

ENVIRONMENTAL PERMIT APPLICATION

AMAZON DATA SERVICES UK LIMITED, LON2
DATA CENTRE, SLOUGH

Environmental Risk Assessment

Prepared for: **Amazon Data Services UK Limited**

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SLR 

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1.0 Introduction

SLR Consulting Limited (SLR) has been instructed by i3 Solutions Group Limited to prepare an Environmental Risk Assessment (ERA) in support of an application for a new bespoke Environmental Permit (EP) for a data centre located at 110 Buckingham Avenue, Trading Estate, Slough, Berkshire, SL1 4PF. The data centre will be owned by Iron Mountain (UK) Data Centre Limited and leased to Amazon Data Services UK Limited (the Operator).

This ERA has been undertaken in accordance with the Environment Agency (EA) guidance Risk Assessments for your Environmental Permit¹ (2021). The aim of the ERA is to identify any potential significant risks to the environment and human health and demonstrate that the risk of pollution or harm will be acceptable by taking the appropriate measures to manage these risks.

2.0 Risk Assessment Approach

This ERA is an assessment of the risks to the environment and to human health that may be associated with the proposed operations at the data centre.

The assessment has been completed in accordance with the EA Technical Guidance '*Risk Assessments for your Environment Permit*' dated March 2021. The aim of the assessment is to identify any significant risks and demonstrate that the risk of pollution or harm will be acceptable by taking the appropriate measures to manage these risks.

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 3.0 of this document is a screening step to identify the risks requiring consideration as part of this assessment.

Section 4.0 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 cultural and ecological importance; and

¹ <https://www.gov.uk/guidance/risk-assessments-for-your-environmental-permit>

- A radius of 500m has been adopted for all other potentially sensitive receptors (for example residential, commercial, industrial, agricultural and surface water receptors).

Section 5.0 of this document presents the ERA and demonstrates that any risks of pollution or harm will be mitigated to manage the risk.

2.1 Climate Change Risk Assessment

An adapting to climate change risk assessment is also required for a new bespoke waste and Installation EP applications if the activity is expected to operate for more than 5 years. As the data centre is expected to operate for more than 5 years a climate change risk assessment has been completed, the results of which are presented in Section 6.0.

3.0 Identifying the Risks

Step 2 of the ERA is a screening step to identify the potential risks to the environment from the Installation. 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;
- Fugitive emissions; and
- Global warming potential.

4.0 The Site

The data centre site, located at 110 Buckingham Avenue, Slough Trading Estate, Slough, Berkshire, SL1 4PF, is centred at National Grid Reference (NGR) SU 95745 81088. The site is located within Slough Trading Estate and the immediate surrounding area is predominately industrial and commercial in all directions. A summary of the immediate environmental site setting is provided in Table 4-1 Surrounding Land Uses.

The site location, local receptors and environmental site setting are shown on drawings 001, 003, and 004 as submitted with the EP application.

Table 4-1
Surrounding Land Uses

Boundary	Description
North	Commercial/industrial premises with residential properties beyond
East	Commercial/industrial premises with residential properties beyond
South	Commercial/industrial premises
West	Commercial/industrial premises

The immediate surrounding land use is described in further detail below.

4.1.1 Industrial and Commercial

The site is located within Slough Trading Estate and is surrounded by commercial/industrial premises in all directions.

4.1.2 Local Transport Network

Adjacent to the north of the site is Buckingham Avenue and adjacent to the south is Malton Avenue. A railway line is located approximately 128m to the south of the site.

4.1.3 Open Land

There are two small pockets of open ground adjacent to residential properties located approximately 400m to the east of the site.

4.1.4 Residential

To the north and east of the site are residential properties. They are located approximately 370m to the north and 400m to the east.

4.2 Geology, Hydrogeology and Hydrology

4.2.1 Geology

British Geological Survey (BGS) data indicates that the site is underlain by a bedrock of Lambeth Group clay, silt and sand formed in the Palaeogene period approximately 48-59 million years ago in an area previously dominated by swamps, estuaries sand deltas.

The BGS also records superficial deposits overlying the bedrock comprising Langley Silt Member, clay and silt formed in the Quaternary period up to 2 million years ago in an area previously dominated by wind blown deposits.

4.2.2 Hydrogeology

A search on the Multi-Agency Geographical Information for the Countryside (MAGIC) map revealed that the bedrock (Lambeth Group) beneath the site is classified as Secondary A Aquifer, defined as 'permeable layers capable of supporting water supplies at a local rather than a strategic scale'².

The superficial deposits are classified as Unproductive Strata which is defined as having low permeability and negligible significance for water supply or river base flow.

The site is located within Source Protection Zone (SPZ) 3. Source protection zones show '*the risk of contamination from any activities that might cause pollution in the area. The closer the activity the greater the risk.*' SPZ 3 is a total catchment area, defined as '*the area around a supply source within which all the groundwater ends up at the abstraction point. This is the point from where the water is taken. This could extend some distance from the source point.*'³

4.2.3 Hydrology

The MAGIC map revealed that there are no surface water features within 500m of the site's EP boundary.

The Flood Map for Planning⁴ 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.

4.3 Ecology and Cultural Heritage

4.3.1 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; these are identified on drawing 004 and the EA Nature and Heritage Conservation Screening Report included in Appendix 01.

European/International Sites

- Ramsar Sites and Special Protection Areas (SPA):

Three areas of southwest and west London waterbodies are designated as a Ramsar and SPA with the closest located approximately 1.7km to the southeast of the site as identified on drawing 004.

- Special Areas of Conservation (SAC):

² <http://apps.environment-agency.gov.uk/wiyby/117020.aspx>.

³ [Environment Agency - Groundwater source protection zones \(environment-agency.gov.uk\)](http://environment-agency.gov.uk/groundwater-source-protection-zones)

⁴ <https://flood-map-for-planning.service.gov.uk/>

There are numerous SAC's within a 10km radius from the site, all are illustrated on drawing 004. The closest SAC is Burnham Beeches located approximately 3.2km to the north of the site.

National Ecological Sites

- Sites of Special Scientific Interest (SSSI):

There are numerous SSSI's within a 10km radius from the site, all are illustrated on drawing 004. The closest SSSI is Burnham Beeches located approximately 3.2km to the north of the site.

- Local Nature Reserve (LNR) within 2km:

Haymill Valley LNR is located approximately 1.4km to the northwest of the site and Cocksherd Wood is located 1.9km to the northwest of the site.

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, included as Appendix 01, does not provide information on priority species that may be present within the screening distance; this information has been sourced from MAGIC. A review of MAGIC map confirms that the site is located within an area where Lapwing are identified as a priority species.

