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Attachment-1-2-Non Technical Summary

EPA Industrial Emissions Licence Review Application LA019578 Cruiseraith, Dublin 15

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Signature		
Name	Mairead Rawal	Jonathan Gauntlett
Title	Principal Environmental Consultant	Associate
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1. INTRODUCTION

Amazon Data Services Ireland Ltd. ("ADSIL" or 'the applicant') is applying to the Environmental Protection Agency ('the Agency' or 'the EPA') for an Industrial Emissions (IE) Licence review to operate its data storage facility (hereafter referred to as the 'Installation') located on Cruiserath Road, Dublin 15.

The site location and Industrial Emissions (IE) site boundary is shown on the Site Location Plan, Drawing: 21_123H-CSE-00-XX-DR-C-0001 included with this application. The application relates to the entire Installation that is c. 26.05 hectares (ha) in total ('the Site').

The 'existing Installation' (i.e. the currently licensed Installation, EPA Ref.: P1182-01) comprises 3 no. two-storey data storage facility buildings (Buildings A, B and C) and associated ancillary elements. While the Cruiserath 220 kV Substation Building is located on the Site, it is excluded from the IEL boundary, as shown on Drawing 21_123H-CSE-00-XX-DR-C-0001.

The 'extended Installation' (i.e. the additional elements proposed to be included as part of this Licence Review) comprises an 3 no. two-storey data storage facility buildings (Buildings E, F and G) and associated ancillary elements. The extended Installation is located fully within the existing Installation boundary (EPA Ref.: P1182-01).

The site layout and main buildings are shown on the Site Layout Plan, Drawing Ref: 21_123H-CSE-00-XX-DR-C-0002 included with this application.

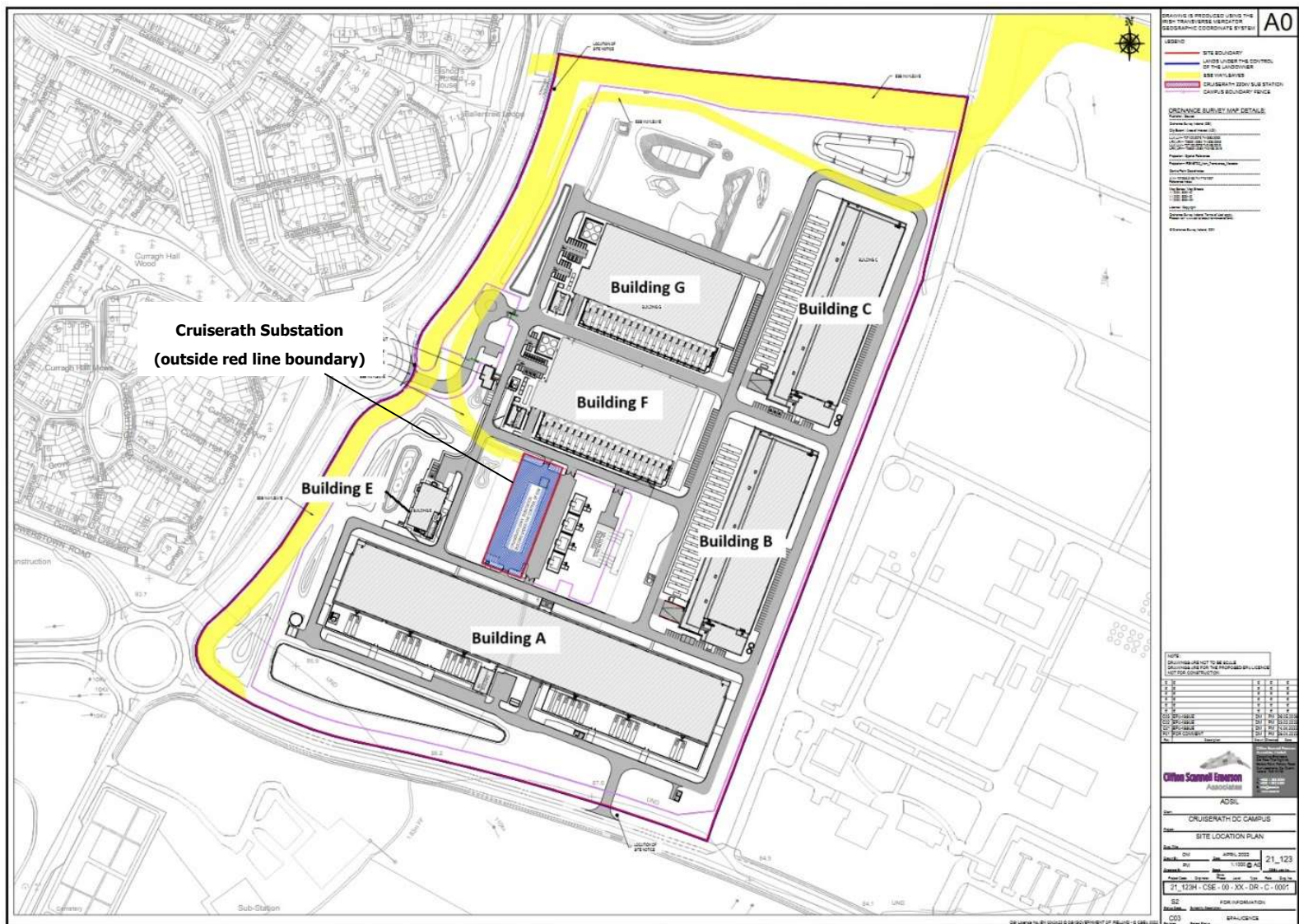
The Installation requires a continuous supply of electricity to operate. During normal operation, the Installation is supplied electricity from the national grid. Outside of routine testing and maintenance, the operation of the emergency back-up generators is typically only required under the following emergency circumstances:

- ▶ A loss, reduction or instability of grid power supply,
- ▶ Critical maintenance to power systems,
- ▶ A request from the utility supplier (or third party acting on its behalf) to reduce grid electricity load.

The relevant requirement for an Industrial Emissions (IE) Licence is Activity Class 2.1 of the First Schedule of the Environmental Protection Agency EPA Act 1992 (as amended) (EPA Act 1992). Activity Class 2.1 states: *Combustion of fuels in installations with a total rated thermal input of 50 MW or more.*

This non-technical summary provides, in non-technical language, a summary of the information provided in the IEL Review Application.

Figure 1.1 Indicative Site Layout Plan



1.1 General Information

1.1.1 Licensable Activity and Regulatory Class

The relevant requirement for an Industrial Emissions (IE) Licence is outlined within the First Schedule of the EPA Act 1992. Activity '*Class 2.1 Combustion of fuels in installations with a total rated thermal input of 50 MW or more*' specifically relates to this Installation.

The Installation, once fully operational, will include the following combustion emission sources listed in Table 1.1 below:

Table 1.1 Installation Combustion Plant

	Emission Point	Description^(a)	Quantity	Rated Thermal Input (MW_{th}) Per Unit	Stack Height above Ground Level (m)
Existing Installation	A3-1 to A3-22	Building A - Emergency Back-up Generator	22	6.49	20
	A3-23 - A3-24	Building A - Fire Sprinkler Pump	2	0.52	-
	A3-25	Building B - Emergency Back-up (administration) Generator	1	2.19	20
	A3-26 to A3-47	Building B - Emergency Back-up Generator	22	6.49	20
	A3-48	Building C - Emergency Back-up (administration) Generator	1	2.19	20
	A3-49 to A3-70	Building C - Emergency Back-up Generator	22	6.49	20
Extended Installation	A3-71	Building E - Emergency Back-up Generator	1	3.57	17
	A3-72 to A3-89	Building F - Emergency Back-up Generator	18	7.45	25
	A3-90	Building F - Emergency Back-up (administration) Generator	1	1.84	25
	A3-91 to A3-108	Building G - Emergency Back-up Generator	18	7.45	25
	A3-109	Building G - Emergency (administration) Back-up Generator	1	1.84	25

- a. Please note that some terms are used interchangeably throughout this Application in reference to the Site's combustion / generation plant. For the purposes of EPA licensing and applicable regulations: the emergency back-up generators, and fire sprinkler pumps, are all 'diesel engines'.

The combined thermal input from the emergency generators once fully operational is c. **709.21 MW_{th}**, which exceeds the 50MW_{th} threshold of Class 2.1 First Schedule of the EPA Act 1992. The applicant is applying to the Environmental Protection Agency (EPA) for an Industrial Emissions (IE) Licence principally relating to the operation of emergency standby generators under Activity Class 2.1.

1.1.2 Planning Status and Environmental Impact Assessment

The Installation received Final Grant of planning permission from Fingal County Council (FCC) and An Bord Pleanála (ABP) under the separate applications listed below:

- ▶ Building A; grant of permission on 25 April 2017 (FCC Reg. Ref.: FW17A/0025 and final grant of permission on 16 January 2018 under ABP Reg Ref. L06F.248544).
- ▶ Building B and C; final grant of permission on 27 August 2019 (FCC Reg. Ref.: FW19A/0087)

- ▶ Buildings E, F and G), final grant of planning permission was obtained from An Bord Pleanála (ABP) on 19 December 2025 under ABP Planning Ref.: ABP-318180-23.

