for emergency conditions. If there is a power failure, an emergency operating condition will activate where all generators run simultaneously to provide continuous power to the data halls. An alternative emergency scenario would occur if a substation transformer fails; higher substation noise levels are expected if this occurs. These scenarios will only occur in the very rare case that a power outage occurs, or a transformer fails.

The emergency scenarios are not considered under the planning condition noise criteria for 'normally operating plant' but have been discussed in detail and agreed with Slough Borough Council. The predicted emergency noise levels have been presented in the NIA report and are compared against BS 8233 residential guidelines for internal noise with windows open and closed.

6.3.2 Noise Limiting Criteria

Normally operating external plant noise emissions are to be controlled to meet the requirements of planning when assessed in accordance with BS4142:2014.

The key assessment criteria are as follows:

"The overall sound rating level from normally operating plant will not exceed 2dB(A) above the background noise levels at existing noise sensitive receptors."

Based on the measured background noise levels, the limiting criteria in the Table below have been derived for this plant noise impact assessment.

External Plant Noise Criteria at the Nearest Noise Sensitive Receptors

Receptor Location	Period	Background Noise Level dB LA90	Limiting Criteria for Normally Operating Plant dB LAr,Tr	Limiting Criteria for Emergency Plant LAeq,T
R1 (north)	Daytime (07:00 – 23:00)	43	45	65
	Night time (23:00 – 07:00)	41	43	60
R2 (east)	Daytime (07:00 – 23:00)	54	55*	65
	Night time (23:00 – 07:00)	42	44	60
R3 (south)	Daytime (07:00 – 23:00)	50	52	65
	Night time (23:00 – 07:00)	43	45	60
R4 (west)	Daytime (07:00 – 23:00)	52	54	65
	Night time (23:00 – 07:00)	43	45	60
*The criterion for this location and period is set against the ambient planning condition requirement (55 dBA LAeq,T during the day) as this is more onerous than the background noise level criterion.				

6.3.3 Proposed Plant and Noise Control Strategies

To achieve the limiting noise criteria at the nearest noise sensitive receptors, a series of noise mitigation and attenuation measures have been determined for various aspects of the installation. Where these measures relate to plant and equipment the design specification has been developed to ensure the limiting noise criteria are attainable. In some instances, the basic design parameters have been enhanced with provision of attenuation measures and operating controls. Details are provided in the NIA report and a summary is presented below:

Data hall chillers - Each chiller will be housed within an attenuation pack and, where required, the fan speed will be capped to reduce the fan noise.

Generators - Each generator will be located within an attenuating container and will have attenuation to the intake, exhaust and flue. Under normal conditions, the generators will be subject to regular testing in accordance with Section 6.1.2.

Monthly testing will be undertaken offload and therefore generator noise emissions are likely to be lower than if running at full capacity. As a worst-case scenario, the noise assessment considers generators running at full capacity during testing. The daytime noise assessment is undertaken with the generators operating which are closest to each of the nearest noise sensitive receptors. Onload testing is to be undertaken on one generator at a time. Offload testing may be undertaken on the other generators sequentially (one-at-a-time) whilst one generator is being tested onload. The maximum number of generators being tested at any one time shall be two (one onload and one offload).

Substation Transformer - The transformer cooling banks are proposed to be separated from the transformer core. This arrangement allows for the transformer core to be located within an enclosure. The enclosures will be mechanically ventilated and the enclosure inlets and outlets will be attenuated.

Other Plant Items – A range of requirements depending on the individual plant have been determined. Details are provided in the NIA report.

The assessments of noise related to the generators are summarised in the following sections.

6.3.4 Normal Operation (Daytime) Noise Assessment

The predictions for normally operating plant comprise the following noise sources:

- Chillers at full capacity
- Generators under test conditions
- Loadbank under normal operation

- Substation under normal operation
- Other plant operating normally
- Noise breakout from the data halls

The noise modelling and assessment has demonstrated that the daytime plant rating noise levels are equal to the existing background noise level at the nearest and worst-affected noise sensitive receptor. This is compliant with the planning condition external plant noise criteria are representative of a low impact when taking account the context in accordance with BS 4142.

Full details of the noise assessment are presented in Appendix F.

6.3.5 Emergency Operation (Power Outage) Noise Assessment

The predictions for the emergency power outage operating condition comprise the following noise sources:

- Chillers at full capacity
- Generators under emergency conditions (all operating at full capacity)
- Substation under normal operation
- Other plant operating normally
- Noise breakout from the data halls

There are no statutory criteria for noise emissions during emergency operating conditions in this instance. To assist in the understanding the noise levels that will occur during the emergency condition, predictions have been made of the worst-case plant noise levels at the receptor facades (façade incident levels), estimations of the internal noise levels within the residential receptors have then been made where windows are closed, and where windows are partially open. This approach was discussed and agreed with Slough Borough Council.

Exact predictions of noise break-in to the residential receptors would require detailed knowledge of the receptor's building envelope specifications, and internal room dimensions/finishes. This level of detail is not available, and therefore assumptions are made with regards to the reductions achieved in both scenarios.

Standard double glazing is known to achieve a sound reduction index of approximately 30 - 34 dB R_w. The external walls should achieve a higher sound reduction performance than the windows. As a typical worst-case, a reduction in external noise break-in of 30 dBA has been applied where windows are closed.

A typical reduction of 15 dBA has been applied where the receptor's windows are open. This value is applicable to partially open windows and is taken from a range stated in the 1999 version of BS 8233. This value was confirmed as suitable by SBC in the pre-applicable meeting.

The predictions presented in the noise impact assessment demonstrate that internal ambient noise levels resulting from data centre operation during a power outage are expected to meet the BS 8233 guideline for levels during the daytime (35 dB $L_{Aeq,T}$) and night time (30 dB $L_{Aeq,T}$) periods when windows are closed.

The BS8233 guideline for internal ambient noise levels will be exceeded if residents have their windows open. However, it should be noted that "reasonable" daytime internal ambient noise levels are predicted with windows open at receptors R1 and R3.

This assessment represents the worst-case scenario and assumes that the emergency operating condition will occur for the entire daytime or night time period which is, in reality, unlikely to happen.

Significant adverse impacts on health or quality of life are not expected as a result of the predicted noise levels during the power outage operating condition. It is considered reasonable for noise levels to exceed the BS 8233 guidelines for brief and rare occurrences, whilst ensuring that residents can achieve internal noise levels which are suitable for sensitive uses (such as sleeping) by closing their windows.

It should also be noted that the internal ambient noise levels within receptors, based on the measured existing external noise levels are predicted to exceed the BS 8233 guideline levels at all receptors with windows open,

meaning that the residential dwellings affected are likely to already require closed windows to achieve suitable internal ambient noise levels. The full assessment is detailed in the noise impact assessment in Appendix F, and has been agreed in full with Slough Borough Council.

6.4 F Gases

According to the Environment Agency guidance, Data Centre FAQ Headline Approach, version 11.0 H.Tee 11/5/20 – Release to Industry, where F-gases are used directly under the combustion aspects of the permitted activity (e.g. switchgear) their use falls within the remit of the EPR permit (for notifications and management).

In respect of the medium voltage (MV) system the MV circuit breakers will comprise Vacuum type (VCBs) and as a result will not include Sulphur hexafluoride SF6 as the insulating medium. This includes the main MV switchboards and Ring Main Units.

The use of Fluorinated gases (F-gases) for other cooling applications such as server room cooling are not strictly under the permit. However, as part for the site EMS,the operator will maintain an F-gas register for the data centre. The register will detail each refrigerant-containing unit, the make, model and serial number, refrigerant type and charge, the global warming potential (GWP), carbon dioxide equivalent (CO_2e kg), maintenance/leak test frequency and refrigerant used per year.

Any units containing refrigerants will be subject to regular maintenance and leak testing; these requirements will be included in the site's PPM system. Maintenance and testing will be undertaken by an approved external specialist contractor; copies of the certificates of the engineers qualified to install, maintain and service refrigeration equipment will be maintained on file by the operator.

Leak detection and maintenance records will be maintained and will include details of the quantity of refrigerant used to recharge the units, date of recharge and leak re-test for those assets where leaks are identified.

7. BAT Assessment

The assessment for the implementation for Best Available Techniques (BAT) at the data centres is based on the following:

- the latest version of the 'Data Centre FAQ Headline Approach, Draft Version 11.0 H. Tee 11/05/20 – Release to Industry', provided by the EA; and
- with respect to technology selection, Department of Energy & Climate Change, Developing Best Available Techniques for Combustion Plants Operating in the Balancing Market, Final Report, June 2016.

The following section provides supporting information relating to:

- The Operating Regime
- Engine configuration and plant sizing;
- Grid reliability and built in redundancy; and
- Stack configuration.

7.1 Data centre BAT - Operating Regime

7.1.1 Planned Maintenance and Testing

During operation for planned testing/maintenance at the data centre, the back-up generators will each operate typically for 3 hours per year; this is notably below the 50 hour per annum data centre BAT requirement. Two selected engines will also be run for a 6 hour period every 6 months, leading to a further run-time of 24 hours / year.

In the event that electricity is not available from the local transmission network (e.g. brown- or black-out) the back-up generators will be operated to deliver the required data centre customer load.

Whilst emergency operation (if required) would increase the total operational hours of each back-up generator, it is extremely unlikely that operation of any single back-up generator would exceed 500 hours per annum (this being the definition of an 'emergency' unit).

The back-up generators provision includes for a level of redundancy to the back-up generators system such that, even in a worse case blackout scenario, whilst all back-up generators would start up they would not operate at full capacity; the operational capacity of the back-up generators at the time of a blackout would be dependent on extent of facility's IT load at the time. Should a back-up generator fail the engine will be covered by all the remaining engines, which will operate to share the required IT load at that time.

Emergency operations are taken to include unplanned hours required to come off grid to make emergency repair of electrical infrastructure within the data centre.

The Operator will notify the EA:

- In advance of planned outage/maintenance of the local transmission system that is expected to exceed 18 continuous hours; and
- Upon an incident of unplanned continuous outage that exceeds 18 hours.

During planned maintenance and testing the back-up generators will each be operated for less than 50 hours per year.

The planned maintenance and testing regime for the back-up generators is scheduled to ensure that the impact on air quality as a result of the diesel combustion emissions is minimised.

The planned operating regime for the back-up generators (i.e. testing and maintenance) at the data centre is presented below:

The diesel generators shall only be used in the event of a power supply outage, and in accordance with the following diesel generator testing regime:

- Monthly testing for each generator for a duration of 15 minutes at no load, equating to 3 hours per generator / year; and
- 6 monthly testing for a duration of 6 hours with the maximum number of generators being tested at any one time being 2 (one generator offload and generator one at load). This equates to a further run time of 24 hours over the course of a year.

The testing shall only be carried out during the daytime (07:00-23:00). The diesel generators shall only be used in accordance with the above details.

Based on the above the overall operational hours for planned maintenance and testing per year for all back-up generators will be 186 hours.

7.2 Elective Electricity Generation

The back-up generators at the data centre will not be operated for elective electricity generation.

7.3 Operating Regime Time Limit

The air emissions modelling completed has predicted that operation of the back-up generators for the planned maintenance and testing regime of 3 hours per back-up generator per year, will not result in adverse impacts on air quality. The operator will therefore not operate the back-up generators for more than these hours per year for the purpose of planned maintenance and testing.

7.4 Choice of Technology

Reference to the EA Data Centre FAQ Headline Approach, Draft Version 11.0 H. Tee 11/05/20 – Release to Industry publication section 1.2 states:

We accept that oil fired diesel generators are presently the default technology for standby generators in data centres. However, the permit application still requires a BAT discussion detailing the choice of engine, the particular configuration and plant sizing meeting the standby arrangement (e.g. 2n).

Diesel-fired back-up generators have been chosen for the provision of emergency back-up energy in the event of a black- or brown out at the facility. A BAT assessment has been undertaken which compares diesel back-up generators to other available technologies to support the chosen technology.

The following key requirements for the back-up generators to provide emergency back-up electricity have been considered for the selected technologies:

- Start-up time;
- Reliability;
- Independence of off-system services; and
- Causing the least environmental impact.

A comparison of the available technology types is presented in the table below. This review has been based on published information including a report prepared by DECC (Department of Energy & Climate Change, Developing Best Available Techniques for Combustion Plants Operating in the Balancing Market, Final Report, June 2016) together with industry experience. Unless otherwise stated figures are reported at oxygen reference values of 15%.

	Combined Cycle Gas Turbines (CCGT)	Open Cycle Gas Turbines (OCGT)	Aero Derivative Gas Turbines[13]	Gas Engines	Diesel Engines
Process Description	CCGT technology uses a primary gas turbine coupled to a secondary steam turbine. A CCGT power plant uses the exhaust heat from gas turbines to generate steam with a heat recovery steam generator. The produced steam is then fed to a steam turbine to provide additional power, either running a generator or as a mechanical drive.	OCGT consist of a compressor, combustion chamber and gas turbine. They differ from CCGTs in that they operate without the secondary component to recover heat. Air is fed into the compressor, pressurised and then passed to the combustion chamber where fuel is added and combusted. The hot exhaust gas turns the turbine blades and energy is converted to electricity.	Aeroderivative gas turbines are similar to open cycle gas turbines but offer greater reliability, efficiency and flexibility. Based on advanced aircraft engine technologies and materials, they are significantly lighter, respond faster and have a smaller footprint compared with their heavy industrial OCGT counterparts and are able to operate under wider ranges of load and start up and shut down quicker than other turbines.	An internal combustion engine injects a mixture of fuel and air into a combustion chamber, where a piston compresses the mix. A spark plug ignites the fuel, driving the piston down and turning a crankshaft. The crankshaft, in turn, spins the generator's rotor in an electromagnetic field, generating an electric current.	Diesel engines work in a similar fashion to gas engines with the key difference being that diesel fuel is injected into the cylinder after compression of the air has taken place, and automatically ignites as a result of the high temperature of the compressed air.
Start-Up Time	1 – 3 hours	15 - 30 minutes	< 10 minutes	< 10 minutes	< 5 minutes
Thermal Efficiency (LHV%)	58.8-60.7	38.3-39.9	35-39	35.0-45.0	35.0-37.0
Notes	The secondary steam turbine increases the start-up time of the facility, as it requires slow warming. The complexity and footprint of a combined cycle, combined with the efficiency of steam cycles only being high at relatively large capacities means that CCGT systems are only suitable for large facilities (c.100MW+)	The significant amount of heat lost in the exhaust gas makes open cycle gas turbines significantly less efficient than combined cycle systems.	As with the open-cycle gas turbine, heat loss in exhaust gases means these systems are not as efficient as other options. Certain enhancements can be added, e.g. steam injection, but these are relatively novel and difficult to apply in a non-continuous scenario.	Gas engines are proven, reliable technology and are known to perform well and emit relatively low amounts of NOx, SOx and particulates when compared to diesel fired engines.	Diesel engines, unabated, emit relatively high amounts of SO2 and particulate matter as well as NOx. The use of low sulphur fuel, catalysts and particle filters can reduce this but diesel engine emissions are considerably higher than other options.

7.4.1 Technology Selection

7.4.1.1 Gas Turbines

CCGTs are not considered BAT for the provision of emergency/standby power. This is due to their lengthy start up times and their size limitations; the efficiency of steam cycles being relatively low at small capacity and the overall system complexity being more appropriate to larger size installations.

[13] GE Power Systems, Aero Derivative Gas Turbines – Design and Operating Features

OCGTs have relatively high capital investment, operating and maintenance costs and lower thermal efficiencies than can be achieved by CCGTs and gas engines.

Aero derivative gas turbines can achieve suitably short start-up times of as low as one minute, however they suffer from relatively low efficiencies compared to engines and the enhancements which have recently become available to improve these are relatively novel and unproven. This is especially applicable for non-continuous operation, where steam or water injection may become a problem as a result of potential condensation within turbine sections.

7.4.1.2 Reciprocating Engines

Reciprocating engines perform well in terms of their thermal efficiencies. At the upper end of their efficiency range, gas engines have higher thermal efficiencies than diesel engines and OCGTs.

Reciprocating engines also have shorter start up times and are thus more suitable for the provision of emergency/standby power. Under standby conditions, higher emissions are produced, including NOx, SO2 and Particulate Matter as soot.

Gas engines benefit from lower NOx emissions than diesel engines and can utilise gas delivered by the national gas grid, avoiding the additional transport and fuel storage issues associated with diesel systems.

Reciprocating engines fired on diesel fuel oil have a high response (i.e. low start-up duration) and good independent performance reliability due to the on-site storage of diesel fuel in sufficient quantities, which will be managed and controlled by the facility, with the option for fuel oil to be sourced from more than one supplier for delivery to the site. Diesel-fired engines do have a large number of moving parts which can be subject to failure and require regular ongoing maintenance to ensure reliability, however these moving parts can be readily obtained and replaced and are 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.

When compared to gas-fired generators diesel engines produce polluting emissions to air, most notably NOx and particulate matter, which can impact local air quality if operated for prolonged periods of time.

7.4.2 Final Choice of Engine

From the above options, and considering all the aspects required of the plant to provide emergency/standby power for the data centre, diesel engines have been determined as BAT on the basis that:

- Proven technology for providing reliable power supply
- These engines provide a fast response speed to the required load; as stated previously, fast start-up of standby generators for data centre is fundamental as an almost instantaneous supply of electricity is required in the event of power loss to the site.
- Diesel engines have low maintenance costs and replacement parts are readily available.
- The need for a reliable supply of fuel (diesel) is essential to ensure reliance, the on-site storage of sufficient quantities of diesel fuel provides the required level of independent performance reliability.
- Space requirements

The datacentre operator requires on-site energy storage to provide the facility to run for up to 92 hours, this is based on 24 hours on-site fuel storage for each back-up generator plus the provision of refuelling the belly tanks to enable continuous operation for 92 hours in the event of an unplanned emergency situation.

The storage of gas on-site as a fuel source will not be possible due to restraints on available space, additionally there are significant health and safety risks associated with such storage. As such, there will be reliance on an off-site supply of gas, which would have to be provided to the site via a pipeline which would be operated and maintained by others. Should this supply of gas be interrupted there will be no emergency back-up generation for the data centre, and as such would not meet the resilience requirements of the facility.

7.5 Engine Configuration and Plant Sizing

As stated in section 7.4.2 above a diesel fuelled engine has been chosen due to the ability to store the required volumes of diesel on site and therefore maximise energy security in the system. EA draft guidance accepts that diesel generators are currently the default technology for standby generators at data centres[14].

The specific engines to be used at the site will conform to emission standards 'TA-Luft 2g' or Tier II USEPA as required by the draft EA guidance. 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% O_2).

Calculations (air and noise emissions) within this application have been based on the Caterpillar's CAT3516E generator set as a typical example of the engines that will be used.

The size of the engines has been selected in order to ensure fast start up and shut down can be achieved as this is a fundamental requirement of the emergency back-up nature of the generators.

Each generator shall be installed within a dedicated weatherproof acoustic enclosure. The complete generator system shall include the diesel generator sets, weatherproof enclosure, engine control panels, exhaust silencers and exhaust flue, air intake and discharge attenuators and a 24hr belly tank.

Each generator shall be supplied with lube oil storage sized to support continuous engine operation for a minimum of 24 hours at full design load. The lube oil must be able to be readily re-filled when required and must include low and high warning alarms.

The starting batteries shall be of the heavy-duty low maintenance lead acid type.

Each generator acoustic enclosure shall be manufactured based upon a standard container built generally in accordance with ISO 8323. Enclosures shall be sized to ensure full access can be gained to the engine and its parts for safe and effective maintenance in situ. Bespoke enclosures shall be used where adequate performance and access cannot otherwise be achieved.

Maximum emission levels shall not be exceeded at any level of power output, with any acceptable fuel type or any allowed ambient conditions. Fuel oil must conform with all EU standards. Emissions optimized sets are to be provided to maximise running hours for site use when fully commissioned.

Where fuel pipework and tanks are provided, they shall conform to the UK and European Standards.

In the event of one generator failing the full design load will be supported by virtue of the distributed redundant LV distribution.

Generally, the control and operation of the transfer between generator and utility supply will be by the controller and PLC within the LV switchboard.

The generator set shall consist of an engine directly coupled to an electric generator, together with the necessary switchgear, controls and accessories, to provide electric power for the duration of any failure of the normal power supply.

7.6 Energy Efficiency

The engines have an efficiency of approximately 42%. The EA guidance refers to an assumed efficiency of 35%[15]. There are no BAT-AEELs that apply to this classification of engine as the installation is not a large combustion plant as defined by the IED. In addition, the engines will be operational for less than 1,500 hours per year which is the threshold for BAT-AEELs to apply to large combustion plants. As such the engine to be installed are expected to exceed the expectations of the EA given the type of technology being used.

[14] Data Centre FAQ Headline Approach, version 11.0 H.Tee 11/5/20 – Release to Industry

[15] Data Centre FAQ Headline Approach, version 11.0 H.Tee 11/5/20 – Release to Industry

Given the use as emergency back-up supply it is not feasible to recover heat from the process or to implement other measures which may increase efficiency.

7.7 Grid Reliability and built in Redundancy

Power for the data centre site will be supplied from the local Iver Primary sub-station; which is owned and operated by Scottish and Southern Electricity, which is fed from the National Grid system. Scottish and Southern Energy and the National Grid both operate their transmission systems in accordance with the Security and Quality of Supply Standard which is a requirement of its Transmission Licence. In accordance with this standard, a level of redundancy is also built into the transmission system.

The overall reliability of supply for the National Grid Electricity Transmission (NGET) System during 2019 – 2020 was 99.99997%, following nine loss of supply events across the transmission network; 54.5MWh supply lost in a period of 180TWh (180,000,000MWh) supplied.

The power distribution system; on-site, starting from the dual 132kV feeds into the site, through the medium voltage substation down to the low voltage distribution, is designed to be safe, reliable, redundant, robust, efficient and have in-built redundancy.

The site operator has designed and is building an electrical network system with redundancy built-in throughout, at various levels. The primary power source to the site shall be dual redundant 132kV connections, with each supply sized and rated to provide the full site supply requirements if required due to a fault or loss of the other supply. This provides security and reliability to the incoming connections. In normal scenario, each connection will provide 50% of the supply, however each supply will automatically take 100% of the load in a fault or loss of supply event.

Each supply connection to the site will be from separate sources upstream of the site with 2 separate cables from 2 separate feeders; therefore, in the event of a loss of supply from a single source, 50% of the site is still on the alternative source, while the remaining 50% is on back-up emergency generators temporarily until the site's own distribution system can be rearranged to resume supply from the available source. This arrangement stays in place until the failed source has restored supply, at which point power returns to the two supply sources. This arrangement has been designed in accordance with connection agreement and compliance with transmission and distribution regulations (and providers).

The on-site MV infrastructure is overall designed on a 2N concurrently maintainable basis. With this system, any one component, or any one distribution path can be out of service without affecting site and building operations. Similarly, for the grid connection to the data centre to fail, it would require a number of failures to the upstream distribution network to occur simultaneously. The requirement to run back-up generators is therefore minimised.

The MV system within each building consists of dual MV switchboards; in a 2N scenario, which are fed from the on site substation; with one ultimately fed from one of the incoming utility connections and the other from the other connection. Each feed and switchboard is capable of providing 100% of the building load if required. MV rings shall be provided to the downstream LV systems from the MV switchboards, with one connection originating at one switchboard and the other connection at the other switchboard. The ring distribution network will be designed to enable the electrical load to be balanced across the network. In the event of a fault at the RMU (downstream Ring Main Unit serving the load) or interconnecting cable, the upstream connection will operate to clear the fault; the affected downstream low voltage (LV) system will be supported by the respective Back-up generators (Standby Back-up Generator) while the location of the fault is investigated, isolated and an un-affected section of the ring re-energised.

The operator will also undertake a regular and robust infrastructure inspection, preventative maintenance and testing programme involving both their staff and various specialist vendors. The specific frequency of a maintenance task will be determined by the equipment manufacturer's recommendations (e.g. generator maintenance) or as required by legislation (e.g. Fluorinated gases leak testing and maintenance).

The operator has an integrated Building Management System (BMS) and an Electrical Power Monitoring System (PMS): these are additional control tools which are used to monitor physical assets and equipment status and performance. The BMS/PMS presents real time and historical data, providing valuable performance metrics such as running time, output functions etc., ensuring that the data centre assets and plant are functioning correctly. Alarms are set up in the BMS/PMS to alert the Operations and Environmental teams of any issues with systems and equipment.

The measures above will minimise the potential for emergency operation of the diesel generators, reducing the overall environmental impact from the installation; in the rare event that they are triggered to operate in emergency.

7.8 Air Emissions

Discussion of the air emissions impacts is presented in 5.1 and 6.1. The air quality assessment (AQA) at Appendix D has assessed the long term and short-term impacts of emissions to air and provides detailed assessment.

7.8.1 BAT Assessment for Air Emissions

The 'Data Centre FAQ Headline Approach' specifies the BAT emissions specification for new diesel-fired reciprocating engines as 2g TA-Luft or US EPA Tier II (or equivalent standard).

All 52 back-up generators supplied comprise Rolls Royce MTU DS3300 diesel generating set with MTU 20V4000G34F NOx turbocharged diesel engine and Leroy Somer LSA53.2 L14 / 4p brushless synchronous alternator.

The manufacturer specification for each engine type confirms that the engine models are optimised to relevant standards and are therefore considered to be compliant with BAT.

Retrofit abatement techniques for existing installations for engine emissions such as selective non-catalytic or catalytic reduction (SNCR or SCR) would not normally be expected for standby plant to mitigate the emissions for standby/emergency operation.

Based on the testing and emergency operation scenarios of the air quality assessment and modelling it is considered the operations of the generators would not lead to significant impact on local air quality:

7.8.2 Stack Configuration

Each back-up generator will have a dedicated stack to aid the dispersion of the engine flue gases (for further details, please see the Air Quality Assessment (AQA) in Appendix D.

For this facility, routine operation of the engines will be for testing only. For the purposes of testing each engine will be run sequentially in order to minimise air quality and noise impacts. Therefore, a multi-flue stack arrangement would not provide any significant benefit.

Further, in all likelihood as the stack height is determined from modelling, if dispersion benefits were achieved with a multi-flue arrangement the stack height determination would have resulted in a lower stack design being put forward. In this case during testing with only one engine operating these benefits would not be achieved and dispersion from a lower stack could be worse.

The stacks will be vertical and located on the roofs of the back-up generator container units. The stack release heights for the back-up generators at the data centre will be 21.95m above ground level (agl).

The site has been developed under the provisions set out by Slough Borough Council under planning. With the heights of the stacks from the back-up generators designed in accordance with planning requirements for development of the site as a datacentre in accordance with planning policy.

The AQA has taken into account the profiles and heights of all the stacks and building downwash impacts at the data centre and has concluded that:

- For planned maintenance and testing significant impacts are not predicted on air quality; and
- For the 92 ‘electrical grid outage’ operational hours, emissions would not lead to a significant effect on local air quality

Further air emissions controls are not considered necessary as, given the very low probability of emergency operation at the site, the overall environmental risk is not considered to be significant (see Appendix B and Appendix d to this submission).

During emergency operation with multiple engines running benefits to the dispersion from combining flues could potentially be achieved. However, emergency operation is not routinely expected, and where required is expected for no more than 92 hours per annum, limiting the potential for significant benefits.

Dispersion modelling for emergency operation has demonstrated that emissions from the diesel engine design with individual stacks screen as insignificant further reducing the potential for significant improvements from a combined flue arrangement. On this basis further modelling to assess potential combined stack arrangements has not been carried out and is not deemed necessary given the limited potential for improvement.

A multi-flue stack configuration will increase capital costs associated with additional and more complex exhaust gas ducting. Further, for plant maintenance there are operational and safety advantages in providing separate stacks as maintenance on one engine will not prevent the operation of the remaining engines. This will allow electricity generation at any time, a significant advantage for a plant designed to provide emergency back-up power at short notice. Furthermore, the footprint of the plant is such that there is insufficient space to accommodate a combined stack structure in one location.

With little potential for any significant environmental benefit from a multi-flue arrangement, combined with additional costs and operational and maintenance complexities, a multi-flue combined stack arrangement is not considered to be BAT.

7.8.3 Air Quality Emergency Action Plan

The operator will look to develop an Air Quality Emergency Action Plan (AQEAP). The AQEAP will detail the management actions to be taken in the event of an emergency outage of the national electricity transmission system that could result in the prolonged usage of the back-up generators which could potentially result in adverse impacts on local air quality.

The operator will liaise with the Local Authority and the Environment Agency to agree actions to be taken in the event of a prolonged outage situation (>18 hours) and a finalised plan will be incorporated into the site’s environmental management system.

The operator will maintain open lines of communication with the Local Authority, particularly to manage any risks that may be identified in the future as becoming significant threats to the local air quality, for example identification of new emissions sources (cumulative impacts) or potential for future site expansion.

7.9 Fuel Storage

7.9.1 Bulk Fuel Storage Tank

The fuel storage for each of the two Data Halls (Buildings A & B) consists of 52no 16,551 Litre (effective volume) double-walled generator belly tanks. Each of the fuel storage tanks is equipped with leak detection sensor which will set off an alarm on the generator control panel, relevant tank control panel and at the master control panels.

The fill operator can monitor the fuel level in the selected belly tank as it is being filled and can cease the fill operation when the required fuel level has been reached. If the operator fails to cease the fill operation the tank would fill until the belly tanks HiHi float switch is activated which would cease the fill operation with a warning light / sounder at the fill cabinet. An overfill prevention valve is fitted to each fill line on each belly tank as a final measure to prevent overfilling the belly tanks.

Diesel will be stored at the data centre in belly tanks which are integral to the individual back-up generators. There will be no bulk storage of diesel at the data centre.

The back-up generator container units at the data centre are shown in appendix A – Drawings.

These areas will be hard surfaced to minimise the risk of percolation of any unplanned diesel releases to the underlying soil and groundwater.

The perimeters of the two Back-up generators compounds will have louvre screening along with Armco galvanised steel vehicle barriers to minimise the risk of vehicular damage to the back-up generator container units within these compounds.

7.9.2 Fuel Transfer Pump & Receiver Tank

Each building is provided with a double skin 1,500 litre bunded fuel oil receiver tank each connected to one of the 2 no. fill points (1no per building) via double skinned pipework.

Each receiver tank contains a cabinet complete that houses the duplex transfer pumps which have been selected to match the expected flow rate from the fuel fill tankers output. Operation of the pumps is monitored by a pulse flow meter and flow switch located in the outlet pipework as well as contactor trip signals. Should a pump fail by either failing to provide flow or by electrical trip, an alarm shall be triggered on the generator control panel. The pumps will operate until the receiver tank reaches low level; at which time they will shut down to prevent air being drawn into the pipe network.

A pressure relief valve and bypass line that dumps back into the receiver tank are included on the transfer pumps combined outlet to control the maximum pressure within the fuel system. The bypass line can be used to test the operation of the pumps without the requirement of sending excess fuel to the day tank.

Once the fuel fill operator has connected their hose to fill cabinet and selected which of the individual belly tanks to fill from the touch screen panel in the fill cabinet, they shall commence the fill operation. Fuel flows from the connection point in the fuel fill cabinet into receiver tank.

The receiver tank has multiple float switches that indicate the receiver tanks fuel level of LoLo, 40% full, 60% full, 80% full and HiHi. Once the 40% float switch is activated (indicating sufficient fuel in tank), one of the transfer pumps begins to operate at low speed to pump fuel to the selected tank via the fuel header and the open motorised valve. When the fuel level within the receiver tank reaches 60% the pump shall increase filling speed. When the fuel level in the receiver tank reaches 80% full the fuel pumps run at full speed to outpace the fill tankers flow rate and begin to drain the receiver tank. The pump speed then decreases in line with the above as the fuel level hits 60% etc. If the fuel level falls below the LoLo float switch the fill operation shall cease as there is insufficient fuel within the receiver tanks.

If the fuel level was to continue increasing above the 80% float switch then the HiHi float switch would activate and cease the fill operation with a warning light / sounder at the fill cabinet.

If the fuel transfer pump failed to operate, function would automatically switch to the identical transfer pump in the duplex system to continue the fill operation from fuel fill system.

The fill operator can monitor the fuel level in the selected belly tank as it is being filled and can cease the fill operation when the required fuel level has been reached. If the operator fails to cease the fill operation the tank would fill until the belly tanks HiHi float switch is activated which would cease the fill operation with a warning light / sounder at the fill cabinet. An overfill prevention valve is fitted to each fill line on each belly tank as a final measure to prevent overfilling the belly tanks.

The operator can then close the motorised valve on the filled belly tank. Select a different belly tank on the fill cabinet touchscreen and begin the new fill procedure in the same way.

The receiver tanks are double skinned with the internal tank venting to the outer skin where it then vents to atmosphere. Leak detection float switches are provided within the outer skins to detect any inner skin leaks or over-filling to send alarms to the generator control panel and the fill point control panels. The generator control panel shall present these alarms to the SCADA RTU for use on the EpMS. Leak detect float switches are also

fitted in the receiver tank pump cabinets. If any spillage is detected in this location an alarm shall sound at the fill point cabinet to alert the fill operator who should cease filling.

Each receiver tank comes complete with an OLE C2020 contents gauge which shall provide detailed fuel level information to the fill point.

7.9.3 Generator Fuel Lift Pump

A fuel lift pump is provided on each generating set to draw the fuel up from the belly tank. The pump is sized to ensure that sufficient fuel delivery is maintained for generator starting only. Once running the generator is able to draw fuel up to 3m without the need for the lift pump allowing for continuous running of the generating set at 100% standby rating at all fuel levels within the belly tank. The generator shall draw and return fuel directly from the belly tank via single skinned pipework located within the bunded canopy. The maximum fuel lift capability of the pump is 5m. The Generator fuel pump sits approximately 1m above the fuel suction line on the belly tank.

7.9.4 Leak detection

Individual vacuum leak detection systems shall be installed within the long runs on fuel fill headers to provide indication if a leak has occurred on the inner pipe that is being contained by the outer pipe.

Normal operation

The vacuum leak detector is connected to the interstitial space via the suction and measuring line. The vacuum generated by the pump is measured and controlled by a pressure sensor. When the operating vacuum (pump OFF) has been reached, the pump is switched off. Due to slight, unavoidable leaks in the leak detection system, the vacuum begins to fall slowly. When the switching value for “pump ON” has been reached, the pump is switched on and the interstitial space evacuated until the operating vacuum (pump OFF) has been reached again. During normal operation the vacuum moves between the switching value pump OFF and the switching value pump ON, with the pump running for a short time and then switching off for a longer time, depending on the tightness and temperature fluctuations in the complete system.

Air leak

If an air leak occurs (in the outer or inner wall, above the liquid level) the vacuum pump switches on in order to re-establish the operating pressure. If the air flow leaking into the pipe exceeds the limited feed flow of the pump, the pump remains on continuously. Increasing leak rates lead to a further increase in pressure until the switching value for alarm ON has been reached. An optical and audible alarm signal is triggered. If solenoid valves are closed, the pump stops.

Liquid leak

In the case of a liquid leak, liquid enters the interstitial space and collects at the lowest point of the interstitial space.

The incoming liquid leads to the vacuum dropping, the pump is switched on and evacuates the interstitial space until operating pressure has been reached. This process is repeated until the liquid stop valve in the suction line closes. Due to the vacuum still present in the measuring line, further leak liquid is sucked into the interstitial space, the measuring pipe and into a pressure compensating vessel. This leads to reduction of the vacuum until the pressure has reached the “alarm ON” level. The optical and audible alarm signal is triggered. Solenoid valves close and the pump stops.

7.9.5 Faults and Alarms

Fire Alarm

Located above the generator is an electro thermal link (E.T.L.) wired back to the set mounted generator control panel. An SQR triggers the fire valve which is in the generator supply line to drop. The following logic sequence triggers if the ETL is triggered; Signal sent to the control panel, signal to the SQR, SQR drops fire valve and the fuel supply to the generators is shut off.

Fire scenario on the generator with the set running:

- Electro thermal link detects elevated temperature, indicative of a fire
- Generator “Fire” indicated on generator controller.
- The SQR drops the fire valves shutting off supply line
- Generator stops

Fault Monitoring

The table below summarises the measures to be provided for monitoring faults and triggering alarms as part of the accident management plan.

FAULT	EFFECT	ALARM
Fuel filter differential pressure switches triggered	Alarm on BMS	Level 3
Fuel pressure relief valves flow switch triggered	Alarm on BMS	Critical
Any bulk storage tank level rises above [95] %	Alarm on BMS	Critical
Any bulk storage tank level rises above [85] %	Alarm on BMS	Level 1
Any bulk storage tank level falls below [50] %	Alarm on BMS	Level 1
Any bulk storage tank level falls below [25] %	Alarm on BMS	Critical
Mismatch in valve command and feedback position	Alarm on BMS	Critical
Any pump fails	Alarm on BMS	Critical
Any fuel delivery pump skids fail	Alarm on BMS	Critical
Fuel polishing system common fault	Alarm on BMS	Level 1
One day tank level below [15]%	Alarm on BMS	Level 1
Two or more-day tank level below [15]%	Alarm on BMS	Critical
Drain tank level below [10]%	Alarm on BMS	Critical
Drain tank level above [95]%	Alarm on BMS	Level 1

7.10 Fuel Fill Station – Fuel Filling

Each building is provided with its own independent fill point cabinets each which shall supply all 26no. belly tanks via pipe in pipe up to their connections to the motorised valves located on each belly tank. These valves connect to individual overfill protection valves and are located within the bunded generator canopies providing an N+1 system. The overfill prevention valves prevent the tanks from being filled beyond their brim-full value of 21,747 l.

Each fuel fill cabinet shall consist of a manual isolation valve (complete with drip tray), non-return valve and fuel fill control panel which shall display the current fuel level of all belly tanks and both receiver tanks.

The fill operator shall connect the tanker to the single connection point in fill cabinet. The touchscreen on the fill cabinet displays the current fuel level for all belly tanks and the receiver tank. The operator selects which of the belly tanks they wish to fill from the touch screen and opens the associated motorised valve via the touch interface. Once open the operator can commence the fill operation. The OLE gauge from the corresponding tank shall provide a signal to the fuel fill control panel (and therefore the fuel fill operator) indicating the current fuel level within the tank. Once filling is complete the operator shall use the touchscreen to close the motorised valve and can either select a new belly tank to fill or disconnect their tanker hose to cease the fill operation.

12.7.4 Tertiary Containment

Tertiary containment will be provided by the contoured hardstanding of the area where the Back-up generators, the receiver station and the fuel road tanker off-loading area will be located, additionally raised kerbing will be present along the western site perimeter and an entrance ramp will be provided.

Any unplanned release of diesel would be prevented from percolating into the ground by the hardstanding; should such a release enter the local on-site surface water drainage system it would be captured by the alarmed interceptor (9,600 litre capacity Class 1 full retention) which will have an automatic shut off device that will activate on detection of diesel in the interceptor (this alarm will be connected to the BMI) preventing the release of diesel to soakaway (the automatic closure devise will also be activated by the BMS in the event of a fire alarm).

In such an event, spillage procedures would be implemented.

The tertiary containment measures will provide adequate containment capacity in the unlikely event that there is a spill/leak of diesel from a belly tank.

Further details of the surface water drainage system and alarmed interceptor are provided in section 7.3 Emissions to Water.

7.11 Preventative and Predictive Maintenance (PPM)

The operator will develop a preventative maintenance system. PPM will be managed and completed by the facilities management personnel and appointed approved third-party specialists, as required. The PPM system will be used to inform facility management personnel of plant status and any system issues.

The PPM system will include the requirement for regular inspection, maintenance and testing of containment on the diesel storage tanks, along with regular checks of the condition of tertiary containment at the site.

The facility will be manned 24 hours a day by data centre personnel.

It is considered that diesel delivery and storage arrangements are BAT.

7.12 Annual reporting requirement in the permit:

The annual report for Data Centres is mainly a summary of how the year was managed; and is best focused on the BAT type aspects on minimising emissions impacts. The following information will be collated and reported:

1) Run hours per engine separately reported as run time for testing and run time for outage (emergency operations);
2) Details of any part-site/whole site blackout test and their scheduling with regards to the AQ modelling;
3) Details of any significant changes to the maintenance testing arrangements and impact on modelling data if appropriate;
4) Details of any grid and internal electric system reliability issues, causes, action taken and follow-up;
5) Confirmation of any notifications of grid outages and requirement to operate under emergency conditions to include total plant emergency hours run;
6) Advising of future plans for example any need to run due to servicing the switch gear, new phases being planned, reconfiguration of generators and similar;
7) Procedure reviews related to the permit;
8) Confirming no incidents (oil spills, F-gas releases etc), and;
9) General aspects of fuel use and energy efficiency.

7.13 BAT Summary

The application has set out the proposed techniques to be operated and these have been considered against BAT and alternatives. The proposed techniques are considered to meet BAT and the operation of the proposed facility is not expected to give rise to significant effects to the environment or human health.

Appendices

Appendix A – Drawings

SLO1X0-SWE-EX-XX-DR-C-0100_P03 – Site Location Plan

LON1X0- SBR- A1- 00- DR Y-0100 – Permit Installation and Emissions Points

LON1X0- SBR- AZ- 00- DR- A- 1000 - General Arrangement Facility A Ground Floor

LON1X0- SBR- AZ- 01- DR- A- 1001 - General Arrangement Facility A First Floor

LON1X0- SBR- AZ- 01- DR- A- 1002 - General Arrangement Facility A Second Floor

LON1X0- SBR- A1- 00- DR- A- 1024 - Facility A Block 1 Ground Floor Assembly Plans - Gantry

LON1X0- SBR- A1- 01- DR- A- 1025 - Facility A Block 1 First Floor Assembly Plans – Gantry

LON1X0- SBR- A1- 02- DR- A- 1026 - Facility A Block 1 Second Floor Assembly Plans – Gantry

SLO1X0-SWE-EX-XX-DR-C-0501 - External Areas Drainage Plan

N

KEY:

- SITE BOUNDARY
- LAND OWNERSHIP BOUNDARY
- RESIDENTIAL DEVELOPMENT BOUNDARY BY OTHERS

NOTES:

1. ALL CO-ORDINATES ARE TO NATIONAL GRID REFERENCE UNLESS OTHERWISE STATED.
2. MAPPING IS BASED UPON THE ORDNANCE SURVEY MAP AND PRODUCED BY PERMISSION OF ORDNANCE SURVEY MAPPING CONTENTS (C) CROWN COPYRIGHT AND DATABASE RIGHTS 2021 ORDNANCE SURVEY 100035207

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SWECO

KEY PLAN:

Rev	Description	Drn	Chck	Date
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P02	ISSUED FOR PLANNING	DE	JF	06/04/21
P01	ISSUED FOR PLANNING	DE	JF	19/03/21

CAMPUS NUMBER & NAME

PROJECT
SLO1X0
SLOUGH ONE

DRAWING TITLE
SITE LOCATION PLAN

yondr
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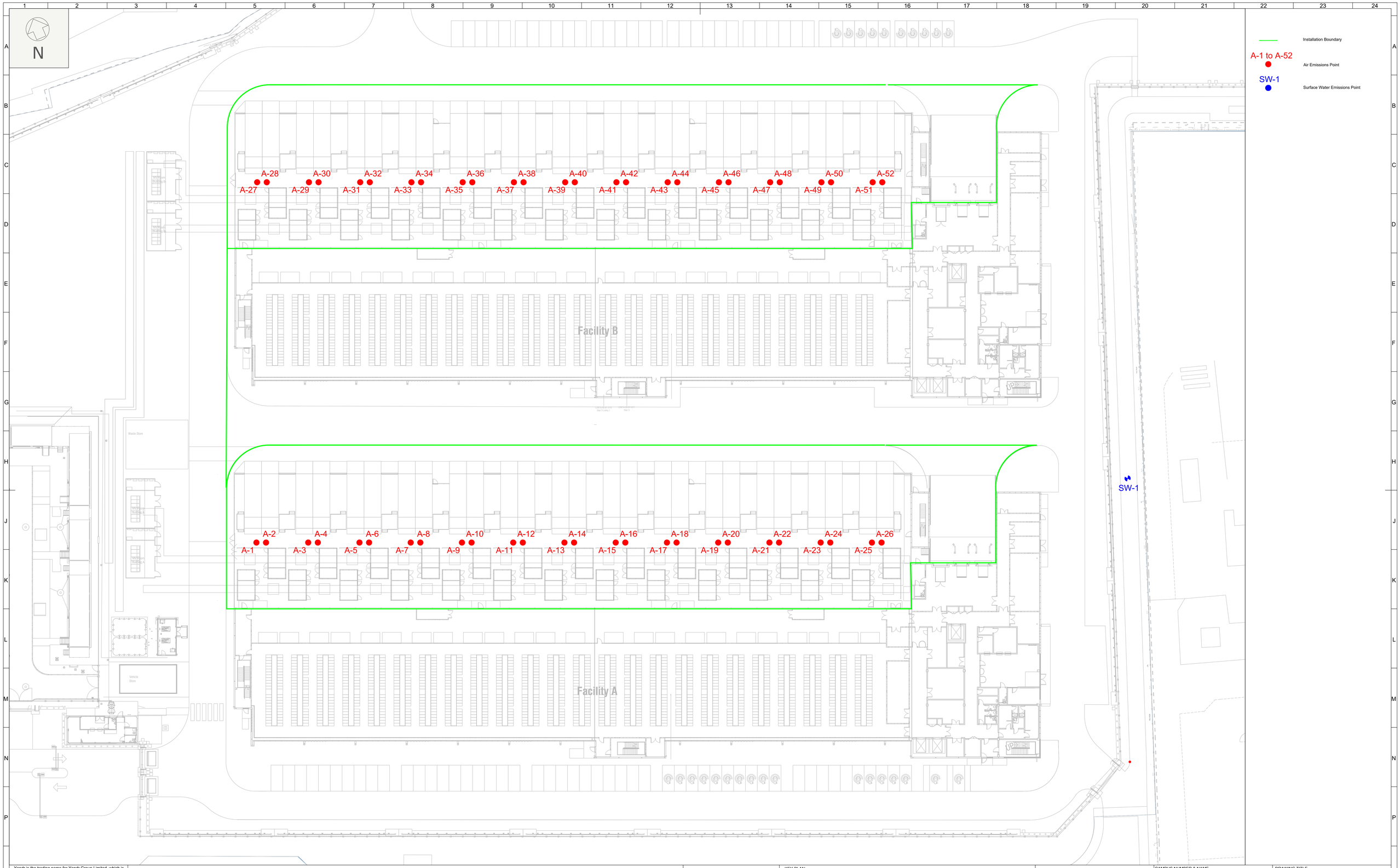
STATUS CODE:
S4 SUITABLE FOR STAGE APPROVAL

STAGE: PLANNING

SCALE 1:1250 @A0

DRAWING NUMBER: SLO1X0-SWE-EX-XX-DR-C-0100

REV P03



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ISG

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KEY PLAN:

Rev	Description	Drn.	Chck	Date
C01	Issued for Construction	DK	TV	15/02/23

CAMPUS NUMBER & NAME
LON1
London One

PROJECT
LON1X0
London One Phase One

DRAWING TITLE
Permit Installation & Emissions Points

STATUS CODE:
A5 - Authorised & Accepted - Construction

STAGE:
Construction

SCALE 1: 250 A0

DRAWING NUMBER:
LON1X0-SWE-AZ-XX-DR-Y-0100

REV
C01

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1 GA FACILITY A GROUND FLOOR
1 : 200