4.3.2 Cultural Heritage

Searches on MAGIC map identified numerous Listed Buildings within 2km of the site, all are illustrated on drawing 004 and the closest listed buildings are detailed below:

- The closest Grade II listed building is Railway Bridge located approximately 138m to the south of the site; and
- The closest Grade I listed building is a former service block adjoining Baylis House which is located approximately 1.2km to the east of the site.

Searches on MAGIC map identified the following Scheduled Monuments within 2km of the site boundary:

- Montem Mound: a motte at Salt Hill located approximately 1.3km to the southeast of the site;
- Moated site at Cippenham Court located approximately 1.3km to the south of the site; and
- Bowl Barrow in Stoke Park playing field located approximately 1.6km to the northeast of the site.

Searches on MAGIC map confirmed that none of the following are present within a 2km radius of the site:

- Registered Parks and Gardens;
- Registered Battlefields; and

- World Heritage Sites.

4.4 Receptors

Table

4-2

Identified Receptors details receptors that could potentially be affected by operations at the data centre.

**Table 4-2
 Identified Receptors**

Receptor Name	Receptor Type	Direction	Approximate Distance at Closest Point (m)
Local Receptors within 500m, as illustrated on Drawing 003 Environmental Site Setting			
Slough Trading Estate	Commercial/industrial premises	All directions	Adjacent
Buckingham Avenue	Local road network	North	Adjacent
Malton Avenue	Local road network	South	Adjacent
Railway line	Local transport network	South	128
Residential properties	Residential	North	370
Open land	Open land	East	400
Residential properties	Residential	East	400
Ecological and Cultural Heritage Receptors are shown on Drawings 004 Environmental Site Setting			
Railway Bridge	Grade II Listed building	South	138
Baylis House	Grade I Listed Building	East	1200
Motem Mound (a motte at Salt Hill)	Ancient scheduled monument	Southeast	1300
Moated site at Cippenham Court	Ancient scheduled monument	South	1300
Haymill Valley	LNR	Northwest	1400
Bowl Borrow in Stoke Park	Ancient schedule monument	Northeast	1600
3 x southwest London waterbodies	Ramsar and SPA	Southeast	1700
Cocksherd Wood	LNR	Northwest	1900
Burnham Beeches	SSSI and SAC	North	3200

4.4.1 Wind Rose

A windrose for Heathrow observing station for the 3-year period (2016 to 2018), providing the frequency of wind speed and direction, is presented in Figure 4-1 Windrose (Heathrow Airport 2016-2018). The windrose shows winds from the south-west are most frequent with winds from the north and south-east least frequent.

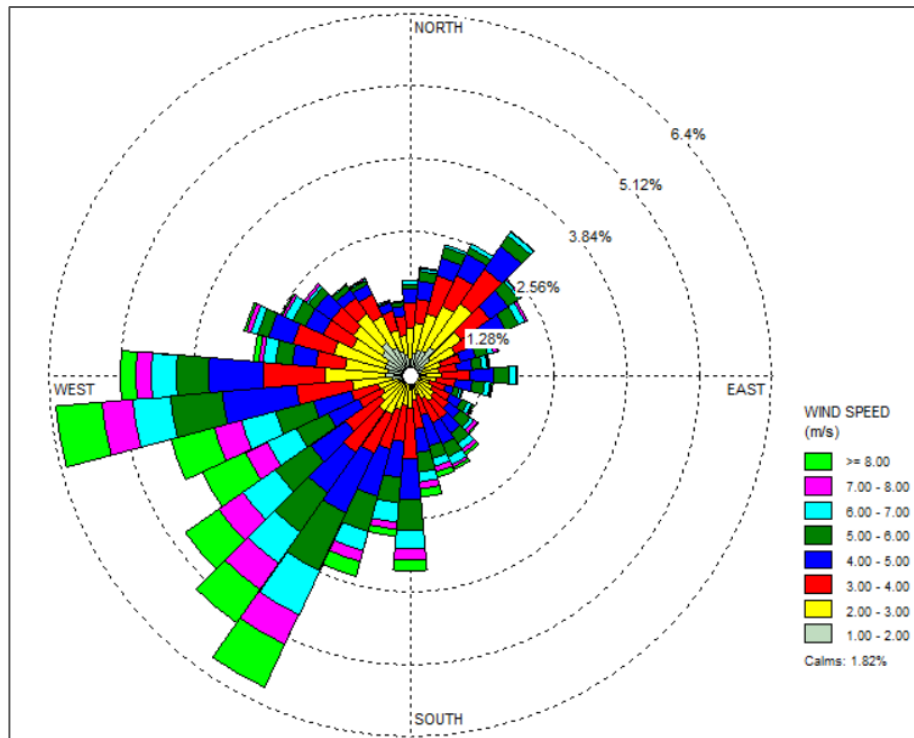


Figure 4-1
Windrose (Heathrow Airport 2016-2018)

5.0 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.

The probability of exposure is the likelihood of the receptors being exposed to the hazard, and is defined as low, medium or high. These terms are qualified as follows:

- Low: exposure is unlikely, barriers in place to mitigate against exposure;

- Medium: exposure is fairly probable, barriers to exposure less controllable; and
- High: exposure is probable, direct exposure likely with few barriers.

The methodology outline in Section 1.0 of this report is the basis on which it is determined whether the proposed operations will lead to significant impacts on the surrounding environment. Where a conclusion of 'not significant' has been reached, it is proposed that the mitigation and management measures that will be in place at the Installation will be sufficient to ensure that there will be no impact at the surrounding environment.

Table 5-1 - Air Risk Assessment and Management Plan

What do you do that can harm and what could be harmed?			Managing the Risk	Assessing the Risk		
Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
Emissions from generator stacks: <ul style="list-style-type: none"> - planned maintenance and testing - emergency outage 	All receptors identified in drawings 003 and 004	Air	<p>A detailed risk assessment of the impact on air quality of emissions of combustion products from the data centre is presented in Section 6 of this EP application (410.11808.00001 AERA). 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.</p> <p>In the highly unlikely event of a 72 hour 'electrical grid outage' there is potential for impacts on human and ecological receptors. 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 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.</p> <p>Planned preventative maintenance (PPM) will be in place for the maintenance and testing of the generators;</p>	Low due to management measures and limited operational hours	Pollution, Harm to environment and human health	Low

			<p>maintenance will be conducted in accordance with the manufacturer requirements.</p> <p>The Site Manager will be responsible for implementing risk management measures in conjunction with the operating techniques document (Ref: 410.11808.00001/BATOT).</p>			
Visible emissions from the diesel fired generator stacks, typically on start-up of the generators.	Human, ecological and cultural heritage receptors identified in drawings 003 and 004	Air	<p>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.</p> <p>The operator will implement visual checks for visible emissions from the generators during start up.</p>	Low due to maintenance measures and limited operational hours	Pollution, Harm to environment and human health	Low