The EIARs related to the installation site under this licence are as follows:

- ▶ An Environmental Impact Statement (EIS) relating to Building A was prepared by AWN Consulting et. al., dated March 2017, with addendum dated September 2017. This EIS was previously submitted to FCC and ABP and is included with this IE Licence review application as Attachment-6-3-6-EIS-Planning-Jan-2018 and Attachment-6-3-6-EIS-Addendum-Jan-2018.
- ▶ An Environmental Impact Assessment Report (EIAR) relating to Building B and Building C, was prepared by AWN Consulting et. al., dated May 2019. This EIAR was previously submitted to FCC and is included as Attachment 6-3-6-EIAR-Planning-Aug-2019 of the IE Licence review application).
- ▶ An EIAR relating to Buildings E, F and G was prepared by AWN Consulting et al., dated December 2022. This EIAR was previously submitted to FCC and ABP and is included as Attachment-6-3-6-EIAR-Planning-Dec-2022 of the Licence review application. An EIAR addendum was submitted in May 2025.

The Installation is to be constructed and operated in accordance with the relevant planning permissions, therefore the EIS/EIARs submitted to the EPA dated March 2017, January 2018 and December 2022 (Attachments 6-3-6 of the IE Licence review application) are relevant to this IE Licence activity.

Any further information, including reports and advice, relating to the environmental impact assessment of the proposed activity is made available and contained within Section 6 of this licence review application.

1.1.3 Other Required Permits

The existing Installation has a Greenhouse Gas (GHG) Emissions Permit (Ref. IE-GHG197-02) due to the type of fuel used and the emissions produced. This GHG Permit will be updated to include the extended Installation.

The site is not classed as a SEVESO site, which applies to locations storing large amounts of dangerous substances. The only substance stored on site that is controlled under the COMAH regulations will be petroleum products (diesel) and alternative fuels (Hydrotreated Vegetable Oil (HVO)) for on-site emergency use. There are no hazard phrases associated with HVO that fall under Schedule 1 of the COMAH Regulations 2015. Therefore, HVO is a non-COMAH substance and is not considered in the COMAH calculation for the Installation.

1.1.4 Application Drawings

The application is accompanied by drawings to provide a visual guide for understanding the physical layout and operational aspects of the Installation, including emission and monitoring points. The drawings included with the application include:

- ▶ Drawing 21_123H-CSE-00-XX-DR-C-0001 – Site Location Plan
- ▶ Drawing 21_123H-CSE-00-XX-DR-C-0002 – Site Layout Plan
- ▶ Drawing 21_123H-CSE-00-XX-DR-C-1100 – Surface Water Layout Plan
- ▶ Drawing 21_123H-CSE-00-XX-DR-C-1200 – Foul Water Layout Plan
- ▶ Drawing 21_123H-CSE-00-XX-DR-C-2000 – Emission Layout Plan

1.1.5 Development Timeline

Due to the scale and complexity of the Installation, it will continue to undergo a staggered commissioning process, with phased construction completion and operational ramp-up across the various development elements. Construction of the existing Installation commenced in Q3 2019. Main construction works for the extended Installation are in preparatory stages.

An overview of the Installation timelines is provided in Table 1-2 below.

Table 1-2 Estimated Installation Timeline

Phase	Ready for Operational Commencement (* Estimated)
Building A	Q3 2020
Building B	Q4 2022
Building C	Q4 2022
Building E	Q2 2027*
Building F	Q2 2027*
Building G	Q4 2027*

2. INSTALLATION OVERVIEW AND SITE CONTEXT

2.1 Site Context

The Installation is located on a site of c. 26.05 hectares and is located along the R121 Cruiserath Road, Dublin 15. The site is relatively flat though it slopes gently northwards. An existing ESB Wayleave, relating to existing underground power lines, is present along the northern and western boundaries, as shown in Figure 1-1 above (in yellow) and on Drawing 21_123H-CSE-00-XX-DR-C-0001 – Site Location Plan).

Prior to development, the site was previously used for agricultural crops. Much of the surrounding land has been developed in the past 10-15 years, mainly for industrial use (to the east and south) and residential (to the west). The site is not located directly adjacent to any areas of national or local environmental sensitivity/designation.

The eastern boundary of the Site is adjacent to an existing pharmaceutical facility, Bristol-Myers Squibb. The Site is bound to the south, and west by the Cruiserath Road R121 (dual-carriageway), and to the north by Hollywood Road and the Carlton Hotel. Blanchardstown Village is located c. 2.5 km to the south. The closest residential properties are located at Tyrrelstown, to the west of the Site boundary (across the R121). The surrounding 1 km of the Site includes IE and IPC Licenced sites including:

- ▶ Alexion Pharma International Operations Unlimited Company (P1030), located to the south of the Site in College Business & Technology Park
- ▶ Mallinckrodt Pharmaceuticals Ireland Limited (P1060) located to the east of the Site in College Business & Technology Park
- ▶ Swords Laboratories Unlimited Company Trading as Bristol Myers Squibb Cruiserath Biologics (P0552) located to the east of the Site in Cruiserath Road
- ▶ Ipsen Manufacturing Limited (P0117) located to the south east of the Site in Blanchardstown Industrial Park.
- ▶ Corduff FlexGen (P1138) located to the northeast of the Site on Corduff Road.
- ▶ Equinix Hyperscale 1 (DB5) Limited (P1168), located to the south east of the Site in Blanchardstown Industrial Park.
- ▶ K2 Strategic Infrastructure Ireland Limited (P1143) located to the south east of the Site.

2.2 Primary Processes / Activities

Once fully operational, there will be c. 290 full time staff in total. This comprises up to 50 full time employees (including external staff, maintenance contractors and visitors) daytime staff in each of Buildings A, B, C, F and G, with up to 7 no. staff on night shifts per building. Building E will have c. 4-5 no. employees. Operational hours are 24 hours a day, 7 days a week.

The overall purpose of the Installation is to provide a secure location for data storage. Data storage facilities are large-scale, centralised computing environments that support the delivery of essential services including healthcare, banking, and governmental administration. The data hosted within these facilities is critical to the functioning of regulated sectors and public services.

- ▶ At scale, these facilities provide:
- ▶ High reliability and built-in redundancy, ensuring continuous availability of essential services;
- ▶ 24/7 monitoring and maintenance by dedicated on-site staff;
- ▶ Enhanced security and data protection to the highest industry standards;

- ▶ Greater energy efficiency — achieving significantly lower Power Usage Effectiveness (PUE) ratios compared to traditional on-premises servers located within individual organisations and businesses; and
- ▶ Scalability to respond to growing demand from essential service providers.

The demand for secure cloud computing and data storage continues to grow as critical services increasingly rely on digital infrastructure. The Installation is intended to meet this need, supporting the reliable delivery of services upon which regulated industries and the public depend.

2.2.1 Existing Installation (Buildings A, B and C)

The existing Installation, which is currently licensed under EPA Licence P1182-01, comprises three two-storey data storage facility buildings, referred to as Buildings A, B and C. These buildings contain data storage rooms housing IT equipment, electrical and mechanical plant rooms, air handling plant rooms, administration and welfare areas, loading and unloading areas, rooftop mechanical plant, solar panels, and associated infrastructure. The air handling plant supports the control of temperature, humidity and pressurisation within the data storage rooms.

The existing Installation also includes supporting infrastructure required for the operation of the site. This includes emergency back-up generators with associated fuel tanks and exhaust stacks, water storage tanks including tanks for the evaporative cooling systems, fuel top-up tanks located within concrete bunds, a fire sprinkler tank and pump house, waste storage areas, a transformer compound and MV control room, an MV switch room, internal roads, car, motorcycle and bicycle parking, underground foul and stormwater drainage networks, underground water supply infrastructure, stormwater attenuation basins, security infrastructure and landscaping.

2.2.2 Extended Installation (Buildings E, F and G)

The extended Installation will comprise three additional two-storey data centre buildings, referred to as Buildings E, F and G. Buildings F and G will also include mezzanine levels. Similar to the existing buildings, the extended Installation will include data storage rooms, electrical and mechanical plant rooms, internal and external air handling plant rooms, administration and welfare areas, emergency back-up generators with associated fuel tanks and exhaust stacks, water storage tanks, loading and unloading areas, rooftop mechanical plant and associated infrastructure. Buildings F and G will also include rainwater harvesting tanks and rooftop solar panels.

Additional infrastructure associated with the extended Installation will include two MV switch room buildings, a fuel top-up tank within a concrete bund serving Buildings F and G, waste storage areas, internal roads and parking areas, underground foul and stormwater drainage networks, underground water supply infrastructure and a new stormwater attenuation basin. The extended Installation will therefore expand the data storage capacity of the site while using similar supporting infrastructure and operational controls to those already in place for the existing Installation.

2.2.3 Cruiserath 220kV Substation

An Electrical Gas Insulated Switchgear (GIS) 220 kV substation (named 'Cruiserath'), owned and operated by ESB, is located within the existing Installation Site. Although it is situated within the footprint of the existing Installation Site, it is outside the IEL boundary, as shown on Drawing 21_123H-CSE-00-XX-DR-C-0002.

The Cruiserath substation is not owned or controlled by the Applicant and does not form part of the licensed activity. The Applicant has no control over activities within the substation, and all operation and environmental management responsibilities rest with ESB.

2.2.4 Emergency Back-up Generators

The data centre buildings are supported by containerised (enclosed) emergency back-up generators located externally in the generator compound associated with each data centre facility building (as set out in Table 1.1). There is no interconnectivity between the generators of different buildings, the generators located within the compound for each building supply electricity solely to that building.

The Installation requires a continuous supply of electricity to operate. During normal operation, the Installation is supplied electricity from the national grid. Outside of routine testing and maintenance, the operation of the emergency back-up generators is typically only required under the following emergency circumstances:

- ▶ A loss, reduction or instability of grid power supply,
- ▶ Critical maintenance to power systems,
- ▶ A request from the utility supplier (or third party acting on its behalf) to reduce grid electricity load.

