ARUP

Amazon Data Services Ireland Limited

DUB159 IE Licence Application

Attachment 4-8-1 Operational Report

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1. Site Overview

1.1 Introduction

Amazon Data Services Ireland Limited (ADSIL) (‘*the Applicant’*) is applying to the Environmental Protection Agency (‘*the Agency’*) for an Industrial Emissions (IE) Licence for its data storage facility (hereafter referred to as the ‘*Installation’*) located at Data Centre Building B1, Kildare Innovation Campus (KIC), Barnhall Road, Leixlip, County Kildare, Ireland.

The Installation site boundary covers an area of c. 3.645 hectares (ha) in total and sits within the wider KIC Masterplan site, which was granted planning permission in January 2024 under Kildare County Council (KCC) Planning Ref. 23/60047. An Environmental Impact Assessment Report (EIAR) and Appropriate Assessment (AA) Screening Report were prepared as part of this planning application and have been submitted with this IE Licence application, refer to Attachment 6-3-6 and Attachment 6-2-1 respectively.

ADSIL holds a long-term lease that concerns lands within the IE licence boundary, which sits within the northwest corner of the KIC Masterplan site. The proposed IE licence relates only to the area concerning the Installation, as shown in Figure 1. The remaining areas within the KIC Masterplan site are controlled by the KIC Masterplan site owner, hereafter referred to as *“the Landowner”*.

This Operational Report relates to the activities taking place at the Installation. The relevant requirement for an IE Licence is outlined within the First Schedule of the EPA Act 1992:

‘*Class 2.1 Combustion of fuels in installations with a total rated thermal input of 50 MW or more*’.

The combined thermal input of the Installation is 110.75 megawatt thermal (MW_{th}), this exceeds the 50 MW_{th} threshold of Class 2.1 First Schedule of the EPA Act 1992. The Applicant is applying to the EPA for an IE Licence principally relating to the operation of emergency generators under Activity Class 2.1. HVO, where supply is available, will be the preferred source of fuel for the operation of the emergency generators at the Installation. Where insufficient quantities of HVO are available, a blend of diesel and HVO will be supplied to the generators, and in the absence of HVO, diesel will be supplied to the generators. Where a blend of HVO and diesel is supplied to the generators, the ratio of HVO : diesel supplied will vary with the availability of HVO.

The Installation will comprise 1 no. single-storey data storage facility building (Data Centre Building B1) with associated office block and ancillary elements. The ancillary elements of the Installation will include: logistics and fuel unloading bays, maintenance and storage spaces, associated water tanks, sprinkler tanks, fire sprinkler pump house, electrical rooms, security and utility spaces, internal road network, underground foul and stormwater drainage networks. The Installation site layout and main building are shown in Figure 1.

The Installation will require a continuous supply of electricity to operate. During normal operation, the Installation will be supplied electricity from the national grid. Outside of normal operations, the Installation will first be supplied electricity by an uninterruptible power supply (UPS) which will provide temporary power for a limited time while the generators start up, to allow the generators to activate without losing power to the data halls and then by some or all of the onsite emergency generators. Outside of routine testing and maintenance, the operation of these emergency generators will typically only be required under the following emergency circumstances:

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

The Installation once fully operational will have installed a total of 14 no. 7.65 MW_{th} critical emergency generators; 1 no. 2.50 MW_{th} house emergency generator; and 2 no. 0.57 MW_{th} diesel-powered fire sprinkler pumps.

Operational hours are expected to be 24 hours a day, 7 days a week.

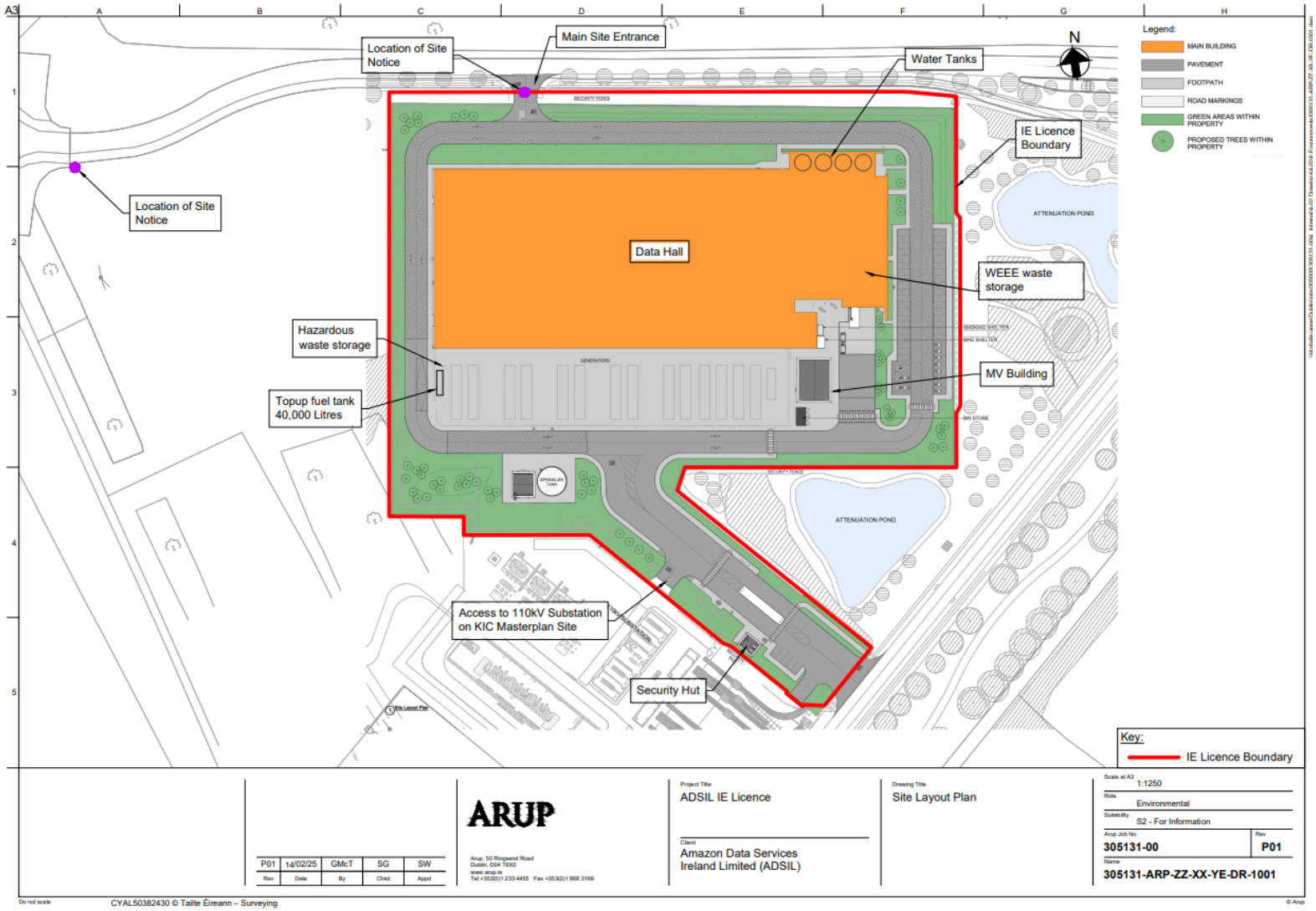

Figure 1: Site Layout with IE Licence boundary indicated by the red line | Not to scale | Arup ©

1.2 Scope of Industrial Emissions Licence

The IE Licence application relates to the operation of 1 no. data storage facility (termed Data Centre Building B1) operated by ADSIL. Although the proposed licence activity is taking place within the KIC Masterplan site, the scope of the licence application relates specifically to industrial emissions activities taking place at Data Centre Building B1, located within the KIC Masterplan site. The Installation site boundary and where it sits within the KIC Masterplan is outlined in Figure 2.

The remaining elements of the KIC Masterplan, such as the Deep Technology Buildings, Energy Centre and other Data Centre Buildings lie outside of the scope of this IE licence application and will operate independently of the Installation.

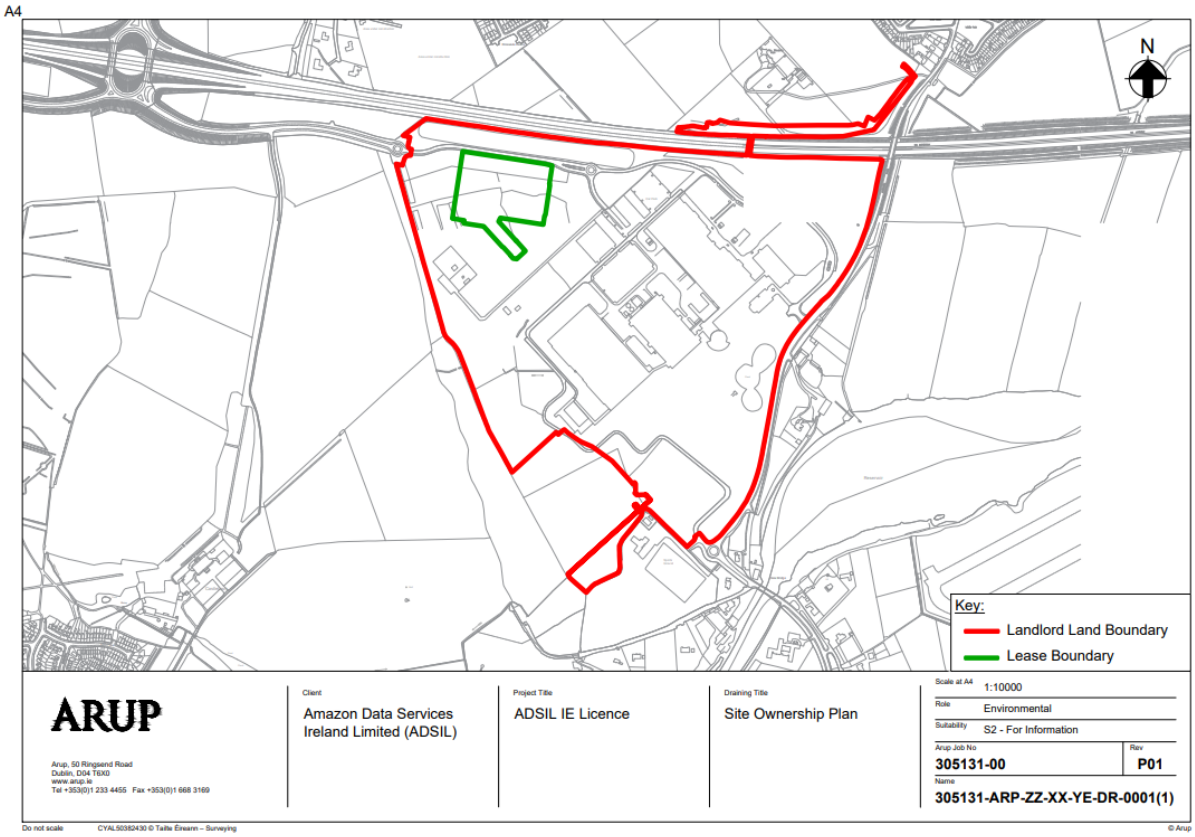

Figure 2: Outline of the proposed IE licence boundary (green) within KIC Masterplan site (red) (Drawing no. 305131-ARP-ZZ-XX-YE-DR-0001(1) Site Ownership Plan | Arup ©)

1.3 Overview of the Proposed Development

The Installation will include the operation of 1 no. Data Centre Building B1 (c.15 m in height to parapet and c. 13.6m overall building height). Data Centre Building B1 will be provided with Solar PV panels at roof level and living walls along selected elevations.

The Installation will consist of a data hall, admin blocks (comprising offices, breakroom, logistics and fuel unloading bays, storage, and ancillary areas) and a variety of mechanical and electrical plant areas/structures including battery storage rooms and mechanical rooms. Car parking, access roads, security fencing/gates, gate houses and landscaping will also be provided. Additionally, the Installation will include 14 no. 7.65 megawatt thermal (MW_{th}) critical emergency generators, 1 no. 2.50 MW_{th} house emergency generator, 2 no. 0.57 MW_{th} fire sprinkler pumps, MV rooms and associated mechanical flues (each c.18m high).

The combined thermal input of the Installation is 110.75 MW_{th}. The Installation will be supported by a dedicated electrical plant room, which will provide the necessary power to ensure Data Centre Building B1 operates optimally at all times.

The Installation will have a ground floor area (gfa) of 12,925m^2. The internal area of the building will include a series of rooms as required by the end user. An admin area will be provided in the building. The Installation will be finished with a mix of insulated metal cladding (mixed tones) and a living wall. The office component will be fully integrated in terms or circulation and design and will be finished with a glazed curtain wall and external feature metal sunshades. The office will include an open plan office as well as a reception area, kitchenette/break room and changing room/showers.

Car parking areas will be provided adjacent to Data Centre Building B1 and provide a total of 48 no. car spaces. Vehicle access will be provided via a gated access from the internal campus road. An emergency fire tender access will be provided via the campus road for Data Centre Building B1.

The use of the 14 no. critical emergency generators and 1 no. house emergency generator will only occur in the event of loss of utility power to the Installation. The generators are designed to automatically activate and provide power pending restoration of the primary power supply to the Installation. An uninterruptible power source or UPS system will also be provided for the short-term transition from mains power to the emergency generators. Fuel for the generators will be stored within the respective fuel storage tanks of each generator.

ADSIL is committed to using HVO (where available) as the fuel source for the emergency generators. Significant environmental benefits will be achieved through the use of HVO, as it is a renewable diesel that operates as a direct replacement for conventional diesel, and is made from renewable, sustainable raw materials which do not release any new CO_2 into the atmosphere.

Based on experience, that the emergency generators will be rarely used. They will be tested periodically to maintain operational readiness.

Bulk fuel will be stored onsite in a double skinned top up tank with a capacity of 40,000 litres. This tank will be filled to 90% capacity under normal conditions; therefore, the tank will store approximately 36,000 litres of fuel. Fuel stored in the top up tank will feed into the fuel storage tanks of each generator.

