APPENDIX A – LIST OF PERMITTED DEVELOPMENT

Application details	Description	Decision & Date
Applicant: Starrus Eco Holdings Ltd. **Reference**: SD17A/0382 **Location**: Dublin Regional Materials Recovery Facility, Merrywell Industrial Estate, Ballymount Road Lower, Dublin 22	Works to existing waste management building including the installation of roof mounted solar panels and all ancillary works and services.	**Decision**: Grant Permission **Date**: 30/01/2018
Applicant: Gavin Property Limited **Reference**: SD17A/0428 **Location**: Former DHL Facility, Ballymount Road Lower, Dublin 12	The change of use of 2.33 ha site from the existing warehousing, distribution and storage use to transport depot, including the existing warehouse building (incorporating internal ancillary offices and related areas over part three levels) (3,812sq.m). The development will include on-site provision for the storage, maintenance and parking of 125 buses; ancillary surface staff car parking (including electrical charging bays); ancillary offices and staff facilities (including toilets and canteen); bus workshop; external fuel storage tank, refuel area and bus wash; landscaping and boundary treatments. The development will also include the removal of existing oil storage tanks; the provision of plant, signage and bicycle parking; external lighting; connections to services and utilities; pipe work and all ancillary site excavation and development works above and below ground. Access to the site is as existing. No elevational changes are proposed as part of this application.	**Decision**: Grant Permission **Date**: 23/03/2018
Applicant: Petrogas Group Limited **Reference**: SD18A/0002 **Location**: M50 Business Park, Ballymount Avenue, Dublin 12	A petrol filling station including forecourt with 6 pump islands and overhead canopy, HGV filling island and an ancillary retail and food sales building with a total GFA of 672.39sq.m, including drive-through restaurant, cafe/deli, seating area of 197sq.m. convenience shop (100sq.m. net), restrooms and ancillary staff and storage space. Associated signage, including 2 internally illuminated totem signs, canopy and building-mounted signage: associated site works, including 76 car parking spaces, 3 HGV parking spaces, 2 coach parking spaces, 40 bicycle spaces, underground fuel tanks, SUDS drainage, site lighting and landscaping: and vehicular access is proposed from Ballymount Avenue and vehicular egress is proposed to the access road to the south east, which serves Fashion City on a site located to the south of Ballymount Avenue and Ballymount Road Upper and to the east of Calmount Road. The Proposed Development amends the extant permission for a petrol filling station including ancillary retail and cafe unit and drive-through restaurant on the subject site as permitted under Reg. Ref. SD16A/0212.	**Decision**: Grant Permission **Date**: 06/04/2018
Applicant: Camgill Property A Do Limited **Reference**: SD18A/0034 **Location**: Ground Floor Unit 3b & Unit 4, Block C, Ballymount Retail Centre, Ballymount Cross, Dublin 24	Expansion of existing business premises located in Unit 3b into the adjoining Unit 4, together with all ancillary existing site works and services.	**Decision**: Grant Permission **Date**: 04/05/2018
Applicant: Linde Material Handling (Irl) Ltd. **Reference**: SD18A/0088	Construction of a mezzanine floor for use as storage area at first floor level, within the existing warehouse; erection of 1 totem pole style sign to front of site, with associated site works; erection of 3 advertisement signs fixed to southern and western elevations of existing building.	**Decision**: Grant Permission **Date**: 18/06/2018

Location: Unit 1, Parkway Business Centre, Lower Ballymount Road, Dublin 12.		
Applicant: Briggs Equipment Ireland Ltd. **Reference**: SD18A/0090 **Location**: Unit 1, Crosslands Industrial Estate, Lower Ballymount Road, Dublin 12	Change of use of part of existing warehouse unit (148 sq.m) to vehicle (forklifts) service area; forming new external vehicle (forklifts) wash area; forming new external vehicle (forklifts) storage areas; new illuminated building signage and new illuminated pylon sign to front boundary.	**Decision**: Grant Permission **Date**: 25/06/2018
Applicant: Panda Power Ltd. **Reference**: SD18A/0130 **Location**: Spanners, Ballymount Avenue, Kilnamanagh, Ballymount, Co. Dublin	Installation of roof mounted solar panels to existing vehicle service facility and all ancillary works and services.	**Decision**: Grant Permission **Date**: 23/07/2018
Applicant: Shred It ROI Ltd. **Reference**: SD18A/0183 **Location**: Unit 6A, Westgate Business Park, Ballymount Road Upper, Dublin 24.	Construction of a single storey sprinkler pump house of 58sq.m, a 7.15m high 173m3 capacity sprinkler water storage tank and associated works, to the rear of an existing light industrial facility. This application relates to a development which comprises or is for the purposes of an activity requiring a Waste Licence.	**Decision**: Grant Permission **Date**: 27/08/2018
Applicant: Dixon's Carphone Warehouse **Reference**: SD19A/0053 **Location**: Ballymount Avenue, Kilnamanagh, Dublin 12	Lightweight demountable loading structure to service area.	**Decision**: Grant Permission **Date**: 22/05/2019
Applicant: Sonoma Valley Ltd. **Reference**: SD19A/0005 **Location**: Unit 4, Westgate Business Park, Ballymount, Dublin 24	Construction of 1,540sq.m approx. of additional hardstanding on northeast and southwest areas of the site for parking of cars and service vehicles; associated works.	**Decision**: Grant Permission **Date**: 26/07/2019
Applicant: Comark Investments Ltd. **Reference**: SD19A/0141 **Location**: Unit 4, Fashion City, M50 Business Park, Ballymount Road Upper, Dublin 24	2 windows to the front elevation at ground floor and Level 2; 1 window to the rear elevation at Level 1.	**Decision**: Grant Permission **Date**: 26/07/2019
Applicant: Management Company Ltd. **Reference**: SD19A/0281 **Location**: Merrywell Industrial Estate, Ballymount, Dublin 12	Installation of new paving; removal of existing timber post and rail fence; installation of textured block walls incorporating new signage; erection of two textured block columns topped with new signage; all associated site development works.	**Decision**: Grant Permission **Date**: 09/12/2019
Applicant: Exertis Ireland Ltd. **Reference**: SD19A/0222	Construction of new 1269sq.m warehouse extension with ancillary trading area; offices; staff site entrance; reconfiguration of existing car park and other associated minor site works to existing 4569sq.m warehouse with existing ancillary showrooms and offices (including limited telemarketing use).	**Decision**: Grant Permission **Date**: 28/01/2020

Location: M50 Business Park, Ballymount Road Upper, Ballymount, Dublin 12		
Applicant: Galco Steel Ltd. **Reference**: SD19A/0384 **Location**: Galco House, Ballymount Road, Walkinstown, Dublin 12	(i) Alterations to existing roofs to include increasing roof height of one bay to match adjoining bay; (ii) new wall & roof cladding including louvred ventilation panels and translucent panels over existing cladding and to altered areas of buildings and extensions; (iii) provision of new roller-shutter doors to three existing opes and three new opes; (iv) demolition of three ancillary structures attached to the north side of the building and provision of four new single storey pitched roof structures attached to the north side of the building; (v) demolition of some existing wall and roof structures to the eastern end of the building, and the provision of new walls & roofs to form new areas of the high-bay plant/fabricating area with raised roof on parapet levels; (vi) demolition of a detached single storey plant building on the north-west of the site and storage buildings on the east of the site and construction of 3 new single storey detached plant and storage buildings; (vii) provision of new signage to the west facing elevation of the building at high level; (viii) all other associated siteworks & services to facilitate the development.	**Decision**: Grant Permission **Date**: 20/03/2020
Applicant: GC Auto Properties Limited **Reference**: SD19A/0404 **Location**: Ballymount Road Upper, M50 Business Park, Dublin 12	Construction of a two storey motorcar retail showroom (c. 904sq.m); 2 floors of ancillary offices and associated uses; access to be provided from existing entrance the internal circulation road to the west; provision of 19 visitor and staff surface car parking (1 disabled access space, 2 electric vehicle charging spaces and 4 bicycle parking spaces); 89 spaces for the display and valet of vehicles, including display area; signage comprising 3 totem signs (2 x 6m and 1 x 7.5m in height) and 5 elevational signs (c. 20.19sq.m of signage in total); single storey substation and bin store as well as all associated infrastructure, landscaping and associated site development works including plant and PV panels at roof level all on a site of c. 0.59ha.	**Decision**: Grant Permission **Date**: 30/06/2020
Applicant: Starrus Eco Holdings Ltd. **Reference**: SD20A/0076 **Location**: Panda Waste Management, Ballymount Road Upper, Dublin 24	Installation of roof mounted solar panels over an existing Waste Transfer/Recycling building and all associated site works and services; the Proposed Development relates to an activity covered by an existing Waste Licence issued by the Environmental Protection Agency.	**Decision**: Grant Permission **Date**: 13/08/2020
Applicant: WeCanSaveYouMoney **Reference**: SD20A/0135 **Location**: Unit 82, Block 5, Western Parkway Business Park, Ballymount Drive, Dublin 12	Alterations to existing northern elevation comprising of four additional windows on northern elevation, two on ground floor and two on first floor.	**Decision**: Grant Permission **Date**: 03/09/2020
Applicant: Virgin Media Ireland **Reference**: SD20A/0160 **Location**: Unit 5, Westgate Business Park, Ballymount, Dublin 24	Erect 1,063.05sq.m of photovoltaic panels on the roof of existing building with all associated site works.	**Decision**: Grant Permission **Date**: 13/10/2020
Applicant: Virgin Media Ireland **Reference**: SD20A/0159 **Location**: Unit 7, Westgate Business Park, Ballymount, Dublin 24	Erect 728.41sq.m of photovoltaic panels on the roof of existing building with all associated site works.	**Decision**: Grant Permission **Date**: 13/10/2020
Applicant: Cleargate Ltd. **Reference**: SD20A/0249	The installation of a new external door to the rear facade & internal alterations at ground floor.	**Decision**: Grant Permission

Location: Unit 23, Fashion City, Upper Ballymount Road, Dublin 24		**Date**: 11/01/2021
Applicant: Gas Networks Ireland **Reference**: SD20A/0291 **Location**: Spanners Ltd. M50 Business Park, Ballymount Avenue, D12 HD35	Single storey CNG (compressed natural gas) compressor installation with a floor area of 19sq.m; covered shelter with a floor area of 30sq.m and a 2.6m high boundary wall around the site with all ancillary services and associated site works.	**Decision**: Grant Permission **Date**: 22/02/2021
Applicant: Amazon Data Services Ire. Ltd. **Reference**: SD21A/0008 **Location**: Unit 1, M50 Business Park, Ballymount Avenue, Dublin 12	Change of use of c.12.25sq.m of floorspace within the existing warehouse building on site, from warehouse use to use for the temporary storage of shredded electrical & electronic equipment and components.	**Decision**: Grant Permission **Date**: 26/04/2021
Applicant: HPC Sales Limited **Reference**: SD21A/0080 **Location**: Unit 2, Building A, Ballymount Retail Park, Dublin 24	Erect 1050sq.m of photovoltaic panels on the roof of existing warehouse unit with all associated site works.	**Decision**: Grant Permission **Date**: 25/06/2021
Applicant: Graine O'Rourke Models Limited **Reference**: SD21A/0153 **Location**: Fashion House 4, Fashion City, Ballymount Road Upper, Dublin 24	Erect 525sq.m. of photovoltaic panels on the roof of existing unit with all associated site works.	**Decision**: Grant Permission **Date**: 13/09/2021
Applicant: Swan Plant Hire (Dublin) Ltd t/a Loxam Swan **Reference**: SD21A/0262 **Location**: Unit 4, Crossbeg industrial Estate, Ballymount Road Upper, Dublin 24	Demolition of industrial shed attached to existing industrial building.	**Decision**: Grant Permission **Date**: 05/01/2022
Applicant: HSIL Properties **Reference**: SD21A/0214 **Location**: M50 Business Park, Ballymount, Dublin 12	Retention for as constructed extended floor areas to ground floor level reception area (approx. 38sq.m) and first floor level office areas (approx. 49sq.m). Permission to construct a new extension to the north-eastern corner of a permitted storage warehouse building together with associated external signage, site development works; provide additional storage space at second floor level only (approx. 2,198sq.m) and form an undercroft to the permitted access/entrance areas.	**Decision**: Grant Permission & Grant Retention **Date**: 11/03/2022
Applicant: Go Ahead Ireland **Reference**: SD21A/0213 **Location**: 12, Ballymount Road Lower, Dublin 12	Extension of the existing depot to provide additional bus parking facilities comprising a total of 221 bus spaces (including 45 electric bus parking spaces), 33 car parking spaces (including 15 electric car parking spaces), 5 motorcycle parking spaces and 30 bicycle parking spaces; revisions to the layout and configuration of the existing bus and car parking areas; the installation of electric vehicle charging units and associated infrastructure; new vehicular entrance/egress arrangement (including barrier and ramp) to Ballymount Avenue on the north-eastern site boundary; the provision of 4 pedestrian entrances located on the south-eastern, south-western and north-eastern site boundaries; internal roads and pedestrian pathways; minor elevational amendments to the existing transport depot building (relocation and addition of roller shutter doors and relocation of signage); hard and soft landscaping;	**Decision**: Grant Permission **Date**: 11/03/2022

	boundary treatments; changes in level; lighting; surface water drainage; piped infrastructure and ducting, and all associated site excavation and development works above and below ground. (The development will also include the underground diversion of the existing ESB power line traversing the south-eastern corner of the site.)	
Applicant: Pinewood Healthcare **Reference**: SD22A/0010 **Location**: Unit 1, M50 Business Park, Ballymount Avenue, Dublin 12	Change of existing ground floor office and workshop area to an additional storage area.	**Decision**: Grant Permission **Date**: 25/04/2022
Applicant: Galco Steel Limited **Reference**: SD21A/0347 **Location**: Galco House, Ballymount Road, Walkinstown, Dublin 12	Construction of a single storey extension (980sq.m) to paint workshop with canopy; two access doors with roller shutters and all associated site development works.	**Decision**: Grant Permission **Date**: 05/07/2022
Applicant: Flairline Fashions Ltd. **Reference**: SD22A/0102 **Location**: Unit 27, Fashioncity, Ballymount, Dublin 24	Erection and installation of 124 photovoltaic solar panels with an area of 235.6sq.m (with average size of 1.9sq.m per panel) on the existing roofslope and all associated alterations to existing elevations, site and ancillary works.	**Decision**: Grant Permission **Date**: 19/07/2022
Applicant: HSIL Properties **Reference**: SD22A/0104 **Location**: M50 Business Park, Ballymount, Dublin 12	Construct additional floors at third and fourth floor levels internally as modifications to a recently permitted development under SD21A/0214 - extension of an existing storage warehouse building.	**Decision**: Grant Permission **Date**: 19/07/2022
Applicant: Sonoma Valley Limited **Reference**: SD22A/0274 **Location**: Unit 4, Westgate Business Park, Ballymount, Dublin 24	Permission for the proposed green energy initiative development consisting of the installation of Photovoltaic Panels on the existing roof structures together with all associated site works	**Decision**: Grant Permission **Date**: 10/08/2022
Applicant: Cleargate Ltd **Reference**: SD22A/0277 **Location**: Unit 26C, Fashion City, Ballymount Road Upper, Dublin 24, D24 KP97	Installation of a new external door in the Northwest Elevation to access a new ESB meter enclosure at ground floor of Unit 26C Fashion City, Ballymount Road Upper, Dublin 24	**Decision**: Grant Permission **Date**: 11/08/2022

Appendix B (i)- Appropriate Assessment (AA) Screening Report

Report for the purposes of Appropriate Assessment Screening

Unit 1 M50 Business Park, Ballymount, Dublin 12 Change of Use

Prepared by: Moore Group – Environmental Services

13 December 2022

On behalf of

Creighton Properties LLC

Project Proponent	Creighton Properties LLC
Project	Unit 1 M50 Business Park, Ballymount, Dublin 12 Change of Use
Title	Report for the purposes of Appropriate Assessment Screening Unit 1 M50 Business Park, Ballymount, Dublin 12 Change of Use

Project Number	22154	**Document Ref**	22154 Ski Lodge AAS1_Rev8 221213	
Revision	**Description**	**Author**		**Date**
Rev8	Updated Site Layout	G. O'Donohoe		13 December 2022
Moore Archaeological and Environmental Services Limited				

Table of Contents

Abbreviations

AA	Appropriate Assessment
EEC	European Economic Community
EPA	Environmental Protection Agency
EU	European Union
GIS	Geographical Information System
NHA	Natural Heritage Area
NIS	Natura Impact Statement
NPWS	National Parks and Wildlife Service
OSI	Ordnance Survey Ireland
pNHA	proposed Natural Heritage Area
SAC	Special Area of Conservation
SPA	Special Protection Area

1. Introduction

1.1. General Introduction

The report contains information required for the competent authority to undertake screening for Appropriate Assessment (AA) for proposed change of use of a warehouse at Unit 1 M50 Business Park, Ballymount Avenue, Dublin 12 (hereafter referred to as the Proposed Development) to significantly affect European sites.

Having regard to the provisions of the Planning and Development Act 2000 – 2021 (the "Planning Acts") (section 177U), the purpose of a screening exercise under section 177U of the PDA 2000 is to assess, in view of best scientific knowledge, if the proposed development, individually or in combination with another plan or project is likely to have a significant effect on a European site.

If it cannot be *excluded* on the basis of objective information that the Proposed Development, individually or in combination with other plans or projects, will have a significant effect on a European site then it is necessary to carry out a Stage 2 appropriate assessment under section 177V of the Planning Acts.

When screening the project, there are two possible outcomes:

- the project poses no potential for a likely significant effect and as such requires no further assessment; and
- the project has potential to have likely significant effect (or this is uncertain) unless mitigation measures are applied, and therefore an AA of the project is necessary.

This report has been prepared by Moore Group - Environmental Services to enable the competent authority to carry out AA screening in relation to the Proposed Development. The report was compiled by Ger O'Donohoe (B.Sc. Applied Aquatic Sciences (ATU Galway, 1993) & M.Sc. Environmental Sciences (TCD, 1999)) who has over 27 years' experience in environmental impact assessment and has completed numerous Appropriate Assessment Screening Reports and Natura Impact Statements on terrestrial and aquatic habitats for various development types.

1.2. Legislative Background - The Habitats and Birds Directives

Article 6 of the Habitats Directive is transposed into Irish Law inter alia by the Part XAB of the Planning Acts (section 177U and 177V) govern the requirement to carry out appropriate assessment screening and appropriate assessment, where required, per Section 1.1 above.

The Habitats Directive (Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora) is the main legislative instrument for the protection and conservation of biodiversity in the European Union (EU). Under the Habitats Directive, Member States are obliged to designate Special Areas

of Conservation (SACs) which contain habitats or species considered important for protection and conservation in a EU context.

The Birds Directive (Council Directive 2009/147/EC on the conservation of wild birds), transposed into Irish law by the Bird and Natural Habitats Regulations 2011, as amended, is concerned with the long-term protection and management of all wild bird species and their habitats in the EU. Among other things, the Birds Directive requires that Special Protection Areas (SPAs) be established to protect migratory species and species which are rare, vulnerable, in danger of extinction, or otherwise require special attention.

SACs designated under the Habitats Directive and SPAs, designated under the Birds Directive, form a pan-European network of protected sites known as Natura 2000. The Habitats Directive sets out a unified system for the protection and management of SACs and SPAs. These sites are also referred to as European sites.

Articles 6(3) and 6(4) of the Habitats Directive set out the requirement for an assessment of proposed plans and projects likely to have a significant effect on Natura 2000 sites.

Article 6(3) establishes the requirement to screen all plans and projects and to carry out an appropriate assessment if required (Appropriate Assessment (AA)). Article 6(4) establishes requirements in cases of imperative reasons of overriding public interest:

> ***Article 6(3):*** *"Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subjected to an appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public."*

2. Methodology

The Commission's methodological guidance (EC, 2002, 2018, 2021 see Section 2.1 below) promotes a four-stage process to complete the AA and outlines the issues and tests at each stage. An important aspect of the process is that the outcome at each successive stage determines whether a further stage in the process is required.

Stages 1 and 2 deal with the main requirements for assessment under Article 6(3). Stage 3 may be part of Article 6(3) or may be a necessary precursor to Stage 4. Stage 4 is the main derogation step of Article 6(4).

Stage 1 Screening: This stage examines the likely effects of a project either alone or in combination with other projects upon a Natura 2000 site and considers whether it can be objectively concluded that these effects will not be significant. In order to screen out a project, it must be excluded, on the basis of objective information,

that the Proposed Development, individually or in combination with other plans or projects, will have a significant effect on a European site.

Stage 2 Appropriate Assessment: In this stage, there is a consideration of the impact of the project with a view to ascertain whether there will be any adverse effect on the integrity of the Natura 2000 site either alone or in combination with other projects or plans, with respect to the site's structure and function and its conservation objectives. Additionally, where there are predicted impacts, an assessment of the potential mitigation of those impacts is considered.

Stage 3 Assessment of Alternative Solutions: This stage examines alternative ways of implementing the project that, where possible, avoid any adverse impacts on the integrity of the Natura 2000 site.

Stage 4 Assessment where no alternative solutions exist and where adverse impacts remain: Where imperative reasons of overriding public interest (IROPI) exist, an assessment to consider whether compensatory measures will or will not effectively offset the damage to the sites will be necessary.

To ensure that the Proposed Development complies fully with the requirements of Article 6 of the Habitats Directive and all relevant Irish transposing legislation, Moore Group compiled this report to enable the competent authority to carry out AA screening in relation to the Proposed Development to determine whether the Proposed Development, individually or in combination with another plan or project will have a significant effect on a Natura 2000 site.

2.1. Guidance

This report has been compiled in accordance with guidance contained in the following documents:

- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities. (Department of Environment, Heritage and Local Government, 2010 rev.).
- Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. Circular NPWS 1/10 & PSSP 2/10.
- Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (European Commission Environment Directorate-General, 2001); hereafter referred to as the EC Article 6 Guidance Document.
- Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitat's Directive 92/43/EEC (EC Environment Directorate-General, 2000); hereafter referred to as MN2000.
- Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitat's Directive 92/43/EEC (EC, 2018).
- Guidance document on the strict protection of animal species of Community interest under the Habitats Directive (EC, 2021).
- Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC (EC, 2021).

- Office of the Planning Regulator (OPR) Practice Note PN01 Appropriate Assessment Screening for Development Management (OPR, 2021).