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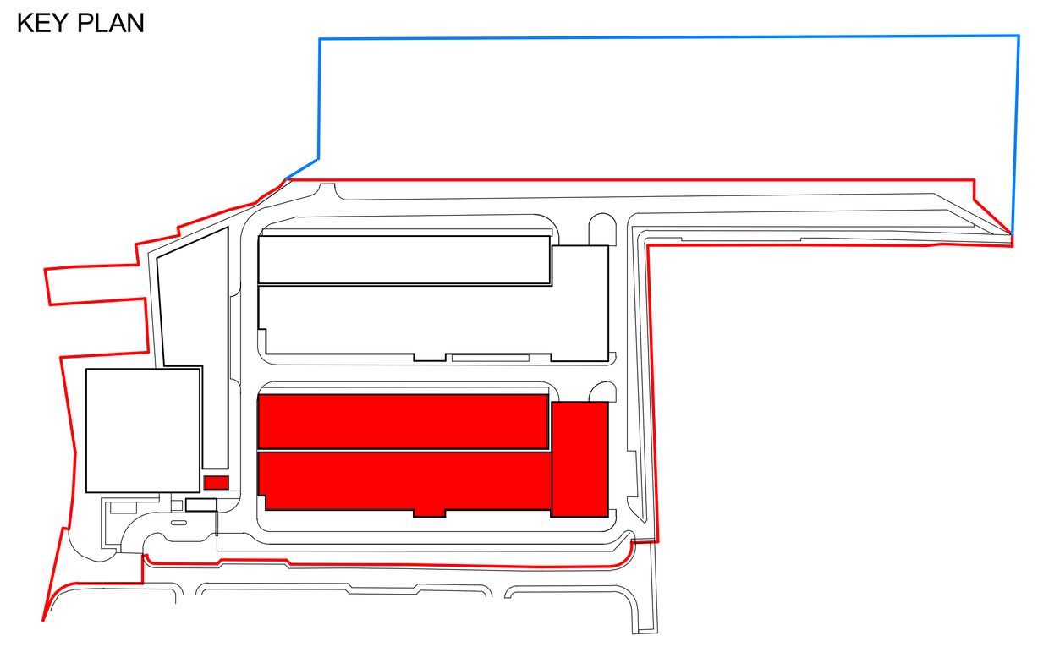
KEY PLAN



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C3	STAGE 5 ISSUE	EB	NL	09/12/2022
C2	INTERIM STAGE 5 ISSUE	NL	SS	07/10/2022
C1	INTERIM STAGE 5 ISSUE	NL	SS	19/08/2022

Campus Number & Name
LON1
London One

Project
LON1X0

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Drawing Title
General Arrangement Facility A Ground Floor

Status Code
A5 - Authorised & Accepted - Stage 5

Stage
Construction Issue

Scale @ A0
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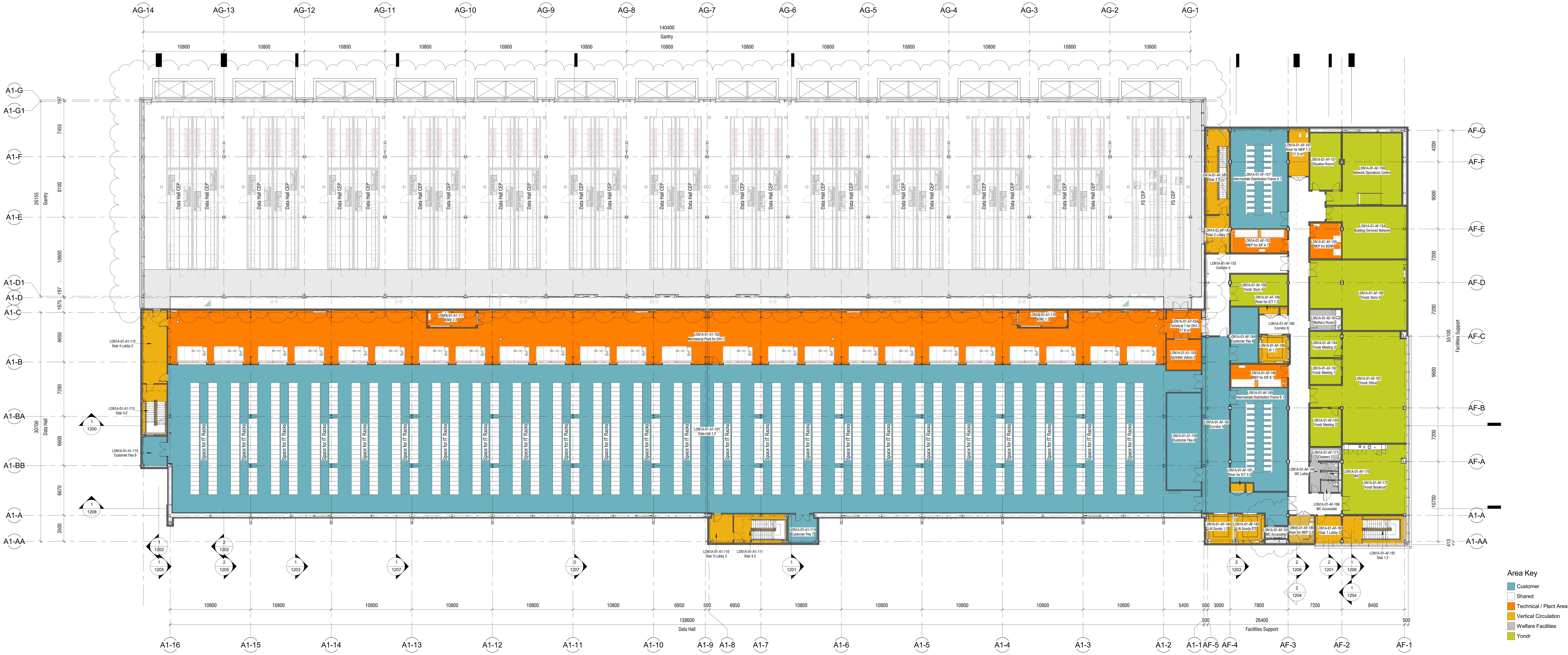
Drawing Number
LON1X0- SBR- AZ- 00- DR- A- 1000

Rev
C4



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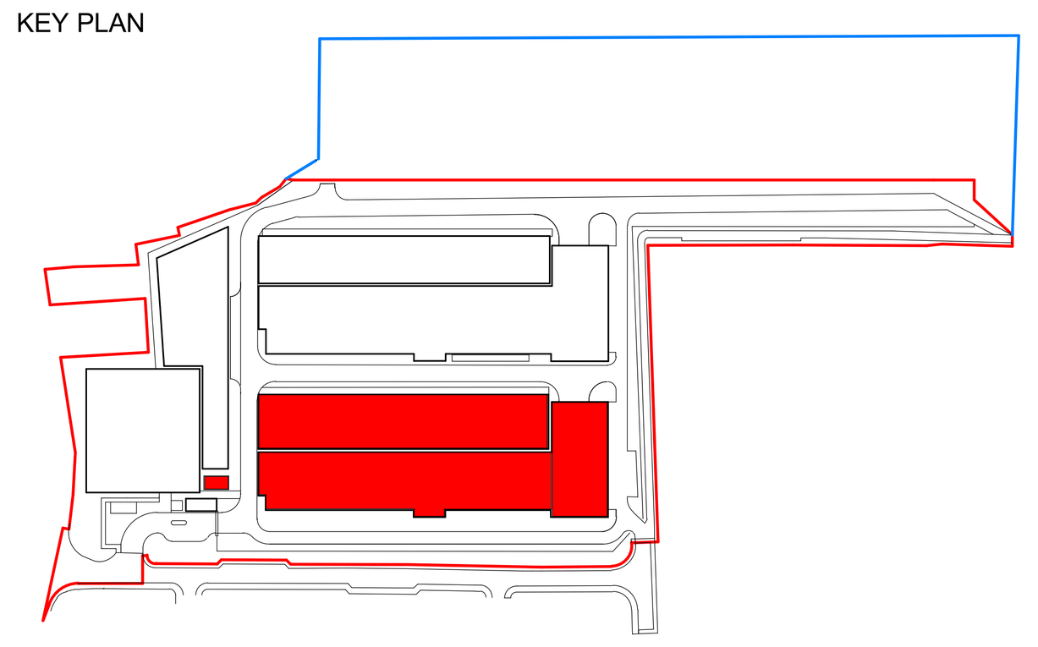

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C2	INTERIM STAGE 5 ISSUE	NL	SS	07/10/2022
C1	INTERIM STAGE 5 ISSUE	NL	SS	19/08/2022

Campus Number & Name
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London One

Project
LON1X0

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Drawing Title
General Arrangement Facility A First Floor

Status Code
A5 - Authorised & Accepted - Stage 5

Stage
Construction Issue

Scale @ A0
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Drawing Number
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Rev
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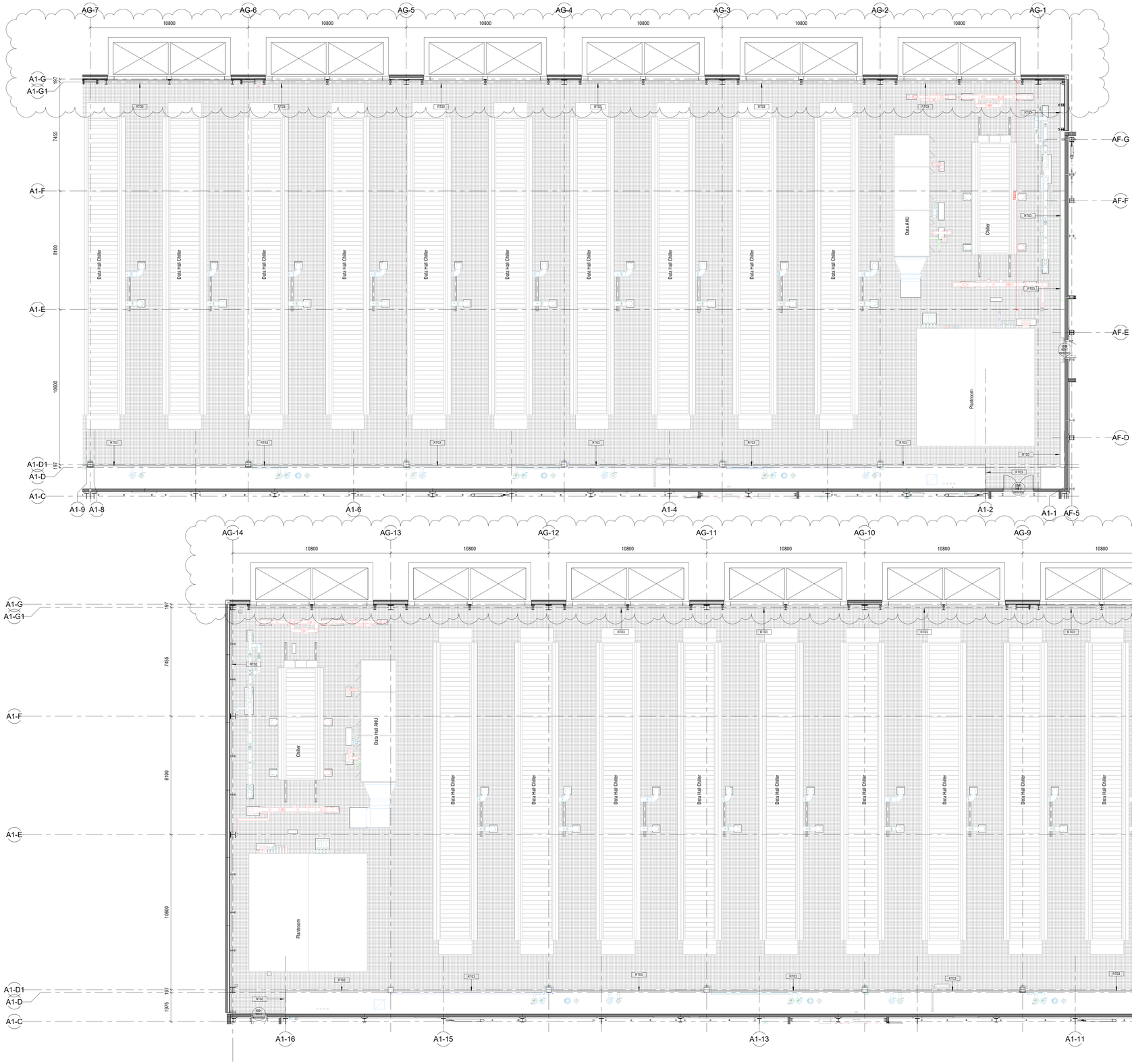

Assembly Plan Legend

- 1200mm Chequer plate to wall base
- Bunding/waterproofing detail at wall base
- Provide Wall 18mm Plywood Patteressing for Wall Units / AV Screens / Fixtures and Fittings from floor to 2440mm FFL
- XX — Setting out dimension
- Slab penetration for services and drawinage. See series A-23 drawings for setting out
- Slab Edge. See series A-23 drawings for setting out
- Step in Slab. See series A-23 drawings for setting out

Wall Tags

W/P HXX / PT XX / W/P BXX

- Wall Head Detail - Ref: DR-A-2222, 2223, 2230, 2231
- Internal partition type - Ref. DR-A-2210
- Wall Base Detail: Ref: DR-A-2224, 2232

Door Tags

ID/ED XX / XXX XX

- Door type - Ref: 31 and 32 Drawing Series
- Door unique identifyer - Ref: 31 and 32 Drawing Series

Window Tags

IW XX / XXX XX

- Window type - Ref: 32 Drawing Series
- Window unique identifyer - Ref: 32 Drawing Series

Partition Types

PT01: Whitewall partition - 100mm Thick

PT04: SR3 rated Security enhanced plasterboard stud partition

PT06: Weldmesh security cage

PT07: Plasterboard stud partition - EI30 - Rw50

PT08: Plasterboard stud partition (moisture resistant) EI30 - Rw50

PT09: Plasterboard stud partition - EI60 - Rw50

PT10: Plasterboard dry lining to external cladding (provide lining above glazed areas if room has glazing)

PT11: Plasterboard stud partition to ceiling height (moisture resistant)

PT12: Whitewall partition - vertically laid -150mm thick

PT13: Shaftwall - EI60

PT14: Double glazed partition up to 3m, studwall partition above

PT16: Plasterboard stud partition - Acoustic - EI90 - Rw59

PT17: Plasterboard bulkhead to ceiling drops

PT18: IPS panel system

PT19: Plasterboard encasement to steel Beams

PT22: Plasterboard encasement to steel columns

PT24: Plasterboard encasement to steel columns - Enhanced acoustic performance

Railing types

RT01: Powdercoated steel railing with vertical bars at 100mm centres and tube handrail

RT02: Galvanized steel key clamp railing

RT03: Galvanized steel key clamp railing with 100mm toe-plate

RT04: Powdercoated steel railing with vertical bars at 100mm centres

Notes:

All rooms that have a water source (such as toilets and sprinkler rooms) have to be provided with floor gullies. All walls surrounding these areas have to be bunded/waterproofed at base.

All dimensions are to face of walls and structural opening of doors

metres 2 4 6 8 10

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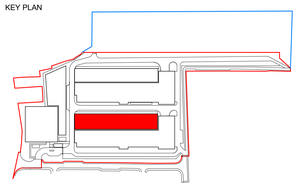
KEY PLAN



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C3	STAGE 5 ISSUE	EB	NL	09/12/2022
C2	INTERIM STAGE 5 ISSUE	NL	SS	07/10/2022
C1	INTERIM STAGE 5 ISSUE	NL	SS	18/09/2022

Campus Number & Name: LON1 London One

Project: LON1X0

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Drawing Title: Facility A Block 1 Second Floor Assembly Plans - Gantry

Status Code: A5 - Authorised & Accepted - Stage 5

Stage: Construction Issue

Scale @ A0: 1 : 100

Drawing Number: LON1X0- SBR- A1- 02- DR- A- 1026

Rev: C3

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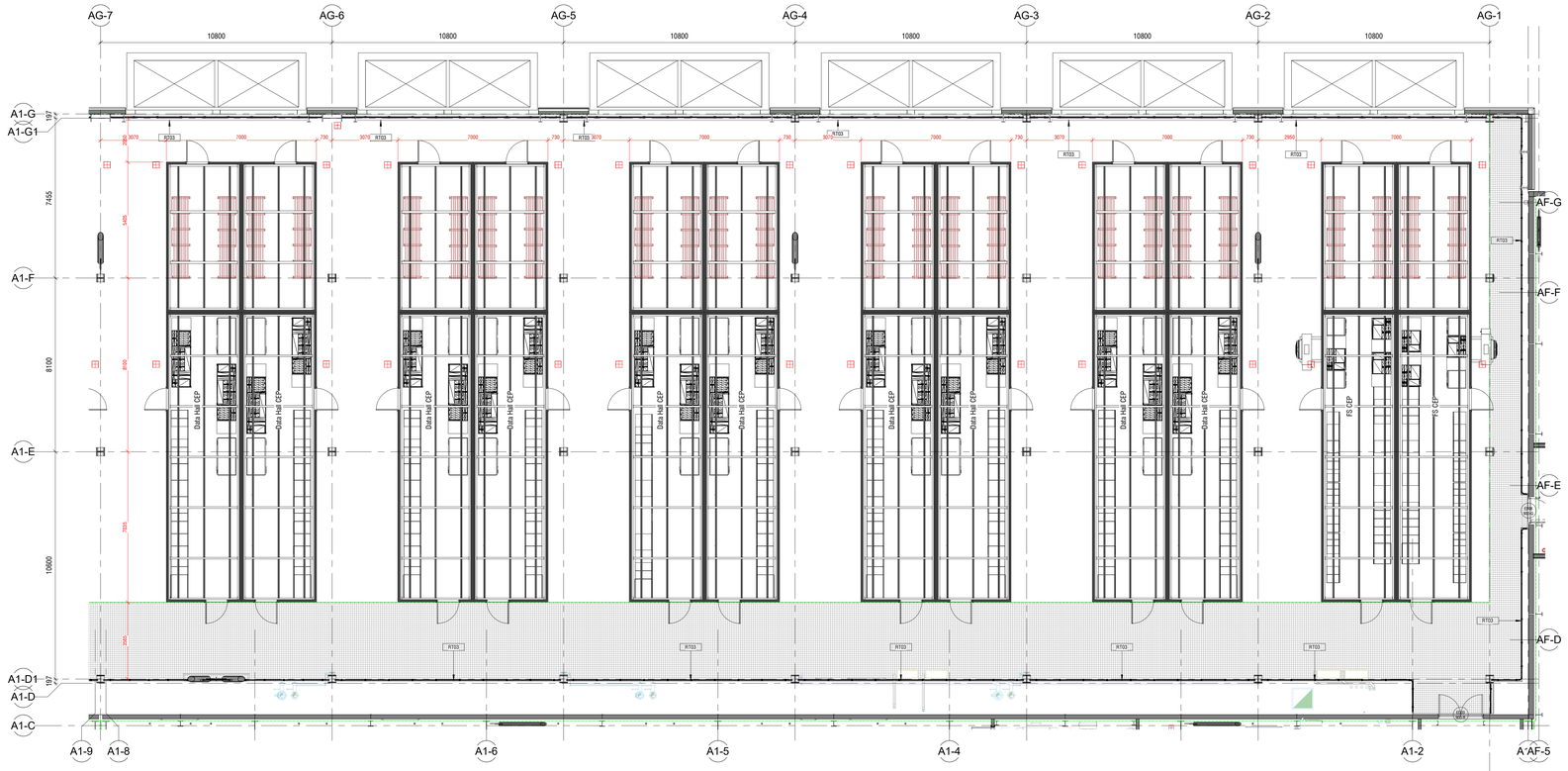

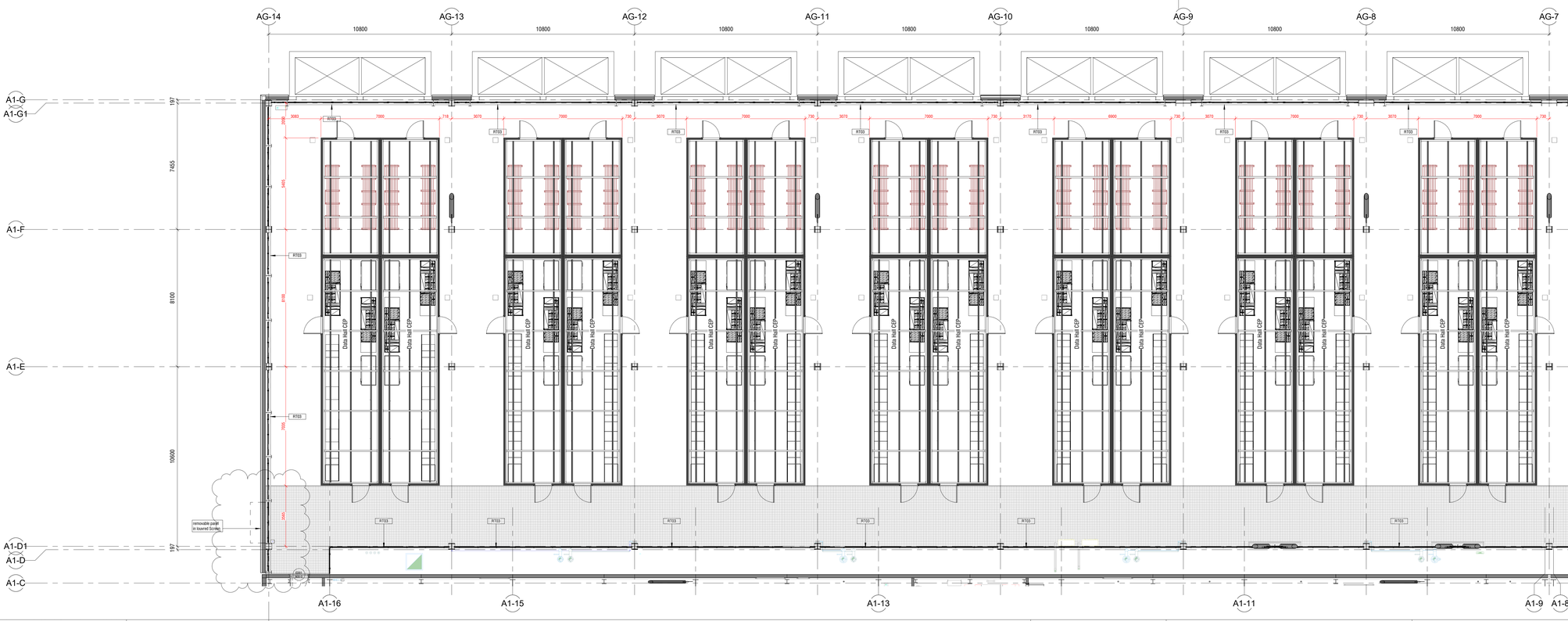

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- PT10: Plasterboard dry lining to external cladding (provide lining above glazed areas if room has glazing)
- PT11: Plasterboard stud partition to ceiling height (moisture resistant)
- PT12: Whitewall partition - vertically laid -150mm thick
- PT13: Shaftwall - EI60
- PT14: Double glazed partition up to 3m, studwall partition above
- PT16: Plasterboard stud partition - Acoustic - EI90 - Rw59
- PT17: Plasterboard bulkhead to ceiling drops
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metres 2 4 6 8 10

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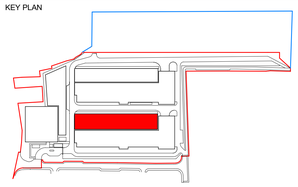
KEY PLAN



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C2	INTERIM STAGE 5 ISSUE	NL	SS	07/10/2022
C1	INTERIM STAGE 5 ISSUE	NL	SS	18/09/2022

Campus Number & Name: LON1 London One

Project: LON1X0

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Drawing Title: Facility A Block 1 First Floor Assembly Plans - Gantry

Status Code: A5 - Authorised & Accepted - Stage 5

Stage: Construction Issue

Scale @ A0: 1 : 100

Drawing Number: LON1X0- SBR- A1- 01- DR- A- 1025

Rev: C4

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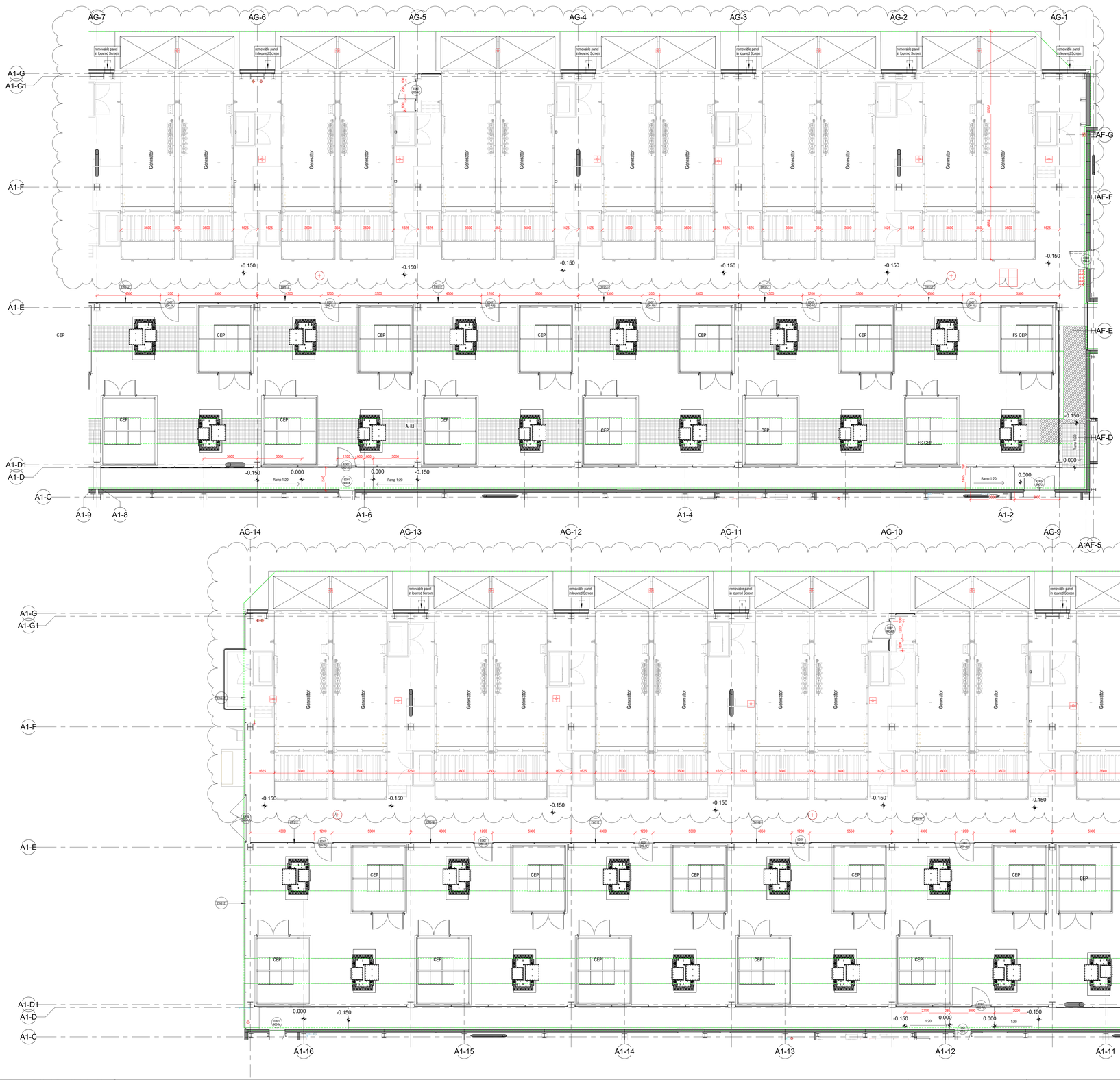

Assembly Plan Legend

- 1200mm Chequer plate to wall base
- Bunding/waterproofing detail at wall base
- Provide Wall 18mm Plywood Patteressing for Wall Units / AV Screens / Fixtures and Fittings from floor to 2440mm FFL
- XX Setting out dimension
- Slab penetration for services and drawinage. See series A-23 drawings for setting out
- Slab Edge. See series A-23 drawings for setting out
- Step in Slab. See series A-23 drawings for setting out

Wall Tags

W/P HXX / PT XX / W/P BXX

- Wall Head Detail - Ref: DR-A-2222, 2223, 2230, 2231
- Internal partition type - Ref. DR-A-2210
- Wall Base Detail: Ref: DR-A-2224, 2232

Door Tags

ID/ED XX / XXX XX

- Door type - Ref: 31 and 32 Drawing Series
- Door unique identifyer - Ref: 31 and 32 Drawing Series

Window Tags

IW XX / XXX XX

- Window type - Ref: 32 Drawing Series
- Window unique identifyer - Ref: 32 Drawing Series

Partition Types

- PT01: Whitewall partition - 100mm Thick
- PT04: SR3 rated Security enhanced plasterboard stud partition
- PT06: Weldmesh security cage
- PT07: Plasterboard stud partition - EI30 - Rw50
- PT08: Plasterboard stud partition (moisture resistant) EI30 - Rw50
- PT09: Plasterboard stud partition - EI60 - Rw50
- PT10: Plasterboard dry lining to external cladding (provide lining above glazed areas if room has glazing)
- PT11: Plasterboard stud partition to ceiling height (moisture resistant)
- PT12: Whitewall partition - vertically laid -150mm thick
- PT13: Shaftwall - EI60
- PT14: Double glazed partition up to 3m, studwall partition above
- PT16: Plasterboard stud partition - Acoustic - EI90 - Rw59
- PT17: Plasterboard bulkhead to ceiling drops
- PT18: IPS panel system
- PT19: Plasterboard encasement to steel Beams
- PT22: Plasterboard encasement to steel columns
- PT24: Plasterboard encasement to steel columns - Enhanced acoustic performance

Railing types

- RT01: Powdercoated steel railing with vertical bars at 100mm centres and tube handrail
- RT02: Galvanized steel key clamp railing
- RT03: Galvanized steel key clamp railing with 100mm toe-plate
- RT04: Powdercoated steel railing with vertical bars at 100mm centres

Notes:

All rooms that have a water source (such as toilets and sprinkler rooms) have to be provided with floor gullies. All walls surrounding these areas have to be bunded/waterproofed at base.

All dimensions are to face of walls and structural opening of doors

metres 2 4 6 8 10

IPD PARTNERS

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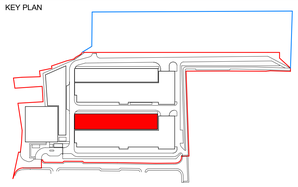
ORIGINATOR

SCOTT BROWNRIGG

KEY PLAN



Rev	Description	Drn	Chck	Date
C4	OFCI COORDINATION	EB	NL	07/02/2023
C3	STAGE 5 ISSUE	EB	NL	09/12/2022
C2	INTERIM STAGE 5 ISSUE	NL	SS	07/10/2022
C1	INTERIM STAGE 5 ISSUE	NL	SS	18/09/2022

Campus Number & Name: LON1 London One

Project: LON1X0

Drawing Title: Facility A Block 1 Ground Floor Assembly Plans - Gantry

yondr
www.yondrgroup.com

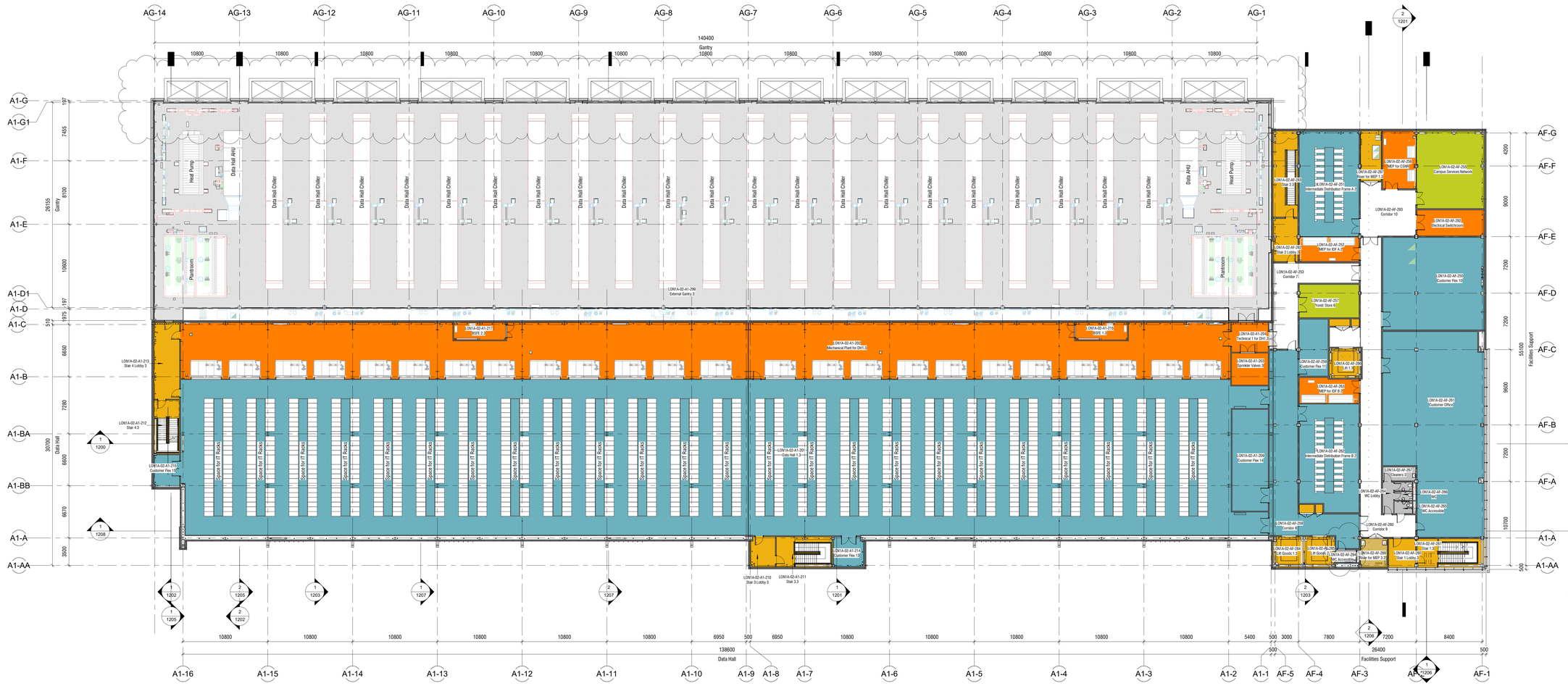
Status Code: A5 - Authorised & Accepted - Stage 5

Stage: Construction Issue

Scale @ A0: 1 : 100

Drawing Number: LON1X0- SBR- A1- 00- DR- A- 1024

Rev: C4



1 GA FACILITY A SECOND FLOOR
1 : 200

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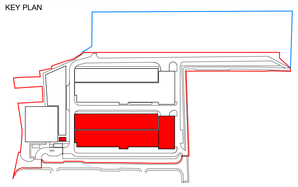
KEY PLAN



C3	STAGE 5 ISSUE	EIB	NL	09/12/2022
C2	INTERIM STAGE 5 ISSUE	NL	SS	07/10/2022
C1	INTERIM STAGE 5 ISSUE	NL	SS	19/08/2022
Rev	Description	Drn	Chck	Date

Campus Number & Name
LON1
London One

Project
LON1X0

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Drawing Title
General Arrangement Facility A Second Floor

Status Code
A5 - Authorised & Accepted - Stage 5

Stage
Construction Issue

Scale @ A0
1 : 200

Drawing Number
LON1X0- SBR- AZ- 02- DR- A- 1002

Rev
C3

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DRAINAGE BMS / SITE WIDE ELECTRICAL CONNECTION REQUIREMENTS

Jonny Fisher - Sweco

22/03/2021

DIVERSION OF EXISTING PRIVATE FOUL NETWORK SERVING THE INDUSTRIAL ESTATE TO THE SITE WIDE FOUL NETWORK.
FLOW RATE LIMITED TO 4 l/s.

Pumping station for grey water harvesting with controls

Water level monitor with highlevel alarm within rainwater harvesting tank

Water level monitor with highlevel alarm within grey water harvesting tank

Oil Interceptor with sludge and oil alarm

Sump pump for the aco channel

Surface water pumping station with water level and pump controls

Sump pump for the aco channel

Foul water pumping station with water level and pump controls

High Level Alarm/Water Level monitoring

High Level Alarm/Water Level monitoring

Oil Interceptor with sludge and oil alarm

High Level Alarm/Water Level monitoring

1800MM DIAMETER RAINWATER HARVESTING
RAINWATER STORAGE DESIGNED AS OFFLINE
OVERFLOW FROM GREY WATER TANK TO FOUL NETWORK WITH NON RETURN VALVE INSTALLED AT DOWNSTREAM CHAMBER
THE SUBSTATION WILL DRA
A GRAVITY PIPE SYSTEM TO
PERMEABLE PAVING LOCATED
THE SITE ENTRANCE
PERFORATED PIPE 150mm ID HORIZONTAL
0.5m WIDE X 1.5m DEEP LINED FILTER DRAIN WITH 150mm PERFORATED PIPE
1586m3 STORAGE TANK
1520m3 STORAGE TANK
BUILDING A
MECHANICAL YARD
GRAND UNION CANAL - SLOUGH ARM

S4.0 CL 27.550 IL 25.979 1.800mØ
F1.2 CL 27.52 IL 25.213 1.200mØ
S6.0 CL 27.6 IL 26.000 1.800mØ
SW 6.0000 750mm ID 1:428
SW 4.000 2x450mm ID 1:124
FW 1.001 150mm ID 1:98
F1.1 CL 27.61 IL 25.932 1.200mØ
SW 4.003 2x150mm ID 1:433
FW 1.000 150mm ID 1:100
S4.3 CL 27.47 IL 24.594 1.200mØ
150mm Ø HIGH LEVEL OVERFLOW PIPE TO BE INSTALLED 400mm BELOW MANHOLE COVER LEVELS
SW 4.003 (1) 150mm ID 1:428
S4.3A CL 27.47 IL 24.553 1.200mØ
S4.2 CL 27.47 IL 24.502 1.500mØ
SW 6.000(A) 750mm ID 1:555
S7.00 CL 28.25 IL 26.473 1.200mØ
S6.0A CL 28.05 IL 25.949 1.800mØ
FW 1.002 150mm ID 1:98
S6.1A DOWNSTREAM DEFENDER INSTALLED WITHIN A 1200mm DIAMETER CHAMBER
S6.1 CL 28.01 IL 24.341 3.000mØ
F1.0 CL 27.43 IL 26.650 1.200mØ
SW 6.001 2100mm ID 1:553
F5.3 CL 27.71 IL 24.653 1.200mØ
SW 5.000(A) 600mm ID 1:168
FW 4.001 150mm ID 1:100
F1.4 CL 27.59 IL 23.638 1.200mØ
S6.2 CL 27.78 IL 24.502 3.000mØ
225mm Ø HIGH LEVEL OVERFLOW PIPE TO BE INSTALLED 400mm BELOW MANHOLE COVER LEVELS
F3.0 CL 27.88 IL 26.516 1.200mØ
FW 3.000 150mm ID 1:80
SW 4.004 600mm ID 1:535
F1.3 CL 27.74 IL 24.505 1.200mØ
S5.0A CL 28.08 IL 26.200 1.500mØ
FW 5.003 150mm ID 1:100
SW 5.000 600mm ID 1:287
FW 1.003 150mm ID 1:98
F4.01 CL 27.59 IL 25.471 1.200mØ
SW 6.002 2100mm ID 1:505
SW 6.003 225mm ID 1:758
S6.3 CL 27.74 IL 24.670 3.000mØ
SW 2.007 225mm ID 1:477
F4.00 CL 27.60 IL 26.290 1.200mØ
F1.5 CL 27.64 IL 22.770 1.200mØ
F3.1 CL 27.32 IL 25.958 1.200mØ
FW 3.001 150mm ID 1:80
FW 2.000 150mm ID 1:33
S5.0 CL 28.23 IL 26.350 1.500mØ
F2.0 CL 27.89 IL 26.650 1.200mØ
S4.5 CL 27.676 IL 24.366 1.800mØ
FW 4.000 150mm ID 1:100
FW 1.004 150mm ID 1:95
FW 1.005 150mm ID 1:110
SW 4.005 825mm ID 1:506
S2.7 CL 27.65 IL 24.164 1.800mØ
PP1 CL 28.39 IL 27.290
SW 2.000 150mm ID 1:48
S2.1 CL 27.87 IL 26.144 1.800mØ
S2.2 CL 28.51 IL 26.087 1.800mØ
SW 2.001 825mm ID 1:90
SW 2.002 2x450mm ID 1:15
S8.0 CL 27.97 IL 27.213 1.200mØ
FULL RETENTION INTERCEPTOR SPEL P015 1C/SC
FW 1.006 150mm ID 1:99
PROPOSED CONNECTION INTO EXISTING SURFACE WATER MANHOLE CL=28.40 IL=26.47 (750mmØ) IL=27.07 (150mmØ)
*DOWNSTREAM DEFENDER 1.200m² SUITABLE FOR TREATMENT PEAK FLOW RATE UP TO 85 l/s CL 27.98 IL 27.136
PROPOSED CONNECTION INTO EXISTING FOUL WATER MANHOLE CL=28.35 IL=24.95 (300mmØ) IL=25.10(150mmØ)
F1.6 CL 27.99 IL 25.617 1.200mØ
F1.7 CL 26.82 IL 25.457 1.200mØ
FW 2.000 150mm ID 1:31
FW 1.007 150mm ID 1:33
SW 2.006 825mm ID 1:499
F2.0 CL 28.04 IL 26.672 1.200mØ
S2.6 CL 27.81 IL 24.299 1.800mØ
S2.5 CL 27.81 IL 24.674 1.200mØ
SW 2.005 2x150mm ID 1:500
SW 2.005 (2) 150mm ID 1:500
150mm Ø HIGH LEVEL OVERFLOW PIPE TO BE INSTALLED 400mm BELOW MANHOLE COVER LEVELS

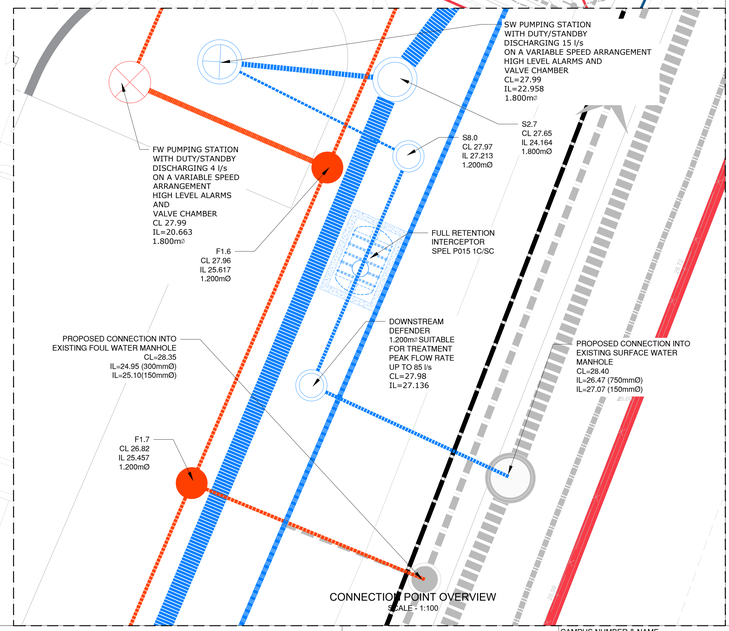
CHANNEL DRAINS WITHIN THE LOADING DOCKS (COVERED AREAS) ARE TO BE PUMPED USING A CHANNEL SUMP PUMP TO THE NEAREST SURFACE WATER SEWER. PUMPS TO BE FITTED WITH A NON RETURN VALVE TO PREVENT FLOODING.

ADDITIONAL CHANNEL DRAINS TO BE INSTALLED ACROSS THE ENTRANCE OF THE LOADING DOCK TO MINIMISE SURFACE WATER RUNOFF INTO THE AREA.

THE MECHANICAL YARD WILL BE SERVED BY A NUMBER OF FOUL AND SURFACE WATER GULLIES LOCATIONS TO BE CONFIRMED BASED ON PLANT ARRANGEMENT.