Bulk fuel will be stored onsite for use in 15 no. double-skinned belly tanks associated with each of the 14 no. critical and 1 no. house emergency generators, which will be filled centrally from the onsite top up tank. Each belly tank associated with the 14 no. critical emergency generators will have the capacity to store 19.6 m^3 of fuel and the belly tank associated with the 1 no. house emergency generator will have the capacity to store 6.2 m^3 of fuel.

HVO, where supply is available, will be the preferred source of fuel for the operation of the emergency generators at the Installation. Where insufficient quantities of HVO are available, a blend of diesel and HVO will be supplied to the storage tanks, and in the absence of HVO, diesel will be supplied to the storage tanks. Where HVO and diesel are blended in fuel storage tanks, the ratio of HVO : diesel in the fuel tanks will vary with the availability of HVO.

In a best case scenario, a total of 268.2 tonnes of HVO (at a density of 0.846 kg/L for HVO) will be stored onsite across the top up tank, critical emergency generator belly tanks and house emergency generator belly tanks. And, in a worst case scenario, a total of 272.6 tonnes of diesel (at a density of 0.86 kg/L for diesel) will be stored onsite across the top up tank, critical emergency generator belly tanks and house emergency generator belly tanks. In reality, diesel and HVO will be blended in the fuel tanks and the ratio of HVO : diesel in the tanks will vary depending on the availability of HVO.

0.8 tonnes of diesel will be stored onsite within the 2 no. double skinned fuel storage tanks associated with each of the diesel-powered sprinkler pumps. Each tank will have a 500 litre capacity and will be filled to 90% capacity under normal conditions.

The server systems and the supporting infrastructure will be monitored by site staff and faults identified and remedied, as required. Staff will primarily be required onsite for security, ongoing monitoring, and maintenance of plant and equipment. Once operational, approximately 50 no. full time employees will be present on site daily, in total, for the Installation, including external staff, maintenance contractors and visitors, as required. The number of external staff, maintenance contractors and visitors will typically be approximately 50 no. staff per day. Staff will be present on a shift basis, so numbers will vary throughout the day with up to approximately 7 no. staff on night shifts each day.

An Operational Waste Management Plan (OWMP) will be developed prior to commencement for the waste anticipated to be generated during the operational phase of the Installation. The plan will seek to ensure the Installation contributes to the targets outlined in the National Waste Management Plan for a Circular Economy 2024 - 2030[1]. Refer to Chapter 12 (Waste) of the Environmental Impact Assessment Report (EIAR) submitted as part of the KIC Masterplan site planning application (KCC Planning Ref. 23/60047) for further detail.

1.4 Development Phasing

Construction of the Installation has begun and is expected to be completed by mid-2026. The entire KIC Masterplan site development is anticipated to be fully completed by 2035.

2. Site Context

The Installation is located within the KIC Masterplan site area, which sits on the site of the former Hewlett Packard (HP) Campus originally permitted under KCC Planning Ref. 95/923 at Barnhall Road, Leixlip, County Kildare, W23 X93P. The IE licence for the HP site has since been surrendered (IE Licence No. P0195-02) and full site closure and decommissioning commitments have been completed.

The KIC Masterplan site is principally bounded by the M4 Motorway (and Barnhall Meadows and Wonderful Barn lands) to the north; Celbridge Road to the east; Barnhall Rugby Football Club and recently completed DB Schenker logistics facility to the south; and by grounds associated with Castletown House to the west. Landcover within the KIC Masterplan site is zoned as '*industrial and commercial units*' and '*agricultural areas'* under the EPA Corine landcover mapping.

The surrounding uses are chiefly enterprise and employment, infrastructural / transport, agricultural, cultural, recreational, and residential. The nearest sensitive receptors are new housing estates c. 150m across the M4 Motorway to the north of the KIC Masterplan site including Barnhall Meadows, which were constructed in phases between 2019 and 2022. There are also a number of private residences on the opposite side of Celbridge Road to the west. The KIC Masterplan site is currently accessed from Barnhall Road to the west and Celbridge Road (R404) to the east and has proximate connections to the M4, accessed through Barnhall Road. A third access point to the campus is provided off the roundabout on Celbridge Road and currently provides access to DB Schenker.

The Installation site will be a total of c. 3.645 ha and will be located within the northwest corner the KIC Masterplan site. The Installation location and wider context is presented in Figure 3.

[1] National Waste Management Plan for a Circular Economy 2024 – 2030 National Waste Management Plan for a Circular Economy 2024-2030 - My Waste

Figure 3: Installation Site Location | Not to scale | Google Earth ©

3. Planning Status

3.1 Kildare Innovation Centre (KIC) Masterplan

Under the Planning and Development Act 2000, as amended, the Davy Platform ICAV on behalf of Liffey Sub Fund, sought planning permission from KCC for the development of the KIC Masterplan site at Barnhall Road, County Kildare (KCC Planning. Ref 23/60047). The construction of 4 no. data centres, 2 no. deep tech buildings and 1 no. energy centre building is proposed as part of the KIC Masterplan site. This IE licence application relates to the operation of one of these data centres (termed 'Data Centre Building B1'), granted under the KIC Masterplan site development, and operated by ADSIL. The Installation site will be located within the northwest corner of the KIC Masterplan site.

Full details of planning applications relating to the KIC Masterplan site, which includes the Installation site, and stakeholder engagement are included under Section 6 of this IE licence application. Additionally, Information on the EIAR prepared for the KIC Masterplan site, which includes the Installation site, is contained within Section 6 of this IE licence application.

3.2 Project Threshold and Planning

Ireland's list of Project for which an Environmental Impact Assessment (EIA) is required are set out Part 1 and Part 2 of Schedule 5 of the Planning and Development Regulations 2001-2018. This list was developed from Annex I and Annex II of the EIA Directive. The proposed activity at the KIC Masterplan site, which includes the Installation site, is not directly listed under Annex I of the EIA Directive, or Part 1, Schedule 5, or Part 2, Schedule 5.

The most relevant development class in the context of the KIC Masterplan site under Part 2, Schedule 5 is Class 10 (b) iv:

> *"Urban development which would involve an area greater than 2 hectares in the case of a business district, 10 hectares in the case of the parts of a built-up area and* ***20 hectares elsewhere."***

The KIC Masterplan site is not within a business district or a built-up area and has a total site area of c. 73.95 hectares. As such, the KIC Masterplan site exceeds the limit, quantity or threshold set out in Part 2, Schedule 5, Class 10 (b) iv. Therefore, an Environmental Impact Assessment Report (EIAR) for the KIC Masterplan site was required and submitted as part of the planning application for KIC Masterplan site Development.

An EIAR relating to this activity was prepared by Tom Phillips + Associates (July 2023) as part of the planning application for the KIC Masterplan site. This EIAR for the KIC Masterplan site was previously submitted to KCC (KCC Planning Ref. 23/60047) and is included with this IE Licence application (Attachment-6-3-6-EIAR-Planning-July-2023-(Volumes 1 & 3), Attachment-6-3-6-EIAR-Planning-July-2023-(Volume 2 part 1), Attachment-6-3-6-EIAR-Planning-July-2023-(Volume 2 part 2), Attachment-6-3-6-EIAR-Planning-July-2023-(Volume 2 part 3), Attachment-6-3-6-EIAR-Planning-July-2023-(Volume 2 part 4), and Attachment-6-3-6-EIAR-Planning-July-2023-(Volume 2 part 5)).

Further information on planning is included in Attachment 6-1-3 Planning Evidence Report and 6-1-3 Planning Evidence Table.

The Installation will be operated in accordance with KCC Planning Ref. 23/60047, therefore the EIAR (Attachment-6-3-6-EIAR-Planning- July-2023) is relevant to this IE Licence application activity.

The proposed IE licence seeks permission to carry out the following activity as listed under 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*'.

The Installation will include 14 no. 7.65 MW_{th} critical emergency generators; 1 no. 2.50 MWth house emergency generator; and 2 no. 0.57 MWth fire sprinkler pumps. The combined thermal input (total capacity) of the Installation is 110.75 MW_{th}. This exceeds the 50MW_{th} threshold of Class 2.1 First Schedule of the EPA Act 1992. ADSIL is, therefore, applying to the EPA for an IE Licence principally relating to the operation of powered emergency generators under Activity Class 2.1.

The Installation will comprise 1 no. data centre facility (Data Centre Building B1) and is committed to using HVO. Where insufficient quantities of HVO are available, a blend of diesel and HVO will be supplied to the generators, and in the absence of HVO, diesel will be supplied to the generators. Where a blend of HVO and diesel is supplied to the generators, the ratio of HVO : diesel supplied will vary with the availability of HVO. HVO is a renewable diesel that operates as a direct replacement for conventional diesel, and is made from renewable and sustainable raw materials which do not release any new CO_2 into the atmosphere.

4. Description of Activity

4.1 Site Overview

The Installation will consist of 1 no. single storey data centre building (Data Centre Building B1) with facilities including: data storage rooms, electrical and mechanical plant rooms and support areas including offices and welfare facilities, logistics and fuel unloading bays, emergency generators with emission stacks, water storage tanks, and mechanical plant at roof level.

The Installation will generally consist of the following primary aspects:

- Data Storage Rooms housing IT electrical equipment.
- Internal and External Air Handling Unit (AHU) Plant Rooms to house the equipment required to maintain the temperature, humidity, and power supply for the Installation.
- Administration areas (office space, meeting rooms, welfare facilities etc.).

- Emergency generators (and associated emissions stacks/flues).
- Fuel storage tanks associated with each emergency generator.
- Fuel top up storage tank.
- Rainwater storage tanks.
- Logistics and fuel delivery unloading bays and associated infrastructure.

Data Centre Building B1 (12,925m^2) will comprise of electrical rooms for electronic operations, logistics unloading bay, stores, office, and staff facilities. The Installation will be single storey with a single data hall. The Installation will include an external generator yard, a mechanical plant, a service and technical space around each data hall with a logistics delivery bay attached to the east of the data centre block. The external generator yard will comprise of 14 no. 7.65 MW_{th} critical emergency generators and 1 no. 2.50 MW_{th} house emergency generator with associated fuel storage tanks. Additionally, the generator yard will include a fuel unloading area and a fuel top up storage tank.

In addition to the 1 no. data centre building, the Installation will include:

- A firewater sprinkler pump house compound with 2 no. 0.57 MW_{th} diesel-powered fire sprinkler pumps, 2 no. 500 litre diesel storage tanks (filled to 90% capacity under normal conditions);
- A firewater storage tank, adjacent to the sprinkler pump house;
- Internal site road network, and car parking;
- Underground foul and stormwater drainage network; and
- Underground water supply network.

The overall combined services layout plan drawing is submitted as part of Section 3 of this IE licence application and outlines the site services within the IE licence boundary, including underground foul and stormwater drainage network and internal road network. Refer to all site plan drawings for further information.

4.2 Primary Processes / Activities

4.2.1 Data Storage Building

Data storage facilities are centralised computer server systems on a large scale, typically involving systemised racks of hundreds/thousands of server units. They offer significant advantages (and economies of scale) over traditional in-house data storage systems. The primary advantages are:

- Higher reliability and redundancy of systems;
- 24/7 monitoring and maintenance of storage by staff;
- Higher security and data protection; and
- Flexibility – ability to increase or decrease storage requirements at short notice in line with specific business needs.

The demand for cloud computing and data storage continues to be high and the Installation is intended to help meet this need.

The Installation will operate using electricity available from the 110kV substations situated within the KIC Masterplan site area, outside of the IE licence boundary.

4.2.2 Emergency Generators

The Installation will require a continuous supply of electricity to operate. During normal operations, the Installation will be supplied electricity from the national grid. Outside of normal operations, Installation will first be supplied electricity by an uninterruptible power supply (UPS) which will provide temporary power

for a limited time while the generators start up, to allow the generators to activate without losing power to the data halls and then by some or all of the onsite emergency generators. Outside of routine testing and maintenance, the operation of these emergency generators will typically only required under the following emergency circumstances:

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

The Installation will be supported by emergency generators that will be located in the generator compound. HVO is the preferred fuel source for the emergency generators onsite, where available. Where insufficient quantities of HVO are available, a blend of diesel and HVO will be supplied to the generators and in the absence of HVO, diesel will be supplied to the generators. These emergency generators will provide the necessary power to ensure the data centre building will continue to operate in the event of a temporary failure of electricity supply. An uninterruptible power source or UPS system will also be provided for the short-term transition from mains power to the emergency generators.

The use of emergency generators will only take place in the event of loss of utility power to the Installation site. Should this occur, 12 no. critical emergency generators will be in use at any one time, and the remaining 2 no. critical emergency generators will be used as "catcher" generators. The use of generators is only anticipated to occur in the unlikely event of a loss of utility power to the Data Centre Building B1. ADSIL estimates, based on experience, that the standby generators will rarely be used.

Fuel will be stored onsite in a top up tank with a useable volume of 36,000 Litres will be used to store fuel onsite. In a best case scenario, where sufficient HVO quantities are available to support the Installation, 30.46 tonnes of HVO (at a density of 0.846 kg/L for HVO) will be stored in the top up tank. In a worst case scenario, where only diesel fuel is used to support the Installation, 30.96 tonnes of diesel (at a density of 0.86 kg/L for diesel) will be stored in the top up tank. HVO will be used where supply is available, otherwise a blend of diesel and HVO will be supplied to the tank. In the absence of HVO, diesel will be supplied to the tank.

Fuel will also be stored onsite for use in 15 no. double-skinned belly tanks associated with each of the 14 no. critical and 1 no. house emergency generators, which will be filled centrally from the onsite top up tank. The belly tanks associated with the 14 no. critical emergency generators have the capacity to store 19.6 m^3 of fuel and the belly tank associated with the 1 no. house emergency generator has the capacity to store 6.2 m^3 of fuel.

HVO, where supply is available, will be the preferred source of fuel for the operation of the emergency generators at the Installation. Where insufficient quantities of HVO are available, a blend of diesel and HVO will be supplied to the tanks, and in the absence of HVO, diesel will be supplied to the tanks. Where HVO and diesel are blended in fuel storage tanks, the ratio of HVO : diesel in the fuel tanks will vary with the availability of HVO.