2.2. Data Sources

Sources of information that were used to collect data on the Natura 2000 network of sites, and the environment within which they are located, are listed below:

- The following mapping and Geographical Information Systems (GIS) data sources, as required:
    - National Parks & Wildlife (NPWS) protected site boundary data;
    - Ordnance Survey of Ireland (OSI) mapping and aerial photography;
    - OSI/Environmental Protection Agency (EPA) rivers and streams, and catchments;
    - Open Street Maps;
    - Digital Elevation Model over Europe (EU-DEM);
    - Google Earth and Bing aerial photography 1995-2022;
- Online data available on Natura 2000 sites as held by the National Parks and Wildlife Service (NPWS) from www.npws.ie including:
    - Natura 2000 - Standard Data Form;
    - Conservation Objectives;
    - Site Synopses;
- National Biodiversity Data Centre records;
    - Online database of rare, threatened and protected species;
    - Publicly accessible biodiversity datasets.
- Status of EU Protected Habitats in Ireland. (National Parks & Wildlife Service, 2019); and
- Relevant Development Plans:
    - South Dublin County Development Plan 2016-2022
    - Draft South Dublin County Development Plan 2022-2028

3. Description of the Proposed Development

The proposed development will consist of: the change of use from warehouse to data repository facility, alterations to external facades, provision of a new 1100 mm parapet, reclad roof, internal alterations, refurbishment of the existing office space, solar panels at roof level, external plant at ground and roof levels and equipment to include 12 no. condenser modules, an emergency back-up generator and associated fuel storage tank, transformer, extension to the existing sub-station (c. 13 m^2), 2 no. sprinkler tanks and pumphouse, bin store, 22 parking spaces including 2 electrical vehicle charging points, bicycle parking shelter, landscaping,

planting, new security fence, external lighting, CCTV, altered vehicular gates, permeable hard surfaces, alterations to internal foul sewerage and water supply networks, provision of SuDS compliant surface water drainage system and all associated site works.

Figure 1 shows the Proposed Development location and Figure 2 shows a detailed view of the existing warehouse on recent aerial photography. The site layout is presented in Figure 3.

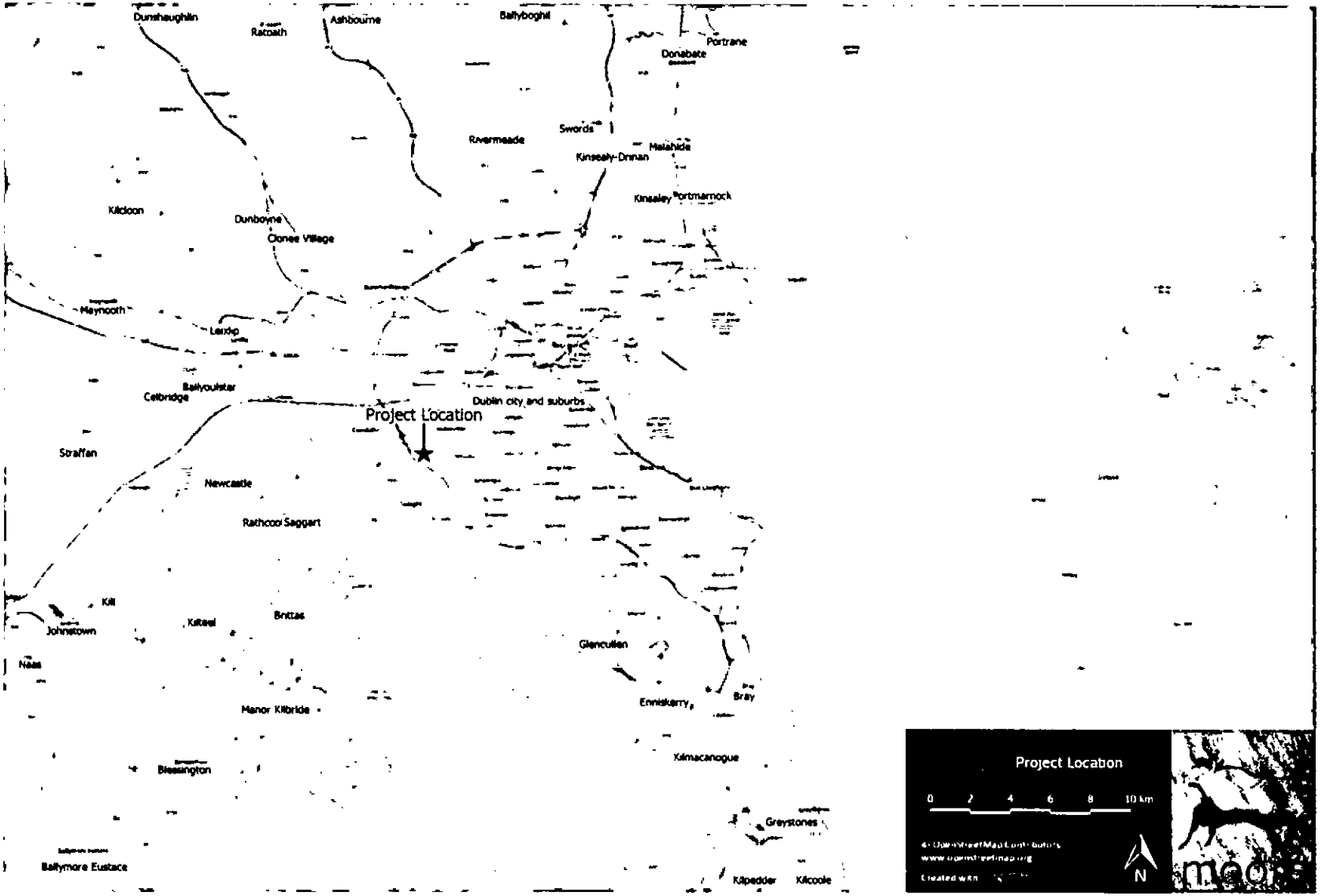


Figure 1. Showing the Proposed Development location in southwest Dublin.

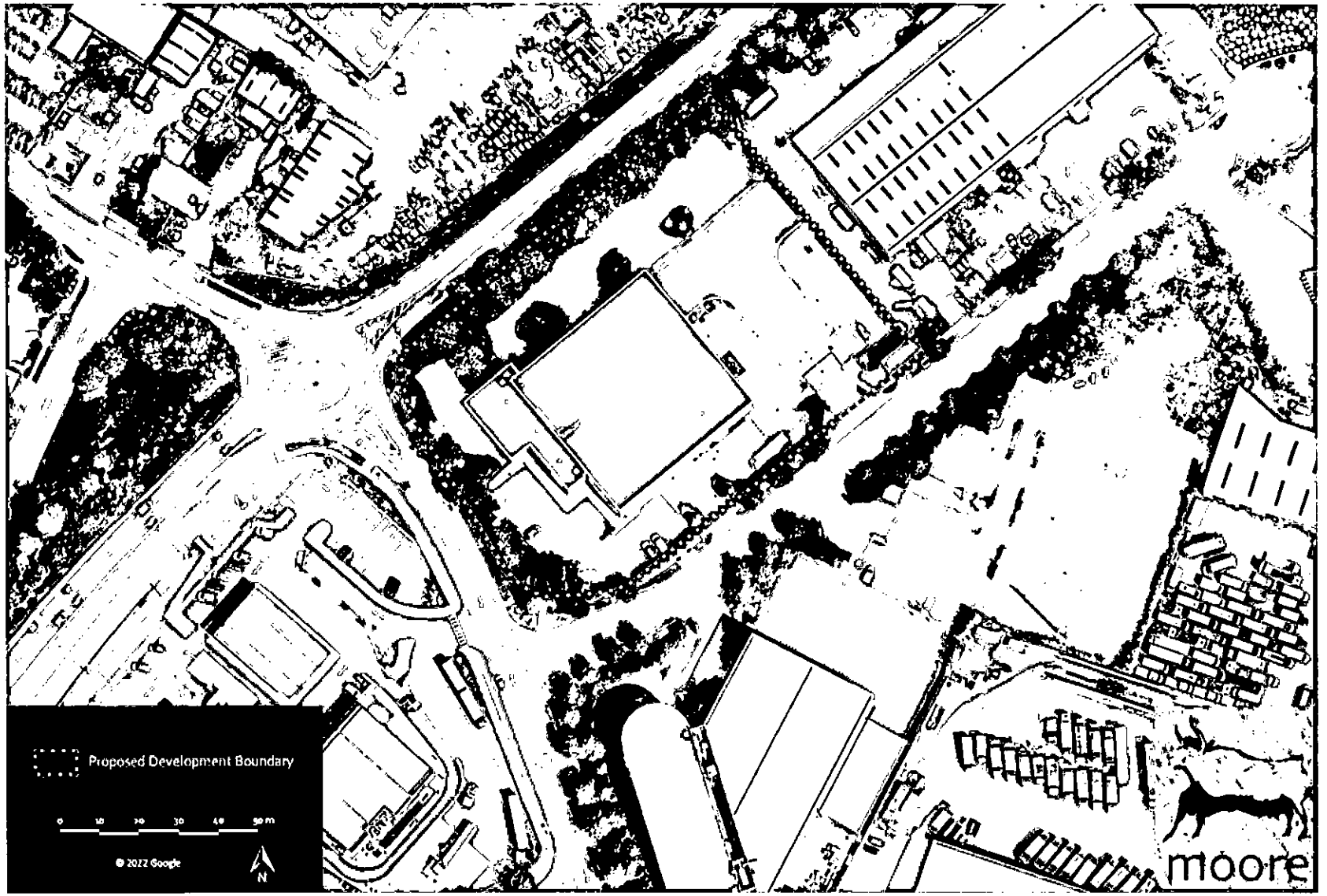


Figure 2. Showing the Proposed Development location on aerial photography with the existing warehouse curtilage outlined.

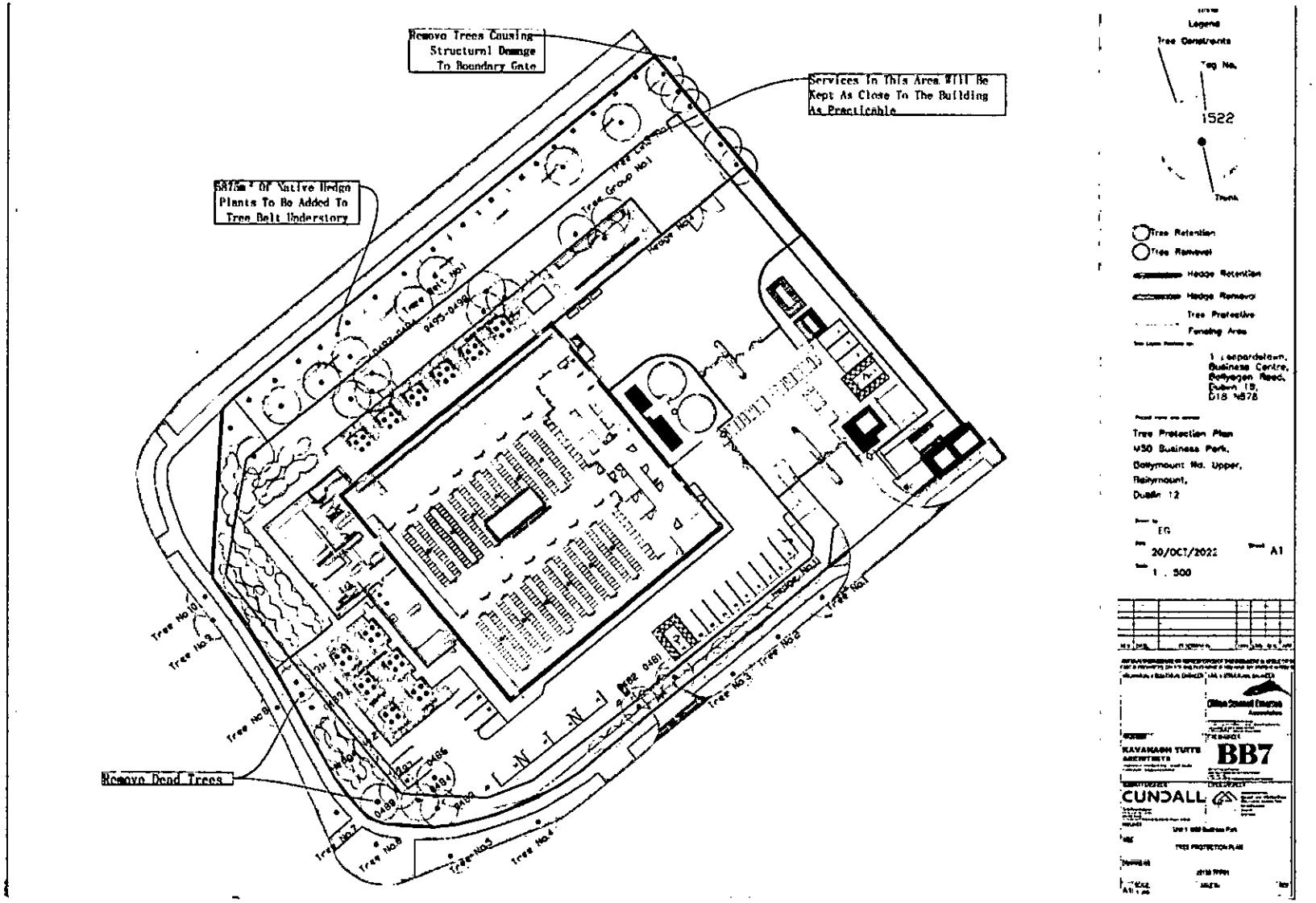


Figure 3. Showing the Proposed Development layout.

4. Identification of Natura 2000 Sites

4.1. Description of Natura Sites Potentially Affected

A Zone of Influence (ZoI) of a proposed development is the geographical area over which it could affect the receiving environment in a way that could have significant effects on the Qualifying Interests of a European site. In accordance with the OPR Practice Note, PN01, the ZoI should be established on a case-by-case basis using the Source- Pathway-Receptor framework.

The European Commission's "*Assessment of plans and projects in relation to Natura 2000 sites guidance on Article 6(3) and (4) of the Methodological Habitats Directive 92/43/EEC*" published 28 September 2021 states at section 3.1.3:

Identifying the Natura 2000 sites that may be affected should be done by taking into consideration all aspects of the plan or project that could have potential effects on any Natura 2000 sites located within the zone of influence of the plan or project. This should take into account all of the designating features (species, habitat types) that are significantly present on the sites and their conservation objectives. In particular, it should identify:

- *any Natura 2000 sites geographically overlapping with any of the actions or aspects of the plan or project in any of its phases, or adjacent to them;*
- *any Natura 2000 sites within the likely zone of influence of the plan or project Natura 2000 sites located in the surroundings of the plan or project (or at some distance) that could still be indirectly affected by aspects of the project, including as regards the use of natural resources (e.g. water) and various types of waste, discharge or emissions of substances or energy;*
- *Natura 2000 sites in the surroundings of the plan or project (or at some distance) which host fauna that can move to the project area and then suffer mortality or other impacts (e.g. loss of feeding areas, reduction of home range);*
- *Natura 2000 sites whose connectivity or ecological continuity can be affected by the plan or project.*

The range of Natura 2000 sites to be assessed, i.e. the zone in which impacts from the plan or project may arise, will depend on the nature of the plan or project and the distance at which effects may occur. For Natura 2000 sites located downstream along rivers or wetlands fed by aquifers, it may be that a plan or project can affect water flows, fish migration and so forth, even at a great distance. Emissions of pollutants may also have effects over a long distance. Some projects or plans that do not directly affect Natura 2000 sites may still have a significant impact on them if they cause a barrier effect or prevent ecological linkages. This may happen, for example, when plans affect features of the landscape that connect Natura 2000 sites or that may obstruct the movements of species or disrupt the continuity of a fluvial or woodland ecosystem. To determine the possible

effects of the plan or project on Natura 2000 sites, it is necessary to identify not only the relevant sites but also the habitats and species that are significantly present within them, as well as the site objectives.

The Zone of Influence may be determined by considering the Proposed Development's potential connectivity with European sites, in terms of:

- Nature, scale, timing and duration of all aspects of the proposed works and possible impacts, including the nature and size of excavations, storage of materials, flat/sloping sites;
- Distance and nature of potential pathways (dilution and dispersion; intervening 'buffer' lands, roads etc.); and
- Location of ecological features and their sensitivity to the possible impacts.

The potential for source pathway receptor connectivity is firstly identified through GIS interrogation and detailed information is then provided on sites with connectivity. European sites that are located within a potential Zone of Influence of the Proposed Development are listed in Table 1 and presented in Figure 4 below. Spatial boundary data on the Natura 2000 network was extracted from the NPWS website (www.npws.ie) on 13 December 2022. This data was interrogated using GIS analysis to provide mapping, distances, locations and pathways to all sites of conservation concern including pNHAs, NHA and European sites.

The Proposed Development is to take place within the existing M50 Business Park in west Dublin City. The proposed development entails use of a warehouse as a Data Repository and associated internal alterations. Therefore there are no predicted discharges to the environment and no pathways to any European sites.

The Proposed Development will not result in any changes to the amount of surface water run-off from the site during operation nor will it result in any contamination of surface waters during operation and will not result in any changes in foul water arising on the site.

Table 1 European Sites located within the potential Zone of Influence[1] of the Proposed Development.

Site Code	Site name	Distance (km)[2]
000206	North Dublin Bay SAC	12.56
000210	South Dublin Bay SAC	9.54
002122	Wicklow Mountains SAC	8.20
004006	North Bull Island SPA	12.55
004024	South Dublin Bay and River Tolka Estuary SPA	9.57
004040	Wicklow Mountains SPA	8.67

[1] All European sites potentially connected irrespective of the nature or scale of the Proposed Development.
[2] Distances indicated are the closest geographical distance between the Proposed Development site and the European site boundary, as made available by the NPWS.

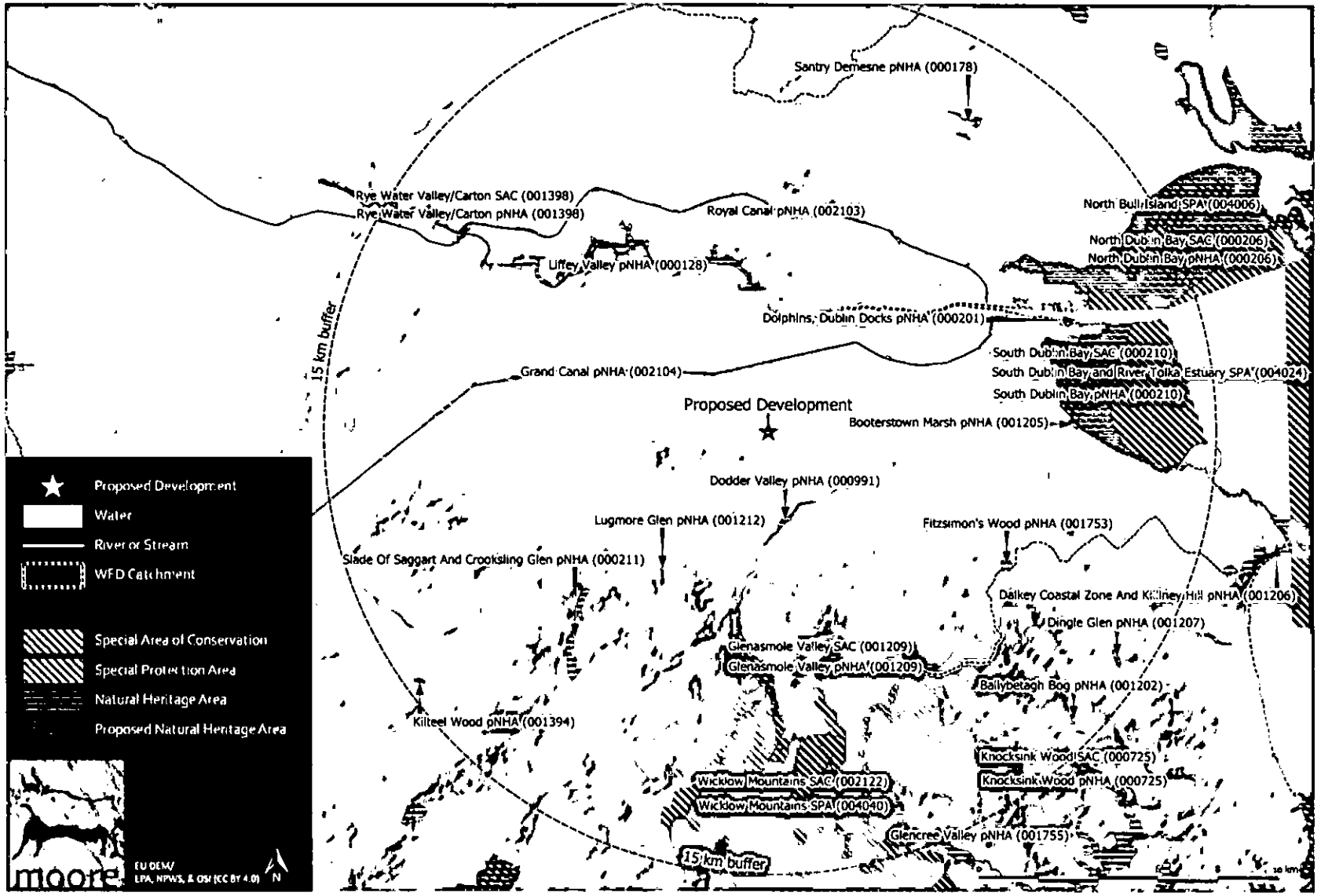


Figure 4. Showing European sites and NHAs/pNHAs within the wider Potential Zone of Influence of the Proposed Development.

4.2. Ecological Network Supporting Natura 2000 Sites

An analysis of the proposed Natural Heritage Areas (pNHA) and designated Natural Heritage Areas (NHA) in terms of their role in supporting the species using Natura 2000 sites was undertaken. It was assumed that these supporting roles mainly related to mobile fauna such as mammals and birds which may use pNHAs and NHAs as "stepping stones" between Natura 2000 sites.

Article 10 of the Habitats Directive and the Habitats Regulations 2011 place a high degree of importance on such non-Natura 2000 areas as features that connect the Natura 2000 network. Features such as ponds, woodlands and important hedgerows were taken into account during the preparation of this AA Screening report.

There are no other areas of conservation concern that would be affected by the Proposed Development.

The NHAs and pNHAs identified in Figure 4 are located outside the potential Zone of Influence of the Proposed Development. There are no predicted discharges to the environment. Therefore, there are no areas of supporting habitat that will be affected by the Proposed Development.

5. Identification of Potential Impacts & Assessment of Significance

The Proposed Development is not directly connected with or necessary to the management of the sites considered in the assessment and therefore potential impacts must be identified and considered.

5.1. Potential Impacts

The Proposed Development is located within the existing M50 Business Park in west Dublin City. The Proposed Development entails use of a warehouse as a Data Repository and associated internal alterations. Therefore there are no predicted discharges to the environment and no pathways to any European sites.

The Proposed Development will not result in any changes to the amount of surface water run-off from the site during operation nor will it result in any contamination of surface waters during operation and will not result in any changes in foul water arising on the site.

Having considered the above, significant effects on any European sites as a result of the Proposed Development have been ruled out and, therefore, potential significant effects on European sites have been excluded at this preliminary screening stage.

5.2. Assessment of Potential In-Combination Effects

In-combination effects are changes in the environment that result from numerous human-induced, small-scale alterations. In-combination effects can be thought of as occurring through two main pathways: first, through persistent additions or losses of the same materials or resource, and second, through the compounding effects as a result of the coming together of two or more effects.

As part of the Screening for an Appropriate Assessment, in addition to the Proposed Development, other relevant plans and projects in the area must also be considered at this stage. This step aims to identify at this early stage any possible significant in-combination effects of the Proposed Development with other such plans and projects on European sites.

