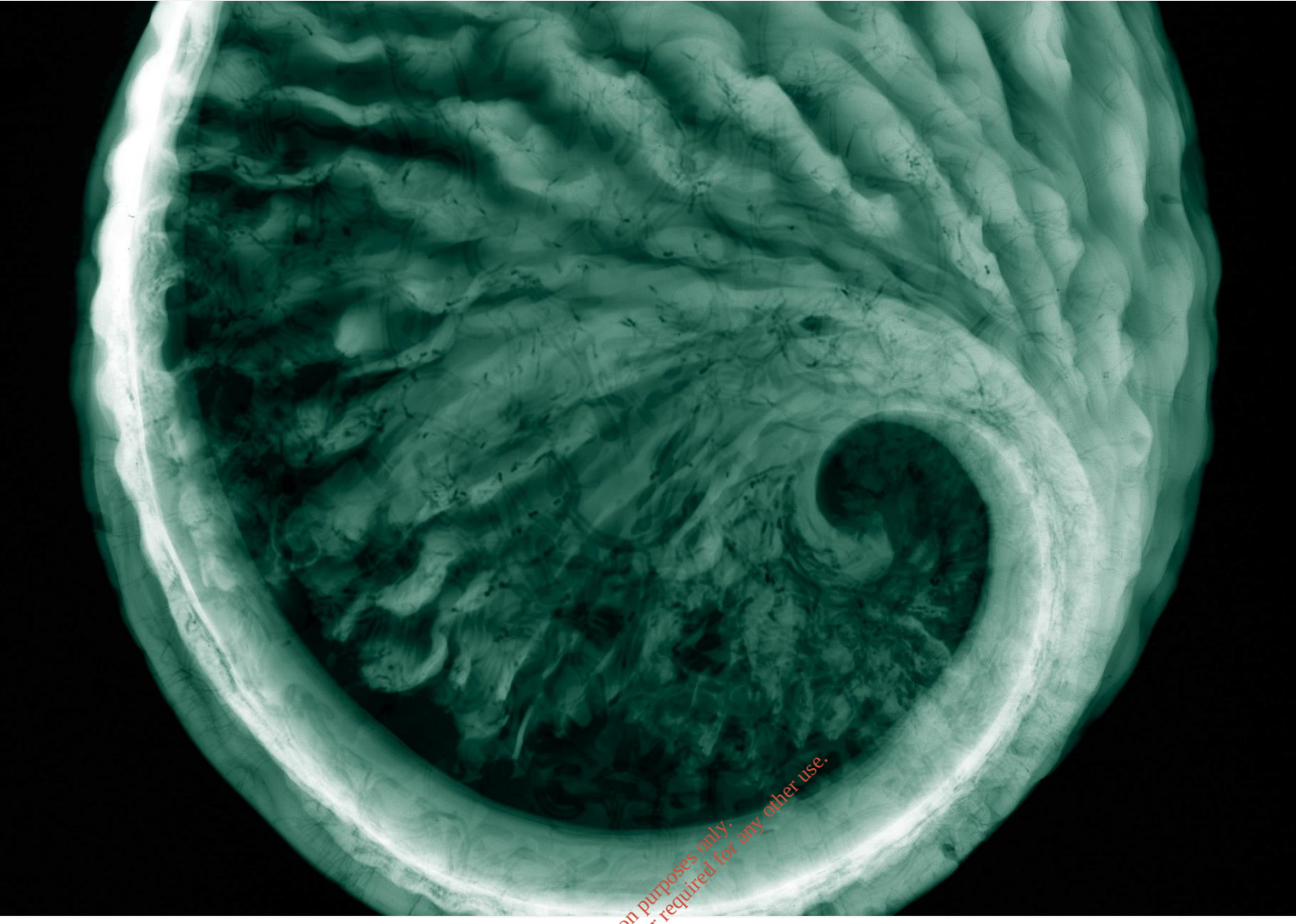

DB5 Data Centre

Industrial Emissions Licence Application: Non-technical Summary

EQUINIX

01 October 2021

Project No.: 0580581

The business of sustainability

ERM

Document details	
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01 October 2021

DB5 Data Centre

Industrial Emissions Licence Application: Non-technical Summary

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Acronyms and Abbreviations

Name	Description
GNI	Gas Network Ireland
IEL	Industrial Emissions License
EPA	Environmental Protection Agency
BAT	Best Available Technique
EDEN	Environmental Data Exchange Network
ERM	Environmental Resources Management
MWth	Megawatts thermal
m	Metres
km	Kilometres
WWTP	Wastewater Treatment Plant

MCPD	Medium Combustion Plant Directive
NO_x	Oxides of nitrogen
SO_2	Sulphur dioxide
CO	Carbon monoxide
LCP	Large Combustion Plant

1. REASON FOR APPLICATION

1.1 The Applicant

Equinix Hyperscale 1 (DB5) Limited (Equinix) is proposing to operate a new data centre campus, DB5/6/7 (DB5 for the purposes of this application), on land to the east of Blanchardstown Road North within IDA Blanchardstown Business and Technology Park, Snugborough Road, Dublin.

This IEL application and supporting information for this data centre has been prepared by Environmental Resources Management Limited (ERM) on behalf of Equinix. The information used to populate the EPA's various Environmental Data Exchange Network (EDEN) templates and other attachments (e.g. this non-technical summary) is based on data provided by Equinix, publically available environmental data and results of detailed environmental impact assessments undertaken by Equinix-appointed suppliers.

1.2 Listed Activities

The main commercial activity of the data centre will be data storage. The activity requiring an IEL is the combustion of fuel in appliances with an aggregated thermal input of more than 50 MWth, see **Table 1.1**.

Table 1.1 – Listed Activities

Activity listed under the First schedule of the EPA Act 1992	Description	Limits
Section 2. (2.1) Combustion of fuels in installations with a total rated thermal input of 50 MW or more.	Combustion of fuel in electrical generators of varying capacities but with an aggregated thermal input >50 MWth (total thermal input c. 167.724 MWth) [a]	From receipt of fuel (diesel and natural gas) to emission of combustion products.