900 Litres of diesel will be stored onsite within the 2 no. double skinned fuel storage tanks associated with the diesel-powered fire sprinkler pumps. These tanks have a 500 litre capacity each and will be filled to 90% capacity under normal conditions.

The storage capacities and details of each type of generator are outlined in Table 1.

Table 1. Overview of generator storage capacities at the Installation

Generator Type	Storage of HVO / Diesel (Litres)	Storage of HVO (Tonnes)[Note 1]	Storage of Diesel (Tonnes)[Note 2]
14 no. Critical Emergency Generators	274,736	232.43 tonnes at a density of 0.846 kg/L for HVO	236.27 tonnes at a density of 0.86 kg/L for diesel

Generator Type	Storage of HVO / Diesel (Litres)	Storage of HVO (Tonnes)[Note 1]	Storage of Diesel (Tonnes)[Note 2]
1 no. House Emergency Generator	6,221	5.26 tonnes at a density of 0.846 kg/L for HVO	5.35 tonnes at a density of 0.86 kg/L for diesel
2 no. Fire sprinkler pump generators [Note 3]	900		0.77 tonnes at a density of 0.86 kg/L for diesel

Note 1: This value represents the total storage volume of HVO that may be stored onsite across the emergency generator belly tanks in a best case scenario where only HVO is stored onsite.

Note 2: This value represents the total storage volume of Diesel that may be stored onsite across the emergency generator belly tanks and the sprinkler pump fuel storage tanks in a worst case scenario where no HVO is available and only Diesel is stored onsite.

Note 3: The fire sprinkler pump generators are diesel powered and will not use HVO in any circumstance. This value represents the total storage volume of Diesel stored onsite for use in the fire sprinkler pump generators.

Fuel will be stored locally in the double skinned belly tanks at each emergency generator and the top up tank located within the generator yard. The individual emergency generators will be housed within containers with various acoustic designed control measures in place including acoustic attenuation and exhaust silencers.

The containerised emergency generator housing will include leak detection systems. Should hydrocarbon be detected in the base of the housing containers, the system will send an alarm signal to the Building Management System (BMS) to alert the onsite Engineering Operations Technicians (EOTs). The onboard controller for individual emergency generators will be connected to the BMS.

The individual fuel storage tanks associated with the varying types of generators and top up tank have level gauges (high and low) connected to an onboard controller which will alarm to the BMS to prevent overfilling and identify a sudden loss of fuel within the tank.

4.3 Secondary Processes / Activities

4.3.1 Ancillary Infrastructure

The Installation will be supported by a dedicated electrical plant room, which will provide the necessary power to ensure the Data Centre Building B1 will operate optimally at all times.

In the event that there is a loss of utility power to the Installation, emergency generators will be provided to maintain power at critical loads. The emergency generators will be designed to automatically activate and provide power pending restoration of the primary power supply to the Installation site. An uninterruptible power source or UPS system will be used for the short-term transition from mains power to generator power.

There will be integrated administration areas associated with the data centre building comprising of:

- Reception areas;
- Open office areas, and conference rooms / meeting rooms;
- Maintenance and storage spaces; and
- Break room and sanitary facilities.

Additional ancillary infrastructure will include:

- Underground foul and storm water drainage network;
- Utility ducts and cables;
- Internal road network and 48 no car parking spaces; and
- security fencing.

4.3.2 Data Hall Cooling Systems

The location of the Installation in Ireland allows for the use of free-cooling media without the need for mechanical cooling. To take advantage of this, the air handling equipment will be fitted with airside condensers to utilise outdoor air to cool the space.

The cooling units or AHUs will provide conditioned air to maintain temperature, relative humidity and pressurisation in the data halls. The cooling units will operate under 2 modes; Free Cooling and Evaporative Cooling: Free Cooling will use outside air and Evaporative Cooling mode or 'Adiabatic Cooling' will use water from the mains supply as the cooling media. Duty and standby units will be in place to ensure cooling is available at all times.

During the warmest periods of the year (at temperatures exceeding 24 degrees Celsius) evaporative cooling systems (integrated into the AHUs) have been incorporated into the design. These systems will be required very infrequently and when used will use primarily recycled rainwater.

The Installation will be designed to use humidifiers and air conditioning systems to maintain the relative humidity and temperature in the internal building space during high temperature days. However, when weather conditions are acceptable for the internal building, fresh air will be directly supplied to reduce both energy and water consumption.

If the relative humidity in the building drops below the minimum required for the electrical equipment, humidifiers will provide moisture to the makeup air. Potable water will be used to supply the humidifiers and is recycled at least 3 times. Any water remaining within the humidifiers will drain to an attenuation tray and then to the foul water system. The humidification process will be non-contact and chemical-free, thus the water discharged will be free of contamination and organics.

When ambient temperature exceeds the allowable internal space temperature, air conditioning systems in the admin area will mechanically reject heat from the space. During this process, condensed water may collect in the air conditioning systems and will drain to the foul water network. There will be no significant contaminants in the air conditioning condensate, as this is purely condensed moisture. During normal operations, the cooling system process will not use any water and will not produce condensation discharge during normal operation.

4.3.3 Office Space Air Conditioning

Office air conditioning will be provided by a Variable Refrigerant Flow (VRF) system which will allow varying degrees of cooling across the office and support spaces thereby reducing energy consumption. High efficiency unit will be used to minimise the electrical power demand.

The fresh air ventilation system for the office areas of the Installation will be served using energy efficient Heat Recovery Units (HRUs) which will recover waste heat from the office spaces and re-use to pre-heat the air with the HRU.

This will reduce the overall energy consumption for this system. The toilet areas will be mechanically ventilated and automatically controlled by occupancy sensors to set back the ventilation rate during periods of non-use.

4.3.4 Waste Heat Recovery

The data storage rooms will be supplied with fresh air which will be sufficient to cool the space for the majority of the annual running hours. For a small number of hours during the peak cooling season, adiabatic cooling will be required. Adiabatic cooling uses rainwater as primarily supply and mains water utility as a back-up at ambient temperature conditions to provide cooling on peak cooling days.

The system will not require chillers/compressors which minimises the use of electrical power to maintain the data storage room environmental conditions. The rainwater harvesting will be utilised from the roof of the Installation throughout the year for the water to be available during those hottest periods during summer months when adiabatic cooling may be needed.

The cooling system design for the Installation can accommodate the future installation of a waste heat recovery system. If incorporated, the heat recovery system would remove heat from the air after it passes

through the data storage rooms to a hydraulic (water) pipe network, before the air is re-introduced to the data storage room or exhausted to the atmosphere.

The heat recovery system could generate hydraulic temperatures of between 20-30°C at the point of recovery.

The above provision could supply heat energy to a future district heating scheme developed by others external to the Installation site boundary. It should be noted that in order to benefit from the above heat recovery that district heating infrastructure external to the Installation site including plate heat exchangers, pumps and distribution networks would need to be developed by others. A suitable receiver of waste heat from the Installation site is not currently available and therefore this is not included in the licence application.

4.3.5 Electricity Supply and 110kV Substation

The development of the KIC Masterplan site will occur in three phases and a connection agreement to supply Phase 1 of the development is currently in place with Eirgrid.

Phase 1 of the KIC Masterplan site development will include the replacement of the existing substation with a 110 kV Gas Insulated Switchgear (GIS) Substation Compound and the construction of the Installation. The power requirements for the Installation will be provided via a direct connection the 110 kV GIS Substation Compound located south of the IE licence site boundary within the KIC Masterplan site area.

To facilitate Phase 3 of the KIC Masterplan site development, the existing overhead lines (OHLs) from the 110kV GIS Substation will be uprated. Once uprated, the new OHLs will allow the substation to provide 170 MW of electricity to the KIC Masterplan site, including the Installation site.

During Phase 1, the 110 kV GIS substation will operate 24/7, 365 days per year and will provide c. 16MW of electricity to the Installation. Following the uprating of the OHLs, during Phase 3 of the KIC Masterplan site development, the energy usage of the Installation will ramp up to 32 MW.

This GIS substation development and associated uprating lies outside of the IE Licence site boundary and outside of the scope of the proposed IE licence activities.

4.3.6 Solar PV Panels

The KIC Masterplan site will include the installation of an array of photovoltaic panels on the roof of buildings, including Data Centre Building B1. The array of photovoltaic panels for Data Centre Building B1 will consist of 180 no. modules yielding a total peak power generated of 72 kWp to offset lighting and electrical power requirements during the peak summer months for the administration section of the Installation.

4.3.7 Thermal Bridging

To avoid excessive heat losses and the risk of local condensation problems, reasonable care will be taken to ensure continuity of insulation and to limit local thermal bridging, e.g., around windows, doors and other wall openings, at junctions between elements and other locations. In general, thermal bridges should not pose a risk of surface or interstitial condensation which can lead to mould growth.

The key factor used in assessing the risk of mould growth or surface condensation in the vicinity of thermal bridges is the temperature factor (fRsi). To limit the risk of surface condensation or mould growth, fRsi will be greater than or equal to a critical value (fCRsi); dependent upon the internal and external environments and applies generally to the whole of the internal surface.

Additional heat loss associated with thermal bridges is accounted for in calculating energy use and CO_2 emissions using the Non-Domestic Energy Assessment Procedure (NEAP) methodology via linear thermal transmittance (ψ, Psi-value).

4.3.8 HVAC Systems

Full mechanical Heating, Ventilation and Air Conditioning (HVAC) systems will be utilised in the data centre due to the high occupancy levels and deep floor plates which means that a natural ventilation strategy will not be feasible. However, the mechanical HVAC strategy will be to minimise energy associated with

space conditioning through the use of high efficiency systems, heat recovery and the efficient control of both ventilation rates and of heating and / or cooling supply.

Variable Refrigerant Flow (VRF) Systems

Variable Refrigerant Flow (VRF) or Variable Refrigerant Volume (VRV) (depending on manufacturer) is an air source heat pump that increases operational efficiency by modulation of cooling capacity at room/zone level. The basic idea is that a large outdoor unit serves multiple indoor units connected by refrigerant pipework. Each indoor unit controls its refrigerant supply to match the demand of the space it serves. The outdoor unit also varies its output to match the communal demands of all the indoor units served by it. Thus, at any point in a system there will be a variable volume of refrigerant flowing.

The most sophisticated VRF systems can have indoor units, served by a single outdoor unit, in both heating and cooling modes simultaneously. This mixed mode operation leads to energy savings as both ends of the thermodynamic cycle are delivering useful heat exchange. It should be noted that this perfect balance of heating and cooling demand is unlikely to occur for many hours each year, but whenever mixed mode is used, energy is saved. Where deep floor plans are present, it is possible that internal units could be in cooling mode and perimeter units in heating mode which would allow for mixed mode operation and very high COPs. Units are now available to deliver heat removed from space cooling into hot water for domestic hot water.

VRF/VRV systems can be linked to other renewable sources of energy such as water based geothermal, solar thermal or solar PV. Typical VRF manufacturers state a cooling SEER of 6.0-8.0 and a heating Seasonal COP of 5.0-6.0 when installed in an office environment located in Ireland. The VRF efficiencies contribute to meet the renewable target in Part L as well as the energy performance coefficient (EPC).

Air Handling Units (AHU)

The administration office area associated with the Installation will be provided with fresh outdoor air via a Dedicated Outdoor Air System (DOAS). This AHU will have two stage heat recovery using a thermal wheel and an integrated heat pump.

Thermal wheel technology offers heat recovery between two air streams. A thermal wheel, also known as a ‘rotary’ or ‘regenerative’ heat exchanger, is a system of heat transfer which involves a single rotating wheel with high thermal capacity located within the supply and exhaust air streams of an AHU. Its rotation allows the recovery of sensible and latent energy from air that would otherwise be lost to the atmosphere. This energy is used to pre-heat (or cool) the incoming fresh air.

The Installation will take the heat recovery thermal wheel technology a step further by gaining further heat recovery using an integrated heat pump. These AHU will combine thermal wheel technology with an air-to-air packaged heat pump. This means that levels of heat recovery within the AHU have removed any need for heating or cooling coils and reduces the capacity of the central plant by a significant margin. The integrated Air to Air heat pumps achieve very high Seasonal Coefficient of Performance (SCOP) and Seasonal Energy Efficiency Ratio (SEER) efficiencies due to the almost constant temperature of the tempered air after the thermal wheel.

4.3.9 Mechanical Systems

The office air conditioning shall be served by a VRF refrigerant system. High efficiency units will be used to minimise electrical power demand. Typically, the energy efficiency of a VRF system will exceed that of traditional air-cooled chillers by 15-25%.

4.3.10 Ventilation Systems

The fresh air ventilation system for the office area will be served using energy efficient HRUs which will recover waste heat from the office spaces and re-use to pre-heat the air with the HRU. This will reduce the overall energy consumption for this system.

The toilet areas in non-data centre buildings shall be mechanically ventilated and automatically controlled by occupancy sensors to set back the ventilation rate during periods of non-use.

4.3.11 Living Walls

The Installation will include the incorporation of a living wall within the data centre building design. The building will be finished with a mix of insulated metal cladding (mixed tones) and a living wall. It is anticipated that this feature will promote biodiversity within the Installation, and provide potential foraging opportunities for bats, potential roosting and nesting opportunities for species such as gulls and support a diversity of invertebrate species. The living wall element is anticipated to require an annual demand of approximately 273.5m^3 potable water.

4.4 Water, Sewer, and Stormwater Drainage Infrastructure

4.4.1 Overview

As outlined in Section 1, the Installation forms part of a wider masterplan area – the KIC Masterplan site. The KIC Masterplan site is owned by a separate landowner ('the Landowner'). The proposed IE licence application relates only to the area operated by ADSIL who are applying for this licence. The remaining areas within the KIC Masterplan site are controlled by the Landowner. Stormwater emissions and emissions to sewer identified in this IE licence application will be monitored by ADSIL where they sit within the IE licence boundary.

4.4.2 Water Supply

The water supply to the Installation will be sourced from the Landowner's network via a metred connection to the existing 150 mm diameter watermain line at Celbridge Road to the south-east corner of the Installation in accordance with the KIC Masterplan site planning application (KCC Planning Ref. 23/60047).