THE OIL STORAGE AREA SHALL BE BUNDED AND FITTED WITH AN OIL DISCRIMINATING PUMP

DRAINAGE STRATEGY OVERVIEW
SCALE - 1:500



CONNECTION POINT OVERVIEW
SCALE - 1:100

KEY:

- DEVELOPMENT BOUNDARY
- FENCELINE
- SURFACE WATER SEWER BY OTHERS
- FOUL WATER SEWER BY OTHERS
- PROPOSED SURFACE WATER SEWER
- PROPOSED FOUL WATER SEWER
- PROPOSED GREY WATER SEWER
- PROPOSED PERMEABLE PAVING
- PROPOSED CHANNEL DRAIN ACO HD200 OR SIMILAR
- PERFORATED PIPE (SURFACE WATER)
- BUILDING OUTLINE

NOTES

1. ALL SETTING OUT CO-ORDINATES AND ELEVATIONS ARE IN METRES (m). CO-ORDINATE AND ELEVATION SYSTEMS ARE BASED ON mAOD to ORDNANCE SURVEY. ALL DIMENSIONS ARE IN METRES (m) UNLESS OTHERWISE STATED.
2. WARNING EXISTING SERVICES MAY BE PRESENT ON SITE THAT HAVE NOT BEEN IDENTIFIED ON THIS DRAWING.
3. PRIOR TO COMMENCEMENT OF WORKS, THE CONTRACTOR SHALL LIAISE WITH ALL RELEVANT AUTHORITIES AND OBTAIN THEIR REQUIREMENTS FOR METHOD OF WORKING. THE CONTRACTOR SHALL LIAISE WITH ALL RELEVANT AUTHORITIES TO LOCATE, PROTECT AND WHERE NECESSARY DIVERT ALL EXISTING SERVICES AFFECTED BY WORKS.
4. THE CONTRACTOR SHALL ENSURE THE STABILITY OF ALL EXCAVATIONS IS MAINTAINED AT ALL TIMES AND SHALL BE KEPT FREE OF STANDING WATER.
5. PRIOR TO THE COMMENCEMENT OF WORKS, THE CONTRACTOR SHALL VERIFY ON SITE THAT THERE ARE NO EXISTING OBSTRUCTIONS; STRUCTURES / SERVICES (REDUNDANT / LIVE) WHICH MAY PREVENT INSTALLATION OF THE PROPOSED DRAINAGE / SERVICE NETWORK.
6. ANY COVER LEVELS SHOWN ARE APPROXIMATE. EXACT LEVELS OF NEW COVERS AND FRAMES TO BE DETERMINED ON SITE TO MATCH LEVEL AND PROFILE OF FINISHED SURFACE.
7. ALL EXISTING CHAMBERS, GULLIES ETC. AND THEIR COVERS, GRATINGS AND FRAMES TO BE IMPROVED, REPAIRED OR REPLACED AS NECESSARY TO SUIT THEIR LOCATION WITHIN THE FINISHED DEVELOPMENT.
8. ALL COVERS, GRATINGS AND FRAMES TO CHAMBERS, GULLIES, CHANNELS ETC. SHALL BE LOAD CLASS D400 UNLESS NOTED OTHERWISE.
9. FOR PROPOSED STRUCTURAL GRID AND FOUNDATION REFER TO ARCHITECTURAL / STRUCTURAL DRAWINGS FOR SETTING OUT OF GRID LINE / FOUNDATIONS.
10. WHEN INSTALLING SERVICES, TAKE GREAT CARE WHEN EXCAVATING ALONGSIDE INSTALLED FOUNDATIONS AND SEEK ENGINEER'S APPROVAL IF SIGNIFICANT EXCAVATION IN CLOSE PROXIMITY TO FOUNDATIONS.
11. ALL EXISTING CHAMBERS, GULLIES, CHANNELS, PIPES AND OTHER DRAINAGE APPARATUS SHALL BE PROTECTED FROM DAMAGE DURING THE WORKS. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO ENSURE THAT NO MATERIAL ENTERS THE DRAINS (OTHER THAN THAT WHICH THEY ARE DESIGNED TO CARRY).
12. REFER TO SITE INVESTIGATION REPORT FOR EXISTING GROUND CONDITIONS AND ANY SPECIAL REQUIREMENTS FOR BURIED CONCRETE (SPECIAL REQUIREMENTS FOR BURIED CONCRETE SHALL INCLUDE ALL PRE-CAST AND IN-SITU CONCRETE AND MORTARS). WHERE APPROPRIATE REFER TO CONTAMINATION REPORTS FOR DETAILS OF CHEMICALS AFFECTING CHOICE OF MATERIALS AND ANY OTHER REQUIREMENTS.
13. ACCESS POINTS, INSPECTION CHAMBERS AND MANHOLES SHALL BE CONSTRUCTED FROM PRODUCTS DESIGNED/RATED FOR THE LOCATION IN WHICH THEY ARE TO BE USED. THEY SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS/SUPPLIERS RECOMMENDATIONS.
14. WHEN INSTALLING SERVICES, TAKE GREAT CARE WHEN EXCAVATING ALONGSIDE INSTALLED FOUNDATIONS AND SEEK ENGINEER'S APPROVAL IF SIGNIFICANT EXCAVATION IN CLOSE PROXIMITY TO FOUNDATIONS.
15. POLYETHYLENE PLASTIC 150mm MINIMUM WIDTH TAPE SHALL BE PLACED ABOVE THE FOUL SEWER, COLOUR CODED FOR UTILITY INVOLVED, WITH WARNING AND IDENTIFICATION IMPRINTED IN BOLD BLACK LETTERS CONTINUOUSLY AND REPEATEDLY OVER ENTIRE TAPE LENGTH STATING "CAUTION - SANITARY SEWER LINES BURIED BELOW".
16. POLYETHYLENE PLASTIC 150mm MINIMUM WIDTH TAPE SHALL BE PLACED ABOVE THE SURFACE WATER SEWER, COLOUR CODED FOR UTILITY INVOLVED, WITH WARNING AND IDENTIFICATION IMPRINTED IN BOLD BLACK LETTERS CONTINUOUSLY AND REPEATEDLY OVER ENTIRE TAPE LENGTH STATING "CAUTION - SURFACE WATER SEWER LINES BURIED BELOW".
17. THE CONTRACTOR SHALL INSTALL WORK IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS, APPROVED SUBMITTALS, REFERENCED SECTIONS OF SPECIFICATIONS AND DRAWINGS, AND CODES AND STANDARDS.
18. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO OBTAIN WATERTIGHT CONSTRUCTION INCLUDING APPLY JOINT SEALER OR RING GASKET TO WALL SECTIONS, SET FIRMLY IN PLACE TO ASSURE WATERTIGHT JOINTS.
19. THE CONTRACTOR SHALL STAKE OUT WORK PRIOR TO INSTALLATION TO ALLOW FOR INSPECTION. SET ALL STAKES FOR LINES AND GRADES. OFFSET STAKES SHALL NORMALLY BE SET AT INTERVALS OF 15m AND AT MANHOLE LOCATIONS. ON STEEP SLOPES, INTERVALS SHALL BE DECREASED TO 7.5m.
20. THE CONTRACTOR SHALL NOT ALLOW HORIZONTAL AND VERTICAL ALIGNMENT OF TRENCHED GRAVITY SEWER LINES TO VARY FROM DESIGN LINE AND GRADE AT ANY POINT ALONG THE PIPE BY MORE THAN 1% OF THE INSIDE DIAMETER OF THE PIPE OR 3.5mm, WHICHEVER IS LARGER. REVERSE SLOPE IS PROHIBITED. THE CONTRACTOR SHALL REMOVE AND REINSTALL PIPE TO PROPER GRADE WHEN TOLERANCES ARE EXCEEDED.
21. THE CONTRACTOR SHALL CONFIRM INVERTS AND LOCATIONS OF EXISTING AND PROPOSED PIPING, MANHOLES AND OTHER STRUCTURES BEFORE INSTALLING ANY MATERIALS. IN CASE OF DISCREPANCY FROM WHAT IS INDICATED ON DRAWINGS, REQUEST FURTHER WRITTEN INSTRUCTION FROM PROJECT MANAGER BEFORE INSTALLATION STARTS.
22. ALL COMPLETED DRAINAGE SHALL BE EITHER AIR TESTED OR A CCTV SURVEY COMPLETED PRIOR TO HANDOVER.
23. 3400³ OF STORAGE INCLUDING OVERSIZED PIPES ALONG THE CENTRAL ROAD, (EXCLUDING CHAMBERS AND INTERCEPTORS), IS AVAILABLE ON THE SITE.
24. DRAINAGE DESIGN SURFACE AREA IS 4.5 HECTARES.
25. ALL BUILDING DRAINAGE CONNECTIONS SHALL BE 160mm OD PP UNLESS NOTED OTHERWISE WITH A NON-RETURN VALVE FITTED TO OUTLET AT EACH SURFACE WATER CHAMBER.
26. ALL ROAD GULLY CONNECTIONS SHALL BE 160mm OD PP UNLESS NOTED OTHERWISE.
27. THE NORTHERN STORAGE TANK HAS BEEN DESIGNED TO ALLOW 4,500 m2 CATCHMENT FROM A FUTURE BUILDING
28. PUMPING STATIONS SHALL HAVE EMERGENCY POWER SUPPLIES LOCATION OF WHICH ARE TO BE CONFIRMED.
29. A 1.5M DEEP X 0.5M WIDE FILTER DRAIN WILL BE LOCATED ALONG THE SOUTHERN ROAD TO CAPTURE FLOWS FROM THE ROAD AND COMING INTO THE SITE. THIS WILL HAVE A 150MM PERFORATED PIPE ALONG THE LENGTH AND THEN CONNECT INTO THE TANK VIA A 225mm PIPE ACROSS THE ROAD.
30. CAR PARKING AREAS WILL BE LINED PERMEABLE PAVING DISCHARGING TO THE SURFACE WATER NETWORK.
31. FOUL CONNECTIONS ARE REQUIRED TO THE MECHANICAL YARD AND SUBSTATION FOR CONDENSATE DISCHARGES
32. THE ENTRANCE BLOCK WILL DRAIN TO THE PERMEABLE PAVING
33. STORAGE TANK CONSTRUCTION TO BE DETERMINED
34. THE DRAINAGE STRATEGY WILL INCLUDE THE USE OF GRAY WATER HARVESTING AND RAIN WATER HARVESTING

IPD PARTNERS

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ORIGINATOR

SWECO

KEY PLAN:

Rev	Description	Drn	Chck	Date
P01	ISSUED FOR PLANNING	AC	JF	19/03/21

CAMPUS NUMBER & NAME

DRAWING TITLE: EXTERNAL AREAS DRAINAGE PLAN

PROJECT: SLO1X0 SLOUGH ONE

yondr — www.yondrgroup.com

STATUS CODE: S4 SUITABLE FOR STAGE APPROVAL

STAGE: PLANNING

SCALE 1:500 @A0

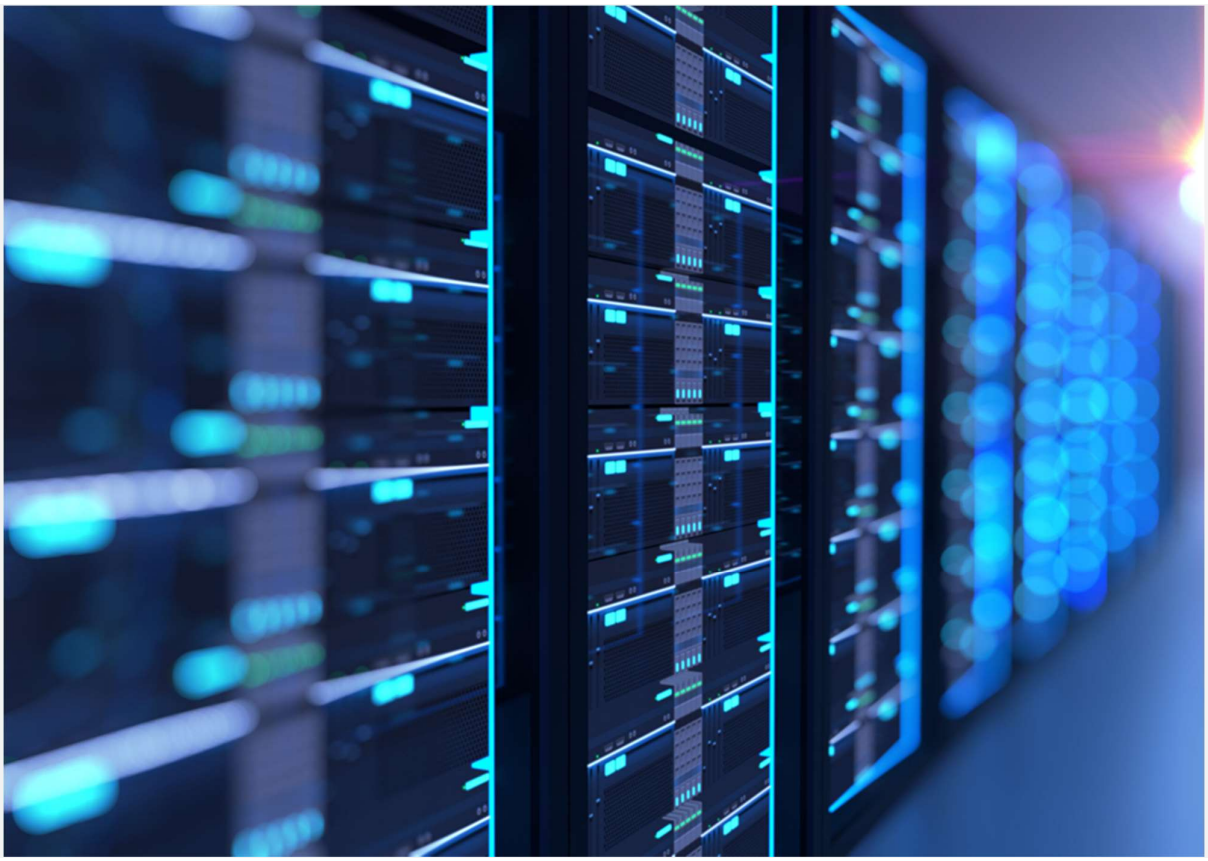
DRAWING NUMBER: SLO1X0-SWE-EX-XX-DR-C-0501

REV P01

Appendix B – Environmental Risk Assessment

LON1XO Data Centre, Slough: Environmental Permit Application

Permit Application Supporting Information: Appendix B Environmental Risk Assessment



SWECO

Change list

Ver:	Date:	Description of the change	Reviewed	Approved by
1	25-01-2023	Draft for discussion		TV
2	15-02-2023	Final		TV
3				

Project Name:	LON_1 Data Centre Slough
Project Number:	65203376-008
Client:	Yondr Group
Ver:	1
Date:	15/02/2023
Author:	
Document Reference:	Permit Application Supporting Information – Appendix B ERA

Table of contents

1. Introduction

This Environmental Risk Assessment (ERA) has been carried out in support of an application for an environmental permit. It includes an assessment of the risk to the environment and human health from a diesel fired emergency back-up generation installation with associated diesel storage.

The Environment Agency (EA) Guidance, “Risk assessments for your environmental permit”, Gov.UK, 25th March 2021, sets out information on when an environmental risk assessment is required together with notes on how to complete a risk assessment.

The following environmental risk assessment has been developed following the Environment Agency Guidance for risk assessment for environmental permits.

The assessment of risks is presented in the risk assessment tables in Section 2.

1.1 Risk Assessment Approach

This ERA uses the following approach for identifying and assessing the risks from the proposed operation:

Step 1 Identify and consider risks for your site, and the sources of risks.

Step 2 identify the receptors at risk from your site.

Step 3 Identify the possible pathways from the sources of risks to the receptors.

Step 4 Assess risks relevant to your specific activity and check they are acceptable and can be screened out.

Step 5 state what you will do to control the risks if they are too high.

Step 6 Submit your risk assessment.

Section 1.2 of this document is a screening step to identify the risks requiring consideration as part of this assessment.

Section 1.3 identifies people or parts of the environment that could be harmed (at potentially significant risk) by the activity. The ERA for an EP application requires all receptors that are near a site and could reasonably be affected by the activities to be identified and considered as part of the assessment.

The guidance requires all receptors that are near the site and could reasonably be affected by the proposed activities to be identified and considered as part of the ERA.

Therefore, for the purposes of this ERA the following distances have been used to identify potentially sensitive receptors for the data centre site:

- A 10km radius has been adopted in reviewing potentially sensitive receptors of international ecological importance;
- A 2km radius has been adopted in reviewing potentially sensitive receptors of national ecological importance; and
- A radius of 500m has been adopted for all other potentially sensitive receptors (for example residential, commercial, industrial, agricultural and surface water receptors).

Section 2 of this document presents the ERA and demonstrates that any risks of pollution or harm will be mitigated to manage the risk.

1.1.1 Climate Change Risk Assessment

Environment Agency (EA) guidance Adapting to Climate Change was withdrawn on 31 August 2022. As a result of this the EA has removed the requirement to consider climate change adaptation from the permit application process.

In place of this, operators are required to integrate climate change adaptation into the environmental management system.

The site management plan will be developed to include an assessment of the risks to the installation associated with Climate Change over the expected period of operation.

Reference will be made to the climate change risk assessment examples for the relevant industry sector, in this case:

- Combustion power: examples for your adapting to climate change risk assessment, October 2021[1].

The CCRA will address potential risks that may occur in the event of predicted changes to the climate in order to allow forward planning in respect of potential risks associated with climate change to ensure that measures are in place to ensure business resilience and continuity.

1.2 Identifying the Risks

The EA's guidance requires the following to be considered as 'Risks from your site':

- Any discharge, for example sewage or trade effluent to surface or groundwater;
- Accidents;
- Odour;
- Noise and vibration;
- Uncontrolled or unintended ('fugitive') emissions, including dust, litter, pests and pollutants that should not be in the discharge;
- Visible emissions, for example smoke or visible plumes; and
- Release of bioaerosols.

Further, for Installation EP applications the EA guidance states that assessment of the following additional aspects is required, where applicable:

- Risks from air emissions;
- Risks to groundwater;
- Global Warming Impact;
- Risks to surface water from hazardous pollutants;
- Risks to surface water from sanitary and other pollutants; and
- Installations must also decide how to treat, recycle or dispose of waste.

The Installation will not produce any process effluent or release bioaerosols, and there will be no point source emissions to groundwater, surface water or land from the application activities.

There will be several point source emissions to air associated with each diesel-fired generator stack and the potential for visible emissions from these stacks.

Therefore, only the following potential impacts are considered further in this ERA:

- Point source emissions to air;
- Accidents;
- Noise & vibration;
- Visible emissions, for example smoke or visible plumes;

[1] https://www.gov.uk/guidance/adapting-to-climate-change-risk-assessment-for-your-environmental-permit

- Fugitive emissions; and
- Global warming potential.

1.3 The Site

The data centre facility is to comprise two buildings A & B located in the central part of the former AkzoNobel Decorative Coatings, Slough Manufacturing Unit located at Wexham Rd, Slough SL2 5DS, National Grid Reference SU 98700 80300. The data centre is currently under construction and has yet to be commissioned and operated.

The area immediately to the north of the proposed data centre is currently unoccupied land. The Grand Union Canal lies beyond this area with residential properties present north of the Canal. To the east lies Uxbridge Road Gas Works with Uxbridge Road and residential properties present beyond.

Immediately to the south, a new residential development is under construction. This is in turn bound by the Railway Line with residential properties present beyond.

Commercial and industrial properties lie beyond Wexham Road to the west.

There are no formal landscape designations (such as Areas of Outstanding Natural Beauty or National Parks close to the Site. The nearest formal landscape designations are located being 13km and 40km respectively.

There are no identified statutory ecological designations within the site or surrounding areas. The closest statutory ecological designations are Black Park Country Park (SSSI) and Wraysbury & Hythe End Gravel Pit (SSSI), which are located approximately 4km to the north and 5km to the south of the site respectively. Tree cover is also very sparse across the Site.

The Site does not lie within an Air Quality Management Area. Further the entirety of the Site is located in a low probability flood risk zone (Flood Zone 1)

The Site is also not located within or adjacent to a Conservation Area.

1.3.1 Geology, Hydrogeology and Hydrology

1.3.1.1 Geology

The geology is shown on the British Geological Survey (BGS) map 269 1:50,000 Series and on the BGS website. The site is underlain by between 5m and 9m of the Taplow Gravel Member, underlain by up to 39m thickness of the Lambeth Group. The underlying bedrock is the Seaford and Newhaven Chalk Formation.

Made ground overlies the natural soils in much of the site as a result of previous development.

1.3.1.2 Hydrogeology

The Taplow Gravel member is classified by the Environment Agency as a Principal Aquifer and the Lambeth Group as a Secondary A aquifer. The Seaford and Newhaven Chalk is classified as a Principal Aquifer. It is considered that the more cohesive and lower permeability strata of the Lambeth Group are acting as an aquiclude between the Taplow Gravel Member and the deeper Chalk aquifer.

The site is located within a Zone III (Total Catchment) groundwater source protection zone (SPZ), with the Zone II (Outer Protection) and Zone I (Inner Protection) located approximately 80m to the southwest and 915m to the west of the site respectively. The closest groundwater abstraction for the site is located 1.25km west. Review of regional boreholes (SU98SE87, SU98SE95 and SU98SE888) suggests that the abstraction is from the Chalk Aquifer.

1.3.1.3 Hydrology

The nearest surface waters to the site are the Grand Union Canal along the northern site boundary and the culverted course of the Dachett Brook, which is understood to be present beneath Uxbridge Road immediately east of the site. The Canal is not considered to be a likely receptor due to its elevated position in relation to the site coupled with its upgradient location. Similarly, the Dachett Brook is not considered a receptor due to its location up-hydraulic gradient from the site.

The Flood Map for Planning identifies the site as lying within a Flood Zone 1, defined as having a less than 1 in 1,000 annual probability of river or sea flooding.

1.3.2 Ecology and Cultural Heritage

1.3.2.1 Ecology

A 10km radius was employed in identifying ecological receptors of European/international sites and a 2km radius for all local/national ecological receptors. A search on MAGIC map identified the ecological receptors listed below. Reference has also been made to the EA Nature and Heritage Conservation Screening Report (Appendix A of this document).

European/International Sites

- Ramsar Sites and Special Protection Areas (SPA):

Southwest London Waterbodies are designated as a Ramsar and SPA with the closest located approximately 4.8km to the southeast of the site.

- Special Areas of Conservation (SAC):

There are SAC's within a 10km radius from the site. The closest is Burnham Beeches SAC located approximately 5.25km to the northwest. Windsor Forest and Great Park is located approximately 5.7km to the southwest.

National Ecological Sites

- Sites of Special Scientific Interest (SSSI):

There are SSSI's within a 10km radius from the site. The closest SSSI is Black Park SSSI which is located 3.6km north-east. Wraysbury & Hythe End Gravel Pit (SSSI), is located approximately 5km to the south of the site.

Local Nature Reserve (LNR) within 2km:

Herschel Park LNR is located approximately 1.1km to the southwest of the site

Local Wildlife Sites (LWS) within 2km

Railway Triangle (off Stranraer Gardens) LWS is located approximately 830 m west.

Upland Court Park LWS is located 1,330 m south.

Searches on the MAGIC map confirmed none of the following are present within a 2km radius of the site:

- National Nature Reserves;
- Areas of Outstanding Natural Beauty;
- Biosphere Reserves; and
- Ancient Woodland.

Priority Habitats (England only)

Priority habitats are 'habitats of principle importance for the conservation of wildlife in England' and include:

- protected or priority species;
- nationally and internationally protected species; and
- species of principle importance for conservation of wildlife in England.

The EA Nature and Heritage Conservation Screening Report, identifies one area of potential priority species that may be present within the screening distance for European Water Vole.

A Preliminary Ecological Appraisal desk study was completed in support of the application for planning permission. This provided five records of water vole within 2 km of the survey area, the closest was located within the Grand Union Canal adjacent to the northern boundary (the area identified in the EA Nature and Heritage Conservation Screening Report) and it was noted that this canal could also potentially be suitable for otter.

2. Environmental Risk Assessment

The following tables in this section assess the potential risk to receptors from the following hazards, taking into account the measures proposed to reduce those risks:

- Point source emissions to air;
- Accidents;
- Noise & vibration;
- Fugitive emissions; and
- Global warming potential.

2.1 Risk Assessment Methodology

The risk assessment methodology has used a scoring mechanism whereby scores are assigned to:

- the probability of exposure; and
- the consequence of the hazard to the environment or human health.

The risk assessment has been completed by scoring the hazard areas outlined above using a risk matrix as shown in Table 2-1 below:

		Consequence			
		Severe	**Medium**	**Mild**	**Negligible**
Probability	**High Likelihood**	Very High Risk	High Risk	Moderate Risk	Moderate/ Low Risk
	Likely	High Risk	Moderate Risk	Moderate/ Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Moderate/ Low Risk	Low Risk	Negligible Risk
	Unlikely	Moderate/ Low Risk	Low Risk	Negligible Risk	Negligible Risk

In completing the assessment, the proposed prevention and control measures are assumed to be in place. Where relevant, details of these measures are identified within the assessment.

The risk assessment has been completed by scoring the hazard areas outlined above using a risk matrix as shown in Table 2-1 below:

Table 2.1 - Air Risk Assessment and Management Plan

Hazard [What has the potential to cause harm?]	Receptor [What is at risk what do I wish to protect?]	Pathway [How can the hazard get to the receptor?]	Risk Management [What measures will you take to reduce the risk? Who is responsible for what?]	Probability of [Exposure How likely is this contact?]	Consequence [What is the harm that can be caused?]	What is the overall risk [What is the risk that still remains? The balance of probability and consequence What has the potential to cause harm?]
Emissions from generator stacks planned maintenance and testing	Site employees, residents from adjacent housing and surrounding commercial and industrial workers ecological and cultural heritage receptors	Air	A detailed risk assessment of the impact on air quality of emissions of combustion products from the data centre is presented in Chapter 6 of permit application. Further technical data is contained within the Air Quality Assessment report included as Appendix D. The findings of the assessment for routine testing and maintenance operations are that for planned maintenance and testing significant impacts are not predicted for the identified sensitive receptors. Planned preventative maintenance (PPM) will be in place for the maintenance and testing of the generators; maintenance will be conducted in accordance with the manufacturer requirements. The Site Manager will be responsible for implementing risk management measures in accordance with the EMS and operating procedures (Chapters 3 and 4 of this application).	Low – Modelling of air emissions indicates operation of the proposed generators would not lead to significant impact on local air quality. Exposure is further limited due to management measures and limited operational hours	Pollution, Harm to environment and human health	Low
Emissions from generator stacks emergency outage	Site employees, residents from adjacent housing and surrounding commercial and industrial workers ecological and cultural heritage receptors	Air	In the highly unlikely event of a 92 hour ‘electrical grid outage’ modelling of air emissions indicates operation of the proposed generators would not lead to significant impact on local air quality. The operator will develop an Air Quality Emergency Action Plan (AQEAP) which will detail the management actions to be taken in the event of an emergency outage that could result in the prolonged usage of the generators. The operator will liaise with the Local Authority and the Environment Agency to agree actions to be taken in the event of a prolonged outage situation.	Low – Modelling of air emissions indicates operation of the proposed generators would not lead to significant impact on local air quality.	Pollution, Harm to environment and human health	Low
Visible emissions from the diesel fired generator stacks, typically on start-up of the generators.	Employees, residents, ecological and cultural heritage receptors	Air	Visible plumes are not anticipated to occur for the majority of operational time due to the diesel being combusted and resulting high exhaust gas temperatures The engines will not be in operation for the majority of the time and therefore there would be zero visible plume during this time. Any visible plumes observed during testing will be reported and investigated. Planned preventative maintenance (PPM) will be in place for the maintenance and testing of the generators; maintenance will be conducted in accordance with manufacturer requirements. The operator will implement visual checks for visible emissions from the generators during start up.	Very Low - due to operating conditions, maintenance measures and limited operational hours	Minor visual disturbance of short duration.	Negligible
Odour from fuel storage on site.	Site employees and adjacent residential and commercial residents	Air	The diesel tanks will be vented but odour emissions are not expected to be significant. Belly tanks will be vented and will be within the engine containers, thereby reducing the risk of odour escape. In the event of a complaint, the operator will follow a complaints procedure to record the complaint and take appropriate action or provide further monitoring as necessary.	Very low - management control measures are in place.	Nuisance to on site staff and local residents.	Negligible

Table 2-2 - Noise Risk Assessment and Management Plan

Hazard [What has the potential to cause harm?]	Receptor [What is at risk what do I wish to protect?]	Pathway [How can the hazard get to the receptor?]	Risk Management [What measures will you take to reduce the risk? Who is responsible for what?]	Probability of [Exposure How likely is this contact?]	Consequence [What is the harm that can be caused?]	What is the overall risk [What is the risk that still remains? The balance of probability and consequence What has the potential to cause harm?]
Noise from vehicle movements onsite	Site employees, residents from adjacent housing and surrounding commercial and industrial workers ecological and cultural heritage receptors	Air	A detailed risk assessment of the impact on noise quality from the operation of the installation is presented in Chapter 6 of permit application. Further technical data is contained within the Noise Impact Assessment report included as Appendix E. The predicted operational noise levels are compliant with the Planning Condition 12 criteria, namely: • The overall sound rating level of normal operating plant is not expected to exceed 2dB(A) above background noise levels • Noise levels from normal external operations are not expected to exceed 55dB LAeq (1hr) during daytime or 45 dB LAeq (1hr) during the night time or 60dB LAmax (15mins) during the night time • Cumulative noise from the operational use of the commercial development is not expected to exceed 2dB(A) above background noise levels at sensitive receptors. Noise levels from external operational use of the commercial development is not expected to exceed 55dB LAeq (1hr) during the daytime or 45dB LAeq (1hr) during night time or 60dB LAmax (15mins) during the night time No significant impacts are identified. Any noise complaint received will be logged. An appropriately designated person will investigate the complaint and will take action to identify the source of the noise and remedial measures implemented where appropriate. Site access and operational areas will be maintained and repaired to minimise emissions of noise due to uneven and poor surfacing. The Site Manager will be responsible for implementing risk management measures in conjunction with the operating techniques document	Very Low – Modelling indicates limited potential for unacceptable noise emissions.	Nuisance	Negligible
Noise from operation of the installation	Site employees, residents from adjacent housing and surrounding commercial and industrial workers ecological and cultural heritage receptors	Air	A detailed risk assessment of the impact on noise quality from the operation of the installation is presented in Chapter 6 of permit application. Further technical data is contained within the Noise Impact Assessment report included as Appendix E. The predicted operational noise levels are compliant with Planning Condition 12 criteria (see above) for both maintenance and testing (normal operation) and in the event of emergency generation (emergency conditions). No significant impacts are identified. Engines and associated plant will be enclosed within individual containers providing significant reductions in acoustic emissions. In the event of a complaint, the operator will follow the complaints procedure to record the complaint and take appropriate action or provide further monitoring as necessary. Noise from the generators has been mitigated and reduced to a minimum by locating the generators in acoustic enclosures. Due to rare nature of the emergency scenario, National Grid reliability and the in-built redundancy and infrastructure maintenance systems noise emissions under emergency conditions are unlikely to occur in practice and/or for any length of time.	Very Low - Modelling indicates limited potential for unacceptable noise emissions. Very low probability of the requirement for emergency back-up use	Nuisance	Negligible
Vibration from the installation	Site employees, residents from adjacent housing and surrounding commercial and industrial workers	Land	An assessment of the potential impacts of vibration from construction work is also included within the Noise Impact Assessment report included as Appendix Limiting criteria and mitigation measures are set out. For the operation of the installation Significant vibration effects are not anticipated. In the event of a complaint, the operator will follow a complaints procedure to record the complaint and take appropriate action or provide further monitoring as necessary.	Very Low - it is anticipated that no significant vibration effects will result from operation of the engines.	Nuisance, structural damage	Negligible

Table 2-3 Fugitive emissions risk assessment and management plan

Hazard [What has the potential to cause harm?]	Receptor [What is at risk what do I wish to protect?]	Pathway [How can the hazard get to the receptor?]	Risk Management [What measures will you take to reduce the risk? Who is responsible for what?]	Probability of [Exposure How likely is this contact?]	Consequence [What is the harm that can be caused?]	What is the overall risk [What is the risk that still remains? The balance of probability and consequence What has the potential to cause harm?]
Dust	Site employees, residents from adjacent housing and surrounding commercial and industrial workers ecological and cultural heritage receptors	Air	There are no significant dust-generating activities or dusty materials used or stored within the installation. In the event of a complaint, the operator will follow a complaints procedure to record the complaint and take appropriate action or provide further monitoring as necessary.	Very Low - significant dust generation is not anticipated for operation of the installation.	Nuisance, pollution, harm to environment	Negligible
Fumes (VOCs) from delivery and storage diesel on site.	Site employees, residents from adjacent housing and surrounding commercial and industrial workers	Air	The diesel tanks will be fitted with vents however these will only allow minimal potential for fumes to escape. No other oils will only be stored on site. Lubricating oil is present within the generators but this will be within a closed loop system with no emissions. Best practice will be adhered to for all fuel loading/unloading activities. Such measures will not remove potential for emissions but will limit the duration of such releases. Deliveries of diesel will be from operator approved suppliers and will be undertaken in accordance with delivery procedures which will be developed as part of the Environmental Management System. Bulk fuel deliveries will be fully supervised by the operator. Fuel delivery tankers will be required to park in a dedicated tanker refuelling area. Once the vehicle is in position, and prior to fuel dispatch, portable spill barriers will be positioned around this area to contain any unplanned releases of fuel in this area during refuelling; the barriers will be removed on completion of refuelling. Spill kits will be available for use in the event of an unplanned fuel release during delivery. A spill procedure will be developed for the site as part of the Environmental Management System. Areas where fuel is to be stored will be subject to daily visual inspections as part of daily operational activities. The Site Manager will be responsible for implementing risk management measures in conjunction with the operating techniques document	Very Low - management control measures are in place.	Nuisance, pollution, harm to environment	Negligible
Leakage of diesel from delivery, storage or pipework	Surface water drainage systems, Thames water surface water sewer Surfacewater courses	Site drainage systems and wider sewer network	All deliveries of diesel will be carried out by suitably qualified personnel in accordance with recognised best practice and standard operating procedures. All connections will take place with drip trays to capture any potential leaks or spillages and appropriate spill kits will be available. Deliveries will take place from tankers in a bunded fuel unloading area. Deliveries will only be made to the fuel receiver tank associated with each building. Connections between the receiver tanks and the individual belly tanks for each engine will have drip trays to capture any leaks or spillages and appropriate spill kits will be available in each compound. Top up of belly tanks will be automated and as such any spillage is unlikely and connections will be fixed. All tanks will be fitted with leak detection and high-level alarms to avoid overfilling. In the unlikely event that any leakage or spill should occur this would be contained by the bund or engine container (depending where this occurred). It would then be dealt with by use of the available spill kits. The belly tanks are housed within the engine containers and would be unable to reach the surface water drainage system. All tanks will be compliant with the Oil Storage Regulations. All bunds and surfacing will be subject to regular inspections and maintenance throughout the life of the installation. The bunds containing the receiver tanks will be checked for rainwater accumulation daily and emptied where necessary. Any potential surface water run off would be directed to the surface water drainage system via a filter drain within a lined stone surfacing area and directed to a class 1 oil water interceptor	Very Low - management control measures are in place.	Pollution, harm to environment, harm to human health	Negligible

Table 2-3 Fugitive emissions risk assessment and management plan

Hazard [What has the potential to cause harm?]	Receptor [What is at risk what do I wish to protect?]	Pathway [How can the hazard get to the receptor?]	Risk Management [What measures will you take to reduce the risk? Who is responsible for what?]	Probability of [Exposure How likely is this contact?]	Consequence [What is the harm that can be caused?]	What is the overall risk [What is the risk that still remains? The balance of probability and consequence What has the potential to cause harm?]
Runoff from potentially contaminated areas (i.e. external areas where the generators and associated diesel	Land, groundwater	Overland percolation through the ground	Generators and associated diesel belly tanks will be housed external to the data centre building; this area will benefit from concrete surfacing. The generators and belly tanks have the benefit of being containerised. Each generator will be located within a dedicated propriety steel contained unit. Each back-up generator will be serviced by a belly tank, which is integral to the container unit, which will automatically supply diesel to the generator via the receiving tank (one located in each building. The belly tanks will be designed to British Standard BS799 Part 5 2010 (Oil Burning Equipment. Carbon steel oil storage tanks. Specification); in accordance with this design standard each tank will be provided with secondary containment (110%). Fuel delivery tankers will be required to park in a dedicated tanker refuelling area. Once the vehicle is in position, and prior to fuel dispatch, portable spill barriers will be positioned around this area to contain any unplanned released of fuel in this area during refuelling; the barriers will be removed on completion of refuelling. Diesel will be delivered from the fuel tanker to the generator belly tanks via a fuel receiver station. The receiver station will include two fill points (1 being duty standby) and two above ground diesel receiver tanks, each with a 1,500 L capacity. The receiver tanks will be designed to British Standard BS799 Part 5 2010 (Oil Burning Equipment. Carbon steel oil storage tanks. Specification); in accordance with this design standard each tank will be provided with secondary containment (110%). The diesel tanker fill points will be located in two lockable cabinets. These fill cabinets will be provided with a spill tray to contain any minor spillages of fuel during fuel delivery. The two cabinets will remain locked when not in use. Additional leak/spill protection measures will include tank level gauges, level alarms, pressure delivery over-fill prevention valves and leak detection alarms connected to the building management system (BMS), fuel pipelines will have a pipe-in-pipe arrangement to minimise the risk of leaks. The integrity of the diesel tanks and secondary containment will be subject to daily visual inspection by site personnel as part of daily operations. Any defects or weaknesses spotted in a tank or containment measures will be repaired as soon as practicable. Tertiary containment will be provided by the contoured hardstanding of the area where the back-up generators, the receiver station and the fuel road tanker off-loading area will be located. Any unplanned release of diesel would be prevented from percolating into the ground by the hardstanding. The hardstanding will be subject to regular visual inspection to ensure continued integrity. Surface water runoff from the area where the back-up generators and diesel receiver station are to be located will be directed to the on-site surface water drainage system via an oil interceptor (9,600 litre capacity) which will ultimately discharge to the Thames Water surface sewer (via discharge point SW1). The interceptor will be fitted with an automatic closure device, this closure device will be activated on detection of diesel in the interceptor, by its integral detection mechanism, preventing the release of diesel. The system will also be fitted with a wired interface to the building's BMS. An audible alarm system for interceptor oil levels will be also installed which will connect to the data centre BMS; the alarm will notify key data centre staff of the issue, via the BMS. The interceptor will be subject to regular emptying and maintenance by an appointed specialist contractor. All interceptor oil/sludge will be removed by suitably licensed contractors. No oily water will be permitted to leave the site under normal operating conditions.	Low - management control measures are in place.	Pollution, harm to environment, harm to human health	Low
Litter from solid waste storage and removal from site	Residents from adjacent housing and surrounding commercial and industrial workers ecological receptors	Windblown to air	Minimal solid waste generation is anticipated on site. Waste minimisation and management procedures will be included within the site EMS. All staff will be trained in waste management procedures by their supervisors. All wastes produced during maintenance tasks will be immediately removed by vendors (specialist contractors) from the installation following completion of the relevant maintenance task. Only licenced contractors are used to remove waste from site, receipts obtained for all removals. Transfer notes for all disposals are filed and held for 3 years.	Low – Limited generation of wastes subject to management control measures	Litter can cause local visual pollution and an increase in vermin and odour	Negligible
Pests / vermin	Employees, residents from adjacent housing and surrounding commercial and industrial workers ecological receptors	Land/air	Not relevant to the operation.	Very Low – No significant sources of waste, food etc. used or stored.	Potential for spread of disease and adverse health impacts on vulnerable people	Negligible

Table 2-3 -Accident Risk Assessment and Management Plan

Hazard [What has the potential to cause harm?]	Receptor [What is at risk what do I wish to protect?]	Pathway [How can the hazard get to the receptor?]	Risk Management [What measures will you take to reduce the risk? Who is responsible for what?]	Probability of [Exposure How likely is this contact?]	Consequence [What is the harm that can be caused?]	What is the overall risk [What is the risk that still remains? The balance of probability and consequence What has the potential to cause harm?]
Operator error	Air/Water/Land	Variable - dependent on nature of the error	The installation will be automatically controlled which will minimise potential for operator error on site. The automatic control system will include alarms and warning lights to alert of potential operational problems. The only anticipated manual tasks will be the connection of the diesel delivery vehicles to the receiving tanks. This will be undertaken within bunded areas by trained operators. All staff (including contractors) will be qualified for the role to be carried out and trained specifically to carry out their responsibilities in relation to the installation.	Low - management control measures are in place.	Variable - dependent on nature of the error	Low
Loss of power	None	N/A	The function of the installation is to operate in the event of loss of power from the grid.	N/A	N/A	N/A
Leak from on-site fuel oil storage	Land, groundwater	Overland percolation through the ground	Generators and associated diesel belly tanks will be housed external to the data centre building; this area will benefit from concrete surfacing. The generators and belly tanks have the benefit of being containerised. Each generator will be located within a dedicated propriety steel contained unit. Each back-up generator will be serviced by a belly tank, which is integral to the container unit, which will automatically supply diesel to the generator via the receiving tank (one located in each building. The belly tanks will be designed to British Standard BS799 Part 5 2010 (Oil Burning Equipment. Carbon steel oil storage tanks. Specification); in accordance with this design standard each tank will be provided with secondary containment (110%). Fuel delivery tankers will be required to park in a dedicated tanker refuelling area. Once the vehicle is in position, and prior to fuel dispatch, portable spill barriers will be positioned around this area to contain any unplanned released of fuel in this area during refuelling; the barriers will be removed on completion of refuelling. Diesel will be delivered from the fuel tanker to the generator belly tanks via a fuel receiver station. The receiver station will include two fill points (1 being duty standby) and two above ground diesel receiver tanks, each with a 1,500 L capacity. The receiver tanks will be designed to British Standard BS799 Part 5 2010 (Oil Burning Equipment. Carbon steel oil storage tanks. Specification); in accordance with this design standard each tank will be provided with secondary containment (110%). The diesel tanker fill points will be located in two lockable cabinets. These fill cabinets will be provided with a spill tray to contain any minor spillages of fuel during fuel delivery. The two cabinets will remain locked when not in use. Additional leak/spill protection measures will include tank level gauges, level alarms, pressure delivery over-fill prevention valves and leak detection alarms connected to the building management system (BMS), fuel pipelines will have a pipe-in-pipe arrangement to minimise the risk of leaks. The integrity of the diesel tanks and secondary containment will be subject to daily visual inspection by site personnel as part of daily operations. Any defects or weaknesses spotted in a tank or containment measures will be repaired as soon as practicable. Tertiary containment will be provided by the contoured hardstanding of the area where the back-up generators, the receiver station and the fuel road tanker off-loading area will be located. Any unplanned release of diesel would be prevented from percolating into the ground by the hardstanding. The hardstanding will be subject to regular visual inspection to ensure continued integrity. Surface water runoff from the area where the back-up generators and diesel receiver station are to be located will be directed to the on-site surface water drainage system via an oil interceptor (9,600 litre capacity) which will ultimately discharge to the Thames Water surface sewer (via discharge point SW1). The interceptor will be fitted with an automatic closure device, this closure device will be activated on detection of diesel in the interceptor, by its integral detection mechanism, preventing the release of diesel. The system will also be fitted with a wired interface to the building's BMS. An audible alarm system for interceptor oil levels will be also installed which will connect to the data centre BMS; the alarm will notify key data centre staff of the issue, via the BMS. The interceptor will be subject to regular emptying and maintenance by an appointed specialist contractor. All interceptor oil/sludge will be removed by suitably licensed contractors. No oily water will be permitted to leave the site under normal operating conditions.	Low - management control measures are in place.	Pollution, harm to environment, harm to human health	Low

Table 2-3 -Accident Risk Assessment and Management Plan

Hazard [What has the potential to cause harm?]	Receptor [What is at risk what do I wish to protect?]	Pathway [How can the hazard get to the receptor?]	Risk Management [What measures will you take to reduce the risk? Who is responsible for what?]	Probability of [Exposure How likely is this contact?]	Consequence [What is the harm that can be caused?]	What is the overall risk [What is the risk that still remains? The balance of probability and consequence What has the potential to cause harm?]
Discharge of fuel oil outside bunded or kerbed area	Industrial, commercial, residential, surface water and ecological receptors	Over Land, Water	Best practice will be adhered to for fuel unloading and loading activities which will limit the duration of potential emission releases. Deliveries of diesel will be from operator approved suppliers and will be undertaken in accordance with delivery procedures which will be developed as part of the Environmental Management System (EMS). Diesel fuel suppliers will be required to adhere to the current Carriage of Dangerous Goods (ADR) Regulations. Storage areas will be kept sealed and secured at all times.	Low - Management control measures are in place.	Pollution, Harm to Environment and Human Health	Low
F-gas storage	Site employees and surrounding atmosphere due to high global warming potential	Airborne – through the leaking of gases.	No F gases are used or stored in the medium voltage switchgear on site. An F-Gas register will be maintained as applicable for other cooling systems not subject to this permit application. Maintenance and inspection will be included within the EMS for relevant plant and equipment.	Very Low – No F-gas in generator switchgear. Management control measures are in place.	Increase in the level of greenhouse gas emissions. Damage to human health through ingestion or dermal contact	Negligible
Leak or spillage of chemicals	Site employees, local residential and commercial residents, underlying soils, groundwater, nearby water bodies and local sewerage system.	Site drainage systems and wider sewer network	Very low quantities of chemicals used and stored on site. All chemicals used on site will be subject to full COSHH assessment and COSHH sheets will be held on site. Management will be in accordance with the site EMS Chemicals to be stored in a bunded and locked cabinets. Toolbox talks will be given to engineering staff covering all elements of the Safety Data Sheet.	Very Low – Very limited quantities of chemicals used and stored on site subject to management control measures	Potential contamination of local sewerage system, nearby water bodies. Damage to human health through ingestion or dermal contact.	Negligible
Incorrect handling and disposal of waste redundant plant	Site employees, local residential and commercial residents, underlying soils, groundwater, nearby water bodies and local sewerage system.	Direct contact, run off over land surface water sewer	Very low quantities of wastes likely to be generated from operation of the installation. Management systems and controls will be in place to identify waste streams potentially produced on site. Waste avoidance, reduction, re-cycling and re-use measures will be adopted. Appropriate handling and storage practices to be followed within dedicated waste storage areas. These measures to be supported by staff training. Uplift and disposal of segregated waste streams will a be undertaken by licenced wastes carriers, all associated licenses and permits etc. will be kept and retained on site in accordance with Duty of Care requirements.	Very Low – Very limited quantities of wastes generated on site, subject to management control measures	Hazardous material could be sent to inappropriate/unsuitable waste treatment facility or landfill which could cause contamination of waste streams Fly tipping / Local visual pollution	Negligible
Fire	Industrial, commercial, residential, surface water, ecological and cultural heritage receptors	Air (smoke), Over Land, Water	In respect of the back-up generators, the following provisions are made: • Generators will be provided with fire suppression in their respective containers. • Walls that are within 6m of any external fuel tanks to be provided with at least 120 minute fire resistance. • The gantry containing the back-up generators on the ground floor, have a structural fire resistance of 15 minutes. • Back-up generators are housed within containers and are provided with water-mist automatic suppression systems. • Fire hose coverage of the back-up generator area is provided to the gantry areas in addition to the firefighting shafts. The installation is monitored via an onsite control room. Routine daily inspections and maintenance will be carried out by a suitably qualified member of staff and subcontractors. These systems will link to the site security office where personnel will alert relevant employees and call the Fire and Rescue Service to attend if necessary. Each generator is enclosed within a minimum 2mm thick metal container and is provided with a watermist fire suppression system. Upon detection of a fire within the container the fuel will be cut off by a thermal fusible link and gravity drop valve and dumping of fuel by gravity from fuel storage tank associated with the generator to fuel tank outside of the building. As the plant is expected to be well maintained and taking account of the fire suppression, fuel dumping and housing of the generators it is considered that the generators do not require any additional fire resistance other than that provided by the metal housing.	Low - Fire detection, alarms, fire suppression systems in place, design and construction includes fire protection measures.	Pollution, Harm to Environment and Human Health	Low

Table 2-3 -Accident Risk Assessment and Management Plan

Hazard [What has the potential to cause harm?]	Receptor [What is at risk what do I wish to protect?]	Pathway [How can the hazard get to the receptor?]	Risk Management [What measures will you take to reduce the risk? Who is responsible for what?]	Probability of [Exposure How likely is this contact?]	Consequence [What is the harm that can be caused?]	What is the overall risk [What is the risk that still remains? The balance of probability and consequence What has the potential to cause harm?]
Security and Vandalism	Air/water/land	Various	The site security has been established by a Securus SR1 / CLD Fencing System around the perimeter and is supported by the AXIS Perimeter Defender Perimeter Intrusion Detection System (PIDS) mounted on poles mounted around the site that include fixed thermal cameras, Pan/Tilt/Zoom cameras and Public address speakers to manage potential breach attempts. In addition, dedicated fixed cameras have been included in certain key areas to monitor potential areas of concern along the eastern area of the fenceline. A Security Guardhouse has been established for site entry that includes an LPS 1175 Platinum SR1 Bi-Fold Gate for managing entry/egress to/from the site. The perimeter fence will include key areas for access to the site by emergency vehicles. The Site Manager will be responsible for implementing risk management measures in conjunction with site operating rules / EMS.	Very Low – Installation is fenced and secure with intrusion detection and monitoring systems	Low to Medium depending on nature of the event.	Negligible
Flooding	Industrial, commercial, residential, surface water, cultural heritage and ecological receptors	Land, Water	The data centre lies within a Flood Zone 1, defined as an area with a low probability of flooding. Operational areas, roads and external surfacing will benefit from impermeable surfacing to prevent the percolation of any potentially contaminated water to soil and groundwater. The site will benefit from a sealed surface water drainage system; surface runoff will discharge to surface water sewer via an interceptor which will be alarmed and have an automatic shut-off device if oil is detected. The Site Manager will be responsible for implementing risk management measures in conjunction with the operating techniques document	Low - Flood risk has been addressed in a drainage philosophy for the wider data centre site which was prepared to support the planning application	Low - Pollution, Harm to Environment and Human Health	Low
Emissions to land – potential contamination from historical land use	Site employees, underlying soils and groundwater.	Leaching through the soils and dermal contact.	The former Akzo Nobel paint and coatings manufacturing site was subject to a comprehensive programme of site investigation, characterisation and assessment leading to a major phase of remediation as a requirement of the planning permission granted for the development site which includes Building A & B subject to the permit application. The remedial work carried out was subject to verification exercise for discharge of relevant planning conditions in order to allow consideration of new development for the intended commercial use. There is limited potential for residual contamination to be present, whilst the provision of buildings and hardcover incorporated for the new development presents a barrier between the operators of the installation and underlying soils / groundwater.	Very Low – The site has been subject to a comprehensive remediation works programme and verification exercise to meet planning requirements.	Low - Pollution, Harm to Environment and Human Health	Negligible

Table 2-4 - Global Warming Potential (GWP)

Hazard [What has the potential to cause harm?]	Receptor [What is at risk what do I wish to protect?]	Pathway [How can the hazard get to the receptor?]	Risk Management [What measures will you take to reduce the risk? Who is responsible for what?]	Probability of [Exposure How likely is this contact?]	Consequence [What is the harm that can be caused?]	What is the overall risk [What is the risk that still remains? The balance of probability and consequence What has the potential to cause harm?]
Generation of CO2e emissions	Surrounding environment through emissions of greenhouse gases. National and global air quality and climate change.	Air	The use of back-up generators is required for emergency outage for the National Grid supply of electricity and limited maintenance and testing purposes. The combustion of diesel will result in limited generation of CO2e emissions. The management of energy will form an integral part of the operator's environmental management system (EMS). Energy consumption has been considered as part of the assessment of Best Available Techniques. Energy efficiency measures will be undertaken in order to reduce the electricity consumption on site.	Low – Back up generators will be limited use in use. Management control measures are in place.	Low - Increase in greenhouse gases to the atmosphere contributing to global warming.	Low

Appendix A

Nature and Heritage Conservation

Screening Report: Bespoke Installation

Reference	**EPR/KP3746QZ/A001**
NGR	**SU 98700 80300**
Buffer (m)	**85**
Date report produced	**01/11/2022**
Number of maps enclosed	**6**

The nature conservation sites identified in the table below must be considered in your application.