[a] The total thermal input has been calculated using the maximum thermal input of each turbine generator when operating in natural gas mode with water injection. When operation in diesel mode with water injection, the total thermal input of the nine turbine generators will be 166.833 MWth. Data sheets for the turbine generators have been uploaded to the EDEN portal to demonstrate how the site capacity was calculated *(Attachment-4-4-1- Capacity Calculations).*

1.3 Seveso III Regulations

Based on the information available for products used on site and corresponding usage and storage volumes, the EC (Control of Major Accidents Hazards involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) do not apply to this site.

2. SITE DESCRIPTION

2.1 Site Location

The site address is Equinix DB5, IDA Blanchardstown Business and Technology Park, Snugborough Road, Blanchardstown, Dublin 15 (the Site).

Equinix operates four other data centres in Ireland, two of which are located in Northwest Business Park, approximately 1.5km northeast of the DB5 site location.

The location of the Campus data centre is also shown on **Figure 2-1** for context.

2.2 Site Description

The Site has planning consent associated with the original planning application, reference FW20A/0087 with Fingal Co. Council submitted on the 16th September 2020 and addendum FW21A/0073 submitted on 23rd April 2021. Another addendum to that planning application has been applied for on the 28th September 2021 to incorporate a change to the turbine generator operating modes.

The data centre will comprise:

- Three buildings containing data storage units;
- 110kV GIS Substation to feed the data centre campus from the EirGrid network as normal power supply;
- Above ground infrastructure for the supply of natural gas from Gas Networks Ireland (GNI);
- Ancillary equipment including nine standby dual fuel turbine generators as backup power supply; and
- A small diesel fuelled fire pump with negligible capacity and emissions.

The installed capacity of the nine dual fuel turbine generators will be in excess of the 50 MWth input threshold for an Industrial Emissions Licence (IEL) identified in the most up-to-date revised first Schedule of the EPA Act 1992, which is regulated by the Environmental Protection Agency (EPA) as listed in **Section 1.2** of this document.

2.3 Site Condition

A Site Condition Report *Attachment-4-8-4-Site Condition Report* and Site Baseline Report *Attachment-4-8-3-Complete Baseline Report* have been prepared for the area shown on **Figure 2-1**. These have been uploaded to the EDEN portal as standalone documents together with the underlying survey and analytical reports.

Figure 2-1 – Site Permit Boundary, IDA Blanchardstown Business and Technology Park, Snugborough Road, Blanchardstown, Dublin 15

708200
708300
708400
740700
740600
Blanchardstown Road North
Blanchardstown-Corduff-ED
Blanchardstown-Mulhuddart-ED
Alcatel-Lucent Ireland Limited
Parking
P
Alcatel-Lucent Parking
Blanchardstown Business and Technology Park

Indicative Site Boundary

Data Sources:
The Indicative Site Boundary has been derived from DB050-BWT-00-ZZ-DR-A-SITE-1043-Proposed Site Plan-P05.pdf, showing the P05 revision of drawing DB050-BWT-00-ZZ-DR-A-SITE-1043, produced by Bryden Wood Technology Ltd on 16/04/2021, which has been supplied to ERM by the client.

Drawing Reference:
ERM_0580581_Site_Layout_A03

0 10 20 30 40
Metres

N

SCALE: See Scale Bar	VERSION: A03
SIZE: A3	DRAWN: JG
PROJECT: 0580581	CHECKED: RP
DATE: 13/08/2021	APPROVED: DP

Site Layout
Blanchardstown Industrial Park
Snugborough Road
Dublin 15

ERM

EQUINIX

PROJECTION: IRENET95 Irish Transverse Mercator

Path: Z:\London\Projects\0580581 Consolidated Equinix Equinix IRE DB5 IEL app.HB\Working\5. GIS\MAPS\0580581_Site_Layout_A03.mxd

2.4 Site Context

The Site is located on land to the east of Blanchardstown Road North within IDA Blanchardstown Business and Technology Park, which surrounds the site to the east. The site comprises of a larger site formerly known as Clyde House which was subdivided into Clyde House 1 and 2. The southern portion of the site (subject site – Clyde House 1) was demolished to facilitate the permitted development of the data centre campus which consists of three data halls. The N3 (Navan Road) which joins to the M50 motorway runs east-west approximately 1.5 km south-west from the Site.

To the north, approximately 500 m, the land use consists of a mix of light industrial uses and office, similar to the site location.

To the east, the Business Park extends approximately 700 m beyond the Site.

The nearest residential receptor, “Corduff”, is located approximately 400 m to the south of the Site.

Directly west on the other side of Blanchardstown Road North there is a Greenfield present, followed by an educational facility (Institute of Technology Blanchardstown) approximately 300 m to the west of the Site boundary.

3. SITE ACTIVITY

3.1 Overview

The data centre will provide secure data storage services and distribution of information to businesses.

The data centre emergency power provision will comprise nine dual fuel turbine generators. The total capacity of the backup power supply of the nine dual fuel turbine generators is in excess of the 50 MWth input threshold for an Industrial Emissions Licence (IEL), identified in the most up to date revised first schedule of the EPA Act 1992, which is regulated by the Environmental Protection Agency (EPA).