The Installation will have a general potable water demand for cleaning, drinking and sanitary facilities as well as for cooling equipment (Air Handling Units (AHUs)) and firefighting purposes.

To reduce both energy and water use in the Installation, ADSIL will use direct evaporative cooling systems, which predominately utilise outside air to cool servers.

On-site water storage will be provided at the Installation. These humidified water storage tanks will support the evaporative cooling function of the Installation's AHUs. Pumps will supply water to the Installation from the humidified water storage tanks.

Where water demand is required during a short-term drought, additional supply may be provided from an alternative source such as tanker supply.

The Installation will have an average domestic water demand of 912.5 m^3/year, a cooling water demand of 1,166 m^3/year, and an additional potable water demand of 273.5 m^3/year to support the onsite living wall. Additionally, the peak cooling water demand is estimated at 0.96 l/s.

Although these figures have been included in the Pre-Connection Enquiry (PCE) to Uisce Eireann, the Installation will be designed to harvest rainwater to meet a significant fraction of the annual cooling water and irrigation requirements for its operation. A portion of the rainwater runoff from impermeable surfaces at the Installation will be harvested throughout the year such that water is available during the hottest periods (summer months) when adiabatic cooling is needed. As a result the Installation will require reduced amounts of water from local supply from the first year of its operation.

Fire water

A 250mm diameter fire hydrant main is in place to provide firefighting water to the Installation in accordance with the KIC Masterplan site planning application (KCC Planning Ref. 23/60047). A fire water ring main will be installed around the Installation to provide firefighting water to hydrants to be used in the event of a fire.

A firewater sprinkler pump house, equipped with 2 no. diesel-powered fire sprinkler pumps for the supply of firefighting water, will be situated beside the emergency generator yard.

Onsite firewater storage will be required for firefighting purposes. A total volume of 450m^3 storage will be required for the operation of the Installation and stored adjacent to the sprinkler pump house on the

Installation site. The fire water tank will be filled over a 24 hour period at a flow rate of 5 l/s during off-peak periods as required.

Rainwater

Rainwater will be stored on-site such that no water is required from Uisce Eireann during the peak summer months.

The water used during these peak summer months will be supplied by on-site water storage only. The storage will be filled during the winter months. For all temperatures below the peak summer days, the cooling system will operate on direct air only. To confirm, no water demand is required for cooling during the winter period.

The Installation will fill water tanks during the months of December, January and February. Rainwater storage tanks will be used for rainwater harvesting and will be topped up by the mains supply during off-peak months to reduce overall demand on the public mains supply.

4.4.3 Stormwater Drainage System

The stormwater drainage network will be designed in accordance with Greater Dublin Strategic Drainage Study (GDSDS)[2] and Greater Dublin Regional Code of Practice[3].

Rainwater runoff from impermeable areas (including but not limited to car parks and roads) at the Installation will be collected via onsite stormwater and sustainable drainage systems (SuDS) networks in accordance with the KIC Masterplan site planning application (KCC Planning Ref. 23/60047).

The network within the Installation site will convey stormwater via 2 no. monitoring stations and 2 no. bypass interceptors with alarms through 2 no. emission points situated at the IE Licence site boundary (SW1 and SW2) to the KIC Masterplan site's 1 no. attenuation pond (2,132 m^3) to the east and 1 no. attenuation pond (1,836 m^3) to the north of the Installation site boundary. Stormwater from the eastern attenuation pond on the KIC Masterplan site will flow to the northern attenuation pond on the KIC Masterplan site before combining with the remainder of the KIC Masterplan site's stormwater network. The attenuation ponds and point of discharge to the Leixlip Reservoir will be situated within KIC Masterplan site (outside of the IE Licence site boundary) and will be under the Landowner's control and monitoring regime. Refer to drawing 305131-ARP-ZZ-XX-YE-DR-1004 - Surface Water Layout.

Stormwater collected around the emergency generator yard will pass through 1 no. full retention interceptor prior to combining with the remainder of the Installation site's stormwater network.

The hydrocarbon interceptors at the Installation site will be equipped with level detection sensors which will send an alarm signal to the BMS to alert EOTs to warn of high hydrocarbon, liquid and silt levels in the separator.

The Installation will include 1 no. inbound stormwater connection point to the Landowner's stormwater network (termed ISW1). The stormwater entering the Installation from the Landowner's surface water network will be monitored at 1 no. inbound stormwater monitoring point (termed ISW1-1) to identify any potential contamination of stormwater prior to entering the Installation site. In the unlikely event that this incoming stormwater is contaminated, this stormwater will be subject to the same control measures as the remainder of the stormwater collected onsite.

It should be noted that there will be 1 no. hydrocarbon interceptor and 1 no. stormwater flow control device located downstream of KIC Masterplan site's attenuation pond which lies to the north of the Installation (outside of the IE Licence site boundary). These devices will ensure the quality and flow rate of stormwater prior to discharge to KIC Masterplan site's stormwater drainage system.

The KIC Masterplan site's stormwater network ultimately discharges attenuated flows to the Leixlip Reservoir, located c. 800m southeast of the Installation immediately across from Celbridge Road. The

[2] https://www.sdcc.ie/en/download-it/publications/gdsds-new-development.pdf

[3] https://www.sdcc.ie/en/download-it/guidelines/greater-dublin-regional-code-of-practice-for-drainage.pdf

Leixlip Reservoir flows to the River Liffey which connects with the South Dublin Bay and River Tolka Estuary Special Protection Area (SPA) c. 19.5 km to the east of the Installation and the other Natura Designated Sites within Dublin Bay (South Dublin Bay and North Dublin Bay Special Areas of Conservation (SACs)).

Rainwater

The Installation will be designed to harvest a portion of the rainwater runoff from impermeable surfaces to meet a significant fraction of the annual cooling water and irrigation requirements for its operation. The remaining rainwater runoff at the Installation will be collected via the onsite stormwater and SuDS networks.

4.4.4 Wastewater Drainage System

The Installation's foul network will be designed in accordance with the relevant guidance including Uisce Eireann Code of Practice for Wastewater Infrastructure, National Building Regulations Technical Guidance Document H – Drainage & Waste Disposal.

The Installation will include 1 no. main emission to sewer, SE1.The Installation's foul drainage network will comprise of 150mm diameter pipes and 2 no. effluent streams. The main foul effluent and cooling water discharge of the Installation will be collected in separate streams throughout the Installation site. The main foul (domestic) and cooling water discharge streams will combine within the IE Licence site boundary prior to outfall and connection to the KIC Masterplan site's foul water network at SE1.

The Installation will include 1 no. inbound foul water connection point to the Landowner's foul network (termed IF1). The foul water entering the Installation from the Landowner's foul network will be monitored at 1 no. inbound foul water monitoring point (termed IF1-1) to identify any potential contamination of foul water prior to entering the Installation site. In the unlikely event that this incoming foul water is contaminated, the incoming foul water will be subject to the same control measures as the remainder of the foul water collected onsite.

The KIC Masterplan site's foul water network will ultimately discharge by gravity to the existing 450 mm diameter KCC public foul network in accordance with KIC Masterplan site planning application (KCC Planning Ref. 23/60047). The KIC Masterplan site's foul water network will connect to the KCC foul sewer outside of the IE Licence site boundary on Celbridge Road and foul water will ultimately be disposed of at Leixlip Wastewater Treatment Plant (WWTP).

Cooling water discharge from the Installation will be monitored via 2 no. monitoring kiosk within the IE Licence site boundary. Monitoring of the cooling water discharge stream will occur prior to its combination with the Installation's main foul (domestic) effluent stream and emission to the KIC Masterplan site's foul network at SE1.

Sewer outfall from the KIC Masterplan site to the KCC public foul sewer will be situated outside the Installation site and regulated under the total outflow limits assigned to the KIC Masterplan site.

Refer to Drawing 305131-ARP-ZZ-XX-YE-DR-1005 - Foul Water Layout for the foul water network layout.

Main Foul Effluent

The fuel unloading bay at the Installation will be surrounded by ACO drainage channels which will capture any spills via a full retention interceptor and ultimately discharge to the Installation's main foul (domestic) network. Other rainwater runoff drainage from the fuel unloading bay at the Installation will be directed to the Installation's stormwater network.

Cooling Water Discharge

The cooling water discharge foul stream will comprise of cooling water used in Air Handling Units (AHUs) at the Installation.

Discharges from AHUs at the Installation will consist of mains water utilised in the AHUs. No treatment chemicals will be added to water used in the AHUs. As such, cooling water discharges will be of sufficient quality to be discharged to the Installation's foul network.

Cooling water will only be used when the external temperature reaches a set point of 24 degrees Celsius, therefore the emissions to foul sewer will vary and will be low. For the majority of the year, there will be no emissions to foul sewer from the cooling systems.

5. Best Available Techniques and Commission Implementing Decision

Section 86A(3) of the EPA Act 1992 as amended, requires that the Agency shall apply Best Available Techniques (BAT) conclusions as a reference for attaching one or more conditions to an IE Licence. The Installation has principally been assessed against the BAT conclusions contained in Table 1.

Table 2: Applicable BAT Documents

BREF	Publication Date	Attachment
Emissions from Storage	July 2007	Attachment 4-7-1-BREF-Emissions from Storage
Energy Efficiency	February 2009	Attachment 4-7-2-BREF-Energy Efficiency
Industrial Cooling Systems	December 2001	Attachment 4-7-3-BREF-Industrial Cooling Systems

The Installation will comply with all applicable BAT Conclusion requirements specified in the Commission Implementing Decisions (CID) and will be in line with the guidance specified in the other relevant BAT Reference (BREF) Documents and relevant national BAT notes.

6. Management of Resources, Energy and Wastes

6.1 Overview

Details of the raw and ancillary materials, fuels and energy utilised as part of the Installation have been addressed in Section 4-6 of this IE Licence application. Attachment 4-6-1 summarises annual water and energy usage required for the operation of the Installation. A list of all raw materials in use at the Installation is provided in Attachment-4-6-2. The only chemical stored in notable quantities on site will be HVO, diesel or a blend of HVO and diesel depending on the availability of supply of HVO.

HVO, where supply is available, will be the preferred source of fuel for the operation of the emergency generators at the Installation. Where insufficient quantities of HVO are available, a blend of diesel and HVO will be supplied to the generators, and in the absence of HVO, diesel will be supplied to the generators. Where a blend of HVO and diesel is supplied to the generators, the ratio of HVO : diesel supplied will vary with the availability of HVO. For this reason, the use of diesel only to supply the emergency operation of the generators has been assumed as a worst-case-scenario. This has been reflected throughout the IE licence application when referring to the storage and usage of fuels on site.

Spill kits will be located across the Installation in highly visible and mobile units. These include absorbent socks, mats, pads, disposable bags, and PPE. Spill kits will be utilised in the event of a spill and staff will be trained in the use of spill management materials. Staff will be fully trained in site procedures, including all Standard Operating Procedures (SOPs) and emergency response and safety procedures in relation to the storage and handling of all substances being used at the Installation.

6.2 Resources Management

The only chemical stored on site in notable quantities will be HVO, diesel, or a blend of HVO and diesel. It should be noted that HVO and diesel will be blended together in the fuel storage tanks.

There will be no other raw materials held onsite other than domestic cleaning chemicals for cleaning of the staff facilities. These will be managed by the cleaning company. All oils, adhesives, or other materials required will be brought onsite and removed from site by the relevant contractors.

Refrigerant R32 will be held within the VRF system for the offices. No additional refrigerants will be stored onsite. R32 refrigerants will be held within this enclosed system on a continuous basis and would only be removed during decommissioning.

6.2.1 Hydrotreated Vegetable Oil (HVO) / Diesel

HVO is a renewable diesel that operates as a direct replacement for conventional diesel. It is made from renewable, sustainable raw materials which do not release any new CO_2 into the atmosphere. HVO is made from 100% renewable plant-waste matter and meets bio content requirements with no Fatty Acid Methyl Ester (FAME) included. This ensures that it avoids the instability and operability issues seen by many low blend diesel fuels and high blend biofuels. Unlike conventional biodiesel, hydrogen is used as a catalyst instead of methanol, which makes HVO cleaner burning and ensures a longer shelf life.

The HVO will be produced and accredited to meet the international fuel standard BS EN 15940, the specification for paraffinic diesel, and the Fuel Quality Directive 2009/30/EC Annex II.

HVO is considered to have substantially lower emissions than traditional fossil fuels. It is noted that burning renewable diesel results in CO_2 emissions, however, emissions from renewable diesels are significantly less than fossil fuel as growing the biomass feedstocks for production of renewable diesel may offset the CO_2 produced in the burning of HVO. For comparison, fossil fuel derived diesel has a total lifecycle emissions of c. 94 gCO_2e/MJ while renewable diesel using waste cooking oil as feedstock can be as low as 5.6 gCO_2e/MJ.

ADSIL is committed to using HVO where available. Where insufficient quantities of HVO are available, a blend of diesel and HVO will be supplied to the generators, and in the absence of HVO, diesel will be supplied to the generators. The ratio of HVO : diesel supplied to generators will vary with the availability of HVO. The use of diesel only to supply the operation of the emergency generators has been assumed as a worst-case-scenario.

Fuel Storage Tanks

Fuel for each generator will be stored in double-skinned belly tanks associated with each of the generators. Each of the belly tanks associated with the 14 no. critical emergency generators will have the capacity to store 19.6m^3 of fuel, equating to a total of 236 tonnes of diesel or 232 tonnes of HVO.

Additionally, the 1 no. house generator onsite will have a double-skinned belly tank with a capacity to store 6.2 m^3 of fuel, equating to a total of 5.4 tonnes of diesel or 5.3 tonnes of HVO.

Furthermore, the tanks associated with the 2 no. emergency fire sprinkler pumps will have the capacity to store a combined 1,000 Litres of fuel oil and tanks are filled to 90% capacity under normal conditions, equating to 0.77 tonnes of diesel.