The data centre facility buildings are supported by containerised (enclosed) emergency back-up generators located externally in the generator compound associated with each building. Emergency back-up generators are stationary diesel engine combustion plant installed at the Installation, which supply the primary electrical load to the Installation during emergency operations.

When there is a temporary loss, reduction or instability in electricity supply, there is a short but critical window of time before the emergency back-up generators can start up, stabilise, and assume the electrical load. During this interval, Backup Battery Units (BBUs) act as an immediate, localised energy buffer, seamlessly supplying power directly to the IT equipment. This ensures that the emergency back-up generators have sufficient time to reach stable operating conditions before taking over the load.

Attachment 4-8-1 (Operational Report) presents further details on the Emergency Back-up Generators as it relates to the IE Licence.

2.3 Secondary Processes/Activities

2.3.1 Data Storage Room Cooling Systems

The primary operational areas within the Installation comprise secure, climate-controlled data storage rooms (or “data halls”), which house the IT equipment and associated infrastructure used for the storage and processing of digital data. These rooms are designed to maintain controlled environmental conditions, including temperature and humidity, to ensure reliable operation of equipment.

The Installation is designed to maximise the use of air-side free cooling, taking advantage of Ireland’s temperate climate and thereby minimising reliance on mechanical cooling systems.

Cooling for Building A, B, C, F, and G is provided by evaporative cooling plant that provide conditioned air to maintain temperature, relative humidity and pressurisation in the data storage rooms. The cooling plant consists of Air Handling Units (AHU), and Computer Room Air Handling Units (CRAHUs).

Free cooling (using outside air directly) is sufficient to cool the data storage rooms for the vast majority of the year. Ireland’s temperate oceanic climate means that external ambient temperatures rarely exceed the threshold at which supplementary cooling is required.

Evaporative cooling (also known as adiabatic cooling) is available as a supplementary measure; however, the external temperatures required to activate this system would represent close to record conditions for the Dublin region. Accordingly, the evaporative cooling system functions for infrequent, exceptional peak temperature events rather than a routine operational requirement.

Building E utilises mechanical cooling, this building does not operate with evaporative cooling systems as described for the remaining buildings.

Attachment 4-8-1 (Operational Report) presents further details on the cooling systems.

2.3.2 Waste Heat Recovery

The Installation has been designed to allow for the potential future recovery of waste heat from the data storage rooms. The airside systems could accommodate heat recovery coils within the central plant, which would allow heat to be removed from the air after it has passed through the data storage rooms and before that air is either recirculated within the buildings or exhausted to atmosphere. This recovered heat could, in future, be made available for use outside the Installation boundary, subject to the delivery of suitable external district heating infrastructure.

Fingal County Council is currently proposing the Blanchardstown District Heating System (BDHS), which seeks to use low-temperature waste heat from the Installation. The proposed scheme would use a large-scale heat pump to supply space heating and hot water to nearby heat users, including a university campus, public hospital and national sports facilities campus in its first phase. ADSIL intends to supply recovered heat to the BDHS should the scheme proceed.

The Installation has been designed to facilitate future heat recovery and export where practicable, but any future connection would depend on the progression of the BDHS and the delivery of associated off-site infrastructure by Codema / Fingal County Council or others. The off-site district heating infrastructure does not form part of this Industrial Emissions Licence review application.

2.3.3 Office Air Conditioning

For both the existing and extended Installation, office air conditioning is provided by a Variable Refrigerant Flow (VRF) system which allows varying degrees of cooling across the office and support spaces thereby reducing energy consumption. High efficiency unit are used to minimise the electrical power demand. R410A and R32 refrigerants are used in these systems.

The fresh air ventilation system for the office areas of the buildings are served using energy efficient Heat Recovery Units (HRU) which recover waste heat from the office spaces and re-use to pre-heat the air with the HRU. This reduces the overall energy consumption for this system. The toilet areas are mechanically ventilated and automatically controlled by occupancy sensors to set back the ventilation rate during periods of non-use.

2.4 Site Utilities and Drainage Infrastructure

2.4.1 Electricity Supply and Substation

The power requirements for the Installation are provided via a direct connection the 220 kV Gas Insulated Switchgear (GIS) Substation Compound (known as Cruiserath), approved under ABP Planning Ref 306834-20. The substation is located within the footprint of the existing Installation (licensed under P1182-01), but lies outside the IEL boundary, as shown on Drawing 21_123H-CSE-00-XX-DR-C-0001.

Electricity supplied to the Installation is used to support IT load, mechanical and electrical plant, and general building services.

In addition to the mains connection, there is provision for an array of PV panels to generate on-site renewable energy on Buildings A, B, C, F and G.

2.4.2 Water Supply

Potable water is used for cleaning, drinking and sanitary facilities, cooling equipment, and for firefighting. The primary water demand is associated with cooling water for the data storage room cooling systems.

The Installation has two sources of water supply:

- ▶ Mains water supply provided by Uisce Éireann via a metered connection at the south-east of the site; and
- ▶ Rainwater harvesting systems, serving Buildings F and G.

The existing Installation requires an average demand of 1.0 litres/sec whilst peak water demand is 6 litres/sec. The extended Installation also requires an average demand of 1.0 litres/sec whilst peak water demand is 6 litres/sec., therefore a total average demand of 1.2 litres/sec and peak demand of 2.0 litres/sec. Where water demand is required during a short-term drought, additional supply can be provided from an alternative source such as tanker supply.

The demand for Buildings F and G's cooling requirements will be met in large part by rainwater from the rainwater harvesting system provided at each of these two buildings, fed by runoff from the buildings' roof areas.

2.4.2.1 Water Treatment

Potable water for domestic and staff use is supplied from the mains water network and is used directly without further treatment.

Cooling water for Buildings A, B and C is also supplied from the mains water network and is used in the evaporative cooling systems described in Section 4.3.2 of the Operational Report. Each of these buildings has a dedicated plant room where the cooling water is treated by 25 micron filtration and ultraviolet (UV) sterilisation to maintain microbiological quality within the cooling water storage tanks. No chemical additives, such as anti-corrosion agents or water softeners, are used for the evaporative cooling water serving Buildings A, B and C.

For Buildings F and G, cooling water is supplied primarily from rainwater harvesting systems, with mains water used for top-up where required. This water is also used in the evaporative cooling systems described in Section 4.3.2 of the Operational Report. Each building has a dedicated plant room where stored rainwater is treated by 25 micron filtration and UV sterilisation before use, to remove suspended solids and reduce microbial loading.

In addition, Buildings F and G will be provided with water oxidation systems for the rainwater harvesting tanks. These systems will generate sodium hypochlorite on site from sodium chloride through an electrolytic process, avoiding the need for bulk chemical storage. The systems will automatically monitor and adjust dosing to maintain a residual chlorine level for disinfection purposes within the cooling water storage tanks.

The water oxidation systems include pre-treatment water softeners, which periodically regenerate and produce a small intermittent brine discharge. This regeneration waste, comprising brine containing dissolved calcium, will be discharged to the foul sewer drainage system, as described in Section 7.2 of the Operational Report.

2.4.3 Storm Water Drainage System

Storm water management at the Installation has been designed by the project engineers in accordance with the requirements of FCC, the *Regional Code of Practice for Drainage Works*, and the *Greater Dublin Strategic Drainage Study*.

Sustainable Urban Drainage Systems (SUDs) have been incorporated into the drainage design for the Installation. The underground stormwater drainage network conveys runoff to a range of control measures prior to discharge. These include (where required) stormwater attenuation systems, and hydrocarbon interceptors, hydrodynamic solids separators, hydrobrakes, as appropriate to the drainage catchment. Areas of permeable paving are also provided on Site, including within car park areas. No potentially contaminating materials, including oil or diesel, are stored or handled in these areas.

Stormwater attenuation is provided across the Installation through a combination of online and offline attenuation basins. These systems have been designed to accommodate a 1-in-100-year storm event, including an additional 20% allowance for climate change. Under dry weather conditions, there is negligible retained water within the attenuation basins. All stormwater from the Installation is ultimately routed to a single off-site emission point, SW1, with monitoring undertaken at SW1-1 and SW1-2 upstream of the final discharge point.

Stormwater management is applied on a catchment-specific basis. Runoff from areas with a higher potential for contamination, such as roads, car parking areas and loading/unloading areas, is routed through hydrocarbon interceptors before discharge. Cleaner roof drainage is collected separately in some areas and does not pass through interceptors. Rainwater from the roof areas of Buildings F and G will also be collected for use in rainwater harvesting systems, with overflow directed to the stormwater network where there is no demand from the storage tanks.

The stormwater drainage system includes a number of pollution prevention and flow control measures. Hydrocarbon interceptors are provided to capture and retain hydrocarbons, such as diesel, HVO or lubricating oil, in the event of an accidental spill. These interceptors are fitted with alarms linked to the Building Management System / Electrical Power Monitoring System, alerting site personnel where high hydrocarbon, liquid or silt levels are detected. Hydrodynamic solids separators and trapped gullies are also provided to reduce the discharge of suspended solids and debris.

The post-development runoff rate from the Installation will remain in line with pre-development conditions and will not exceed the permitted greenfield runoff rate of 126.3 litres per second. Hydrobrakes are provided within the drainage network to control discharge rates, and manual shut-off valves are installed immediately upstream of the final stormwater outfall. These valves allow the discharge from the stormwater network to be isolated if required, for example in the event of a spill or firewater incident.