Nature and heritage conservation sites	Screening distance (km)	Further information
Special Areas of Conservation (cSAC or SAC)	10	Joint Nature Conservation Committee
Bumham Beaches		
Windsor Forest & Great Park		
Special Protection Area (pSPA or SPA)	10	Joint Nature Conservation Committee
South West London Waterbodies		
Ramsar	10	Joint Nature Conservation Committee
South West London Waterbodies		
Local Nature Reserve (LNR)	2	Natural England
Herschel Park		
Local Wildlife Sites (LWS)	2	Appropriate Local Record Centre (LRC)
Railway Triangle (off Stranraer Gardens)		

Upton Court Park Wetland

Protected Species	Screening distance (m)	Further Information
European Water Vole	up to 500m	Natural England Appropriate Local Record Centre (LRC)

Where protected species are present, a licence may be required from Natural England or the Welsh Government to handle the species or undertake the proposed works.

The relevant Local Records Centre must be contacted for information on the features within local wildlife sites. A small administration charge may also be incurred for this service.

Please note we have screened this application for protected and priority sites, habitats and species for which we have information. It is however your responsibility to comply with all environmental and planning legislation, this information does not imply that no other checks or permissions will be required.

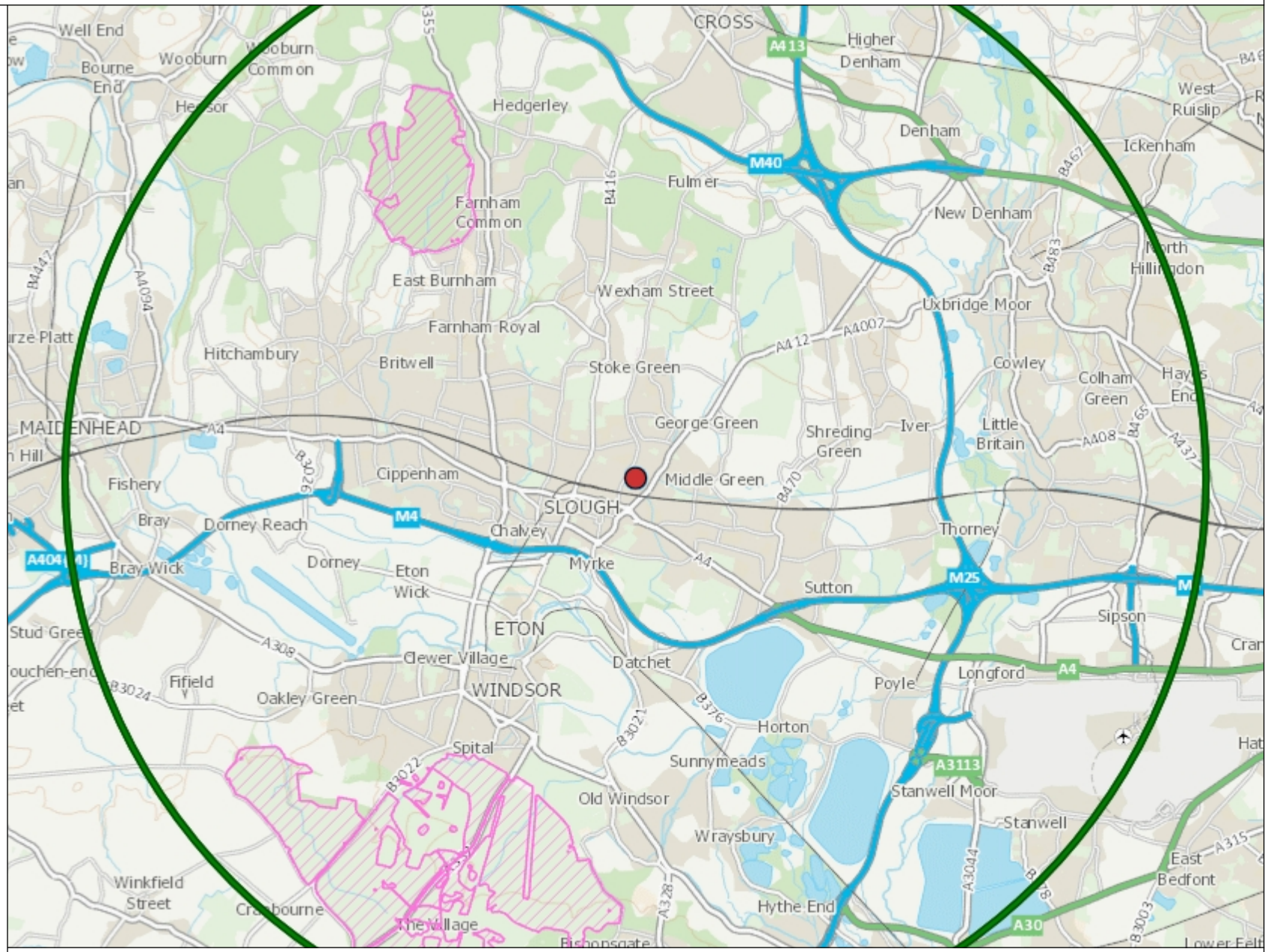
Please note the nature and heritage screening we have conducted as part of this report is subject to change as it is based on data we hold at the time it is generated. We cannot guarantee there will be no changes to our screening data between the date of this report and the submission of the permit application, which could result in the return of an application or requesting further information.

Special Areas of Conservation

Environment Agency

Legend

SAC (England)



1: 100,000

0 2,500

Metres

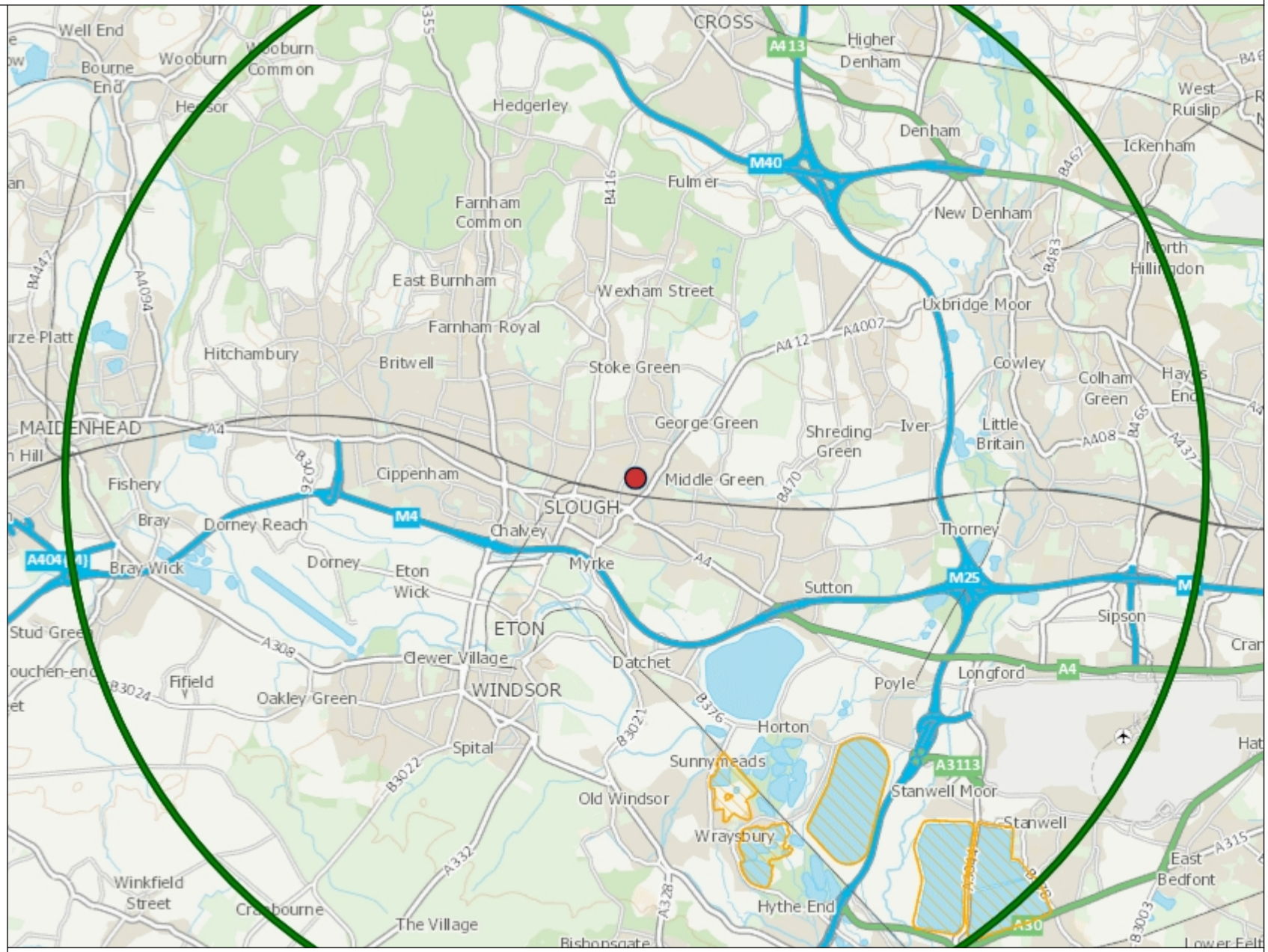
N W E S

Special Protection Areas

Environment Agency

Legend

SPA (England)



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0 2,500

Metres

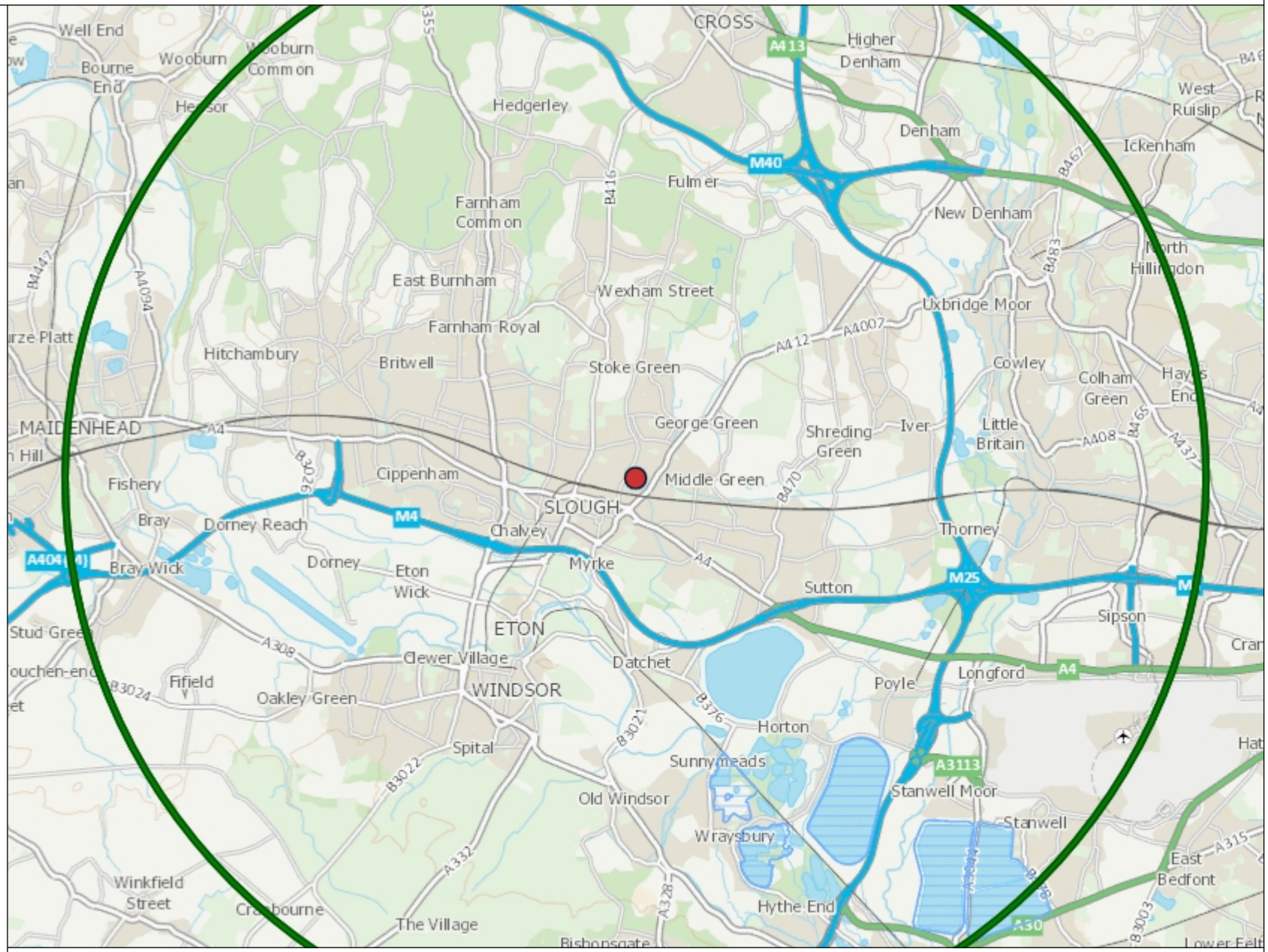
N W E S

Ramsar Sites

Environment Agency

Legend

Ramsar (England)



1: 100,000

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Metres

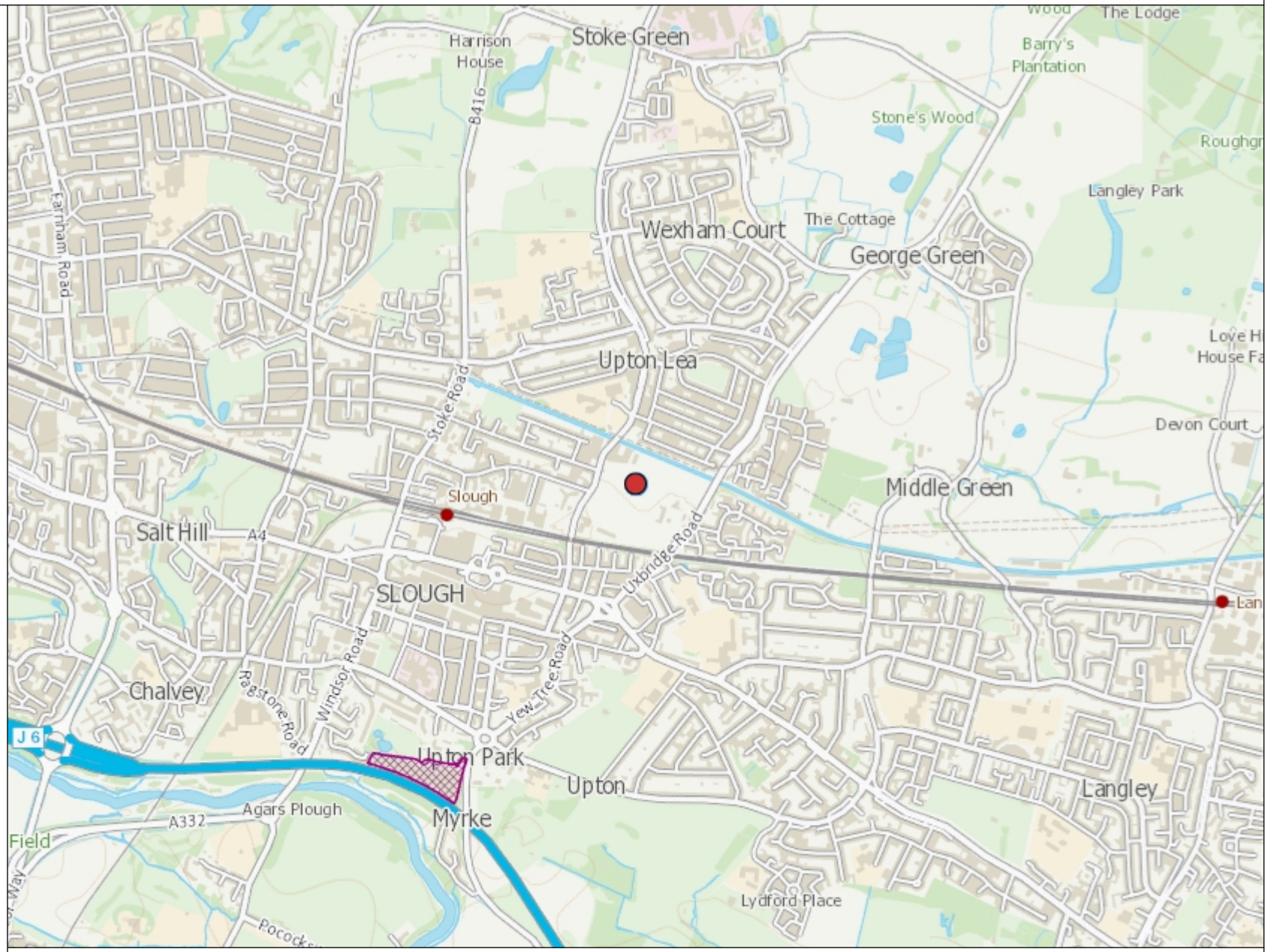
N W E S

Local Nature Reserves

Environment Agency

Legend

LNR (England)



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0 625

Metres

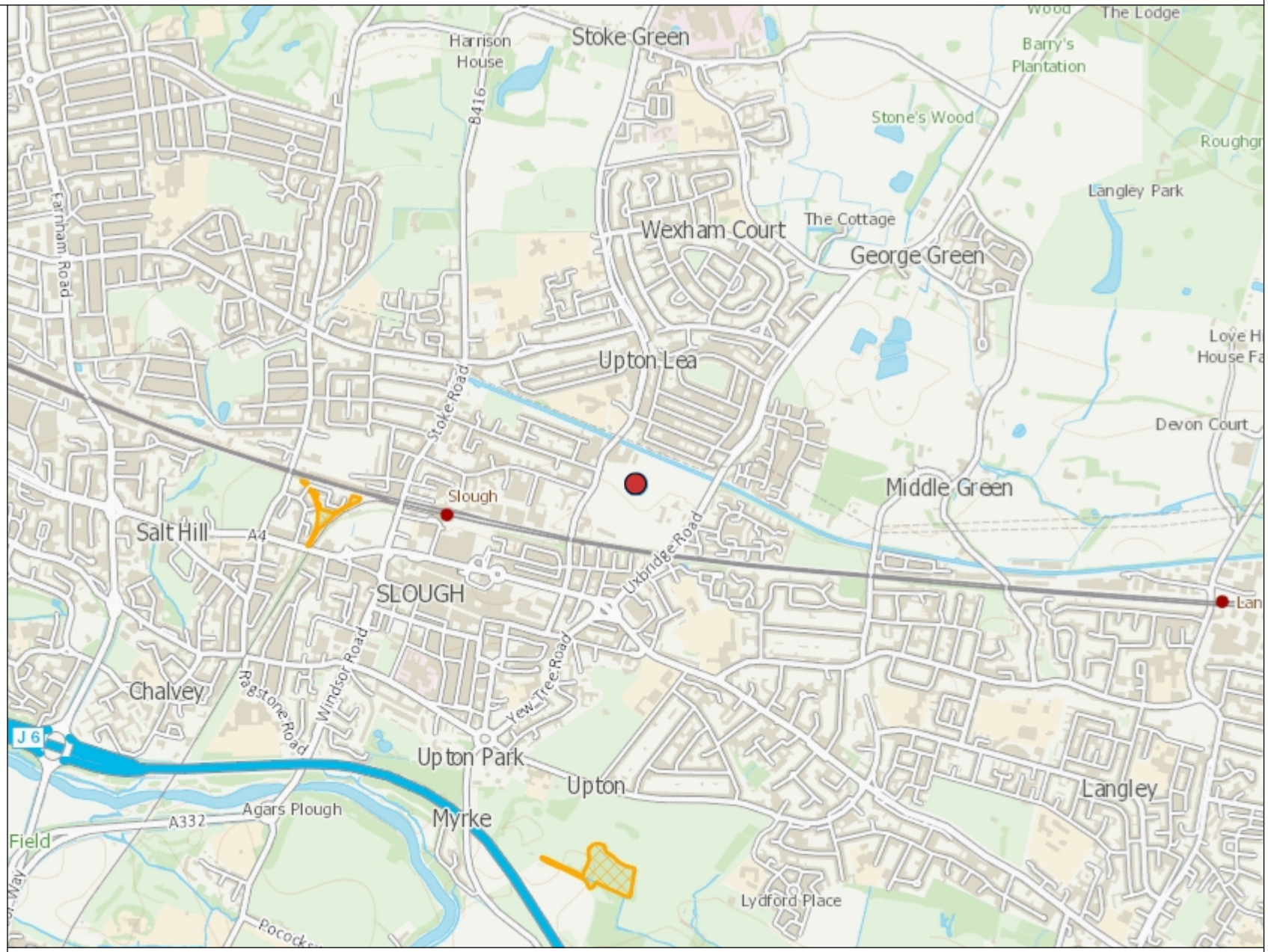
N W E S

Local Wildlife Sites

Environment Agency

Legend

Local Wildlife Sites



1: 25,000

0 625

Metres

N W E S

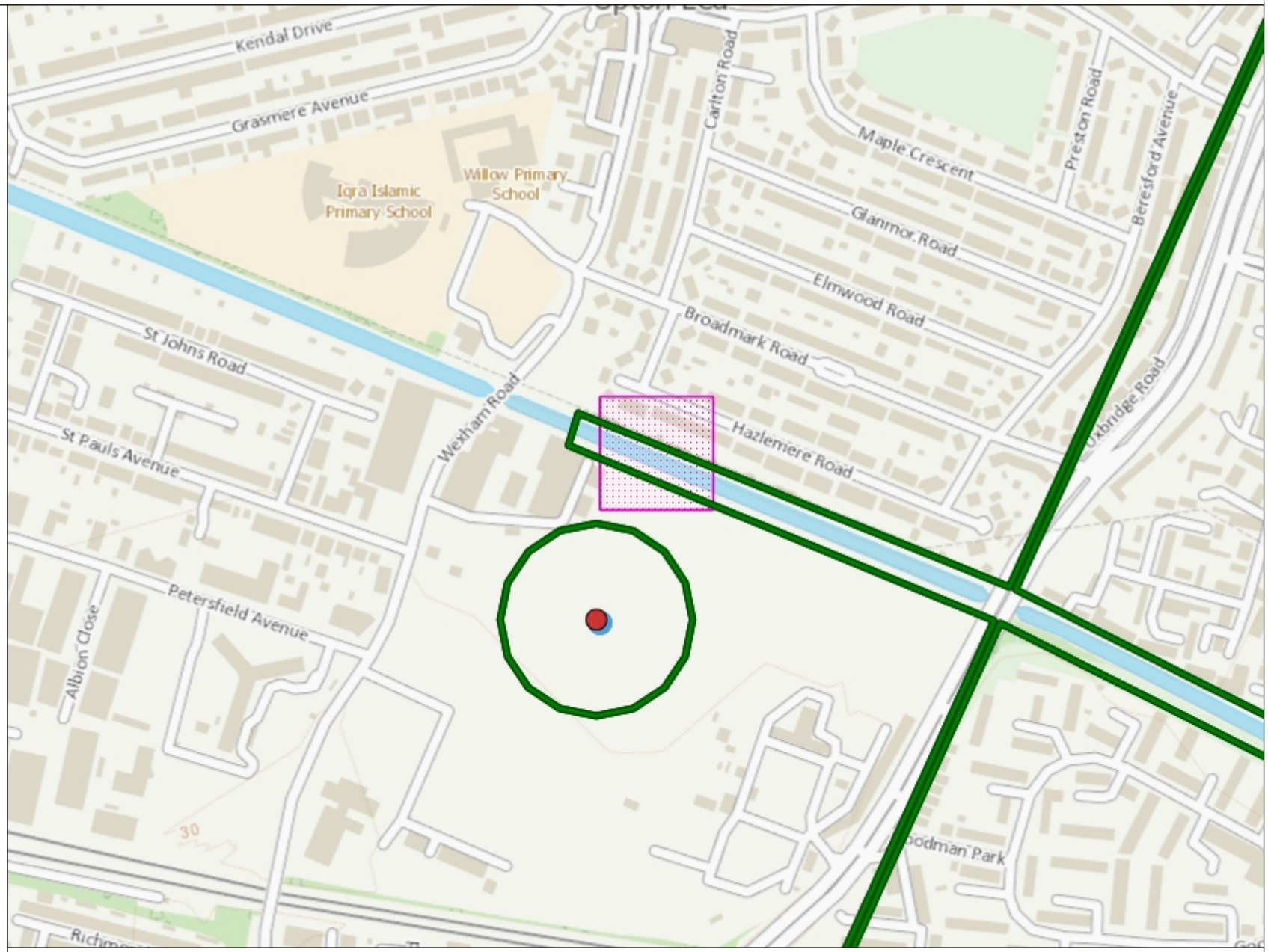
Protected Species

Environment Agency

Legend

Protected species screened for Env Permits - complete set

- Protected species, non fish
- Protected fish
- Protected fish migratory route



1: 5,000

0 125

Metres

N W E S

Appendix C – Diesel Generator Specification

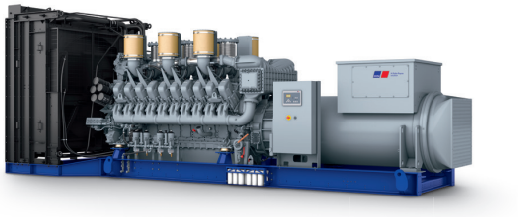
APPENDIX 01

Generator Datasheet

Diesel Generator Set

mtu 20V4000 DS3300

380V – 11 kV/50 Hz/data center continuous power/ NOx emission optimized/20V4000G34F/water charge air cooling



*Project Specific Datasheet LON1XO

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: 3020 kVA - 3130 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
- 100% 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
- NOx emission 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	20V4000G34F
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	2590
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:	689.6	221
At 75% of power rating:	510.2	218
At 50% of power rating:	335.5	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	3.7
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/rh	32.5
Heat rejection to coolant: kW	1100
Heat radiated to charge air cooling: kW	660
Heat radiated to ambient: kW	105
Fan power for electr. radiator (40°C): kW	70

Exhaust system	
Exhaust gas temp. (after turbocharger): °C	535
Exhaust gas volume: m^3/s	10.3
Maximum allowable back pressure: mbar	85
Minimum allowable back pressure: mbar	30

Standard and optional features

System ratings (kW/kVA)

Generator model	Voltage	NOx emission optimized					
		without radiator			with mechanical radiator		
		kWel	kVA*	AMPS	kWel	kVA*	AMPS
~~Leroy Somer LSA53.2 M12 (Low voltage Leroy Somer standard)~~	~~380 V~~	~~2488~~	~~3110~~	~~4725~~	~~2424~~	~~3030~~	~~4604~~
	~~400 V~~	~~2488~~	~~3110~~	~~4489~~	~~2424~~	~~3030~~	~~4373~~
	~~415 V~~	~~2488~~	~~3110~~	~~4327~~	~~2424~~	~~3030~~	~~4215~~
~~Marathon 1030FDL7094 (Low voltage Marathon)~~	~~380 V~~	~~2496~~	~~3120~~	~~4740~~	~~2416~~	~~3020~~	~~4588~~
	~~400 V~~	~~2488~~	~~3110~~	~~4489~~	~~2416~~	~~3020~~	~~4359~~
	~~415 V~~	~~2488~~	~~3110~~	~~4327~~	~~2416~~	~~3020~~	~~4201~~
~~Marathon 1040FDH7102 (Medium volt. marathon)~~	~~11 kV~~	~~2496~~	~~3120~~	~~164~~	~~2416~~	~~3020~~	~~159~~
~~Leroy Somer LSA54.2 XL11 (Med. volt. Leroy Somer)~~	~~11 kV~~	~~2504~~	~~3130~~	~~164~~	~~2424~~	~~3030~~	~~159~~

* cos phi = 0.8

Leroy Somer LSA53.2 L14 (12% volt. Leroy Somer)	400V	2488	3110	4489	2424	3030	4373

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 improved oil seperator
- ■ Governor-electronic isochronous
- ■ Common rail fuel injection
- ■ NOx emission optimized engine
- ■ Centrifugal oil filter

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

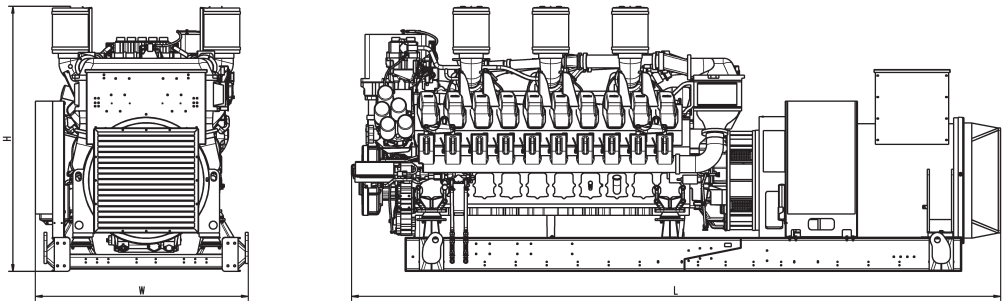
- ■ Welded base frame
- ■ Resilient engine and generator mounting
- ■ Modular base frame design
- ☐ Base frame mounting on foundation/base plate with using clamping brackets

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 1887 x 2332 mm	15819 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

— Data center continuous power ratings (DCP) apply to data center installations where a reliable utility power is available and comply with Uptime Institute Tier III and IV requirements. At constant or varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with ISO 8528-1, ISO 3046-1, BS 5514 and AS 2789. Average load factor: ≤ 100%.
— Consult your local ***mtu*** distributor for derating information.

Subject to change. | 3238931 | Edition 01/22 | BMC 2021-12.

APPENDIX 05

Emissions Datasheet & Letter

Rolls-Royce Solutions GmbH
Maybachplatz 1
88045 Friedrichshafen
Germany
T +49 7541 90-0

To whom it may concern

Contact: Robert Welz
e-Mail: robert.welz2@ps.rolls-royce.com
Tel. No.: +49 7541 904675
Fax No.:
Date: 23 March 2022
Ref.:

Explanation Nominal Emissions and Not to Exceed Emissions in the Emission Data Sheets

Nominal emission values are the result of one specific measurement on one single engine. These measurements have been done under standard conditions on test benches in Friedrichshafen. Because it's a single measurement of one single engine it doesn't show engine to engine variations, nor measurement to measurement variations.

Based on experience, our development team defines safety margins for each load point covering such effects. These safety margins are then added to the nominal emission values. As a result, we have the "not to exceed (NTE)" values in our EDS, which will be valid for all engines out of the series production – as long as the conditions are standard conditions.

These NTE- values will cover any tolerances, deviations etc. and therefore we consider all engines will be within the NTE- emission values under the conditions stated on the Emission Data Sheet.

Sincerely,

Digitale Unterschrift - Original abgelegt bei TSF.

i.V. Michael Koliwer
Director of PG Engineering
Rolls Royce Solutions GmbH

Digital Signature - Original filed at TSL

i.A. Robert Welz
Senior Manager of PG Engineering
Rolls Royce Solutions GmbH

Revision *Change index*					

Motordaten

engine data

	Genset	Marine	O & G	Rail	C & I
Application	x				
Engine model	20V4000G34F 6ETC				
Application group	3B, 3E, 3F, 3G				
Emission Stage/Optimisation	TA-Luft				
Test cycle	D2 + 110%				
fuel sulphur content [ppm]	5				
mg/mN³ values base on residual oxygen value of [%]	5				

Not to exceed Werte*

*not to exceed values**

Cycle point	[-]	n1	n2	n3	n4	n5	n6	n7	n8
Power (P/PN)	[-]	1,00	0,75	0,50	0,25				
Power	[kW]	2590	1942	1295	647				
Speed (n/nN)	[-]	1	1	1	1				
Speed	[rpm]	1500	1500	1500	1500				
Exhaust back pressure	[mbar]	20	14	6	2				
NOx	[g/kWh]	5,8	5,6	5,9	9,1				
	[mg/mN³]	1998	1994	2096	3033				
CO	[g/kWh]	1,3	1,1	0,9	2,6				
	[mg/mN³]	406	362	304	821				
HC	[g/kWh]	0,12	0,13	0,21	0,39				
	[mg/mN³]	38	44	71	121				
O2	[%]	9,4	10,2	10,8	13,1				
Particulate calculated	[g/kWh]	0,11	0,11	0,09	0,22				
	[mg/mN³]	32	34	29	64				

* Calculated values are not proven by tests and therefore the accuracy cannot be guaranteed.

Emissions data measurement procedures are consistent with those described in the applicable rules and standards.

The NOx, CO, HC and PM emission data tabulated here were taken from a single new engine under the test conditions shown above and are valid for the following conditions:

- Ambient air pressure 1 bar
- Air intake temperature approx. 25°C
- Rel. Humidity 30%-60%
- New Engine
- New standard- air filter
- Exhaust gas back pressure according the given value in this EDS
- Fuel according to EN 590 or US EPA 40CFR89
- Coolant and Lubricants according MTU Fuels and Lubricants Specification
- measured after combined exhaust streams.

The nominal emissions data shown is subject to instrumentation, measurement, facility and engine to engine variations. Emissions data is based on single operating points and thus cannot be used to compare to EPA regulations which use values based on a weighted cycle. Emissions data may vary depending on the type of exhaust gas aftertreatment that may be installed on the engine, therefore it is suggested that the engine manufacturer be contacted directly for further information.

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. Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may results in elevated emission levels.

MTU Friedrichshafen GmbH has made efforts to ensure that the information in this data sheet is accurate, but 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.

Appendix D – Air Quality Assessment

Application for approval of reserved matters following outline approval reference P/00072/096 dated 19th November 2020, for the mixed-use development of land at the former Akzonobel Decorative Paints facility, Wexham Road, Slough SL2 5DB.

SLO1X0 - Air Quality Assessment for Discharge of Condition 17

Status / Revisions

Rev.	Date	Reason for issue	Prepared		Reviewed		Approved	
P01	22.03.21	S3	KN	24.03.21	AC	24.03.21	RE	24.03.21
C01	07.04.21	S3	KN	07.04.21	RE	08.04.21	RE	08.04.21
C02	23.06.21	S3	KN	23.06.21	JS	23.06.21	JS	23.06.21

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Karunakar Nagula

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SWECO

Table of contents

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1 Introduction

Sweco UK has been commissioned by Yondr ('Client') to undertake an air quality assessment to appraise the impact of atmospheric emissions from the operation of emergency generators at the proposed development named SLO1 located off Wexham Road, Slough ('Site').

The proposals comprise two 30MWit data centre buildings with associated substation and mechanical yard. Each building (A & B) will include three storeys of data halls and facility support (offices and ancillary space), and a four-storey external gantry where most of the external plant will be located ('Proposed Development'). At this stage, it is also likely that a data centre use will come forward on 'Block J' area (ie the remaining commercial plot on the approved Parameter Plan).

The Site has outline planning consent for data centre use (planning ref - P/00072/096). To inform this previous application a detailed air quality impact assessment was undertaken and submitted as part of an Environment Statement (Chapter 12 (document ref - A114100, dated December 2019) ('AQ ES Chapter')) to Slough Borough Council (SBC).

Outline planning consent has been granted and condition 17 attached to this permission states that:

"*Should a reserved matters application be made for Data Centre use on all or any part of the commercial land, an Air Quality assessment demonstrating that ambient concentrations of applicable pollutants during the operation of the proposed facility (s) would not result in significant impact at relevant sensitive receptors, shall be submitted and approved by the Local Authority alongside the first Reserved Matters applications.*

REASON: to protect sensitive receptors from pollution in accordance with Policy 8 of the adopted Core Strategy 2006 - 2026 and the National Planning Policy Framework (2019)."

This report contains further assessment of air quality impacts, to request for the discharge of the above condition and to accompany a reserved matters planning application for the data centre development (to include buildings A and B).

The report takes into account comments received from SBC during the pre-app meeting in March 2021.

This air quality assessment only predicts the air emissions from the operation of the data centre development and assesses the impacts of the proposed development in addition to the traffic related emissions and construction phase dust impacts that were already assessed as part of the AQ ES Chapter.

2 Site Location and Proposed Development

2.1 Site Description

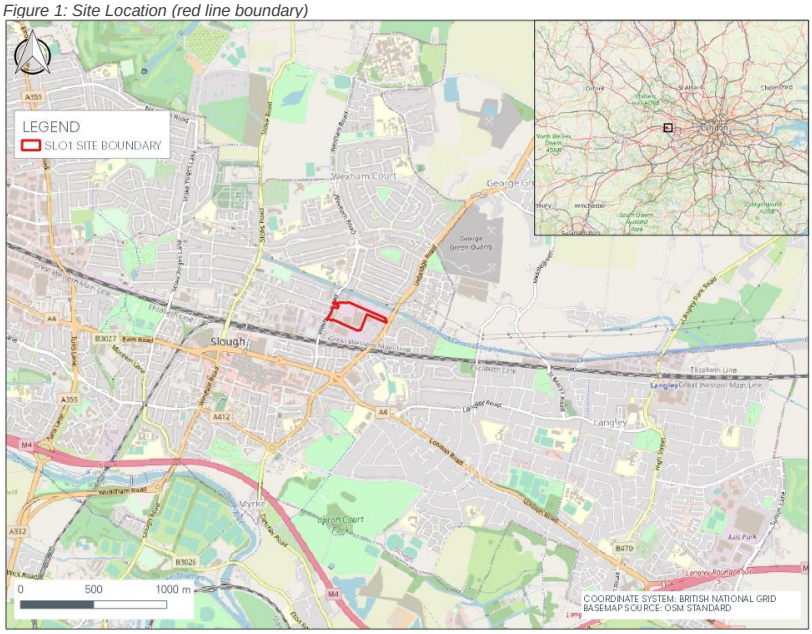
The Site is located to the east of Wexham Road and falls within the jurisdiction of Slough Borough Council (SBC). The surrounding area is a mixture of commercial and residential developments. The Site forms part of a wider development which will see additional residential properties construction to the south of the Proposed Development.

An outline planning permission has been granted for the former Akzonobel Paintworks Factory site in Slough, including the provision of commercial floorspace including sui generis data centre (including ancillary office space and associated plant and infrastructure provision); car parking, landscaping and vehicular and pedestrian access.

Pursuant to outline approval, reserved matters submissions made on behalf of Yondr for the first phase of commercial development on part of the site are being made, to which this report relates under outline planning approval reference P/00072/096. This includes the central portion of the former Akzonobel site, hereafter referred to as SLO1.

Figure 1 presents the red line boundary for the Proposed Development.

Figure 1: Site Location (red line boundary)



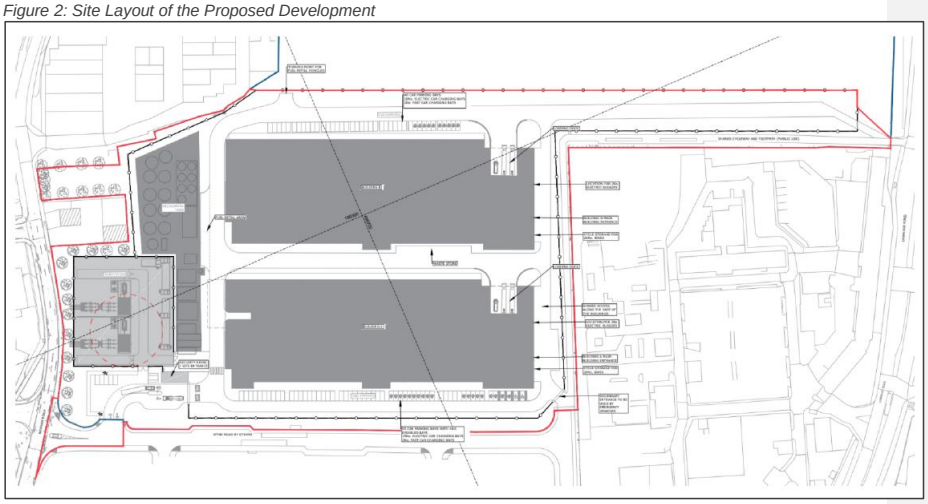
2.2 Proposed Development

The Proposed Development comprises the demolition of the existing site buildings, and the construction of two 30MWit data centre buildings with associated substation and mechanical yard. Each building (A & B) will include three storeys of data halls and facility support (offices and ancillary space), and a four-storey external gantry where most of the external plant will be located. It should be noted that majority of the demolition at the Site is now completed.

The area of the Site to the south of the Grand Union Canal, is likely to comprise a future phase of data centre development. This does not form part of this Reserved Matters Planning Application. However, future air quality emissions from this potential future facility are also considered in the assessment to ensure that compliance with the relevant air quality objectives can be achieved once the future phases of development have been completed.

Figures 2 presents the site plan of the Proposed Development.

Figure 2: Site Layout of the Proposed Development



Most of the external plant will be located on an external gantry to the north of the data halls. The proposed gantry layouts and sections are shown in Figures 3 to 7 below.

Figure 3: Ground Floor Gantry Layout (Generator Layout) – Buildings A & B

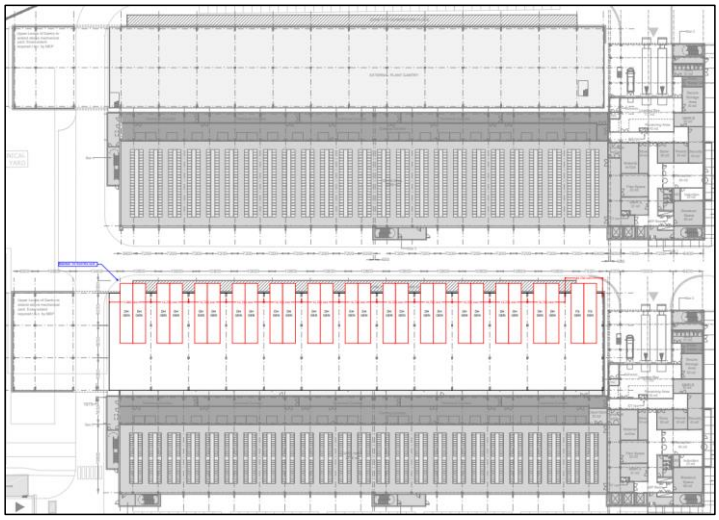


Figure 4: First Floor Gantry Layout (CEP Layout) – Buildings A & B

Figure 5: Second Floor Gantry Layout (CEP Layout) – Buildings A & B

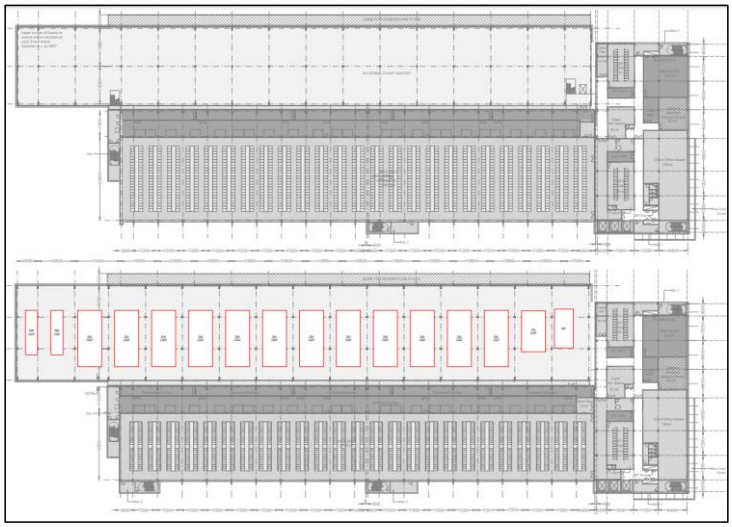


Figure 6: Third Floor Gantry Layout (Chiller Layout) – Buildings A & B

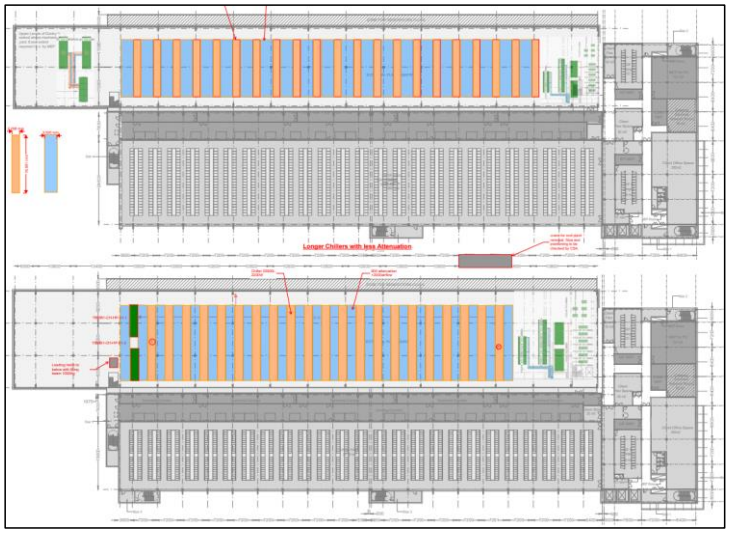
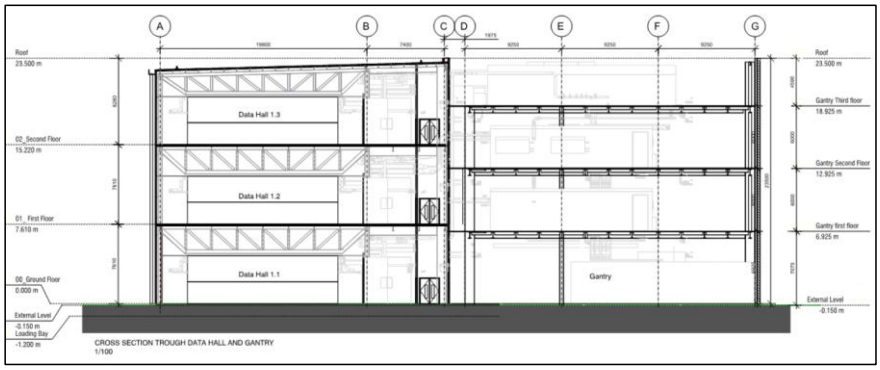


Figure 7: Gantry Section – Buildings A & B



2.3 Future Phase

The future phase of development to the north is likely to comprise further data halls and associated gantries. This phase of the development does not form part of this Reserved Matters Planning Application. However, to adopt a worst case approach atmospheric emissions from the entire site have been modelled to identify if the total emission burden could potentially exceed the relevant air quality objective at sensitive receptors.

Emissions from the future development phase are therefore included in this air quality impact assessment.

The approximate location of generator stacks and structures within the future development have been included within the air quality modelling.

3 Policy, Standards, and Guidance

The policy applicable to the air quality assessment undertaken for the discharge of condition 17 is summarised below. This is consistent with policy context summarised within the AQ ES Chapter as part of the approved outline planning application.

3.1 Air Quality Standards

The UK's legislation and regulatory regime, along with national, regional and local planning policy play a key role in the prevention, control and minimisation of atmospheric emissions that are potentially harmful to human health and the environment. Air Quality Objectives (AQOs) are quality standards for clean air that are used as assessment criteria for determining the significance of any potential changes in local air quality resulting from development proposals.

3.1.1 Environment Act 1995

Part IV of the Environment Act 19951 places a duty on the Secretary of State for the Environment to develop, implement and maintain an Air Quality Strategy with the aim of reducing atmospheric emissions and improving air quality. The Air Quality Strategy for England, Scotland, Wales and Northern Ireland provides the framework for ensuring the air quality limit values are complied with based on a combination of international, national and local measures to reduce emissions and improve air quality. This includes the statutory duty, also under Part IV of the Environment Act 1995, for local authorities to undergo a process of local air quality management and declare AQMAs where necessary.

3.1.2 Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2007)

The focus on local air quality is reflected in the air quality objectives (AQOs) set out in the Department for Environment, Food and Rural Affairs (Defra) and the Devolved Administrations Air Quality Strategy for England, Scotland, Wales and Northern Ireland, which, although not mandatory, represents Government policy on air quality. The strategy presents measures to control and improve the quality of air in the UK and reflects the increasing understanding of the potential health risks associated with poor air quality and the benefits that can be gained from its improvements.
The AQOs relevant to this assessment, which are those commonly close to or in excess of statutory levels in many UK urban areas, are set out in Table 3.1~~Table 3.1~~. The AQOs relevant to this assessment are laid down in the Air Quality Standards (England) Regulations[2].