Thus, the 17 no. tanks associated with generators on the Installation site will store approximately 26,745 litres of fuel oil. In a best case scenario, where only HVO is stored in the tanks, this is equivalent to 238 tonnes of HVO (at a density of 0.846 kg/L), and in a worst-case scenario where only diesel is stored in the tanks, this is equivalent to 242 tonnes of diesel (at a density of 0.86 kg/L). HVO and diesel will be blended in the fuel storage tanks and the ratio of HVO : diesel will vary depending on the availability of HVO.

Top Up Tank Storage Capacity

Bulk fuel will be stored onsite in a double skinned top up tank with a capacity of 40,000 litres. The tank will be filled to 90% capacity under normal conditions; therefore, it will store approximately 36,000 litres of fuel. In a best case scenario, where only HVO is stored in the tanks this is equivalent to 30.5 tonnes of HVO (at a density of 0.846 kg/L) and in a worst-case scenario where only diesel is stored in the tanks this is equivalent to 31.0 tonnes of diesel (at a density of 0.86 kg/L). HVO and diesel will be blended together in the fuel tank and the ratio of HVO : diesel in the fuel tank will vary with the availability of HVO.

There will be 2 no. underground fuel lines servicing the emergency generators and sprinkler pumphouse tanks (refer to Figure 4 and Drawing 305131-ARP-ZZ-XX-YE-DR-1006 - Combined Services).

Fuel delivery takes place within designated fuel unloading areas under strict SOPs.

6.2.2 R32 Refrigerant

R32 refrigerant, also known as difluoromethane, is used in the heating, ventilation and air conditioning systems within the Installation. It is used in small volumes for use in the cooling systems.

Refrigerant will be held within the Variable Refrigerant Flow (VRF) system for the offices. R32 will be held within this enclosed system on a continuous basis and would only be removed during decommissioning.

6.2.3 Other Raw Materials

There will be no other raw materials held onsite other than domestic cleaning chemicals for cleaning of the staff facilities. These will be managed by the cleaning company.

All oils, adhesives or other materials required will be brought onsite and removed from the Installation by the relevant contractors.

6.2.4 Energy, Water and Fuel Consumption

The operation of the Installation will involve the consumption of electricity, fuel, and mains water. The estimated quantities of these resources that will be consumed by the Installation during operation are specified in Attachment-4-6-1 of the application and are shown below in Table 3 below.

Table 3: Summary of the Estimated Resource Use at the Installation

Resource	Estimated Quantity Per Annum
Electricity (purchased) (max consumption)	280,320 MWh
Total Electricity (generated and used) (max consumption)	110.75 MW thermal (only during emergency generation) 72kWp (produced by 180 no. PV Panels)
Diesel (Gas Oil) consumed Note 1	718.04 Tonnes (emergency generators) 0.77 Tonnes (firewater sprinklers)
Hydrotreated Vegetable Oil (HVO) consumed Note 1	706.4 tonnes
Water (Public Supply) consumed	2,352.00 m^3

Note 1: HVO, where supply is available, will be the preferred source of fuel for the operation of the emergency generators at the Installation. Where insufficient quantities of HVO are available, a blend of diesel and HVO will be supplied to the generators, and in the absence of HVO, diesel will be supplied to the generators. Where a blend of HVO and diesel is supplied to generators, the ratio of HVO : diesel supplied will vary with the availability of HVO.

ADSIL will employ a variety of technologies to maximise the efficient use of energy within the Installation. The Installation is operated in accordance with an Energy Efficiency Management System (ENEMS) as well as the requirements of BAT. The application of BAT provides for the efficient use of resources and energy in all site operations. It requires an energy audit to be carried out and repeated at intervals as required by the Agency and the recommendations of the audit to be incorporated into the ENEMS.

6.3 Intermediates or Products

There will be no intermediates or products produced as part of the data storage operations.

6.4 Waste Management

6.4.1 On-site Waste Management

There will be minimal solid and liquid waste produced at the Installation. The waste will comprise mainly domestic wastes, kitchen wastes, packaging wastes, non-hazardous waste electrical and electronic equipment (WEEE), E-Waste, filters, waste oils and spent batteries. A more detailed description of the waste types and their management is provided in Section 8 of this IE Licence application.

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 site.

The small amounts of hazardous waste generated will be stored in a designated, hardstanding storage area situated within the fuel unloading area. A small, covered bund container will be in place to contain any liquid waste that requires storage, where required. The waste will be collected from these areas by an authorised waste contractor for recovery and / or disposal off-site.

Additionally, the small amounts of waste electrical and electronic equipment (WEEE) generated will be stored in a designated, hardstanding area situated in the building within the logistics/storage area. A small, covered bund container will be in place to store WEEE waste. The waste will be collected from these areas by an authorised waste contractor for recovery and / or disposal off-site

Waste oil and filters and waste batteries will not be stored onsite and will be removed by the maintenance contractors during maintenance operations and change outs.

Waste sludge from the hydrocarbon interceptors will be removed directly from each interceptor by a specialised and appropriately licensed contractor by means of a vacuum tanker.

Other smaller amounts of domestic waste will be produced at the offices and other staff areas including the canteens. This includes paper and office waste as well as dry mixed recyclables and compost food wastes. Very small quantities of mixed municipal wastes may also be produced from time to time. These will be separated at the Installation and then will be emptied into skips/larger bins externally for collection by the nominated waste contractor. The quantities will be small due to the number of staff present onsite on a daily basis.

Regular inspection of the onsite waste storage facilities and infrastructure, management of the waste contractors, and auditing and maintenance of a full paper trail of waste documentation for all waste movements from the site will be carried out by the Data Centre Engineering Operations (DCEO) and Engineering Operations Technicians (EOTs). The Regional Environmental Engineer will provide advice on waste segregation requirements, prepare and control documented procedures for waste management, and will also ensure that all waste contractors engaged by the installation and all recovery/disposal outlets will be suitable for use, appropriately authorised and audited as required.

6.4.2 Offsite Waste Management

Waste management companies authorised by ADSIL will be responsible for the transfer of waste off-site to authorised recycling/recovery/disposal facilities. An approved waste vendor list will be in place at the Installation for waste contractor selection. ADSIL's contracts with Waste Vendors require that all waste contractors conform to the relevant legislations and standards as well as ADSIL's environmental requirements.

A chronological record will also be kept showing the date, the amount, nature, origin, destination, treatment method and, means of transport and frequency of collection of the hazardous and non-hazardous waste generated.

Waste will only be collected by Waste Contractors who have been properly evaluated and will be on the ADSIL Approved Waste Vendor List.

Waste will not be stored onsite for more than six months.

6.5 Tanks and Pipelines

All tanks and pipelines will be designed for the specific purpose and contents. As required the structures will be rendered impervious to the materials stored therein. Fuel pipelines below ground will be Close Fit PLX (dual-contained pipe system). The top up tank and storage tanks associated with each generator will be double skinned.

The top up fuel tank will be fitted with automated level gauges and the online readings from these gauges will be fed back into the Installation's BMS/EPMS. The top up fuel tank will also have high/low level alarms (90% high, 30% low) and a high-level switch at 95% which will alarm to the BMS/EPMS critical alarm.

Delivery of fuel will be a controlled process, and is undertaken in accordance with the Fuel Delivery SOPs. Fuel deliveries will be supervised and will take place in designated fuel unloading bays. Hydrocarbon interceptors will be in place for the fuel tanker delivery bay to capture any spills.

The containerised emergency generator housing will include retention in the base of the container. There will be leak detection systems within the containers to alert in the event of a leak from the generator fuel tank or lubricating oil tank. The onboard controller for individual generators will be connected and alarm to the BMS.

The removal of any waste (fuel) from the interceptors will be undertaken by a licenced contractor.

All containment systems and underground pipelines will be integrity tested following installation.

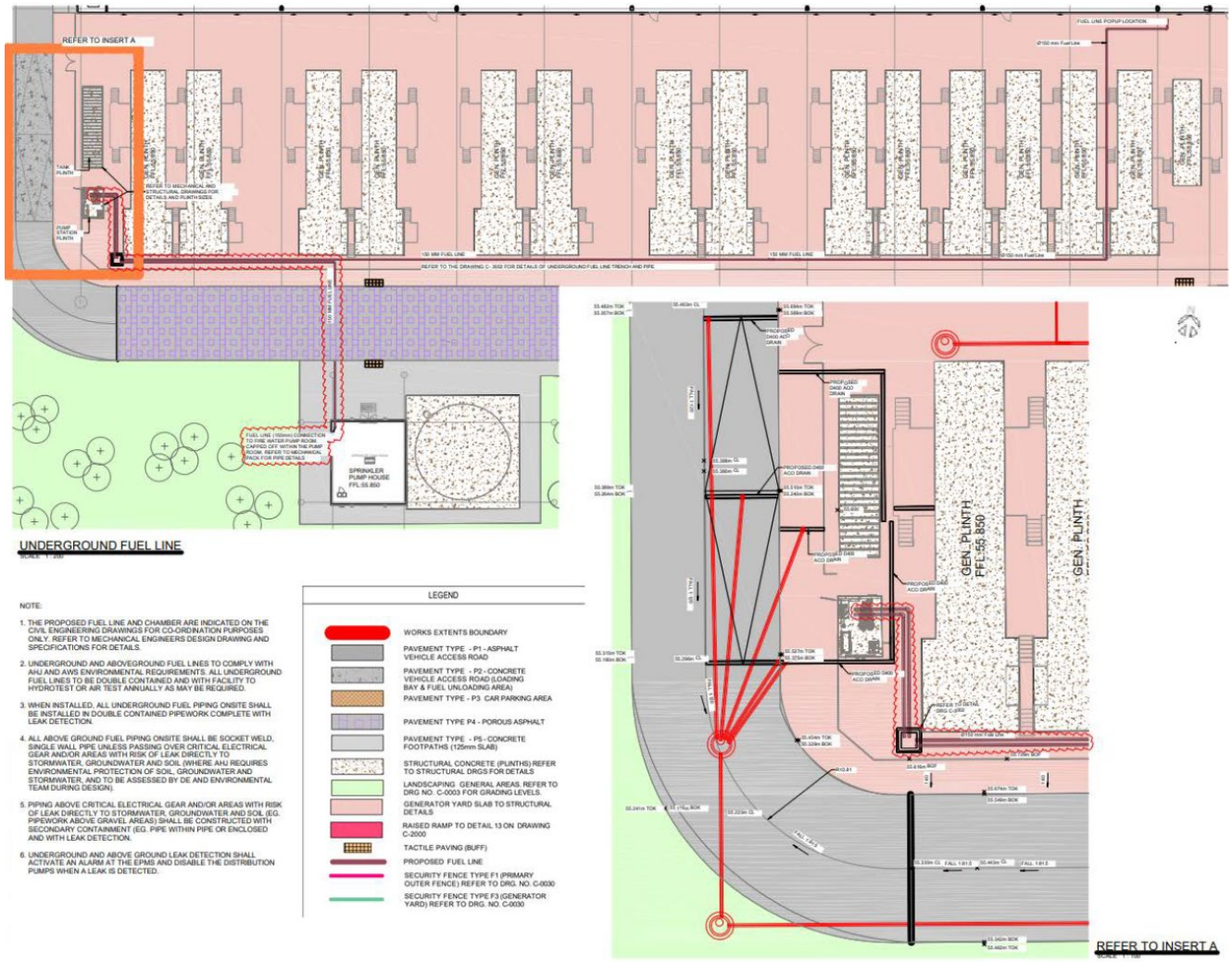

Figure 4: Underground Fuel Line and Fuel Unloading Area | ADSIL ©

7. Emissions and Abatement Treatment Systems

This section describes the emissions from the operation of the Installation and summarises any monitoring controls that will be in place at the Installation. There is no selective catalytic reduction (SCR) abatement or treatment systems proposed or required for the emergency generators. There are no planned direct emissions to ground, ground water or surface water from the Installation therefore this has not been described.

7.1 Air Emissions

7.1.1 Emissions Overview

Main Air Emissions

No main air emissions are proposed as part of the Installation.

Minor Emissions

Minor Emissions at the Installation site pertain to the two-way normal pressure (breather) vents associated with the top up tank and fuel storage tanks onsite.

The following is a list of minor air emission points at the Installation. These emission points are shown in Figure 5.

- 14 no. belly tank relief vents associated with the critical emergency generators (1 per each belly tank);
- 1 no. belly tank relief vents associated with the house emergency generator (1 per each belly tank);
- 2 no. tank relief vents associated with the fire sprinkler pumps (1 per each fuel storage tank); and
- 1 no. tank relief vent associated with the top up tank.

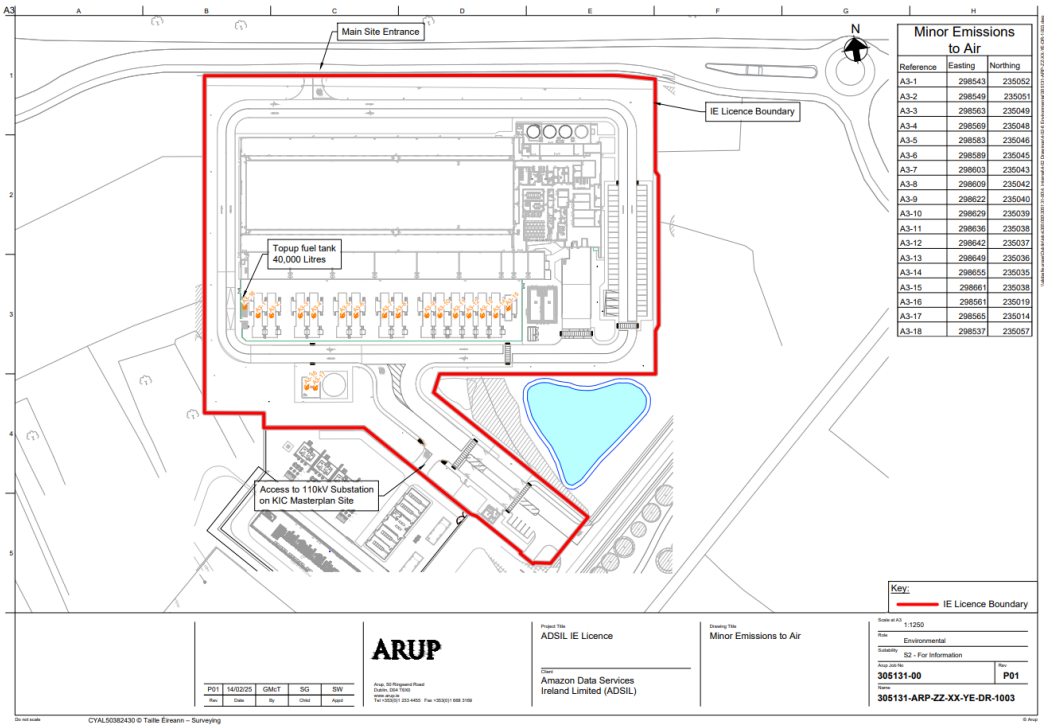

Figure 5: Minor Emissions to Air Location at Installation Site | Arup (extract Drawing no. 305131-ARP-ZZ-XX-YE-DR-1003 Minor Emissions to Air | Not to Scale | Arup ©)

The potential for environmental impacts due to emissions from these minor emission points are set out in Section 7, Attachment-7-1-3-2-Air Emissions Impact Assessment Report of this IE Licence application.