Table 5-2 - Noise Risk Assessment and Management Plan

What do you do that can harm and what could be harmed?			Managing the Risk	Assessing the Risk		
Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor?	What measures will you take to reduce the risk? Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
Noise from vehicular movements (fuel deliveries)	Industrial, commercial, residential and ecological receptors identified in	Air (propagation)	The site will be operational on a 24 hour a day, seven days a week basis. On-site vehicles will be required to adhere to a considerate speed limit.	Low	Nuisance	Low

	drawings 003 and 004		<p>Fuel oil deliveries will only be carried out during daytime hours except in the case of emergency outage situations where more frequent deliveries may be required.</p> <p>Due to the distance of residential receptors and the intervening industrial/commercial activities, it is not expected that noise from vehicles will impact the local residents in a detrimental way.</p> <p>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.</p> <p>Site access and operational areas will be maintained and repaired to minimise emissions of noise due to uneven and poor surfacing.</p> <p>The Site Manager will be responsible for implementing risk management measures in conjunction with the operating techniques document (Ref: 410.11808.00001/BATOT).</p>			
Noise from operation of the generators	Industrial, commercial, residential and ecological receptors identified in drawings 003 and 004	Air (propagation)	<p>A Noise Assessment has been undertaken for the data centre (prepared by KP Acoustics Limited (report reference <i>Iron Mountain Data Centre 110 Buckingham Avenue, Slough, Planning Compliance Report, Report 22166.BS4142.01 Revision A 06/07/2021</i>, presented in Appendix 06 of the BATOT report submitted with this permit application). The assessment concluded that with the installation of a louvered acoustic enclosure around the generators to minimise noise egress, operation of the generators is unlikely to cause an adverse impact on the nearby noise-sensitive receptors.</p> <p>The generators will be housed within bespoke container units fitted with noise attenuation.</p>	Low due to mitigation measures in place	Nuisance	Low

			<p>All equipment will be maintained and operated in accordance with the manufacturer's guidance and maintained in good working order.</p> <p>The planned maintenance and testing of the generators is not predicted to result in excessive levels of noise that could adversely impact identified sensitive receptors.</p> <p>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 will be implemented where appropriate.</p> <p>The Site Manager will be responsible for implementing risk management measures in conjunction with the operating techniques document (Ref: 410.11808.00001/BATOT).</p>			
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Table 5-3 - Fugitive Emissions Risk Assessment and Management Plan

What do you do that can harm and what could be harmed?			Managing the Risk	Assessing the Risk		
Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor ?	What measures will you take to reduce the risk? Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
To Air						

<p>Emissions during the transfer of substances in and out of storage (filling and emptying). Emissions during tank breathing</p>	<p>Industrial, commercial, and residential receptors identified in drawings 003 and 004</p>	<p>Air</p>	<p>Best practices 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.</p> <p>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.</p> <p>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.</p> <p>Spill kits will be available for use in the event of an unplanned fuel release during delivery.</p> <p>A spill procedure will be developed for the site as part of the Environmental Management System.</p> <p>Areas where fuel is to be stored will be subject to daily visual inspections as part of daily operational activities.</p> <p>The Site Manager will be responsible for implementing risk management measures in conjunction with the operating techniques document (Ref: 410.11808.00001 BATOT).</p>	<p>Low</p>	<p>Pollution, Harm to Environment and Human Health</p>	<p>Low</p>
<p>To Water</p>						
<p>Runoff from potentially contaminated areas (i.e. external areas where the generators and associated diesel</p>	<p>Land, groundwater See drawings 003 and 004</p>	<p>Overland percolation through</p>	<p>Generators and associated diesel belly tanks will be housed external to the data centre building; this area will benefit from concrete surfacing.</p> <p>The generators and belly tanks have the benefit of being containerised.</p>	<p>Low</p>	<p>Pollution, Harm to Environment</p>	<p>Low</p>

<p>belly tanks are located).</p>		<p>the ground</p>	<p>Each generator will be located within a dedicated propriety steel contained unit. Beneath the floor of the container units for each SBG will be a belly tank, which is integral to the SBG container unit, which will automatically supply diesel to the SBG. 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%).</p> <p>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.</p> <p>Diesel will be delivered from the fuel tanker to the generator belly tanks via a fuel receiver station. The receiver station will include four fill points (2 being duty standby) and two above ground diesel receiver tanks, each with a 1.2m³ capacity. These tanks may on occasion be used for the storage of fuel to ensure the availability of a fuel supply to the SBGs on the upper gantry tier. 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%).</p> <p>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.</p>			
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		<p>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.</p> <p>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.</p> <p>Tertiary containment will be provided by the contoured hardstanding of the area where the SBGs, the receiver station and the fuel road tanker off-loading area will be located, additionally the western site perimeter in the area where diesel will be stored (i.e. in the SBG belly tanks and fuel receiver tanks) will have a raised kerb. 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.</p> <p>Surface water runoff from the area where the SBGs and diesel receiver station are to be located will be directed to the on-site surface water drainage system via an oil interceptor (17,000 litre capacity) which will ultimately discharge to an on-site soakaway (via discharge point SW1).</p> <p>The interceptor will be fitted with an automatic closure device, this closure device will be activated on detection of diesel in the interceptor, by it's integral detection mechanism, preventing the release of diesel to soakaway. 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</p>			
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			<p>connect to the data centre BMS; the alarm will notify key data centre staff of the issue, via the BMS.</p> <p>The interceptor will be subject to regular emptying and maintenance by an appointed specialist contractor.</p> <p>All interceptor oil/sludge will be removed by suitably licensed contractors.</p> <p>No oily water will be permitted to leave the site under normal operating conditions.</p>			
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Table 5-4 -Accident Risk Assessment and Management Plan

What do you do that can harm and what could be harmed?			Managing the Risk	Assessing the Risk		
Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor ?	What measures will you take to reduce the risk? Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
Leak from on-site fuel oil storage	Land, groundwater See drawings 003 and 004	Over land, Water	<p>Generators will be housed external to the data centre building; this area will benefit from concrete surfacing. The generators have the benefit of being containerised.</p> <p>The generator belly tanks will be located within the generator container units and provided with suitable secondary containment. Leak/spill protection measures will include tank level gauges, level alarms, pressure delivery over-fill prevention valves, leak detection alarms connected to the BMS.</p>	Low	Pollution, Harm to Environment and Human Health	Low