Attenuated stormwater discharges from the Installation at SW1 to the existing Fingal County Council stormwater network in the R121 Regional Road / Cruiserath Road. From there, flows are conveyed via the wider public stormwater network to the Ballycoolin Stream and subsequently to the River Tolka, which ultimately flows to the Tolka Estuary and Dublin Bay.

Rainwater collected within certain fuel top-up tank bunds and fuel unloading bays is also routed to the stormwater network via hydrocarbon interceptors. These areas include the fuel top-up tank and unloading bay west of Building B, the equivalent area west of Building F, and the unloading bay south of Building E. Each bund or unloading bay includes sump pumping systems designed to separate hydrocarbons from water. If hydrocarbons are detected, the pump shuts down and an alarm is raised, preventing contaminated water from entering the stormwater network.

Rainfall runoff from the MV Control Building and the Cruiserath 220 kV Substation building, including associated access roads, is also directed to the on-site stormwater drainage network. Runoff from the substation building roof, access roads and MV Control Building access roads is routed via hydrocarbon interceptor FRS3, while clean runoff from certain MV Control Building roof and paved areas is directed to the stormwater network without passing through an interceptor. The Cruiserath 220 kV Substation building is located outside the Applicant's IEL boundary.

Cooling wastewater from the evaporative cooling systems serving Buildings A, B and C also discharges to the on-site stormwater drainage network. This wastewater comprises recirculated mains water that has passed through the cooling plant. No water treatment chemicals are added to this cooling water, and further detail on the cooling systems and stormwater emissions is provided in Section 4.3.2 and Section 7.3 of the Operational Report. In accordance with Condition 3.17 of the existing licence, the Applicant will undertake a feasibility study to assess the potential diversion of evaporative cooling wastewater to sewer.

2.4.4 Wastewater (Sewer) Drainage System

The foul drainage network at the Installation has been designed in accordance with relevant wastewater and drainage guidance, including Uisce Éireann's Code of Practice for Wastewater Infrastructure and the National Building Regulations Technical Guidance Document H – Drainage and Waste Disposal. Wastewater from the Installation will ultimately discharge to the public foul sewer at Emission Point SE1 and will be conveyed for final treatment at Ringsend Wastewater Treatment Plant. A Services Connection Application has been made to Uisce Éireann, and the foul sewer connection is consistent with the relevant planning permissions for both the existing and extended Installation.

Domestic wastewater from the Installation buildings, including staff welfare facilities, and from the Cruiserath 220 kV Substation, will be collected through the on-site underground foul drainage network and discharged to the public foul sewer at SE1. Due to site levels, foul water from Buildings F and G will be collected in a pumping station to the east of Building G and pumped through the on-site drainage network before discharge to the public sewer.

Cooling-related wastewater from the extended Installation will also discharge to foul sewer. This includes evaporative cooling wastewater from Buildings F and G, and condensate and humidifier blowdown wastewater from Building E. Within each building, domestic wastewater and cooling / water treatment wastewater will be kept separate locally before combining downstream within the site-wide foul drainage network prior to discharge at SE1. Further information on the cooling systems is provided in Section 4.3.2 of the Operational Report, and further information on the quality of cooling wastewater is provided in Attachment-7-3-1-Emissions-to-Sewer.

Water treatment wastewater will also be generated from the water oxidation systems serving Buildings F and G. Further information on wastewater emissions to sewer is provided in Section 7.2 of the Operational Report.

In some areas of the Installation, stormwater is directed to the foul drainage network as a precautionary measure.

For the existing Installation, rainwater can enter the emergency back-up generator exhaust flues serving Buildings A, B and C. Drainage is provided at the base of these flues to prevent water accumulation and potential corrosion. Rainwater from Building A flues is directed to the foul network, while rainwater from Building B and C flues is routed via hydrocarbon interceptors FR3 and FR4 respectively to the storm water drainage network.

For the extended Installation, rainfall entering the generator exhaust stacks for Buildings E, F and G will be directed to storage containment, as described in Section 6.3.5 of the Operational Report.

3. BEST AVAILABLE TECHNIQUES ASSESSMENT

The consideration of BAT (Best Available Techniques) evaluates the Installation against the relevant European Commission documents that outline the effective and advanced techniques available for the specific industry or activity this includes consideration against the relevant industry commissioning implementing decision (CID) BAT conclusions documents and BAT reference documents (BREFs).

This consideration ensures that the proposed methods and technologies align with the best practices recommended for minimising environmental impact. The relevant industry or activity BAT are to the Installation are:

- ▶ Attachment-4-7-1-CID-Large Combustion Plants
- ▶ Attachment-4-7-2-BREF–Energy Efficiency
- ▶ Attachment-4-7-3-BREF-Emissions from Storage
- ▶ Attachment-4-7-4- BREF-Industrial Cooling Systems

The assessment against the BAT has demonstrated that the Installation will comply with all applicable BAT Conclusion requirements specified in the Commission Implementing Decision (CID) and will align with the guidance set out in other relevant BREF documents and national BAT notes.

4. RAW MATERIALS, ENERGY, AND WASTES

The operation of the facility will require the use of fuel, water, and electricity. The primary fuel used on site will be Hydrotreated Vegetable Oil (HVO).

Further details on raw materials, energy use and waste management are provided in Section 4 (Raw Materials, Water and Energy Usage) and Section 8 (Waste) of the application documentation, with supporting information contained in:

- ▶ Attachment-4-6-1 – Water and Energy Usage
- ▶ Attachment-4-6-2 – Raw Materials and Interim Products
- ▶ Attachment-8-1 – Waste Generated
- ▶ Attachment-8-2-1 – Waste Hierarchy

4.1.1 Raw Material and Energy Usage

The main raw material stored on site will be liquid fuel, consisting of Hydrotreated Vegetable Oil (HVO) and/or diesel. These fuels will be used to support the operation of the emergency back-up generators and fire sprinkler pumps. ADSIL intends to use HVO where feasible, as it has lower greenhouse gas emissions than conventional diesel; however, diesel may also be used where HVO supply is unavailable. HVO and diesel may be stored interchangeably in the same tanks, and the maximum storage quantities presented in the application represent alternative maximum scenarios rather than cumulative storage of both fuels.

The estimated maximum quantities of raw materials and energy to be used when the Installation is operational are shown in Table 3.1 below.

Table 3.1 Summary of the Estimated Future Resource Use

Resource	Estimated Maximum Quantity p.a.
Electricity (purchased) (max consumption)	1,924,572 MWh
Total Electricity (generated and used) (max consumption)	1,924,572 MWh
Electricity (generated and exported)	N/A
Natural Gas	N/A
Diesel (if only using Diesel) or	6,221.33 tonnes
HVO (if only using HVO)	5,742.77 tonnes
Water Usage (Mains)	6,420 m ³ /year
Water Usage (Rainwater Harvesting)	1,110 m ³ /year
Sodium Chloride (Salt)	3.65 t/year
Hydrogen Peroxide	<0.01 t/year
R32 Refrigerant / R410A Refrigerant	<0.1 t/year

4.1.1.1 Liquid Fuel Storage and Raw Materials

The Installation will store liquid fuel to support the operation of the emergency back-up generators and fire sprinkler pumps. The fuel will comprise Hydrotreated Vegetable Oil (HVO) and/or diesel. ADSIL intends to use HVO where feasible, as it provides lower greenhouse gas emissions than conventional diesel; however, diesel may be used where HVO supply is unavailable. HVO and diesel may be stored interchangeably in the same tanks, and the storage quantities presented in the application represent alternative maximum fuel storage scenarios, rather than the combined storage of both fuels at the same time.

Fuel will be stored in a combination of fuel top-up tanks, generator belly tanks, generator day tanks and fire sprinkler pump tanks. The total maximum fuel storage capacity is approximately 1,559 tonnes if stored

as diesel or 1,439 tonnes if stored as HVO, depending on the fuel type in use. The fuel storage arrangements are shown on Drawing 21_123H-CSE-00-XX-DR-C-0002.

Fuel usage has been assessed on a conservative worst-case basis for the purposes of the licence review application. This assumes the maximum operating scenarios for the emergency back-up generators, including emergency operation and testing. In practice, actual fuel use is expected to be significantly lower, as generator operation is generally limited to emergency events and necessary testing and maintenance. Based on historic operational data, predicted annual fuel usage is expected to be substantially below the conservative maximum scenario.

The fuel storage systems include a range of containment and control measures to minimise the risk of leaks or spills. Fuel top-up tanks are located within concrete bunds designed to contain at least 110% of the tank capacity, in accordance with EPA guidance. These tanks are fitted with automated level gauges and alarms connected to the Building Management System / Electrical Power Monitoring System. Fuel deliveries will take place in designated unloading bays under site procedures, and fuel pipelines will be integrity tested following installation.

Emergency generator belly tanks and day tanks are double-skinned, providing both primary and secondary containment. These tanks are fitted with leak detection systems and level alarms to alert site personnel in the event of a leak, overfill or sudden loss of fuel. Generator tanks are located on impermeable hardstanding, and the site drainage system includes hydrocarbon interceptors to retain any hydrocarbon runoff in the unlikely event of a spill. Fire sprinkler pump fuel tanks are also double-skinned and fitted with leak detection alarms. These tanks are located internally, reducing the risk of any fuel release entering the stormwater system.