The turbine generators will be tested regularly to demonstrate that they are capable of fulfilling the backup supply requirements. Further information on the design justifications for the proposed technology can be found in **Section 5.**

The Irish electrical grid is under critical stress loads, in particular during wintertime, and consequently the backup power supply of the dual fuel turbine generators is expected to be required to operate under the modes shown in **Table 3.1** – Turbine generator Operating Modes**.**

Table 3.1 – Turbine generator Operating Modes

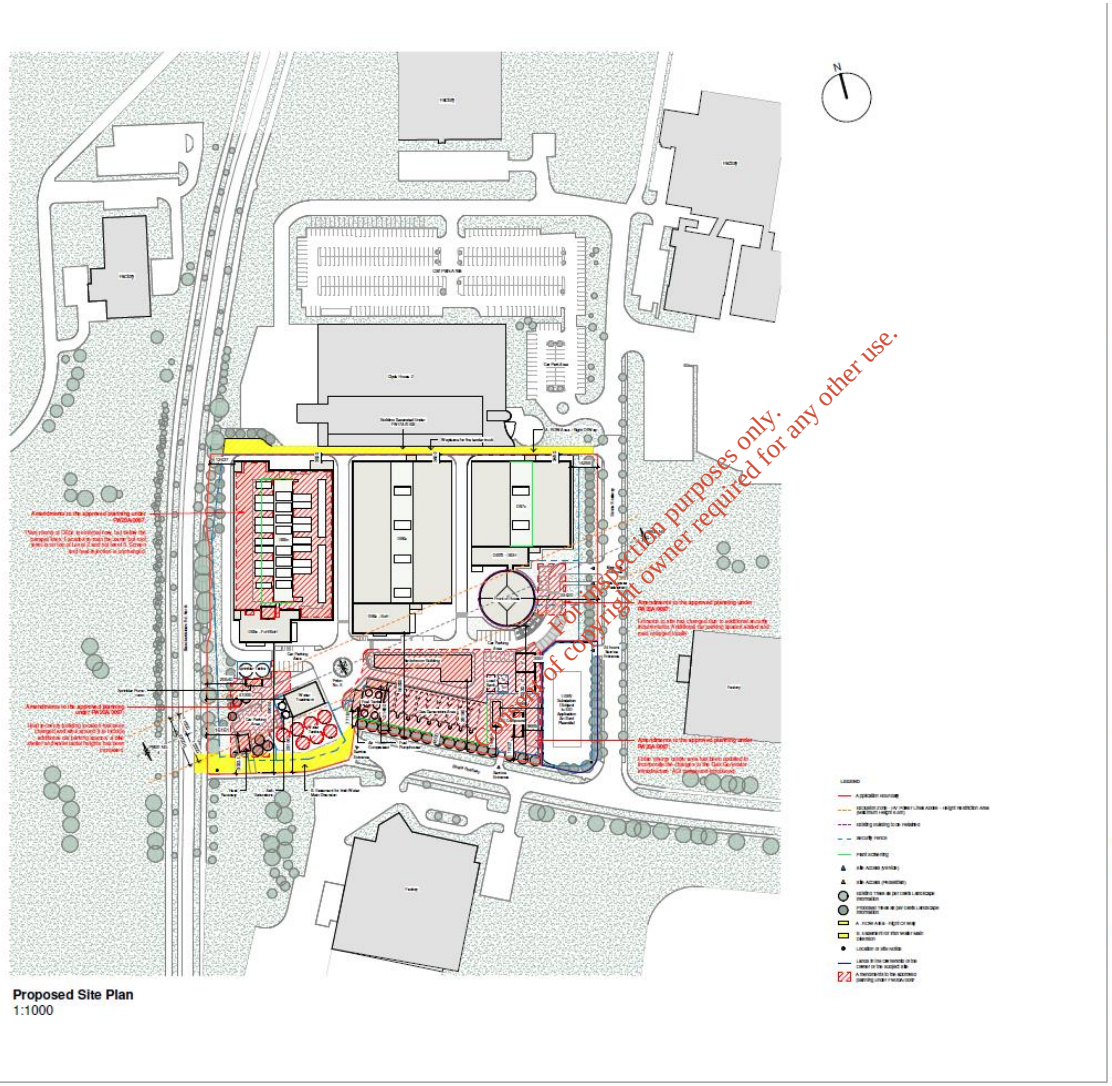
Mode	Identification	Description
1	Test Mode	Testing of each turbine generator for 1 hour each month
2	Backup Mode	In case the EirGrid network is not available (due to fault or outage). Operation under this mode is expected to be highly unlikely
3	Flex mode	In case EirGrid needs the data centre to disconnect from the grid and to operate in Island mode under the Site's Flex contract (up to 500 hours per year)
4	First two years shortage mode	During first two years of operation (July 2022 to July 2024), in case EirGrid is not able to provide the mains power connection, the backup power supply may be called to operate up to eight of the nine turbine generators full time using various fuel mixes (diesel or natural gas). Refer to *Attachment-7-1-3-2-Emissions Impact Assessment* for the full breakdown of fuel mixes used under this mode.

The Site will have six double skinned bulk diesel storage tanks, each of 100 to 120 m^3 capacity.

The data halls within the data centre are to be cooled using a closed loop chilled water system utilising thirteen cooling towers on site (and chillers when required) to provide cool water to the data hall cooling units.

Further details of the site activities can be in the Operational Report which has been uploaded to the EDEN portal as a standalone document *Attachment 4-8-1-Operational Report*.

Figure 3-1 – Site Layout



Proposed Site Plan
1:1000

4. EMISSIONS

4.1 Emissions to air

4.1.1 Point source emissions to air

The only notable point source emissions to air from the data centre will be from the turbine generator exhausts. These are identified in **Table 4.1** and the locations of each emission point are shown in **Figure 4-1.**

Emissions would also result from the operation of the fire pump but this would only be in emergency situations.

Small quantities of diesel vapour from six external diesel storage tank breathers will also emit to atmosphere. These point source emissions are identified in **Table 4.1** and the locations of the tanks are shown in **Figure 4-1.**

Further details of the Site's emissions to air are included in the EDEN templates *Attachment-7-4-1 Emissions to Air-Main and Fugitive* and *Attachment 7-4-2-Emissions to Air-Minor and Potential*.