A review of the National Planning Application Database was undertaken. The first stage of this review confirmed that there were no data gaps in the area where the Proposed Development is located. The database was then queried for developments granted planning permission within 250m of the Proposed Development within the last three years, these are presented in Table 2.

Table 2.Planning applications granted permission in the vicinity of the Proposed Development.

Planning Ref.	Description of development	Comments
SD19A/0005	Construction of 1,540sq.m approx. of additional hardstanding on northeast and southwest areas of the site for parking of cars and service vehicles; associated works.	No potential for in-combination effects given the scale and location of the project and that the Proposed Development will have no emissions to the environment.
SD19A/0141	2 windows to the front elevation at ground floor and Level 2; 1 window to the rear elevation at Level 1.	No potential for in-combination effects given the scale and location of the project and that the Proposed Development will have no emissions to the environment.
SD19A/0281	Installation of new paving; removal of existing timber post and rail fence; installation of textured block walls incorporating new signage; erection of two textured block columns topped with new signage; all associated site development works.	No potential for in-combination effects given the scale and location of the project and that the Proposed Development will have no emissions to the environment.
SD19A/0222	Construction of new 1269sq.m warehouse extension with ancillary trading area; offices; staff site entrance; reconfiguration of existing car park and other associated minor site works to existing 4569sq.m warehouse with existing ancillary showrooms and offices (including limited telemarketing use).	No potential for in-combination effects given the scale and location of the project and that the Proposed Development will have no emissions to the environment.
SD19A/0290	Increase in height from 5.6 metres (as required under Condition 5 of Reg ref:SD18A/0002) to 7 metres for two internally illuminated totem signs at the Applegreen Petrol filling station located to the south of Ballymount Avenue and Ballymount Road Upper and to the east of Calmount Road.	No potential for in-combination effects given the scale and location of the project and that the Proposed Development will have no emissions to the environment.
SD19A/0384	(i) Alterations to existing roofs to include increasing roof height of one bay to match adjoining bay; (ii) new wall & roof cladding including louvred ventilation	No potential for in-combination effects given the scale and location of the project and that the

Planning Ref.	Description of development	Comments
	panels and translucent panels over existing cladding and to altered areas of buildings and extensions; (iii) provision of new roller-shutter doors to three existing opes and three new opes; (iv) demolition of three ancillary structures attached to the north side of the building and provision of four new single storey pitched roof structures attached to the north side of the building; (v) demolition of some existing wall and roof structures to the eastern end of the building, and the provision of new walls & roofs to form new areas of the high-bay plant/fabricating area with raised roof on parapet levels; (vi) demolition of a detached single storey plant building on the north-west of the site and storage buildings on the east of the site and construction of 3 new single storey detached plant and storage buildings; (vii) provision of new signage to the west facing elevation of the building at high level; (viii) all other associated siteworks & services to facilitate the development.	Proposed Development will have no emissions to the environment.
SD19A/0404	Construction of a two storey motorcar retail showroom (c. 904sq.m); 2 floors of ancillary offices and associated uses; access to be provided from existing entrance the internal circulation road to the west; provision of 19 visitor and staff surface car parking (1 disabled access space, 2 electric vehicle charging spaces and 4 bicycle parking spaces); 89 spaces for the display and valet of vehicles, including display area; signage comprising 3 totem signs (2 x 6m and 1 x 7.5m in height) and 5 elevational signs (c. 20.19sq.m of signage in total); single storey substation and bin store as well as all associated infrastructure, landscaping and associated site development works including plant and PV panels at roof level all on a site of c. 0.59ha.	No potential for in-combination effects given the scale and location of the project and that the Proposed Development will have no emissions to the environment.
SD20A/0076	Installation of roof mounted solar panels over an existing Waste Transfer/Recycling building and all associated site works and services; the proposed development relates to an activity covered by an existing Waste Licence issued by the Environmental Protection Agency.	No potential for in-combination effects given the scale and location of the project and that the Proposed Development will have no emissions to the environment.
SD20A/0159	Erect 728.41sq.m of photovoltaic panels on the roof of existing building with all associated site works.	No potential for in-combination effects given the scale and location of the project and that the Proposed Development will have no emissions to the environment.
SD20A/0135	Alterations to existing northern elevation comprising of four additional windows on northern elevation, two on ground floor and two on first floor.	No potential for in-combination effects given the scale and location of the project and that the Proposed Development will have no emissions to the environment.
SD20A/0160	Erect 1,063.05sq.m of photovoltaic panels on the roof of existing building with all associated site works.	No potential for in-combination effects given the scale and location of the project and that the Proposed Development will have no emissions to the environment.
SD20A/0291	Single storey CNG (compressed natural gas) compressor installation with a floor area of 19sq.m; covered shelter with a floor area of 30sq.m and a	No potential for in-combination effects given the scale and location of the project and that the

Planning Ref.	Description of development	Comments
	2.6m high boundary wall around the site with all ancillary services and associated site works.	Proposed Development will have no emissions to the environment.
SD20A/0249	The installation of a new external door to the rear facade & internal alterations at ground floor.	No potential for in-combination effects given the scale and location of the project and that the Proposed Development will have no emissions to the environment.
SD20B/0264	Retention of an existing 5.175m wide vehicular entrance to the driveway and proposed new dishing of front footpath.	No potential for in-combination effects given the scale and location of the project and that the Proposed Development will have no emissions to the environment.
SD21A/0008	Change of use of c.12.25sq.m of floorspace within the existing warehouse building on site, from warehouse use to use for the temporary storage of shredded electrical & electronic equipment and components.	No potential for in-combination effects given the scale and location of the project and that the Proposed Development will have no emissions to the environment.
SD21A/0080	Erect 1050sq.m of photovoltaic panels on the roof of existing warehouse unit with all associated site works.	No potential for in-combination effects given the scale and location of the project and that the Proposed Development will have no emissions to the environment.
SD21A/0153	Erect 525sq.m. of photovoltaic panels on the roof of existing unit with all associated site works.	No potential for in-combination effects given the scale and location of the project and that the Proposed Development will have no emissions to the environment.
SD21A/0214	Retention for as constructed extended floor areas to ground floor level reception area (approx. 38sq.m) and first floor level office areas (approx. 49sq.m). Permission to construct a new extension to the north-eastern corner of a permitted storage warehouse building together with associated external signage, site development works; provide additional storage space at second floor level only (approx. 2,198sq.m) and form an undercroft to the permitted access/entrance areas.	No potential for in-combination effects given the scale and location of the project and that the Proposed Development will have no emissions to the environment.
SD21A/0213	Extension of the existing depot to provide additional bus parking facilities comprising a total of 221 bus spaces (including 45 electric bus parking spaces), 33 car parking spaces (including 15 electric car parking spaces), 5 motorcycle parking spaces and 30 bicycle parking spaces; revisions to the layout and configuration of the existing bus and car parking areas; the installation of electric vehicle charging units and associated infrastructure; new vehicular entrance/egress arrangement (including barrier and ramp) to Ballymount Avenue on the north-eastern site boundary; the provision of 4 pedestrian entrances located on the south-eastern, south-western and north-eastern site boundaries; internal roads and pedestrian pathways; minor elevational amendments to the existing transport depot building (relocation and addition of roller shutter doors and relocation of signage); hard and soft landscaping; boundary treatments; changes in level; lighting; surface water drainage; piped infrastructure and ducting, and all	No potential for in-combination effects given the scale and location of the project and that the Proposed Development will have no emissions to the environment.

Planning Ref.	Description of development	Comments
	associated site excavation and development works above and below ground. (The development will also include the underground diversion of the existing ESB power line traversing the south-eastern corner of the site.)	
SD21A/0262	Demolition of industrial shed attached to existing industrial building.	No potential for in-combination effects given the scale and location of the project and that the Proposed Development will have no emissions to the environment.
SD22A/0010	Change of existing ground floor office and workshop area to an additional storage area.	No potential for in-combination effects given the scale and location of the project and that the Proposed Development will have no emissions to the environment.

The South Dublin County Development Plan in complying with the requirements of the Habitats Directive requires that all Projects and Plans that could affect the Natura 2000 sites in the same zone of impact of the Proposed Development site would be initially screened for Appropriate Assessment and if requiring Stage 2 AA, that appropriate employable mitigation measures would be put in place to avoid, reduce or ameliorate negative impacts. In this way any, in-combination impacts with Plans or Projects for the development area and surrounding townlands in which the development site is located, would be avoided.

The listed developments have been granted permission in most cases with conditions relating to sustainable development by the consenting authority in compliance with the relevant Local Authority Development Plan and in compliance with the Local Authority requirement for regard to the Habitats Directive. The development cannot have received planning permission without having met the consenting authority requirement in this regard. There are no predicted in-combination effects given that it is predicted that the Proposed Development will have no effect on any European site.

There are no predicted in-combination effects given that the reasons discussed in the 'Comments' column of Table 2, above, and given that the Proposed Development is unlikely to have any adverse effects on any European sites.

Any new applications for the Proposed Development area will be assessed on a case by case basis *initially* by South Dublin County Council which will determine the requirement for AA Screening as per the requirements of Article 6(3) of the Habitats Directive.

6. Conclusion

The Proposed Development is to take place within the existing M50 Business Park in west Dublin City. The proposed development entails use of a warehouse as a data repository and associated internal alterations. Therefore, there are no predicted discharges to the environment and no pathways to any European sites.

The Proposed Development will not result in any changes to the amount of surface water run-off from the site during operation nor will it result in any contamination of surface waters during operation and will not result in any changes in foul water arising on the site.

Having considered the above, significant effects on any European sites as a result of the Proposed Development have been ruled out and, therefore, potential significant effects on European sites have been excluded at a preliminary screening stage.

It has been objectively concluded by Moore Group Environmental Services that:

1. The Proposed Development is not directly connected with, or necessary to the conservation management of the European sites considered in this assessment.
2. The Proposed Development is unlikely to significantly affect the Qualifying interests or Conservation Objectives of the European sites considered in this assessment.
3. The Proposed Development, alone or in combination with other projects, is not likely to have significant effects on the European sites considered in this assessment in view of their conservation objectives.
4. It is possible to conclude that there would be no significant effects, no potentially significant effects and no uncertain effects if the Proposed Development were to proceed.

It can be *excluded*, on the basis of objective information, that the Proposed Development, individually or in combination with other plans or projects, will have a significant effect on a European site.

An appropriate assessment is not, therefore, required.

A final determination will be made by the competent authority in this regard.

7. References

Department of the Environment, Heritage and Local Government (2010) Guidance on Appropriate Assessment of Plans and Projects in Ireland (as amended February 2010).

European Commission (2000) Managing Natura 2000 sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.

European Commission (2001) Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43EEC. European Commission, Brussels.

European Commission (2018) Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitat's Directive 92/43/EEC.

European Commission (2021) Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC, Brussels 28.9.21.

European Commission (2021) Guidance document on the strict protection of animal species of Community interest under the Habitats Directive, Brussels 12.10.21.

NPWS (2019) The Status of EU Protected Habitats and Species in Ireland. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin.

NPWS (2022) National Parks and Wildlife Service Metadata available online at https://www.npws.ie/maps-and-data

Office-of-the-Planning-Regulator (2021) Appropriate Assessment Screening for Development Management OPR Practice Note PN01. March 2021

Appendix B (ii) - Ecological Impact Assessment (EcIA)

Unit 1 M50 Business Park, Ballymount, Dublin 12

Change of Use

Ecological Impact Assessment

Prepared By:

Moore Group -
Environmental Services

On behalf of:
Creighton Properties LLC

Job Number 22154
December 2022

Project Proponent	Creighton Properties LLC
Project	Unit 1 M50 Business Park, Ballymount, Dublin 12 Change of Use
Title	Unit 1 M50 Business Park, Ballymount, Dublin 12 Change of Use Ecological Impact Assessment

Project Number	22154	**Document Reference**	22154 DUB602 EcIA Rev4
Revision	**Description**	**Author**	**Date**
Rev4	Updated Site Layout	G. O'Donohoe	13 December 2022
Moore Archaeological and Environmental Services Limited			

TABLE OF CONTENTS **PAGE**

1. INTRODUCTION

Moore Group was commissioned by AWN Consulting on behalf of Creighton Properties LLC to undertake a Habitat Survey and EclA of the proposed change of use of a warehouse at Unit 1 M50 Business Park, Ballymount Avenue, Dublin 12 (hereafter referred to as the Proposed Development).

This report provides information on ecological features if present within the potential Zone of Influence of the Proposed Development, of particular significance, primarily designated habitats and species, including habitats/species listed in Annex I, II and IV of the EU Habitats Directive, rare flora listed in the Flora Protection Order along with other semi-natural habitats of conservational value.

This report was compiled by Ger O'Donohoe M.Sc. of Moore Group providing information on habitats in the study area. Ger is the principal ecologist with Moore Group and has over 27 years' experience in ecological impact assessment. He graduated from ATU Galway in 1993 with a B.Sc. in Applied Freshwater & Marine Biology and subsequently worked in environmental consultancy while completing an M.Sc. in Environmental Sciences, graduating from Trinity College, Dublin in 1999. (He also has over 15 years' experience of carrying out bat surveys and has completed the Bat Conservation Ireland, Bat Detector Workshop which is the standard training for the carrying out of bat surveys in Ireland and follows the Bat Conservation Ireland 'Bat Survey Guidelines' (Aughney *et al.,* 2008). In addition, Ger is an active member of the Galway Bat Group and Bat Conservation Ireland, which monitors bat populations in Ireland, and facilitates the education of bat communities to the public.)

The following important ecological receptors were considered in planning and designing the project, and in assessing its likely ecological effects:

- Sites with nature conservation designations, including proposed NHAs, the reasons for their designation, and their conservation objectives, where available;
- Annex IV (Habitats Directive) species of fauna and flora, and their breeding sites and resting places, which are strictly protected under the European Communities (Birds and Natural Habitats) Regulations, 2011;
- Other species of fauna and flora which are protected under the Wildlife Acts, 1976-2012;
- *'Protected species and natural habitats'*, as defined in the Environmental Liability Directive (2004/35/EC) and European Communities (Environmental Liability) Regulations, 2008, including:
    - Birds Directive – Annex I species and other regularly occurring migratory species, and their habitats (wherever they occur);
    - Habitats Directive – Annex I habitats, Annex II species and their habitats, and Annex IV species and their breeding sites and resting places (wherever they occur);
- Other habitats of ecological value in a national to local context, including rocky habitats in the general area;
- Stepping stones and ecological corridors encapsulated by Article 10 of the Habitats Directive.

The report has been compiled in compliance with the European Communities Legal requirements and follows EPA Draft Guidelines on Information to be contained in an EIAR (EPA, 2022) and on Transport Infrastructure Ireland TII policy and guidance outlined in Section 2.

The European Habitats Directive 92/43/EEC (Article 6) indicates the need for plans and projects to be subject to Habitats Directive Assessment (also known as Appropriate Assessment) if the plan or project not directly connected with or necessary to the management of a Natura 2000 site (which includes SACs and SPAs) but which has the potential to have implications on a site's conservation objectives. These implications can be significant effects either individually or in combination with other plans or projects.

As such, a report for the purposes of Appropriate Assessment Screening was undertaken by Moore Group for the proposed development in support of the application to An Bord Pleanála. This stand-alone report is presented separately as part of the design package for the Project.

The site location is presented in Figure 1 below.

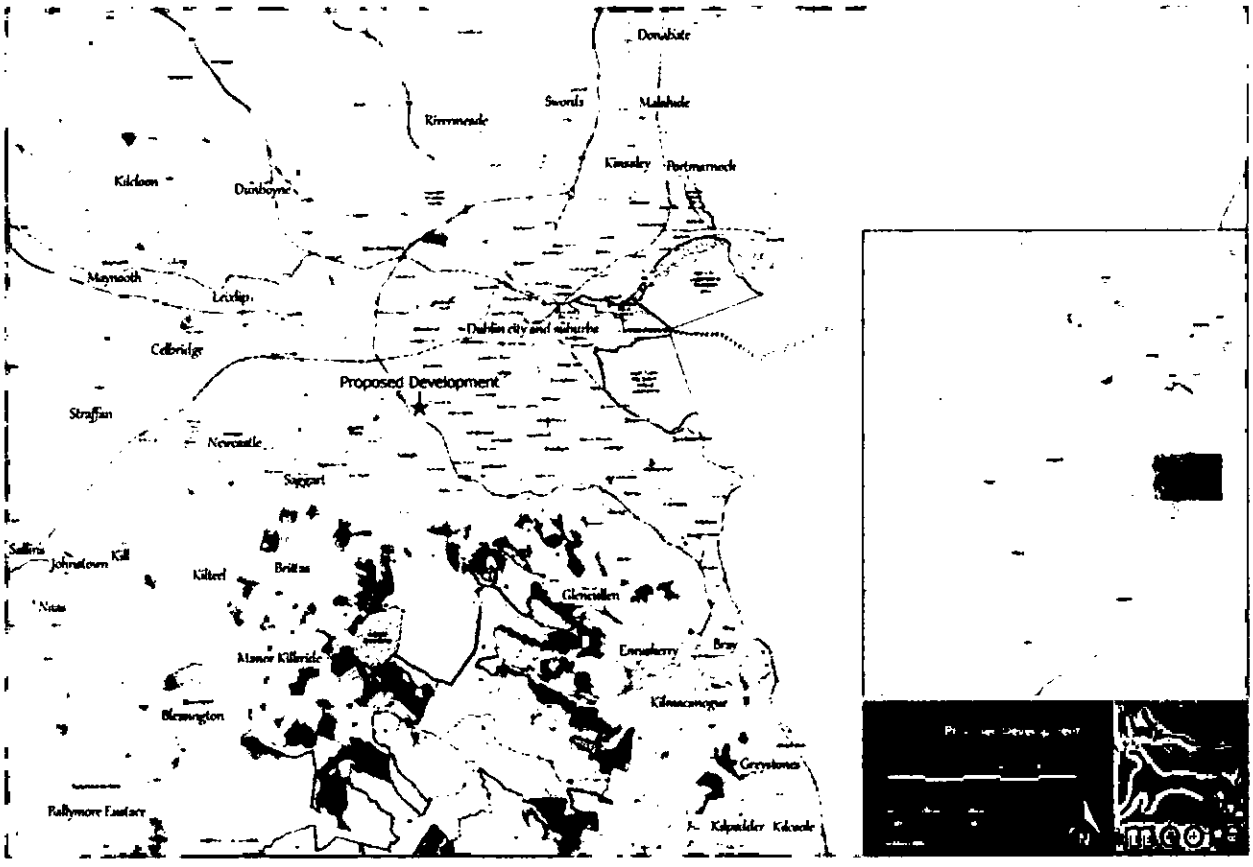


Figure 1. Showing the site location at M50 Business Park, Co. Dublin.

2. ASSESSMENT METHODOLOGY

2.1. POLICY & LEGISLATION

2.1.1. EU Habitats Directive

The "*Habitats Directive*" (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna) is the main legislative instrument for the protection and conservation of biodiversity within the European Union. The Habitats Directive provides for the designation, conservation and protection of sites comprising Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), collectively forming the Natura 2000 network of 'European sites'. Article 3 of the Habitats Directive obliges Member States to designate as SACs sites hosting the natural habitat types listed in Annex I and habitats of the species listed in Annex II of the Habitats Directive. Article 10 of the Habitats Directive requires that Member States endeavour to improve the ecological coherence of the Natura 2000 network to manage and conserve features of the landscape which are of major importance for wild fauna and flora, for example ecological corridors or stepping-stones which are important for the migration, dispersal and genetic exchange of species.

Article 6(2) obliges Member States to take the necessary measures to avoid the deterioration of an SAC, or disturbance of a species for which the site is designated. Article 6(3) sets out the requirement for an "Appropriate Assessment", to ensure that a proposed plan or project will not have an adverse effect on the integrity of a SAC. Article 7 applies the requirements of Article 6(2) and 6(3) of the Habitats Directive to SPAs designated under the Birds Directive.

In addition and separate to the Appropriate Assessment requirements, Article 12 of the Habitats Directive obliges Member States to establish a regime of strict protection for certain species listed in Annex IV of the Directive, wherever they occur within their natural range. The protection for species under Article 12 of the Habitats Directive is not confined to the boundary of SACs. Species listed in Annex IV include the otter and certain species of bat.

2.1.2. EU Birds Directive

The "*Birds Directive*" (European Council (2009) Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds) confers legal protection to all naturally occurring wild birds within the EU territory. Member States are obliged to adopt the necessary measures to maintain the population of bird species, and that includes, in accordance with Article 3, an obligation to create, maintain and manage habitats for birds, and specifically for the species of Bird listed in Annex I of the Directive, Article 4 requires Member States to create SPAs which, by virtue of Article 7 of the Habitats Directive, form part of the Natura 2000 network of European sites and are subject to the Appropriate Assessment requirements under Article 6(3) of the Habitats Directive.

Additionally, Article 5 of the Birds Directive requires that Member States establish a general system of protection for all naturally occurring wild birds within the EU territory, similar to the system of strict protection required for Annex IV species under the Habitats Directive.

2.1.3. Wildlife Acts 1976 - 2021[1]

The primary domestic legislation providing for the protection of wildlife in general, and wild birds in particular, and the control of some activities adversely impacting upon wildlife is the Wildlife Act of 1976, as amended. The aims of the Wildlife Act, according to the National Parks and Wildlife Service (NPWS) are "... to provide for the protection and conservation of wild fauna and flora, to conserve a representative sample of important ecosystems, to provide for the development and protection of game resources and to regulate their exploitation, and to provide the services necessary to accomplish such aims." All wild bird species are protected under the Act. The European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011) made significant amendments to the Wildlife Acts to ensure consistency with the Habitats and Birds Directives.

2.2. SURVEY METHODOLOGY

2.2.1. Desk Study

The assessment was carried out in three stages, firstly through desktop assessment to determine existing records in relation to habitats and species present in the potential Zone of Influence of the Proposed Development. This included research on the NPWS metadata website, the National Biodiversity Data Centre (NBDC) database and a literature review of published information on flora and fauna occurring in the development area.