Refer to Attachment 7-4-2 Emissions to Air – Minor and Potential for further details on minor emissions and drawing 305131-ARP-ZZ-XX-YE-DR-1003 – Minor Emissions to Air for the location of the emission points.

Potential Air Emissions

Potential Emissions at the Installation site pertain to the operation of the generators onsite, which will only operate under emergency conditions.

The following is a list of potential air emission points at the Installation:

- 14 no. critical emergency generator stacks with a height of 18.0m above ground level;
- 1 no. house emergency generator stacks with a height of 18.0m above ground level; and
- 2 no. diesel-powered fire sprinkler pumps.

Refer to Attachment 7-4-2 Emissions to Air – Minor and Potential for further details on potential emissions.

Fugitive Air Emissions

Fugitive emissions are defined as low level diffuse emissions, mainly of volatile organic compounds, that occur when either gaseous or liquid process fluids escape from plant equipment. There are no such emissions anticipated from the Installation. External pipelines containing fuel will have flange guards to prevent fugitive emissions.

7.1.2 Occurrence of Emissions

The Installation will require a continuous supply of electricity to operate. During normal operations, the Installation will be supplied electricity from the national grid. Outside of normal operations, the Installation will first be supplied electricity by an uninterruptible power supply (UPS) which will provide temporary power for a limited time while the generators start up, to allow the generators to activate without losing power to the data and then by some or all of the onsite emergency generators. Only 12 no. critical emergency generators and 1 no. house emergency generator will be used at any time, with 2 no. critical emergency generators for use as “catcher” generators to provide redundancy to the remaining generators.

Outside of routine testing and maintenance, the operation of these emergency generators will typically only be required under the following emergency circumstances:

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

7.1.3 Abatement Treatment Systems

The emissions from the emergency generators have been considered against the Medium Combustion Plant (MCP) Regulations (S.I No. 595 of 2017), which transposed the Medium Combustion Plant Directive ((EU) 2015/2193). Under the Regulations, new medium combustion plants which do not operate more than 500 operating hours per year, as a rolling average over a period of three years, shall not be required to comply with the Emission Limit Values (ELV) under the Regulations.

In order to reduce the risk to health from poor air quality, national and European statutory bodies have set limit values in ambient air for a range of air pollutants. Predictive air dispersion modelling has been undertaken (refer to Attachment-7-1-3-2-Air Emissions Impact Assessment) to ensure that the appropriate ambient air quality standards are met. The modelling has been undertaken using the AERMOD air dispersion model in line with EPA Guidance Note AG4. The modelling assessment included the impact of operations of the Installation alone (termed ‘the Installation Operations Assessment’) and the cumulative impact of additional facilities with emissions near the Installation (termed ‘the Cumulative Operations Assessment’).

The modelling assessment included the impact of operations of the Installation alone (termed 'the Installation Operations Assessment') and the cumulative impact of additional facilities with emissions near the Installation (termed 'the Cumulative Operations Assessment').

Results from the Installation and Cumulative Operations Assessments indicate emissions to atmosphere of NO_x, NO_2, SO_2, $PM_{2.5}$ and PM_{10} from the emergency generators at the Installation site, 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 and no additional abatement systems are required.

The results of the air dispersion model undertaken for the Installation are set out in Attachment-7-1-3-2-Air Emissions Impact.

The stack heights of the emergency generators will be designed to ensure that an adequate height was selected to aid dispersion of the emissions and achieve compliance with these ambient air quality standards at all off-site locations (including background concentrations). There is no selective catalytic reduction (SCR) abatement or treatment systems proposed or required for the emergency generators.

7.1.4 Control and Monitoring

The generators are for emergency only and are not anticipated to operate in excess of 500 hours per annum. Therefore, the emergency generators as proposed are exempt from complying with the emission limit values subject to Section 13(3) of the MCP Regulations. Refer to Attachment 7-1-3-2 Air Emissions Impact Assessment for further details.

Minor and potential emissions will be monitored in line with the conditions set out in the IE licence, once granted.

7.2 Sewer Emissions (Wastewater Emissions)

7.2.1 Wastewater Drainage

The Installation's foul network will be designed in accordance with the relevant guidance including Uisce Eireann Code of Practice for Wastewater Infrastructure, National Building Regulations Technical Guidance Document H – Drainage & Waste Disposal.

The Installation will include 1 no. main emission to sewer, SE1.The Installation's foul drainage network will comprise of 150mm diameter pipes and 2 no. effluent streams. The main foul effluent and cooling water discharge from the Installation will be collected in separate streams throughout the Installation site. The main foul (domestic) and cooling water discharge streams will combine within the IE Licence site boundary prior to outfall and connection to the KIC Masterplan site's foul water network at SE1.

The Installation will include 1 no. inbound foul water connection point to the Landowner's foul network (termed IF1). The foul water entering the Installation from the Landowner's foul network will be monitored at 1 no. inbound foul water monitoring point (termed IF1-1) to identify any potential contamination of foul water prior to entering the Installation site. In the unlikely event that this incoming foul water is contaminated, the incoming foul water will be subject to the same control measures as the remainder of the foul water collected onsite.

The KIC Masterplan site's foul water network will ultimately discharge by gravity to the existing 450 mm diameter KCC public foul network in accordance with KIC Masterplan site planning application (KCC Planning Ref. 23/60047). The KIC Masterplan site's foul water network will connect to the KCC foul sewer outside of the IE Licence site boundary on Celbridge Road and foul water will ultimately be disposed of at Leixlip Wastewater Treatment Plant (WWTP).

Refer to Site Plan drawings included in Section 3 of this IE licence application.

Main Foul Effluent

The fuel unloading bay at the Installation will be surrounded by ACO drainage channels which will capture any spills via a full retention interceptor and ultimately discharge to the Installation's main foul (domestic)

network. Other rainwater runoff drainage from the fuel unloading bay at the Installation will be directed to the Installation's stormwater network.

Cooling Water Discharge

The cooling water discharge foul stream will comprise of cooling water used in Air Handling Units (AHUs) at the Installation.

Discharges from AHUs at the Installation will consist of mains water utilised in the AHUs. No treatment chemicals will be added to water used in the AHUs. As such, cooling water discharges will be of sufficient quality to be discharged to the Installation's foul network.

Cooling water will only be used when the external temperature reaches a set point of 24 degrees Celsius, therefore the emissions to foul sewer will vary and will be low. For the majority of the year, there will be no emissions to foul sewer from the cooling systems.

7.2.2 Abatement Treatment Systems

Emissions to sewer will be treated offsite at the Leixlip Wastewater Treatment Plant.

The rainwater management system for the top up tank and fuel unloading bay at the Installation will be equipped with 1 no. full retention interceptor to prevent hydrocarbons from entering the foul network of the KIC Masterplan site. Refer to Drawing 305131-ARP-ZZ-XX-YE-DR-1005 - Foul Water Layout and Attachment 7-3-1 Emissions to Sewer for further details.

As there will be no food preparation areas within the buildings there is no requirement for grease traps to prevent fats, oils and greases (FOG) from entering the foul network.

7.2.3 Control and Monitoring

Foul water entering the Installation from the Landowner's foul network will be monitored at 1 no. inbound foul water monitoring point (IF1-1) to identify any potential contamination and monitor the quality of foul water prior to entering the Installation site.

Cooling water discharge from the Installation will be monitored via 2 no. monitoring kiosk within the IE Licence site boundary. Monitoring of the cooling water discharge stream will occur prior to its combination with the Installation's main foul (domestic) effluent stream and emission to the KIC Masterplan site's foul network at SE1.

Sewer outfall from the KIC Masterplan site to the KCC public foul sewer will be situated outside the Installation site and regulated under the total outflow limits assigned to the KIC Masterplan site.

7.3 Stormwater Emissions

The emissions to stormwater consist of stormwater runoff from building roofs, yards and the road network, but does not include residual evaporative cooling water (mains water that has passed through the cooling / AHU equipment).

The stormwater drainage network will be designed in accordance with Greater Dublin Strategic Drainage Study (GDSDS)[4] and Greater Dublin Regional Code of Practice[5].

Rainwater runoff from impermeable areas (including but not limited to car parks and roads) at the Installation will be collected via onsite stormwater and sustainable drainage systems (SuDS) networks in accordance with the KIC Masterplan site planning application (KCC Planning Ref. 23/60047).

The Installation will include 1 no. inbound stormwater connection point to the Landowner's stormwater network (termed ISW1). The network within the Installation site will convey stormwater via 2 no. monitoring stations and 2 no. bypass interceptors with alarms through 2 no. emission points situated at the IE

[4] https://www.sdcc.ie/en/download-it/publications/gdsds-new-development.pdf

[5] https://www.sdcc.ie/en/download-it/guidelines/greater-dublin-regional-code-of-practice-for-drainage.pdf

Licence site boundary (SW1 and SW2) to the KIC Masterplan site's 1 no. attenuation pond (2,132 m^3) to the east and 1 no. attenuation pond (1,836 m^3) to the north of the Installation site boundary. Stormwater from the eastern attenuation pond on the KIC Masterplan site will flow to the northern attenuation pond on the KIC Masterplan site before combining with the remainder of the KIC Masterplan site's stormwater network. The attenuation ponds and point of discharge to the Leixlip Reservoir will be situated within KIC Masterplan site (outside of the IE Licence site boundary) and will be under the Landowner's control and monitoring regime.

Rainwater

The Installation will be designed to harvest a portion of the rainwater runoff from impermeable surfaces to meet a significant fraction of the annual cooling water and irrigation requirements for its operation. The remaining rainwater runoff at the Installation will be collected via the onsite stormwater and SuDS networks.

Refer to Surface Water Layout Plan drawings submitted under Section 3 of this IE licence application, and Attachment 7-7 Storm Water Discharges.

7.3.1 Abatement Treatment Systems

Stormwater collected around the emergency generator yard will pass through 1 no. full retention interceptor prior to combining with the remainder of the Installation site's stormwater network.

The network within the Installation site boundary will convey stormwater via 2 no. monitoring stations and 2 no. bypass interceptors with alarms through 2 no. emission points (SW1 and SW2) to the KIC Masterplan site's 1 no. attenuation pond (2,132 m^3) to the east and 1 no. attenuation pond (1,836 m^3) to the north of the Installation site boundary.

The hydrocarbon interceptors at the Installation site will be equipped with level detection sensors which will send an alarm signal to the BMS to alert EOTs to warn of high hydrocarbon, liquid and silt levels in the separator.

The Installation will include 1 no. inbound stormwater connection point to the Landowner's stormwater network (termed ISW1). The stormwater entering the Installation from the Landowner's surface water network will be monitored at 1 no. inbound stormwater monitoring point (termed ISW1-1) to identify any potential contamination of stormwater prior to entering the Installation site. In the unlikely event that this incoming stormwater is contaminated, the incoming stormwater will be subject to the same control measures as the remainder of the stormwater collected onsite.

It should be noted that there will be 1 no. hydrocarbon interceptor and 1 no. stormwater flow control device located downstream of KIC Masterplan site's attenuation pond which lies to the north of the Installation (outside of the IE Licence site boundary). These devices will ensure the quality and flow rate of stormwater prior to discharge to KIC Masterplan site's stormwater drainage system.

There will be no further requirement for additional on-site treatment of stormwater from the Installation.

However, additional onsite control and mitigation measures will be in place including:

- High- and low-level alarms in each double skinned fuel storage tank associated with the 14 no. critical emergency, 1 no. house emergency and 2 no. fire sprinkler pump generators;
- High- and low-level alarms in the double skinned fuel top up tank; and
- Standard operating procedures for fuel delivery.

7.3.2 Control and Monitoring

Stormwater collected around the emergency generator yard will pass through 1 no. full retention interceptor prior to combining with the remainder of the Installation site's stormwater network.

The stormwater network will convey stormwater via monitoring stations and hydrocarbon interceptors with alarms upstream of the 2 no. Emission Points SW1 and SW2 situated at the Installation site boundary.

No online monitoring is proposed for the stormwater discharge. The only chemical stored in notable quantities onsite will be fuel; adequate control measures will be in place to monitor any potential leaks or spills of hydrocarbons at source.

Weekly visual inspections will be undertaken at the outfalls from the Installation (monitoring points SW1-1 and SW2-1) to monitor the quality of the discharge.

Weekly visual inspections will be undertaken at the inbound stormwater connection point from the Landowner's stormwater network to the Installation (monitoring point ISW1-1) to monitor the quality of the stormwater prior to entering the Installation stormwater network.

Penstocks will be installed on the outfalls prior to the discharge into the KIC Masterplan site's stormwater network. Once installed, the penstocks will restrict stormwater outflow in the event of a large spill or a fire. Any resulting stormwater of unacceptable quality will be pumped out or otherwise removed from the stormwater network and disposed of appropriately.

Due to the limited storage of bulk chemicals on site, and the robust control measures outlined, above it is considered that not further monitoring or control methods will be required for stormwater.

7.4 Ground Emissions

There are no emissions to ground proposed from the Installation.