Table 4.1 – Point Source Emissions to Air

Emission Point ID	Emission Source	Use	Parameter	Limits (mg/Nm^3)
Turbine generators 1 to 9 (referenced A1-1 to A1-9 in **Figure 4-1 – Emission Points**)	9 x Centrax CX-501 KB7 dual fuel turbine generators	Operation in excess of 500hrs per annum on a 3yr rolling average	NO_x	50 (natural gas fired) or 75 (diesel fired) [a]
			SO_2	---
			CO	---
			Particulates	---
		Emergency backup generation (when operating <500hrs per annum on a 3yr rolling average)	NO_x, SO_2, CO, Particulates	No limits set [b] Backup generation only
Fuel tanks 1 to 6 (referenced A2-1 to A2-6 in **Figure 4-1 – Emission Points**)	External diesel storage tank breathers	Diesel storage	Diesel vapour	No limits set
Fire pump (referenced A3-1 in **Figure 4-1 – Emission Points**)	Fire Pump	Fire water pump	NO_x, SO_2, CO, Particulates	No limits set [c] Fire water pump for emergency use only and is < 1MWth input

[a] Limits are based on Annex II Part 1 of the Medium Combustion Plant Directive (MCPD). Limits are only applicable above 70% load.

[b] Limits do not need to be complied with for combustion plants that do not operate for more than 500 operating hours per year, as a rolling average over a period of three years. Where the combustion plants exceed this rolling average, the relevant limits will be complied with.

[c] The fire pump is below the 1 MWth threshold defined in the MCPD and operates exclusively for emergencies.

Figure 4-1 – Emission Points

708200 708300 708400

740700

740600

Building 1
Building 2
Building 3
A3-1
Front of House
Switchroom Building
A2-5
A2-6
A2-4
A2-3
A2-1
A2-2
A1-1
A1-3
A1-5
A1-7
A1-2
A1-4
A1-6
A1-8
A1-9
SW1
SE1

- Indicative Site Boundary

Emission Point
- Indicative Stack Location
- Indicative Diesel Tank Location
- Foul Sewer Discharge Point
- Storm Water Sewer Discharge Point
- Indicative Fire Pump Location

Structure/Area
- Indicative Gas Generator Block Location
- Indicative Fuel Tank Location
- Indicative Sprinkler Tank Location
- Indicative Gas Generators Area
- Indicative Fuel Storage Area
- Indicative Sprinkler Tanks Area
- Indicative Building Location

Data Sources:
The Indicative Site Boundary, selected building outlines and other site areas have been derived from DB050-BWT-00-ZZ-DR-A-SITE-1043-Proposed Site Plan-P05.pdf, showing the P05 revision of drawing DB050-BWT-00-ZZ-DR-A-SITE-1043, produced by Bryden Wood Technology Ltd on 16/04/2021, which has been supplied to ERM by the client.

The Indicative Emission Points have been derived from DB050-BWT-00-ZZ-DR-A-SITE-1043-Proposed Site Plan-P05.pdf, except Foul Sewer and Storm Water Sewer Discharge points, coordinates of which were supplied directly by the client.

Drawing Reference:
ERM_0580581_Emission_Points_To_Air_And_Sewer_A03

0 10 20 30 40
Metres

N

SCALE: See Scale Bar	VERSION: A03
SIZE: A3	DRAWN: JG
PROJECT: 0580581	CHECKED: RP
DATE: 13/08/2021	APPROVED: DP

Emission Points To Air and Sewer
Blanchardstown Industrial Park
Snugborough Road
Dublin 15

ERM

EQUINIX

PROJECTION: IRENET95 Irish Transverse Mercator

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Path: Z:\London\Projects\0580581 Consolidated Equinix Equinix IRE DB5 IEL app.HB\Working\5. GIS\MAPS\0580581_Emission_Points_To_Air_And_Sewer_A03.mxd

4.1.2 Fugitive emissions to air

No material fugitive emissions are expected from the licensed activities associated with the data centre.

4.1.3 Fluorinated gas (F-gas) legislation

No F-gases are planned to be used by the licensed activities associated with the data centre.

4.2 Emissions to water

4.2.1 Point source emissions to water

There will be no material point source emissions to water from the licensed activities associated with the data centre.

4.2.2 Fugitive emissions to water

There are not expected to be fugitive emissions to water from the data centre.

4.3 Emissions to sewer

4.3.1 Point source emissions to sewer

Uncontaminated surface water drainage (storm water)

Surface water from the facility comprising storm water runoff from roads, hard standing and roof surfaces will be collected in the site drainage system and discharged to the storm water drainage system via emission point SW1. This network will accommodate the completed site area. See **Figure 4-1.** Storm water drainage from all areas of the facility (excluding roof drainage) will be routed through an oil/water separator before discharge to storm water sewer.

Permeable paving will be provided to capture surface water within car parking spaces. Surface water discharge attenuation will be provided in below ground tanks located to the east of the site underneath the car park.

Some rainwater from roofs will be collected for re-use in site processes and shall be isolated from surface water collected from hardstanding areas and filtered prior to connection to a separate rainwater harvesting attenuation tank. From the attenuation tank, rainwater will be pumped to the Water Treatment Building for re-use within the cooling system. Cooling tower bleed from the Site will be pumped to Water Treatment Building for further re-circulation.

The site drainage plan has been uploaded as standalone document to the EDEN portal *Attachment-Site Drainage Plan*.

Further details of the Site's emissions to storm water is included in the EDEN template *Attachment-7-7-Storm Water Discharges.*

Process effluent drainage

Wastewater from the Site's two reverse osmosis processes and nano-filtration system will be discharged to foul sewer via emission point SE1 (see **Figure 4-1**). One reverse osmosis system will be used to treat water used in the site's cooling towers so that water can be reused in the process. The second reverse osmosis process, and nano-filtration system will be used to improve the quality of incoming water from the mains supply so that it can be used in the Site's water injection abatement system to minimise emissions from the dual fuel turbine generators.

The discharge to sewer will be consented by a trade effluent consent which is to be issued by Irish Water, the sewerage undertaker. The Site will comply with the conditions of the consent including emission limits and monitoring requirements.

Further details of the Site's process effluent drainage are included in the EDEN templates *Attachment-7-3-1-Emissions to Sewer* and *Attachment-7-3-2-Equivilant Level of Protection.*

Foul drainage

Equinix has secured a connection agreement with Irish Water for a new wastewater connection to the existing sewer to the east of the site. The foul effluent to the Irish Water sewer will be treated at the Ringsend Wastewater Treatment Plant (WWTP). Process effluent and domestic wastewater will share a single foul water combined network with a system of shut-off valves to isolate domestic sewage if required. The planned emission point is referenced SE1. See **Figure 4-1**.