Sources of information that were used to collate data on biodiversity in the potential Zone of Influence are listed below:

- The following mapping and Geographical Information Systems (GIS) data sources, as required:
  - National Parks & Wildlife (NPWS) protected site boundary data;
  - Ordnance Survey of Ireland (OSI) mapping and aerial photography;
  - OSI/ Environmental Protection Agency (EPA) rivers and streams, and catchments;
  - Open Street Maps;
  - Digital Elevation Model over Europe (EU-DEM);
  - Google Earth and Bing aerial photography 1995-2022;
- Online data available on Natura 2000 sites as held by the National Parks and Wildlife Service (NPWS) from www.npws.ie including:
  - Natura 2000 - Standard Data Form;
  - Conservation Objectives;

[1] Wildlife Act 1976, as amended. Administrative consolidation of the Wildlife Act 1976, Law Reform Commission (2021)

- Site Synopses;

- National Biodiversity Data Centre records;
  - Online database of rare, threatened and protected species;
  - Publicly accessible biodiversity datasets.
- Status of EU Protected Habitats in Ireland. (National Parks & Wildlife Service, 2019); and
- Relevant Development Plans:
  - South Dublin County Development Plan 2016-2022
  - Draft South Dublin County Development Plan 2022-2028

2.2.2. Field Study

The second phase of the assessment involved a site visit to establish the existing environment in the footprint of the proposed development area. Areas which were highlighted during desktop assessment were investigated in closer detail according to the Heritage Council Best Practice Guidance for Habitat Survey and Mapping (Smith *et al.*, 2011). Habitats in the proposed development area were classified according to the Heritage Council publication *"A Guide to Habitats in Ireland"* (Fossitt, 2000). This publication sets out a standard scheme for identifying, describing and classifying wildlife habitats in Ireland. This form of classification uses codes to classify different habitats based on the plant species present. Species recorded in this report are given in both their Latin and English names. Latin names for plant species follow the nomenclature of *"An Irish Flora"* (Parnell & Curtis, 2012).

Habitats were surveyed on the 6 July and 25 August 2022 by conducting a study area walkover covering the main ecological areas identified in the desktop assessment. The survey dates are within the optimal botanical survey period.

Signs of mammals such as badgers and otters were searched for while surveying the study area noting any sights, signs or any activity in the vicinity especially along adjacent boundaries.

A Bat Survey was undertaken by Altemar and this report is presented as a separate report as part of the planning application. The pertinent results of the bat survey are included in this EclA.

Birds were surveyed using standard transect methodology and signs were recorded where encountered during the field walkover surveys.

2.2.3. Site Evaluation and Impact Assessment

The final part of the assessment involves an evaluation of the study area and determination of the potential impacts on the habitats of the study area. This part of the assessment forms the basis for Impact Assessment and is based on the following guidelines and publications:

- Guidelines for Ecological Impact Assessment in the UK And Ireland Terrestrial, Freshwater, Coastal and Marine September 2018 Version 1.1 - Updated September 2019 (CIEEM, 2019);
- EPA Draft Guidelines on Information to be contained in an EIAR (EPA, 2022);
- Best Practice Guidance for Habitat Survey and Mapping (Heritage Council, 2011);
- Ecological Surveying Techniques for Protected Flora & Fauna (NRA, 2008);
- Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009);
- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (DEHLG, December 2009, Rev 2010);
- Assessment of plans and projects significantly affecting Natura 2000 sites (EC, 2002);
- Guidance document on Article 6(4) of the Habitats Directive 92/43/EEC (EC, 2007).

While prepared for linear projects the TII Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009) are still relevant and outlines the methodology for evaluating ecological impacts of the project in the present report. According to the TII Guidelines, the Ecological Study should address:

- Designated conservation areas and sites proposed for designation within the zone(s) of influence of any of the Project options,
- All the main inland surface waters (e.g. rivers, streams, canals, lakes and tanks) that are intersected by any of the route corridor options, including their fisheries value and any relevant designations,
- Aquifers and dependent systems and turloughs and their subterranean water systems,
- Any known or potentially important sites for rare or protected flora or fauna that occur along or within the zone(s) of influence of any of the route options,
- Any other sites of ecological value, that are not designated, along or in close proximity to any of the route corridor options,
- Any other relevant conservation designations or programmes (e.g. catchment management schemes, habitat restoration or creation projects, community conservation projects, etc.),
- Any other features of particular ecological or conservation significance along any of the route options.

The TII Guidelines set out a method of evaluating the importance of sites identified and in turn the evaluation of the significance of impacts. The Evaluation Scheme is presented in Appendix 1 for reference.

Impact Assessment is then based on CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland, 2019.

3. PROJECT DESCRIPTION

The proposed development will consist of: the change of use from warehouse to data repository facility, alterations to external facades, provision of a new 1100 mm parapet, reclad roof, internal alterations, refurbishment of the existing office space, solar panels at roof level, external plant at ground and roof levels

and equipment to include 12 no. condenser modules, an emergency back-up generator and associated fuel storage tank, transformer, extension to the existing sub-station (c. 13 m^2), 2 no. sprinkler tanks and pumphouse, bin store, 22 parking spaces including 2 electrical vehicle charging points, bicycle parking shelter, landscaping, planting, new security fence, external lighting, CCTV, altered vehicular gates, permeable hard surfaces, alterations to internal foul sewerage and water supply networks, provision of SuDS compliant surface water drainage system and all associated site works.

Figure 2 shows a detailed view of the existing site on high resolution aerial photography.

Figure 2. Showing the Proposed Development location on aerial photography with the existing warehouse curtilage outlined.

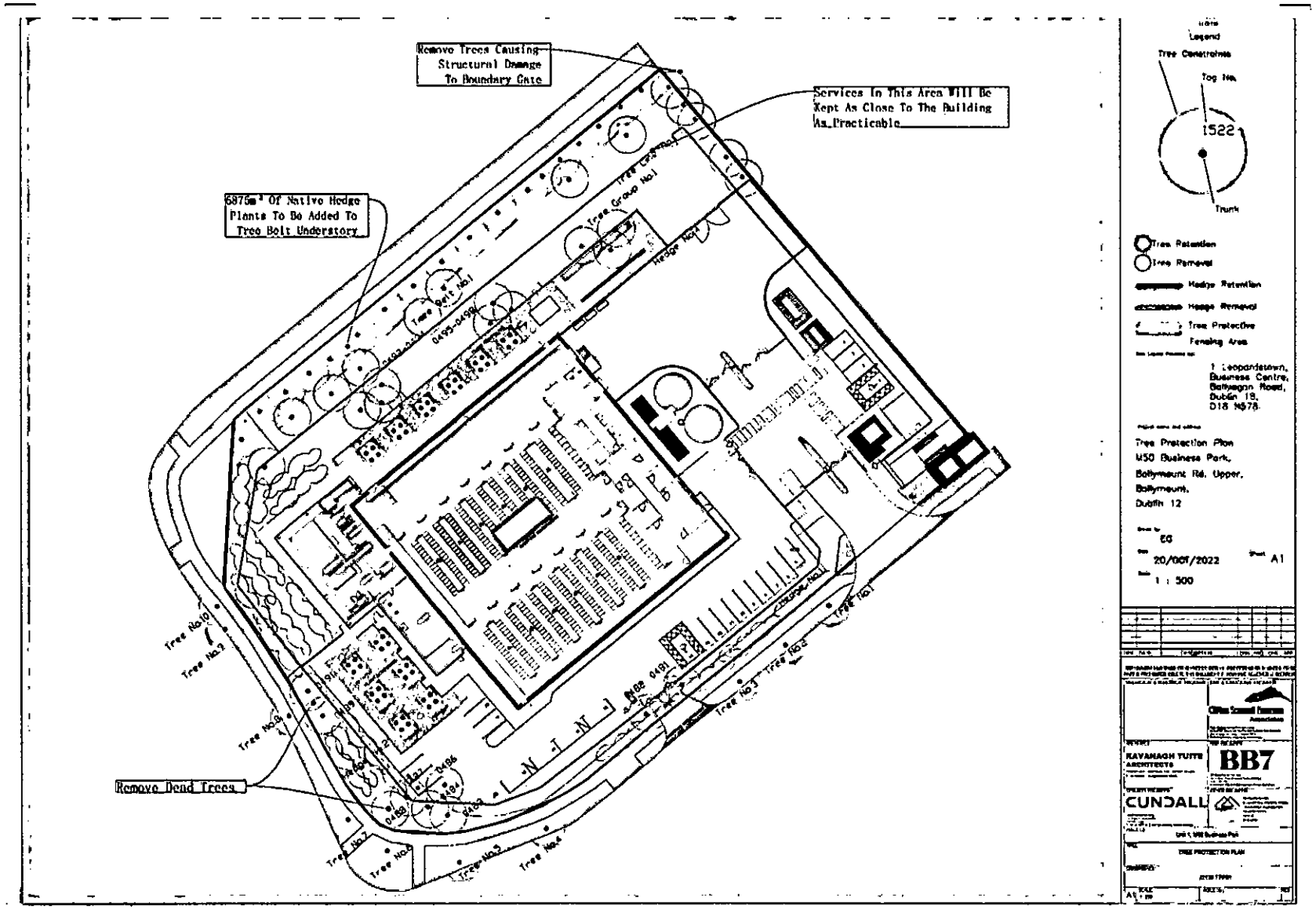


Figure 3. Showing the Proposed Development landscape plans with removal of trees indicated.

4. EXISTING ENVIRONMENT

4.1. DESIGNATED CONSERVATION AREAS

A Zone of Influence (ZoI) of a proposed development is the geographical area over which it could affect the receiving environment in a way that could have significant effects on the Qualifying Interests of a European site. In accordance with the OPR Practice Note, PN01, the ZoI should be established on a case-by-case basis using the Source- Pathway-Receptor framework.

The European Commission's *"Assessment of plans and projects in relation to Natura 2000 sites guidance on Article 6(3) and (4) of the Methodological Habitats Directive 92/43/EEC"* published 28 September 2021 states at section 3.1.3:

Identifying the Natura 2000 sites that may be affected should be done by taking into consideration all aspects of the plan or project that could have potential effects on any Natura 2000 sites located within the zone of influence of the plan or project. This should take into account all of the designating features (species, habitat types) that are significantly present on the sites and their conservation objectives. In particular, it should identify:

- *any Natura 2000 sites geographically overlapping with any of the actions or aspects of the plan or project in any of its phases, or adjacent to them;*
- *any Natura 2000 sites within the likely zone of influence of the plan or project Natura 2000 sites located in the surroundings of the plan or project (or at some distance) that could still be indirectly affected by aspects of the project, including as regards the use of natural resources (e.g. water) and various types of waste, discharge or emissions of substances or energy;*
- *Natura 2000 sites in the surroundings of the plan or project (or at some distance) which host fauna that can move to the project area and then suffer mortality or other impacts (e.g. loss of feeding areas, reduction of home range);*
- *Natura 2000 sites whose connectivity or ecological continuity can be affected by the plan or project.*

The range of Natura 2000 sites to be assessed, i.e. the zone in which impacts from the plan or project may arise, will depend on the nature of the plan or project and the distance at which effects may occur. For Natura 2000 sites located downstream along rivers or wetlands fed by aquifers, it may be that a plan or project can affect water flows, fish migration and so forth, even at a great distance. Emissions of pollutants may also have effects over a long distance. Some projects or plans that do not directly affect Natura 2000 sites may still have a significant impact on them if they cause a barrier effect or prevent ecological linkages. This may happen, for example, when plans affect features of the landscape

that connect Natura 2000 sites or that may obstruct the movements of species or disrupt the continuity of a fluvial or woodland ecosystem. To determine the possible effects of the plan or project on Natura 2000 sites, it is necessary to identify not only the relevant sites but also the habitats and species that are significantly present within them, as well as the site objectives.

The potential for source pathway receptor connectivity is firstly identified through GIS interrogation and detailed information is then provided on sites with connectivity. European sites that are located within a potential Zone of Influence of the Proposed Development are listed in Table 1 and presented in Figure 4 below. Spatial boundary data on the Natura 2000 network was extracted from the NPWS website (www.npws.ie) on 13 December 2022. This data was interrogated using GIS analysis to provide mapping, distances, locations and pathways to all sites of conservation concern including pNHAs, NHA and European sites.

The Proposed Development is to take place within the existing M50 Business Park in west Dublin City. The proposed development entails use of a warehouse as a Data Repository and associated internal alterations. Therefore there are no predicted discharges to the environment and no pathways to any European sites.

Table 1 European Sites located within the potential Zone of Influence[2] of the Proposed Development.

Site Code	Site name	Distance (km)[3]
000206	North Dublin Bay SAC	12.56
000210	South Dublin Bay SAC	9.54
002122	Wicklow Mountains SAC	8.20
004006	North Bull Island SPA	12.55
004024	South Dublin Bay and River Tolka Estuary SPA	9.57
004040	Wicklow Mountains SPA	8.67

The Proposed Development will not result in any changes to the amount of surface water run-off from the site during operation nor will it result in any contamination of surface waters during operation and will not result in any changes in foul water arising on the site.

[2] All European sites potentially connected irrespective of the nature or scale of the Proposed Development.
[3] Distances indicated are the closest geographical distance between the Proposed Development site and the European site boundary, as made available by the NPWS.

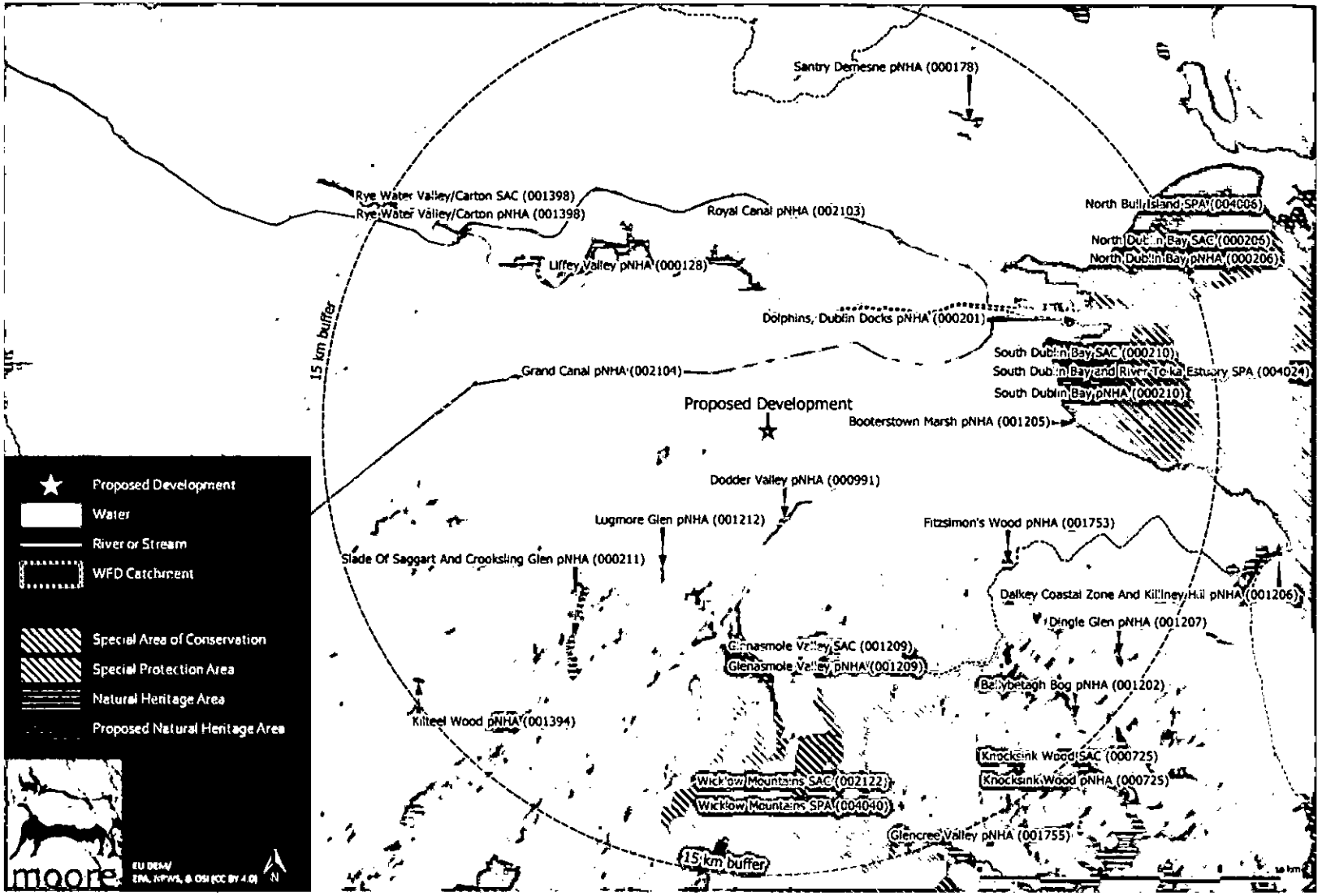


Figure 4. Showing European sites and NHAs/pNHAs within the wider Potential Zone of Influence of the Proposed Development.

4.2. HABITAT DESCRIPTIONS

The Proposed Development comprises an existing landscaped site of an industrial warehouse unit at the M50 Business Park. The predominant habitats are visible on Figure 2 and include a surrounding mixed species landscaped Treeline (WL2), Amenity Grassland (GA2) and Buildings and artificial surfaces (BL3) with scattered trees including Sycamore, Beech, Poplar, Birch and Willow.

There were no invasive species recorded at the proposed development site.

4.1. FAUNA

4.1.1. Mammals

Otters

There are no otter habitats in the study area and no potential for otters on the site.

Badgers

There are no badger setts in the study area and no potential for badgers on the site. The field boundaries were surveyed and no setts were recorded.

Bats

There is low potential for bat habitats or bat commuting on site.

The results of the bat survey report that the site is brightly lit both internally and externally. Security lighting is on site and in neighbouring industrial properties which create a brightly lit environment.

No bats were noted on site.

No confirmed bat roosts will be lost.

No trees of bat roosting potential are noted on site.

4.1.2. Birds

All birds are protected under the Wildlife Acts. A list of breeding bird species recorded during fieldwork in 2022 is presented in Table 2 below.

Table 2. Birds recorded during fieldwork in July and August 2022.

Birds	Scientific name	BWI Status	Habitat Type
Magpie	*Pica pica*	Green	Anywhere in lowland areas
Woodpigeon	*Columba palumbus*	Green	Gardens, woods, hedges
Wren	*Troglodytes troglodytes*	Green	Gardens, woods, hedges

5. ASSESSMENT OF IMPACTS

5.1. SITE EVALUATION

Due cognisance of features of the landscape which are of major importance for wild flora and fauna, such as those with a "*stepping stone*" and ecological corridors function, as referenced in Article 10 of the Habitats Directive were considered in this assessment.

Following a detailed literature review, desktop assessment and field survey the footprint of the proposed development site can be categorised into three main habitat types:

- mixed species landscaped Treeline (WL2),
- Amenity Grassland (GA2) and
- Buildings and artificial surfaces (BL3) with scattered trees.

There are no rare or protected species recorded on the site and there were no records of invasive species.

The habitats under the footprint of the proposed development are of low local ecological value.

The ecological value of the site was assessed following the guidelines set out in the Institute of Ecology and Environmental Management's Guidelines for Ecological Impact Assessment (2019) and according to the Natura Scheme for evaluating ecological sites (after Nairn & Fossitt, 2004). Judgements on the evaluation were made using geographic frames of reference, *e.g.* European, National, Regional or Local.

The Proposed Development is located within the existing M50 Business Park in west Dublin City. The Proposed Development entails use of a warehouse as a Data Repository and associated internal alterations. Therefore there are no predicted discharges to the environment and no pathways to any European sites.

5.2. IMPACT ASSESSMENT

5.2.1. Direct Effects

Habitats

The Proposed Development included pruning and removal of a number of semi-mature and immature trees.

There were no invasive species recorded in the Project area.

There will be no significant effects on biodiversity from the Proposed Development.

Fauna

Otters

There will be no direct or indirect effects on otters.

Badgers

There will be no direct or indirect effects on badgers.

Bats

Given that no bat species were found using the site and the site is brightly lit the proposed project will not have any significant effect on local bat populations. No bat roosts or potential bat roosts will be lost due to this development. The proposed development is not in proximity to sensitive bat areas. The potential for collision risk and impact on flight paths in relation to bats is considered low due to the low level of bat activity on site and the buildings would be deemed to be clearly visible to bats.

Birds

There are no predicted significant effects on birds. As a precaution all tree surgery will be undertaken outside the bird nesting season March 1 to August 31.

5.2.2. Indirect Effects

Given that no bat species were found using the site and the site is brightly lit the proposed project will not have any significant effect on local bat populations.

5.2.3. Cumulative Effects

Cumulative impacts or effects are changes in the environment that result from numerous human-induced, small-scale alterations. Cumulative impacts can be thought of as occurring through two main

pathways: first, through persistent additions or losses of the same materials or resource, and second, through the compounding effects as a result of the coming together of two or more effects.

A review of the National Planning Application Database was undertaken. The first stage of this review confirmed that there were no data gaps in the area where the Proposed Development is located. The database was then queried for developments granted planning permission within 250m of the Proposed Development within the last three years.

There are no predicted in-combination effects on biodiversity given the nature and small scale of the proposed works.

6. CONCLUSION & RECOMMENDATION

As a precaution all tree surgery will be undertaken outside the bird nesting season March 1 to August 31.

The existing woodland northern boundary belt is to be bolstered with additional native tree planting and understory species.

There are no predicted significant effects from the proposed development on habitats, flora, fauna or biodiversity.

7. REFERENCES

CIEEM (2019) Guidelines for Ecological Impact Assessment in the UK And Ireland Terrestrial, Freshwater, Coastal and Marine September 2018 Version 1.1 - Updated September 2019.

Department of the Environment, Heritage and Local Government (2010) Guidance on Appropriate Assessment of Plans and Projects in Ireland (as amended February 2010).

EPA (2022) Guidelines on Information to be contained in an EIAR; EPA, May 2022.

European Commission (2007) Guidance document on Article 6(4) of the 'Habitats Directive '92/43/EEC: Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interests, compensatory measures, overall coherence and opinion of the Commission. European Commission, Brussels.

European Commission (2018) Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitat's Directive 92/43/EEC.

Fossitt, J. (2000) A Guide to Habitats in Ireland. The Heritage Council.

Nairn, R. and J. Fossitt (2004) The Ecological Impacts of Roads, and an Approach to their Assessment for National Road Schemes. In: J. Davenport and J.L Davenport (eds) The Effects of Human Transport on Ecosystems: Cars and Planes, Boats and Trains, 98-114. Dublin. Royal Irish Academy.

NPWS (2019) The Status of EU Protected Habitats and Species in Ireland. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.

NPWS (2022) National Parks and Wildlife Service Metadata available online at https://www.npws.ie/maps-and-data

NRA (2008) Ecological Surveying Techniques for Protected Flora & Fauna. Available at: http://www.nra.ie/Environment/

NRA (2009) Guidelines for Assessment of Ecological Impacts of National Road Schemes. Dublin: National Roads Authority. Available at: http://www.nra.ie/Environment/

Parnell, J. and T. Curtis (2012) Webb's An Irish Flora. Cork University Press.

Smith, G.F., O'Donoghue, P., O'Hora, K. and E. Delaney (2011) Best Practice Guidance for Habitat Survey and Mapping. The Heritage Council.