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Table 3.1: Objectives included in the Air Quality Regulations and subsequent Amendments for the purpose of Local Air Quality Management

1 Environment Act 1995, Chapter 25, Part IV Air Quality

2 The Air Quality Standards Regulations 2010 (http://www.legislation.gov.uk/uksi/2010/1001/contents/made)

Pollutant	Concentrations	Measured As
Nitrogen Dioxide (NO_2)	200µg/m^3 not to be exceeded more than 18 times per year	One hour mean
	40µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3 not to be exceeded more than 35 times per year	24 hour mean
	40µg/m^3	Annual mean

3.1.3 Sensitive Locations

The locations where objectives apply are defined in the Air Quality Strategy (AQS) as locations outside buildings or other natural or man-made structures above or below ground where members of the public are regularly present and might reasonably be expected to be exposed over the relevant averaging period of the objectives. Typically, these include residential properties, hospitals and schools for the longer averaging periods (i.e. annual mean) pollutant objectives. Table 3.2~~Table 3.2~~ provides a summary of where the AQS objectives should and should not apply.

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Table 3.2: Examples of where the Air Quality Objectives should and should not apply

Averaging Period	Objectives Should Apply at:	Objectives Should Generally Not Apply at:
Annual mean	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.
24-hour mean and eight-hour mean	All locations where the annual mean objective would apply, together with hotels. Gardens of residential properties*	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.

Averaging Period	Objectives Should Apply at:	Objectives Should Generally Not Apply at:
One-hour mean	All locations where the annual mean and: 24 and eight-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably expected to spend one hour or longer	Kerbside sites where the public would not be expected to have regular access.
15-min mean	All locations where members of the public might reasonably be exposed for a period of 15 minutes.	

* – Such locations should represent parts of the garden where relevant public exposure to pollutants is likely, for example where there is seating or play areas. It is unlikely that relevant public exposure to pollutants would occur at the extremities of the garden boundary, or in front gardens, although local judgement should always be applied.

3.2 Air Quality Policy

3.2.1 National Planning Policy Framework (NPPF) 2019

NPPF (2019)[3] is the revised National Planning Policy Framework which is a vital tool in enable sustainable development. The NPPF recognises that development should be focused on locations which promote sustainability through reducing the need for travel. Where developments reduce the need for travel, this can result in reduced congestion and emissions and improve air quality.

The NPPF advises that plans should contribute towards compliance with relevant limit values or national objectives for pollutants, considering AQMA and Clean Air Zones and the cumulative impacts from individual sites in local areas. It further advised that any opportunities to improve air quality or mitigate the impacts should be identified (e.g. through traffic and travel management or green infrastructure provision and

3 Available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/810197/NPPF_Feb_2019_revised.pdf

enhancement). Any new developments in AQMA and Clean Air Zones should be consistent with the local air quality plan.

3.2.2 National Planning Practice Guidance

The National Planning Practice Guidance (PPG) (2019 update) provides a web-based summary guidance on air quality issues within NPPF and notes that air quality assessments of Proposed Developments should include the following information:

- The existing air quality in the study area (existing baseline);
- The future air quality without the development in place (future baseline);
- The future air quality with the development in place; and
- Construction phase impacts.

The guidance advises that a planning application can be determined with appropriate planning conditions or planning obligation, if the Proposed Development (including mitigation) would not lead to an unacceptable risk from air pollution, prevent compliance with EU limit values or fail to comply with the requirements of the Conservation of Habitats and Species Regulations.

3.2.3 Local Policy

Slough Borough Council adopted its Local Plan Core Strategy[4] in December 2008. This outlines the SBC's broad planning strategy. Following a review of policies within the development core strategy, the followingstatements were identified as being relevant to the proposed development from an air quality perspective:

"*CORE POLICY 8 (SUTAINBILITY AND THE ENVIRONMENT) – All development in the Borough shall be sustainable, of a high-quality design, improve the quality of the environment and address the impact of climate change….*

….3. Pollution Development shall not: a) Give rise to unacceptable levels of pollution including air pollution, dust, odour, artificial lighting or noise".

The Council's new Local Plan will set out how to guide development in Slough through to 2036. The plan will contain policies to guide business and residential development to meet the needs of Slough's expanding population.

The new Local Plan will update the existing Core Strategy, Site Allocations, and Local Plan Saved Policies.

The emerging Local Plan aims to address some of the key challenges facing Slough. In particular:

- Meeting the new for new homes;

4 Available at https://www.slough.gov.uk/downloads/file/54/dpd-core-strategy-2006-2026

- Continuing to provide for locally and nationally important businesses;
- How to make the most of the Heathrow Expansion; and
- How to tackle congestion on Slough's roads.

3.3 Air Quality Guidance

A summary of the publications referred to in the undertaking of this AQA is provided below.

3.3.1 Local Air Quality Management Review and Assessment Technical Guidance

The Department for Environment, Food and Rural Affairs (Defra) has published technical guidance[5] for use by local authorities in their review and assessment work. This guidance, referred to in this document as LAQM.TG (16), has been used where appropriate in the assessment presented herein.

3.3.2 Land-Use Planning & Development Control: Planning for Air Quality

Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have published guidance[6] that offers comprehensive advice on: when an air quality assessment may be required; what should be included in an assessment; how to determine the significance of any air quality impacts associated with a development; and, the possible mitigation measures that may be implemented to minimise these impacts.

3.3.3 Guidance on the Assessment of Dust from Demolition and Construction

This document[7] published by the IAQM was produced to provide guidance to developers, consultants and environmental health officers on how to assess the impacts arising from construction activities. The emphasis of the methodology is on classifying sites according to the risk of impacts (in terms of dust nuisance, PM_{10} impacts on public exposure and impact upon sensitive ecological receptors) and to identify mitigation measures appropriate to the level of risk identified.

3.3.4 National Planning Practice Guidance – Air Quality National Planning Practice Guidance – Air Quality

This guidance[8] provides a number of guiding principles on how the planning process can take into account the impact of new development on air quality, and explains how much detail air quality assessments need to include for proposed developments, and how impacts on air quality can be mitigated. It also provides information on how air quality is taken into account by Local Authorities in both the wider planning context of Local Plans and neighbourhood planning, and in individual cases where air quality is a consideration in a planning decision.

5 Defra (2016) Part IV The Environment Act 1995 and Environment (Northern Ireland) Order 2002 Part III, Local Air Quality Management Technical Guidance LAQM.TG16

6 Environmental Protection UK and Institute of Air Quality Management (Version 1.2 Updated January 2017). Land Use Planning & Development Control: Planning for Air Quality

7 Institute of Air Quality Management (Version 1.1 Updated June 2016). Guidance on the Assessment of Dust from Demolition and Construction

8 Department of Communities and Local Government (DCLG) (March 2014). National Planning Practice Guidance

3.4 Air Quality Standards and Guidelines for Ecology

In addition to undertaking an assessment of the potential effects of emissions from the Proposed Development on human health, assessment of air quality impacts on protected ecological receptors has also been undertaken. These impacts are of interest only for the operational phase, as short-term impacts during construction are negligible. Effects on sensitive ecological receptors primarily arise as a result of pollutant emissions by the following mechanisms:

- direct effects on flora due to increased concentrations of airborne pollutants;
- secondary effects on flora due to changes in soil chemistry brought about by deposition of pollutants to soil; and
- secondary effects on fauna due to changes in flora

The European Habitats Directive[9] sets out the legal framework requiring EU member states to protect habitat sites supporting vulnerable and protected species, as listed within the Directive. This Directive was incorporated into UK domestic legislation by means of the Conservation of Habitats and Species Regulations 2010[10]. This Directive requires the protection of certain sites including Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites. In addition, impacts on air quality are predicted at nationally important ecology sites in the form of Sites of Special Scientific Interest (SSSIs) and any relevant locally designated habitat sites.

The relevant standards and guidelines that provide a framework for assessing impacts on sensitive ecological receptors are derived from several sources:

- air quality standards (AQS) for NO_x (annual mean) for the protection of habitats are derived from European Union Air Quality Directives;
- air quality guidelines for NO_x (24 hours mean) have been derived by the Centre for Ecology and Hydrology (CEH) and are set out in Environment Agency Guidance[11]; and
- guidelines for the assessment of acid and nutrient nitrogen deposition as set out in the UK Air Pollution Information Service (APIS) website[12].

Based on the above legislative framework and guidance, relevant critical levels (that relate to airborne pollutants) and site-specific critical loads (that relate to deposition of materials to soils) have been established. These values represent the environmental criteria used in this assessment.

9 Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora

10 Statutory Instrument 2010 No. 490 The Conservation of Habitats and Species Regulations 2010

11 Environment Agency (2016) Air emissions risk assessment for your environmental permit, available at: https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit#page-navigation

12 Centre for Ecology and Hydrology (2010) UK Air Pollution Information Service http://www.apis.ac.uk/

4 Scope and Methodology

4.1 Overview

This section details the scope of the assessment and basis of the methodology used for the assessment. The methodology has remained broadly unchanged when compared to the previous submitted AQ ES Chapter.

The scope and methodology applied in this air quality assessment have been discussed with SBC during the pre-application meeting in March 2021.

4.1.1 Assessment of Dust Impacts during Construction Phase

Impacts of dust emissions during the construction phase were included within the approved AQ ES Chapter. The construction dust risks have remained unchanged and the mitigation measures suggested within the AQ ES Chapter would be incorporated into a Construction Environment Management Plan (CEMP). Therefore, assessment of construction dust risks has been scoped-out of this assessment.

4.1.2 Assessment of Traffic Related Impacts during Construction Phase

Impacts of traffic related emissions during the construction phase were scoped-out of the approved AQ ES Chapter. As the traffic movements estimated for the Proposed Development remain unchanged, this assessment has been scoped-out.

4.1.3 Assessment of Odour Impacts during Operational Phase

Due to use of diesel as fuel for the generators, odour emissions are possible. However, given that the generators would only be used during emergency scenarios (such as power failures or essential maintenance works), the potential for significant odour impacts are considered unlikely.

During the 6-monthly testing scenarios, odour emissions are not considered to lead to significant impacts due to adequate dispersion achieved by dispersion through the stacks. Furthermore, only 1 or 2 generators would be tested simultaneously. Hence, reducing odorous emissions and the associated potential impact, if any.

Therefore, odour emissions that would lead to any impact to general amenity are limited and are adequately dispersed. aBased on this information, assessment of odour impacts during the operational phase has been scoped-out.

4.1.4 Assessment of Impact of Atmospheric Emissions from the Emergency Generators during Operational Phase

Impacts of atmospheric emissions during the operational phase are included within this assessment and further details are provided in the next section. The applicable air quality limits, as agreed during the discussions with SBC and are also summarised.

4.2 Applicable Air Quality Limits

Based on the emissions data from the Proposed Development, the below air quality limits have been identified.

4.2.1 Oxides of Nitrogen (NO_2 for human receptors and NO_x for ecological receptors)

Assessment of NO_2 impact on human receptors and NO_x impact on ecological receptors have been undertaken with this AQA. The impacts on NO_2 and NO_x concentrations from increased traffic were assessed as part of the AQ ES Chapter and concluded that they have insignificant impact. NO_2 and NO_x contribution from the data centre has been included to assess the cumulative impact.

During the pre-application meeting with SBC in March 2021, it has been agreed that assessment of impact on short-term objectives for NO_2 and NO_x (1-hour and 24-hour mean, respectively) have been scoped out of this assessment. Assessment of 1-hour mean NO_2 was not considered appropriate due to the emergency nature during the operational scenario and assessment of 24-hour mean NO_x was not included due to the emergency nature and distance of the applicable ecological receptors.

4.2.2 Particulate Matter (PM_{10})

Assessment of PM_{10} impacts has been undertaken with this AQA. The impacts on PM_{10} concentrations from increased traffic were assessed as part of the AQ ES Chapter and concluded that they have insignificant impact. PM_{10} contribution from the data centre has been included to assess the cumulative impact.

4.2.3 Particulate Matter ($PM_{2.5}$)

Assessment of $PM_{2.5}$ impacts has not been undertaken with this AQA. This is considered appropriate as these emissions are not expected to be significant from the operation of the proposed data centres. The impacts on $PM_{2.5}$ concentrations were assessed as part of the AQ ES Chapter and concluded that they have insignificant impact thus are not considered further.

4.2.4 Carbon Monoxide (CO) emissions

Given the emergency nature of the use of the proposed generators (approximately 107 hours/year), it is not anticipated that CO emissions would result in significant impacts. Hence assessment of CO emissions is scoped out and not considered further.

4.2.5 Volatile Organic Compounds (VOC) Concentrations

There are no assessment levels for total VOC emissions as they comprise a mixture of volatile organic compounds. Furthermore, there is no information available about the proportion of benzene, or other harmful hydrocarbon species, that may be present in the total VOC emission from the gas-fired engines associated with the Proposed Development, although, it is likely to be a very small percentage of the total.

The limits for human receptors are shown in Table 4.1 below.

Table 4.1 Limits for Protection of Human Health

Pollutant	Averaging Period	EAL/AQS ($\mu g/m^3$)	Comments
Nitrogen Dioxide (NO_2)	**Annual Mean**	**40**	UK AQO
Nitrogen Dioxide (NO_2)	1-hour Mean	200	UK AQO, not to be exceeded more than 18 times per annum

For the purposes of LAQM, regulations state that exceedances of the objectives should be assessed in relation to 'the quality of the air at locations which are situated outside of buildings or other natural or man-made structures, above or below ground, and where members of the public are regularly present'.

Examples of where the objectives should, and should not apply, are summarised in DEFRA Guidance LAQM TG(16). This guidance should be considered in the context of the conclusions of various review documents such as The Air Quality Consultant's report, 'Relationship between the UK Air Quality Objectives and Occupational Air Quality Standards (November 2016)[13]'. It is important that, when setting the objective, DEFRA took account of EPAQs' recommendations. It was also influenced by the limit value set in European Commission's First Air Quality Daughter Directive which made it clear that it only applied to 'outdoor air in the troposphere, excluding workplace'. The Ambient air quality Directive is consistent with this, stating that 'Compliance with the limit values directed at the protection of human health shall not be assessed… on factory premises or at industrial installations to which all relevant provisions concerning health and safety at work apply'.

Limits for ecological receptors are shown in Table 4.2.

Table 4.2 Limits for Protection of Ecological Receptors (applicable to flora)

Pollutant	Averaging Period	Concentration (µg/m3)
Oxides of Nitrogen (NO_x)	Annual Mean	**30**
Oxides of Nitrogen (NO_x)	**Daily Mean**	**75**

13 Available at https://www.aqconsultants.co.uk/CMSPages/GetFile.aspx?guid=18a226ab-99c6-47f9-a947-301800d7da1f

4.3 Study Area

The assessment will consider the sensitivity and potential impacts of the Proposed Development on ecological and human receptors that are expected to have potential impact from the Proposed Development.

The receptor locations for the assessment has been identified based on the size, location and operational regime of the Proposed Development.

All receptors assessed in the ES Chapter are also included, along with additional receptors as considered appropriate for assessment of emissions from the emergency generators.

4.3.1 Sensitive Human Health Receptors

The term 'sensitive receptors' includes any persons, locations or systems that may be susceptible to changes in air quality as a consequence of the Proposed Development.

Impacts have been modelled against specific discrete receptor locations in addition to a receptor grid and impact pollution contours presented within this report. The Site lies close to parts of the Slough AQMA, declared as a result of traffic pollution in the area. The declaration covers exceedances of the annual average NO_2 AQO.

The list of discrete receptors included within the model is shown in Table 4.3 below.

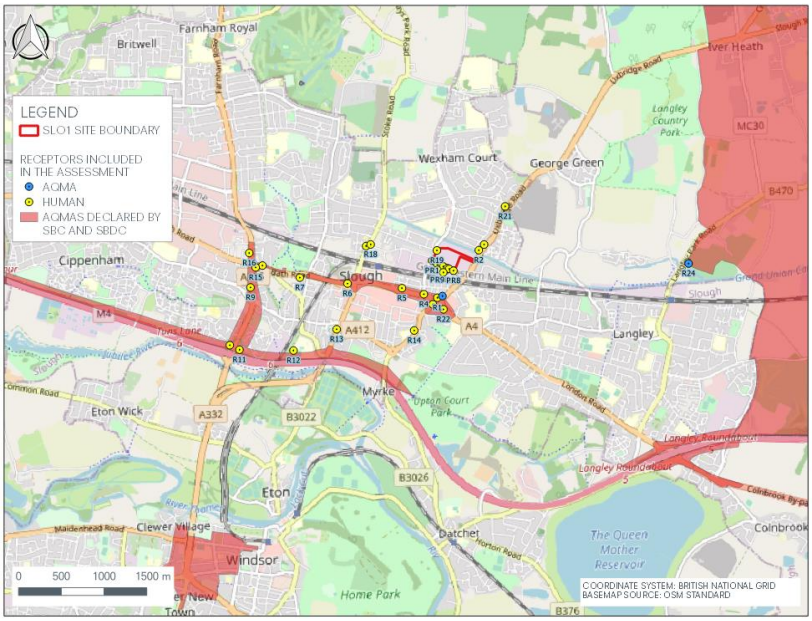
Table 4.3 Discrete receptor Locations

ID	Receptor	Description	OS GR X	OS GR Y	Receptor
R1	Princes Street	Human	498552	179808	1.5
R2	Hazelmere Road	Human	499037	180364	1.5
R3	Yew Tree Road	Human	498499	179731	1.5
R4	Wexham Road	Human	498394	179849	1.5
R5	Apsley House	Human	498138	179920	1.5
R6	Cornwall House	Human	497501	179974	1.5
R7	Claycoats School	Human	496943	180043	1.5
R8	Windmill Care Centre	Human	496506	180184	1.5
R9	Tuns Lane	Human	496366	179928	1.5
R10	Paxton Avenue	Human	496124	179253	1.5
R11	Spackmans Way	Human	496237	179200	1.5
R12	Slough and Eton CoE Business	Human	496869	179191	1.5
R13	Windsor Road	Human	497374	179439	1.5
R14	Saint Mary's Church of England	Human	498281	179425	1.5
R15	16 John Taylor Court	Human	496426	180162	1.5
R16	19 Farnham Road	Human	496351	180331	1.5

ID	Receptor	Description	OS GR X	OS GR Y	Receptor
R17	49 Stoke Road	Human	497718	180412	1.5
R18	50 Stoke Road	Human	497772	180431	1.5
R19	100 Wexham Road	Human	498547	180361	1.5
R20	98 Broadmark Road	Human	499099	180430	1.5
R21	25 Cannon Gate	Human	499345	180876	1.5
R22	27 Clifton Road	Human	498623	179672	1.5
R23	Slough AQMA	AQMA	498611.7	179827	1.5
R24	South Bucks AQMA	AQMA	501491.1	180208.1	1.5
PR1	New Resi Development to South	Human	498491.5	180241.5	1.5
PR2	New Resi Development to South	Human	498537.6	180222.1	1.5
PR3	New Resi Development to South	Human	498551.8	180201.6	1.5
PR4	New Resi Development to South	Human	498602.5	180180.8	1.5
PR5	New Resi Development to South	Human	498621.9	180172.9	1.5
PR6	New Resi Development to South	Human	498671.5	180152.4	1.5
PR7	New Resi Development to South	Human	498690.5	180144.8	1.5
PR8	New Resi Development to South	Human	498740.5	180124	1.5
PR9	New Resi Development to South	Human	498551.5	180133	1.5
PR10	New Resi Development to South	Human	498621.9	180103.9	1.5

All residential discrete receptors are shown in the below figure along with the AQMA declared by SBC and South Bucks District Council (SBDC).

Figure 8: Discrete Receptors included within the Assessment



4.3.2 Sensitive Ecological Receptors and Designated Habitats

The presence of the following sites protected on account of their habitats or species have been assessed:

- Special Areas of Conservation (SACs) and candidate SACs (cSACs) designated under the EC Habitats Directive[14];
- Special Protection Areas (SPAs) and potential SPAs designated under the EC Birds Directive[15];
- Ramsar Sites designated under the Convention on Wetlands of International Importance[16];
- Sites of Special Scientific Interest (SSSI);
- National Nature Reserves (NNR);
- Local Nature Reserves (LNR);
- Local wildlife sites; and
- Ancient woodland.

14 Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora.

15 Council Directive 79/409/EEC on the conservation of wild birds.

16 The Convention of Wetlands of International Importance especially as Waterfowl Habitat 1971 (The Ramsar Convention).

Where sensitive ecological receptors are present, maximum predicted ground level concentrations of NO_x are compared with the relevant critical levels and thresholds of airborne pollutant concentrations above which damage may be sustained to sensitive flora and species. The Proposed Development is not a significant source of SO_2 or HCl/HF arising from the combustion of natural gas and these pollutants are not considered further.

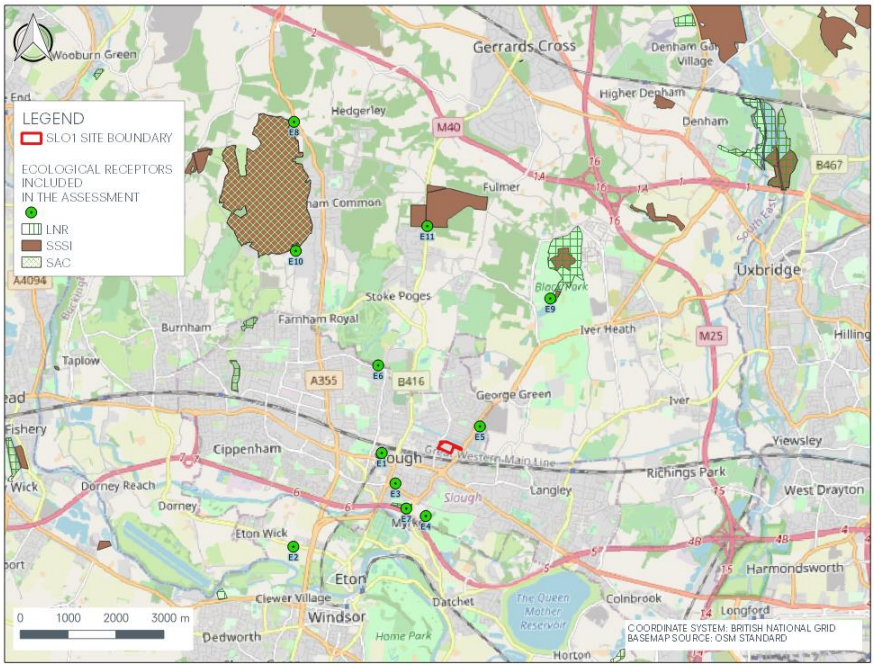
The list of ecological receptors included within the model is shown in Table 4.4 below.

Table 4.4 Ecological Receptor Locations

ID	Receptor	Designation	Sensitivity Rating in relation to NO_x	OS GR X (m)	OS GR Y (m)
E1	Railway Triangle	Local Wildlife Site	Low	497318	180155
E2	Eton Meadows	Biodiversity Opportunity Areas	Low	495473	178197
E3	St Marys Churchyard	Biological Notification Site	Low	497605	179519
E4	Upton Court Park	Local Wildlife Site	Low	498238	178838
E5	Langley Park	Biological Notification Site	Low	499367	180709
E6	Stoke Park	Biological Notification Site	Low	497244	181983
E7	Herschel Park	Local Nature Reserve	Medium	497830	178995
E8	Burnham Beeches	Special Areas of Conservation	High	495487	187068
E9	Black Park LNR	Local Nature Reserve	Low	500835	183379
E10	Burnham Beeches	Special Areas of Conservation	High	495524	184373
E11	Stoke Common	Sites of Special Scientific	High	498269	184891

The location of ecological receptors is shown in the below Figure 9.

Figure 9: Ecological Receptor Locations



4.4 Scope and Extent of the Assessment

4.4.1 Construction Dust

The ES Chapter submitted with the outline planning application included the dust risk assessment. No additional information has been required for submission in relation to dust risks with this Reserved Matters Planning Application. This has been discussed and agreed with SBC during pre-application meeting in March 2021.

Mitigation measures were identified where necessary and significance of dust effects determined following such mitigation. All recommended migration measures will be implemented through a Construction Environment Management Plan (CEMP), Condition 19 of the outline consent.

Therefore, dust impact assessment has been scoped out of this assessment and not considered further.

4.4.2 Operational Emissions to Atmosphere (Traffic Emissions)

The only vehicle movements associated with the Proposed Development will be service and maintenance visits.

Indicative information on the number of deliveries has been provided by the Yondr Operations team in terms of the period after which operations commence; the number of deliveries will decrease over time. The figures below are for each 30MW building:

- 0 – 6 months: 10 HGV deliveries per week;
- 6 – 24 months: 5 HGV deliveries per week; and,
- 24+ months: 3 HGV deliveries per week.

The above vehicle trips do not exceed the criteria set out in IAQM/EPUK Guidance.

Therefore, dispersion modelling of traffic impacts during the operational phase of the Proposed Development is not included within the assessment.

However, it should be noted that traffic emissions, as predicted within the ES Chapter (including those from the future consented development ~~as data centre use~~), have been included within the baseline concentrations within this assessment. Based on the Transport Statement submitted for the Reserved Matters Application (*SLO1X0 - Transport Statement and Discharge of Conditions 20 (EVCP) & 21 (Servicing and Delivery Plan*)), the traffic movements of the proposed data centre are significantly lower than the outline consented development. Hence representing a worst-case assessment.

Table 4.5 below summarises the traffic data utilised within the dispersion modelling as submitted in the AQ ES Chapter. The associated NO_2 emissions (under the Do Minimum Scenario) are included as baseline concentrations for this AQA and are summarised in Section 5 of this report. The NO_2 and NO_x contributions from the traffic associated with development as assessed in the AQ ES Chapter are also utilised as predicted under the Do Something Scenario.

Table 4.5 Traffic Data utilised within the AQ ES Chapter

Parameter	2026 Do Minimum AADT	2026 Do Minimum %HGV	2026 Do Something AADT	2026 Do Something %HGV	Speed (km/h)
Wexham Road	17392	1.11%	17178	1.02%	**48**
Wellington Street (West of HTC Roundabout) Eastbound	23551	2.64%	23527	2.54%	**48**
Wellington Street (West of HTC Roundabout) Westbound	13020	3.62%	13001	3.46%	**48**
Wellington Street (East of HTC Roundabout) Eastbound	16983	3.87%	16992	3.91%	**48**
Wellington Street (East of HTC Roundabout) Westbound	12081	4.03%	12085	4.08%	**48**
Sussex Place	40724	2.30%	40601	2.24%	**48**

Parameter	2026 Do Minimum AADT	2026 Do Minimum %HGV	2026 Do Something AADT	2026 Do Something %HGV	Speed (km/h)
Wellington Street (East of Uxbridge Road) Eastbound	22203	2.05%	22183	2.00%	**48**
Wellington Street (East of Uxbridge Road) Westbound	18521	2.55%	18419	2.48%	**48**
London Road	40724	2.30%	40601	2.24%	**48**
Uxbridge Road (North of Wellington Street) Southbound	15093	1.82%	15084	1.76%	**48**
Uxbridge Road (North of Wellington Street) Northbound	15847	1.77%	15840	1.72%	**48**
Uxbridge Road (North of Victoria Road) Southbound	15093	1.82%	15084	1.76%	**48**
Uxbridge Road (North of Victoria Road) Northbound	15847	1.77%	15840	1.72%	**48**
Uxbridge Road (North of Broadmark Road) Southbound	15137	1.59%	15039	1.54%	**48**
Uxbridge Road (North of Broadmark Road) Northbound	14948	1.74%	14932	1.69%	**48**
Stoke Road	20495	7.40%	20495	7.40%	**48**
William Street	20495	7.40%	20495	7.40%	**48**
Windsor Road (North of Herschel Street)	13565	1.54%	13565	1.54%	**48**
Windsor Road (North of Chalvey Road)	13565	1.54%	13565	1.54%	**48**
Windsor Road (North of Ragstone Road))	22231	0.89%	22231	0.89%	**48**
Slough Road	11782	0.89%	11782	0.89%	**64**
Yew Tree Road	17175	0.81%	17175	0.81%	**48**
Datchet Road	17175	0.81%	17175	0.81%	**48**
Tuns Lane	39813	3.93%	39817	3.93%	**48**
Farnham Road	16046	2.77%	16050	2.77%	**48**
Bath Road (West of Tuns Lane)	17275	2.15%	17279	2.15%	**48**
Bath Road (West of Stoke Poges Lane)	39018	2.15%	39022	2.15%	**48**
Bath Road (East of Stoke Poges Lane)	30752	1.23%	30756	1.23%	**48**
Wellington Street (West of Stoke Road) Eastbound	23551	2.64%	23527	2.54%	**48**
Wellington Street (West of Stoke Road) Westbound	13020	3.62%	13001	3.46%	**48**
M4	158429	6.99%	158429	6.99%	**112**
Broadmark Road	6775	1.83%	6691	1.86%	**32**
Petersfield Avenue	**6208**	**1.71%**	**6208**	**1.71%**	**48**

4.4.3 Operational Emissions to Atmosphere (Generator Emissions)

The scope of the impact assessment for stack emissions from the Proposed Development has been determined in the following way:

- Review of air quality data for the area surrounding the Site, including data from local authority monitoring from SBC, the Defra Air Quality Information Resource (UK-AIR) and the APIS;
- Desk study to confirm the location of nearby areas that may be sensitive to changes in local air quality; and
- Review of emission parameters for the Proposed Development and dispersion modelling using the Breeze AERMOD 8 dispersion model (version 16216r) to predict ground-level concentrations of pollutants at sensitive human and habitat receptor locations.

4.5 Modelling Inputs

4.5.1 Design Basis for the Assessment

Two model scenarios have been assessed which represents the proposed layout and design details for development across the entire commercial area (beyond the RM boundary) for DC use. All emissions to air will be via a total of 88 No. flues 2m above the roofline of the adjacent plant building.

Manufacturer emission limits have been assumed for the purposes of the modelling assessment and the Proposed Development is assumed to be operating at full load.

The below two scenarios have been modelled. These have been agreed during the pre-application discussion meeting with SBC in March 2021.

Most Likely Scenario

- Monthly testing for a duration of 15 minutes at no load; and,
- 6 monthly testing for a duration of 6 hours – totalling to 12 hours/year;

Worst Case Scenario

- Monthly testing for a duration of 15 minutes at no load; and,
- 6 monthly testing for a duration of 6 hours – totalling to 12 hours/year; and,
- Emergency operation of 88 generators operating for a maximum duration of 95 hours/year.

4.5.2 Engine Parameters

The facility will use diesel-fuelled spark ignition engines for the generation of electricity. There are a number of different manufacturers/suppliers of such units, including for example MWM, Caterpillar, Cummins, Jenbacher. The supplier of the engines for this site will be chosen based on a competitive tender process once full planning permission has been granted. As such, the final manufacturer is unknown at this time, with only the engine rating known (ie MWe).

The input parameters used in this assessment were based on Caterpillar's CAT3516E generators. These are shown in Table 4.5 below. As the engines all work on similar combustion principles and comply with the same emission limits, the parameters for all units of a similar size will not materially differ. For purposes of this air quality assessment, a single engine type and model has been chosen and the technical details are presented; this data is regarded as worst case and robust. The intention would be to install either this engine, or a similarly sized equivalent (with the same emission limits) at this site.

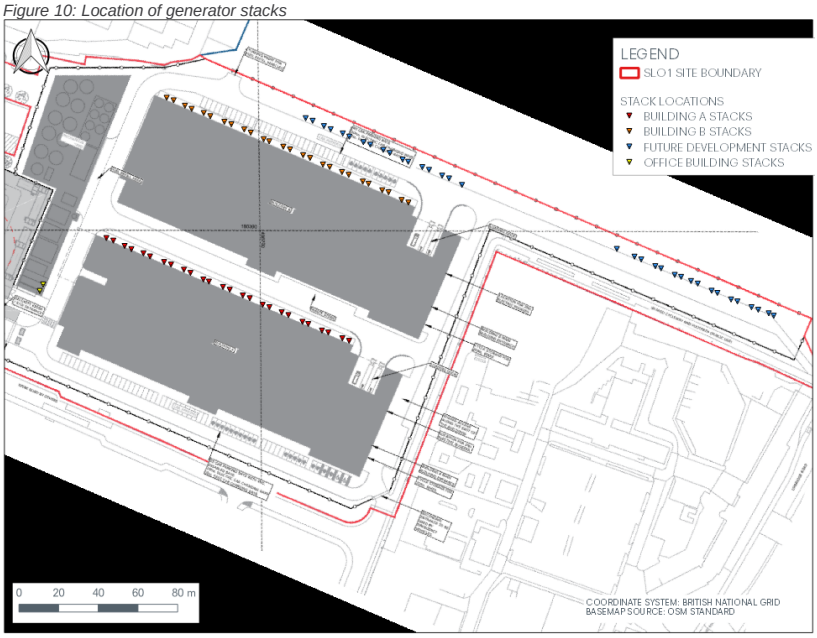
Design details for the future data centre use to the north of the Site boundary are based on current internal plans. It should be noted that a separate reserved matters application will be submitted for this future development and the revised design details would be included, as appropriate.

The locations of the generator stacks are shown in Figure 10, below.

Table 4.5 Release Parameters

Parameter	Building A	Building B	Plot to north of RM boundary	Office Building
Number of Units	26	26	34	2
Generator Power, at 100% load (KWe)	2400	2200	2200	2200
Stack Height, above ground level (m)	25.5	25.5	17	10
Temperature of Release (K)	757.7	750.8	750.8	750.8
Emission Velocity at Stack Exit (m/s)	43.6	41.1	41.1	41.1
Actual Flow Rate per combined stack (Am^3/s)	8.56	8.07	8.07	8.07
Normalised Flow Rate per combined stack (Nm^3/s)	0.92	0.87	0.87	0.87
NO_x Emission Concentration (mg/Nm^3)	3581.7	2575.8	2575.8	2575.8
NO_x Emission Concentration (g/s)	3.31	2.25	2.25	2.25
O_2 Content (%)	9.7	10.1	10.1	10.1
Water Content (%)	8.7	9.1	9.1	9.1

Figure 10: Location of generator stacks



4.5.3 Local Meteorological Data

The dispersion modelling has been based on five years (2016-2020) of hourly sequential meteorological data in order to take account of inter-annual variability and reduce the effect of any atypical conditions.

The software BREEZE AERMOD utilises two input files providing detailed hourly sequential meteorological data into the model domain as follows:

- Surface File (.sfc)
  - Year
  - Month (1 - 12)
  - Day (1 -31)
  - Julian day (1 - 366)
  - Hour (1 - 24)
  - Sensible heat flux (W m^{-2})
  - Surface friction velocity, u* (ms^{-1})
  - Convective velocity scale, w* (ms^{-1})
  - Vertical potential temperature gradient in the 500 m layer above the planetary boundary layer
  - Height of the convectively-generated boundary layer (m)

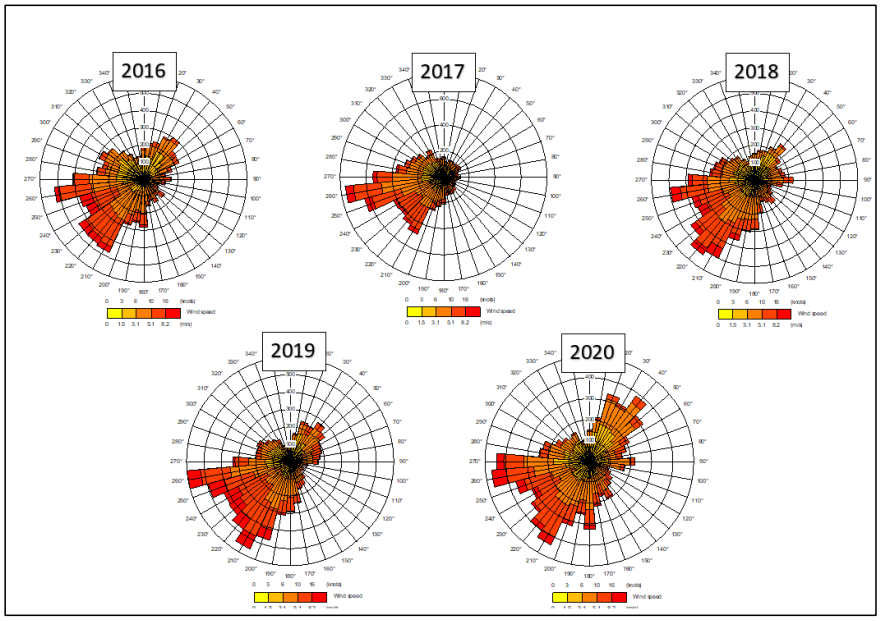
- Height of the mechanically-generated boundary layer (m)
- Monin-Obukhov length, L (m)
- Surface roughness length, z0 (m)
- Bowen ratio
- Albedo
- Wind speed (ms^{-1}) used in the computations
- Wind direction (degrees) corresponding to the wind speed above
- Height at which the wind above was measured (m)
- Temperature (K) used in the computations
- Height at which the temperature above was measured (m)
- Precipitation code
- Precipitation amount (mm)
- Relative humidity (%)
- Station pressure (mb)
- Cloud cover (tenths)
- Data source (adjusted [ADJ-] vs. no adjustment [NAD-], 1-minute ASOS [A1], hourly surface observation [SFC], or onsite [OS]); and,

- Profile file (.pfl)
- Year
- Month (1 - 12)
- Day (1 -31)
- Hour (1 - 24)
- Measurement height (m)
- Top flag = 1, if this is the last (highest) level for this hour, 0, otherwise
- Wind direction for the current level (degrees)
- Wind speed for the current level (ms^{-1})
- Temperature at the current level (K)
- Standard deviation of the wind direction, F2 (degrees)
- Standard deviation of the vertical wind speed, Fw (ms^{-1})

Data from the meteorological station at Heathrow Airport has been used for the assessment, which is the most representative data currently available for the study area.

A wind rose for all years of meteorological data is presented in Figure 11.

Figure 11: Wind Rose data from Heathrow Airport Met Station (2016-2020)



4.5.4 Building Downwash/Entrainment

The presence of buildings close to emission sources can significantly affect the dispersion of pollutants by leading to downwash. This occurs when a building distorts the wind flow, creating zones of increased turbulence. Increased turbulence causes the plume to come to ground earlier than otherwise would be the case and result in higher ground level concentrations closer to the stack.

Downwash effects are only significant where building heights are greater than 40% of the emission release height. The downwash structures also need to be sufficiently close for their influence to be significant.

All proposed buildings have been included in the dispersion model to account for potential downwash effects and allow for stack height determination.

In addition to the above two buildings, assumed location of future buildings on the Plot to north of RM boundary have been included for air quality modelling purposes. Design details for the future data centre use to the north of the Site boundary are based on current internal plans. It should be noted that a separate reserved matters

application would be submitted for this future development and the revised design details, including the building locations etc would be included.

Details of all buildings included in the model are shown in Table 4.6 below.

Table 4.6 Building Dimensions within the Site used in the Dispersion Model

Building	Approximate Centre Point (X)	(Y)	Height (m)	Length (m)	Width (m)	Angle (°)
Building A	498610.1	180269.3	23.5	27.8	138.5	113.2
Building B	498641.6	180343.7	23.5	32.4	139	113.3

4.5.5 Nitric Oxide to NO_2 Conversion

Oxides of nitrogen (NO_x) emitted to atmosphere as a result of combustion will consist largely of nitric oxide (NO), a relatively innocuous substance. Once released into the atmosphere, NO is oxidised to NO_2. The proportion of NO converted to NO_2 depends on several factors including wind speed, distance from the source, solar irradiation and the availability of oxidants, such as ozone (O_3).

A conversion ratio of 70% NO_x: NO_2 has been assumed for comparison of predicted concentrations with the long-term objectives for NO_2. A conversion ratio of 35% has been utilised for the assessment of short-term impacts, as recommended by Environment Agency guidance[17].

4.6 Significance of Impact

4.6.1 Long-term impacts (Human Receptors)

IAQM/EPUK Guidance on land-use planning and development control: Planning for air quality January 2017 (v1.2) describes that:

'Impacts on air quality, whether adverse or beneficial, will have an effect on human health that can be judged as 'significant' or 'not significant'. This is the primary requirement of the EIA regulations, but is also relevant to other air quality assessments.

It is important to distinguish between the meaning of 'impact' and 'effect' in this context. An impact is the change in the concentration of an air pollutant, as experienced by a receptor.

17 AQMAU, Conversion Rates for NOx and NO2.

This may have an effect on the health of a human receptor, depending on the severity of the impact and other factors that may need to be taken into account. Judging the severity of an impact is generally easier than judging the significance of an effect.'
In determining impact significance from the pollutants discharged to air, specific reference has been made to Table 6.3 of "Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) jointly published a guidance note 'Land-Use Planning & Development Control: Planning for Air Quality' (and updated in January 2017)[18]", which presents descriptors for impact magnitude and impact significance. These descriptors are reproduced below in Table 4.7 and relate to long-term (annual average) impacts.

The following standard terminology has been applied:

- Substantial beneficial;
- Moderate beneficial;
- Minor beneficial;
- Neutral/negligible;
- Minor adverse;
- Moderate adverse; and
- Substantial adverse.

Table 4.7 Impact Descriptors for Individual Receptors

Long Term Average Concentration at Receptor in Assessment Year	% Change in Concentration Relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial
***Changes are rounded up to the nearest whole percentage. Changes of less than 0.5% of the AQAL are considered imperceptible**				

4.6.2 Short-term impacts (Human Receptors)

In relation to short-term impacts, the EPUK guidance states in Paragraph 6.38 that:

' Where such peak short term concentrations from an elevated source are in the range 10-20% of the relevant AQAL, then their magnitude can be described as small, those in the range 20-50% medium and those above 50% as large. These are the maximum concentrations experienced in any year and the severity of this impact can be described as slight, moderate and substantial respectively, without the need to

18 Moorcroft and Barrowcliffe et al. (2017) Land-Use Planning & Development Control: Planning For Air Quality. V.1.2. Institute of Air Quality Management, London.

reference background or baseline concentrations. That is not to say that background concentrations are unimportant, but they will, on an annual average basis, be a much smaller quantity than the peak concentration caused by a substantial plume and it is the contribution that is used as a measure of the impact, not the overall concentration at a receptor. This approach is intended to be a streamlined and pragmatic assessment procedure that avoids undue complexity.'

Therefore, the following descriptors for impact magnitude resulting from short-term impacts are applied in this assessment:

- <10%: Negligible;
- 10-20%: Small;
- 20-50%: Medium; and
- >50 Large.

The EPUK guidance also states that:

'Judgement of the significance should be made by a competent professional who is suitably qualified. The reasons for reaching the conclusions should be transparent and set out logically.'

4.6.3 Long-term impacts (Ecological Receptors)

An impact which results in an exceedance of a long-term air quality objective at a sensitive receptor, will normally be regarded as 'significant'.

In relation to ecological impacts, EA Guidance ('Air emissions risk assessment for your environmental permit') states that, if the long-term process contribution (PC) is greater than 1% and the predicted environmental concentration (PEC) is greater than 70% of the long-term environmental standard, the emissions are 'significant'.

However, if the long-term process contribution (PC) is greater than 1% and the predicted environmental concentration (PEC) is less than 70% of the long-term environmental standard, the emissions are 'insignificant'.

4.6.4 Short-term impacts (Ecological Receptors)

An impact which results in an exceedance of a short-term air quality objective at a sensitive receptor (human or ecological), will normally be regarded as 'significant'.

For high sensitive ecological receptors, the impact of the Proposed Development is considered insignificant if the short-term PC is less than 10% of the short-term environmental standard for protected conservation areas.

If the emissions meet both of the following criteria for local nature sites (low and medium sensitive sites), they are insignificant – and no further assessment is required:

- The short-term PC is less than 100% of the short-term environmental standard; and
- The long-term PC is less than 100% of the long-term environmental standard.

5 Baseline Conditions

5.1 Data from the AQ ES Chapter

Given that this AQA is an extension to the full detailed air quality assessment completed as part of the AQ ES Chapter, data from the traffic modelling assessment has been considered as the baseline data. The revised emissions from the data centre use (from all 88 stacks) are combined with the previously assessed traffic emissions within the AQ ES Chapter. It should be noted that the traffic emissions included within the AQ ES Chapter include contribution from the residential aspect of the outline application. Hence, representing worst-case assessment.

5.1.1 Baseline NO_2 Concentrations for Human Receptors

For this assessment the results for the 'Do Minimum' concentrations for scenario 2b CURED [19](as summarised in Table C8 of the AQ ES Chapter) are utilised as the baseline concentrations. The NO_2 contribution from additional traffic movements (from the same table) are combined with the contribution from 88 generators at the Proposed Development to assess the potential impacts.

The NO_2 concentrations used as baseline and traffic contribution (from the AQ ES Chapter, Table C8) are summarised in the below Table 5.1.

Table 5.1 Baseline NO_2 Concentrations and contribution from Traffic Movements (as presented within the AQ ES Chapter)

Receptor ID	Receptor Details	NO_2 Concentrations for the DM Scenario (CURED version)	Contribution from increase in traffic (Table 4.5)	Notes
R1	Princes Street	35.64	0.02	
R2	Hazelmere Road	25.82	0.01	
R3	Yew Tree Road	34.08	0.01	
R4	Wexham Road	33.35	0.05	
R5	Apsley House	30.97	0.01	
R6	Cornwall House	32.81	0.01	

[19] Calculator Using Realistic Emissions for Diesels (CURED). The CURED model was originally created in recognition of the disconnection between 'official' emissions factors for nitrogen oxides, as published by Defra (in its Emissions Factors Toolkits (EFTs) V6 and V7), and those measured in the real world.

Receptor ID	Receptor Details	NO_2 Concentrations for the DM Scenario (CURED version)	Contribution from increase in traffic (Table 4.5)	Notes
R7	Claycoats School	29.61	0.01	
R8	Windmill Care Centre	32.45	0.01	
R9	Tuns Lane	32.03	0.01	
R10	Paxton Avenue	39.23	0.01	
R11	Spackmans Way	38.46	0.01	
R12	Slough and Eton CoE Business and Enterprise College	31.25	0.01	
R13	Windsor Road	32.97	0.01	
R14	Saint Mary's Church of England	26.68	0.01	
R15	16 John Taylor Court	34.7	0.01	
R16	19 Farnham Road	28.91	0.01	
R17	49 Stoke Road	30.01	0.01	
R18	50 Stoke Road	28.95	0.01	
R19	100 Wexham Road	33.62	0.03	
R20	98 Broadmark Road	27.95	0.04	
R21	25 Cannon Gate	25.16	0.02	
R22	27 Clifton Road	30.44	0.01	
R23	Slough AQMA	35.64	0.02	Used the data predicted for R1 of the AQ ES Chapter
R24	South Bucks AQMA	35.64	0.02	
PR1	New Resi Development to South	32.82	0.01	Used the data predicted for PR2 of the AQ ES Chapter
PR2	New Resi Development to South	32.82	0.01	
PR3	New Resi Development to South	32.82	0.01	
PR4	New Resi Development to South	32.82	0.01	
PR5	New Resi Development to South	32.82	0.01	
PR6	New Resi Development to South	32.82	0.01	
PR7	New Resi Development to South	32.82	0.01	
PR8	New Resi Development to South	32.82	0.01	
PR9	New Resi Development to South	32.82	0.01	
PR10	New Resi Development to South	32.82	0.01	

5.1.2 Baseline NO_x Concentrations for Ecological Receptors

For this assessment the results for the 'Do Minimum' concentrations for scenario 2b (as summarised in Table 7.21 of the AQ ES Chapter) are utilised as the baseline concentrations. The NO_x contribution from additional traffic movements (from the

same table) are combined with the contribution from 88 generators at the Proposed Development to assess the potential impacts.

The NO_x concentrations used as baseline and traffic contribution (from the AQ ES Chapter, Table 7.21) are summarised in the below Table 5.2.

Table 5.2 Baseline NO_x Concentrations and contribution from Traffic Movements (as presented within the AQ ES Chapter)

Receptor ID	Receptor Details	NO_2 Concentrations for the DM Scenario (CURED version)	Contribution from increase in traffic (Table 4.5)	Notes
E1	Railway Triangle	43.87	0.01	
E2	Eton Meadows	34.58	0.01	
E3	St Marys Churchyard	44.55	0.01	
E4	Upton Court Park	41.63	0.01	
E5	Langley Park	38.12	0.03	
E6	Stoke Park	31.04	0.01	
E7	Herschel Park	60.17	0.01	
E8	Burnham Beeches	22.27	0.01	
E9	Black Park LNR	22.27	0.01	Used data from E8
E10	Burnham Beeches	22.27	0.01	
E11	Stoke Common SSSI	22.27	0.01	

5.1.3 Baseline PM_{10} Concentrations for Human Receptors

For this assessment the results for the 'Do Minimum' concentrations for scenario 1b (as summarised in Table B3 of the AQ ES Chapter) are utilised as the baseline concentrations. The PM_{10} contribution from additional traffic movements (from the same table) are combined with the contribution from 88 generators at the Proposed Development to assess the potential impacts.