Further details of the Site's expected emissions to sewer are included in the EDEN templates *Attachment-7-3-1-Emissions* to Sewer and *Attachment-7-3-2-Equivilant Level of Protection.*

4.4 Emissions to land and groundwater

4.4.1 Point source emissions to land and groundwater

No point source emissions to land or groundwater are planned from the data centre.

4.4.2 Fugitive emissions to land and groundwater

The only anticipated, potentially significant fugitive emissions to land and groundwater from the permitted operation would be in the event of loss of integrity from an above ground fuel tank with subsequent penetration of hard surfacing by diesel.

The diesel filling procedure has been uploaded as a standalone document to the EDEN portal (*Attachment-1-2-1-Diesel Filling Procedure*).

Equinix has emergency response procedures in place in the event of a release of lubricating oil or diesel, processes for the planning for such eventualities and checklists to audit the response in case such an event occurs. The emergency response procedure has been uploaded as a standalone document to the EDEN portal (*Attachment-1-2-2-Emergency Response Procedure).*

Details of the existing condition of the Site can be found in Site Condition Report (*Attachment-4-8-4-Site Condition Report*) and Site Baseline Report (*Attachment-4-8-3-Complete Baseline Report*) which have been uploaded as standalone documents to the EDEN portal.

5. OPERATING TECHNIQUES

5.1 Applicable Technical Standards

In order to demonstrate that DB5 will operate Best Available Techniques (BAT) for its activities, a review of the European Commission's BAT Reference Documents (BREFs) has been carried out.

The EPA does not provide specific guidance for the operation of data centres. In the absence of such regulatory guidance, an assessment has been undertaken against the Environment Agency's (UK) technical data centre guidance.

The two documents reviewed for the BAT assessment are:

- Best Available Techniques (BAT) Reference Document for Large Combustion plants, 2017; and
- Environment Agency (UK) Data Centre FAQ, 2019 – Release to Industry**.**

It is noted that the Site does not contain any Large Combustion Plants (LCP) under the meaning of Chapter III of the Industrial Emissions Directive (2010/75/EU). The LCP BREF has therefore been reviewed for general measures appropriate to data centres.

The individual turbine generators, being in the 1-50 MWth size range, are Medium Combustion Plants (MCP) under the meaning of the Medium Combustion Plant Directive (2015/2193/EU) (MCPD) as transposed into S.I. No. 595 of 2017 EU Medium Combustion Plants Regulations 2017. S.I. No. 595 of 2017 EU Medium Combustion Plants Regulations 2017 states[1]: "*13.(3) Subject to Regulation 20, 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 set out in Part 2 of Schedule 2 but, where they burn solid fuels, shall comply with an emission limit value for dust of 200 mg/Nm³".*

Based on this condition of the Regulations, none of the turbine generators will need to comply with emission limit values nor monitor emissions when fulfilling their main emergency standby generation purpose. However, it is noted that emission limits and monitoring as stipulated in the MCPD will need to be complied with during the first two years of full time operation of up to eight of the nine turbine generators.

The full BAT assessment has been uploaded to the EDEN portal as a standalone document, please refer to this for further details (*Attachment-4-7-2-BREF-Large Combustion Plants*).

5.2 Proposed technology

Equinix has been challenged by internal and external stakeholders to develop Data Centre facilities that balance development cost with operational efficiency and environmental performance.

The current Equinix Global reference design is underpinned by a utility electricity connection as the primary source of operational power, with back-up resilience from reciprocating diesel engines and sufficient on-site liquid fuel (diesel) storage for between 48 hours and 72 hours continuous operation, at full design demand. In locations with reliable public power grids, emergency generators are typically only operated for testing and periodic maintenance (circa 20 hours pa) and are rarely called to operate in response to an unplanned utility interruption.

The electricity grid in Ireland is currently struggling to balance system capacity and the combined demand of connected customers, with specific risks of a shortfall in the networks supporting Dublin and the industrial and business parks to West of the city. Despite recently completed network re-enforcement, demand for power capacity, specifically from the Data Centre community, is placing

[1] S.I. No. 595 of 2017 EU Medium Combustion Plants Regulations 2017, available here: S.I. No. 595/2017 - European Union (Medium Combustion Plants) Regulations 2017 (irishstatutebook.ie)

further stress on a fragile network balance, further complicated by the shift towards renewable generation and the intermittent nature of wind and solar generation.

In response, both the Transmission operator (Eirgrid) and Distribution operator (ESB) have introduced a 'Flex' (interruptible) product specifically developed for new Data Centre connections where capacity can be withdrawn during periods when the network is compromised. During these periods, operators will be expected to run on-site emergency generators for extended periods with annual operation expected to be below 500 hours.

Historically, diesel generators at Data Centres have only been required to be 'registered' with the EPA and, due to low annual run hours (under Emergency scenarios), it has not been necessary to submit application for Industrial Emission Licencing (IEL). The introduction of 'Flex' power connections has altered the operational profile, with generators more exposed to MCPD scrutiny.

Equinix has reflected on the challenge of permitting diesel generators for extended operation and taken the initiative to secure a natural gas connection for the purpose of On-Site Emergency/Flex power generation at its Dublin 5 (DB5) facility and introduced optionality around equipment choice (i.e. reciprocating engines, turbine generators, fuel cells etc.).

For the DB5 project, Equinix has selected open cycle dual fuel turbine generators as the prime mover for the power generation solution as they provide low emissions (with water injection), low noise characteristics (compared to reciprocating engines), compact design and can be easily calibrated for a variety of fuels (i.e. gas, gas-oil, bio-fuel, blended hydrogen etc.). With rapid deployment characteristics and long maintenance intervals, turbine generator technology is also suitable for the extended operation anticipated under the new supplier 'Flex' arrangements, with the option to operate the site in Island mode in any event that the power grid is unable to satisfy the contracted power demands of the facility.