Appendix 1

TII Evaluation of Habitats

Ecological valuation: Examples
International Importance: ☐ 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation. ☐ Proposed Special Protection Area (pSPA). ☐ Site that fulfills the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended). ☐ Features essential to maintaining the coherence of the Natura 2000 Network.[4] ☐ Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive. ☐ Resident or regularly occurring populations (assessed to be important at the national level)[5] of the following: ☐ Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or ☐ Species of animal and plants listed in Annex II and/or IV of the Habitats Directive. ☐ Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971). ☐ World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972). ☐ Biosphere Reserve (UNESCO Man & The Biosphere Programme). ☐ Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979). ☐ Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979). ☐ Biogenetic Reserve under the Council of Europe. ☐ European Diploma Site under the Council of Europe. ☐ Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).[6]
National Importance: ☐ Site designated or proposed as a Natural Heritage Area (NHA). ☐ Statutory Nature Reserve. ☐ Refuge for Fauna and Flora protected under the Wildlife Acts. ☐ National Park. ☐ Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park. ☐ Resident or regularly occurring populations (assessed to be important at the national level)[7] of the following: ☐ Species protected under the Wildlife Acts; and/or ☐ Species listed on the relevant Red Data list. ☐ Site containing 'viable areas'[8] of the habitat types listed in Annex I of the Habitats Directive.

County Importance:

- ☐ Area of Special Amenity.[9]
- ☐ Area subject to a Tree Preservation Order.
- ☐ Area of High Amenity, or equivalent, designated under the County Development Plan.
- ☐ Resident or regularly occurring populations (assessed to be important at the County level)[10] of the following:
  - ☐ Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
  - ☐ Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
  - ☐ Species protected under the Wildlife Acts; and/or
  - ☐ Species listed on the relevant Red Data list.
- ☐ Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.
- ☐ County important populations of species, or viable areas of semi-natural habitats or natural heritage features identified in the National or Local BAP,[11] if this has been prepared.
- ☐ Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.
- ☐ Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.

Local Importance (higher value):

- ☐ Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP, if this has been prepared;
- ☐ Resident or regularly occurring populations (assessed to be important at the Local level)[12] of the following:
  - ☐ Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
  - ☐ Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
  - ☐ Species protected under the Wildlife Acts; and/or
  - ☐ Species listed on the relevant Red Data list.
- ☐ Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality;
- ☐ Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.

Local Importance (lower value):

- ☐ Sites containing small areas of semi-natural habitat that are of some local importance for wildlife;
- ☐ Sites or features containing non-native species that are of some importance in maintaining habitat links.

Appendix 2

Site Photos

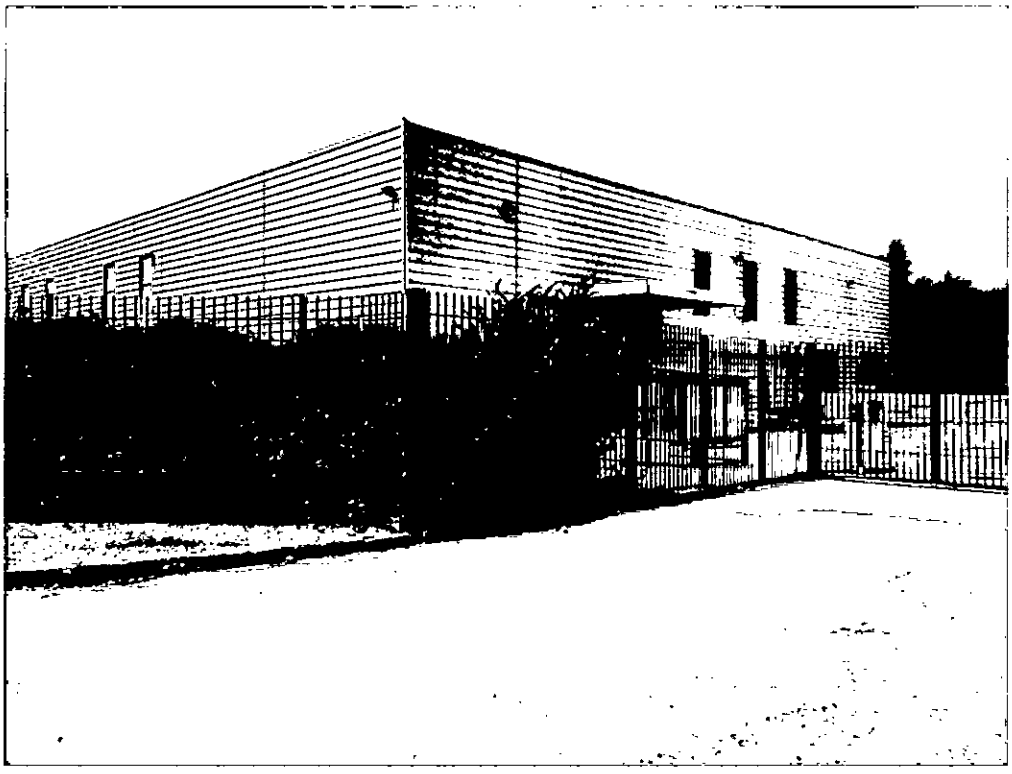


Photo 1. Existing building on site.

Photo 2. Existing northern boundary treeline of mixed Sycamore.

Photo 3. Example of scattered tree groups, this one showing Birch inside the northern boundary.

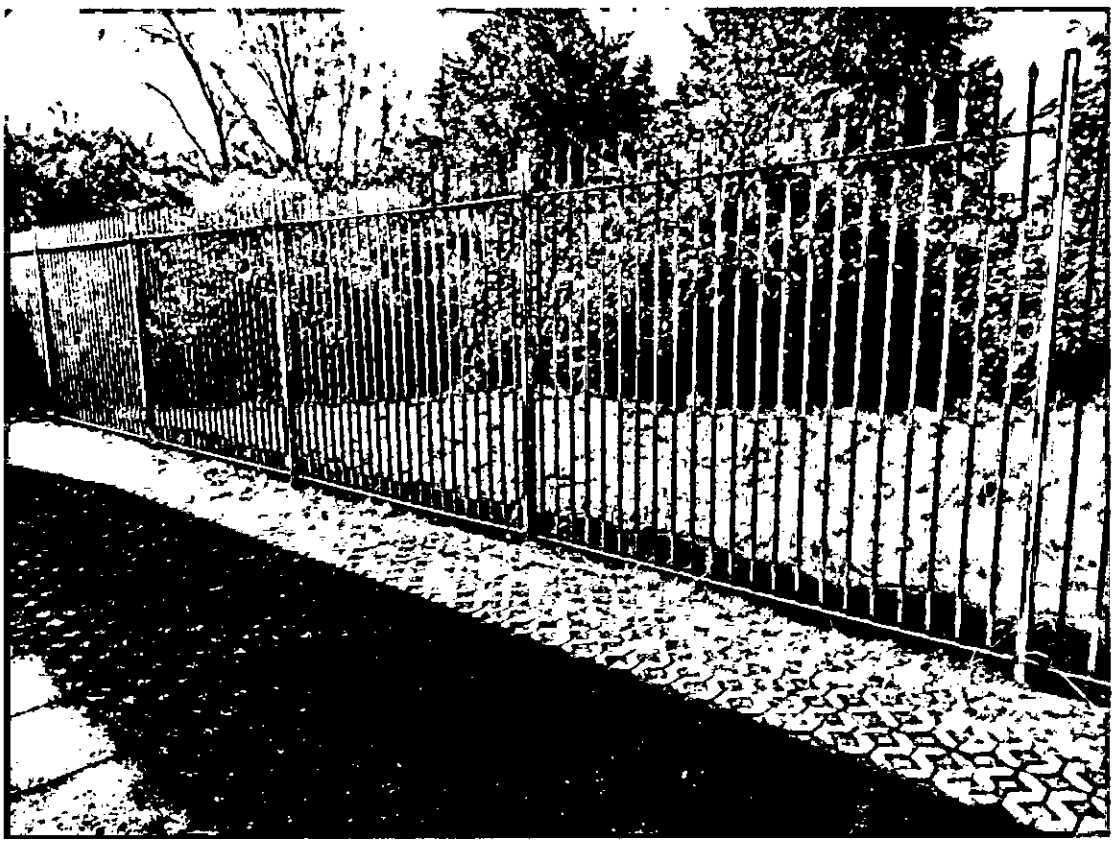


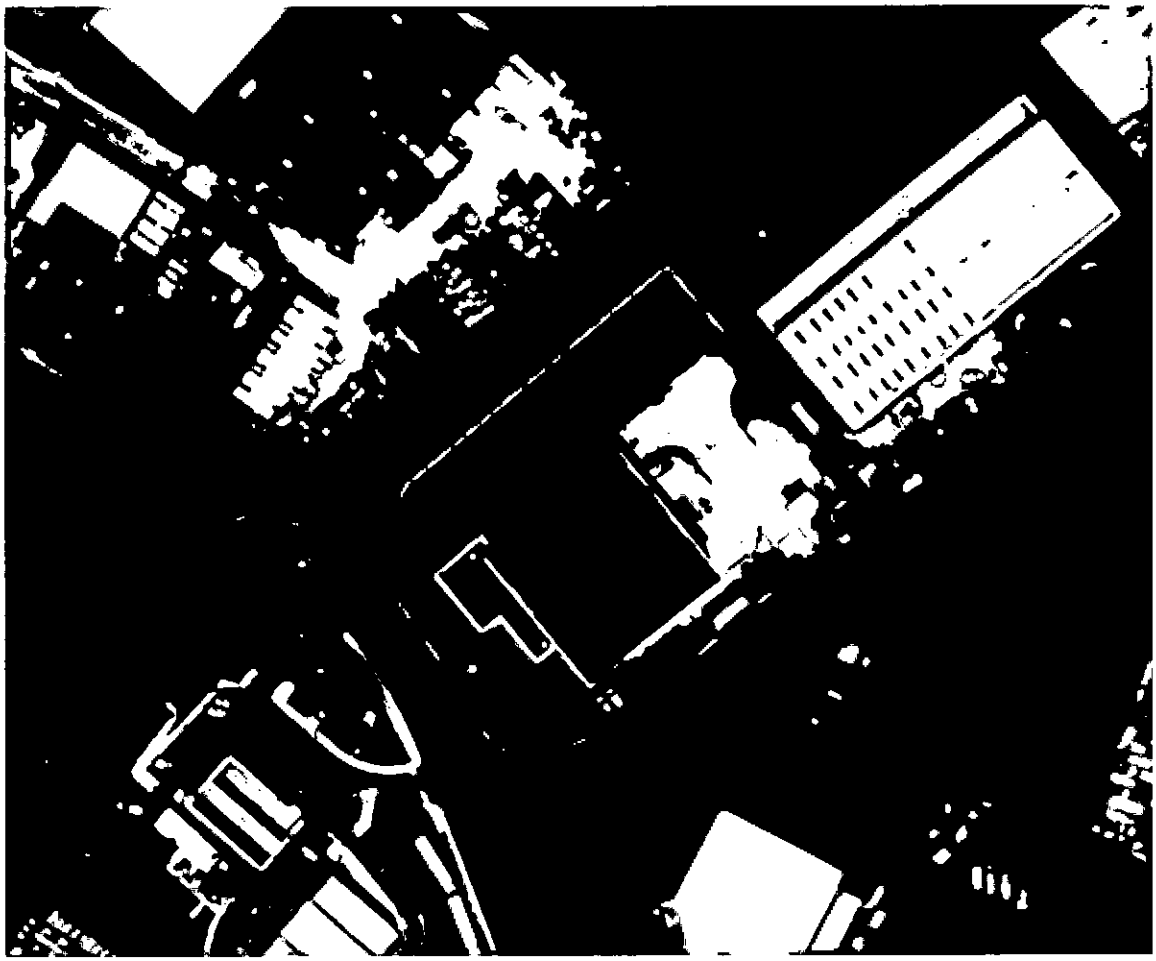
Photo 4. Example of porous paving and amenity grassland.

Appendix B (ii) – Bat Fauna Survey

ALTEMAR

Marine & Environmental Consultancy

Bat Fauna Survey for change of use from warehouse to data repository facility at Unit 1, M50 Business Park, Ballymount Avenue, Dublin 12.



14th December 2022

Prepared by: Bryan Deegan (MCIEEM) of Altemar Ltd.
On behalf of: Mullins Developments LLC

SUMMARY

Structure:	An existing warehouse structure, boundary fence, carpark, security hut. There is also a treeline located along the subject site's north western boundary.
Location:	Unit 1, M50 Business Park, Ballymount Avenue, Dublin 12.
Bat species present:	None Roosting. None foraging.
Proposed work:	Change of use from warehouse to data repository facility.
Impact on bats:	The site is brightly lit both internally and externally. Security lighting is on site and in neighbouring industrial properties which create a brightly lit environment. No bats were noted on site. No confirmed bat roosts will be lost. No trees of bat roosting potential are noted on site. G[redacted] that no bat species were found using the site and the site is brightly lit the proposed project will not have any significant effect on local bat populations. No bat roosts or potential bat roosts will be lost due to this development. The proposed development is not in proximity to sensitive bat areas. The potential for collision risk and impact on flight paths in relation to bats is considered is considered low due to the low level of bat activity on site and the buildings would be deemed to be clearly visible to bats.
Survey by:	Bryan Deegan MCIEEM
Survey date:	15th September 2022

Receiving Environment

Background

Creighton Properties LLC intend to apply for Permission for development at this site, Unit 1, M50 Business Park, Ballymount Avenue, Dublin 12.

The proposed development will consist of:

the change of use from warehouse to data repository facility, alterations to external facades, provision of a new 1100 mm parapet, reclad roof, internal alterations, refurbishment of the existing office space, solar panels at roof level, external plant and equipment to include 12 no. condenser modules, an emergency back-up generator and associated fuel storage tank, transformer, extension to the existing sub-station (c. 13 m2), 2 no. sprinkler tanks and pumphouse, bin store, 22 parking spaces including 2 electrical vehicle charging points, bicycle parking shelter, landscaping, planting, new security fence, external lighting, CCTV, altered vehicular gates, permeable hard surfaces, alterations to internal foul sewerage and water supply networks, provision of SuDS compliant surface water drainage system and all associated site works.

The proposed site outline and location are demonstrated in Figure 1.

Landscape

The landscape strategy for the proposed development has been prepared by Kavanagh Tuite Architects. The proposed landscape plan is demonstrated in Figure 2.

Figure 1. Proposed site outline

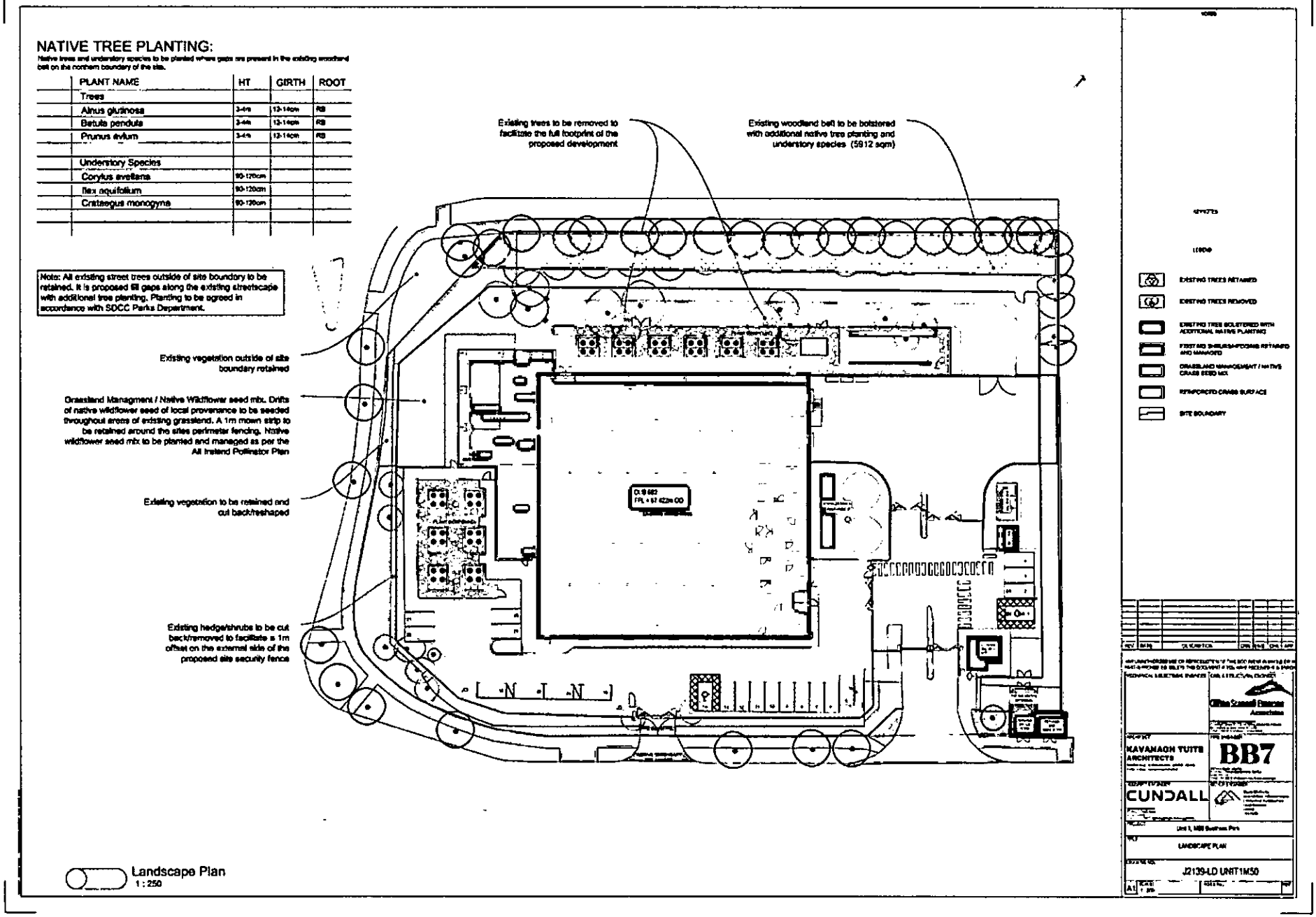


Figure 2. Proposed landscape plan

Arborist

An Arboricultural Assessment Report has been prepared by Veon Limited to accompany this planning application. This report outlines the following impact of the proposed development, and demonstrates how its impact can be mitigated:

'To facilitate the proposed development the following tree and hedge vegetation will need to be removed. o Tree Nos. 0481, 0482, 0483, 0484, 0486, 0487, 0488, 0489, 0490, 0492, 0493, 0494, 0495, 0496, 0498, Tree Group No.1, c.70m of Tree Belt No.1, Tree Line No.1, Hedge No.3, Hedge No.4.

The above tree and hedge vegetation is of a semi-mature age class, <20 years old, and was planted as part of the landscaping of this industrial estate, as such, it holds less ecological value and its loss is more easily mitigated through replacement planting elsewhere in the site area.

Tree Belt No.1, along the northern boundary, will be bolstered with 5875m² of native species understory planting to mitigate the loss of vegetation on site.

The remaining, and newly planted, vegetation will have organic mulch applied around their bases to contribute to their longevity.

If permeable paving is to be used on the southern and eastern side of the site area, and the existing tarmac is to be removed, then care will need to be taken not to damage the roots beneath. Ground protection, such as Cell-Web, will then need to be applied over the roots and filled with angular stone before laying the slabs. This method will spread the loading over the soil surface and allow for gas and water exchange.

Services will need to be kept as close to the building as practicably possible and trenchless solutions should be employed to avoid root damage to the peripheral vegetation.

Tree Nos. 1-11 are growing just outside of the site area but they contribute to the overall value of this area; therefore, care will need to be taken to avoid damage to these trees during the construction process i.e. avoid storing materials around their bases and/or causing mechanical damage with machinery.'

The tree constraints plan and tree protection plan are demonstrated in Figures 3 & 4.

Lighting Plan

The proposed lighting plan is seen in Figure 5. Elevated light levels will be seen across the site that would not be conducive to optimal foraging conditions for bats. It should be noted however, that no foraging was noted on site and the proposed project is within an existing industrial estate with significant existing light levels.