Small quantities of other raw materials will also be used at the Installation. Sodium chloride, or common salt, will be used in the water oxidation system serving cooling water systems. Sodium hypochlorite will be generated on site from salt brine and used to maintain a low residual chlorine concentration in the cooling water tanks.

Cleaning of the water-based cooling systems with hydrogen peroxide solution is undertaken if positive legionella samples have been detected. There is no storage of hydrogen peroxide at the Installation; it is brought in and used only as needed.

Small quantities of refrigerants, including R410A and R32, will be held on site within sealed heating, ventilation and cooling systems. These refrigerants will remain contained within the systems during normal operation and will only be recovered during decommissioning or major servicing. Routine inspections and servicing will be undertaken by certified contractors in accordance with F-gas requirements.

Other ancillary materials, such as oils, paints, adhesives and similar maintenance materials, will be brought to site only as required and removed by contractors following completion of works. These materials will not be stored in significant quantities. Cleaning chemicals for staff welfare areas will be managed by the cleaning contractor. All chemical storage and handling will be managed through the site Environmental Management System, including appropriate procedures, training, emergency response measures and audits.

4.1.1.2 Fuel and Chemical Handling

Fuel delivery to the Installation will be a controlled activity carried out in accordance with the site Fuel Delivery Standard Operating Procedure. Fuel, comprising HVO and/or diesel, will be delivered by qualified personnel and unloading activities will be supervised. Fuel unloading will take place at designated unloading bays constructed on impermeable hardstanding surfaces, with spill response materials available at each location. Delivery volumes and unloading locations will be confirmed in advance by site personnel to ensure controlled and accurate fuel transfer.

Fuel unloading areas will include a number of built-in environmental protection measures. Refuelling cabinets will be fitted with drip trays to reduce the risk of spillage during hose connection and disconnection, and leak detection alarms will be provided where required. Fuel storage tanks will be fitted with level monitoring and high-level alarms to reduce the risk of overfilling during deliveries. Fuel top-up tanks will include high and low-level alarms, as well as high-high level alarms linked to the Building Management System / Electrical Power Monitoring System.

Fuel top-up tank bunds and unloading bays will be fitted with sump pumping systems designed to distinguish between water and hydrocarbons. Where only water is present, the sump pump can remove it from the bund. If hydrocarbons are detected, the pump will shut down and an alarm will be sent to the Building Management System, preventing potentially contaminated water from entering the drainage network. Hydrocarbon interceptors will also be provided at fuel unloading areas to contain hydrocarbon runoff in the unlikely event of a spill that cannot be contained at source.

The Installation will operate 24 hours a day, 7 days a week, with Engineering Operations Technicians available at all times to respond to alarms or incidents. Alarms associated with hydrocarbon interceptors, tank level monitoring systems or leak detection systems will be managed in accordance with the site alarm response procedures described in Section 8.2 of the Operational Report.

Spill prevention and response procedures will also be in place. These procedures form part of the site Emergency Response Procedure and Accident Prevention Procedure. Spill kits will be located across the Installation in visible and accessible locations and will include absorbent materials and personal protective equipment. Staff will be trained in spill response, Standard Operating Procedures and emergency procedures relevant to the storage and handling of substances used at the Installation.

4.1.1.3 Control of Major Accident Hazards

The Installation has been assessed against the requirements of the Control of Major Accident Hazards Regulations. These Regulations set threshold quantities for certain dangerous substances, including petroleum products such as diesel. The lower-tier threshold for diesel under the Regulations is 2,500 tonnes.

The maximum quantity of diesel that may be stored at the Installation at any one time is below the lower-tier COMAH threshold. On this basis, the Installation does not qualify as a COMAH establishment.

HVO also differs from conventional diesel in terms of its environmental and flammability hazard profile. Diesel is derived from crude oil and is subject to COMAH as a petroleum product. HVO is derived from renewable or waste-based feedstocks, has a lower carbon footprint and is not considered a COMAH substance due to the absence of the relevant COMAH hazard classifications.

4.1.2 Waste Generation and Management

The installation is not expected to generate significant volumes of waste during operational activities. The majority of waste generated at the Installation will be classified as non-hazardous. Key non-hazardous waste streams include: Dry Mixed Recyclables (DMR), Mixed Municipal Waste (MMW), Food Waste, Confidential Waste, and Metals. Hazardous waste generated will primarily result from planned maintenance activities and will be managed directly by maintenance contractors.

Waste types, identified and classified in accordance with the European List of Waste (LoW) codes, are detailed in Attachment 8.1. The quantities presented in Attachment 8-1 are anticipated only; the quantities will be recorded and advised to the Environmental Protection Agency (EPA) each year as part of the Annual Environmental Report (AER) for the installation.

Waste generation at the Installation is limited in scale and arises primarily from ancillary operational activities, rather than from any industrial or manufacturing process. The Installation does not involve

production activities that generate significant waste streams. Instead, waste is generated through routine site operation, occupancy, and maintenance activities.

All waste materials will be segregated into appropriate categories and will be stored in appropriate bins or other suitable receptacles in designated, easily accessible areas of the Installation. Refer to Drawing 21_123H-CSE-00-XX-DR-C-0002 for waste storage locations.

Most of the wastes generated at the Installation are non-hazardous. Waste operations involve proper segregation and management of waste.

Table 4.1 Summary of Waste Generated

European Waste Catalogue Code	Description of Waste	Estimated Tonnes/Year
20 01 01 / 20 01 39	Dry mixed recyclables	29.39
15 01 01	Cardboard packaging	30.94
20 03 01	Mixed municipal waste	13.51
20 01 08	Biodegradable kitchen and canteen waste	1.48
20 03 07	Wood / pallets from deliveries	19.83
20 01 02	Glass from canteens	Very low quantities
08 03 15	Waste printer cartridges / toners	<1
15 02 03	Air filters, evaporative media, containment curtains and other non-hazardous filter materials	c. 1.00
15 02 02*	Absorbents / materials from minor spills	0.59
15 02 02*	Other filters containing hazardous substances	0.84
13 05 07*	Oily water from oil / water separators	34.24
15 01 10*	Packaging contaminated by product residues	3.65
16 10 01*	Aqueous waste / hazardous liquid waste	1.86
20 01 39	Other clean plastic material, excluding packaging	c. 0.10
16 02 14	Non-hazardous electronic equipment	29.46
20 03 07	Bulky non-hazardous waste, e.g. broken office equipment	54.57
20 01 36	Miscellaneous non-hazardous electrical and electronic equipment	c. 10.00
20 01 40	Metals, including copper, steel and aluminium	c. 5.00
16 06 05	Lithium batteries	0.21
16 06 01*	Lead acid sealed batteries	c. 0.25
16 06 04	Alkaline batteries	<0.01

5. EMISSIONS SOURCES AND ABATEMENT TREATMENT SYSTEMS

The application documentation (Section 7) sets out provides a comprehensive overview of the emissions generated by the Installation, the likely impact of those emissions, as well as any measures in place to control and monitor these emissions.

5.1 Air Emissions to Air

5.1.1 Emissions

Emissions to Atmosphere refers to the release of gases, particles, or other substances into the air from the facility. The proposed installation will generate electricity through combustion processes, that will results in emissions to atmosphere. This generation achieved through the MFGP, which consists of dual-fuel engines capable of operating on natural gas as the primary fuel, with liquid fuel (hydrotreated vegetable oil or diesel) available as a secondary fuel. In addition, the installation includes a number of emergency generators and smaller combustion units such as fire pumps and a life-safety generator.

The main substances released to atmosphere are:

- ▶ Nitrogen oxides (NO_x)
- ▶ Carbon monoxide (CO)
- ▶ Particulate matter (PM₁₀, PM_{2.5})
- ▶ Sulphur dioxide (SO₂)

AWN conducted air emissions modelling for the Site to evaluate concentrations of nitrogen dioxide (NO₂), carbon monoxide (CO), particulate matter (PM₁₀ and PM_{2.5}), and sulphur dioxide (SO₂) at multiple locations beyond the Site boundary. This assessment considered both the Site's emissions alone and in combination with emissions from other nearby facilities holding Industrial Emissions licences or planning permissions. The modelling results demonstrate that predicted ambient ground-level concentrations of all pollutants comply with the applicable air quality standards under all operational scenarios assessed, as detailed in Attachment 7-1-3-2 – Air Emissions Impact.

The air assessment has also considered the impact on habitat requirements at ecological receptors.

Full details of the air emission points, including coordinates and descriptions, are provided in Attachment-7-4-1–Emissions to Air Main and Fugitive and in Attachment-7-4-2–Emissions to Air Minor and Potential (refer to Drawings 25_059-CSE-00-XX-DR-C-005). Table 5-1 provides the air emissions to air from the Installation:

Table 5-1: Summary of Emissions to Air

Emissions Type	Emission Points	Emission Source
Minor emission to Atmosphere	A3-1 to A3-22	Building A - Emergency Generator
	A3-23 and A3-24	Building A - Fire Sprinkler Pump
	A3-25	Building B - Emergency Administration Generator
	A3-26 to A3-47	Building B - Emergency Generator
	A3-48	Building C - Emergency Administration Generator
	A3-49 to A3-70	Building C - Emergency Generator
	A3-71	Building E - Emergency Generator
	A3-72 to A3-89	Building F - Emergency Generator
	A3-90	Building F - Emergency Administration Generator
	A3-91 to A3-108	Building G - Emergency Generator

	A3-109	Building G - Emergency Administration Generator
Potential emission to Atmosphere	A4-1	Top up Fuel Tank Breathing Vent 1 - (Bulk Tank 40 m3)
	A4-2	Top up Fuel Tank Breathing Vent 2 - (Bulk Tank 40 m3)
	A4-3 to A4-70	Belly Fuel Tank Breathing Vent
	A4-71	Top up Fuel Tank Breathing Vent 3 - (Bulk Tank 40 m3)
	A4-72 to A4-110	Belly Fuel Tank Breathing Vent

5.1.2 Treatment and Abatement Systems

Minor Emissions to Atmosphere

There are no abatement or treatment systems proposed or required for the individual emergency generators (Minor Emission Points A3-1 to A3-22, and A3-25 to A3-109) due to their limited annual operating time.