7.5 Noise Emissions

7.5.1 Noise Emissions and Monitoring Locations

During operation, the primary source of noise expected to arise from the Installation will be from the building service plant required to service the Installation (i.e. the AHU air intake and the AHU air exhaust); and the operation of the generators onsite during testing and emergency scenarios (i.e. generator air intake, generator air exhaust and generator engine exhaust).

The primary sources of outward noise from the operation of the Installation will occur in during the following scenarios:

- Day to day operation of fixed plant at the Installation;
- Emergency site operations where backup electrical power will be used due to a power outage or issue with supply from the national grid occur (this is extremely unlikely); and
- Testing of emergency generators, which occurs once a week for a maximum of one hour each, one generator at a time (only takes place between 9:00 and 17:00 hours).

An assessment of the noise emission impacts in line with the *EPA Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)* has been conducted by Arup as part of the IE licence application and included in Attachment-7-1-3-2- Noise Emissions Impact Assessment.

7.5.2 Abatement Treatment Systems

Plant items will be selected in order to ensure onsite operations do not exceed the required noise levels . Each emergency generator will be contained within an acoustic container to dampen the noise, and in line attenuators for the emergency generator stacks and exhausts will be used where necessary.

The Installation will be designed to ensure that the Installation operates within the constraints of EPA noise limits.

It is anticipated that the proposed noise abatement measures will be sufficient to ensure that the noise levels comply with the daytime, evening and night-time noise limits proposed, to be stipulated in the IE licence at the nearest noise sensitive receptors.

7.5.3 Control and Monitoring

Annual day time, evening and night-time monitoring is proposed to be undertaken in accordance with standard IE licence requirements.

See Attachment 7-1-3-2-Noise Emissions Impact Assessment for further details.

8. Management and Process Control Systems

8.1 Environmental Management Systems (EMS)

An Environmental Management System (EMS) has been developed for ADSIL and will be amended to include the Installation site in accordance with the requirements of BAT. The EMS will outline the management of the Installation's environmental program and is ISO14001 accredited.

8.1.1 Building Management System (BMS) and Electrical Power Monitoring System (EPMS)

The Installation will operate a BMS and an Electrical Power Monitoring System (EPMS) for control and monitoring, data collection and alarm/reporting of the air handling systems and mechanical utility systems site wide. Specifically, this will include the cooling systems, electrical supply, emergency generators, water supply, fire alarms, fire detection and suppression systems and fuel use.

The BMS/EPMS will ensure the Installation is running an optimal efficiency and will alert the operators in the event of a malfunction through the use of visual and auditable alarms. This will include malfunctions of the bulk fuel storage tank level indications, of the hydrocarbon interceptors, and any fuel storage tank leaks.

The EPMS will monitor the total fuel use as required for the GHG Permit. The EPMS will also control the changeover in electrical supply from the grid to the emergency generators in the event of an outage.

8.2 Emergency Response Plan

An on-site Emergency Response Plan (ERP) will be developed for the Installation and will be updated to incorporate any requirements of the IE licence once issued. The ERP will detail 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 will also include the arrangements for contacting the emergency services and the relevant ADSIL personnel. The ERP will be reviewed regularly by the Regional Environmental Manager and Regional Safety Manager and will be updated as required.

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

In addition to the ERP there will be a disaster response procedure which will provide instruction for the Disaster Response Action Team (DRAT).

8.3 Standard Operating Procedures (SOPs)

SOPs have been developed for the Installation and these will be continuously updated in conjunction with the EMS. These 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; and
- Emergency electricity supply and changeover procedures.

8.4 Preventative Maintenance (PM)

Preventative Maintenance (PM) will be undertaken on mechanical moving parts equipment and electrical equipment including pumps, AHUs, humidifiers, generators, power transformers, etc. This maintenance will include 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.

Enterprise Asset Management (EAM) is the software platform ADSIL Infrastructure uses to maintain and manage its mechanical, electrical, and plumbing (MEP) equipment. This platform enables Infrastructure teams to do a variety of tasks:

- Track and coordinate planned and unplanned maintenance;
- Track the full life cycle of critical data centre assets;
- Identify defective equipment through mechanisms like field service bulletins (FSBs);
- Provide tracking for Data Centre Engineering Options (DCEO) spare part inventory; and
- Provide key insights for equipment failure, root cause analysis (RCA), and total cost of ownership (TCO).

The EAM team maintains the EAM system – the EAM team objective is to create and maintain a reliable maintenance platform that improves operational excellence, reduces both equipment failures and maintenance costs, and promotes standardized processes that support operations in the Installation.

A Maintenance Plan will be developed before commissioning of equipment to include 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 shall also include periodic assessments of the state of the Installation and proposals for improvement.

In addition to the PM, regular inspections of all infrastructure onsite will occur. The twice a shift inspection of infrastructure will ensure that any issues will be dealt with if they arise.

8.5 Waste Management

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

All waste leaving the Installation will be recycled or recovered, except for those waste streams where appropriate recycling facilities are currently not available and the waste is disposed of as a last resort. All waste leaving the Installation will be transported by suitably permitted contractors and taken to suitably registered, permitted and / or licenced facilities. All waste leaving the Installation will be recorded and copies of relevant documentation maintained.

Any waste classed as hazardous will be stored in a designated area and will be removed off site by a licensed hazardous waste contractor(s).

Waste oil, filters, waste batteries and waste sludge from the hydrocarbon interceptors will be removed directly by the maintenance contractors as and when generated; however, ADSIL will appropriate permits and waste documentation, compliant with relevant legislation will be provided by the licensed waste contractors.

Waste SOPs will be in place for the operation of the Installation. This will ensure the proper management and recycling of wastes generated at the Installation. The waste SOPs will enable the Installation to contribute to the targets and policies outlined in the National Waste Management Plan for a Circular Economy 2024 - 2030[6].

[6] National Waste Management Plan for a Circular Economy 2024 – 2030 National Waste Management Plan for a Circular Economy 2024-2030 - My Waste

8.6 Energy Management

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

A BMS/EPMS will be in place to track the operation of critical sub-units and report back on energy efficiency of each section.

The ENEMS that will be developed for the Installation in accordance with BAT will set out the energy targets for the specific facility 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 for the Installation. Energy efficiency learnings are shared between sister facilities in Ireland and Europe.

The ENEMS will include Key Performance Indicators (KPIs) for energy efficiency. The efficient use of energy will be monitored as part of the Installation's continuous improvement programme to ensure all colleagues on site actively participate in the programme. Key process monitoring will be carried out to monitor the plant performance including water usage, energy consumption (diesel and electricity), hours of operation and power generated. The energy monitoring via the BMS will be accessible in real time so that future decisions on energy management/optimisation can be made on a fully informed basis.

Electrical performance monitoring in respect of Power Usage Effectiveness (PUE) of the Installation is undertaken on a continuous basis. PUE is an indicator for measuring the energy efficiency of a data centre. PUE is measured as a ratio of total amount of energy used by a computer data storage facility to the energy delivered to computing equipment. An ideal PUE is 1.0. Anything that isn't considered a computing device in a data storage facility (i.e., lighting, cooling, etc.) falls into the category of facility energy consumption.

Further details of energy efficiency measures on site are included in Attachment-4-7-2 BREF document of this IE licence application.

8.7 Fire Management

A system will be provided for detection, alarm, and fire suppression to enhance life safety and protection of property by the detection of fire, enabling an audio/visual alarm to be given such that emergency actions may be taken fully compliant with Irish and EU regulations and in accordance with the insurers' requirements.

The Installation will be equipped with automated fire detection systems (heat and smoke). These will be connected to a main fire panel in the security office which is manned at all times. In the event that a fire is detected, the fire panel will display the location of the detected fire. Once detected the location of the potential fire will go into an alarm state. The fire detection and alarm systems will be connected to the sprinkler system, and these will be triggered in the event of a fire.

The fire detection and alarm systems will be subject to routine checks by site personnel and will be inspected and tested by the external service provider on a regular basis.

9. Cessation of Activity

9.1 Site Closure

A certain amount of environmental risk is associated with the cessation of any licensable activity (site closure). An outline Site Closure Plan has been provided in Section 9 of this IE Licence application (Attachment 9-2). 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 emergency generators, the transformers, and all other relevant operational equipment at the Installation,
- The emergency 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.

Upon cessation of operations and subsequent decommissioning of the Installation, it is anticipated that there will be no remaining environmental liabilities, i.e. clean closure is expected. Once operations cease and the Installation site is decommissioned, there will be no significant emissions to atmosphere at the Installation and monitoring of emissions will not be required.

It is anticipated that the EPA will impose suitable conditions to the IE Licence, once granted, to ensure the proper closure of the activity with aim of protecting the environment. Environmental monitoring will be conducted upon agreement and request of the Agency.

9.2 Baseline Report

A complete Baseline Report for the Installation has been produced and included in Attachment-4-8-2 Baseline Report. The baseline report provides conditions of the Installation prior as it existed prior to the construction and operation of the Installation.

Based on the site-specific data available from the KIC Masterplan site investigations undertaken in 2019 and 2020, and prior to the construction of the KIC Masterplan site, an assessment of source-pathways-receptors has been completed. The following conclusions have been made:

- Bedrock at the Installation site consists of Carboniferous Limestone and a "*Locally Important*" aquifer with moderate vulnerability.
- The KIC Masterplan site, which includes the Installation site, was previously used by Hewlett Packard (HP) Manufacturing Limited which was licensed for the use of coating materials in processes using organic solvents and electroplating operations until 2019, when the licence was surrendered with approval from the EPA.
- Site specific soil and water quality data show no evidence of any historical contamination at the Installation site.
- Only bulk fuel is proposed to be stored at the Installation in double skinned top up tank and storage tanks associated with each of the generators onsite. However, the risk prevention measures planned at the Installation significantly reduce the potential for an environmental impact to soil or water to occur. These measures include double contained fuel storage vessels, dual-contained fuel pipe system (when underground), spill management procedures and the incorporation of hydrocarbon interceptors in the stormwater and foul drainage networks.
- Source-pathway-receptor linkages were assessed for potential contamination of soil or groundwater arising from accidental emissions of fuel from the storage of fuel at the storage and top up tanks used to fuel generators at the Installation. It was concluded that there will be no direct pathways to either the soil or groundwater environment. A leakage from the top up tank or a storage tank will be fully contained in the double skin lining of the tank, and leaks during fuel delivery will be fully contained within the continuous hardstand fuel delivery area. Any leakage outside of the fuel delivery area will be contained within the drainage system, which will include hydrocarbon interceptors. Drainage from the containment area(s) shall be diverted for collection and safe disposal. Spill kits and appropriate training will also be in place.
- Based on the assessment of the source-pathway-receptor linkages, there are no potential for impact of any downgradient protected sites. The Installation's surface water network will connect to the KIC Masterplan's stormwater sewer which will discharge to the Leixlip Reservoir. The Leixlip Reservoir ultimately flows into River Liffey. There is no hydrological connection identified between the Installation and the Rye Water Valley / Carton Special Area of Conservation (SAC) (1.6km north) or Royal Canal pNHA (1.3km north) as these are located upstream of the River Liffey and the Installation. However, an indirect hydrological connection exists between the Installation site and the Liffey Valley pNHA (2km northeast) through the stormwater discharge from the KIC Masterplan site to Leixlip

reservoir. According to the EIAR prepared as part of the planning application for the KIC masterplan site, which includes the Installation site, (KCC Planning Ref. 23/60047), "*Potential adverse effects on these European sites* [from the KIC Masterplan site, which includes the Installation site] *are highly unlikely given the distance of removal and integrated mitigation measures in place through standard nature-based SuDS measures on site."*

9.3 Alternatives

9.3.1 Overview

The EIAR relating to this IE Licence activity, prepared by Tom Philips + Associates dated July 2023, was submitted to KCC as part of the planning application for the KIC Masterplan site (KCC Planning Ref. 23/60047) and has been submitted to the Agency as part of this IE licence application (Attachment-6-3-6-EIAR-Planning-July-2023-(Volumes 1 & 3), Attachment-6-3-6-EIAR-Planning-July-2023-(Volume 2 part 1), Attachment-6-3-6-EIAR-Planning-July-2023-(Volume 2 part 2), Attachment-6-3-6-EIAR-Planning-July-2023-(Volume 2 part 3), Attachment-6-3-6-EIAR-Planning-July-2023-(Volume 2 part 4), and Attachment-6-3-6-EIAR-Planning-July-2023-(Volume 2 part 5)).

Alternatives considered as part of the EIAR include the "do nothing" alternative, alternative site location, alternative site layout and land use, alternative design, alternative processes and alternative mitigation measures, all of which are explored in the following subsections, as they relate to the KIC Masterplan site in which the IE licence site boundary sits.

9.3.2 "Do-Nothing" Alternative

This alternative would not include the operation of the Installation and would not meet the KIC Masterplan site objective to provide for redevelopment / regeneration of an underutilised business and innovation campus to encourage Foreign Direct Investment and employment generation in Ireland and Kildare County.

9.3.3 Alternative Site Location

As part of the KIC Masterplan site planning application, a variety of environmental and economic criteria were considered when choosing the Installation location. This included the availability of telecommunications, electricity network and development zoning; accessibility to natural gas network; proximity to global tech companies; potential to expand the Installation; and low natural disaster risk.

9.3.4 Alternative Site Layout and Land Use

The proposed KIC Masterplan site has been informed by national, regional and local planning policies, in particular the Leixlip LAP 2020-2023. The master planning process evolved over several years and involved numerous meetings and discussions with relevant stakeholders including the local planning authority. The final site layout and land use for the proposed Installation was chosen due to the potential job creation as a result of the data centre and having the least environmental impact from a noise, air and visual perspective, when compared to other potential layouts and land uses proposed for the site.

9.3.5 Alternative Design

Alternative building designs were considered as part of the development of the KIC Masterplan site. The final design for the proposed Data Centre Building B1 was advanced by the design team as it incorporates elements of green vegetation (living walls) as a more visually sensitive design which aligns with the sustainability principles of the entire KIC Masterplan site campus.

9.3.6 Alternative Processes

In terms of technology, the Installation will employ similar data server technology that is used by ADSIL 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 ADSIL as a part of each of its designs based on many factors including technical feasibility, environmental impact, efficiency, security, reliability, and cost.