			<p>The two fuel receiver tanks will be provided with secondary containment (110%) and will have the following protection measures: tank level gauge; high and low level alarms connected to the BMS; a pressure delivery over-fill prevention valve; leak detection alarm connected to the BMS; and pressure relief valves to prevent over pressurisation of diesel supplied from the delivery tanker. Fuel delivery pipework will have a pipe-in-pipe arrangement with leak detection connected to the BMS. To minimise the risk of corrosion all pipework will be painted or constructed of corrosion resistant material.</p> <p>The integrity of diesel tanks and secondary containment will be subject to daily visual inspection by site personnel as part of standard daily operations. Any defects or weaknesses spotted in a tank or containment measures will be repaired as soon as practicable.</p> <p>The Site Manager will be responsible for implementing risk management measures in conjunction with the operating techniques document (Ref: 410.11808.00001 BATOT).</p>			
Discharge of fuel oil outside bunded or kerbed area	Industrial, commercial, residential, surface water and ecological receptors identified in drawings 003 and 004	Over Land, Water	<p>Best practices will be adhered to for fuel unloading and loading activities which will limit the duration of potential emission releases.</p> <p>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).</p> <p>Diesel fuel suppliers will be required to adhere to the current Carriage of Dangerous Goods (ADR) Regulations.</p> <p>Storage areas will be kept sealed and secured at all times.</p>	Low	Pollution, Harm to Environment and Human Health	Low

			<p>Operational areas, roads and external surfacing will benefit from impermeable surfacing to prevent percolation of any spilt/leaked fuel or potentially contaminated runoff to soil and groundwater.</p> <p>Any spillage that does occur will be cleaned up/contained immediately using absorbent material in the spill kits which will be provided on-site. All spills will be removed from site by a suitably licensed waste contractor.</p> <p>A spill procedure will be developed for the site as part of the Environmental Management System.</p> <p>The Site Manager will be responsible for implementing risk management measures in conjunction with the Operating Techniques (Ref: 410.11808.00001/BATOT).</p>			
Fire	Industrial, commercial, residential, surface water, ecological and cultural heritage receptors identified in drawings 003 and 004	Air (smoke), Over Land, Water	<p>The site will benefit from a fire alarm system and associated fire suppression systems inside the data centre building. The generator containment units themselves will each have independent fire suppression systems.</p> <p>The external area where the SBGs and associated diesel storage will be located will be designed to provide a containment volume of up to 621,000 litres (the containment volume will be achieved by tertiary containment measures, i.e. surface hardstanding, the 17,000 litre oil interceptor as detailed previously, surface water drainage in the diesel storage area, raised perimeter wall along the western site boundary and entrance ramp). Following discussion with the Fire Stations Royal Berkshire Fire and Rescue Service (RBFRS) (Slough fire station), a sump will be installed in this area to enable the recirculation of firefighting water generated in the event of a fire, this will help minimise the volume of firewater generated in such an emergency event.</p>	Low	Pollution, Harm to Environment and Human Health	Low

			<p>Emergency Procedures will be developed as part of the EMS; these will detail the actions to be taken in the event of a fire.</p> <p>The Site Manager will be responsible for implementing risk management measures in conjunction with the operating techniques document (Ref: 410.11808.00001/BATOT).</p>			
Security and Vandalism	Industrial, commercial, residential, surface water and ecological receptors identified in drawings 003 and 004	Air/Land	<p>The following security measures will be implemented at the site:</p> <ul style="list-style-type: none"> • 24/7 security; • Site access control system; • Site perimeter security fencing; and • CCTV monitoring. <p>A minimum of 10 site personnel (including security and facilities management personnel) will be present on site 24/7.</p> <p>All visitors to the site will be required to sign in and out of the site to prevent unauthorised access.</p> <p>The Site Manager will be responsible for implementing risk management measures in conjunction with the Operating Techniques (Ref: 410.11808.00001/BATOT).</p>	Low	Pollution, Harm to Environment and Human Health	Low
Flooding	Industrial, commercial, residential, surface water, cultural heritage and ecological receptors identified in drawings 003 and 004	Land, Water	<p>The data centre lies within a Flood Zone 1, defined as an area with a low probability of flooding.</p> <p>Operational areas, roads and external surfacing will benefit from impermeable surfacing to prevent the percolation of any potentially contaminated water to soil and groundwater.</p> <p>The site will benefit from a sealed surface water drainage system; surface runoff from the two generator compounds will discharge to an on-site soakaway via an</p>	Low	Pollution, Harm to Environment and Human Health	Low

			<p>interceptor which will be alarmed and have an automatic shut-off device if oil is detected.</p> <p>The surface water drainage system within the site has been designed to contain up to and including a 1 in 100 year event plus 20% climate change allowance and that the soakaway empties within 24 hours</p> <p>Evacuation procedures will be implemented in the event of flooding.</p> <p>The Site Manager will be responsible for implementing risk management measures in conjunction with the operating techniques document (Ref: 410.11808.00001/BATOT).</p>			
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Table 5-5 - Global Warming Potential (GWP)

What do you do that can harm and what could be harmed?			Managing the Risk	Assessing the Risk		
Hazard	Receptor	Pathway	Risk Management	Probability of Exposure	Consequence	What is the overall risk
What has the potential to cause harm?	What is at risk what do I wish to protect?	How can the hazard get to the receptor ?	What measures will you take to reduce the risk? Who is responsible for what?	How likely is this contact?	What is the harm that can be caused?	What is the risk that still remains? The balance of probability and consequence
Generation of CO ₂ e emissions	National and global air quality and climate change	Air	Operation of the generators will involve the combustion of diesel fuel to generate electricity for use at the data centre in the event of an emergency outage of the National Grid supply of electricity. The generators will be subject to planned maintenance and testing. The	Medium	Harm to environment , Harm to human health	Medium

			<p>combustion of diesel will result in the generation of CO_{2e} emissions.</p> <p>The management of energy will form an integral part of the operator's environmental management system (EMS).</p> <p>Energy consumption has been considered in the BATOT document (ref. 410.11808.00001/BATOT).</p>			
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6.0 Adaptation to Climate Change Risk Assessment

An adapting to climate change risk assessment (CCRA) is required for new bespoke Installation EP applications if the Installation is expected to operate for more than 5 years. A CCRA must be completed even if it is possible that the Installation will not be operational in 2050 as predicted climate changes, which can potentially be extreme, may be experienced before this time.

The data centre will be operational for more than 5 years from the date of this EP application and therefore CCRA screening has been completed.

6.1 CCRA Screening

CCRA screening involved completion of Part 6b of application form B2 for a bespoke EP. The results of the screening assessment are included in application form B2; these are presented in Table 6-1 - Climate Change Screening Assessment. As the screening score for the data centre was >5 a CCRA is required.

Table 6-1 - Climate Change Screening Assessment

Screening Category	Screening Answers	Screening Score
Timescales	The environmental permit will be required until 2060 or beyond (more than 40 years from now)	5
Flood Risk for Rivers and Sea*	Very low	1
Water Use	Mains water	1
Screening Score Total		7
* - https://flood-warning-information.service.gov.uk/long-term-flood-risk		

6.2 Climate Change Risk Assessment

In order to complete the CCRA the appropriate risk assessment worksheet must be selected, this is based on the river basin district the site is located in. The data centre will be located in the Thames River Basin District; the completed risk assessment worksheet is presented in Appendix 02.