5.3 Proposed abatement

Emissions abatement for the each dual fuel turbine generator will include water spray injection delivered at a ratio of 1:1.3 (fuel to water) for NO_x reduction as well as low NO_x burners. Water will be provided by mains supply which is subject to treatment by reverse osmosis and nano-filtration to improve the quality of water before being used in the abatement system. There will be a wastewater stream resulting from the treatment of the water by these processes, these will discharge to foul sewer and will be consented by Irish Water. After the water is treated, it is injected through the abatement system. All water will be vaporised on delivery to the turbine generator stacks due to the high temperatures in the stack which are > 600°C. Water injection is a well understood and effective abatement technology for reducing NO_x emissions and is considered BAT by the Large Combustion Plant BREF for turbine generators.

5.4 Main alternatives to proposed technology

Table 5.1 – Comparison of proposed technology to alternatives provides a comparison of the proposed dual fuel turbine generators against alternative technologies including diesel engines, hydrogen fuel cell, batter banks and renewables.

Table 5.1 – Comparison of proposed technology to alternatives

Criteria	Diesel engines generators	Dual fuel turbine generators	Hydrogen fuel cell	Battery banks	Renewable energy (wind or solar)
Provides sufficient power quickly following power outage	Yes – response time is low	Yes – response time is low	Yes – but unknown reliability	Yes – response time is the fastest	No – insufficient space on site for required capacity and would be subject to meteorological conditions
Provide continuous power	Yes – easy to continue filling diesel tanks if required.	Yes – when there is sufficient capacity on national gas pipeline connection (natural gas operation) Easy to continue filling diesel tanks if required (diesel operation) Dual-fuel turbine generators are also more resilient to disruption of the incoming fuel supply. In the event that one fuel supply is compromised, an alternative fuel can be used	Yes – as long as hydrogen storage on site	No – can only provide power during the short battery life	
Operational constraints	Engines need regular servicing to ensure they operate efficiently	Generators/turbines need regular servicing to ensure they operate efficiently	Technology is largely new so servicing would need undertaking by a specialist	Little, if no maintenance but batteries become depleted and require renewing resulting in hazardous waste	
Emissions	High NO_x emissions compared to dual-fuel generators operating on natural gas	Lower NO_x emissions than diesel fuelled generators when operating on natural gas mode	Low emissions	Low emissions	
Noise	Can generate significant noise at high loads	Generally much quieter than diesel engine when operating at high loads	Low noise	Low noise	

6. ENVIRONMENTAL MANAGEMENT SYSTEM

6.1 ISO 14001

Equinix operates an ISO 14001 accredited environmental management system (EMS) for their existing Dublin data centres. The EMS will be expanded to include the DB5 data centre.

6.2 Summary of Equinix Environmental Management System

The following is a summary of the contents of the Equinix EMS which will be expanded to include DB5. Further detail on any aspect is available on request.

Contents:

7. WASTE MANAGEMENT, RAW MATERIALS AND ENERGY

7.1 Waste generation

Equinix has a Waste Management Procedure for its data centres, which will be expanded to incorporate the DB5 Site. The Waste Management Procedure sets out procedures for waste management at Equinix's data centre sites including:

- Responsibilities;
- Waste arisings and disposal routes;
- Storage and control of wastes;
- Record keeping;
- Audit; and
- Waste minimization.

In general the main source of waste in the data centre is expected to be from the unboxing of customer equipment. The wastes generated at the Site are outlined in the EDEN upload *Attachment-8-1-Waste Generated.*

7.2 Waste minimization

As waste generation will be principally from the unboxing of customer equipment, waste minimization efforts will focus on the level of packaging of that equipment (at the customer/supplier level) and a requirement for a tidy workplace to prevent the unnecessary generation of waste.

7.3 Waste storage

As the majority of waste arising in the data centre will be combustible packaging material, waste will be removed to storage/collection areas in the perimeter of the data centre site. Any hazardous waste arising will be segregated from non-hazardous wastes and will be stored depending on the nature of the waste in either hazardous container, covered or caged or bunded.

7.4 Raw Materials

The data centre will use the raw materials listed below:

- Nytro Libra;
- Eastman Turbo Oil 2197 Containing Tricresyl phosphate;
- Transformer oil;
- CDA9 (Hydrochloric acid 9%);
- pH CHOLORDOX 750 (Sodium chlorite 7.5%);
- Genesys RED;
- Genesys LF;
- PH-SP300 dispersant;
- Envirohib 400;
- Sodium hypochlorite;
- Sodium bromide;
- Diesel; and

- ZOK 27 Washwater.

Handling of raw materials will be managed appropriately to avoid any pollution incidents resulting from the raw materials used on Site. Further details of the Site's raw materials is included in the EDEN template upload *Attachment-4.6-2-Raw Materials*.

7.5 Energy Management System

Equinix operates an ISO 50001 accredited energy management system for their Irish data centres, which will be expanded to include DB5. The certifier is Lloyd's Register who are accredited by UKAS to undertake certification.

Further details on the energy management system are included in the EDEN template *Attachment-9-1-EMT*.

8. NOISE

8.1 Noise Impact Assessment

A noise impact assessment (prepared by Arup, titled: Noise and Vibration Impact Assessment and dated: 24th September 2021) has been carried out according to Transport Infrastructure Ireland's (TII) Good Practice Guidance for the treatment of Noise during the planning of National Road Schemes (TII, 2014).

Each turbine generator will be tested once a month, for a maximum duration of one hour. Standby turbine generators will only be tested one at a time and only during daytime.

No significant change in existing noise levels is predicted to occur due to the proposed development.

The noise impact assessment has been uploaded as a standalone document to the EDEN portal *Attachment-7-5-Noise Emissions*.

9. AIR QUALITY

9.1 Air Quality Impact Assessment

Detailed dispersion modelling (prepared by Arup, titled: Air Quality and Climate Impact Assessment Report and dated: 24th September 2021) of anticipated emissions to air has been undertaken to assess the potential impact of the turbine generators' emissions on air quality. The modelling has been undertaken based on three operational scenarios of *Mode 4: First two years shortage mode* as follows:

- Scenario 1: Continuous Operation;
- Scenario 2: Low Pressure Gas and Fuel Oil; and
- Scenario 3: Fuel oil.