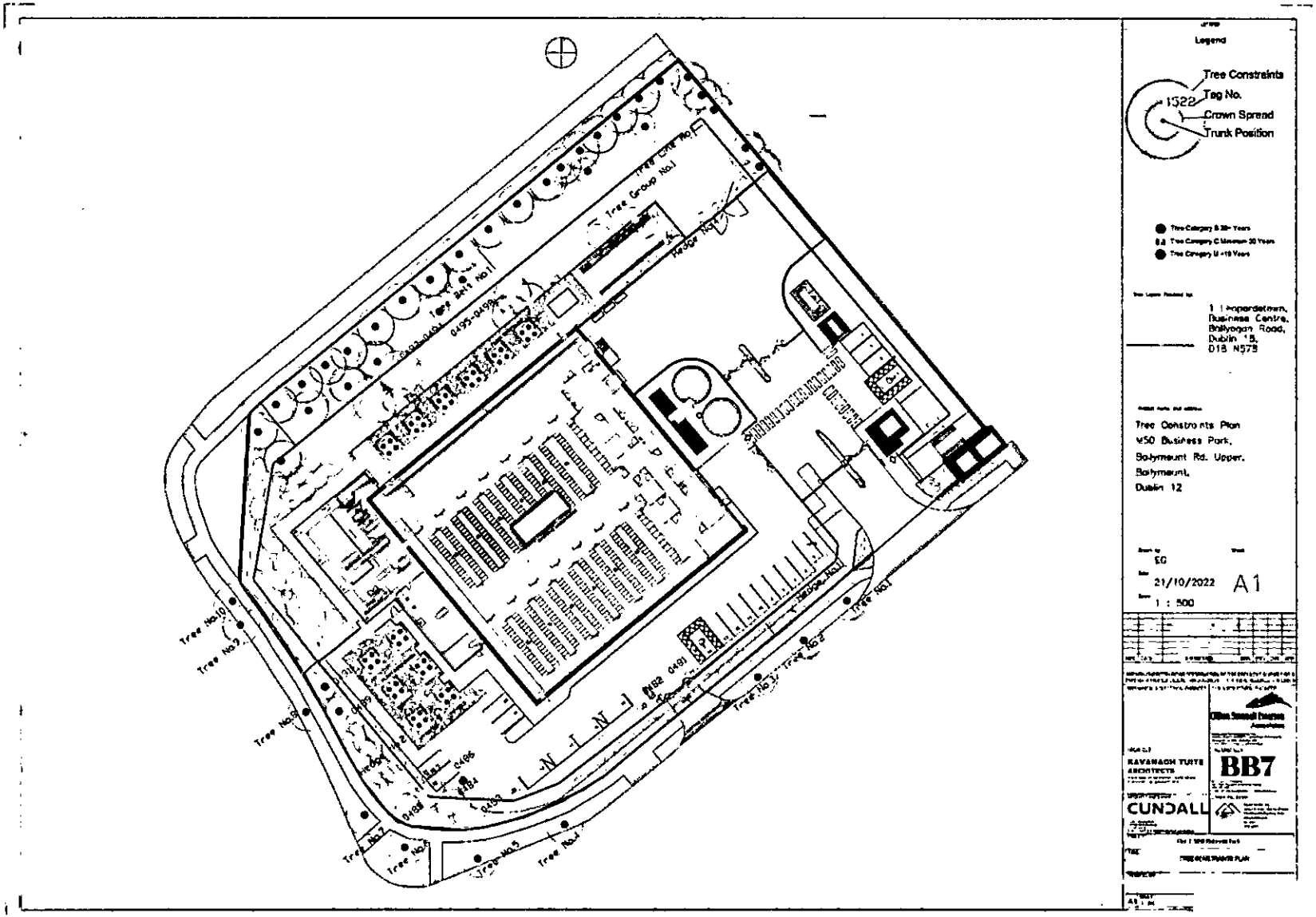


Figure 3. Tree constraints plan

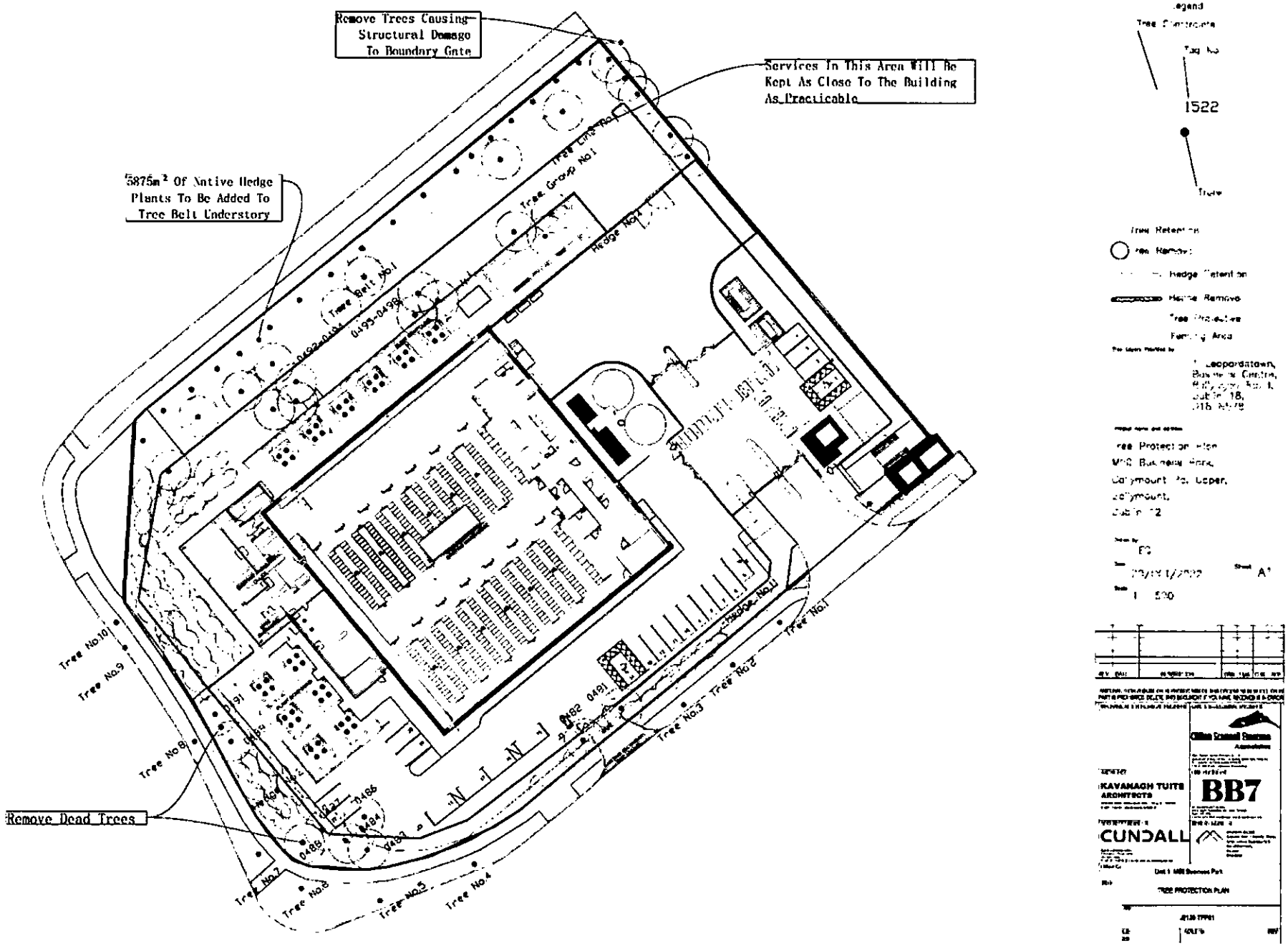


Figure 4. Tree Protection Plan

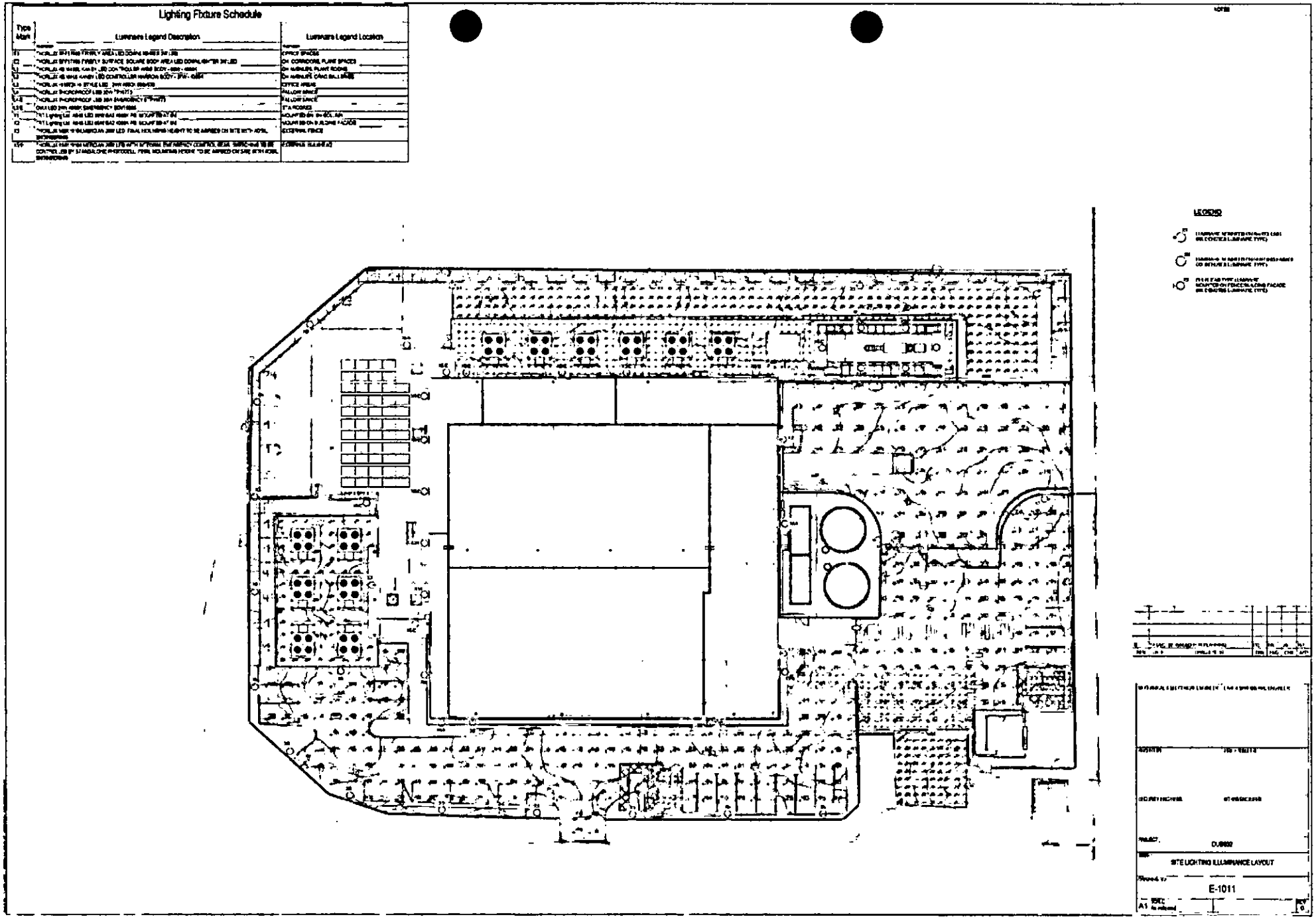


Figure 5. Lighting Plan

Competency of Assessor

This report has been prepared by Bryan Deegan MSc, BSc (MCIEEM). Bryan has over 26 years of experience providing ecological consultancy services in Ireland. He has extensive experience in carrying out a wide range of bat surveys including dusk emergence, dawn re-entry and static detector surveys. He also has extensive experience reducing the potential impact of projects that involve external lighting on Bats. Bryan trained with Conor Kelleher author of the Bat Mitigation Guidelines for Ireland (Kelleher and Marnell (2022)) and Bryan is currently providing bat ecology (impact assessment and enhancement) services to Dun Laoghaire Rathdown County Council primarily on the Shanganagh Park Masterplan. The desk and field surveys were carried out having regard to the guidance: Bat Surveys for Professional Ecologists – Good Practice Guidelines 3rd Edition (Collins, J. (Ed.) 2016) and Marnell, Kelleher and Mullen (2022), Bat Mitigation Guidelines for Ireland V2 (which update and replace the Bat Mitigation Guidelines for Ireland published in 2006).

Legislative Context

Wildlife Act 1976 (as amended by, inter alia, the Wildlife (Amendment) Act 2000).

Bats in Ireland are protected by the Wildlife (Amendment) Act 2000. Based on this legislation it is an offence to wilfully interfere with or destroy the breeding or resting place of any species of bat. Under this legislation it is an offence to *"Intentionally kill, injure or take a bat, possess or control any live or dead specimen or anything derived from a bat, wilfully interfere with any structure or place used for breeding or resting by a bat, wilfully interfere with a bat while it is occupying a structure or place which it uses for that purpose. "*

Habitats Directive- Council Directive 92/43/EEC 1992 on the conservation of natural habitats and of wild fauna and flora has been transposed into Irish Law, including, via, *inter alia*, the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended). See Art.73 of the 2011 Regulations which revokes the 1997 Regulations.

Annex II of the Council Directive 92/43/EEC 1992 on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive) lists animal and plant species of Community interest, the conservation of which requires the designation of Special Areas of Conservation (SACs); Annex IV lists animal and plant species of Community interest in need of strict protection. All bat species in Ireland are listed on Annex IV of the Directive, while the Lesser Horseshoe Bat (*Rhinolophus hipposideros*) is protected under Annex II which related to the designation of Special Areas of Conservation for a species.

Under the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended), all bat species are listed under the First Schedule and, pursuant to, *inter alia*, Part 6 and Regulation 51, it is an offence to:

- Deliberately capture or kill a bat;
- Deliberately disturb a bat particularly during the period of breeding, hibernating or migrating;
- Damage or destroy a breeding site or resting place of a bat;
- Keep, sell, transport, exchange, offer for sale or offer for exchange any bat taken in the wild.

Bat survey

This report presents the results of site visit by Bryan Deegan (MCIEEM) on the 6th September 2022. A bat emergent and detector survey was carried out. Trees on site were examined for bat roosting potential.

Survey methodology

As outlined in Marnell *et al.* 2022 *'The presence of a large maternity roost can normally be determined on a single visit at any time of year, provided that the entire structure is accessible and that any signs of bats have not been removed by others. However, most roosts are less obvious. A visit during the summer or autumn has the advantage that bats may be seen or heard. Buildings (which for this definition exclude cellars and other underground structures) are rarely used for hibernation alone, so droppings deposited by active bats provide the best clues. Roosts of species which habitually enter roof voids are probably the easiest to detect as the droppings will normally be readily visible. Roosts of crevice-dwelling species may require careful searching and, in some situations, the opening up of*

otherwise inaccessible areas. If this is not possible, best judgement might have to be used and a precautionary approach adopted. Roosts used by a small number of bats, as opposed to large maternity sites, can be particularly difficult to detect and may require extensive searching backed up by bat detector surveys (including static detectors) or emergence counts.' In relation to the factors influencing survey results the guidelines outlines the following *'During the winter, bats will move around to find sites that present the optimum environmental conditions for their age, sex and bodyweight and some species will only be found in underground sites when the weather is particularly cold. During the summer, bats may be reluctant to leave their roost during heavy rain or when the temperature is unseasonably low, so exit counts should record the conditions under which they were made. Similarly, there may be times when females with young do not emerge at all or emerge only briefly and return while other bats are still emerging thus confusing the count. Within roosts, bats will move around according to the temperature and may or may not be visible on any particular visit. Bats also react to disturbance, so a survey the day after a disturbance event, may give a misleading picture of roost usage.'*

The survey involved the methodologies outlined in Collins (2016) which included the roost inspection methodologies i.e. external methodology outlined in section 5.2.4.1 and the internal survey outlines in section 5.2.4.2 of the guidelines. In addition, the methodologies for Presence absence surveys (Section 7) was carried out for dust emergent surveys.'

As outlined in Collins (2016) 'The bat active period is generally considered to be between April and October inclusive (although the season is likely to be shorter in northern latitudes). However, because bats wake up during mild conditions, bat activity can also be recorded during winter months.'

Survey Results

Trees as potential bat roosts.

A ground level roost assessment was carried and used to examine the trees on site for features that could form bat roosts. Potential roosting features include heavy ivy growth, broken limbs, areas of decay, vertical or horizontal cracks, cracks in bark etc. None of the trees on site had features that would be considered to be of importance to roosting bats. All trees on site were assessed. No bats, evidence of bats or bat roost were identified in any of the onsite trees. A derogation license is therefore not required for the removal of trees on site.

Plate 1. Tree line and area of grassland to the north east of the site (brightly lit during night).

Buildings as potential bat roosts.

An internal and external assessment of the buildings on site was carried out. Although the warehouse building appears in little use the inside was brightly lit. External security lighting was also in place. The building showed no signs of bat use internally or externally.

Plate 2. Brightly lit interior of building.

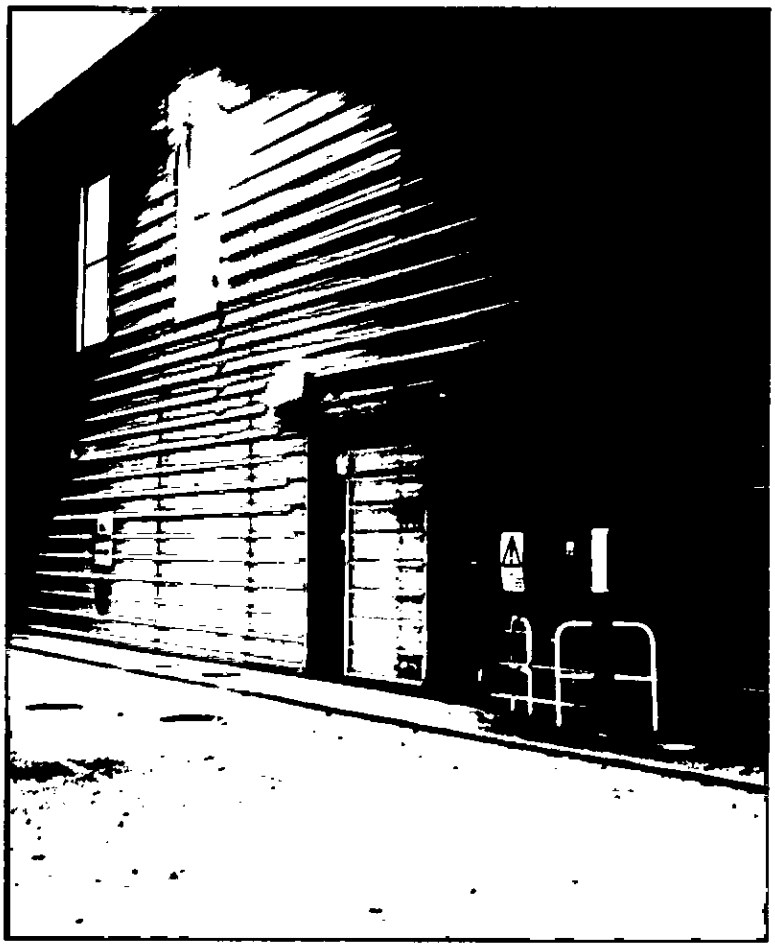


Plate 3. Brightly lit (security lighting) exterior of building.

Emergent/detector surveys.

Emergent/detector surveys were carried out by Bryan Deegan on the 15th September 2022.

The detector survey was undertaken within the active bat season and the transects covered the entire site multiple times during the night. Weather conditions were good with mild temperatures of 14°C after sunset. Winds were light and there was no rainfall. Insects were observed in flight during the survey.

As outlined in Collins (2016) in relation to weather conditions *'The aim should be to carry out surveys in conditions that are close to optimal (sunset temperature 10°C or above, no rain or strong wind.), particularly when only one survey is planned.... Where surveys are carried out when the temperature at sunset is below 10°C should be justified by the ecologist and the effect on bat behaviour considered.'* There were no constraints in relation to the surveys carried out. All areas of the site were accessible and weather conditions were optimal for bat assessments.

At dusk, bat detector surveys were carried out onsite using a*n Echo meter touch 2 Pro* detector to determine bat activity. Bats if present were identified by their ultrasonic calls coupled with behavioural and flight observations. No bats were noted on site.

Bat assessment findings

Review of local bat records

The review of existing bat records (sourced from Bat Conservation Ireland's National Bat Records Database) within a 2km^2 grid (Reference grid OO03V) encompassing the study area reveals that none of the nine known Irish species have been observed locally. The National Biodiversity Data Centre's online viewer was consulted in order to determine whether there have been recorded bat sightings in the wider area. The following species were noted in the wider area: Brown Long-eared Bat (*Plecotus autirus*), Daubenton's Bat (*Myotis daubentonii*), Soprano Pipistrelle (*Pipistrellus pygmaeus*), and Lesser Noctule (*Nyctalus leisleri*) (Figures 5-6).

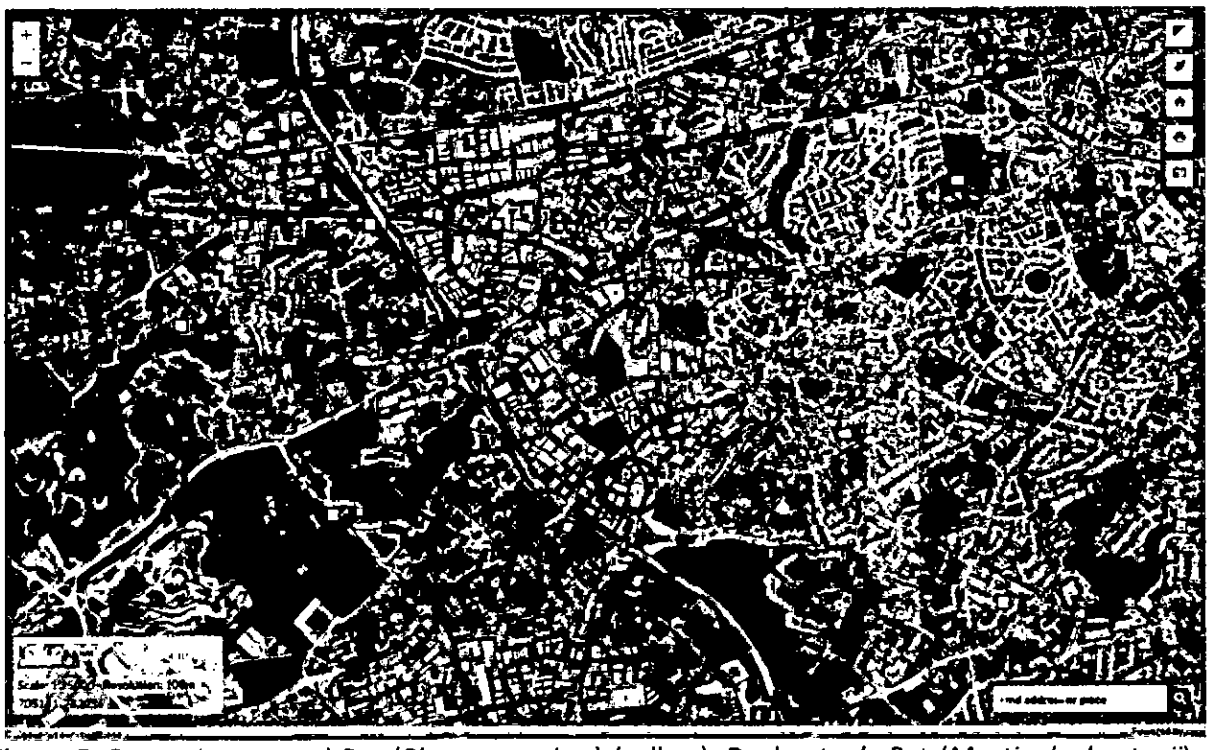


Figure 5. Brown Long-eared Bat (*Plecotus auritus*) (yellow), Daubenton's Bat (*Myotis daubentonii*) (purple), and both Brown Long-eared Bat and Daubenton's Bat (orange) (Source NBDC) (Site location – red circle)

Figure 6. Lesser Noctule (*Nyctalus leisleri*) (purple), Soprano Pipistrelle (*Pipistrellus pygmaeus*) (yellow), and both Soprano Pipistrelle and Lesser Noctule (orange) (Source NBDC) (Site location – red circle)

Figure 7. Common Pipistrelle (Pipistrellus pipistrellus sensu stricto) (purple), Pipistrelle (*Pipistrellus pipistrellus sensu lato*) (Combined Soprano and Common pipistrelle) (yellow), and both Common Pipistrelle (*Pipistrellus pipistrellus sensu stricto*) (purple), Pipistrelle (*Pipistrellus pipistrellus sensu lato*) (orange) (Source NBDC) (Site location – red circle)

Evaluation of Results

The bat surveys comply with bat survey guidance documentation including Marnell et al (2022) and Collins (2016). No bats were observed emerging from trees or buildings on site. No evidence of bats roosting in buildings or trees was noted. No bats were noted foraging on site. No bats were noted transiting through the subject site. The site is of relatively low importance to the local bat population.

Potential Impact of the development on Bats

No bats were noted on site. No bats were noted roosting on site. No trees of bat roosting potential are noted on site. The site is brightly lit both internally and externally. Security lighting is on site and in neighbouring industrial properties which create a brightly lit environment. No bats were noted on site. No confirmed bat roosts will be lost.

Given that no bat species were found using the site and the site is brightly lit from within and externally, the proposed project will not have any significant effect on local bat populations. No bat roosts or potential bat roosts will be lost due to this development. The proposed development is not in proximity to sensitive bat areas. The project is within a brightly lit industrial estate. The potential for collision risk and impact on flight paths in relation to bats is considered is considered low due to the low level of bat activity on site and the buildings would be deemed to be clearly visible to bats.

Mitigation Measures

As outlined in Marnell et al. (2022) *"Mitigation should be proportionate. The level of mitigation required depends on the size and type of impact, and the importance of the population affected."* In addition, as outlined in Marnell et. al (2022) *'Mitigation for bats normally comprises the following elements:*

- *Avoidance of deliberate, killing, injury or disturbance – taking all reasonable steps to ensure works do not harm individuals by altering working methods or timing to avoid bats. The seasonal occupation of most roosts provides good opportunities for this*
- *Roost creation, restoration or enhancement – to provide appropriate replacements for roosts to be lost or damaged*
- *Long-term habitat management and maintenance – to ensure the population will persist*
- *Post-development population monitoring – to assess the success of the scheme and to inform management or remedial operations.'*

However, no bats were noted on site. No bats were noted roosting on site. No trees of bat roosting potential are noted on site. As a result, the following mitigation will be implemented:

- Lighting at all construction stage will be done sensitively, pointing inwards with no external spill, on site with no significant direct lighting outside of the proposed site.