Based on the 'potential changing climate variables' presented in the worksheet and the potential impact on operations at the data centre, specifically related to the diesel-fired generators and diesel storage, the overall risks are low, with risk scores ranging from 1 – 3; these scores are below the threshold whereby mitigation measures are required to ensure operational resilience against potential climate change impacts.

The risk assessment worksheet will be included in the sites Environmental Management System and will be subject to regular updates. Where there are changes in the level of risk, for example as a result of new climate change predications or changes in site infrastructure, the CCRA worksheet will be updated and if necessary, mitigation measures implemented to reduce risk.

APPENDIX 01

EA Nature and Heritage Conservation Screening Report 2nd June 2021

Nature and Heritage Conservation

Screening Report: Bespoke Installation

Reference	EPR/PP3309MK/A001
NGR	SU 95745 81088
Buffer (m)	55
Date report produced	2 June 2021
Number of maps enclosed	5

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) Windsor Forest & Great Park (SAC) Burnham Beeches (SAC)	10	Joint Nature Conservation Committee
Special Protection Area (pSPA or SPA) South West London Waterbodies (SPA)	10	Joint Nature Conservation Committee
Ramsar South West London Waterbodies (Ramsar)	10	Joint Nature Conservation Committee
Local Nature Reserve (LNR) Haymill Valley (LNR) Cocksherd Wood (LNR)	2	Natural England
Local Wildlife Sites (LWS) Haymill Valley Cocksherd Wood Railway Triangle (off Stranraer Gardens)	2	Appropriate Local Record Centre (LRC)

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.

customer service line
03708 506 506

incident hotline
0800 80 70 60


floodline
0845 988 1188

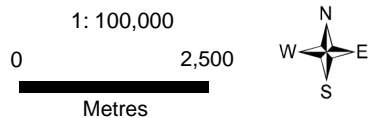
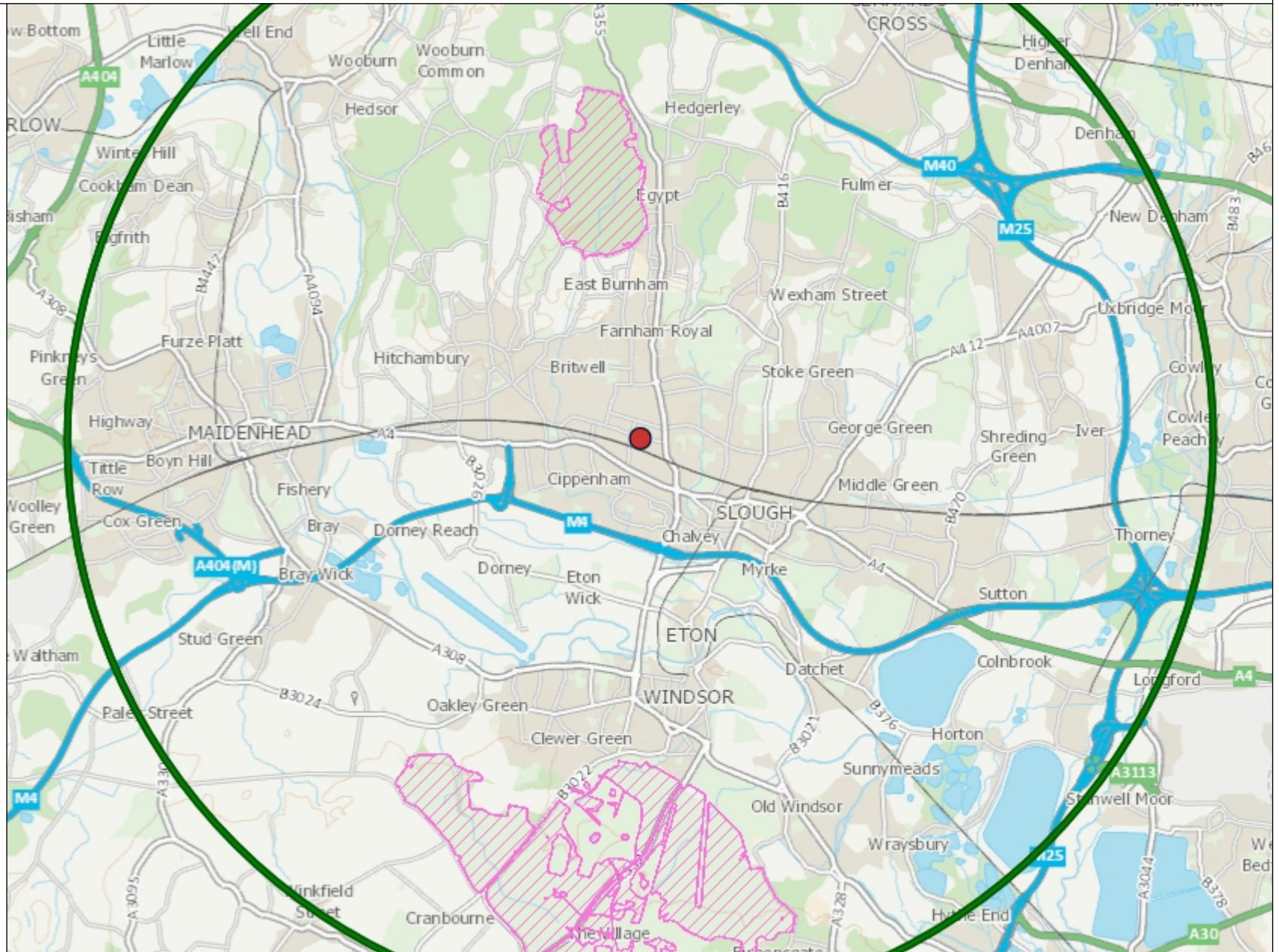
www.environment-agency.gov.uk

Special Areas of Conservation



Legend


 SAC (England)