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

Furthermore, ADSIL is committed to the use of HVO fuel oil for the generators, where available. Other alternatives, such as biogas, hydrogen and biomethane were considered, and ultimately it was decided that renewable diesel, specifically HVO, would be the most sustainable option due to it being made from plant waste and renewable materials. Diesel and biodiesel have also been explored and diesel was chosen.

In addition, other sources of power through the provision of roof mounted solar PV panels on all proposed new buildings. Providing solar PV panels above all parking spaces were explored; however, due to the level of construction required (not simply placing panels on roofs of buildings), the cost-benefit ratio was too high in favour of cost.

9.3.7 Alternative Mitigation Measures

The mitigation measures proposed for the operation of the Installation are outlined in the accompanying EIAR completed for KIC Masterplan site development (Attachment 6-3-6). These represent the best practice for achieving minimal impact on the receiving environment.

For each environmental factor considered within the EIAR, the specialist considered the existing environment, likely impacts of the Installation and reviewed feasible mitigation measures to identify the most suitable measure appropriate to the environmental setting the project design. In making a decision on the most suitable mitigation measure the specialist considered relevant guidance and legislation at the time. The selected mitigation measures are set out in the EIAR (Attachment 6-3-6) accompanying the IE Licence application.

In each case, the specialist reviewed the possible mitigation measures available and considered the use of the mitigation in terms of the likely residual impact on the environment. The four established strategies for mitigation of effects were considered: avoidance, prevention, reduction and offsetting (not required in this Installation). The mitigation measures presented in the EIAR represent the best options for the Installation.

The mitigation measures for the environmental aspects considered under this IE licence application (if relevant) are set out in the accompanying EIAR (Attachment 6-3-6).

Appendix A

SOP Fuel Refuelling Process

SOP Fuel Refuelling Process

Contents

1. Description of Work

Use this procedure to monitor and supervise the delivery and pumping of fuel from a delivery truck at Data Centre Building B1, Kildare Innovation Campus (KIC), Barnhall Road, Leixlip, County Kildare, Ireland (hereafter referred to as '*DUB159'*).

Important: Fuel farm will be composed of 1 fuel tank. The top up fuel tank at the DUB159 location consist of a 40,000-litre capacity double-walled, steel above-ground storage tank for fuel.

Important: Do not perform this procedure if you are not qualified.

Before starting this procedure, note the following guidelines:

- Always work safely and prioritize safety over performance and speed.
- Always follow all applicable Environmental documentation.
- Provide security with the names of vendors and support services that will be on site to assist with this procedure.
- Follow the correct escalation path to ensure the right personnel are notified at the right time. If you don't know the correct escalation path for this emergency, contact the Facility Operations Center (FOC) and the site's facility manager (FM) for guidance.

2. Safety Requirements

Follow the Safety Briefing procedure to identify safety hazards and correctly mitigate those hazards to minimize risk to personnel.

For assistance understanding the safety requirements for this procedure, contact your regional safety engineer at dcgs-safety@amazon.com or go to policy.amazon.com to access data centre safety documentation.

3. Important Indicators and Acronyms

The following indicators identify critical steps in this SOP:

Graphic Symbol	Indicates
	Change of state
	Safety Alert
	Rollback here, if necessary
	Stop, validate/verify/go no go
	Important note

For acronyms and abbreviations that aren't defined in this procedure refer to the DCEO Terms and Acronyms List.

4. Vendor Information

If a vendor is participating in this SOP, provide the following information (add rows as necessary):

Item	Description
Company Name Service Contact Information (24x7)	Jones Oil Ltd
Service Contact Information (24x7)	Claire Burns 087 284 6961 Ciaran Nevin 087 139 918

Note: Ensure vendors are briefed on the work they will be doing. Vendors must review Safety, Security, and other DC rules.

5. Employee Information

Provide information about everyone participating in this SOP (add rows as necessary).

Group	Name / title	Alias / Contact #	Role	Initials
Internal (blue badge)				
	EOT		Checks and rollback	
	EOT		Monitoring BMS	
External (Vendor)				
	Driver		Delivering fuel	
Escalation Contacts				

6. Expected Alarms

Provide a complete list of all alarms expected to occur during this procedure.

No expected alarms

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7. Affected Equipment

List all equipment that will be worked on, shut off, or locked out during this procedure.

Equipment Name	Manufacturer	Model	Serial #	Rating/Capacity
Main fuel Tank				

8. Required PPE, Tools and Materials

List the personal protective equipment (PPE), tools, and materials needed to do this procedure.

PPE / Tools / Materials	Reason Needed
Laptop	BMS – To ensure that the HVO / diesel level does not exceed limits
Universal Panel Key	To open fuel connection point enclosure on HVO / diesel yard
Safety Glasses	General PPE
Safety Boots	General PPE
Hi-Visibility Clothing	General PPE
Nitrile or latex gloves	General PPE
Aprons (optional)	General PPE
Spill Kit	To prevent or contain HVO / diesel spills

9. Pre-Work and Mitigation Steps

Section 1: Perform Pre-Work and Mitigation Steps				Completed by AWS
Step	**Location**	**Equipment**	**Action/Task**	**Initials**
1.0	DCEO Office	N/A	DCEO to assess MCM and ensure risk assessment has been provided for unloading fuel.	
1.1	DCEO Office	N/A	Verify proper safety equipment and additional forms/permits.	
1.2	DCEO Office	N/A	Check local weather conditions.	
1.3	DCEO Office	N/A	Prior to the arrival of the fuel delivery contractor, notify security personal.	
1.4	DCEO Office	N/A	Points to note for the HVO / diesel delivery system. Refill HVO / diesel tank's until 85% of total capacity, unless specified differently for Chief engineer HVO / diesel tanks actuator closes at 90% of each tank's total capacity. High alarm at 95% of each HVO / diesel tank's total capacity	
1.5	DCEO Office	N/A	Monitoring of the Fuel Fill Panel and BMS is essential to ensure that during filling a faulty actuator will not result in overfilling of the tank and HVO / diesel in the bunded area.	
1.6	DCEO Office	BMS / Fuel Fill Panel	Take note of how many litres are in Main HVO / diesel Tank _____ Litres.	
1.7	DCEO Office	N/A	Calculate how many litres are required and inform the driver _____ Litres.	
1.8	DCEO Office	N/A	Identify the role of each person participating in the procedure, and identify each person's assigned location and each person's roles/responsibilities. Additional personnel may be required for monitoring of BMS.	
1.9	Fuel reloading bay	HVO / diesel cabinet	Ensure that there are no works taking place in the immediate area.	

Section 1: Perform Pre-Work and Mitigation Steps				Completed by AWS
1.10	Fuel reloading bay	HVO / diesel cabinet	Check HVO / diesel pipework and filling area have no leaks.	
1.11	Fuel reloading bay	HVO / diesel cabinet	Ensure that the delivery driver has the correct adapter for DUB159 HVO / diesel fill pipe.	
1.12	HVO / diesel farm / office	Laptop / BMS	Ensure HVO / diesel farm BMS is being monitored.	
Summary: Pre-work data is collected. Safety meeting is conducted. Roles and responsibilities are assigned. Teams have been notified. **If any discrepancies are found in steps 1.0 through 1.12 immediately stop and escalate.**				

10. Procedure

Section 2: Procedure – Filling of Main HVO / diesel Tank				Completed by AWS
Step	**Location**	**Equipment**	**Action/Task**	**Initials**
Minimum PPE Required: Safety Boots, Safety glasses, Hearing protection.				
If at any point in this section the tank over fills proceed to Section 4: Rollback – In the event of a fuel spill				
2.1	Security Gate	N/A	When fuel vendor arrives on site, Security personnel must notify AWS personnel of all fuelling activities and remain present during all fuelling activities.	
2.2	Security Gate	N/A	DCEO personnel will obtain a bill of lading from the fuel vendor truck operator to verify that it specifies the correct fuel product (HVO and / or diesel fuel) and specify the volume to be delivered.	
2.3	Security Gate	N/A	AWS Security personnel unlock gate (as applicable) and direct the driver to the fuel reloading bay	
2.4	Fuel reloading bay	N/A	Fuel delivery vendor turns off truck motor unless required for unloading. Wear proper personal protective equipment (PPE)—high visibility vest, safety boots, safety glasses, and safety gloves. Ensure spill kits are fully stocked, including drain plugs.	
2.5	Fuel reloading bay	N/A	DCEO to deploy Barrier & Signage prior to fuelling	
2.6	Fuel reloading bay	N/A	DCEO to perform checks on Fuel delivery driver: • Level of English is adequate; • That the driver has a valid ADR Card; • The driver is familiar and trained with loading and unloading processes; • That the traffic management arrangements have been communicated to and understood, including pedestrian interfaces;	

Section 2: Procedure – Filling of Main HVO / diesel Tank				Completed by AWS
			• That the driver is informed verbally of the local site hazards; • That a DSG note is provided; • Transport documents to be provided.	
2.7	Fuel reloading bay	N/A	 Conduct a safety inspection of the delivery area: • Ensure there is a serviceable fire extinguisher available on the fuel truck and in the generator enclosure. • Smoking or any activity that can cause sparks or flames is prohibited during fuel transfer operations. • Cover all down-gradient storm drains prior to fuelling activities. Appropriate covers, mats and drain plugs to be deployed to form active secondary containment. • Ensure mats are placed under all fuel delivery pipe joints • Ensure appropriate spill control equipment is readily available to clean up small spills, which at a minimum will include granular absorbent, absorbent pads and booms, shovels, and an empty drum.	
2.8	Fuel reloading bay	Fuel Connection Panel	DCEO personnel will unlock and open the fuel connection point cabinet door using Universal Panel Key and check that a drip tray is in position beneath the fuel hose connection.	
2.9	Fuel reloading bay	Fuel Connection Panel	Fuel delivery vendor removes the cam lock cap that covers the fuel line.	
2.10	Fuel reloading bay	Fuel Connection Panel	Fuel delivery vendor connects the hose to the fuel line  **Keep the main lever valve closed.**	
2.11	Fuel reloading bay	HVO / diesel cabinet	 DCEO personnel will verify the current amount of fuel in HVO / diesel tank by indication on corresponding control panels located inside level indicator panel Fuel Level: _____ Litres	
2.12	Fuel reloading bay	N/A	DCEO will verify delivery volume with Truck Operator. Truck Operator will adjust unloading pump to load the HVO / diesel tank with only the requested and verified volume. Expected Fuel Delivery: _____ Litres	
2.13	Fuel reloading bay	Fuel Connection Panel	Fuel delivery vendor opens the main lever valve in fuel connection panel and can commences refuelling  In the event of a spill proceed to the rollback steps.  In the event of a Fuel High Level alarm immediately secure fuel loading.	
2.14	Fuel reloading bay	Control Panel / BMS	DCEO continuously monitors the BMS and Fuel Fill Panel during refuelling to ensure tanks do not overfill.	
2.15	Fuel reloading bay	N/A	When designated HVO / diesel tank has reached its required level, vendor should stop refuelling process.	
2.16	DCEO Office	BMS	 If a high-level alarm is triggered, or there is a spill or leak happens, DCEO will stop work immediately and assess the reason for alarm prior to deciding to continue refuelling	
2.17	Fuel reloading bay	Fuel Connection Panel	DCEO will supervise as the Truck Operator disconnects loading hose, ensuring that all product remains in the hose or is contained in the spill container (if applicable) and secures the fill cap back on the fuel tank inlet.	
2.18	Fuel reloading bay	Fuel Connection Panel	DCEO to ensure that all fuel ports are secured and the main lever valve is closed after fill is complete.	

Section 2: Procedure – Filling of Main HVO / diesel Tank				Completed by AWS
2.19	N/A	Fuel reloading bay	Check fuel reloading bay tank to ensure all areas have no spills	
2.20	Fuel reloading bay	N/A	Truck operator cleans up any oil spills, including any product contained in the spill container (if applicable) before leaving area. Prior to departure, the driver and DCEO personnel are required to do a visual walk around inspection of the fuel truck. DCEO personnel must file trouble ticket if any spill was observed.	
2.21	Fuel reloading bay	HVO / diesel Fill Pipe Connection	DCEO personnel shall verify condition of fill pipe area to ensure that any spills have been addressed. DCEO personnel shall document this information on the bill of lading.	
2.22	DCEO Office	Permit Folder	DCEO shall retain copies of the bill of lading and fuel loading receipt in the Permit to Operate binder	
2.23	Fuel reloading bay	N/A	DCEO to Remove any barrier deployed storm drain covers, and pink mats.	
Stage Summary: Filling of Main HVO / diesel Tank has been completed.				

11. Validation Steps

Section 3: Verify Normal Operations				Completed by AWS
Step	**Location**	**Equipment**	**Action/Task**	**Initials**
3.1	Fuel reloading bay	Laptop / BMS	Make sure the main lever valve is in the closed position.	
3.2	DCEO Office	Excel	Fill readings/ match vendors readings.	
3.3	Fuel reloading bay	N/A	Make sure there are no leaks evident at fuel reloading bay.	
3.4	Fuel reloading bay	BMS and Control Panel	Take note of how many litres are in the main tank _____ Litres.	
3.5	Fuel reloading bay	Delivery Docket	Take note of how many litres delivered by the driver _____ Litres.	
Stage Summary: Validation data is collected. Filling has been completed and delivery quantity verified.				

12. Rollback Steps

Section 4: Rollback – In the event of a fuel spill				Completed by AWS
Step	**Location**	**Equipment**	**Action/Task**	**Initials**
4.1	DUB159	SPCC Plan	In the event of a spill, refer to the SPCC Plan and follow the instructions. Notify CE, FM and Regional Environmental Engineer.	
4.2	HVO / diesel Fill	Fill point and Gen	Perform spill clean-up if required.	

Section 4: Rollback – In the event of a fuel spill				Completed by AWS
	and Gen Yard			
Stage Summary: Delivery has been halted and issue escalated.				

13. Technical / Related Documentation

Title		Issue/Revision

14. Comments

Following the procedure, use this section to identify any issues or additional information for future use.

15. Document Information

Version	Date	Author(s)	Approved by	Approved by
1.l0	29/01/2025			