The following is recommended (not mitigation):

- That the external lighting on site is reviewed to minimise spill and comply with bat lighting guidelines.
- The use of security lighting being permanently on is reviewed with the installation of PIR's or similar timing to minimize lighting on site.

Predicted Residual Impact of Planned Development on Bats

Given that no bat species were found using the site and the site is brightly lit from within and externally, the proposed project will not have any significant effect on local bat populations. No bat roosts or potential bat roosts will be lost due to this development. The proposed development is not in proximity to sensitive bat areas. The potential for collision risk and impact on flight paths in relation to bats is considered is considered low due to the low level of bat activity on site and the buildings would be deemed to be clearly visible to bats. No significant effect on bats would be foreseen.

References

Collins, J. (ed.) (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). The Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1

Marnell, F., Kelleher, C. & Mullen, E. (2022). *Bat mitigation guidelines for Ireland V2. Irish Wildlife Manuals, No. 134*. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland.

Chartered Institute of Ecology and Environmental Management (2021). *Bat Mitigation Guidelines: A guide to impact assessment; mitigation and compensation for developments affecting bats. Beta version.* Chartered Institute of Ecology and Environmental Management, Winchester.

Chartered Institute of Ecology and Environmental Management (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal, and Marine.* Chartered Institute of Ecology and Environmental Management, Winchester.

Institution of Lighting Professionals (2018). *Bats and Artificial Lighting in the UK – Bats and the Built Environment Series: Guidance Note 08/18.* Institution of Lighting Professionals and the Bat Conservation Trust.

Department of Housing, Planning and Local Government (December, 2018). *Urban Development and Building Heights Guidelines for Planning Authorities.*

Bat Conservation Trust (May 2022). *Interim Guidance Note: Use of night vision aids for bat emergence surveys and further comment on dawn surveys.* The Bat Conservation Trust, London.

Bat Conservation Ireland 2004 on-going, *National Bat Record Database.* Virginia, Co. Cavan

Boyd, I. and Stebbings, R.E. 1989 Population changes in brown long-eared bats (*Plecotus auritus*) in Bat Boxes at Thetford Forest. *Journal of Applied Ecology* **26**: 101 - 112

Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) 1982

Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) 1979

EC Directive on The Conservation of Natural habitats and of Wild Fauna and Flora (Habitats Directive) 1992

Jefferies, D.J. 1972 Organochlorine insecticide residues in British bats and their significance. *Journal of Zoology*, London **166**: 245 - 263

Kelleher, C. 2004, Thirty years, six counties, one species – an update on the lesser horseshoe bat *Rhinolophus hipposideros* (Bechstein) in Ireland – *Irish Naturalists' Journal* **27**, No. 10, 387 – 392

Kelleher, C. 2015 *Proposed Residential Development, Church Road, Killiney, Dublin: Bat Fauna Study.* Report prepared for Altemar Marine and Environmental Consultants

Marnell, F., Kingston, N. and Looney, D. 2009 *Ireland Red List No. 3: Terrestrial Mammals.* National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin

Marnell, F., Kelleher, C., & Mullen, E. (2022), BAT MITIGATION GUIDELINES FOR IRELAND – V2 https://www.npws.ie/sites/default/files/publications/pdf/IWM134.pdf

Racey, P.A. and Swift, S.M. 1986 The residual effects of remedial timber treatments on bats. *Biological Conservation* **35**: 205 – 214

Smal, C.M. 1995 *The Badger & Habitat Survey of Ireland.* The Stationery Office, Dublin

Wildlife Act 1976 and Wildlife [Amendment] Act 2000. Government of Ireland.

Appendix C - Noise Impact Assessment

awnconsulting
A Trinity Consultants Company

The Tecpro Building,
Clonshaugh Business & Technology Park,
Dublin 17, Ireland.

T: + 353 1 847 4220
F: + 353 1 847 4257
E: info@awnconsulting.com
W: www.awnconsulting.com

NOISE IMPACT ASSESSMENT FOR A PROPOSED DATA REPOSITORY FACILITY

Technical Report Prepared For

Amazon Data Services Ireland Ltd

Technical Report Prepared By

Mike Simms BE MEngSc MIOA MIET

Our Reference

227501.0378NR01a

Date of Issue

13 December 2022

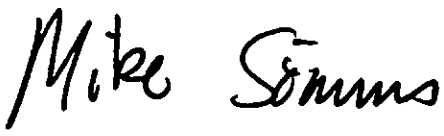
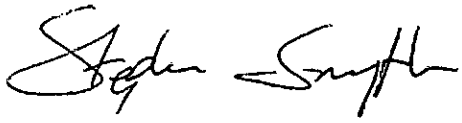
Cork Office
Unit 5, ATS Building,
Carrigaline Industrial Estate,
Carrigaline, Co. Cork.
T: +353 21 438 7400
F: +353 21 483 4606

AWN Consulting Limited
Registered in Ireland No. 319812

Document History

Document Reference		Original Issue Date	
227501.0378NR01		13 September 2022	
Revision Level	Revision Date	Description	Sections Affected
a	20 October 2022	Additional NSL	Various
	13 December 2022	Final Issue	Various

Record of Approval

Details	Written by	Checked by
Signature		
Name	Mike Simms	Stephen Smyth
Title	Senior Acoustic Consultant	Associate (Acoustics)
Date	13 December 2022	13 December 2022

EXECUTIVE SUMMARY

This report presents the assessment of the likely noise and vibration impacts associated with the proposed data repository facility during the construction and operational stages on its surrounding environment.

The construction noise assessment has shown that in accordance with the 'significance' thresholds presented in the *British Standard BS 5228 – 1: 2009+A1:2014: Code of practice for noise and vibration control on construction and open sites – Noise* impacts during construction will be moderate to major at residential locations and will be controlled to operate within the recommended noise criteria.

Guidance from relevant noise standards relating to environmental noise in addition to the prevailing noise levels measured have been used to set appropriate noise limits at the nearest noise sensitive locations to the Proposed Development.

The assessment has concluded that noise emissions from building services plant can achieve the adopted criteria at the façade of the nearby noise sensitive locations.

The operational noise assessment of fixed plant associated with the Proposed Development has shown that at the closest residential locations, which are at least 300 m from the site, the predicted change in background noise level due to the Proposed Development less than 1dB during the quietest night-time periods resulting in an imperceptible noise impact. Ambient noise levels are and will continue to be dictated by road traffic noise in the area.

The operational noise assessment of vehicle movements associated with the site has shown that in accordance with the scale in the '*Guidelines on the Information to be contained in Environmental Impact Statements*' there will be an imperceptible impact at noise sensitive locations considering existing traffic volumes on the local road network.

CONTENTS

1.0 INTRODUCTION

This noise impact assessment report has been prepared to assess the planning application for a proposed data repository facility (the "Proposed Development") at Unit 1, M50 Business Park, Ballymount, Dublin 12. The Proposed Development site is outlined in red on Figure 1.

The Proposed Development will consist of: the change of use from warehouse to data repository facility, alterations to external facades, provision of a new 1100 mm parapet, reclad roof, internal alterations, refurbishment of the existing office space, solar panels at roof level, external plant at ground and roof levels and equipment to include 12 no. condenser modules, an emergency back-up generator and associated fuel storage tank, transformer, extension to the existing sub-station (c. 13 m2), 2 no. sprinkler tanks and pumphouse, bin store, 22 parking spaces including 2 electrical vehicle charging points, bicycle parking shelter, landscaping, planting, new security fence, external lighting, CCTV, altered vehicular gates, permeable hard surfaces, alterations to internal foul sewerage and water supply networks, provision of SuDS compliant surface water drainage system and all associated site works.

The nearest residential locations are at distances of approximately 325 m to the southeast at Greenhills Road, 400 m to the east at Keadeen Avenue and at approximately 520 m to the west at Forest Lawn and Forrest Drive. Buildings in the immediate area of the site are commercial in nature.

Figure 1 Approximate Site Red Line Boundary

The development of the data repository facility building will include cooling condenser units to the north and west of the building, an air handling units (AHU) located internally and a single standby generator to the east of the building.

Appendix A of this document presents a glossary of the acoustic terminology used throughout this document.

2.0 METHODOLOGY

2.1 Outline Methodology

The following methodology has been adopted for this assessment:

- A review of appropriate guidance, typical local authority planning conditions, etc. in order to identify appropriate noise criteria for the site operations has been undertaken;
- Baseline noise monitoring has been undertaken at locations representative of the nearest noise sensitive properties/boundaries) to identify existing levels of noise in the vicinity of the development;
- A detailed 3D noise model of the Proposed Development has been undertaken to predict noise levels at the nearest noise sensitive locations for a range of different operational scenarios, and;
- The predicted levels have been assessed against the appropriate criteria and existing noise levels to determine the requirement for noise mitigation measures (if any).

2.2 Forecasting Methods

The following forecasting methods have been adopted for the key potential noise sources and scenarios associated with the Proposed Development:

- Construction noise calculations have been conducted generally in accordance with BS 5228: 2009+A1:2014: Code of practice for noise control on construction and open sites – Noise.
- Prediction calculations for building services noise have been conducted generally in accordance with ISO 9613 (1996): Acoustics – Attenuation of sound outdoors – Part 2: General method of calculation.
- Changes in road traffic noise on the local road network have been considered using prediction guidance contained within Calculation of Road Traffic Noise (CRTN) issued by the Department of Transport in 1988.

3.0 EXISTING RECEIVING ENVIRONMENT

3.1 Baseline Noise Survey Locations

An environmental noise survey has been conducted at the site in order to quantify the existing noise environment. The survey was conducted in general accordance with ISO 1996: 2017: *Acoustics – Description, measurement and assessment of environmental noise.*

The noise measurement locations were selected to represent the noise environment at the NSLs surrounding the Proposed Development.

The monitoring locations are discussed below and shown in Figure 2:

Figure 2 *Baseline noise measurement locations (indicative redline shown)*

Location N1 Attended measurement location to capture the noise level at the front of proposed site location along Ballymount Avenue.

Location N2 Attended measurement location to capture the noise level at the NSLs along row of houses on Keaden Avenue.

Location N3 Attended measurement location to capture the noise level at the NSLs at the end of Forest Lawn.

3.2 Survey Periods

Attended measurements were carried out during the following periods:

- Daytime: 12:05 hrs to 15:44 hrs on 27 July 2022

- Evening time: 21:49 hrs to 22:48 hrs on 2 August 2022
- Night-time: 23:01 hrs on 2 August to 01:04 hrs on 3 August 2022.

The weather during the survey periods was dry with varying cloud cover. Wind speeds were generally moderate; however they were not considered to have had a detrimental effect on the noise measurements.

3.3 Personnel and Instrumentation

AWN carried out the noise surveys. The following instrumentation was used in conducting the noise and surveys:

Equipment	Type	Serial Number	Calibration Date
Sound Level Meter	Rion NL – 52	998413	Mar 2022

Table 1 Instrumentation Details

3.4 Noise Measurement Parameters

The noise survey results are presented in terms of the following parameters.

L_{Aeq} is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period.

L_{A90} is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.

The "A" suffix for the noise parameters denotes the fact that the sound levels have been "A-weighted" in order to account for the non-linear nature of human hearing. All sound levels in this report are expressed in terms of decibels (dB) relative to $2x10^{-5}$ Pa.

3.5 Survey Results

The survey results for the daytime attended monitoring are given in Table 2.

Location	Start Time (hrs)	Measured Noise Levels (dB re. $2x10^{-5}$ Pa)	
		$L_{Aeq,15min}$	L_{A90}
N1	12:05	62	51
	13:16	59	51
	14:44	59	51
N2	12:26	54	50
	13:37	54	50
	15:04	55	51
N3	12:52	57	54
	14:02	57	53
	15:30	56	53

Table 2 Summary of Attended Results – Daytime

At N1, Noise levels were in the range 59 to 62 dB $L_{Aeq,15min}$ and of the order of 51 dB $L_{A90,15min}$. Traffic was the dominant noise source, with a degree of construction noise including reversing alarms audible.

At N2, Noise levels were in the range 54 to 55 dB $L_{Aeq,15min}$ and 50 to 51 dB $L_{A90,15min}$. Traffic was the dominant noise source.

At N3, Noise levels were in the range 56 to 57 dB $L_{Aeq,15min}$ and 53 to 54 dB $L_{A90,15min}$. Traffic and LUAS pass-bys were the dominant source, with children playing also audible.

The survey results for the evening time attended monitoring are given in Table 3.

Location	Start Time (hrs)	Measured Noise Levels (dB re. $2x10^{-5}$ Pa)	
		$L_{Aeq,15min}$	L_{A90}
N1	21:49	52	50
N2	22:09	53	49
N3	22:33	49	45

Table 3 Summary of Attended Results – Evening Time

During the evening periods, the noise levels at the noise survey locations ranged from 49 to 53 dB L_{Aeq} and 45 to 50 dB L_{A90}. Although reduced, traffic was the dominant noise source, along with Luas movements at location N3.

The survey results for the night-time attended monitoring are given in Table 4.

Location	Start Time (hrs)	Measured Noise Levels (dB re. $2x10^{-5}$ Pa)	
		$L_{Aeq,15min}$	L_{A90}
N1	23:01	50	47
	00:06	49	43
N2	23:20	49	43
	00:26	47	42
N3	23:44	48	42
	00:49	49	43

Table 4 Summary of Attended Results – Night-time

During the night-time time periods, the noise levels at the noise survey locations ranged from 47 to 50 dB L_{Aeq} and 42 to 47 dB L_{A90}. Road traffic remained the dominant noise source, along with foliage blowing in the breeze also being audible.

3.6 Nearest Noise-Sensitive Locations

In the first instance it is considered appropriate to define a noise sensitive location. In this context, it is considered prudent to give consideration to the definition supplied by the Environmental Protection Agency (EPA) which states the following:

> *"NSL – any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels."*

Figure 3 highlights the nearest noise sensitive locations where predictions have been carried out to. Locations R01 to R09 represent commercial locations in the immediate surroundings of the proposed site. Location R15 represents Kilnamanagh House on Greenhills Road at some 325m from the boundary of the Proposed Development to the southeast. Locations R10, R11 and R12 represent residential locations at Keaden Avenue at some 400m distance. Locations R13 and R14 represent the residential locations at some 520m to the west at Forest Lawn and Forest Drive.

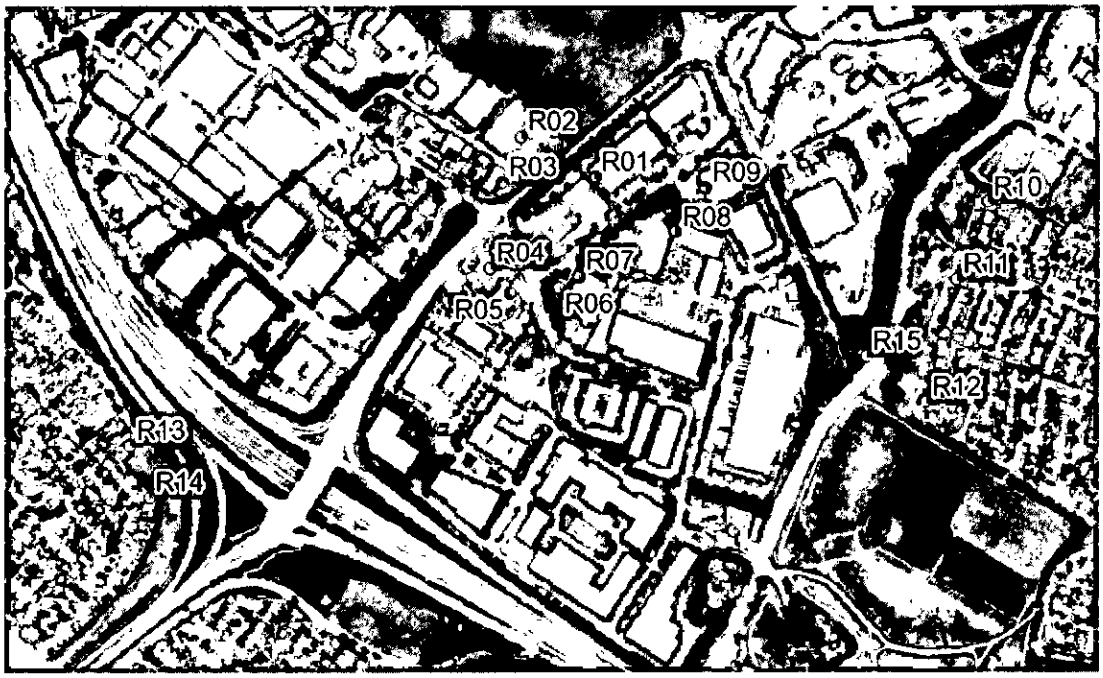


Figure 3 Noise-sensitive locations

4.0 RELEVANT CRITERIA

4.1 Significance of Impacts

The Environmental Protection Agency (EPA) *Guidelines on the Information to be contained in Environmental Impact Assessment Reports*, (May 2022) and the *Draft EPA Advice Notes for Preparing Environmental Impact Statements* (2015), see Tables 5 to 7 below. As these guidelines do not quantify the impacts in decibel terms further reference has been made to the '*Guidelines for Environmental Noise Impact Assessment*'[a] produced by the Institute of Environmental Management and Assessment Working Party (2014). With regard to the quality of the impact, ratings may have positive, neutral or negative applications where:

Quality of Impact	Definition
Negative	A change which reduces the quality of the environment (e.g. by causing a nuisance).
Neutral	No effects or effects that are imperceptible, within the normal bounds of variation or within the margin of forecasting error.
Positive	A change that improves the quality of the environment (e.g. by removing a nuisance).

Table 5 Quality of Potential Effects

The significance of an effect on the receiving environment are described as follows:

Significance of Impact on the Receiving Environment	Description of Potential Effect
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters a sensitive aspect of the environment.

Table 6 Significance of Effects

The duration of effects as described in the EPA Guidelines are:

Duration of Impact	Definition
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting one year or less
Short-term	Effects lasting one to seven years
Medium-term	Effects lasting seven to fifteen years
Long-term	Effects lasting fifteen to sixty years
Permanent	Effects lasting over sixty years
Reversible	Effects that can be undone, for example through remediation or restoration

Table 7 Duration of Effects

[a] IEMA Guidelines for Environmental Noise Impact Assessment 2014

4.2 Construction Phase Guidance

4.2.1 Criteria for Rating Noise Impacts

There is no published statutory Irish guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project. Local authorities normally control construction activities by imposing limits on the hours of operation and consider noise limits at their discretion.

In the absence of specific noise limits, appropriate criteria relating to permissible construction noise levels for a development of this scale may be found in the *British Standard BS 5228 – 1: 2009+A1:2014: Code of practice for noise and vibration control on construction and open sites – Noise*.

The nearest residential locations are at distances of approximately 325 m to the southeast at Greenhills Road, 400 m to the east at Keadeen Avenue and at approximately 520 m to the west at Forest Lawn and Forrest Drive. There are commercial NSLs at closer distances of 45 to 65 m; based on the results of the baseline noise surveys undertaken, the ambient daytime noise level at these commercial properties was found to be between 59 and 62 dB $L_{Aeq,T}$.

When considering non-residential receptors, such as those sharing a boundary with the Proposed Development, reference is made to BS 5228-1:2009+A1:2014, which gives several examples of acceptable limits for construction noise, the most simplistic being based upon the exceedance of fixed noise limits. For example, paragraph E.2 states:

> *"Noise from construction and demolition sites should not exceed the level at which conversation in the nearest building would be difficult with the windows shut."*

Paragraph E.2 goes on to state: -

> *"Noise levels, between say 07.00 and 19.00 hours, outside the nearest window of the occupied room closest to the site boundary should not exceed: -*
>
> *70 decibels (dBA) in rural, suburban areas away from main road traffic and industrial noise;*
>
> *75 decibels (dBA) in urban areas near main roads in heavy industrial areas".*

4.2.2 Criteria for Rating Vibration Impacts

There are two aspects to the issue of vibration that are addressed in the standards and guidelines: the risk of cosmetic or structural damage to buildings; and human perception of vibration. In the case of this development, vibration levels used for the purposes of evaluating building protection and human comfort are expressed in terms of Peak Particle Velocity (PPV) in mm/s.

There is no published statutory Irish guidance relating to the maximum permissible vibration level. The following standards are the most widely accepted in this context and are referenced here in relation to cosmetic or structural damage to buildings:

- British Standard BS 5228-2 (BSI 2014); and
- British Standard BS 7385-2 (BSI 1993)

Type of building	Peak component particle velocity in frequency range of predominant pulse	
	4 Hz to 15 Hz	15 Hz and above
Unreinforced or light framed structures. Residential or light commercial buildings.	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

Table 8 Transient vibration guide values for cosmetic damage
Note 1: Values referred to are at the base of the building.
Note 2: At frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.

Furthermore, BS 5228-2 and BS 7385-2 state that minor structural damage can occur at vibration magnitudes greater than twice those in Table 8 and major structural damage can occur at vibration magnitudes greater than four times those in Table 8.

BS 5228-2 also provides guidance relating to the human response to vibration. Guidance is again provided in terms of PPV in mm/s since this parameter is routinely measured when monitoring the structural effects of vibration. The potential human response at different vibration levels, as set out in BS 5228-2, is summarised in Table 9.

Vibration level Note A) B) C) (mm/s)	Effect
0.14	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3	Vibration might be just perceptible in residential environments.
1.0	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents.
10	Vibration is likely to be intolerable for any more than a very brief exposure to this level in most building environments.

Table 9 Transient vibration guide values for cosmetic damage

A) The magnitudes of the values presented apply to a measurement position that is representative of the point of entry into the recipient.
B) A transfer function (which relates an external level to an internal level) needs to be applied if only external measurements are available.
C) Single or infrequent occurrences of these levels do not necessarily correspond to the stated effect in every case. The values are provided to give an initial indication of potential effects, and where these values are routinely measured or expected then an assessment in accordance with BS 6472-1 or -2, and/or other available guidance, might be appropriate to determine whether the time varying exposure is likely to give rise to any degree of adverse comment.

4.3 Operational Phase Guidance

The relevant local authority, South County Council (SDCC), does not have any standard noise conditions listed in the Dublin Agglomeration Environmental Noise Action Plan December 2018 – July 2023 - Volume 4 - South Dublin County Council .

However, within section 2.5 *IPPC Licensing* of that document, the following comment is made regarding sites which require IPC/IED Licencing:

> *Certain activities that are required to be licensed may be subject to controls relating to sound emissions. The relevant guidance is set out in the EPA*

document, „Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)" was originally published in April 2012 and was updated in 2016. This revised Noise Guidance Note (NG4) is intended to assist licensed sites with the assessment of their potential and actual noise impact on the local environment. It recommends a "Best Available Technique" approach to the assessment and mitigation of noise pollution.