The assessment of only *Mode 4: First two years shortage mode* is on the basis that this mode of operation represents an assumed worst case of all four of the proposed operating modes, as outlined in **Table 3.1.**

No significant impacts are predicted to nearby sensitive human or ecological receptors based on any of these three operational scenarios of *Mode 4: First two years shortage mode*.

The air quality impact assessment has been uploaded as a standalone document to the EDEN portal *Attachment-7-1-3-2-Emissions Impact Assessment*.

10. MONITORING

10.1 Emissions to Air

Equinix proposes to undertake periodic monitoring for NO_x and CO at the DB5 facility. This will be achieved through the installation of a high level access platform around the monitoring port locations of a single turbine generator's stack. There will be fixed ladder access provided. The access platform will be designed as per the EPA's AG2 guidance. Two ports will be provided and will be located in the straight duct in between the two silencer sections across the gas path perpendicular to one another.

During pre-application discussions with the EPA, it was agreed that scaffold and mobile access was not sufficient for the project, and that they would require access to at least one stack to take representative samples.

Due to spatial constraints at the Site, it would be difficult to provide safe, permanent access to all turbine generators for manual sampling. A remotely accessed continuous emission monitoring system (CEMS) alternative was considered and discussed with the EPA during pre-application discussions, however, the EPA informed Equinix that they would still require access to monitoring ports to allow confirmation that the CEMS equipment is calibrated and working correctly. Inclusion of CEMS in the installation was therefore discarded as the access limitations are the same as for periodic monitoring.

Equinix therefore proposes to periodically monitor emissions from a single turbine generator stack on the basis that all units will be the same make and model and will be drawing from the same fuel source from a common header. Additionally, all turbine generators are being built in the same factory one after another and are identical in design. The stack sample of any single turbine generator may therefore be expected to be reasonably representative of all nine units.

During the first two years of operation, full time operation of up to eight of the nine turbine generators may be required. Emissions will be monitored as appropriate every 3 years as stipulated in the Medium Combustion Plant Directive. The emission parameters to be monitored, monitoring frequencies and standards to be used are as follows.

Table 10.1 – Monitoring Schedule

Emission parameter	Monitoring frequency	Standard
NO_x	Every 3 years	BS EN 14792
CO [a]		BS EN 15058
Particulates	---	---
SO_2		

[a] CO is required to be monitoring for all MCPs, however, there is no emission limit value to comply with.

Equinix also proposes to monitor and report the following metrics annually in relation to the backup generation activity at the data centre:

- Number of test/maintenance running hours per year;
- Number of emergency generation events and running hours – per year; and
- Quantity and type of backup generation fuel used over the period.

11. ENVIRONMENTAL RISK ASSESSMENT

11.1 Identify and consider risks from the site

Equinix has conducted an environmental risk assessment for the data centre. This has included identification of sources, pathways and receptors and is presented in **Table 11.1**.

11.2 Site closure and liability

It has been determined that a Closure, Restoration and Aftercare Management Plan (CRAMP) and Environmental Liabilities Risk Assessment (ELRA) are not required in this application. Further information of CRAMP and ELRA is included in the EDEN template "*Attachment-9-1-EMT*."

11.3 Derogation

A derogation in accordance with section 86A(6)(a) has not been sought for this site.

Table 11.1 – Environmental Risk Assessment

Hazard	Operational scenario	Receptor	Pathway	Risk management techniques	Probability of exposure	Consequence	Overall risk
Emission to air (NO_x, CO, particulates)	Testing	See detailed air quality modelling, **Section 9**	Dispersion through the air	Testing regime scheduled for minimum impact – see detailed air quality modelling in **Section 9**	Low	Low	Low
	Emergency operation	See detailed air quality modelling, **Section 9**	Dispersion through the air	The data centre will have a separate substation feed so that there is a good level of redundancy in power supply. The new utility connection will be derived from a new 110kV Eirgrid substation, which will be installed prior to the completion of Building 2	Low	Low	Low
	First two years of operation	See detailed air quality modelling, **Section 9**	Dispersion through the air	Minimisation of the duration of full time operation of up to eight of the nine turbine generators. Gas firing only during this period. See detailed air quality modelling, **Section 9**	Medium	Low	Medium
	In case of fire	Local residents	Dispersion through the air	Should a fire occur, action to extinguish the fire as quickly as possible will be taken to reduce emissions to air Fire suppression system comprises centralised sprinkler storage and distribution is provided in line with GDS and FDC MKII. A diesel pump, electric pump for resilience and a jockey pump are to be provided to deliver water to Building DB5 systems	Low	Medium	Low

Emission to water	No known scenarios due to no surface water bodies in proximity to the data centre						
Emission to sewer (Bulk fuel)	Accidental	Ringsend WWTP	Emission to sewer following a direct spill onto land through catastrophic failure of tank/ pipework/ overfill, bund and site surfacing	Bulk storage tanks will be double skinned and situated within a bund(s) that are 110% storage capacity of the largest tank Any water that accumulates in external bunds will be tested prior to discharge into rainwater drains. Any oil and oily water will be removed using a vacuum pump, and recycled or disposed using an appropriate waste disposal company The areas in which the bulk tanks are planned to be located will be subject to a daily site housekeeping walk around to look for issues The site will have a diesel filling procedure to minimise spills The turbine generators are to be stored in their own individual containers over hardstanding concrete The Site will consist of hardstanding both inside and outside of the building Site drainage is designed to minimise pollutants from entering the sewer Equinix will have emergency response procedures in place in the	Low	Medium. WWTP may need to quarantine the affected flow	Low