The PM_{10} concentrations used as baseline and traffic contribution (from the AQ ES Chapter, Table B3) are summarised in the below Table 5.3.

Table 5.3 Baseline PM_{10} Concentrations and contribution from Traffic Movements (as presented within the AQ ES Chapter)

Receptor ID	Receptor Details	PM_{10} Concentrations for the DM Scenario	Contribution from increase in traffic (Table 4.5)	Notes
R1	Princes Street	19.24	0.01	
R2	Hazelmere Road	17.03	0.01	
R3	Yew Tree Road	18.86	0.01	
R4	Wexham Road	18.85	0.04	
R5	Apsley House	18.13	0.01	
R6	Cornwall House	19.44	0.01	
R7	Claycoats School	17.89	0.01	
R8	Windmill Care Centre	18.66	0.01	
R9	Tuns Lane	19.14	0.01	
R10	Paxton Avenue	20.28	0.01	
R11	Spackmans Way	20	0.01	
R12	Slough and Eton CoE Business and Enterprise College	18.45	0.01	
R13	Windsor Road	19.24	0.01	
R14	Saint Mary's Church of England	17.17	0.01	
R15	16 John Taylor Court	18.97	0.01	
R16	19 Farnham Road	17.72	0.01	
R17	49 Stoke Road	17.85	0.01	
R18	50 Stoke Road	17.62	0.01	
R19	100 Wexham Road	19.19	0.03	
R20	98 Broadmark Road	17.48	0.02	
R21	25 Cannon Gate	16.94	0.01	
R22	27 Clifton Road	18.15	0.01	
R23	Slough AQMA	19.24	0.01	Used the data predicted for R1 of the AQ ES Chapter
R24	South Bucks AQMA	19.~~79~~24	0.01	
PR1	New Resi Development to South	~~19.79~~18.96	0.01	Used the data predicted for PR2 of the AQ ES Chapter
PR2	New Resi Development to South	18.96~~19.79~~	0.01	
PR3	New Resi Development to South	18.96~~19.79~~	0.01	
PR4	New Resi Development to South	18.96~~19.79~~	0.01	
PR5	New Resi Development to South	18.96~~19.79~~	0.01	
PR6	New Resi Development to South	18.96~~19.79~~	0.01	
PR7	New Resi Development to South	18.96~~19.79~~	0.01	
PR8	New Resi Development to South	18.96~~19.79~~	0.01	

Receptor ID	Receptor Details	PM_{10} Concentrations for the DM Scenario	Contribution from increase in traffic (Table 4.5)	Notes
PR9	New Resi Development to South	~~19.79~~18.96	0.01	
PR10	New Resi Development to South	~~19.79~~18.96	0.01	

6 Assessment of Impacts

6.1 General

The assessment results are presented in the tables below. These relate to the operation of the Proposed Development:

6.2 Impacts during 'Most-Likely' Scenario

This section summarises the model results and operational impacts from the Proposed Development during the 'Most-Likely' scenario. Under this scenario, modelling has been undertaking for the below operation:

- Testing every 1 month at 'no load' for a duration of 15 minutes;
- Testing every 6 months for a maximum duration of 6 hours during each testing;

The results have been compared against the baseline (i.e. as summarised in Section 5) and using the EPUK and IAQM significance of impact criteria as detailed in Section 4.6.

6.2.1 Operational Phase Impacts on NO_2 Annual Mean Concentrations at Existing Receptors

Table 6.1 show that the assessment predicts an increase in NO_2 concentrations at many of the modelled existing receptors in the 2026 operational phase during the 'Most-Likely' scenario. The increase in NO_2 concertation was predicted to be ranging from 0.02 to 0.79 µg/m^3.

The impact descriptors are predicted to be '***Negligible'*** at all receptors.

Table 6.1 NO_2 Annual Mean Concentration Changes and Associated Impact at Existing Sensitive Receptors in 2026 ('Most-Likely' Scenario)

ID	2026 Baseline (µg/m^3)	2026 Baseline + Proposed Development (µg/m^3)	Concentration Change (µg/m^3)	Long term average Concentration at receptor in assessment year	Impact Descriptor
R1	35.6	35.9	0.23	76-94% of AQAL	Negligible
R2	25.8	26.6	0.79	75% or less of AQAL	Negligible
R3	34.1	34.3	0.19	76-94% of AQAL	Negligible
R4	33.4	33.6	0.29	76-94% of AQAL	Negligible
R5	31.0	31.1	0.14	76-94% of AQAL	Negligible
R6	32.8	32.9	0.04	76-94% of AQAL	Negligible
R7	29.6	29.6	0.03	75% or less of AQAL	Negligible
R8	32.5	32.5	0.02	76-94% of AQAL	Negligible
R9	32.0	32.1	0.02	76-94% of AQAL	Negligible

ID	2026 Baseline (µg/m^3)	2026 Baseline + Proposed Development (µg/m^3)	Concentration Change (µg/m^3)	Long term average Concentration at receptor in assessment year	Impact Descriptor
R10	39.2	39.2	0.02	95-102% of AQAL	Negligible
R11	38.5	38.5	0.02	95-102% of AQAL	Negligible
R12	31.3	31.3	0.03	76-94% of AQAL	Negligible
R13	33.0	33.0	0.05	76-94% of AQAL	Negligible
R14	26.7	26.8	0.11	75% or less of AQAL	Negligible
R15	34.7	34.7	0.02	76-94% of AQAL	Negligible
R16	28.9	28.9	0.02	75% or less of AQAL	Negligible
R17	30.0	30.1	0.05	75% or less of AQAL	Negligible
R18	29.0	29.0	0.05	75% or less of AQAL	Negligible
R19	33.6	33.8	0.19	76-94% of AQAL	Negligible
R20	28.0	28.5	0.52	75% or less of AQAL	Negligible
R21	25.2	25.4	0.19	75% or less of AQAL	Negligible
R22	30.4	30.6	0.14	76-94% of AQAL	Negligible
R23	35.6	35.9	0.22	76-94% of AQAL	Negligible
R24	32.8	32.9	0.04	76-94% of AQAL	Negligible

Based on the details provided in the above paragraphs, it is considered that the air quality impact of the Proposed Development on annual mean NO_2 concentrations is '***not significant***'.

6.2.2 NO_2 Concentrations at Future Receptor Locations within the Proposed Residential Development to the South

Regarding the future receptors to the south of the Proposed Development, the annual mean concentrations for NO_2 are not expected to exceed the relevant air quality objective at any relevant receptor location during the 'worst case' scenario. The results are shown in the below Table 6.2

No new exceedances of the any air quality objective have been predicted at the identified future residential receptor locations.

Table 6.2 NO_2 Annual Mean Concentration at Proposed Residential Receptors to the South of the Proposed Development in 2026 ('Most-Likely' Scenario)

ID	2026 Baseline + Proposed Development (µg/m^3)	Annual Mean Air Quality Objective for NO_2
PR1	33.1	40
PR2	33.3	

ID	2026 Baseline + Proposed Development (µg/m^3)	Annual Mean Air Quality Objective for NO_2
PR3	33.5	
PR4	33.6	
PR5	33.6	
PR6	33.4	
PR7	33.4	
PR8	33.3	
PR9	33.3	
PR10	33.3	

6.2.3 Operational Phase Impacts on PM_{10} Annual Mean Concentrations at Existing Receptors

Table 6.3 show that the assessment predicts an increase in PM_{10} concentrations at many of the modelled existing receptors in the 2026 operational phase during the 'Most-Likely' scenario. The increase in PM_{10} concertation was predicted to be ranging from 0.01 to 0.04 µg/m^3.

The impact descriptors are predicted to be '***Negligible'*** at all receptors.

Table 6.3 PM_{10} Annual Mean Concentration Changes and Associated Impact at Existing Sensitive Receptors in 2026 ('Most-Likely' Scenario)

ID	2026 Baseline (µg/m^3)	2026 Baseline + Proposed Development (µg/m^3)	Concentration Change (µg/m^3)	Long term average Concentration at receptor in assessment year	Impact Descriptor
R1	19.2	19.3	0.01	75% or less of AQAL	Negligible
R2	17.0	17.0	0.01	75% or less of AQAL	Negligible
R3	18.9	18.9	0.01	75% or less of AQAL	Negligible
R4	18.9	18.9	0.04	75% or less of AQAL	Negligible
R5	18.1	18.1	0.01	75% or less of AQAL	Negligible
R6	19.4	19.5	0.01	75% or less of AQAL	Negligible
R7	17.9	17.9	0.01	75% or less of AQAL	Negligible
R8	18.7	18.7	0.01	75% or less of AQAL	Negligible
R9	19.1	19.2	0.01	75% or less of AQAL	Negligible
R10	20.3	20.3	0.01	75% or less of AQAL	Negligible
R11	20.0	20.0	0.01	75% or less of AQAL	Negligible
R12	18.5	18.5	0.01	75% or less of AQAL	Negligible
R13	19.2	19.3	0.01	75% or less of AQAL	Negligible

ID	2026 Baseline (µg/m^3)	2026 Baseline + Proposed Development (µg/m^3)	Concentration Change (µg/m^3)	Long term average Concentration at receptor in assessment year	Impact Descriptor
R14	17.2	17.2	0.01	75% or less of AQAL	Negligible
R15	19.0	19.0	0.01	75% or less of AQAL	Negligible
R16	17.7	17.7	0.01	75% or less of AQAL	Negligible
R17	17.9	17.9	0.01	75% or less of AQAL	Negligible
R18	17.6	17.6	0.01	75% or less of AQAL	Negligible
R19	19.2	19.2	0.03	75% or less of AQAL	Negligible
R20	17.5	17.5	0.02	75% or less of AQAL	Negligible
R21	16.9	17.0	0.01	75% or less of AQAL	Negligible
R22	18.2	18.2	0.01	75% or less of AQAL	Negligible
R23	19.2	19.3	0.01	75% or less of AQAL	Negligible
R24	19.~~8~~2	19.~~8~~3	0.01	75% or less of AQAL	Negligible

Based on the details provided in the above paragraphs, it is considered that the air quality impact of the Proposed Development on annual mean PM_{10} concentrations is '***not significant***'.

6.2.4 PM_{10} Concentrations at Future Receptor Locations within the Proposed Residential Development to the South

Regarding the future receptors to the south of the Proposed Development, the annual mean concentrations for PM_{10} are not expected to exceed the relevant air quality objective at any relevant receptor location during the 'worst case' scenario. The results are shown in the below Table 6.4

No new exceedances of the any air quality objective have been predicted at the identified future residential receptor locations.

Table 6.4 PM_{10} Annual Mean Concentration at Proposed Residential Receptors to the South of the Proposed Development in 2026 ('Most-Likely' Scenario)

ID	2026 Baseline + Proposed Development (µg/m^3)	Annual Mean Air Quality Objective for PM_{10}
PR1	18.97~~19.8~~	40
PR2	18.97~~19.8~~	
PR3	18.97~~19.8~~	
PR4	18.97~~19.8~~	
PR5	18.97~~19.8~~	

ID	2026 Baseline + Proposed Development (µg/m³)	Annual Mean Air Quality Objective for PM_{10}
PR6	18.97~~19.8~~	
PR7	18.97~~19.8~~	
PR8	18.97~~19.8~~	
PR9	18.97~~19.8~~	
PR10	18.97~~19.8~~	

6.2.5 Impacts of the Proposed Development on Ecological Receptors during 'Most-Likely' Scenario

The air quality impacts of the operation of the proposed generators along with the contribution from road sources has been assessed.

Predicted Pollutant Ground Level Concentrations for Comparison with Critical Levels for the Protection of Ecosystems / Vegetation.

A summary of maximum predicted ground level concentrations of NO_x at the identified sensitive habitat sites is presented in Table 6.5.

Table 6.5 Critical Level

ID	Critical Level, CL (µg/m³)	Total PC NOx (µg/m³)	PC (as a %age of the CL)	**Sensitivity Rating in relation to NO_x**	Impact Descriptor
E1	30	0.05	0.15	Low	Negligible (PC% is <100%)
E2	30	0.02	0.07	Low	Negligible (PC% is <100%)
E3	30	0.09	0.30	Low	Negligible (PC% is <100%)
E4	30	0.06	0.21	Low	Negligible (PC% is <100%)
E5	30	0.30	1.01	Low	Negligible (PC% is <100%)
E6	30	0.03	0.09	Low	Negligible (PC% is <100%)
E7	30	0.11	0.38	Medium	Negligible (PC% is <100%)
E8	30	0.02	0.06	High	Negligible (PC% is <1%)
E9	30	0.04	0.13	Low	Negligible (PC% is <100%)
E10	30	0.02	0.06	High	Negligible (PC% is <1%)
E11	30	0.02	0.08	High	Negligible (PC% is <1%)

The maximum annual mean NO_x PC is predicted to be below 1% of the critical level at the SPA and the SSSI. The impact of the Proposed Development operating would be considered 'insignificant' when compared to the criteria set out in Section 4.6.4.

6.3 Impacts during 'Worst-Case' Scenario

This section summarises the model results and operational impacts from the Proposed Development during the 'Worst-Case' scenario. Under this scenario, modelling has been undertaking for the below operation:

- Testing every 1 month at 'no load' for a duration of 15 minutes;
- Testing every 6 months for a maximum duration of 6 hours during each testing;
- Emergency operation (all 88 generators operating simultaneously) for a maximum duration of 95 hours/year.

The results have been compared against the baseline (i.e. as summarised in Section 5) and using the EPUK and IAQM significance of impact criteria as detailed in Section 4.6.

6.3.1 Operational Phase Impacts on NO_2 Annual Mean Concentrations at Existing Receptors

Table 6.6 show that the assessment predicts an increase in NO_2 concentrations at many of the modelled existing receptors in the 2026 operational phase during the 'Most-Likely' scenario. The increase in NO_2 concertation was predicted to be ranging from 0.08 to 7 µg/m^3.

The impact descriptors are predicted to be '***Negligible or Slight Adverse'*** at all receptors except R2 and R20. Though the impact descriptor at these receptors is ***'Moderate Adverse'***, given the nature of the operation as detailed within the 'Worst-Case' scenario, it is considered that the overall air quality impact of the Proposed Development on annual mean NO_2 concentrations is '***not significant***'.

Table 6.6 NO_2 Annual Mean Concentration Changes and Associated Impact at Existing Sensitive Receptors in 2026 ('Worst-Case' Scenario)

ID	2026 Baseline (µg/m^3)	2026 Baseline + Proposed Development (µg/m^3)	Concentration Change (µg/m^3)	Long term average Concentration at receptor in assessment year	Impact Descriptor
R1	35.6	37.5	1.90	76-94% of AQAL	Slight
R2	25.8	32.8	7.00	76-94% of AQAL	Moderate
R3	34.1	35.7	1.64	76-94% of AQAL	Slight
R4	33.4	35.5	2.18	76-94% of AQAL	Slight
R5	31.0	32.1	1.16	76-94% of AQAL	Slight
R6	32.8	33.1	0.28	76-94% of AQAL	Negligible
R7	29.6	29.8	0.15	75% or less of AQAL	Negligible
R8	32.5	32.6	0.12	76-94% of AQAL	Negligible

ID	2026 Baseline (µg/m^3)	2026 Baseline + Proposed Development (µg/m^3)	Concentration Change (µg/m^3)	Long term average Concentration at receptor in assessment year	Impact Descriptor
R9	32.0	32.1	0.10	76-94% of AQAL	Negligible
R10	39.2	39.3	0.08	95-102% of AQAL	Negligible
R11	38.5	38.5	0.08	95-102% of AQAL	Negligible
R12	31.3	31.5	0.20	76-94% of AQAL	Negligible
R13	33.0	33.3	0.37	76-94% of AQAL	Negligible
R14	26.7	27.6	0.91	75% or less of AQAL	Negligible
R15	34.7	34.8	0.11	76-94% of AQAL	Negligible
R16	28.9	29.0	0.12	75% or less of AQAL	Negligible
R17	30.0	30.4	0.37	76-94% of AQAL	Negligible
R18	29.0	29.3	0.37	75% or less of AQAL	Negligible
R19	33.6	35.1	1.46	76-94% of AQAL	Slight
R20	28.0	32.3	4.34	76-94% of AQAL	Moderate
R21	25.2	26.7	1.56	75% or less of AQAL	Negligible
R22	30.4	31.6	1.21	76-94% of AQAL	Slight
R23	35.6	37.5	1.83	76-94% of AQAL	Slight
R24	32.8	33.0	0.22	76-94% of AQAL	Negligible

6.3.2 NO_2 Concentrations at Future Receptor Locations within the Proposed Residential Development to the South

Regarding the future receptors to the south of the Proposed Development, the annual mean concentrations for NO_2 are not expected to exceed the relevant air quality objective at any relevant receptor location during the 'worst case' scenario. The results are shown in the below Table 6.7

No new exceedances of the any air quality objective have been predicted at the identified future residential receptor locations.

Table 6.72 NO_2 Annual Mean Concentration at Proposed Residential Receptors to the South of the Proposed Development in 2026 ('Worst-Case' Scenario)

ID	2026 Baseline + Proposed Development (µg/m^3)	Annual Mean Air Quality Objective for NO_2
PR1	35.4	40
PR2	37.4	
PR3	38.8	
PR4	39.7	
PR5	39.4	

ID	2026 Baseline + Proposed Development (µg/m^3)	Annual Mean Air Quality Objective for NO_2
PR6	38.2	
PR7	37.7	
PR8	36.9	
PR9	37.1	
PR10	36.8	

6.3.3 Operational Phase Impacts on PM_{10} Annual Mean Concentrations at Existing Receptors

Table 6.8 show that the assessment predicts an increase in PM_{10} concentrations at many of the modelled existing receptors in the 2026 operational phase during the 'Most-Likely' scenario. The increase in PM_{10} concertation was predicted to be ranging from 0.01 to 0.05 µg/m^3.

The impact descriptors are predicted to be '***Negligible'*** at all receptors.

Table 6.8 PM_{10} Annual Mean Concentration Changes and Associated Impact at Existing Sensitive Receptors in 2026 ('Worst-Case' Scenario)

ID	2026 Baseline (µg/m^3)	2026 Baseline + Proposed Development (µg/m^3)	Concentration Change (µg/m^3)	Long term average Concentration at receptor in assessment year	Impact Descriptor
R1	19.2	19.3	0.02	75% or less of AQAL	Negligible
R2	17.0	17.1	0.04	75% or less of AQAL	Negligible
R3	18.9	18.9	0.02	75% or less of AQAL	Negligible
R4	18.9	18.9	0.05	75% or less of AQAL	Negligible
R5	18.1	18.1	0.01	75% or less of AQAL	Negligible
R6	19.4	19.5	0.01	75% or less of AQAL	Negligible
R7	17.9	17.9	0.01	75% or less of AQAL	Negligible
R8	18.7	18.7	0.01	75% or less of AQAL	Negligible
R9	19.1	19.2	0.01	75% or less of AQAL	Negligible
R10	20.3	20.3	0.01	75% or less of AQAL	Negligible
R11	20.0	20.0	0.01	75% or less of AQAL	Negligible
R12	18.5	18.5	0.01	75% or less of AQAL	Negligible
R13	19.2	19.3	0.01	75% or less of AQAL	Negligible
R14	17.2	17.2	0.01	75% or less of AQAL	Negligible
R15	19.0	19.0	0.01	75% or less of AQAL	Negligible
R16	17.7	17.7	0.01	75% or less of AQAL	Negligible
R17	17.9	17.9	0.01	75% or less of AQAL	Negligible

ID	2026 Baseline (µg/m^3)	2026 Baseline + Proposed Development (µg/m^3)	Concentration Change (µg/m^3)	Long term average Concentration at receptor in assessment year	Impact Descriptor
R18	17.6	17.6	0.01	75% or less of AQAL	Negligible
R19	19.2	19.2	0.04	75% or less of AQAL	Negligible
R20	17.5	17.5	0.04	75% or less of AQAL	Negligible
R21	16.9	17.0	0.02	75% or less of AQAL	Negligible
R22	18.2	18.2	0.01	75% or less of AQAL	Negligible
R23	19.2	19.3	0.02	75% or less of AQAL	Negligible
R24	19.~~8~~2	19.~~8~~3	0.01	75% or less of AQAL	Negligible

Based on the details provided in the above paragraphs, it is considered that the air quality impact of the Proposed Development on annual mean PM_{10} concentrations is '***not significant***'.

6.3.4 PM_{10} Concentrations at Future Receptor Locations within the Proposed Residential Development to the South

Regarding the future receptors to the south of the Proposed Development, the annual mean concentrations for PM_{10} are not expected to exceed the relevant air quality objective at any relevant receptor location during the 'worst case' scenario. The results are shown in the below Table 6.9

No new exceedances of the any air quality objective have been predicted at the identified future residential receptor locations.

Table 6.9 PM_{10} Annual Mean Concentration at Proposed Residential Receptors to the South of the Proposed Development in 2026 ('Worst-Case' Scenario)

ID	2026 Baseline + Proposed Development (µg/m^3)	Annual Mean Air Quality Objective for PM_{10}
PR1	18.98~~19.8~~	40
PR2	18.99~~19.8~~	
PR3	18.99~~19.8~~	
PR4	18.99~~19.8~~	
PR5	18.99~~19.8~~	
PR6	18.99~~19.8~~	
PR7	18.99~~19.8~~	
PR8	18.99~~19.8~~	
PR9	18.99~~19.8~~	
PR10	18.99~~19.8~~	

6.3.5 Impacts of the Proposed Development on Ecological Receptors during 'Most-Likely' Scenario

The air quality impacts of the operation of the proposed generators along with the contribution from road sources has been assessed.

Predicted Pollutant Ground Level Concentrations for Comparison with Critical Levels for the Protection of Ecosystems / Vegetation.

A summary of maximum predicted ground level concentrations of NO_x at the identified sensitive habitat sites is presented in Table 6.10.

Table 6.10 Critical Level ('Worst-Case' Scenario)

ID	Critical Level, CL (µg/m³)	Total PC NOx (µg/m³)	PC (as a %age of the CL)	**Sensitivity Rating in relation to NO_x**	Impact Descriptor
E1	30	0.32	1.08	Low	Negligible (PC% is <100%)
E2	30	0.12	0.39	Low	Negligible (PC% is <100%)
E3	30	0.73	2.44	Low	Negligible (PC% is <100%)
E4	30	0.47	1.57	Low	Negligible (PC% is <100%)
E5	30	2.46	8.19	Low	Negligible (PC% is <100%)
E6	30	0.16	0.54	Low	Negligible (PC% is <100%)
E7	30	0.93	3.11	Medium	Negligible (PC% is <100%)
E8	30	0.07	0.25	High	Negligible (PC% is <1%)
E9	30	0.27	0.92	Low	Negligible (PC% is <100%)
E10	30	0.09	0.30	High	Negligible (PC% is <1%)
E11	30	0.14	0.48	High	Negligible (PC% is <1%)

The maximum annual mean NO_x PC is predicted to be below 1% of the critical level at the SPA and the SSSI. The impact of the Proposed Development operating would be considered 'insignificant' when compared to the criteria set out in Section 4.6.4.

7 Mitigation

7.1 Construction

It is recommended that the following 'best practice' measures be implemented, as appropriate, during the any construction activities to be undertaken during the construction of the Proposed Development. These may include, for example:

- Ensuring that all construction plant and equipment is maintained in good working order; and
- No unauthorised burning of any material anywhere on site.

A list of best practice measures was recommended for the Proposed Development within the AQ ES Chapter, Section 12.1. These will be incorporated into the CEMP, a separate condition of the outline consent.

7.2 Operation

The stack heights have been selected through iterative dispersion modelling to ensure that the impact is acceptable at relevant sensitive receptor locations during both modelled scenarios of the generators within the Proposed Development. Combination of options included within the iterative modelling process are shown below and the final design represents best available technology (BAT) for the Proposed Development.

- Stack height (i.e. the exit point);
- Exit velocity (for stack designs);
- Generator emissions (different types of engines); and,
- Volume of stack emissions.

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The operation of the generators will be limited to the 'Worst-Case' scenarios, as below:

- Testing every 1 month at 'no load' for a duration of 15 minutes;
- Testing every 6 months for a maximum duration of 6 hours during each testing;
- Emergency operation (all 88 generators operating simultaneously) for a maximum duration of 95 hours/year.

Maintenance of the engines in accordance with an approved service schedule will ensure that emissions remain within manufacturers stated limits.

Based on the information available from Ofgem[20], the Site is connected to connected to a reliable DNO network (SSE) and the actual average minutes lost per customer per year is 51.4 minutes.

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No further mitigation measures are required.

20 Document reference RIIO-ED1 Network Performance Summary 2019-20 (Annual Report).

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8 Summary and Conclusions

An assessment has been carried out to determine the local air quality impacts associated with the operation of the Proposed Development under two scenarios – 'Most-Likely' and 'Worst-Case'.

Detailed air quality modelling using the AERMOD dispersion model has been undertaken to predict the impacts associated with stack emissions from 88 generators at the Site under the two identified scenarios. Previously predicted 'worst-case' traffic emissions and baseline concentrations were combined with the contribution from the 88 generators under both scenarios. Manufacturer emission limits have been used for the modelling assessment and the plant is assumed to be operating at full load for up to 107 hours per year (in total) under the 'Worst-Case' scenario.

All long-term impacts at human and ecological receptors, are predicted to be 'Negligible' under the 'Most-Likely' scenario. All long-term impacts at human and ecological receptors, are either predicted to be 'Slight Adverse' or 'Negligible' at majority of the receptors. Though the impact descriptor for impact on NO_2 annual mean at two receptors is 'Moderate Adverse', given the nature of the operation as detailed within the 'Worst-Case' scenario, it is considered that the overall air quality impact of the Proposed Development on annual mean NO_2 concentrations is '***not significant***'.

The maximum short term NO_2 impact is not at a location where members of the public would reasonably be expected to spend an hour or more as the maximum impact is immediately adjacent to the boundary. Therefore, the cumulative air quality impacts of the Proposed Development (i.e. including those from the residential development and any future additional data centre use) at relevant human and ecological receptors is considered to be within acceptable limits.

Based on the assessment undertaken, it is considered the operations of the proposed generators as per the below would not lead to significant impact on local air quality:

Testing Scenarios:

- Monthly testing for a duration of 15 minutes at no load; and,
- 6 monthly testing for a duration of 6 hours – totalling to 12 hours/year;

Emergency Scenario:

- All 88 generators operating for a maximum duration of 95 hours/year.

Therefore, condition 17 of the outline consent can be discharged from the Proposed Development.

Planning Department
Slough Borough Council
Observatory House
25 Windsor Rd
Slough
SL1 2EL

12/10/2022
Your reference: P/00072/106(004)
Our reference: 65203376-007

Revised Emissions Parameters and Modelling Results

Dear Sirs,

Sweco UK has been commissioned by Yondr ('Client') to undertake a reappraisal of the impact of atmospheric emissions from the operation of emergency generators at the proposed development named SLO1 located off Wexham Road, Slough ('Site'). The proposals comprise two 30MWit data centre buildings with associated substation and mechanical yard. Each building (A & B) will include three storeys of data halls and facility support (offices and ancillary space), and a four-storey external gantry where most of the external plant will be located ('Proposed Development')

An air quality impact assessment report (ref: 66202273-SWE-ZZ-XX-YA-RP-0003) was submitted in April 2021 for the discharge of planning condition 17 of the consent P/00072/096. A reassessment has been undertaken due to changes in design parameters such as generator emissions, exit height. Full details of these changes are provided in Table 1 of this this technical letter.

Results of the reassessment using detailed dispersion modelling are included within Tables 2 to 5 of this technical letter. All other results and conclusions of the original AQA remain unchanged.

Based on the remodelling appraisal concludes that the impact of atmospheric emissions from the operation of emergency generators at the proposed development are unchanged from the original full air quality impact assessment undertaken April 2021.

It is considered the operations of the proposed generators as per the below would not lead to significant impact on local air quality:

Testing Scenarios:

- Monthly testing for a duration of 15 minutes at no load – totalling to 3 hours/year; and,
- 6 monthly testing for a duration of 6 hours – totalling to 12 hours/year;

Emergency Scenario:

- All 86 generators operating for a maximum duration of 92 hours/year.

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Therefore, the information submitted for the discharge of condition 17 remains unchanged.

Best regards

Karunakar Nagula
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Attachments

Table 1 – Generator Emissions Data - as previously assessed vs as revised

Table 2 - Building Dimensions within the Site used in the Dispersion Model (Revised)

Table 3 - Revised NO_2 Annual Mean Concentration Changes and Associated Impact at Existing Sensitive Receptors in 2026 ('Worst-Case' Scenario)

Table 4 - Revised NO_2 Annual Mean Concentration at Proposed Residential Receptors to the South of the Proposed Development in 2026 ('Worst-Case' Scenario)

Table 5 – Revised Critical Level ('Worst-Case' Scenario)

Table 1 - Generator Emissions Data - as previously assessed vs as revised

Parameter (per engine)	Previously Assessed				New Parameters			
	Building A	Building B	Plot to north of RM boundary	Office Building	Building A	Building B	Plot to north of RM boundary	Office Building
Number of Units	26	26	34	2	26	26	34	**Removed from the design**
Generator Power, at 100% load (KWe)	2400	2200	2200	2200	2400	2400	2200	
Stack Height, above ground level (m)	25.5	25.5	17	10	21.95	21.95	17	
Temperature of Release (K)	757.7	750.8	750.8	750.8	789.15	789.15	750.8	
Emission Velocity at Stack Exit (m/s)	43.6	41.1	41.1	41.1	44	44	41.1	
Actual Flow Rate per combined stack (Am^3/s)	8.56	8.07	8.07	8.07	10.3	10.3	8.07	
Normalised Flow Rate per combined stack (Nm^3/s)*	0.92	0.87	0.87	0.87	1.11	1.11	0.87	
NO_x Emission Concentration (mg/Nm^3)*	3581.7	2575.8	2575.8	2575.8	1998	1998	2575.8	
NO_x Emission Concentration (g/s)	3.31	2.25	2.25	2.25	2.22	2.22	2.25	
O_2 Content (%)	9.7	10.1	10.1	10.1	9.4	9.4	10.1	
Water Content (%)	**8.7**	**9.1**	**9.1**	9.1	**4.8**	**4.8**	**9.1**	
*** - Normalised at 273K, 101.3 kPa, dry, 5% O_2**								

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Table 2 - Building Dimensions within the Site used in the Dispersion Model (Revised)

Building	Approximate Centre Point		Height (m)	Length (m)	Width (m)	Angle (°)
	(X)	(Y)				
Building A	498610.1	180269.3	**19.95**	27.8	138.5	113.2
Building B	498641.6	180343.7	**19.95**	32.4	139	113.3
Residential Block A-28.5m	498492.2	180238.6	28.5	Not applicable as included as polygon buildings		
Residential Block A-25.5m	498510.5	180230.4	25.5			
Residential Block B-25.5m	498536	180158.1	25.5			
Residential Block B-21m	498554.3	180205	21			
Residential Block C-25.5m	498722.4	180136.7	25.5			
Residential Block C-21m	498722.4	180135.7	21			
Residential Block G-28.5	498441.2	180102.1	28.5			
Note: Details changed from previously assessment are shown in **bold underline**						

Table 3 - Revised NO_2 Annual Mean Concentration Changes and Associated Impact at Existing Sensitive Receptors in 2026 ('Worst-Case' Scenario)

ID	2026 Baseline (µg/m^3)	2026 Baseline + Proposed Development (µg/m^3)	Concentration Change (µg/m^3)	Long term average Concentration at receptor in assessment year	Impact Descriptor
R1	35.6	37.2	1.57	76-94% of AQAL	Slight
R2	25.8	32.2	6.36	76-94% of AQAL	Moderate
R3	34.1	35.4	1.35	76-94% of AQAL	Slight
R4	33.4	35.2	1.82	76-94% of AQAL	Slight
R5	31.0	31.9	0.95	76-94% of AQAL	Slight
R6	32.8	33.0	0.21	76-94% of AQAL	Negligible
R7	29.6	29.7	0.12	75% or less of AQAL	Negligible
R8	32.5	32.5	0.09	76-94% of AQAL	Negligible
R9	32.0	32.1	0.08	76-94% of AQAL	Negligible
R10	39.2	39.3	0.07	95-102% of AQAL	Negligible
R11	38.5	38.5	0.07	95-102% of AQAL	Negligible
R12	31.3	31.4	0.15	76-94% of AQAL	Negligible
R13	33.0	33.3	0.29	76-94% of AQAL	Negligible
R14	26.7	27.4	0.71	75% or less of AQAL	Negligible
R15	34.7	34.8	0.09	76-94% of AQAL	Negligible
R16	28.9	29.0	0.09	75% or less of AQAL	Negligible
R17	30.0	30.3	0.29	76-94% of AQAL	Negligible
R18	29.0	29.2	0.29	75% or less of AQAL	Negligible
R19	33.6	34.8	1.22	76-94% of AQAL	Slight

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ID	2026 Baseline (µg/m^3)	2026 Baseline + Proposed Development (µg/m^3)	Concentration Change (µg/m^3)	Long term average Concentration at receptor in assessment year	Impact Descriptor
R20	28.0	31.7	3.80	76-94% of AQAL	Moderate
R21	25.2	26.5	1.37	75% or less of AQAL	Negligible
R22	30.4	31.5	1.01	76-94% of AQAL	Slight
R23	35.6	37.2	1.53	76-94% of AQAL	Slight
R24	32.8	33.0	0.16	76-94% of AQAL	Negligible

Table 4 - Revised NO_2 Annual Mean Concentration at Proposed Residential Receptors to the South of the Proposed Development in 2026 ('Worst-Case' Scenario)

ID	2026 Baseline + Proposed Development (µg/m^3)	Annual Mean Air Quality Objective for NO_2
PR1	35.0	40
PR2	36.3	
PR3	37.4	
PR4	38.1	
PR5	37.8	
PR6	36.8	
PR7	36.5	
PR8	35.7	
PR9	36.3	
PR10	35.9	

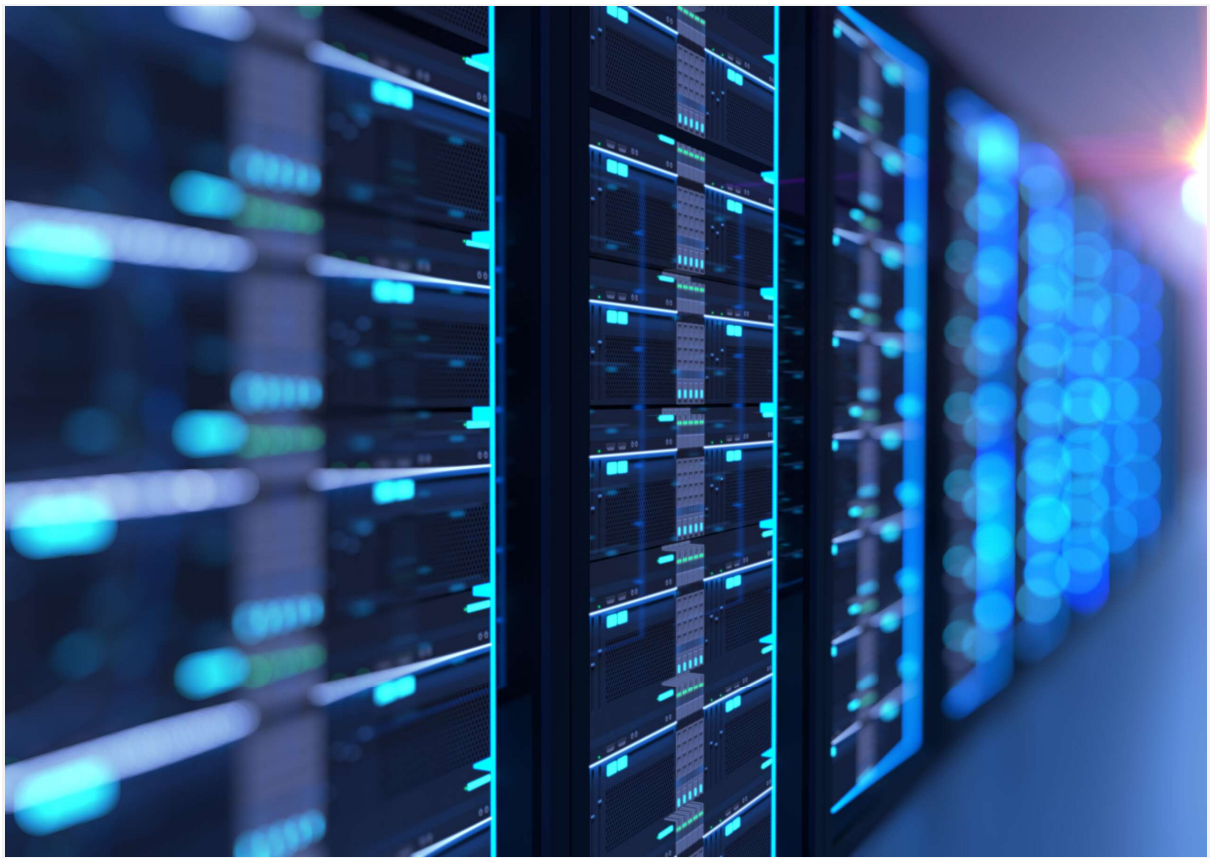
Table 5 – Revised Critical Level ('Worst-Case' Scenario)

ID	Critical Level, CL (µg/m^3)	Total PC NOx (µg/m^3)	PC (as a %age of the CL)	Sensitivity Rating in relation to NO_x	Are emissions insignificant with no need for additional assessment
E1	30	0.24	0.80	Low	Yes (PC% is <100%)
E2	30	0.09	0.28	Low	Yes (PC% is <100%)
E3	30	0.59	1.97	Low	Yes (PC% is <100%)
E4	30	0.32	1.08	Low	Yes (PC% is <100%)
E5	30	2.17	7.22	Low	Yes (PC% is <100%)
E6	30	0.12	0.40	Low	Yes (PC% is <100%)
E7	30	0.71	2.36	Medium	Yes (PC% is <100%)
E8	30	0.06	0.21	High	Yes (PC% is <1%)
E9	30	0.22	0.74	Low	Yes (PC% is <100%)
E10	30	0.08	0.26	High	Yes (PC% is <1%)
E11	30	0.12	0.41	High	Yes (PC% is <1%)

Appendix E – Site Condition Report

LON1XO Data Centre, Slough: Environmental Permit Application

Appendix E - Site Condition Report



SWECO

Change list

Ver:	Date:	Description of the change	Reviewed	Approved by
1	09-02-2023	Draft	CP	TV
2	09-02-2023	Final	CP	TV

Project Name:	LON_1 Data Centre Slough
Project Number:	65203376-008
Client:	Yondr Group
Ver:	2
Date:	09/02/2023
Author:	
Document Reference:	c:\users\gbtonv\documents\documents\proposal mitting & compliance\ dc\nts\appendices\appendix e - scr\lon1 site co report -cp (3) - tv.docx

Table of contents

1. Introduction

Yondr Group intend to establish and operate a Data Centre campus for which a bespoke Environmental Permit is required for an installation undertaking combustion activities including “burning any fuel in an appliance with a rated thermal input of 50 or more megawatts”.

Sweco UK Limited (Sweco) were appointed to provide planning and design services for Yondr Group in connection with the development of a new Data Centre Campus.

As part of this appointment, Sweco were tasked with preparation of the application for a new bespoke Environmental Permit for the development taking place at Wexham Rd, Slough SL2 5DS, National Grid Reference SU 98700 80300 (the Site).

1.1 Background

This Site Condition Report draws on information provided for the Site and surrounding area as part of the planning application to turn the former AkzoNobel Decorative Coatings, Slough Manufacturing Unit over to a mixed use commercial and residential development, following the acquisition of the Akzo site by Panattoni UK Developments Ltd.

As a Condition of the grant of planning permission in November 2020, provision of a contaminated land verification report was required. A grant of partial discharge was made in June 2022, following submission of the required information.

The objective of the reports and data presented to help secure planning permission was to determine the nature, degree and extent of contamination associated with historical manufacturing activities at the Site, develop a remediation strategy to clean up the legacy of contamination proven and leave the Site in a condition suitable to allow new development to proceed.

1.2 The Scheme

The project comprises the design of a new purpose-built Data Centre campus site, located in Slough, London, UK. The site shall include the following key features:

- Two Data Centre Buildings, each comprising of three new 10MW Data Halls, Plant Gantry, Network Rooms (MMRs, IDFs, BSNRs & CSNRs) and facilities services block;
- MV Switchboards in an N+N arrangement on the gantry; fed from on site substation
- LV UPS Power Streams in an N+1 Distributed Redundant Arrangement; 4 to make 3 (4M3), per Half Data Hall
- LV UPS Power Streams in an N+N Block Redundant Arrangement for Network Rooms & Facility Services Block
- LV power streams systems (MV feed, TX and Switchgear) fed from the new MV head ends.
- Provision of new LV Generators; 1 per Power Stream, located externally in the Ground Floor Gantry within individual acoustic weatherproof enclosures
- Feeds to Data hall Busbar End Feed Units and Busbars from Power Streams
- General Services & UPS Backed Distribution Boards provided throughout data halls, network rooms and facilities services block
- Feeds to Mechanical Items such as Chillers, Fan Wall Units, Air Handling Units, Heat Pumps etc., and;
- Mechanical resilience of N+1 on chillers, N+2 on fan walls

This specification covers the supply, delivery, erection, putting into operation, testing and commissioning of the LV Generator System for the Project Yondr LON1X0 data centre campus, located in Slough, London, UK.

This report presents the Site Condition Report. Further details regarding the site location and setting are presented in Section 2.

1.3 Site Details

Name of the applicant	Yondr Group Limited
Activity address	Wexham Rd, Slough SL2 5DS
National grid reference	498684, 180207
Document reference	LON1XO Data Centre, Slough: Environmental Permit Application, Permit Application Supporting Information Appendix E
Document references for site plans (including location and boundaries)	LON1XO Data Centre, Slough: Environmental Permit Application, Permit Application Supporting Information Appendix A

1.4 Site Condition Report

A site condition report (SCR) is required for any facility which is subject to regulation under the Environmental Permitting Regulations where there may be a significant risk to land or groundwater including where one is necessary to satisfy requirements of the Industrial Emissions Directive (IED).

A SCR describes and records the condition of the land and groundwater at a site at particular points in time. The objective is allow the operator to demonstrate that land and groundwater has been protected during the lifetime of the site and that the land is in a satisfactory state for the purposes of permit surrender.

Full demonstration that the permitted operation has ensured the protection of groundwater against pollution and environmental deterioration requires:

- Development of the relevant sections (1 to 3) of the SCR at the time of application for Permit. For installations subject to the IED this will satisfy the requirements to provide a “baseline report”.
- Updating the SCR during the lifetime of the permit as appropriate (sections 4 to 7), and;
- Completing the surrender parts (Sections 8 to 10) and submitting the fully completed SCR on application to surrender the environmental permit.

The following sections of this SCR set out the technical basis for satisfying the requirements of a “baseline report”.

2. Condition of the land at permit issue

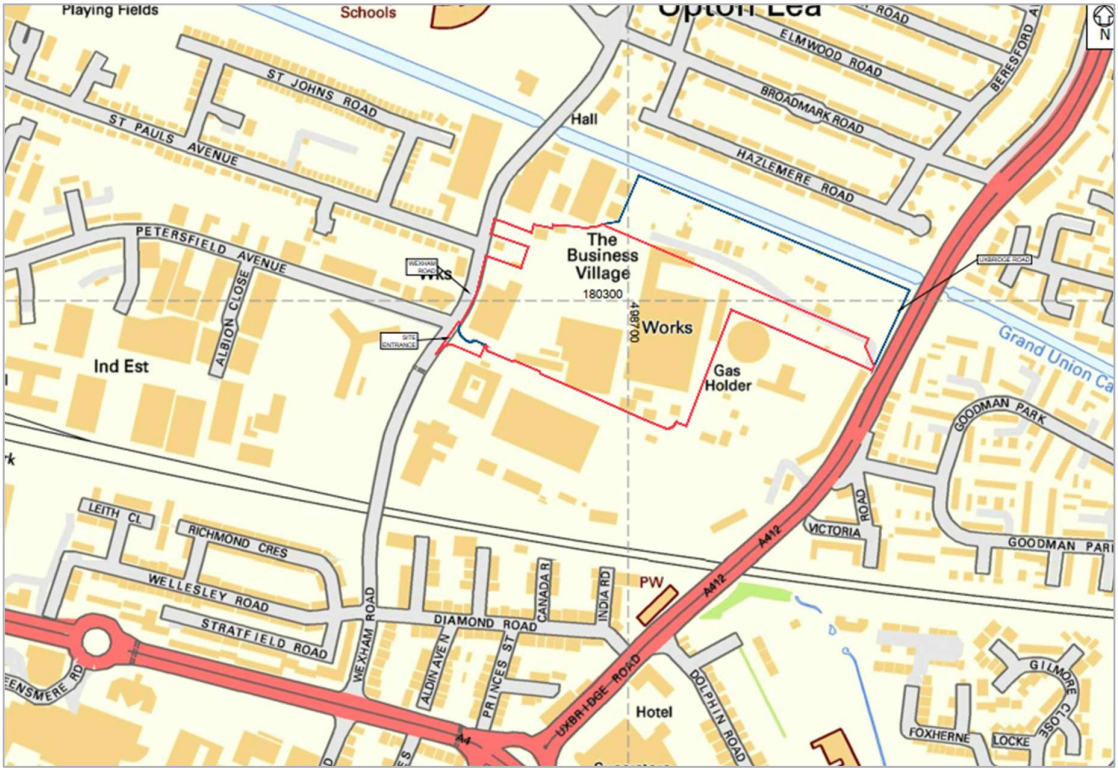
2.1 Site Description & Location

The following sections provide a summary current and historical land use, geological and environmental setting of the Site. This section is primarily based on information presented within the report prepared by Buckingham Group Contracting Limited entitled Former Akzonobel Site - Slough Remediation Completion and MMP Verification Report, dated November 2021, and the BWB Consulting report, Panattoni UK Developments Ltd, Akzo Nobel Site, Slough, Land Condition Report, October 2019. Where other sources have been used these have been documented below.

2.1.1 Site Location

As shown in Figure 2.1, the Scheme is located at Wexham Road, Slough, SL2 5DS, on the former site of the AkzoNobel Decorative Coatings, Slough Manufacturing Unit. This site was purchased for redevelopment by Panatonni UK Developments and proposed new development will include a Data Centre Campus to be operated by Yondr Group on behalf of a confidential tenant. Construction is scheduled for completion in2023.

Figure 2.1: Scheme Location



2.1.2 Current Land Use

At present the site is under development and has been subject to remediation works. The site is being redeveloped under Slough Borough Planning permission planning permission P/00072/096.

The redevelopment is for mixed use comprising part B2/B8 sui generis and/or data centre use (and associated infrastructure) divided into 3 Phases. This Site Condition Report has been written in support of a Permit application for the operation of a data centre constructed during Phase 1 of the redevelopment. This data centre will be the first to be constructed within the proposed new 'Data Centre Campus'.

Phase 2 of the redevelopment (to be confirmed) will also occur within the boundaries of the site as delineated in Figure 2.1 and will comprise the construction of a second data centre within the Data Centre Campus for which a separate Permit application will be made.

Phase 3 of the redevelopment (to be confirmed) will be construction of multi-storey residential apartments with associated access and car parking and limited soft landscaping. This will be undertaken in the wider former AkzoNobel Decorative Coatings, Slough Manufacturing Unit, adjacent to the south of the current Permit application site.

2.1.3 Historical Land Use

Historically the site has been used for paint and coating manufacture from 1919 until operation ceased in 2018. Prior to this the site was utilised for brickearth excavation and brick making in the late 1800s as well as for a US/Canadian Army Storage Base between 1914-1918.