The stack heights for the emergency back-up generators have been designed to ensure that an adequate height was selected to aid dispersion of the emissions and achieve compliance with the ambient air quality standards at all off-site locations (including background concentrations).

There are no abatement or treatment systems proposed or required for the fire sprinkler pumps (A3-23 to A3-24) due to their limited size and limited operational requirements

Potential Emissions to Atmosphere

The tank breathing vents (A4-1 to A4-110) associated with fuel storage tanks are pressure relief systems designed to prevent over-pressurisation. Emissions from these vents are intermittent and arise primarily during tank filling operations. Given the low vapour pressure of the stored fuels (diesel and/or HVO), vapour generation is limited and associated emissions are minor in nature.

5.1.3 Control and Monitoring

Monitoring of emissions from the emergency generators (A3-1 to A3-22, and A3-25 to A3-109) are proposed to be undertaken for Nitrogen oxides (as NO₂), Oxides of sulphur (SO₂), Carbon monoxide (CO), Dust, and Flow. The objective is to undertake monitoring at least once every five years or when three times the permitted maximum annual operating hours have elapsed, where the relevant plant is operating under conditions suitable for emissions measurement.

The emergency back-up generator operating hours are recorded on the Enterprise Asset Management System (EAM).

There are no control or monitoring systems proposed or required for the Fire Sprinkler Pumps (A3-23 and A3-24). These combustion plant at the installation are below 1 MW_{th} and no monitoring or emission limit values are required.

5.1.4 Assessment of Impact

Air dispersion modelling of operational stage emissions from the dual-fuel engines and operations of the emergency generators, was carried out in line with the requirements of the *Industrial Emissions Directive (IED) (Directive 2010/75/EU)* and the *Commission Implementing Decision (EU) 2021/2326 establishing the BAT conclusions for large combustion plants* was using the United States Environmental Protection

Agency's regulated model AERMOD. This assessment is included as Attachment-7-1-3-2–Air Emissions Impact Assessment of the IEL application.

The modelling of air emissions from the site was carried out to assess concentrations of nitrogen dioxide (NO₂), carbon monoxide (CO), particulate matter (PM₁₀ and PM_{2.5}) and sulphur dioxide (SO₂) at a variety of locations beyond the site boundary. The results of the modelling assessment indicate that ambient ground level pollutant concentrations are in compliance with the relevant air quality standards for NO₂, CO, PM₁₀, PM_{2.5} and SO₂ for the Installation Operations scenario and Cumulative Operations scenario.

The impact of emissions of NO_x, SO₂ and nitrogen and acid deposition from the Installation on European habitat sites and nationally designated habitat sites within the model study area have been modelled. The modelling assessment determined that emissions of NO_x, SO₂ and nitrogen and acid deposition from the Installation, in terms of Process Contributions, are in compliance with the relevant critical levels and critical loads for the sensitive habitats in the ecologically sensitive areas within the relevant European site assessed indicating that emissions from the Installation are not predicted to significantly impact sensitive ecology.

In summary, emissions to atmosphere from the Installation will be in compliance with the ambient air quality standards which are based on the protection of the environment and human health. Therefore, no significant impacts to the ambient air quality environment are predicted.

5.2 Wastewater Emissions

5.2.1 Emissions

The wastewater from the Installation comprises:

- ▶ Domestic effluent arising from occupation of the Installation buildings, and from the Cruiserath 220kV substation;
- ▶ Cooling wastewater from the evaporative cooling plant in Buildings F and G, and condensate and humidifier blowdown wastewater from Building E;
- ▶ Brine discharge from the water oxidation system for the rainwater harvesting tanks (Buildings F and G) (small amounts);
- ▶ Storm water (in certain areas of the Installation, storm water is directed to the foul water drainage network for some identified higher-risk areas, including fuel handling areas and transformer compounds, where there is potential for hydrocarbon contamination);
- ▶ Rainwater from certain areas of the Site, including: rainwater that collect within the fuel top-up tank bund and fuel unloading bay at Building A; and rainwater entering transformer bunds; rainwater entering generator exhaust flues for Buildings A, B and C.

The Installation will include one primary emission to the sewer, SE1. Wastewater will be treated off-site at the Ringsend WWTP (Reg No. D0034-02). Emissions to sewer are described in Attachment 7-3-1 and Equivalent Protection Sewer Attachment 7-3-2.

5.2.2 Treatment and Abatement Systems

There is no requirement for onsite treatment or abatement of domestic foul water or cooling/water treatment wastewater from the Installation. This will be treated offsite at the Ringsend WWTP. There are no food preparation areas within the data storage facility buildings.

There is no requirement for onsite treatment or abatement of cooling / water treatment wastewater from the Installation. This will be treated offsite at the Ringsend WWTP.

The storm water collected and discharged to foul sewer from the Installation is expected to be of a clean discharge quality. The storm water emission to sewer is maintained in a clean condition through the

following abatement/treatment systems, in combination with site management procedures. More detail is provided in Attachment-4-8-1 of the Licence application.

The fuel top-up tank bund and fuel unloading bay for Building A have sumps with pumping systems that discriminate between hydrocarbons and water. The sump pump activates as required to remove only water from the bund, when hydrocarbons are detected the sump pump shuts down, preventing any contaminated discharge to the drainage network.

Wastewater will be treated off-site at the Ringsend WWTP.

5.2.3 Control and Monitoring

No control or monitoring is proposed for domestic wastewater emissions.

For process wastewater from Buildings E, F and G, monitoring will be carried out at 3 no. locations, one monitoring point at each of the buildings, prior to mixing with onsite domestic wastewater. The emission point and the monitoring points are shown on Drawing 21_123H -CSE-00-XX-DR-C-1200 included with this licence application.

5.2.4 Assessment of Impact

Uisce Éireann is the statutory authority responsible for the provision of public water and wastewater services in Ireland, including the determination of connection feasibility and available capacity in the wastewater network. This role is established under the Water Services (No. 2) Act 2013, which transferred responsibility for public water services from local authorities to Uisce Éireann (formerly Irish Water). Under Section 7 of the Act, Uisce Éireann is designated as the national water services authority.

The existing Installation has a valid connection to the public foul sewer network and has been in operation since 2020 under the existing Industrial Emissions Licence. Foul water generated from the Installation is currently discharged to the municipal network and conveyed for treatment at the Ringsend Wastewater Treatment Plant (WWTP).

A wastewater connection application for the extended Installation has been submitted to Uisce Éireann (Application Ref.: CDS2200401101), and this lodged application forms the basis for increase in emissions to sewer from the extended Installation.

Ringsend WWTP operates under an Industrial Emissions Licence issued by the Environmental Protection Agency (EPA) (Licence Reg. No. D0034-02). In fulfilling its functions, Uisce Éireann is required to operate the facility within the conditions set out in this regulatory framework. This includes compliance with discharge limits, monitoring requirements, and environmental protection standards to ensure the safe and effective treatment of emission to foul sewer while minimising impacts on the receiving environment.

Uisce Éireann is the definitive authority in relation to wastewater capacity and feasibility. Accordingly, reliance on Uisce Éireann's assessment and subsequent connection offer, informed by Application Ref. CDS2200401101, is both appropriate and consistent with national legislation, providing assurance that foul water emissions from the development will be effectively managed and will not result in significant impacts on the receiving environment.

Taking into account the nature of the discharge, the presence of hydrocarbon interceptors at potential risk areas, the treatment at Ringsend WWTP, the on-site monitoring of the wastewater, and that foul water discharges from the Installation represent a negligible percentage of the overall influent volumes at Ringsend WWTP, it is considered that the emissions will not have a significant effect on the environment in the vicinity of the Ringsend WWTP discharge in the Liffey Estuary Lower and Dublin Bay and eventually the Irish Sea, into which it flows.

5.3 Storm Water Emissions

5.3.1 Emissions

Storm water from the Site comprises:

- ▶ Rainwater from impermeable areas of the Site (including buildings, roads, carparking areas and other hard standing areas);
- ▶ Rainwater from the fuel top-up tank bunds and fuel unloading bays (with the exception of Building A, which drains to foul sewer);
- ▶ Rainfall runoff from the MV control building and Cruiserath substation building; and
- ▶ Cooling wastewater from Buildings A, B and C.

The storm water emission point is shown on Drawing 21_123H-CSE-00-XX-DR -C-1100. There are no direct discharges to surface water, and no planned discharges of contaminated waters.