				event of a release of oil or diesel, processes for the planning for such eventualities and checklists to audit the response in case such an event occurs			
Emission to sewer (firefighting water)	Firefighting water	Ringsend WWTP	Emission to sewer following a fire where significant water is required to extinguish it	The large majority of the site will not contain significant quantities of hazardous substances and is therefore not considered to pose a risk to the environment through the generation of contaminated firewater. Firewater may therefore be disposed of via the storm-water drainage network. The principal hazardous material which will be stored on site is diesel fuel. There is bund capacity to contain 110% of the largest diesel tank and 25% of the aggregate of all diesel storage. The surface water drainage system will be able to be isolated through a shut off valve in the event of fire-water run-off being generated. This will limit the risk to offsite environmental receptors from the site in the event of a fire. A Firewater Risk Assessment has been completed for the site. This can be provided on request (there is no section of the EDEN portal to allow it to be uploaded as an additional document).	Medium	Medium	Medium
Emission to	Accidental	Land within the installation	Direct spill onto land through	See above response for Emission to sewer (bulk fuel)	Low	Medium. Site clean-up and	Medium –

land (Bulk fuel)		boundary (quantity stored is too low for an off-site incident)	catastrophic failure of tank/ pipework/ overfill, bund and penetration of site surfacing			possible remediation required	Low
Emission to groundwater (Bulk fuel)	Accidental	DB5 is underlain by the Dublin Groundwater Body (EU code: IE_EA_G_008)	Infiltration through land surface following direct spill as above	See response for Emission to sewer (bulk fuel)	Low	Medium. Site clean-up and possible remediation required	Low
Odour	No known as no odorous substances handled on site						
Noise and vibration	Turbine generator testing /emergency operation	Local businesses /residential receptors	Airborne	Testing regime scheduled for daytime hours. Emergency running likelihood is very low and unlikely to be of extended duration with the exception of first two years of full time operation of up to eight of the nine turbine generators Noise impact assessment determined risk would be low. See **Section 8**	Very low	Low	Low
Litter / pests	Normal operation	Neighbouring industrial and commercial units	Windblown	Housekeeping will be given a high priority as company policy. Waste generating activities occur within the data centre building and are not external	Very low	Low	Very Low
Visible emissions (Black smoke on start-up)	Turbine generator testing /emergency	Neighbouring industrial and commercial units	Airborne / visual Minimisation of planned testing	Minimisation of planned testing Low likelihood of emergency running Black smoke will only be an issue on start-up when the turbine generators are fired on diesel. Natural gas will be the main fuel	Low	Low – short duration visible emission	Low

				source for emergency operations with diesel only being used when gas supply from the GNI network is interrupted			
Surface water flooding from a weather event	All operational scenarios	Site operations restricted	Direct effects	Surface water drainage to stormwater sewer via class 1 bypass separator Site operations are principally internal (within buildings)	Low	Low – operational impact	Low

12. APPROPRIATE ASSESSMENT

An appropriate assessment screening has been undertaken by Scott Cawley on the 27th September 2021, to determine whether an appropriate assessment would be required to determine the scale of impacts resulting from the operation of the turbine generators at DB5 to nearby European habitat sites.

The screening assessment concluded that there is no potential for likely significant effects on any of the European sites considered by the screening. The full report has been uploaded as a standalone document to the EDEN portal *Attachment-6-2-1-AA-Screening -September-2021*.

13. ENVIRONMENTAL IMPACT STATEMENT

The proposal is not of a scale which falls within the fifth schedule of the Planning and Development Regulations 2001 (as amended) requiring an Environmental Impact Assessment Report/Environmental Impact Statement (EIAR/EIS).

Schedule 5, Part 2 of the Planning and Development Regulations 2001 (as amended) defines specific activities as requiring an EIAR/EIS. **Table 13.1** screens the applicability of each of the relevant criteria.

Table 13.1 – EIAR/EIS Screening Assessment

Criteria	Applicability
Energy industry	
(a) Industrial installations for the production of electricity, steam and hot water not included in Part 1 of this Schedule with a heat output of 300 megawatts or more.	N/A – Site output is < 300 MW
(b) Industrial installations for carrying gas, steam and hot water with a potential heat output of 300 megawatts or more, or transmission of electrical energy by overhead cables not included in Part 1 of this Schedule, where the voltage would be 200 kilovolts or more.	N/A – Site output is < 300 MW
(c) Installations for surface storage of natural gas, where the storage capacity would exceed 200 tonnes.	N/A – no gas storage
(d) Installations for underground storage of combustible gases, where the storage capacity would exceed 200 tonnes.	N/A – no underground storage
(e) Installations for the surface storage of fossil fuels, where the storage capacity would exceed 100,000 tonnes.	N/A – storage of diesel is not > 100,000 tonnes
(f) Installations for industrial briquetting of coal and lignite, where the production capacity would exceed 150 tonnes per day.	N/A – Site is a data centre comprising generators

(g) Installations for the processing and storage of radioactive waste not included in Part 1 of this Schedule.	N/A – Site is a data centre comprising generators
(h) Installations for hydroelectric energy production with an output of 20 megawatts or more, or where the new or extended superficial area of water impounded would be 30 hectares or more, or where there would be a 30 per cent change in the maximum, minimum or mean flows in the main river channel.	N/A – Site is a data centre comprising generators
(i) Installations for the harnessing of wind power for energy production (wind farms) with more than 5 turbines or having a total output greater than 5 megawatts."	N/A – Site is a data centre comprising generators
Infrastructure projects	
(a) Industrial estate development projects, where the area would exceed 15 hectares.	N/A – Site footprint is <15 ha
(b) (i) Construction of more than 500 dwelling units.	N/A – Site is a data centre
(b) (ii) Construction of a car-park providing more than 400 spaces, other than a car-park provided as part of, and incidental to the primary purpose of, a development.	N/A – Site is a data centre
(b) (iii) Construction of a shopping centre with a gross floor space exceeding 10,000 square metres.	N/A – Site is a data centre
(b) (iv) Urban development which would involve an area greater than 2 hectares in the case of a business district[a], 10 hectares in the case of other parts of a built-up area and 20 hectares elsewhere.	N/A – Site's footprint will not exceed any threshold

[a] "business district" means a district within a city or town in which the predominant land use is retail or commercial use.

It is also noted that of the environmental receptors noted in the seventh schedule of the same regulations, that there are no characteristics of the proposed development which would require an EIA to be undertaken.

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