Planning permission was sought in November 2020 for the mixed-use development of the site (Ref P/00072/116). As part of the permission the site underwent remediation in accordance with Buckingham Group Contracting Ltd's (BCGL) "First Panattoni, Former AkzoNobel Site-Slough, Remediation Scheme for Contamination" (reference BGCL-C19019/001/v5, dated 31 March 2020). The remediation was approved by the regulatory bodies including the local contaminated land officer and the Environment Agency, and Condition 34 (Contaminated Land Verification Report) of the planning permission was discharged in June 2022.

2.2 Geology

2.2.1 Published Geology

The geology is shown on the British Geological Survey (BGS) map 269 1:50,000 Series and on the BGS website. The site is underlain by between 5m and 9m of the Taplow Gravel Member, underlain by up to 39m thickness of the Lambeth Group. The underlying bedrock is the Seaford and Newhaven Chalk Formation.

Made ground overlies the natural soils in much of the site as a result of previous development and had a thickness of between 1.0 – 1.5m.

2.3 Hydrogeology

2.3.1 Published Hydrogeology

The Taplow Gravel Member is classified by the Environment Agency as a Principal Aquifer and the Lambeth Group as a Secondary A aquifer. The Seaford and Newhaven Chalk is classified as a Principal Aquifer. It is considered that the more cohesive and lower permeability strata of the Lambeth Group are acting as an aquiclude between the Taplow Gravel Member and the deeper Chalk aquifer.

The site is located within a Zone III (Total Catchment) groundwater source protection zone (SPZ), with the Zone II (Outer Protection) and Zone I (Inner Protection) located approximately 80 m to the southwest and 915 m to the west of the site respectively.

The site has been subject to environmental monitoring as part of site investigations undertaken between 2015 and 2018. Groundwater was encountered at between 0.99m below ground level (mbgl) and 4 mbgl.

2.4 Hydrology

The nearest surface waters to the site are the Grand Union Canal along the northern site boundary and the culverted course of the Dachett Brook, which is understood to be present beneath Uxbridge Road immediately east of the site. The Canal is not considered to be a likely receptor due to its elevated position in relation to the site coupled with its upgradient location. Similarly, the Dachett Brook is not considered to be a receptor due to its location up-hydraulic gradient from the site.

2.5 Pollution History

2.5.1 Historical land uses and associated contaminants

As described in Section 2.1.3 there has been a history of paint and coatings manufacture on the site since circa 1919.

2.6 Evidence of historic contamination

2.6.1 Historical site investigation

Numerous intrusive investigations have been undertaken at the site from 2015. BGCL provide a summary of the previous intrusive investigations undertaken within their Remediation Scheme for Contamination Report (ref BGCL-C19019/001/v3) provided in support of planning application P/00072/096. This includes a summary of visual and olfactory evidence of contamination and previous Detailed Quantitative Risk Assessments (controlled waters and human health).

Historical land use left a legacy of contamination on the site, including from past uncontrolled waste disposal resulting in soil and groundwater contamination:

- Tank Farm/Plume 1 – groundwater contamination including dissolved phase BTEX, TPH, and alcohols, as well a free phase hydrocarbon and elevated TPH concentrations in unsaturated soils. Buried drums, tins and gross paint contamination was also encountered during historical ground investigations
- Plume 2- localised plume of dissolved phase BTEX and TPH with occasional elevated concentrations in the unsaturated soils
- Plume 3- Historic solvent and oil storage and industrial use since the 1930s. Dissolved phase BTEX, TPH, chlorinated solvents and localised asbestos in the unsaturated soils. Buried drums, tins, oily rags, waste wood and gross hydrocarbon contamination in two burial pits.
- Plume 4- Groundwater plume with elevated dissolved phase BTEX, TPH and naphthalene.

2.6.2 Remediation and Verification of the site

The site has been subject to a programme of remediation works undertaken by BCGL between 2019 and 2021.

A multi-phased remediation of the site was undertaken which comprised the following:

- Targeted delineation and further site wide ground investigation
- Targeted abstraction and offsite disposal of floating free phase hydrocarbons on the groundwater
- Provision of a downgradient permeable reactive barrier to intersect and treat residual dissolved phase contamination.
- Excavation and segregation of historical disposed waste and associated contaminated soils.
- Direct injection treatment of the dissolved phase groundwater plumes with Oxygen Release Compound
- Ex-situ bioremediation of excavated soils and offsite disposal of segregated extraneous materials
- Ongoing regular groundwater quality monitoring.

The remediation works were completed in 2021 and the Verification Report produced by BGCL was reviewed and approved by the Regulatory Authorities.

2.7 Baseline soil and groundwater reference data

Based on the remediation works undertaken on the site, legacy contamination risks associated with the historical activity undertaken at the location are considered to have been removed.

The BUGCL Remediation Completion and MMP Verification Report (and associated appendices) dated November 2021 (Ref BGCL-C19019/007/v3) establishes the current soil and groundwater baseline conditions at the site.

2.7.1 Supporting Information

- BGCL Former Akzonobel Site – Slough. Remediation Scheme for Contamination. December 2019
- BGCL Former Akzonobel Site- Slough. Remediation Completion and MMP Verification Report. February 2021.
- Slough Borough Council Application for Approval of Details Reserved by Condition. Amended Decision Notice 1st July 2022. Planning Application P/00072/116

3. Permitted activities

3.1.1 Permitted activities

This SCR has been developed in support of an application for an Environmental Permit under Schedule 1, Section 1.1 Part A(1)(a) 'Burning any fuel in an appliance with a rated thermal input of 50 or more megawatts'.

See the Environmental Permit- supporting information, for a full description of the site including permitted activities and wider ancillary activities undertaken across the site. The remediation was approved by the regulatory bodies including the local contaminated land officer and the Environment Agency, and Condition 34 (Contaminated Land Verification Report) of the planning permission was discharged in June 2022.

3.1.2 Non-permitted activities

Activities associated with the operation of a data centre excluding the operation of diesel fired generators and diesel storage.

3.1.3 Document references

See the Environmental Permit supporting information document for site plan showing activity layout (Appendix A) and the Environmental Risk Assessment (Appendix B).

3.2 Operating Techniques

Technical standards and EA guidance used to ensure appropriate measures are followed as part of the data centre operation are listed as:

- Environment Agency - Data Centre FAQ DRAFT version 11.0 H.Tee 11/5/20 – Release to Industry
- Environment Agency - Risk assessments for your environmental permit https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit
- Environment Agency - Develop a management system: environmental permits https://www.gov.uk/guidance/develop-a-management-system-environmental-permits
- Department for Environment, Food & Rural Affairs (DEFRA)- Environmental permitting: Core Guidance for the Environmental Permitting (England and Wales) Regulations 2016 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/935917/environmental-permitting-core-guidance.pdf
- Department for Environment, Food & Rural Affairs (DEFRA) - Control and monitor emissions for your environmental permit https://www.gov.uk/guidance/control-and-monitor-emissions-for-your-environmental-permit

4. Operational Phase

The operation of the installation subject to permit does not include any point source emissions to land or groundwater. The principal risk to land and groundwater is associated with the accidental release of diesel to the ground. The design and installation of fuel storage facilities has been developed in accordance with best available techniques, whilst the site EMS, operating procedures and preventative maintenance regime will be developed to minimise the potential for accidental loss of fuel. These approaches set out how the operator will ensure that land and controlled waters are protected during the operational lifetime of the permit and how the site will be left in a satisfactory condition.

This section provides a structure for collecting and recording relevant information throughout the life of the permit in order to provide confirmation that the pollution prevention, monitoring and control measures implemented have been effective. Many of these records are expected to be required by the permit conditions/rules and will also be included with the site EMS.

This section of the SCR is intentionally left blank in order to allow changes to be made as and when they occur.

4.1 Changes to the activity

4.1.1 Have there been any changes to the activity boundary?

If yes, provide a plan showing the changes to the activity boundary.

4.1.2 Have there been any changes to the permitted activities?

If yes, provide a description of the changes to the permitted activities

4.1.3 Have any 'dangerous substances' not identified in the Application Site Condition Report been used or produced as a result of the permitted activities?

If yes, list of them

Checklist of supporting information

- Plan showing any changes to the boundary (where relevant)
- Description of the changes to the permitted activities (where relevant)

List of 'dangerous substances' used/produced by the permitted activities that were not identified in the Application Site Condition Report (where relevant)

4.2 Measures taken to protect land

Use records that you collected during the life of the permit to summarise whether pollution prevention measures worked. If you can't, you need to collect land and/or groundwater data to assess whether the land has deteriorated.

Checklist of supporting information

- Inspection records and summary of findings of inspections for all pollution prevention measures

Records of maintenance, repair and replacement of pollution prevention measures

4.3 Pollution incidents that may have had an impact on land, and their remediation

Summarise any pollution incidents that may have damaged the land. Describe how you investigated and remedied each one. If you can't, you need to collect land and /or groundwater reference data to assess whether the land has deteriorated while you've been there.

Checklist of supporting information

- Records of pollution incidents that may have impacted on land

Records of their investigation and remediation

4.4 Soil gas and water quality monitoring (where undertaken)

Provide details of any soil gas and/or water monitoring you did. Include a summary of the findings. Say whether it shows that the land deteriorated as a result of the permitted activities. If it did, outline how you investigated and remedied this.

Checklist of supporting information

- **Description of soil gas and/or water monitoring undertaken**

Monitoring results (including graphs)

5. Site Closure & Surrender

The surrender part of the SCR is intended to describe the condition of the land and groundwater at the point at which an application to surrender the environmental permit is made. It must provide the evidence necessary to convince the Environment Agency (EA) that the site does not pose a pollution risk and is in a satisfactory state.

5.1 Decommissioning and removal of pollution risk

Describe how the site was decommissioned. Demonstrate that all sources of pollution risk have been removed. Describe whether the decommissioning had any impact on the land. Outline how you investigated and remedied this.

Checklist of supporting information

- **Site closure plan**
- **List of potential sources of pollution risk**

Investigation and remediation reports (where relevant)

5.2 Reference data and remediation (where relevant)

Say whether you had to collect land and/or groundwater data. Or say that you didn't need to because the information from sections 3, 4, 5 and 6 of the Surrender Site Condition Report shows that the land has not deteriorated.

If you did collect land and/or groundwater reference data, summarise what this entailed, and what your data found. Say whether the data shows that the condition of the land has deteriorated, or whether the land at the site is in a "satisfactory state". If it isn't, summarise what you did to remedy this. Confirm that the land is now in a "satisfactory state" at surrender.

Checklist of supporting information

- Land and/or groundwater data collected at application (if collected)
- Land and/or groundwater data collected at surrender (where needed)
- Assessment of satisfactory state
- Remediation and verification reports (where undertaken)

5.3 Statement of site condition

Using the information from sections 3 to 7, give a statement about the condition of the land at the site. This should confirm that:

- the permitted activities have stopped
- decommissioning is complete, and the pollution risk has been removed
- **the land is in a satisfactory condition.**

Appendix F – Noise Impact Assessment

Noise Impact Assessment

Application for Part Discharge of Planning Condition 12

SLO1 Data Centre

Mixed-use Development of Land at former Azkonobel Facility

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10/11/2022
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Document Reference: 66202273-SWE-ZZ-XX-YA-RP-0002
Revision: P04
Prepared For: Yondr Group

Status / Revisions

Rev.	Date	Reason for issue	Prepared		Reviewed		Approved	
P01	17.03.21	S3	JW	19.03.21	MS	19.03.21	MS	19.03.21
P02	07.04.21	S4	JW	07.04.21	KF	07.04.21	KF	07.04.21
P03	08.11.22	S4	RT	08.11.22	JW	08.11.22	JW	08.11.22
P04	10.11.22	S4	RT	10.11.22	JW	10.11.22	JW	10.11.22

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1 Introduction

Sweco UK has been commissioned by Yondr Group to undertake a noise assessment to accompany a Section 73 submission for the proposed data centre development at land at the former AkzoNobel Decorative Paints facility, Wexham Road, Slough SL2 5DB, as required by Planning Condition 12 of outline planning permission reference: P/00072/096.

The Proposed Development comprises two 30MW data centre buildings with associated substation and mechanical yard. Each building (A & B) will include three storeys of data halls and facility support (offices and ancillary space), and a three-storey external gantry where most of the external plant will be located.

The site has outline planning consent for data centre use. This report contains a noise impact assessment to accompany an application for the approval of a reserved matters planning application, and to seek part discharge of Planning Condition 12.

The current development proposals and the existing site noise levels have been reviewed to assess the scheme against the Planning Condition 12 criteria. The development has been designed from the onset to accord with the condition standards.

The existing background noise levels, as measured by others as part of the outline planning application have been analysed to provide external plant noise limits in accordance with Planning Condition 12.

The aspects of acoustics that are considered in this assessment, as defined in Planning Condition 12, are as follows:

- Operational plant noise emissions.
- Operational deliveries.

The Planning Condition 12 criteria are presented in this report, the measured acoustic data is then presented followed by the assessment of compliance against the condition criteria.

A pre-application meeting was held with Slough Borough Council (SBC) on 26th March 2021 to present and discuss the noise impact assessment methodology and preliminary findings. Further comments were provided by SBC after the meeting. The key outcomes of the discussions and follow-up comments were as follows:

- The scope of the assessment was generally agreed.
- The assessment methodology was generally agreed.
- Concerns were raised regarding the scoping out of a construction noise assessment – to address this concern, this assessment includes limiting criteria for construction noise and general advice on the control of emissions; further details are to be provided and controlled as part of the Construction Environmental Management Plan (CEMP).
- It was confirmed that use of the outline planning noise survey data was appropriate.

- Clarification was requested with regards to generator testing. Test durations and frequencies are confirmed in this report.
- Queries were raised with regards to the assessment of impact during the emergency scenario, and whether this be undertaken with windows open or closed. This assessment presents both scenarios so that the internal noise levels that would occur are clear for each.
- It was queried whether HGV deliveries would occur during the daytime only. This is confirmed in this report.

This report was first prepared for the reserved matters planning application, and has been updated due to changes to the proposed development which are being proposed to the Local Authority as part of a Section 74 planning application.

Whilst every effort has been made to ensure that this Report is easily understood, it is technical in nature; a glossary of terms in Appendix A is included to assist the reader.

2 Policy, Standards, and Guidance

2.1 Standards and Guidance Documents

A summary of the Standards and guidance documents used to inform the acoustic design of the scheme can be found below. Further detail on these documents is provided in Appendix B.

- National Planning Policy Framework
- Noise Policy Statement for England
- Planning Practice Guidance – Noise
- British Standard 8233:2014 – Guidance on Sound Insulation and Noise Reduction in Buildings
- British Standard 4142:2014 – Method for Rating and Assessing Industrial and Commercial Sound
- British Standard 5228:2009 – Code of Practice for Noise and Vibration Control on Construction and Open Sites
- Local Authority Requirements – Slough Borough Council.

2.2 Noise Assessment Criteria

2.2.1 Normally Operating Plant and Operational Noise

The noise impact assessment is undertaken based on the criteria presented in Planning Condition 12 of the outline planning consent (P/00072/096), as follows:

Planning Condition 12 - Noise assessment for commercial area

Alongside each first reserved matters application for each individual part within the commercial area a detailed noise assessment and mitigation scheme shall be submitted to and approved by the Council in writing.

a) The scheme will demonstrate:

i. how the overall sound rating level from normally operating plant will not exceed 2dB(A) above the background noise levels at existing noise sensitive receptors; and

ii. how noise levels from normal external operations will not exceed 55 dB $L_{Aeq(1\ hr)}$ during the daytime (07:00 – 23:00); or 45 dB $L_{Aeq(1\ hr)}$ during the night - time (23:00 – 07:00); or 60 dB $L_{Amax(15\ mins)}$ during the night - time (23:00 – 07:00) as determined by measurement or calculation at free field locations representing facades of dwellings at existing noise sensitive receptors.

b) Cumulative noise from the operational use of the commercial development will not exceed 2dB(A) above background noise levels at noise sensitive receptors. Noise levels from external operations will not exceed 55 dB $L_{Aeq(1\ hr)}$ during the daytime (07:00 – 23:00); or 45 dB $L_{Aeq(1\ hr)}$ during the night - time (23:00 – 07:00); or 60 dB $L_{Amax(15\ mins)}$ during the nighttime (23:00 – 07:00) as determined by

measurement or calculation at free field locations representing facades of existing noise sensitive receptors.

The assessment will be made in accordance with BS 4142:2014+A1:2019 and BS8233:2014. The approved noise mitigation scheme will be fully implemented in the construction and operation of the development and thereafter retained indefinitely.

The acoustic performance specification for external plant which operates under normal conditions, and for the external building fabric, are being developed to ensure that the limiting criteria set out in Planning Condition 12 are achieved.

2.2.2 Emergency Plant

The planning condition does not set out noise criteria for emergency conditions. If there is a power failure, an emergency operating condition will activate where all generators run simultaneously to provide continuous power to the data halls. An alternative emergency scenario would occur if a substation transformer fails; higher substation noise levels are expected if this occurs. These scenarios will only occur in the very rare case that a power outage occurs, or a transformer fails

The emergency scenarios are not considered under the planning condition noise criteria for 'normally operating plant'. The predicted emergency noise levels have been presented in this report and are compared against BS 8233 residential guidelines for internal noise. These guidelines are presented in Table 1.

TABLE 1: BS 8233:2014 RESIDENTIAL INTERNAL AMBIENT NOISE LEVEL GUIDELINES

Location	Noise Level Guideline during the Daytime Period dB $L_{Aeq,16hour}$ (07:00 – 23:00)	Noise Level Guideline during the Night Time Period dB $L_{Aeq,16hour}$ (23:00 – 07:00)
Living Room	35	-
Bedroom	35	30

BS 8233:2014 states that where a development is considered necessary or desirable, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions will still be achieved.

2.2.3 Construction Noise and Vibration

The planning conditions do not set out any requirements for construction noise and vibration, however SBC have requested that the matter be considered as part of the noise assessment.

Guidance in BS 5228:2009+A1:2014 has been used to provide limiting criteria for construction noise.

BS5228 gives several examples of acceptable limits for construction or demolition noise. The most simplistic is based upon the exceedance of fixed noise limits and paragraph E.2 states that: "Noise from construction and demolition sites should not exceed the level at which conversation in the nearest building would be difficult with the windows shut."

Paragraph E.2 goes on to state: “Noise levels, between say 07.00 and 19.00 hours, outside the nearest window of the occupied room closest to the Site boundary should not exceed: 70 decibels (dBA) in rural, suburban areas away from main road traffic and industrial noise or 75 decibels (dBA) in urban areas near main roads in heavy industrial areas. These limits are for daytime working outside living rooms and offices.”

This assessment considers the criteria set out in Section E.3 of BS5228, which considers impact significance based upon the change in ambient noise associated with construction activities. It is stated that this can be considered as “an alternative and/or additional method to determine the significance of construction noise levels”. Example Method 1 (The ABC Method) considers the existing ambient noise environment (the L_{Aeq} noise level environment) at the neighbouring sensitive receptors and proposes levels which are not to be exceeded.

Table E.1 of BS5228 sets out significance effect threshold values at receptors. The process for determining this requires the determination of the ambient noise level at the relevant receptor (rounded to the nearest 5dB), which is then compared to the total noise level, including the predicted construction noise level. If the combined noise level exceeds the appropriate category value, then the impact is deemed to be significant. The relevant aspects from Table E.1 are set out in Table 2 below.

TABLE 2: BS 5228: ABC METHOD FOR CONSTRUCTION NOISE ASSESSMENT

	Threshold Value dBA		
Period	**Category A**	**Category B**	**Category C**
Daytime	65	70	75
Evenings and Weekends	55	60	65
Night time	45	50	55

NOTE 1: A significant effect has been deemed to occur if the total L_{Aeq} noise level, including construction, exceeds the threshold level for the Category appropriate to the ambient noise level.

NOTE 2: If the ambient noise level exceeds the threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a significant effect is deemed to occur if the total L_{Aeq} noise level for the period increases by more than 3 dB due to construction activity.

NOTE 3: Applied to residential receptors only.
A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.
B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.
C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

Guidance in BS 5228 has also been used to provide limiting criteria for construction vibration.

The primary cause of community concern in relation to vibration generally relates to building damage from both construction and operational sources of vibration,

although, the human body can perceive vibration at levels which are substantially lower than those required to cause building damage.

Damage to buildings associated solely with ground-borne vibration is not common and although vibration may be noticeable, there is little evidence to suggest that they produce cosmetic damage such as a cracks in plaster unless the magnitude of the vibration is excessively high. The most likely impact, where elevated levels of vibration do occur during the demolition and construction phases, is associated with perceptibility.

To control the impact of vibration during demolition and construction of a development, limits relating to the perceptibility of vibration are typically set.

BS5228 indicates that the threshold of human perception to vibration is around 0.14 mm/s, although it is generally accepted that for the majority of people vibration levels in excess of between 0.15 and 0.3 mm/s peak particle velocity (PPV) are just perceptible, which forms the basis of the recommend maximum permitted vibration levels of 1 mm/s PPV within occupied residential dwellings. Table 3 below summarizes vibrations significance criteria. The limits are presented in terms of PPV as it is the simplest indicator for both perceptibility and building damage.

TABLE 3: BS 5228 GUIDANCE ON EFFECTS OF VIBRATION LEVELS

Vibration Level	Effect
0.14 mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3 mm/s	Vibration might be just perceptible in residential environments
1.0 mm/s	It is likely that vibration of this level in residential environments will cause complaint but can be tolerated if prior warning and explanation has been given to residents.
10.0 mm/s	Vibration is likely to be intolerable for any more than a very brief exposure to this level in most building environments.

A) The magnitudes of the values presented apply to a measurement position that is representative of the point of entry into the recipient.
B) A transfer function (which relates an external level to an internal level) needs to be applied if only external measurements are available.
C) Single or infrequent occurrences of these levels do not necessarily correspond to the stated effect in every case. The values are provided to give an initial indication of potential effects, and where these values are routinely measured or expected then an assessment in accordance with BS 6472-1 or -2, and/or other available guidance, might be appropriate to determine whether the time varying exposure is likely to give rise to any degree of adverse comment.

The purpose of the target construction vibration criteria is to control the impact of construction vibration insofar as is reasonably practicable and is entirely based on the likelihood of the vibration being perceptible, rather than causing damage to properties.

Hence, although vibration levels in excess of 1 mm/s PPV would be considered adverse in respect of the likelihood of perceptibility, they would not be considered significant in terms of the potential for building damage, which would require levels of at least 15 mm/s PPV to result in minor cosmetic damage in light / unreinforced buildings.

3 Site Location and Proposed Development

3.1 Site Description

The site is located to the east of Wexham Road and falls within the jurisdiction of Slough Borough Council. The surrounding area is a mixture of commercial and residential developments. The site forms part of a wider development which will see additional residential properties construction to the south of the Proposed Development.

The area of site to the north of the Proposed Development, to the south of the Grand Union Canal, is likely to comprise a future phase of data centre development. This does not form part of this Reserved Matters Planning Application, however future noise emissions from this site are considered in the assessment to ensure that compliance with the limiting noise criteria can be achieved once the future phases of development have been completed.

Figure 1 presents the red line boundary for the proposed development, identifies the approximate location of the future data centre and residential development, and the location of the nearest noise sensitive receptors to the Proposed Development.

Figure 1: Site Location (approximate red line), Future Development and Nearest Noise Sensitive Receptors

The nearest/worst-affected existing noise-sensitive receptors to the Proposed Development are expected to be the residential properties on Hazlemere Road to the north, Uxbridge Road to the east, the proposed dwellings to the south, and Wexham Road to the west.

3.2 Proposed Development

The Proposed Development comprises the construction of two 30MW data centre buildings with associated substation and mechanical yard. Each building (A & B) will include three storeys of data halls and facility support (offices and ancillary space), and a three-storey external gantry where most of the external plant will be located. The facility support block will also comprise a rooftop plant area.

The design for Building A is developed, and includes the specifics with regards to plant types, layouts and noise data. Building B is still to be designed in detail however for the purposes of this assessment, it is assumed to be essentially identical to Building A.

Figures 2 presents the proposed site plan.

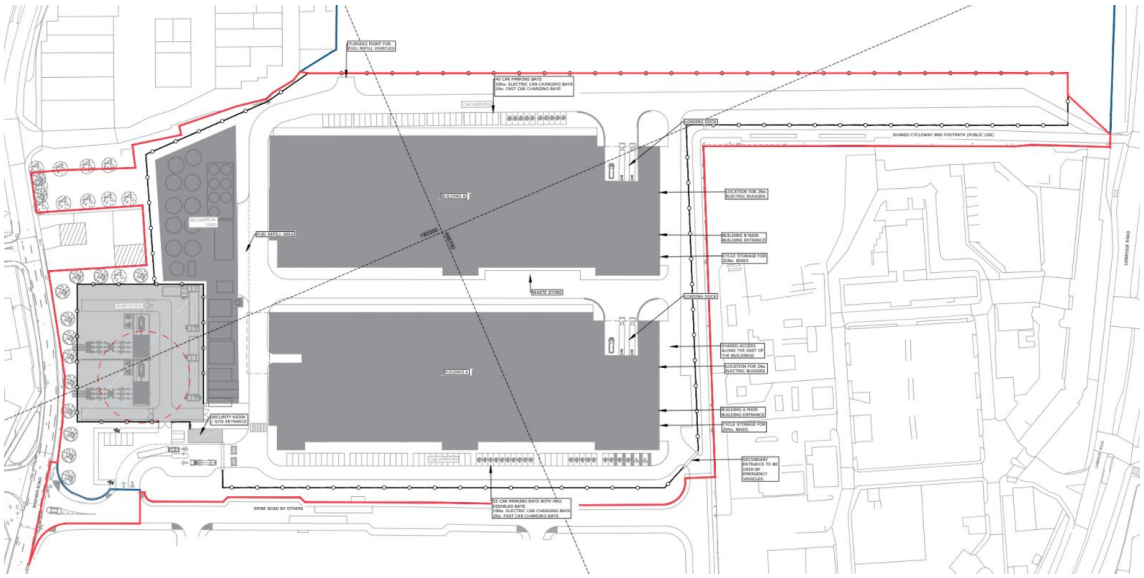

Figure 2: Masterplan: Site Location (approximate red line) and Future Development

Most of the external plant will be located on an external gantry to the north of the data halls. The proposed gantry layouts and sections are shown in Figures 3 to 5 below for information purposes. The proposed FS building (Facility Support building) rooftop plant and the substation layouts are also shown in Figure 6 and 7 respectively.

Figure 3: Ground Floor Gantry Layout – Generators

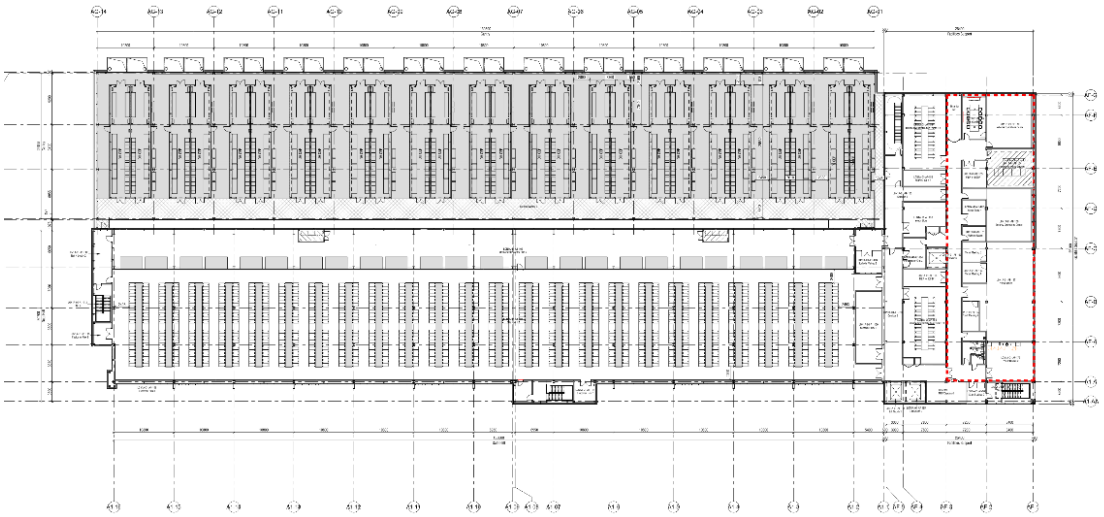

Figure 4: First Floor Gantry Layout – CEP and FS Containers

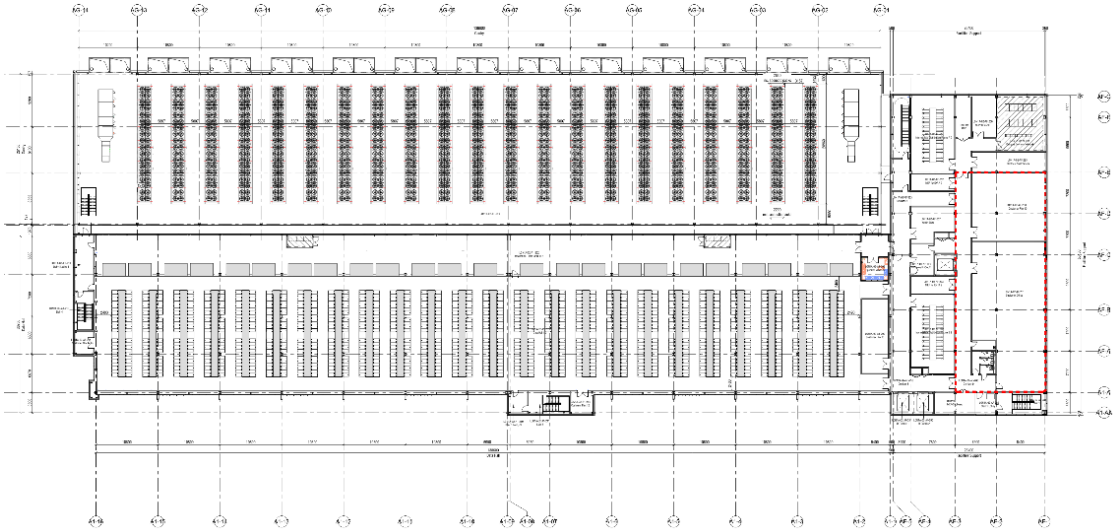

Figure 5: Second Floor Gantry Layout – Chillers

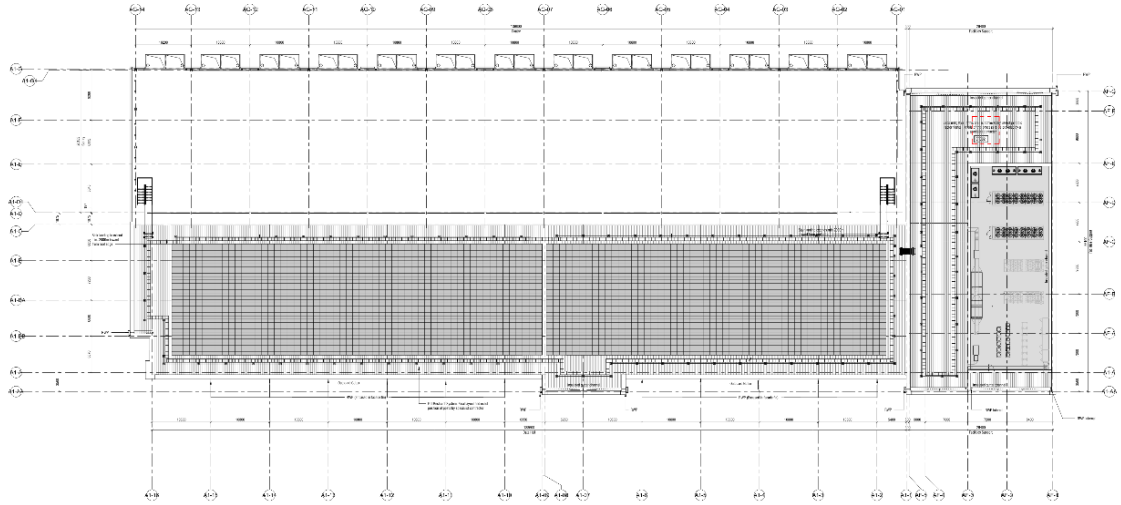

Figure 6: Roof Layout – Rooftop Plant

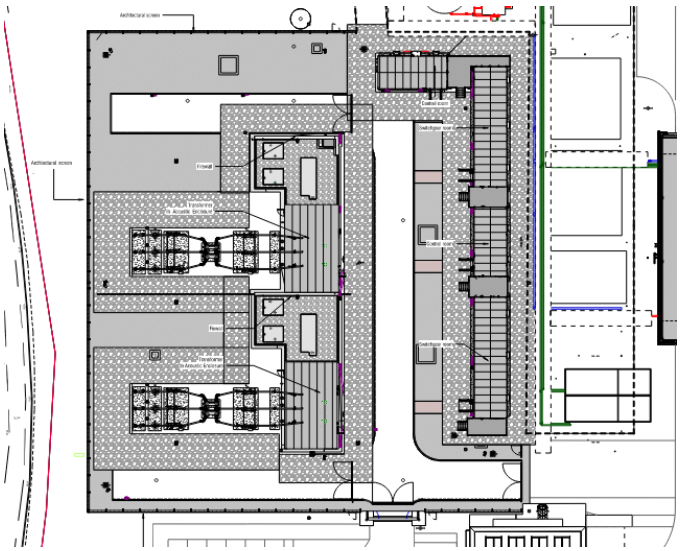

Figure 7: Sub Station - Transformers Layout

3.3 Future Phase

The future phase of development to the north is likely to comprise further data halls and associated gantries. This phase of the development does not form part of this reserved matters planning application; however, it must be ensured that noise emissions from the entire site do not exceed the limiting criteria at the noise sensitive receptors. Plant noise sources for the future development phase have therefore been included in this noise impact assessment.

4 Baseline Sound Conditions

The prevailing sound conditions in the area have been determined by WYG as part of the noise impact assessment for the outline planning application in June 2019. No significant long-term changes in the ambient noise climate in the area are deemed to have occurred since 2019 and therefore the noise measurements are considered suitable for use in this assessment. Additionally, the current restrictions on movement in the UK due to the ongoing COVID 19 pandemic mean that noise levels measured at this time would not be representative of the typical noise climate. This approach has been agreed by SBC as part of the follow-up comments to the pre-application meeting.

Full details of the survey, including survey methodology, equipment used, survey results and time history graphs are presented in the WYG noise assessment, reference A114100, dated December 2019. However, for summary purposes, the relevant measured background noise levels are presented in Figure 8, and the relevant ambient noise levels are presented in Figure 9.

Noise level data is shown for the measurement positions which are relevant to this assessment, the WYG report may be referred to for full details at the other measurement positions. The underlying drawing is taken from the original outline planning application report and therefore the redline boundary is not applicable to the Proposed Development.

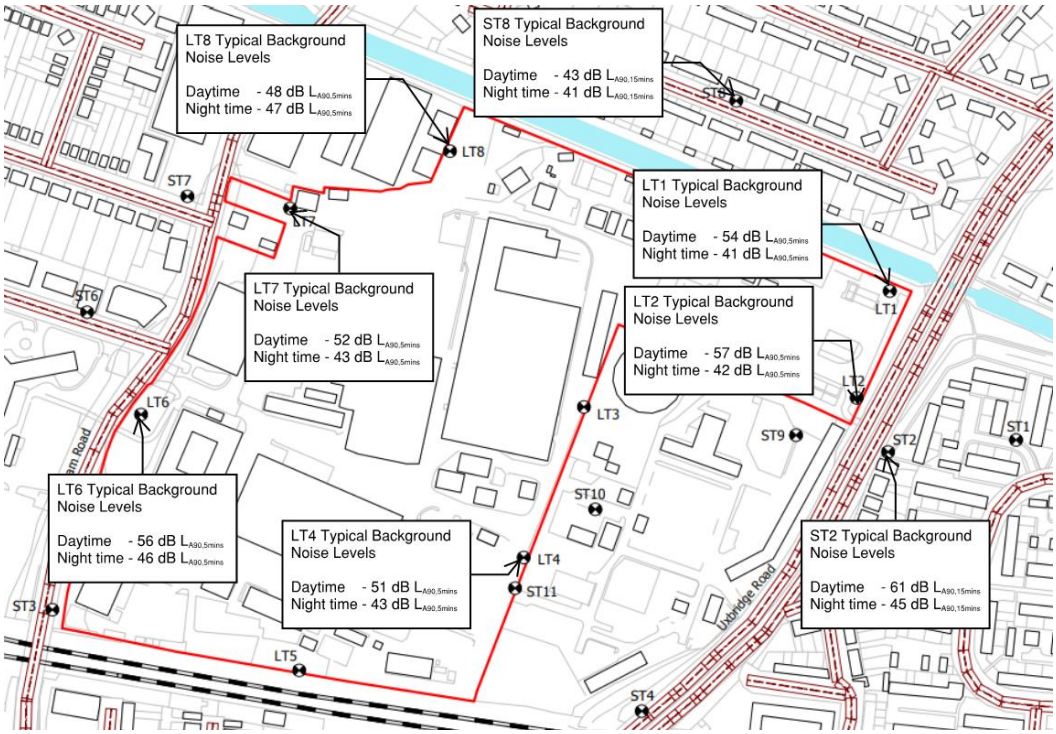

Figure 8: Outline Planning Application Noise Impact Assessment Measurement Positions with Typical Background Noise Level Data

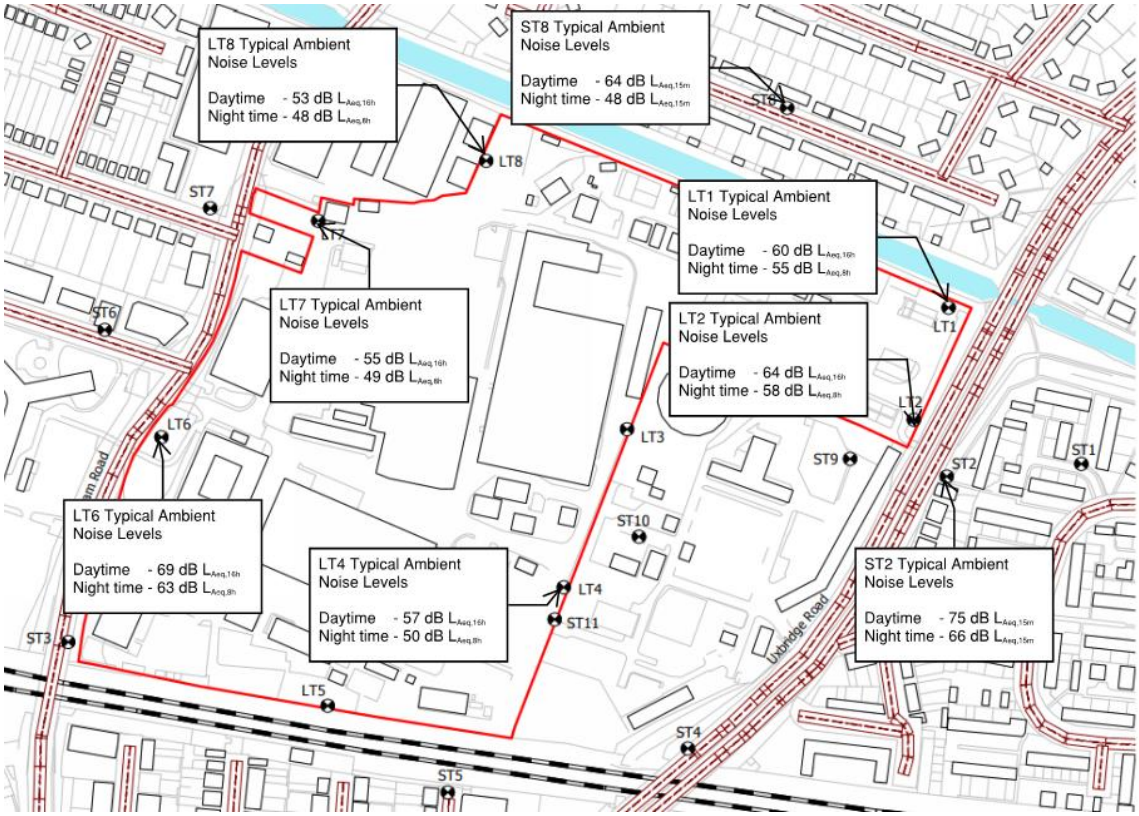

Figure 9: Outline Planning Application Noise Impact Assessment Measurement Positions with Typical Ambient Noise Level Data

5 External Building Services Noise

5.1 Assessment Criteria

Normally operating external plant noise emissions are to be controlled to meet the requirements of Planning Condition 12 when assessed in accordance with BS4142:2014. Planning Condition 12 states the following:

"The overall sound rating level from normally operating plant will not exceed 2dB(A) above the background noise levels at existing noise sensitive receptors."

Based on the measured background noise levels, as summarised in Figure 8, the limiting criteria in Table 4 have been derived for this plant noise impact assessment.

TABLE 4: EXTERNAL PLANT NOISE CRITERIA AT THE NEAREST NOISE SENSTIVE RECEPTORS

Receptor Location	Period	Background Noise Level dB L_{A90}	Limiting Criteria for Normally Operating Plant dB $L_{Ar,Tr}$	Limiting Criteria for Emergency Plant $L_{Aeq,T}$
R1 (north)	Daytime (07:00 – 23:00)	43	45	65
	Night time (23:00 – 07:00)	41	43	60
R2 (east)	Daytime (07:00 – 23:00)	54	55*	65
	Night time (23:00 – 07:00)	42	44	60
R3 (south)	Daytime (07:00 – 23:00)	50	52	65
	Night time (23:00 – 07:00)	43	45	60
R4 (west)	Daytime (07:00 – 23:00)	52	54	65
	Night time (23:00 – 07:00)	43	45	60

*The criterion for this location and period is set against the ambient planning condition requirement (55 dBA $L_{Aeq,T}$ during the day) as this is more onerous than the background noise level criterion.

The above limits apply to the total noise emission levels from all static plant and processes within the proposed development. Individual plant items may need to be designed to a lower limit such that the overall total level achieves the stated criteria above.

All plant noise predictions include indicative noise sources for the future phases on the data centre development and are therefore representative of the cumulative noise emissions from the data centre development.

5.2 Proposed Plant and Noise Control Strategies

5.2.1 Data Hall Chillers

To achieve the limiting noise criteria at the nearest noise sensitive receptors, each chiller will be housed within an attenuation pack and, where required, the fan speed will be capped to reduce the fan noise.

The specification for the proposed chillers is an Airedale DCF130T2R-36K2S2S2S2 (nett cooling capacity: 1856kW). Table 5 below presents the noise data for the proposed data hall chillers.

TABLE 5: DATA HALL - CHILLER NOISE LEVELS (BUILDINGS A AND B)

		Sound Pressure Level at 10m (dB) at Octave Band Centre Frequency (Hz)								
Operational Mode	**Attenuated**	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**Total dBA**
Daytime (Cooling Capacity: 1723kW)	Unattenuated	50	64	60	59	57	50	45	39	61
	Attenuated	47	56	51	45	41	33	30	25	48
Night time (Cooling Capacity: Approximately 1476kW) *	Unattenuated	52	59	55	53	53	43	38	26	56
	Attenuated	48	51	46	39	45	28	27	14	47

*Spectrum values calculated based on the spectrum shapes and broadband values provided for the attenuated option with a 'capped' fan speed.

The sound data assumed for the data hall chillers for the future phase are summarized in Table 6 below. The attenuation pack insertion loss specifications used in the assessment are also presented in this table.

TABLE 6: DATA HALL - CHILLER NOISE LEVELS AND ATTENUATION PACK SPECIFICATIONS (FUTURE PHASE)

		Sound Level / Insertion Loss (dB) at Octave Band Centre Frequency (Hz)								
Operational Mode	**Parameter**	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**Total dBA**
Daytime	Sound Power	89.4	95.6	94.8	89.9	88.3	86.1	81.9	73.3	93.7
	Sound Pressure @ 10m	67.2	62.8	62.0	57.1	55.5	53.3	49.1	39.5	61.0
Night time	Sound Power	89.4	95.6	94.8	89.9	88.3	86.1	81.9	73.3	93.7
	Sound pressure @ 10m	67.2	62.8	62.0	57.1	55.5	53.3	49.1	39.5	61.0
Attenuation Pack - Insertion Losses (Model: AA303S)		4	8	13	22	24	21	18	14	4

5.2.2 Generators and Loadbank

The current proposals include for AVK diesel generator sets. Each generator will be located within an attenuating container and will have attenuation to the exhaust and flue. The container and silencer attenuation will be sufficient to limit generator noise levels to those stated in Table 7.

TABLE 7: GENERATOR NOISE LEVELS

	Sound Pressure Level $L_{p,1m}$ (dB) at Octave Band Centre Frequency (Hz)								$L_{p,1m}$ (dBA)
Description	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	
Outside container wall	70	76	71	64	60	60	57	65	70
Before air inlet attenuator:	90	83	73	59	54	51	48	60	71
Outside air outlet attenuator	91	83	73	61	57	53	50	66	72
Outside flue gas silencer	94	82	70	63	62	58	50	1	72

Generators on the future phase will be subject to similar restrictions, to be finalized during the design of that phase.

The attenuation required to limit noise emissions to these levels is extensive. Increasing the specification of such attenuation would have significant spatial/layout implications and is therefore not deemed possible or necessary.

Under normal conditions, the generators will be subject to regular testing. The proposed test regime for each generator is currently as follows:

- Monthly testing for a duration of 15 minutes at no load; and
- 6 monthly testing for a duration of 6 hours – totalling 12 hours per year.

Monthly testing is likely to be undertaken offload and therefore generator noise emissions are likely to be lower than if running at full capacity. As a worst-case scenario, the noise assessment considers generators running at full capacity during testing. The daytime noise assessment is undertaken with the generators operating which are closest to each of the nearest noise sensitive receptors. Onload testing is to be undertaken on one generator at a time. Offload testing may be undertaken on the other generators sequentially (one-at-a-time) whilst one generator is being tested onload. The maximum number of generators being tested at any one time shall be two (one onload and one offload).

Generator testing will also comprise the operation of a Loadbank unit. This will be located at ground floor level outside the louvred area to the west of the gantry. The proposed unit shall be limited to the noise levels listed below, as presented below and in Figure 10.

- 56dBA at 10m
- 72dBA at 1m
- 78dBA at 1m from the hot exhaust (vertical)

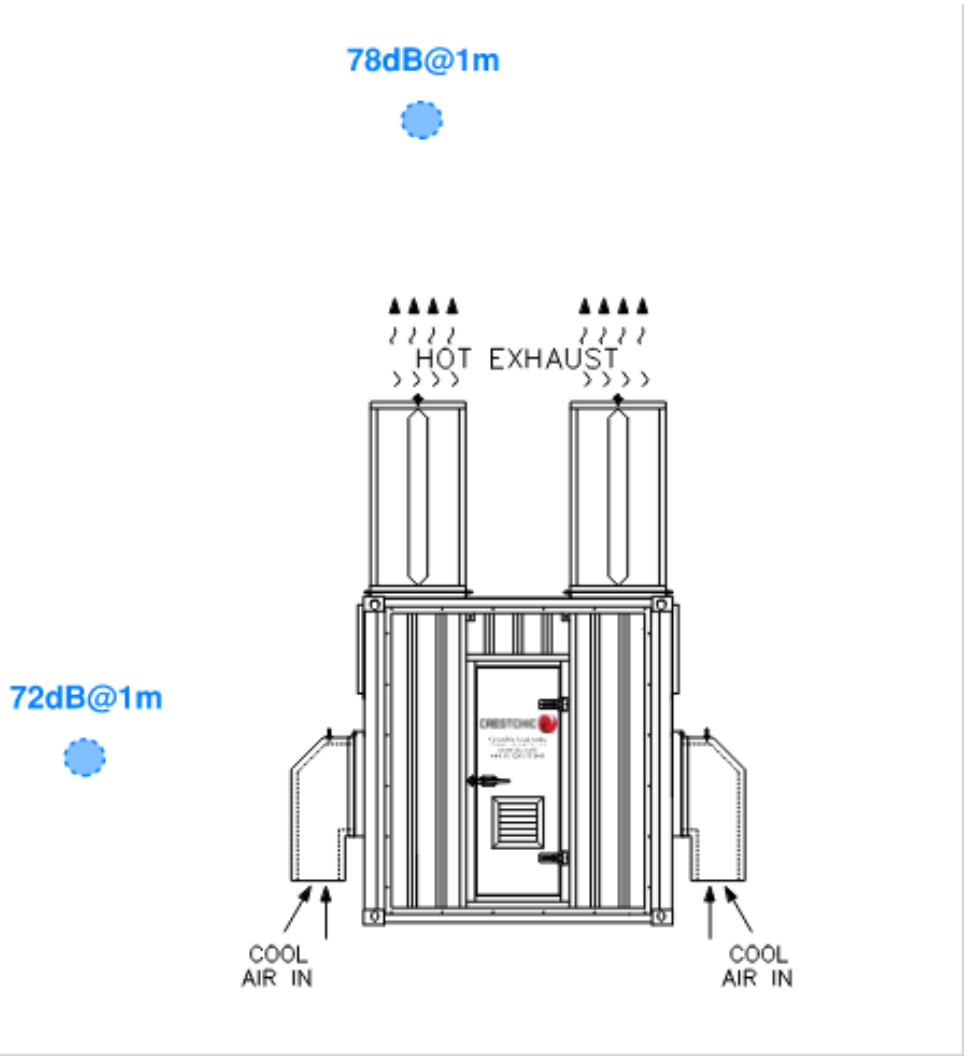

Figure 10: Loadbank – Noise Limits

The emergency operating condition includes for all generators running at full capacity. This will only occur if there is a power outage is therefore not considered under normal operating conditions.