5.3.2 Treatment and Abatement Systems

The storm water emissions from the Installation are expected to be of a clean discharge quality. Storm water is maintained in a clean condition through the following abatement/treatment systems, in combination with site management procedures:

- ▶ The storm water from the Installation is attenuated prior to outfall, within the attenuation basins located on the Site as shown on Drawing 21_123H -CSE-00-XX-DR-C-1100.
- ▶ Class 1 hydrocarbon interceptors installed to capture hydrocarbons before off-site discharge. Locations of these are shown on Drawing Ref. 21_123H-00-XX-DR-C-1100.
- ▶ Hydrocarbon Interceptors are fitted with an alarm system. The alarm is installed, tested, commissioned and regularly serviced by a qualified technician. The hydrocarbon interceptors are equipped with level detection sensors which sends an alarm signal to the BMS/EPMS to alert Engineering Operations Technicians (EOTs) to warn of high hydrocarbon, liquid and silt levels in the interceptor.
- ▶ Hydrocarbon Interceptors are maintained and cleaned out (if required) every 6 months in accordance with manufacturers guidelines. Oil and hydrocarbon residues captured in the hydrocarbon interceptors on the underground drainage system are retained within the interceptor tanks until removed by a qualified specialist contractor as a waste. Integrity testing will be carried out periodically in accordance with EPA guidance to confirm the structural integrity and leak-tightness.
- ▶ Fuel top-up tank bunds and unloading bays that connect to storm water are equipped with a pumping system that discriminates between hydrocarbons and water. The sump pumps activate as required to remove only clean water from the bund; while retaining any hydrocarbons within the sumps. This ensures that only stormwater is removed from the bund and discharged to the storm water network.
- ▶ Trapped gullies will be utilised in all storm water systems to the road, turning bays and carpark infrastructure so that sediment pollution to the local watercourses is minimised.
- ▶ A standard operating procedure (SOP) for fuel unloading is in place at the Site to reduce the risk of spills and an on-site Emergency Response Plan (ERP) is in place, and spill kits are maintained at all storage areas.
- ▶ Housekeeping measures will be enforced to ensure that spill-prone areas are kept clean and free from potential contaminants. Regular inspections and maintenance will be conducted to prevent leaks or spills, in addition to regular inspections and maintenance of the hydrocarbon interceptor to ensure its proper functioning.

There is no further requirement for additional on-site treatment of storm water from the Site.

5.3.3 Control and Monitoring

Storm water network controls include:

- ▶ Flow restriction using manual shutoff valves to maintain discharges at greenfield QBAR rates.
- ▶ Manual shut off valves will be installed at the Installation to allow the outfall of the storm water network to be closed off to prevent storm water discharge in the event of the spill or fire.

No online monitoring is proposed for the storm water discharge. Storm water monitoring takes place at the existing Installation and will continue to be carried out for the overall Installation, once extended (refer to Attachment 7-7-Storm Water Discharges). This includes:

- ▶ Weekly monitoring for pH, Conductivity, Temperature and Total Organic Carbon (TOC);
- ▶ Daily visual inspections for discolouration and odour; and
- ▶ Monitoring is undertaken upstream of the stormwater discharge point at Monitoring Points SW1-1 and SW1-2.

Due to the limited storage of bulk chemicals (diesel or HVO fuel only) on site, and the abatement measures outlined above it is considered that no further control or monitoring are required for storm water.

5.3.4 Assessment of Impact

There is an indirect discharge to surface water via the off-site storm sewer, which subsequently discharges to the Ballycoolin Stream. However, a number of mitigations, controls, and secondary containment measures are in place to prevent discharge of contaminants off site. The Installation will not have a noticeable impact on the surface water of the receiving environment.

Given the nature of the runoff, the embedded design and operational controls, and the low contaminant potential of cooling wastewater, stormwater discharges are not expected to contain more than trace levels of hydrocarbons or metals. There is a negligible risk of Principle Pollution Substances, Priority Substances or Priority Hazardous Substances (main polluting substances (as defined in the Schedule of EPA (Licensing)(Amendment) Regulations 2004, S.I. No. 394 of 2004) being discharged from the Installation above the limits outlined in the Surface Waters Regulations (S.I. No. 272 of 2009) via the storm water network due to the controls and procedures in place to prevent and minimise spills, and the hydrocarbon interceptors within the storm water infrastructure.

The assimilative capacity assessment (Appendix A to Attachment 7-1-3-2) demonstrates that cooling wastewater discharges do not materially affect the receiving waterbody.

On this basis, and taking into account the standard design and operational controls in place, the Installation will not have a noticeable impact on the quality or water body status of the receiving surface water bodies.

5.4 Emissions to Ground

There are no emissions to ground from the Installation.

5.5 Noise Emissions

5.5.1 Emissions

The operational Installation includes various sources that contribute to outward noise emissions. The primary sources of outward noise have been identified as follows:

- ▶ Building service plant which will be required to service the data storage facility buildings (i.e. the AHU air intake and the AHU air exhaust);
- ▶ Emergency back-up generators during testing and emergency scenarios (i.e. generator air intake, generator air exhaust and generator engine exhaust); and
- ▶ Emergency back-up generators: during emergency situations or power outages, they will operate to provide power to the data centre facility buildings.

The Installation operates on a 24-hour basis; however, noise emissions vary depending on plant duty, system load, and operational conditions. An assessment of the worst-case noise emission impacts has been conducted. The results of the noise impact assessment are detailed in Attachment-7-1-3-2-Noise Impact Assessment. This document provides the findings of the assessment, including predictions of noise levels at various locations around the Installation during worst case operational scenarios.

5.5.2 Treatment and Abatement Systems

The Installation plant items (equipment and machinery) have been carefully selected to meet specific noise level requirements. This means selecting machinery and devices that inherently produce lower noise levels during their operation. By incorporating low noise equipment, the overall noise impact of the plant is reduced. The main objective is to ensure that the noise generated by the Installation during its operations remains within acceptable limits.

The mitigation measures to attenuate noise sources are as follows:

- ▶ Emergency Generators: Each generator is enclosed within an acoustic container designed to effectively dampen the noise produced during operation and attenuate the intake and ventilation outlets;
- ▶ The generator yards are surrounded by an acoustic barrier 6 m in height;
- ▶ Low-noise condensers have been selected on Building E;
- ▶ Extract Fans at roof top level have acoustic attenuators incorporated into each unit;
- ▶ Data Room (Hall) intake louvres along the north and south elevations of Buildings F and G have acoustic attenuators to reduce noise from the AHUs within and to reduce noise breakout from the data rooms:
 - 700 mm long acoustic attenuators along the north side of Buildings F and G, and
 - 900 mm long acoustic attenuators along the south side of Buildings F and G.

5.5.3 Control And Monitoring

Annual day time, evening and night-time monitoring is currently carried out for the existing Installation, and is undertaken in accordance with standard IE licence requirements. Proposed monitoring locations are set out in Attachment-7-5.

This monitoring will continue to be undertaken for the overall Installation (including the extended Installation).

Running of the generators during emergencies will be managed through a Noise Management Plan (NMP). The standard noise conditions and limit values during day to day operation based on the day, evening, night criteria will continue to apply.

5.5.4 Assessment of Impact

Baseline noise levels for Noise Sensitive Locations (NSLs) have been derived from noise surveys carried out prior any construction works on the Site. For normal operations including generator testing, the operational noise emission limits applied to the existing IED Licence have been used in this assessment report. Running of the generators during emergencies will be managed through a Noise Management Plan (NMP). The standard noise conditions during normal day to day operations and limit values based on the day, evening, night criteria will continue to apply.

A noise model has been prepared using proprietary DGMR iNoise modelling software in accordance with the calculation method outlined in ISO 9613-2:2024 to determine predicted operational noise levels at the nearest NSLs. The calculated noise levels are based on conservative assumptions reflecting worst-case continuous operation scenarios, and include previously licenced Buildings A, B and C, along with the new Buildings E, F and G.

The predicted noise levels at all NSLs are below the relevant day, evening and night-time noise criteria derived for the Site operations in line with the EPA's NG4 (2016) document. All plant items will be maintained and managed such that no clearly audible tonal or impulsive characteristics occur at noise-sensitive locations.

Where any unforeseen substantial variation in noise emission levels occurs post-installation, additional noise control measures such as attenuator systems will be employed where necessary to ensure ongoing compliance with the required noise criteria set out in this report or defined in the Licence issued to the operator.

5.6 Greenhouse Gas Emissions

5.6.1 Emissions

The indirect (electricity-related) and direct (fuel-related) annual CO₂e emissions associated with operation of the Installation under this Licence Review have been estimated below on a worst-case basis.

The projected carbon intensity of grid electricity for the period 2027 to 2032 is presented in Table .

Table 5-2 Projected Carbon Intensity of Electricity From 2027 - 2032

Year	Predicted Electricity ^{Note (a)} (g CO₂ / kWh)
2027	172.7
2028	160.1
2029	147.6
2030	135.0
2031	128.3
2032	121.5

a. Based on the SEAI¹ carbon intensity of 197.8 g CO₂ / kWh in 2025 and assuming linear interpolation to 135 g CO₂ / kWh by 2030 and net zero by 2050. The 2030 target is equivalent to reaching 68.3% renewable electricity by 2030 as outlined by the EPA (EPA, 2025) whilst net zero is the 2050 target as outlined in CAP25.

Greenhouse gas emissions associated with diesel fuel use at the Installation have been calculated using published Sustainable Energy Authority of Ireland (SEAI) emission factors, reproduced in Table 5-3.

Table 5-3 Emission factors for CO₂ produced from combustion of Liquid fuels

Liquid	gCO₂/kWh	gCO₂/MJ	kgCO₂/kg	kgCO₂/l
Diesel / gasoil (100% petroleum)	263.9	73.30	3.174	2.682

Based on the projected 2027 opening-year electricity mix, and including direct emissions from emergency generator operation, the estimated total direct and indirect greenhouse gas emissions is approximately 349,325.5 tonnes CO₂e per annum for the Installation, once extended.