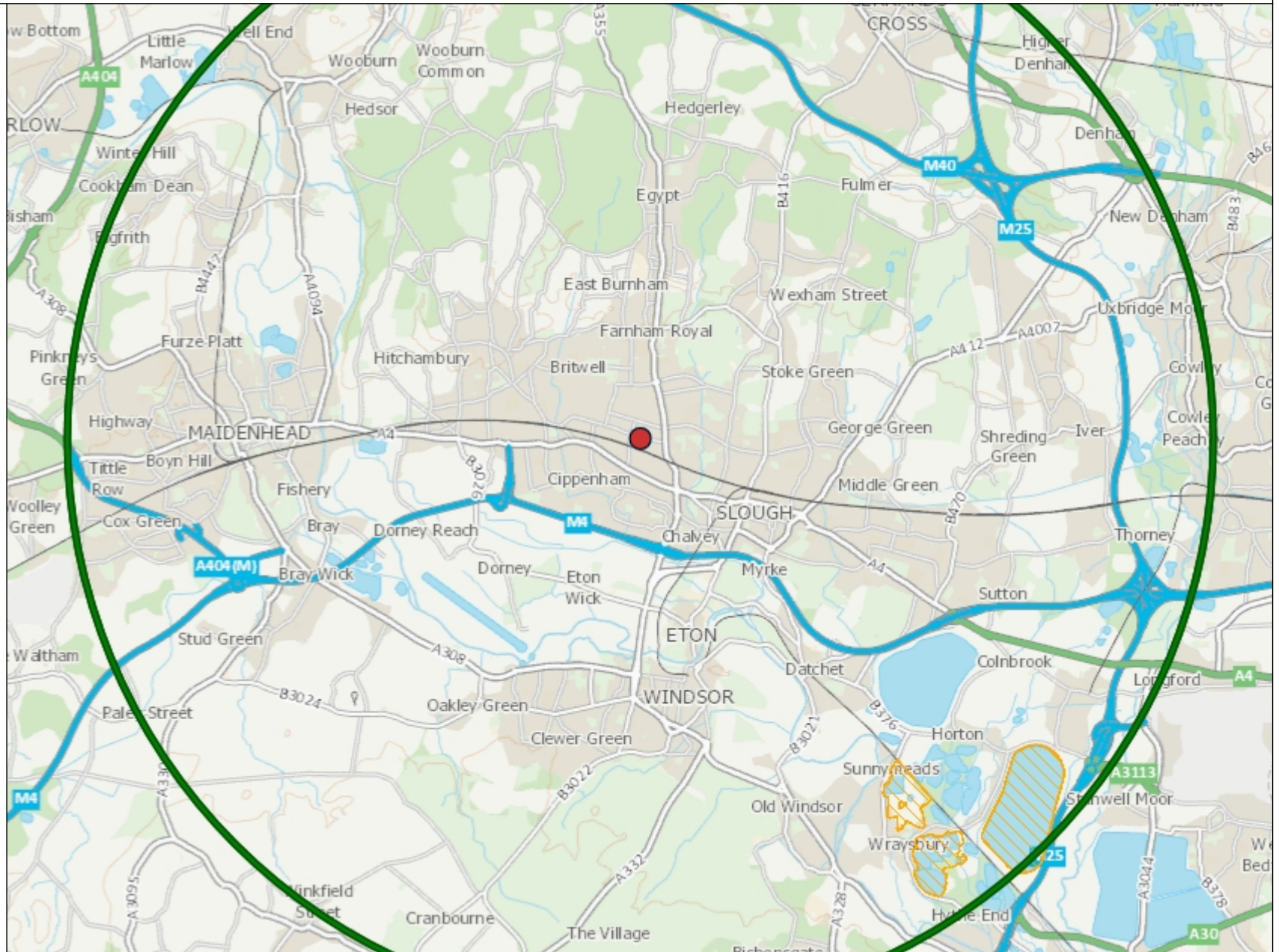


Special Protection Areas



Legend

 SPA (England)



1: 100,000


0 2,500

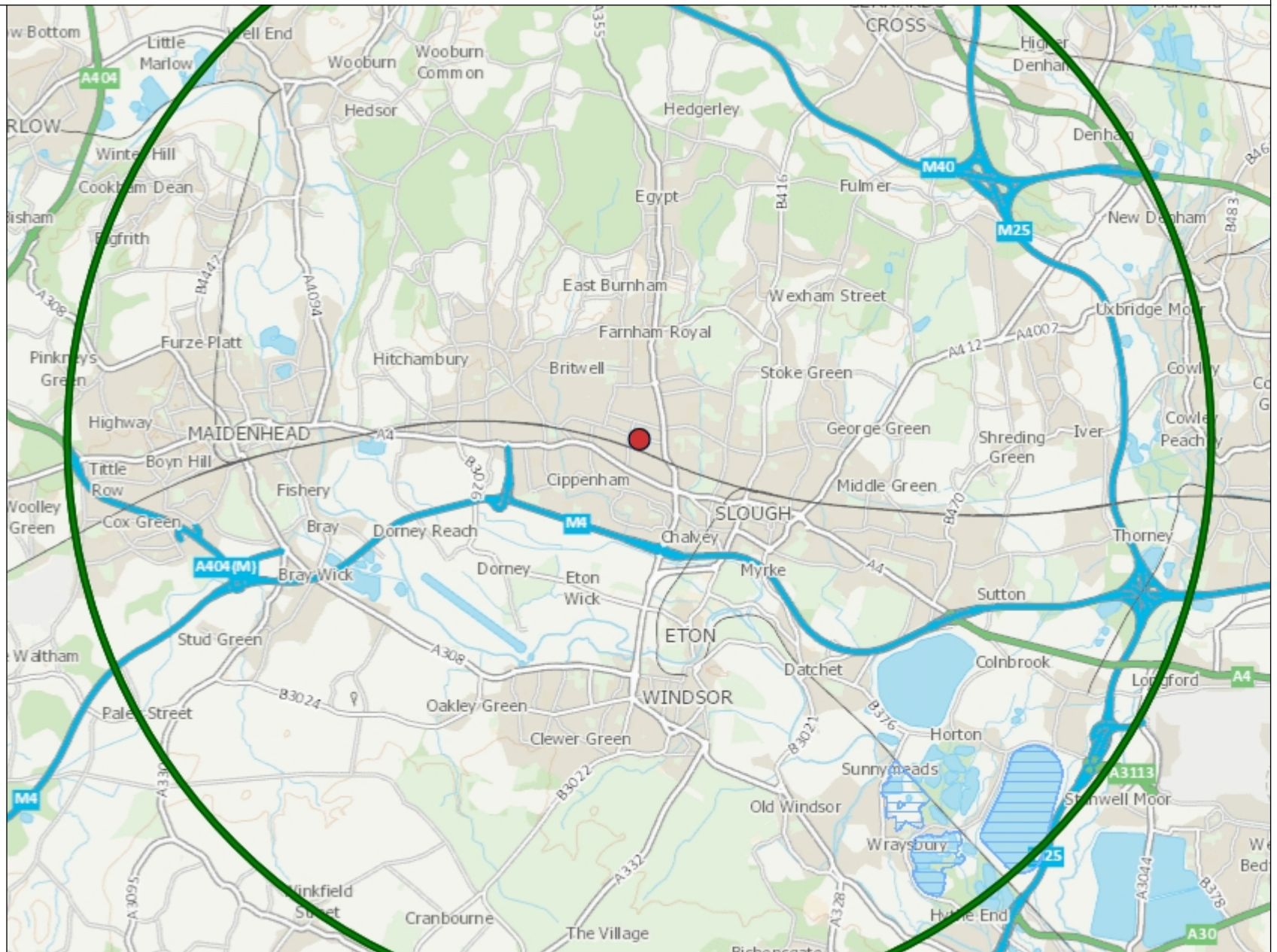
Metres



Ramsar

Legend

 Ramsar (England)