5.2.3 Substation Transformer

To achieve suitable noise levels at the nearest noise sensitive receptors, the transformer cooling banks are proposed to be separated from the transformer core. This arrangement allows for the transformer core to be located within an enclosure. The enclosures will have a limited number of louvred openings to provide ventilation to the transformer cores.

It has been confirmed that during normal operating conditions there will be no other sources of noise in the substation other than the transformers.

The substation has an emergency operating condition which occurs when one of the transformers fails. If this were to occur, then emergency fans will operate to ensure that the remaining transformer remains operational until the fault can be fixed. These fans operate outside of the transformer enclosure and are therefore considered separately.

Table 8 presents the available noise data for the proposed substation transformers.

TABLE 8: SUBSTATION TRANSFORMER NOISE LEVELS

		dB - Octave Band Centre Frequency (Hz)								
Description	**Quantity**	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**dBA**
Transformer – Ventilation Noise – Coolers (Emergency Condition Only)	Sound Pressure Level at 1m	-	-	-	-	-	-	-	-	52.5
	Assumed Spectrum Shape	60	55	50	50	50	45	40	35	-
Transformer – Operating Noise	Sound Power Level (dB)	-	-	-	-	-	-	-	-	89
	Sound Spectral Shape	59	82	62	50	47	41	38	33	-
Transformer Enclosure – AGS Panel	Sound Reduction Index R_w(dB)	21	24	31	38	40	36	43	43	-
	Internal Absorption Coeficient (α)	-	0.56	0.85	0.95	0.98	0.97	0.9	-	-
Transformer Enclosure – AGS Louvre	Required Louvre Insertion Loss (dB)	6	6	9	13	21	20	16	13	-

5.2.4 Other Plant Items

The following plant will also be installed to serve the data halls and the FS building:

Gantry

- 28 x Switchrooms comprising 6 x Condenser units and 2 x extract fans each
- 26 x Transformers
- 2 x Plantrooms: Pumps and Condensers
- 2 x Heat pumps
- 2 x Air handling units

FS building – Rooftop plant

- 2 x Enclosed pumps
- 2 x Heat pumps
- 1 x Network room AHU
- 1 x FS AHU
- 15 x Condenser units
- 2 x Network chillers

The final plant selections for all proposals are not available at this stage of the design, and therefore representative noise data has been used to assess noise emissions from these plant types at this stage. Plant is to be procured with noise emissions which are equal to, or lower than those stated below.

Table 9 presents a summary of the plant noise levels used for this assessment and confirms the mitigation measures proposed based on the noise data stated. These are to be confirmed further to confirmation of the final plant specifications.

TABLE 9 – PLANT NOISE DATA AND MITIGATION SUMMARY

Unit Type	Quantity	dBA	Attenuation Type Required	Indicative Attenuation Required (dB)
CEP Container – Condenser	Sound Pressure Level at 5m	64	Quieter unit required	6
FS Container – Condenser	Sound Pressure Level at 5m	61	Quieter unit required	3
Battery Module (Container) - Condenser	Sound Power Level	63	-	-
Gantry Plantroom - Pumps	Sound Power Level	66	Enclosure - Plantroom canopy	10
Gantry Condensers: Mitsubishi PUZ-ZM71VHAR-1	Sound Power Level	67	-	-
Gantry heat pump	Sound Pressure Level at 10m	62	Attenuation pack	11
Data hall AHU (case breakout + Inlet)	Sound Power Level	81	-	-
FS Enclosed pump	Sound Power Level	66	Enclosure - Plantroom canopy	5
FS Heat pump	Sound Pressure Level at 10m	52	-	-
Network Room AHU (case breakout + Inlet)	Sound Power Level	77	-	-
FS AHU (case breakout + Supply Inlet + Extract Outlet)	Sound Power Level	80	-	-
Network Chiller + Proposed Attenuation Pack	Sound Pressure Level at 10m	47	-	-
FS Condenser Unit: DAIKIN ERQ250AW1	Sound Power Level	78	-	-
FS Condenser Unit: Mitsubishi PUZ-ZM100VHAR	Sound Power Level	69		
FS Condenser Unit: Mitsubishi PURY-P900YSNW-A1	Sound Power Level	92		
FS Condenser Unit: Mitsubishi PURY-P800YSNW-A1	Sound Power Level	91		
FS Condenser Unit: Mitsubishi PURY-P1000YSNW-A1	Sound Power Level	87		
FS Condenser Unit: Mitsubishi PURY-P450YSNW-A	Sound Power Level	89		
FS Extract Fan (case breakout + extract outlet)	Sound Power Level	75	-	-

In addition to the items stated above, the mechanical yard and the ground floor level for the gantry will comprise a number of pumps and booster sets. No noise data is available for these at this stage of design; however, they are to be housed within plant rooms/enclosures and underground chambers and therefore these are to be designed to ensure noise breakout from these units is suitably controlled.

5.2.5 Internal Noise Breakout

Noise breakout through the building envelope must be considered when predicting the total emissions at the nearest noise sensitive receptors.

Calculations have been made to predict the internal levels in the proposed Data Halls and Mechanical Corridors. The main sound sources dictating the reverberant noise levels in these spaces are fan walls.

Table 10 below details the noise levels for the proposed fan walls used in this assessment.

TABLE 10: FAN WALL NOISE LEVELS

	Sound Pressure Level $L_{p,1m}$ (dB) at Octave Band Centre Frequency (Hz)								dBA
Description	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	
Case Break Out	96	101	95	91	87	84	84	76	97
Discharge Air	96	101	95	91	87	84	84	76	97
Return Air	96	101	95	91	87	84	84	76	97

24 number of fan walls are proposed per mechanical corridor and per data hall.

Based on the above, the following reverberant noise levels have been predicted.

- Data Hall: 80 dBA
- Mechanical Corridor: 97 dBA

The noise breakout from the office block and other minor plant/network rooms is considered negligible at this stage.

A paneled façade with internal linings and lightweight roof systems are currently proposed. The sound reduction index specifications for the proposed roofs and external walls are listed below.

- External Wall – Data Hall: 28 dB R_w+C_{tr}
- Roof – Data Hall: 38 dB R_w+C_{tr}
- Roof – Mechanical Corridor: 31 dB R_w+C_{tr}

5.2.6 Other Mitigation Measures

To achieve sufficient external plant noise reduction, the external gantries will be screened using full height acoustic louvred screens which will extend around the entirety of each gantry edge.

The louvres will be full height, except around the western edge where the gantry extends over the mechanical yard. In this instance, the louvre will in effect be a floating barrier, which extends from the height of the first gantry floor up to the height of the top of the chillers.

The insertion loss requirements for the louvre a presented in Table 11.

TABLE 11: GANTRY LOUVRE INSERTION LOSS REQUIREMENTS

		Insertion Loss (dB) at Octave Band Centre Frequency (Hz)								
Mitigation	**Attenuation Type**	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**Total R_w**
Gantry screening	Acoustic louvre	6	7	10	18	31	28	26	25	21

5.3 External Plant Noise Modelling

To assess the impact of noise from the proposals, the likely specific noise level from the most significant sources of noise associated with the development has been predicted at the nearest noise-sensitive receptors. Predictions have been carried out in the noise-modelling suite Cadna/A, in accordance with the ISO 9613 prediction methodology.

The model considers the effects of ground absorption, atmospheric absorption, and acoustic reflections, as well as applying a light downwind correction to consider a typical worst-case downwind situation. In terms of ground absorption, the intervening ground between the sources and receivers has been modelled as mixed ground (G=0.5), which is considered suitable considering the variation in ground conditions between the development and the receptors. A maximum 1 order of reflection has been considered in the model and correction factors in the order of 1dB to 2dB have been added to the results to allow for the consideration of multiple reflections (please note that reflection correction factors are dependent on the receptor location).

The current assessment has been carried out based on the detailed information and the assumptions presented in Section 5.2.

Figure 11 presents a 3D image of the noise model for information purposes. A grey area is shown for the plant noise sources of the future phase however this does not represent the final building location as this is still to be designed.

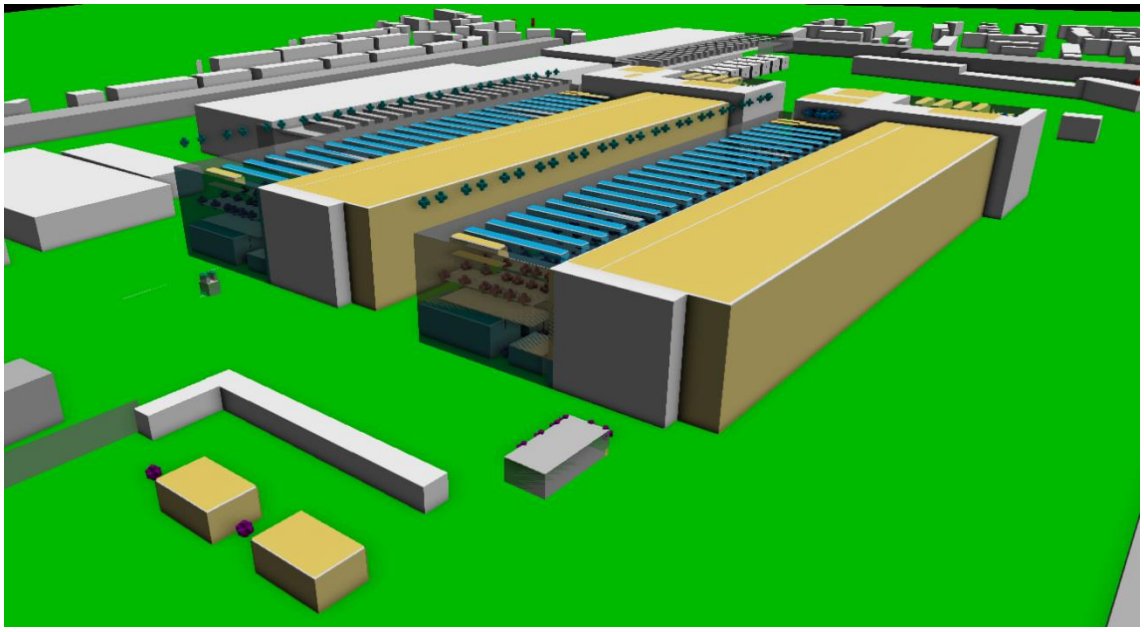

Figure 11: 3D Model View

5.4 Plant Noise Impact Assessment

5.4.1 Normal Operation (Daytime 07:00 – 23:00)

The predictions for normally operating plant comprise the following noise sources:

- Chillers at full capacity
- Generators under test conditions
- Loadbank under normal operation
- Substation under normal operation
- Other plant operating normally
- Noise breakout from the data halls

BS 4142:2014 requires consideration of rating penalties for features in the noise, such as tonality, impulsivity, and intermittency. It will be ensured that noise from chillers, generators and other normally operating plant is not typically tonal and therefore, tonal corrections are not applied to these items. Substations are typically tonal at 50Hz; however, this noise source has been designed to a level of approximately 5 dB below the cumulative noise from the chillers and other constantly operating plant so that the tonality will be masked.

Under normal conditions, generators will be tested as per the details in Section 5.2.2. Generators will not operate continuously and therefore there is potential for the on-off conditions for this noise source to be noticeable at the receptors where generator test noise levels significantly exceed the noise levels produced by other constantly operating plant such as the chillers. On this basis, the BS 4142 intermittency correction of +3 dB has been applied to the predicted specific noise levels where the generator test noise levels exceed the specific noise levels in the absence of generator noise by more than 3 dB.

The plant will not be impulsive, as these corrections are applied where there are noticeable impulses in the noise which isn't the case for the proposed plant.

The predicted specific normally operating plant noise levels during the daytime period are presented in Table 12. The table also shows the feature corrections that have been applied in accordance with the BS 4142 guidance, and the resulting rating noise level which is directly comparable to the Planning Condition 12 rating level criteria.

TABLE 12 – PREDICTED SPECIFIC AND RATING NOISE LEVELS FOR NORMALLY OPERATING PLANT DURING THE DAY

Receptor Location	Limiting Rating Noise Level Criteria for Normally Operating Plant dB $L_{Ar,Tr}$ (07:00 – 23:00)	Predicted Specific Plant Noise Level dB $L_{Aeq,1hour}$ (07:00 – 23:00)	Applicable Feature Correction dB (Type)	Predicted Rating Plant Noise Level dB $L_{Ar,Tr}$ (07:00 – 23:00)
R1 (north)	45	44	0	44
R2 (east)	55	50	+3 (intermittency)	53
R3 (south)	52	45	+3 (intermittency)	48
R4 (west)	54	51	+3 (intermittency)	54

The predicted rating noise levels are compliant with the Planning Condition 12 rating noise daytime criteria for normally operating plant.

5.4.2 Normal Operation (Night time 23:00 – 07:00)

The predictions for normally operating plant comprise the following noise sources:

- Chillers on night operating mode
- Substation under normal operation
- Other plant operating normally
- Noise breakout from the data halls

The predicted specific normally operating plant noise levels during the night time period are presented in Table 13.

As detailed in Section 5.4.1, noise from the chillers, substation, and other constantly operating plant will not be tonal or impulsive. Generators will not be tested during the night time period and therefore plant that operates during the night will not be intermittent. No feature corrections are therefore applicable to normally operating plant during the night.

TABLE 13 – PREDICTED SPECIFIC AND RATING NOISE LEVELS FOR NORMALLY OPERATING PLANT DURING THE NIGHT

Receptor Location	Limiting Criteria for Normally Operating Plant dB $L_{Ar,Tr}$ (23:00 – 07:00)	Predicted Specific Plant Noise Level dB $L_{Aeq,1hour}$ (23:00 – 07:00)	Applicable Feature Correction dB (Type)	Predicted Rating Plant Noise Level dB $L_{Ar,Tr}$ (23:00 – 07:00)
R1 (north)	43	43	0	43
R2 (east)	44	43	0	43
R3 (south)	45	42	0	42
R4 (west)	45	45	0	45

The predicted rating noise levels are compliant with the Planning Condition 12 rating noise night time criteria for normally operating plant.

5.4.3 Emergency Operation (Power Outage)

The predictions for the emergency power outage operating condition comprise the following noise sources:

- Chillers at full capacity
- Generators under emergency conditions (all operating at full capacity)
- Substation under normal operation
- Other plant operating normally
- Noise breakout from the data halls

The predicted specific plant noise levels during the power outage condition are presented in Table 14.

There are no noise criteria for noise emissions during emergency operating conditions. To assist in the understanding the noise levels that will occur during the emergency condition, predictions have been made of the worst-case ambient plant noise levels at the receptor facades (façade incident levels), inside the residential receptors if windows are closed, and inside the residential receptors if windows are open. This has been requested by SBC.

Exact predictions of noise break-in to the residential receptors would require detailed knowledge on the receptor's building envelope specifications, and internal room dimensions/finishes. This level of detail is not available, and therefore assumptions are made with regards to the reductions achieved in both scenarios.

Standard double glazing is known to achieve a sound reduction index of approximately 30 - 34 dB R_w. The external walls should achieve a higher sound reduction performance than the windows. As a typical worst-case, a reduction in external noise break-in of 30 dBA has been applied where windows are closed.

A typical reduction of 15 dBA has been applied where the receptor's windows are open. This value is applicable to partially open windows and is taken from a range

stated in the 1999 version of BS 8233. This value was confirmed as suitable by SBC in the pre-applicable meeting.

TABLE 14 – PREDICTED SPECIFIC NOISE LEVELS FOR PLANT OPERATING DURING A POWER OUTAGE

Receptor Location	Predicted Specific Plant Noise Level at the Building Facade dB $L_{Aeq,1hour}$	Prediction Internal Ambient Noise Level at the Receptor with Windows Closed dB $L_{Aeq,1hour}$	Prediction Internal Ambient Noise Level at the Receptor with Windows Open dB $L_{Aeq,1hour}$
R1 (north)	52	22	37
R2 (east)	57	27	42
R3 (south)	51	21	36
R4 (west)	58	28	43

The predictions in Table 14 demonstrate that internal ambient noise levels resulting from data centre operation during a power outage are expected to meet the BS 8233 guideline for levels during the daytime (35 dB $L_{Aeq,T}$) and night time (30 dB $L_{Aeq,T}$) periods when windows are closed.

However, the BS8233 guideline for internal ambient noise levels will be exceeded if residents have their windows open. It should be noted that “reasonable” daytime internal ambient noise levels are predicted with windows open at R1 and R3.

This assessment represents the worst-case scenario and assumes that the emergency operating condition will occur for the entire daytime or night time period which is, in reality, unlikely to happen.

Significant adverse impacts on health or quality of life are not expected as a result of the predicted noise levels during the power outage operating condition. It is considered reasonable for noise levels to exceed the BS 8233 guidelines for brief and rare occurrences, whilst ensuring that residents can achieve internal noise levels which are suitable for sensitive uses (such as sleeping) by closing their windows.

It should also be noted that the internal ambient noise levels within receptors, based on the measured existing external noise levels are predicted to exceed the BS 8233 guideline levels at all receptors with windows open

Table 15 presents the existing ambient noise levels at the receptors, and the predicted internal ambient noise levels resulting from existing noise sources for comparative purposes.

TABLE 15 – EXISTING AMBIENT NOISE LEVELS AT THE NEAREST NOISE SENSITIVE RECEPTORS

Receptor Location	Period	Existing Ambient Noise Level at the Building Facade dB $L_{Aeq,1hour}$	Prediction Internal Ambient Noise Level at the Receptor with Windows Open dB $L_{Aeq,1hour}$
R1 (north)	Daytime (07:00 – 23:00)	53	38
	Night time (23:00 – 07:00)	48	33
R2 (east)	Daytime (07:00 – 23:00)	64	49
	Night time (23:00 – 07:00)	58	43
R3 (south)	Daytime (07:00 – 23:00)	57	42
	Night time (23:00 – 07:00)	50	35
R4 (west)	Daytime (07:00 – 23:00)	55	40
	Night time (23:00 – 07:00)	49	34

As presented above, the internal ambient noise levels at all sensitive receptors are predicted to exceed the BS 8233 guideline levels with windows open, in the absence of noise emitted by the Proposed Development. This is considered to further limit the significance of the noise levels predicted in the unlikely event of a power outage.

5.4.4 Emergency Operation (Transformer Failure)

The predictions for the emergency operating condition, where one transformer has failed, comprise the following noise sources:

- Chillers at full capacity at full capacity during the daytime and low mode during the night time period
- Substation under emergency operation – Emergency coolers On
- Other plant operating normally
- Noise breakout from the data halls

The predicted specific plant noise levels when one transformer has failed are presented in Table 16. The prediction is shown for R4 only as this is the worst-case receptor for this noise source, the noise level at all other receptors will be lower than that presented for R4.

It is understood that generator testing will not be undertaken during the transformer failure operating scenario.

TABLE 16 – PREDICTED SPECIFIC NOISE LEVELS FOR PLANT OPERATING DURING A TRANSFORMER FAILURE

Receptor Location	Predicted Specific Plant Noise Level at the Building Facade dB $L_{Aeq,1hour}$	Prediction Internal Ambient Noise Level at the Receptor with Windows Closed dB $L_{Aeq,1hour}$	Prediction Internal Ambient Noise Level at the Receptor with Windows Open dB $L_{Aeq,1hour}$
R4 (west)	45	15	30

The predictions in Table 16 demonstrate that internal ambient noise levels resulting from data centre operation during a transformer failure are expected to meet the BS 8233 guideline for levels during the daytime (35 dB $L_{Aeq,T}$) and the night time (30 dB $L_{Aeq,T}$) and therefore this is deemed to be acceptable.

6 External Operational Noise

6.1 Assessment Criteria

Normal external operational noise emissions are to be controlled to meet the requirements of Planning Condition 12. Planning Condition 12 states the following:

"Noise levels from normal external operations will not exceed 55 dB $L_{Aeq(1\ hr)}$ during the daytime (07:00 – 23:00); or 45 dB $L_{Aeq(1\ hr)}$ during the night - time (23:00 – 07:00); or 60 dB $L_{Amax(15\ mins)}$ during the night - time (23:00 – 07:00) as determined by measurement or calculation at free field locations representing facades of dwellings at existing noise sensitive receptors."

The primary noise producing external operation will be deliveries which will occur during the daytime only, and therefore the applicable criteria at each receptor is 55 dB $L_{Aeq\ (1\ hr)}$. The car parking is likely to be used at a reduced rate during the night time period, and the applicable criteria at each receptor is 45 dB $L_{Aeq\ (1\ hr)}$ for this period.

6.2 Proposed Operational Noise Sources

The main significant operational noise source will be heavy goods vehicle (HGV) deliveries. Indicative information on the number of deliveries has been provided by the Yondr Operations team in terms of the period after which operations commence; the number of deliveries will decrease over time. The figures below are for each 30MW building.

- 0 – 6 months: 10 HGV deliveries per week
- 6 – 24 months: 5 HGV deliveries per week
- 24+ months: 3 HGV deliveries per week

Noise measurement data for HGV deliveries from previous projects has been used as the basis for the operational noise assessment. The source noise data presented in Table 17 has been used.

TABLE 17: HGV NOISE SOURCES

		Sound Pressure Level (dB) at Octave Band Centre Frequency (Hz)								
Source Type	**Measurement Distance (m)**	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**Total dBA**
HGV manoeuvring in service yard	10m	65	64	64	65	63	65	64	52	70
Unloading HGV docked in bay	25m	54	53	53	54	52	54	53	41	59

In addition to the HGV and unloading noise sources, the car parking spaces to the south of Building A and to the north of Building B are considered as detailed further in the section below.

6.3 External Operational Noise Modelling

To assess the impact of noise from the proposals, the likely noise level from the most significant sources of operational noise associated with the development has been predicted at the nearest noise-sensitive receptors. Predictions have been carried out in the noise-modelling suite Cadna/A, in accordance with the ISO 9613 prediction methodology.

The model considers the effects of ground absorption, atmospheric absorption, and acoustic reflections, as well as applying a light downwind correction to consider a typical worst-case downwind situation. In terms of ground absorption, the intervening ground between the sources and receivers has been modelled as mixed ground (G=0.5), which is considered suitable considering the variation in ground conditions between the development and the receptors. A maximum 3 order of reflection has been considered in the model.

The current assessment has been carried out based on the information and the assumptions presented in Section 6.2. The HGV movement has been assessed as a line source by calibrating this to give the source noise level in Table 17 and assigning a duration of 50 seconds per HGV delivery; this is based on an assumed HGV speed of 10km/h and represents the time taken for the HGV to travel a length of 150m (the approximate length from south to north, or from east to west along the boundary roads).

The unloading of the HGV in the loading bay has been modelled as a point source calibrated to give the source noise level stated in Table 17.

The Cadna/A modelling software enables assessment of car park noise emissions using the RLS-90 calculation methodology; this is a German standard for the prediction of car park emissions and is considered appropriate for use in this instance. The proposed 95 car park spaces have been modelled with a worst-case scenario of one car park movement per space per hour during the daytime period.

The car parking is likely to be used at night, but at a reduced rate. For the purposes of the noise emission prediction, it is assumed that there would be one movement per hour for half of the parking spaces during the night time period; this is considered representative of the worst-case scenario.

Figure 12 presents the location of the noise sources that have been modelled. A maximum of four deliveries per day is considered the worst-case based on the information provided. Therefore, two deliveries in any one-hour daytime period have been modelled on this basis.

The future phase of development will also require development; however, it is assumed that this development will become operational once the deliveries for Building A and Building B have become less frequent. The predictions should therefore be representative of the worst-case cumulative operational noise emissions.

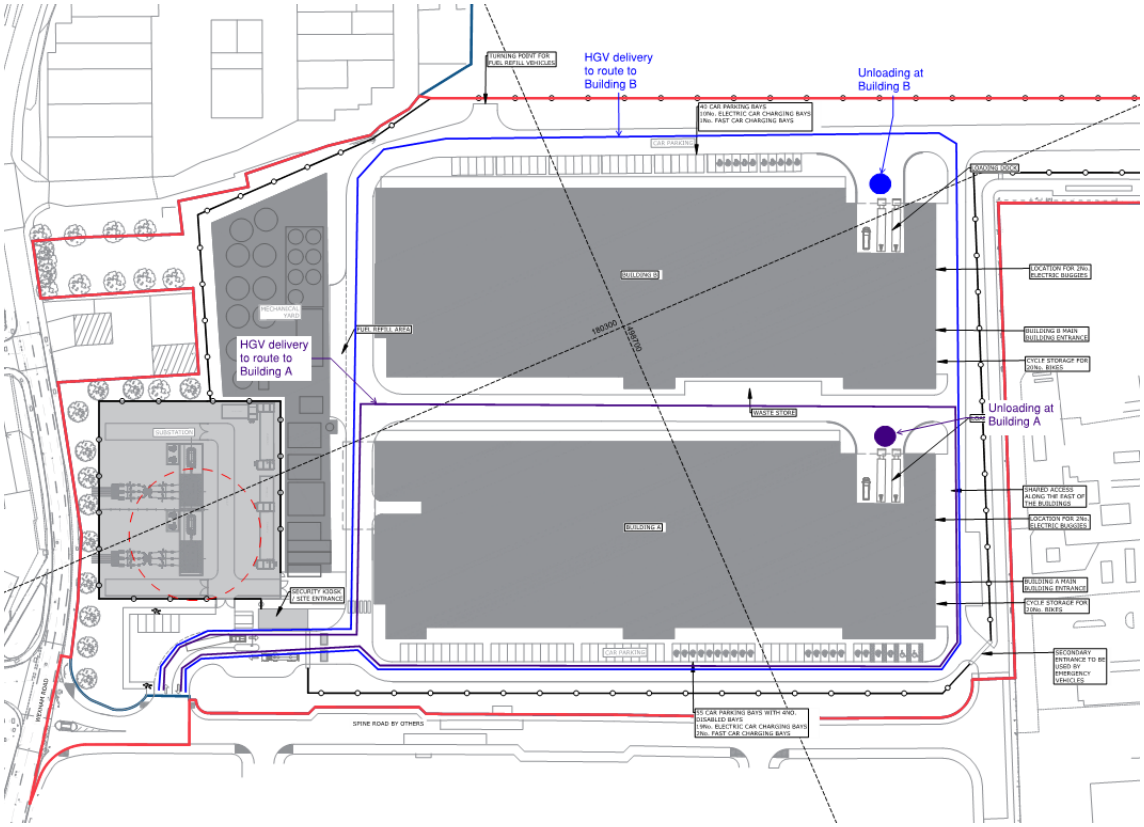

Figure 12: Operational Noise Sources Included in the Noise Model

6.4 Operational Noise Impact Assessment

The noise level predictions for HGV movements and unloading, and car parking as detailed in Section 6.3, are presented in Table 18 for the daytime period.

TABLE 18 – PREDICTED OPERATIONAL NOISE LEVELS FOR HGV MOVEMENTS AND UNLOADING AND CAR PARKING DURING THE DAY

Receptor Location	Limiting Criteria for Daytime Operational Noise dB $L_{Aeq,1hour}$	Predicted Operational Noise Level dB $L_{Aeq,1hour}$ (07:00 – 23:00)
R1 (north)	55	33
R2 (east)	55	34
R3 (south)	55	52
R4 (west)	55	47

The predicted operational noise levels are compliant with the Planning Condition 12 criteria during the day.

The noise level predictions for car parking as detailed in Section 6.3, are presented in Table 19 for the daytime period.

TABLE 19 – PREDICTED OPERATIONAL NOISE LEVELS FOR CAR PARKING DURING THE NIGHT

Receptor Location	Limiting Criteria for Night time Operational Noise dB $L_{Aeq,1hour}$	Predicted Operational Noise Level dB $L_{Aeq,1hour}$ (23:00 – 07:00)
R1 (north)	45	18
R2 (east)	45	18
R3 (south)	45	43
R4 (west)	45	17

The predicted operational noise levels are compliant with the Planning Condition 12 criteria during the night.

7 Construction Noise and Vibration

7.1 Construction Noise Limiting Criteria

According to the ABC method for assessing the significant effects from construction noise, in BS 5228:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise, it states that "a potential significant effect is indicated if the L_{Aeq} noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level."

Based on the measured ambient noise levels as summarised in Figure 9, the ambient noise levels at the nearest noise sensitive receptors vary based on the receptor location. Table 20 presents the existing daytime ambient noise level and the resulting construction noise limit assigned to avoid significant noise effects. A significant effect is only expected where the noise limit is exceeded for a period of 10 or more days of working in any 15 consecutive days or for a total number of days exceeding 40 in any six consecutive months.

It is currently assumed that all construction works will be undertaken during the daytime periods only (including Saturday mornings). Any works required to be undertaken during other periods would be agreed beforehand with SBC.

Where site noise levels are expected to exceed 65 dBA, BS5228 states that the level at which noise insulation, or the reasonable costs thereof, will be offered to occupiers of the nearest receptors; this is 75 dBA $L_{eq,10\ hours}$. This level is also set out as the basic construction noise limit in urban areas near main roads in the 1976 version of Advisory Leaflet 72. The standard states that noise insulation should be provided where 75 dBA $L_{eq,10\ hours}$ is exceeded for a period of 10 or more days of working in any 15 consecutive days or for a total number of days exceeding 40 in any six consecutive months.

TABLE 20 – PROPOSED NOISE LIMITS DURING CONSTRUCTION AND THE NEAREST NOISE SENSITIVE RECEPTORS

Receptor Location	Period	Measured Ambient Noise Level	BS5228 Construction Noise Limit for Significant Effect dB $L_{Aeq,T}$	BS5228 Construction Noise Limit at which Noise Insulation Measures should be Provided dB $L_{Aeq,T}$
R1 (north)	Daytime (08:00 – 18:00)	53	65	75
R2 (east)	Daytime (08:00 – 18:00)	64	70	75
R3 (south)	Daytime (08:00 – 18:00)	57	65	75
R4 (west)	Daytime (08:00 – 18:00)	55	65	75

These limiting criteria shall be controlled by the Construction Environmental Management Plan (CEMP) which will detail the type of construction plant that will be used, the periods of use, and the predicted construction noise levels at the nearest noise sensitive receptors.

The following section presents typical mitigation measures that should be employed by the Contractor where possible.

7.2 Typical Construction Noise Mitigation Measures

The following typical mitigation measures are recommendations from BS5228 and should be employed on this site where possible.

- Avoid unnecessary revving of engines and switch off equipment when not required.
- Keep internal haul routes well maintained and avoid steep gradients.
- Use rubber linings in, for example, chutes and dumpers to reduce impact noise.
- Minimize drop height of materials.
- Start plant and vehicles sequentially rather than all together.
- All plant specifications should be reviewed to ensure they are the quietest available for the required purpose; this is in accordance with best practicable means.
- All plant should be used in accordance with manufacturers' instructions.
- Plant should be located away from noise-sensitive areas where possible; loading and unloading should not be carried out next to the sensitive receptors. The concrete pump and drum should be located at least 25m from the nearest sensitive receptors wherever possible.
- Cranes, and other plant use intermittently, should be shut down or throttled down to a minimum between work periods.
- Acoustic covers to engines must be kept closed when the plant is in use or idling; compressors should have effective enclosures and should not be operated with access panels open.
- Materials should be lowered whenever practicable and should not be dropped. The surfaces on to which the materials are being moved should be covered by resilient material.
- When a site is in a residential environment, lorries should not arrive at or depart from the site at a time inconvenient to residents.
- Regular and effective maintenance by trained personnel is essential and will do much to reduce noise from plant and machinery. Increases in plant noise are often indicative of future mechanical failure.
- Noise caused by vibrating machinery having rotating parts can be reduced by attention to proper balancing. Frictional noise from the cutting action of tools and saws can be reduced if the tools are kept sharp. Noises caused by friction in conveyor rollers, trolleys and other machines can be reduced by proper lubrication.
- Solid site hoarding should be used where necessary and possible to reduce line-of-sight between the construction plant and the residential receptors.

The above forms general guidance which may inform the CEMP. The CEMP will detail any mitigation measures which must be employed to ensure temporary significant adverse noise effects are avoided.

7.3 Construction Vibration Limiting Criteria

Construction vibration emissions are to be controlled as part of the CEMP, in accordance with the BS 5228 guidelines. The limiting criteria are the same for each of the sensitive receptors and are presented in Table 21.

TABLE 21: PROPOSED VIBRATION LIMITIS DURING CONSTRUCTION AT THE NEAREST SENSITIVE RECEPTORS

Vibration Level	Action
1.0 mm/s	Where vibration is likely to exceed the level, residents should be given prior warning regarding the types of works being undertaken, and the durations that the works are likely to occur for.
10.0 mm/s	Construction vibration emissions should not exceed this value at the nearest sensitive receptors where possible.

Predictions shall be undertaken and presented as part of the CEMP which show the likely vibration levels at the nearest sensitive receptors during the works. Where the predicted levels exceed those stated in Table 21, mitigation measures shall be employed as recommended in the following section.

7.4 Typical Construction Vibration Mitigation Measures

There are two primary mitigation strategies for construction vibration: prior warning, and plant selection.

BS5228 suggests the following with respect to community relations:

"Good relations with people living and working in the vicinity of site operations are of paramount importance. Early establishment and maintenance of these relations throughout the carrying out of site operations will go some way towards allaying people's fears.

It is suggested that good relations can be developed by keeping people informed of progress and by treating complaints fairly and expeditiously. The person, company or organization carrying out work on site should appoint a responsible person to liaise with the public. The formation of liaison committees with members of the public can be considered for longer term projects when relatively large numbers of people are involved."

With vibration, the fear of building damage can be exacerbated where people are unsure of the levels of vibration it would take to impact upon their property, and therefore good communication can help to alleviate fears beforehand.

Where the predicted vibration levels are expected to exceed 1.0 mm/s PPV, residents shall be given prior warning as detailed above.

If vibration levels are predicted to exceed 10 mm/s PPV then the type of plant being used should be reviewed to determine whether an alternative strategy with lower vibration emissions would be feasible.

8 Conclusion

Sweco UK has been commissioned by Yondr Group to undertake a noise impact assessment of the proposed 60MW Data Centre facility off Wexham Road, Slough, to accompany a reserved matters planning application for the Proposed Development.

Noise predictions have been carried out in the noise-modelling suite Cadna/A, in accordance with the ISO 9613 prediction methodology. The predicted noise levels at the nearest noise-sensitive receptors have then been assessed against the limiting criteria presented in Planning Condition 12 of the outline planning consent (P/00072/096). The following scenarios have been assessed:

- Normal Operation – Daytime
- Normal Operation – Night time
- Emergency Operation – Power Failure
- Emergency Operation – Transformer Failure

Additionally, operational noise levels have been predicted for HGV deliveries and car parking. The prediction noise levels are assessed against the operational noise requirements of Planning Condition 12.

The outcomes of the assessment identify that the proposed development has been designed be acceptable from a noise perspective, providing that plant is constructed and operated in accordance with the proposed plant noise control strategies, which are detailed in Section 5.2 on this report. Sweco are employed to provide acoustic design services through to completion of the project to ensure that the design remains compliant throughout the build process.

This assessment demonstrates the following with regards to the specific Planning Condition 12 requirements:

- The overall sound rating level of normal operating plant is not expected to exceed 2dB(A) above background noise levels
- Noise levels from normal external operations are not expected to exceed 55dB $L_{Aeq\ (1hr)}$ during daytime or 45 dB $L_{Aeq\ (1hr)}$ during the night time or 60dB $L_{Amax\ (15mins)}$ during the night time
- Cumulative noise from the operational use of the commercial development is not expected to exceed 2dB(A) above background noise levels at sensitive receptors. Noise levels from external operational use of the commercial development is not expected to exceed 55dB $L_{Aeq\ (1hr)}$ during the daytime or 45dB $L_{Aeq\ (1hr)}$ during night time or 60dB $L_{Amax\ (15mins)}$ during the night time.

Appendix A – Glossary of Acoustic Terminology

Sound is the vibration of particles in a medium, such as air, which may be detected by the human ear. This sound is defined as noise when it is audible and unwanted or undesirable to a listener.

The vibration, or oscillation, of particles about an equilibrium position results in local pressure fluctuations from the normal pressure. These local pressure fluctuations are described as sound pressure, and the number of oscillations per second is described as the frequency.

The human ear responds to an incredibly large range of sound pressure, from 0.00002 Pa to 200 Pa, and the perceived loudness is proportional to the logarithm of the sound pressure squared. For this reason, sound is measured in terms of a logarithmic parameter, the sound pressure level, to approximate the response of the ear. Sound pressure levels are quantified in decibels (dB) relative to the threshold of hearing.

The human ear responds to a wide range of sound frequencies, from the lowest perceptible bass note, around 20 Hz, to the highest perceptible treble note, around 20,000 Hz. The ear does not respond equally to each frequency - the ear is most sensitive to sound within the mid-frequency range of around 600 to 8000 Hz.

The response of the ear to each frequency also varies with the sound pressure level. For very loud sounds the difference in perceived loudness between each frequency is less pronounced than for low level sound.

Acousticians measure sound pressure levels using sound level meters, which incorporate a microphone.

A sound level meter approximates the response of the human ear to sound by using frequency filters. For typical environment sounds, the A-weighting filter is used to approximate the response of the ear at typical sound pressure levels. The sound pressure level, adjusted to approximate the response of the ear, is then quantified in A-weighted decibels, dB(A).

In a typical environment, the A-weighted sound pressure level will vary with time. For this reason, acousticians use statistical measurement parameters to describe the sound environment. The most common measurement parameters are as follows:

- dB $L_{Aeq,T}$: Equivalent continuous A-weighted sound pressure level - This is the energy-average sound pressure level during a measurement period, T.
- dB $L_{AFmax,T}$: Maximum A-weighted sound pressure level - This is the maximum sound pressure level during a measurement period, T, and measured in a way that approximates the time-response of the ear.
- dB $L_{A90,T}$: 90th percentile A-weighted sound pressure level - This is the sound pressure level exceeded for 90% of the measurement period, T, commonly used to quantify the background sound level.

The sound pressure level in typical environments are presented in Table A1.

Further definitions of acoustic parameters are presented in Table A2.

TABLE A1 – TYPICAL SOUND LEVELS FOUND IN THE ENVIRONMENT

Sound Level	Location
0dB(A)	Threshold of hearing
20 to 30dB(A)	Quiet bedroom at night
30 to 40dB(A)	Living room during the day
40 to 50dB(A)	Typical office
50 to 60dB(A)	Inside a car
60 to 70dB(A)	Typical high street
70 to 90dB(A)	Inside factory
100 to 110dB(A)	Burglar alarm at 1m away
110 to 130dB(A)	Jet aircraft on take off
140dB(A)	Threshold of Pain

TABLE A2 – GLOASSARY OF ACOUSTIC TERMS

Terminology/Parameter	Definition
Ambient sound level	The total sound pressure level in a given position from all surrounding sources of noise, both near and far. Normally expressed as an equivalent continuous A-weighted sound pressure level, dB $L_{Aeq,T}$.
A-weighting	The process of weighting the observed sound pressure level at each frequency band, to approximate the sensitivity of the human ear to sounds of different frequencies. A-weighted sound pressure levels are expressed as dB(A) or dB L_{Ap}.
C_{tr}	Spectrum adaptation term No. 2 as defined in BS EN ISO 717-1. This term is a correction that applies to the weighted standardised level difference to account for how well a partition insulates against sound which has mainly low and medium frequency content (e.g. road traffic noise, amplified disco music).
Decibel	A logarithmic value quantifying the sound pressure at a specified position or sound power relative to a reference sound pressure or sound power (20 μPa for sound pressure, 10-12 W for sound power).
D	Sound level difference. The difference in energy-average sound pressure levels between a “source” room containing a loudspeaker and an adjacent “receiving” room. D = L(source) – L(receiving).
$D_{ne,w}$	Weighted element normalised sound level difference. The single-figure rating of the difference in sound level between rooms when sound is transmitted only through a small technical element only, such as a vent or grille, and normalised to a reference absorption area A0 of 10 m2. Measured in a laboratory in accordance with BS EN ISO 10140, with single figure rating determined in accordance with BS EN ISO 717-1.
$D_{nF,w}$	Weighted normalised flanking sound level difference. A single-figure rating of the difference in sound level between rooms when sound is transmitted only via a specified flanking path, such a via a flanking curtain wall system. Measured in a laboratory in accordance with BS EN ISO 10848, with single figure rating determined in accordance with BS EN ISO 717-1.
$D_{nT,w}$	Weighted standardised sound level difference. A single-figure rating of the sound insulation between adjacent rooms or spaces in real-world conditions in completed buildings. The rating is determined over a range of frequencies and normalised to a reference reverberation time of 0.5 seconds for dwellings. Measured in-situ in accordance with BS EN ISO 140-4, with single figure rating determined in

	accordance with BS EN ISO 717-1. The measurement includes the effects of sound transmission via flanking routes and weak points at junctions, interfaces, and penetrations.
Façade	A sound monitoring position is a “façade” position when it includes a strong reflection from an adjacent building or structure. This corresponds with a position that is between 1 and 2 metres away from a reflecting building or structure.
Flanking sound transmission	The transmission of sound between two spaces via an indirect path rather than via the separating element. Example would be sound transmission via a flanking corridor, or sound transmission via a flanking curtain wall.
Free-field	A sound monitoring position is a “free-field” position when it is not affected by sound reflections from surrounding buildings and structures. This corresponds with a position at least 3.5 metres away from reflecting buildings or structures.
Frequency	The number of oscillations per second of a vibrating particle in a medium, measured in Hertz (Hz) or cycles per second.
Impact sound	Sound due to impacts on a floor, such as due to footfall, as observed in the room below the floor.
$L_{n,w}$	Weighted normalised impact sound pressure level. A single-figure rating of the impact sound level in a lower room due to a standard impact sound source in laboratory conditions. The rating is determined over a range of frequencies and normalised to a reference absorption area of 10 m2. A single-figure rating of the impact sound insulation provided by the floor construction in idealised conditions over a range of frequencies. Measured in a laboratory in accordance with BS EN ISO 140-6 (or BS EN ISO 10140-3), with single figure rating determined in accordance with BS EN ISO 717-2.
$L'_{nT,w}$	Weighted standardised impact sound pressure level. A single-figure rating of the impact sound level in a lower room due to a standard impact sound source in real-world conditions in completed buildings. The rating is determined over a range of frequencies and normalised to a reference reverberation time of 0.5 seconds for dwellings. Measured in-situ in accordance with BS EN ISO 140-7, with single figure rating determined in accordance with BS EN ISO 717-2. The measurement includes the effects of impact sound transmission via flanking routes and weak points at junctions, interfaces, and penetrations.
$L_{A90,T}$	The A-weighted sound pressure level exceeded during 90% of the time interval, T. Typically used to quantify the background sound level at a specified position.
$L_{Aeq,T}$	The equivalent continuous A-weighted sound pressure level over a time interval, T. This is an energy-average sound pressure level over the specified time period.
$L_{AFmax,T}$	The maximum A-weight sound pressure level during a specified time interval, T. Measured with “fast” time-weighting (which approximates the time-response of the human ear).
Noise	Unwanted or undesirable sounds observed by a listener.
Octave band	A frequency band used in acoustical measurements. An octave is a frequency interval between two sounds where the frequency of the lower sound is half the frequency of the upper sound. The human hearing range is divided into ten logarithmically equal frequency divisions called octave bands, with centre-band frequencies as follows: (16 Hz, 32 Hz,) 63 Hz, 125 Hz, 250 Hz, 500 Hz, 1000 Hz, 2000 Hz, 4000 Hz, 16000 Hz.
Rating level, $L_{Ar,Tr}$	The specific sound level plus a correction accounting for acoustic features such as impulses, tones, intermittent features, or any other characteristics that draw more attention to the sound source.
Residual sound level	The equivalent continuous A-weighted sound pressure level of the ambient sound remaining at a specified position when the specific sound source (the sound source being assessed) does not contribute to the ambient sound.
Reverberation	The reflection of sound from room surfaces, resulting in the prolongation or persistence of a sound in a room.
Reverberation time	Time, in seconds, required for the sound pressure level in a room to decrease by 60 dB after a sound source has stopped. Long reverberation times are present in large empty rooms with hard surfaces (e.g.

	a cathedral); short reverberation times are present in smaller rooms with soft furnishing (e.g. typical living room, a recording studio).
R_w	The weighted sound reduction index of an architectural element. A single-figure rating of the sound insulation provided by the architectural element in idealised conditions over a range of frequencies. Measured in a laboratory in accordance with BS EN ISO 140-3 (or BS EN ISO 10140-2), with single figure rating determined in accordance with BS EN ISO 717-1.
Sound	The vibration, or oscillation, of particles in a medium, such as air, which may be detected by the human ear.
Sound absorption	The reduction of sound energy by transmission through an absorbing medium such an “acoustically soft” material or surface which results in a reduced reflection of incident sound.
Sound absorption class.	A classification system describing the ability of a specified material or surface to absorb sound. Typically measured in a laboratory in accordance with BS EN ISO 354, with class determined in accordance with BS EN ISO 11654.
Sound absorption coefficient, α	A fractional measure of the ability of a material or surface to absorb incident sound. Expressed as a value between 1.0 (total absorption of incident sound, no reflection) and 0.0 (no absorption, 100% reflection).
Sound insulation	The ability of architectural elements or structures to reduce the transmission of sound, predominantly due to the reflection of sound incident on the element or structure. Typically measured as the difference in sound pressure levels between a “source” room containing a loudspeaker and an adjacent “receiving” room.
Sound power level	A logarithmic measurement that quantifies the total sound power of a source emitted in all directions relative to a reference sound power (Wref = 1 pW or 10-12 W). Equal to 10 log10 (W / Wref) and expressed in decibels.
Sound pressure level	A logarithmic measurement that quantifies the sound pressure at a specified position relative to a reference sound pressure (pref = 20 µPa). Equal to 20 log10 (p / pref) and expressed in decibels.
Specific sound level	The equivalent continuous A-weighted sound pressure level at a specified position due to the specific sound source (the sound source being assessed).
Speech transmission index (STI)	The STI is a measurement of the intelligibility of speech content from a sound system or within a speech environment at a defined position and with defined background noise conditions and is a value ranging from 0 to 1. In practice this value varies from around 0.3 (poor intelligibility) to around 0.8 (excellent intelligibility).
STIPA	The STIPA (speech transmission index for public address systems) test method within BS EN 60268-16 is used to assess the speech transmission index within a speech environment. These involves broadcasting a modulated test sound within a space under defined background sound conditions to determine the STI value at defined positions within the space
Third-octave band	A higher-resolution frequency band used in sound measurements. One of three logarithmically equal parts of the corresponding octave frequency band. The upper band edge frequency is equal to the lower band-edge frequency multiplied by 21/3.