5.6.2 Treatment and Abatement Systems

The following climate mitigation measures are in place for the Installation, addressing both direct (fuel-related) and indirect (electricity-related) greenhouse gas emissions. Full details of the mitigations are provided in Appendix A to this report (including the statement regarding compliance with Section 15 of the Climate Action and Low Carbon Development Act 2015, as amended). A summary of the key measures is provided below.

Direct Emissions Mitigation:

¹ SEAI Emissions Factors for Electricity: <https://www.seai.ie/data-and-insights/seai-statistics/conversion-factors>

- ▶ Emergency back-up generators are designed to operate on Hydrotreated Vegetable Oil (HVO), a renewable diesel alternative certified under the Renewable Energy Directive. Where available, this fuel provides a lower lifecycle GHG intensity than conventional diesel.
- ▶ The use of HVO will be subject to supply availability and sourced from suppliers providing Proof of Sustainability (PoS) under recognised RED certification schemes.
- ▶ The limited operational hours of emergency generators further restrict direct emissions associated with fuel combustion.
- ▶ The Installation will operate under a Greenhouse Gas (GHG) Permit within the EU Emissions Trading System (EU ETS).

Indirect Emissions Mitigation:

- ▶ On-site renewable energy generation is provided via rooftop photovoltaic (PV) arrays to offset a portion of site electrical demand.
- ▶ The Installation will be supported by Corporate Power Purchase Agreements (cPPAs)
- ▶ The Installation is designed to achieve high energy efficiency, including low Power Usage Effectiveness (PUE) and Water Usage Effectiveness (WUE), minimising electricity demand.
- ▶ Efficient cooling design maximises the use of free cooling (ambient air), reducing reliance on mechanical and adiabatic systems.
- ▶ Building Management System (BMS) controls optimise plant performance, including fan and pump speeds, to ensure operation at minimum energy demand.
- ▶ High-efficiency EC direct drive fans and optimised mechanical systems are used throughout the Installation.
- ▶ Energy-efficient LED lighting with appropriate controls further reduces electricity consumption.
- ▶ Indirect emissions associated with electricity consumption are accounted for under the EU ETS at the point of generation and will reduce in line with the decarbonisation of the national grid.
- ▶ The Installation includes provision for future district heating / waste heat reuse, allowing potential off-site utilisation of waste heat and improving overall energy efficiency.
- ▶ Implementation of rainwater harvesting systems (Buildings F and G) to supply non-potable cooling water, significantly reducing reliance on mains water and associated embodied energy.

5.6.3 Control And Monitoring

Under the Greenhouse Gas (GHG) Permit the operator will be required to report annually all direct CO₂ emissions from the Installation and to surrender EU allowances to cover the emissions of the previous calendar year. Fuel usage will be metered and recorded for all relevant combustion plant, and this data will form the basis of GHG reporting and verification.

The annual operating hours of the emergency generation plant will be restricted as per Licence conditions.

Energy usage will be reported to the EPA as part of the Annual Environmental Report, along with Environmental Performance Reporting as required by the IE Licence. These reports are made publicly available.

The potential release of fluorinated greenhouse gases are controlled under the F Regulation (EU) No. 517/2014 on fluorinated greenhouse gases. The Installation will implement appropriate management procedures to ensure compliance, including periodic leak testing of relevant equipment, prompt repair of any detected leaks, and proper record maintenance.

6. MANAGEMENT AND PROCESS CONTROL SYSTEMS

6.1 Environmental Management Systems

An Environmental Management System (EMS) has been developed for the Installation in accordance with the requirements of BAT. The EMS is certified by ISO14001. This EMS will be updated to incorporate the extended Installation and associated ancillary development.

6.2 Building Management System and Electrical Power Monitoring System

The installation operates a Building Management System (BMS) and an Electrical Power Management System (EPMS) for control and monitoring, data collection and alarm/reporting of the air handling systems and mechanical utility systems site wide. Specifically, this includes the cooling systems, electrical supply, emergency back-up generators, water supply, fire alarms, fire detection and suppression systems and fuel use.

The BMS/EPMS ensures the Installation is running an optimal efficiency and will alert the operators in the event of a malfunction through the use of visual and audible alarms. This includes malfunctions of the top-up fuel tank level indications and of the hydrocarbon interceptors, and any fuel bund or tank leaks.

6.3 Preventative Maintenance

Preventative Maintenance (PM) is undertaken on mechanical moving parts equipment and electrical equipment including pumps, AHUs, humidifiers, generators, power transformers, etc. This maintenance includes all the regular and systematic tasks that ADSIL will carry out to ensure that the equipment is in an acceptable working condition, delivering required performance and expected durability.

A Preventative Maintenance Plan, developed before commissioning of equipment, includes all the operations to be carried out in detail, as well as the means to be used and the estimated duration of the operations. The plan also includes periodic assessments of the state of the Installation and proposals for improvement. In addition to the PM, regular inspections are undertaken of all infrastructure onsite. The twice a shift inspection of infrastructure ensures that any issues are dealt with if they arise.

6.4 Emergency Response Procedure

An on-site Emergency Response Plan (ERP) has been developed for the Installation. It includes any requirements of the existing Installation, and will be updated to incorporate the extended Installation and any future development. The ERP details the required actions to be undertaken in the event of an incident on site and will cover all possible emergency scenarios including fires, explosions, natural disasters, chemical spills, terrorism, etc. The ERP also includes the arrangements for contacting the emergency services and the relevant ADSIL personnel. The ERP is reviewed regularly by the Regional Environmental Manager and Regional Safety Manager and is updated as required.

It should be noted that the installation operates 24/7, 365 days a year. There is therefore no additional specific procedure required for emergencies outside normal working hours.

6.5 Standard Operating Procedures

Standard Operating Procedures (SOPs) have been developed for ADSIL sites and these will be continuously updated in conjunction with the EMS. The SOPs address all the relevant environmental matters onsite including, but not limited to:

- ▶ Spill prevention and response procedures,
- ▶ Pollution management and prevention,
- ▶ Waste Management,
- ▶ Fuel delivery,
- ▶ Emergency electricity supply and changeover procedures.

These SOPs are integral to ensuring consistent environmental compliance and operational best practices across the facility.

6.6 Energy Management

Energy management forms an integral part of the Installation's management and the Site is ISO50001 certified. Measures are in place to minimise energy use as far as possible. ADSIL is committed to continually improving their energy efficiency and reducing their carbon footprint.

The Energy Efficiency Management System (EnEMS) for the Site in accordance with BAT will set out the energy targets for the Installation on an annual basis along with the responsible party; and targets will be assessed at the end of each year and reported in the Annual Environmental Report (AER) for the Installation. Energy efficiency learnings are shared between similar facilities in Ireland and Europe.

6.7 Fire Management

Buildings are provided with fire detection, alarm, and fire suppression systems to enhance life safety/ protection of occupants and property in compliance with Irish, EU and NFPA regulations (insurers' requirements).

The fire detection and alarm systems and the fire protection systems are maintained, inspected and tested by an approved external service provider on a regular basis.

7. CESSATION OF ACTIVITY

7.1 Site Closure

A certain amount of environmental risk is associated with the cessation of any licensable activity (site closure). An outline Site Closure report has been provided with this application (Attachment-9-2-3-Site Closure). Details outlined in the Site Closure Plan include the following:

- ▶ Decommissioning of equipment will involve disconnecting all electrical connections and decommissioning the IT Hardware, the generators, the transformers, and all other relevant operational equipment at the installation,
- ▶ The generators, transformers, servers, and other equipment will be removed and sold to a third party or scrapped depending on the age/condition at the time of closure,
- ▶ Hazardous materials stored in chem-stores, raw materials in the operations area, and any other materials on site will either be returned to the suppliers or disposed of as hazardous waste by a suitable waste contractor; and
- ▶ All non-hazardous waste will be sent for appropriate recycling, recovery, treatment, or disposal.

7.2 Baseline Report

A Complete Baseline Report (Attachment 4-8-3 Complete Baseline Report) for the site has been produced and included in Section 4 of this application. The complete baseline report provides conditions of the site prior as it existed prior to the construction and operation of the Installation. There is no evidence of any historical soil contamination.

8. ALTERNATIVES

8.1 Process Alternatives

In terms of technology, the Installation employs similar data server technology that is used by the Operator at their other facilities, in the greater Dublin area and around the world, and represents state of the art technology. Alternative technologies are considered on an ongoing basis by the Operator as a part of each of its designs based on many factors including technical feasibility, environmental impact, efficiency, security, reliability, and cost.

The Operator is committed to continually assessing and improving this technology particularly with respect to minimising power and water consumption, in accordance with the goals of Irelands Framework for Sustainable Development 'Our Sustainable Future'. The operator's designs are constantly evolving, and hardware is chosen with energy efficiency central to the decision-making process.

8.2 Alternative Mitigation Measures

The Environmental Impact Assessment Reports (EIARs) relating to this activity, prepared by AWN Consulting et. al. dated May 2019 and December 2022, which have been previously submitted to FCC and ABP and have been submitted to the Agency as part of this application (Attachment 6-3-6 of this application).

The mitigation measures proposed are outlined in the EIARs completed for the Installation at planning phase (operational phase and construction phase). These represent the best practice for achieving minimal impact on the receiving environment. The mitigation measures for the environmental aspects considered under this IE licence review application (if relevant) are set out in the accompanying emissions impact assessment reports within Section 7 of this licence application.