1: 100,000


0 2,500

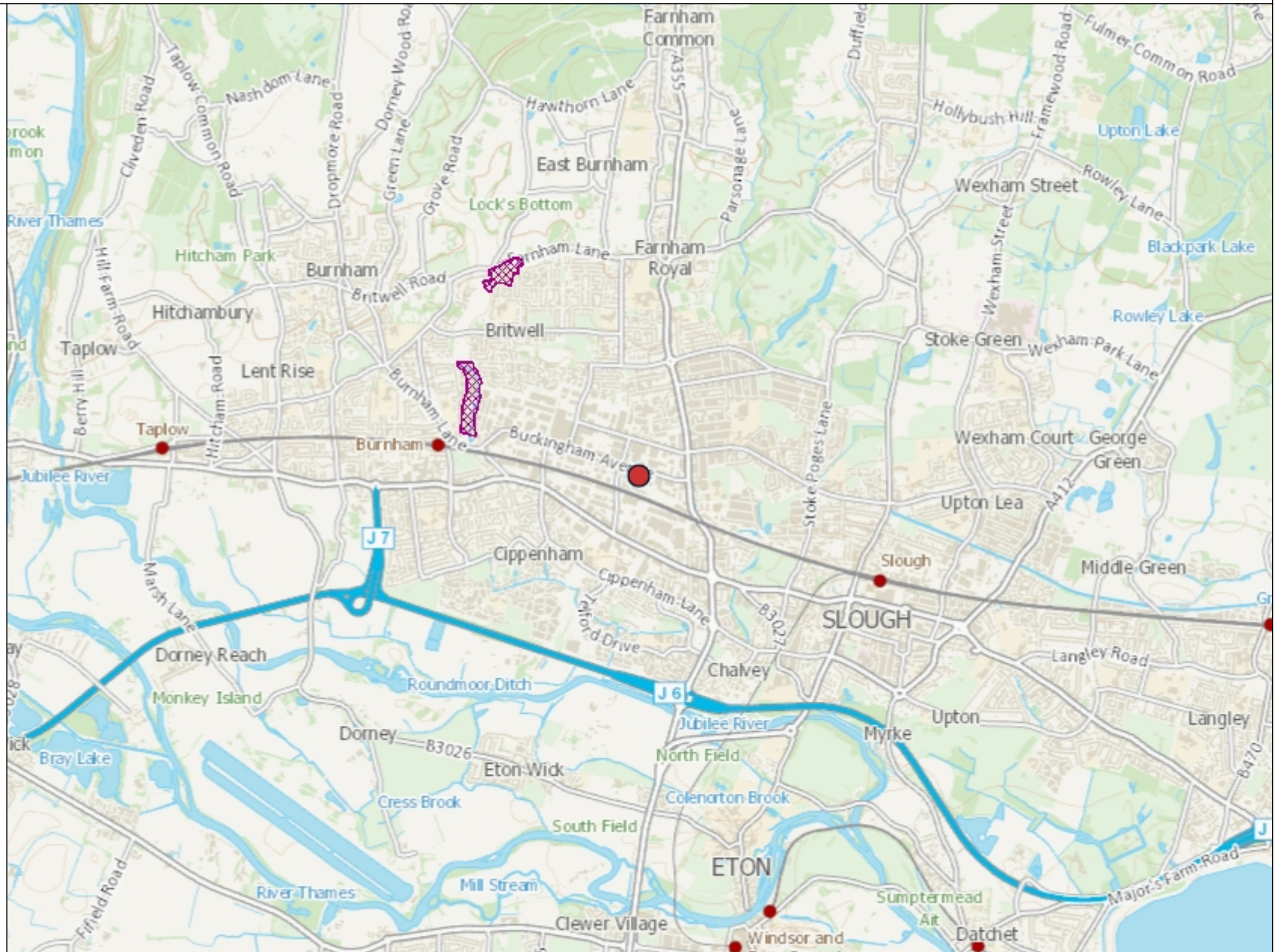
Metres



Local Nature Reserves

Legend

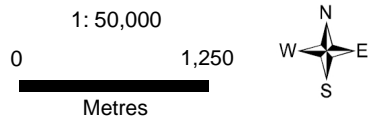
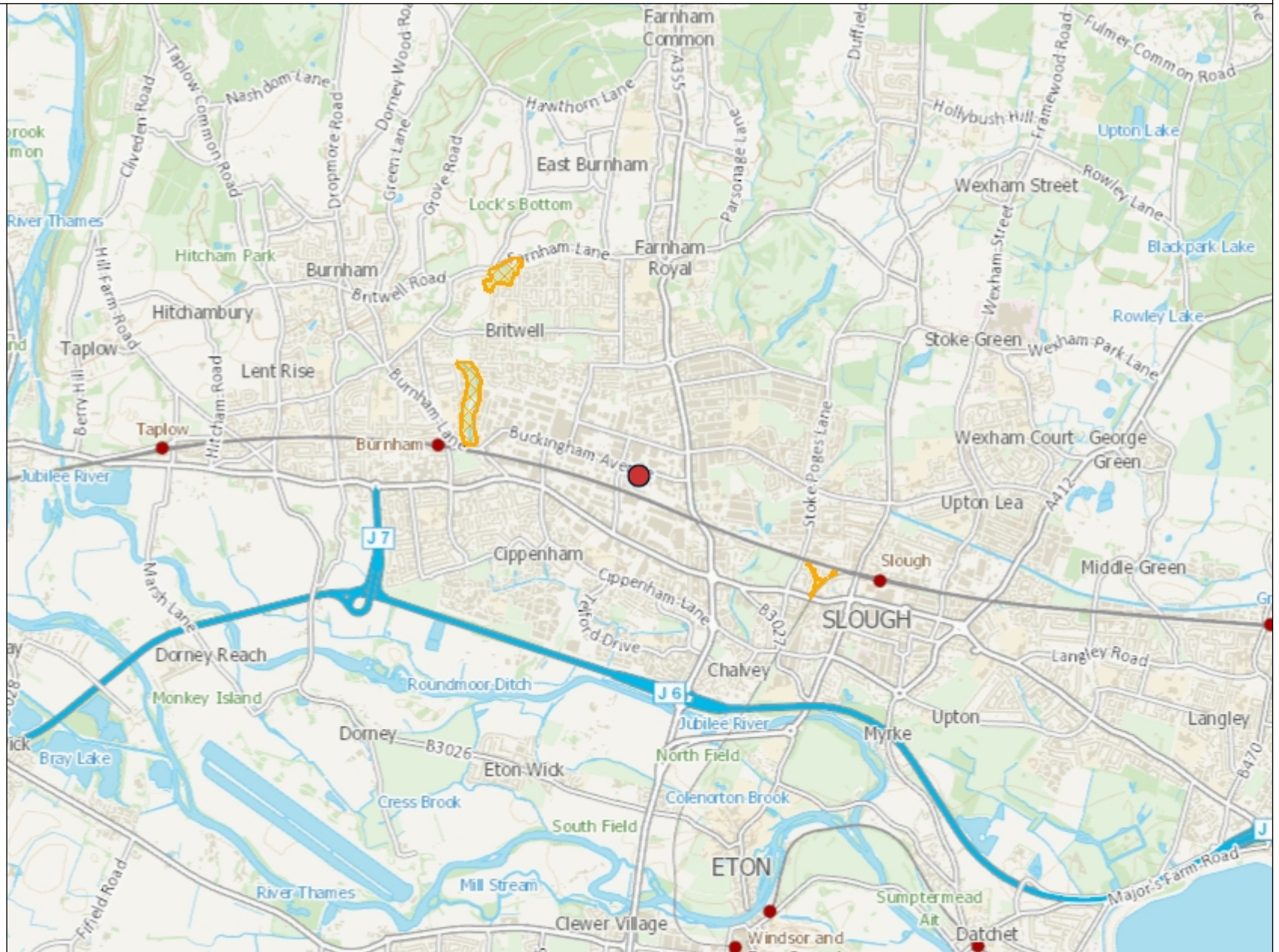
 LNR (England)



Local Wildlife Sites

Legend

 Local Wildlife Sites



APPENDIX 02

Adaption to Climate Change Risk Assessment: Thames River Basin District Worksheet

Thames river basin district: climate change risk assessment worksheet

Name (as on your part A application form): Amazon Data Services UK Limited

Our permit reference number (if you have one): EPR/PP3309MK/A001

Your document reference number: 410.11808.00001_Climate Change Risk Assessment

Risk assessment worksheet for the 2050s

Thames river basin district

You must carry out a climate change risk assessment for any new bespoke waste and installations permit applications if you expect to operate for more than 5 years. Use the [user guide](#) to complete the table. You can add in extra pages if necessary.

Consider how your operations will be affected by the changes in weather and climate described in the table. Consider any changes to average climate conditions that may impact on your operations, for example extreme rainfall.

Also consider:

- critical thresholds - where a 'tipping point' is reached, for example a specific temperature where site processes cannot operate safely
- changes to averages - for example an entire summer of higher than expected rainfall causing waterlogging
- where hazards may combine to cause more impacts

You can add in other climate variables if you wish.

If you have stated on your application form that you do not expect to be operational in 2050, you must still consider climate change risks for the time you do intend to operate. Whilst the variables are for the 2050s, this is an estimated date and you may experience these conditions before then.

This worksheet will sit in your management system. It must appear on the management system summary you submit with your application, even if you do not need to submit the whole risk assessment with your application.

If your pre-mitigation risk score (column D) is 5 or higher, you must complete columns E to H.

Potential changing climate variable	A Impact	B Likelihood	C Severity	D Risk (B x C)	E Mitigation (what will you do to mitigate this risk)	F Likelihood (after mitigation)	G Severity (after mitigation)	H Residual risk (F x G)
<p>1. Summer daily maximum temperature may be around 7°C higher compared to average summer temperatures now.</p>	<p>Interruptions in National Grid electricity supply to the data-centre resulting in the need to operate the generators as emergency back-up resulting in emissions to air due to the combustion of diesel.</p> <p>National Grid Climate Change Adaptation Reporting, Second Round Response, July 2016 states that increased temperatures are unlikely to have a significant impact on electricity supply (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/566151/climate-adrep-national-grid.pdf)</p> <p>It is considered unlikely that each generator will be operated for >72 hours per year for emergency back-up purposes.</p>	1	3	3	N/A	N/A	N/A	N/A
<p>2. Winter daily maximum temperature could be 4°C more than the current average, with the potential for more extreme temperatures, both warmer and colder than present.</p>	<p>No negative impact expected</p>	N/A	N/A	N/A	N/A	N/A	N/A	N/A

<p>3. The biggest rainfall events are up to 20% more intense than current extremes (peak rainfall intensity)*.</p>	<p>(a) Surface water drainage system is overloaded. The UK surface water flood risk maps (https://flood-warning-information.service.gov.uk/long-term-flood-risk/postcode) indicates that the area where the generators are to be located is in an area at low risk of surface water flooding i.e. a chance of flooding of between 0.1% and 1%.</p> <p>(b) flooding of generator container units. The UK flood risk maps (https://flood-warning-information.service.gov.uk/long-term-flood-risk/postcode) indicates that the area where the generators are to be located is in an area at very low risk of flooding from rivers and or the sea i.e. that each year this area has a chance of flooding of less than 0.1%.</p>	<p>(a) 1 (b) 1</p>	<p>(a) 3 (b) 3</p>	<p>(a) 3 (b) 3</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>	<p>N/A</p>
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Potential changing climate variable	A Impact	B Likelihood	C Severity	D Risk (B x C)	E Mitigation (what will you do to mitigate this risk)	F Likelihood (after mitigation)	G Severity (after mitigation)	H Residual risk (F x G)
	The site's drainage system is designed to contain up to and including a 1 in 100 year event plus 20% climate change allowance and that the soakaway empties within 24 hours.							
4. Average winter rainfall may increase by 36% on today's averages.	As per response to question 3 above.	(a) 1 (b) 1	(a) 3 (b) 3	(a) 3 (b) 3	N/A	N/A	N/A	N/A
5. Sea level could be as much as 0.6m higher compared to today's level *.	<p>No negative impact expected.</p> <p>The MAGIC map indicates that the data-centre is not located in an area designated as a Flood Risk Management Priorities (England) (i.e. priority areas for measures to address flood risk management issues).</p> <p>Climate Change Risk Assessment screening stage confirmed that there is a very low risk of flood from rivers and sea.</p>	1	1	N/A	N/A	N/A	N/A	N/A
6. Drier summers, potentially up to 42% less rain than now.	<p>No negative impact expected.</p> <p>Water use is not integral to operation and maintenance of the generators or the associated diesel storage arrangements.</p>	1	1	1	N/A	N/A	N/A	N/A

Potential changing climate variable	A Impact	B Likelihood	C Severity	D Risk (B x C)	E Mitigation (what will you do to mitigate this risk)	F Likelihood (after mitigation)	G Severity (after mitigation)	H Residual risk (F x G)
7. At its peak, the flow in watercourses could be 35% more than now, and at its lowest it could be 75% less than now.	No negative impact expected. The datacentre will not generate process wastewater that will require discharge to surface watercourses and will not abstract water from surface watercourses.	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Indicates data has come from climate change allowances as part of the spatial planning process. Evidence from your planning submission is acceptable evidence for this worksheet.

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