Therefore, guidance in the EPA NG4 document has been considered in this environmental noise assessment.

4.3.1 EPA – NG4

In order to establish whether the noise sensitive locations in the vicinity of the site would be considered 'low background noise' areas as defined in the Environmental Protection Agency (EPA) publication Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4 2016) guidance, the noise levels measured during the environmental noise survey need to satisfy the following criteria:

- Arithmetic Average of L_{A90} During Daytime Period ≤40 dB L_{A90}, and;
- Arithmetic Average of L_{A90} During Evening Period ≤35 dB L_{A90}, and;
- Arithmetic Average of L_{A90} During Night-time Period ≤30 dB L_{A90}.

Determining Appropriate Noise Criteria

Table 10 below outlines the noise emission limit criteria detailed in the NG4 document.

Scenario	Daytime Noise Criterion, dB $L_{Ar,T}$ (07:00 to 19:00hrs)	Evening Noise Criterion, dB $L_{Ar,T}$ (19:00 to 23:00hrs)	Night Noise Criterion, dB L_{Aeq} (23:00 to 07:00hrs)
Areas of Low Background Noise	45 dB	40 dB	35 dB
All Other Areas	55 dB	50 dB	45 dB

Table 10 NG4 Approach for Determining Appropriate Noise Criteria

As these nearest noise-sensitive locations are not identified as areas of low background noise as per the NG4 guidance, a 45 dB $L_{Aeq,T}$ night time criterion applies. Note if buildings were designed to this level, plant noise would be clearly audible and the dominant background source of noise at a number of noise sensitive locations in the vicinity of the development.

4.3.2 BS 4142:2014

BS 4142:2014+A1:2019: Methods for rating and assessing industrial and commercial sound is the industry standard method for analysing building services plant sound emissions to residential receptors. BS 4142 describes methods for rating and assessing sound of an industrial and/or commercial nature. The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident. It should also be noted that the EPA NG4 document indicates that this assessment methodology should be used in the assessment of complaints associated with a site's operations. While the current site will not be licenced, the guidance contained therein needs to be given due regard.

For an appropriate BS 4142 assessment it is necessary to compare the measured external background sound level (i.e. the $L_{A90,T}$ level measured in the absence of plant items) to the rating level ($L_{Ar,T}$) of the various plant items, when operational. Where sound emissions are found to be tonal, impulsive, intermittent or to have other sound characteristics that are readily distinctive against the residual acoustic environment, BS4142 advises that penalties be applied to the specific level to arrive at the rating level.

The subjective method for applying a penalty for tonal sound characteristics outlined in BS 4142 recommends the application of a 2 dB penalty for a tone which is just perceptible at the receptor, 4 dB where it is clearly perceptible, and 6dB where it is highly perceptible. In relation to intermittency, BS 4142 recommends that If the intermittency us readily is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied. The following definitions as discussed in BS 4142 as summarised below:

"*ambient sound level, $L_{Aeq,T}$*"	equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at any given time, usually from many sources near and far, at the assessment location over a given time interval, T.
"*residual sound level, $L_{Aeq,T}$*"	equivalent continuous A-weighted sound pressure level of the residual sound (i.e. ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound) at the assessment location over a given time interval, T.
"*specific sound level, $L_{Aeq,T}$*"	equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, Tr.
"*rating level, $L_{Ar,T}$*"	specific sound level plus any adjustment for the characteristic features of the sound.
"*background sound level, $L_{A90,T}$*"	A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting F and quoted to the nearest whole number of decibels.

In order to establish an initial estimate of impact, BS 4142 states the following:

Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level from the rating level, and consider the following.

a. *Typically, the greater this difference, the greater the magnitude of the impact.*
b. *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.*

c. *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.*
d. *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.*

Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.

Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.

The assessment methodology described above (i.e. comparison of rated sound level to background sound level) is quoted in BS4142 as representing a methodology to 'obtain an initial estimate' of impact. It is important to note that BS4142 also comments that 'Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration'. BS4142 provides a list of potential pertinent factors that can influence the 'initial estimate'. The plant noise assessment conducted in the following sections has been carried out with consideration of the guidance contained in BS4142 as summarised above.

4.3.3 Commercial Properties

A number of commercial / industrial properties are located in the vicinity of the site. In terms of noise emissions from the site it is considered that an appropriate noise criterion at these locations is 55 dB $L_{Aeq,15min}$.

4.3.4 Emergency Operation

In order to provide continuity of service, a standby generator is proposed. This generator will only operate in a situation where there is a failure in the electricity supply from the national grid. Section 4.4.1 of the Environmental Protection Agency (EPA) document "Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities" (NG4 - 2016) contains the following comments in relation to emergency plant items:

> *'In some instances, ...sites will have certain items of emergency equipment (e.g. standby generators) that will only operate in urgent situations (e.g. grid power failure). Depending upon the context, it may be deemed permissible for such items of equipment to give rise to exceedances in the noise criteria/limits during limited testing and emergency operation only. If such equipment is in regular use for any purposes other than intermittent testing, it is subject to the standard limit values for the site'.*

On the understanding that generator testing will take place during daytime hours only, the proposed noise criterion of 55 dB $L_{Aeq,T}$ on these emergency units is appropriate. Generators will be designed and mitigated in order to achieve this design goal at nearby residential noise sensitive locations.

4.3.6 Recommended Criteria

Following review of relevant guidance, the following noise criteria are proposed for the development:

Day to Day Operation (Noise Sensitive) – 40 dB $L_{Aeq,15min}$
Day to Day Operation (Commercial) – 55 dB $L_{Aeq,15min}$
Emergency Operation – 55 dB $L_{Aeq,15min}$
Generator Testing – 55 dB $L_{Aeq,15min}$

Note plant noise emissions are to be designed such that they are not tonal and do not have impulsive characteristics at the nearest noise sensitive locations.

4.3.7 Assessment of Significance

The IEMA '*Guidelines for Environmental Noise Impact Assessment*' (2014) have been referenced in order to categorise the potential effect of changes in the ambient noise levels during the operational phases of the Proposed Development.

The guidelines state that for any assessment, the potential significance should be determined by the assessor, based upon the specific evidence and likely subjective response to noise. Due to varying factors which effect human response to environmental noise (prevailing environment, noise characteristics, time periods, duration and level etc.) assigning a subjective response must take account of these factors.

The scale adopted in this assessment is shown in Table 11 and is based on an example scale within the IEMA guidelines. The corresponding significance of impact presented in the '*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*' (EPA, 2022) is also presented.

Noise Level Change dB(A)	Subjective Response	Impact Guidelines for Noise Impact Assessment Significance (Institute of Acoustics)	Effect Guidelines on the Information to be contained in EIARs (EPA)
0	No change	Negligible	Imperceptible
0.1 – 2.9	Barely perceptible		Not Significant
3.0 – 4.9	Noticeable	Minor	Slight - Moderate
5.0 – 9.9	Up to a doubling or halving of loudness	Moderate	Moderate - Significant
10.0 or more	More than a doubling or halving of loudness	Major	Significant - Profound

Table 11 Noise Impact Scale

The criteria above reflect the key benchmarks that relate to human perception of sound. A change of 3dB(A) is generally considered to be the smallest change in environmental noise that is perceptible to the human ear. A 10dB(A) change in noise represents a doubling or halving of the noise level. The difference between the minimum perceptible change and the doubling or halving of the noise level is split to provide greater definition to the assessment of changes in noise level.

It is considered that the criteria specified in the above table provide a good indication as to the likely significance of changes on noise levels in this case and have been used to assess the impact of operational noise. The following section presents a review of significance criterion in relation to construction noise.

5.0 PROPOSED DEVELOPMENT SUMMARY

The Proposed Development will consist of: the change of use from warehouse to data repository facility, alterations to external facades, reclad roof, internal alterations, solar panels at roof level, external plant and equipment to include 12 no. condenser modules, an emergency back-up generator and associated fuel storage tank, transformer, extension to the existing sub-station (c. 13 m2), 2 no. sprinkler tanks and pumphouse, bin store, 18 parking spaces including 2 electrical vehicle charging points, bicycle parking shelter, landscaping, planting, new security fence, external lighting, CCTV, altered vehicular gates, permeable hard surfaces, alterations to internal foul sewerage and water supply networks, provision of SuDS compliant surface water drainage system and all associated site works. The Proposed Development, including the proposed demolitions works, are described further in Section 3 of this report. Proposed Development.

The construction phase will involve excavation, construction of foundations and hardstanding area, general site preparation over the development site and the erection of new buildings over a phased construction period.

An initial demolition phase will take place, the works are limited to a strip of external facades roof, and internal areas including the demolition of the existing mezzanine floor of the warehouse buildings circa 115 m2 of internal floor space. The structure of the warehouse building will not be demolished. The proposed timeline for demolition works is 5 weeks in total and is included within the overall construction phase.

The estimated construction duration for the Proposed Development is 36 weeks. This includes all site works, building upgrade works and full building fit-out and will all be constructed in a single phase. It is envisaged that construction will commence in March 2023 and will be complete in December 2023, subject to grant of planning.

Once operational, the outward noise in the operational context are deemed long term and will involve:

- building services noise;
- emergency site operations, and;
- additional vehicular traffic on public roads.

These issues are discussed in detailed in the following sections.

6.0 POTENTIAL IMPACTS OF THE DEVELOPMENT

The potential impacts of the Proposed Development are discussed for the short-term construction phase and long-term operational phase. These are set out in the following sections.

6.1 Construction Phase

The largest noise and vibration impact of the Proposed Development will occur during the construction phase due to the operation of various plant machinery and HGV movement to, from and around the site. However, the construction phase can be classed as a short-term phase.
The nearest residential NSLs to the site are at distances of more than approximately 325 m to the southeast at Greenhills Road, 400 m to the east at Keadeen Avenue and at approximately 520 m to the west at Forest Lawn and Forrest Drive. There are commercial NSLs at closer distances of 45 to 65 m; based on the results of the baseline noise surveys undertaken, the ambient daytime noise level at these commercial properties was found to be between 59 and 62 dB $L_{Aeq,T}$.

As the nearest NSLs are commercial in nature, the fixed limit of 75 dB $L_{Aeq,1hr}$ as discussed in Section 4.2.1 is adopted for these locations.

BS 5228-1 contains noise level data for various construction machinery. The noise levels relating to site clearance, ground excavation and loading lorries (dozers, tracked excavators and wheeled loaders) reach a maximum of 81 dB $L_{Aeq,T}$ at a distance of 10 m. For this assessment, a worst-case scenario is assumed of 3 no. such items with a sound pressure level (SPL) of 81 dB at 10 m operating simultaneously along the closest works boundary. This would result in a total noise level of 86 dB at 10 m and an equivalent combined sound power level of 114 dB L_{WA}. This worst-case scenario is the typical assumption made for developments of this size, on the basis that it is unlikely that more than 3 no. items of such plant/equipment would be operating simultaneously in such close proximity to each other. Table 12 presents the results of construction noise calculations at a range of distances from the source.

Description of Noise Source	Sound Power Level (dB $L_w(A)$)	Calculated noise levels at varying distances (dB $L_{Aeq,1hr}$)				
		45 m	55 m	65 m	75 m	100 m
3 no. items each with SPL of 81 dB at 10 m operating simultaneously.	114	71	69	68	66	64

Table 12 *Potential construction noise levels at varying distances*

The calculated noise levels in Table 12 show that there is predicted noise levels are within the adopted construction noise criteria of 75 dB $L_{Aeq,1hr}$. This indicates that construction noise effects are ***negative***, ***not significant*** and ***temporary*** *(effects lasting less than a year).*

Construction Vibration

Potential for vibration impacts during the construction phase programme are likely to be limited to excavations and piling works to be used for foundations. For the purposes of this assessment the expected vibration levels during piling assuming augured or bored piles have been determined through reference to published empirical data. The British Standard BS 5228 – Part 2*: Vibration*, publishes the measured magnitude of vibration of rotary bored piling using a 600mm pile diameter for bored piling into soft ground over rock, (Table D.6, Ref. No. 106):

- 0.54 mm/s at a distance of 5m, for auguring;
- 0.22 mm/s at a distance of 5m, for twisting in casing;
- 0.42 mm/s at a distance of 5m, for spinning off, and;
- 0.43 mm/s at a distance of 5m, for boring with rock auger.

Considering the low vibration levels at very close distances to the piling rigs, vibration levels at the nearest buildings are not expected to pose any significance in terms of cosmetic or structural damage. In addition the range of vibration levels is typically below a level which would cause any disturbance to occupants of nearby buildings. This indicates that construction vibration effects are **negative**, **not significant** and ***temporary*** *(effects lasting less than a year).*

Construction Traffic

In terms of the additional construction traffic on local roads that will be generated as a result of the Proposed Development the following comment is presented: Considering that in order to increase traffic noise levels by 1dB traffic volumes would need to increase by the order of 25% it is considered that additional traffic introduced onto the local road network due to the construction phase associated of the development will not result in a significant noise impact.

6.2 Operational Phase

The primary sources of outward noise in the operational context are deemed medium term and will involve:

- building services noise;
- emergency site operations; and
- additional vehicular traffic on public roads.

These issues are discussed in following sections. See Appendix B for details of the noise modelling undertaken for this assessment and associated assumptions.

6.1.1 Building Services Noise / Emergency Site Operation

Three scenarios have been developed to consider the noise impact of the proposed operations. Scenarios A considers the data repository facility in normal day-to-day. Scenario B are representative of emergency situation when a power outage or issue with supply from the national grid has occurred. It should be noted that such an event is an extremely rare occurrence.

Scenario C represents the impact associated with the occasional daytime testing of proposed emergency generators on the site. In this instance, as there is only one emergency generator, the predicted noise levels are the same as for emergency generation. The adopted criteria for scenarios B and C are also the same at 55 dB $L_{Aeq,15min}$.

See Appendix B for details of the noise model and input sound power levels.

Noise contours plots are also presented for the various scenarios in order to demonstrate the noise impact of the Proposed Development. These are presented in Appendix C.

The results of the iterations of the noise model are presented in Table 13 for Scenarios A, B and C as discussed above. Note all plant will be selected such that no tonal noise emissions are evident at noise sensitive locations.

Location	Predicted dB $L_{Aeq,T}$		
	Scenario A	Scenario B	Scenario C
R01	45	55	55
R02	46	49	49
R03	49	51	51
R04	48	49	49
R05	48	48	48
R06	49	49	49
R07	47	48	48
R08	34	43	43
R09	32	40	40
R10	19	28	28
R11	23	29	29
R12	28	31	31
R13	28	32	32
R14	28	32	32
R15	29	32	32

Table 13 Predicted Plant Noise Levels for Various Scenarios (Scenario A through C)

The above predicted levels are based on a situation where the receiver is downwind of all noise sources. For the purposes of the assessment against the adopted criteria this is a robust worst-case assumption.

Comment on Adopted Noise Criteria Day to Day Operations

The predicted noise levels presented in Table 13 are compared to the relevant noise criteria as adopted for this assessment in Table 14 overleaf.

It should be noted that the emergency generator testing shall take place only between 09.00 and 17.00hrs. The results are summarised as follows:

Scenario A All locations are within with the adopted criteria of 55 dB $L_{Aeq,15min}$ for commercial locations and 35 to 40 dB $L_{Aeq,15min}$ for residential locations for to day to day operations.

Scenario B All locations are within the relevant adopted emergency operation limit of 55 dB $L_{Aeq,15min}$, in the rare event that a power loss to the site occurs.

Scenario C All locations are within the relevant adopted daytime limit of 55 dB $L_{Aeq,15min}$ during periods when a single generator is undergoing routine testing.

Location	Scenario A			Scenario B			Scenario C		
	Predicted dB $L_{Aeq,15min}$	Criterion dB $L_{Aeq,15min}$	Complies?	Predicted dB $L_{Aeq,15min}$	Criterion dB $L_{Aeq,15min}$	Complies?	Predicted dB $L_{Aeq,15min}$	Criterion dB $L_{Aeq,15min}$	Complies?
R01	45	55	✓	55	55	✓	55	55	✓
R02	46		✓	49		✓	49		✓
R03	49		✓	51		✓	51		✓
R04	48		✓	49		✓	49		✓
R05	48		✓	48		✓	48		✓
R06	49		✓	49		✓	49		✓
R07	47		✓	48		✓	48		✓
R08	34		✓	43		✓	43		✓
R09	32		✓	40		✓	40		✓
R10	19	40	✓	28		✓	28		✓
R11	23		✓	29		✓	29		✓
R12	28		✓	31		✓	31		✓
R13	28		✓	32		✓	32		✓
R14	28		✓	32		✓	32		✓
R15	29		✓	32		✓	32		✓

Table 14 Comparison of Predicted Noise Levels vs. Adopted Noise Criteria

Review of Increases in Noise Level

Table 15 presents the predicted changes in noise level associated with the development at the nearest *residential* noise sensitive locations for daytime periods..

Loc.	Scenario A – Typical Operation Daytime				
	Predicted dB $L_{Aeq,15min}$	Background Level dB $L_{A90,15min}$ NOTE A	Cumulative Noise Level (dB(A))	Change in Noise Level (dB)	EPA Glossary of Impacts
R10	19	50	50	0	Imperceptible
R11	23	50	50	0	Imperceptible
R12	28	50	50	0	Imperceptible
R13	28	53	53	0	Imperceptible
R14	28	53	53	0	Imperceptible
R15	29	50	50	0	Imperceptible

Table 15 Review of Predicted Changes in Existing Noise Levels at residential NSLs

Note A The background noise levels are presented for the quietest night-time hours recorded during the baseline survey to present a worst case assessment.

Review of the predicted increases in noise level at the nearest noise sensitive locations for Scenario A concludes that the associated impact is 'imperceptible' at all residential locations assessed, for daytime periods.

Table 16 presents predicted changes in noise level associated with the development at the nearest noise residential sensitive locations for night-time periods.

Loc.	Scenario A – Typical Operation Night-time				
	Predicted dB $L_{Aeq,15min}$	Background Level dB $L_{A90,15min}$	Cumulative Noise Level (dB(A))	Change in Noise Level (dB)	EPA Glossary of Impacts
R10	19	42	42	0	Imperceptible
R11	23	42	42	0	Imperceptible
R12	28	42	42	0	Imperceptible
R13	28	43	43	0	Imperceptible
R14	28	43	43	0	Imperceptible
R15	29	42	42	0	Imperceptible

Table 16 Review of Predicted Changes in Existing Noise Levels

Review of the predicted increases in noise level at the nearest noise sensitive locations for Scenario A concludes that the associated impact is 'imperceptible' at all residential locations assessed, for night-time periods.

6.2.1 Additional Vehicular Traffic on Public Roads

In terms of the additional traffic on local roads that will be generated as a result of this development the following comment is presented. Considering that in order to increase traffic noise levels by 1dB traffic volumes would need to increase by the order of 25% it is considered that additional traffic introduced onto the local road network due to this development will not result in a significant noise impact.

6.2.2 Vibration

There is no source of vibration associated with the day to day operation of the development that will give rise to impacts at nearby noise sensitive locations. In terms of these the operational phase of the development the associated effect is stated to be neutral, imperceptible, long term.

7.0 REMEDIAL MEASURES

In order to sufficiently ameliorate the likely noise impact, a schedule of noise control measures has been formulated for both construction and operational phases associated with the Proposed Development.

7.1 Construction phase

With regard to construction activities, reference will be made to BS5228 Parts 1 and 2, which offer detailed guidance on the control of noise and vibration from demolition and construction activities. Various mitigation measures will be considered and applied during the construction of the Proposed Development. Specific examples of such measures are:

- limiting the hours during which site activities likely to create high levels of noise or vibration are permitted (for example, as in paragraph 6(a) of the planning conditions Ref SD18A/0301);
- establishing channels of communication between the contractor/developer, Local Authority and residents;
- appointing a site representative responsible for matters relating to noise and vibration;
- monitoring levels of noise and/or vibration during critical periods and at sensitive locations; and
- all site access roads will be kept even so as to mitigate the potential for vibration from lorries.

Furthermore, it is envisaged that a variety of practicable noise control measures will be employed. These may include:

- selection of plant with low inherent potential for generation of noise and/ or vibration;
- erection of barriers as necessary around items such as generators or high duty compressors;
- situate any noisy plant as far away from sensitive properties as permitted by site constraints and the use of vibration isolated support structures where necessary.

We would recommend that vibration from construction activities to off-site residences be limited to the values set out in Section 3.2.2. It should be noted that these limits are not absolute, but provide guidance as to magnitudes of vibration that are very unlikely to cause cosmetic damage. Magnitudes of vibration slightly greater than those in the table are normally unlikely to cause cosmetic damage, but construction work creating such magnitudes should proceed with caution. Where there is existing damage these limits may need to be reduced by up to 50%.

7.2 Operational Phase

7.2.1 Building Services Noise / Emergency Site Operation

Noise from building services plant will be minimised by selecting low noise generating equipment and incorporating appropriately specified in line attenuators where necessary. With due consideration as part of the detailed design process, this approach will result in the site operating well within the constraints of the best practice guidance noise limits that have been adopted as part of this detailed assessment.

It is acknowledged that the detail design of the facility may result in alterations to the plant selection and the associated sound output from the operational plant items. It is possible therefore for the operational noise criteria to be achieved by alternative means including selection of AHU's with a lower noise output or with the inclusion of at source attenuation.

Any alterations to the noise source data, building and plant layouts associated with operational phase of the development will be designed such that the operational noise criteria outlined in this report are achieved and associated noise impacts are no greater than those discussed in Section 6.

7.2.2 Additional Vehicular Traffic on Public Roads

The noise impact assessment outlined previously has demonstrated that mitigation measures are not required.

8.0 CUMULATIVE IMPACTS

8.1 Existing Developments

The environmental noise surveys (Section 3) take account of any noise emissions from existing developments. It was noted that the existing ambient noise levels in the area were dominated by road traffic noise from the local road network. During daytime, evening and night periods existing ambient noise levels at the various noise sensitive locations are typically 10dB(A) or more above predicted noise levels associated with the Proposed Development and hence the existing ambient noise levels will remain unchanged during these periods.

8.1 Permitted Development SD19A/0222

There is a development on the neighbouring site to the south, Ref. SD19A/0222, which has been granted but not yet constructed. The development contains an extension to an existing warehouse.

Construction noise

This site has potential to be constructed at the same time as the Proposed Development. The planning conditions for SD19A/0222, Condition 11 requires that the applicant or developer shall comply with S.I. No. 140/2006 – Environmental Noise Regulations 2006 and BS 5228:2009 Noise and Vibration Control on Construction and Open Sites, and have regard to the World Health Organisation (WHO) – Guidelines for Community Noise. Condition 11 also requires that no equipment or machinery that could give rise to unacceptable levels of noise pollution shall be operated on the site before the hours of 07:00 on weekdays, and 09:00 on Saturdays, nor after 19:00 hours on weekdays and 13:00 hours on Saturdays, nor at any time on Sundays, Bank Holidays or Public Holidays.

Once the site complies with planning conditions in this regard, significant cumulative effects are not considered likely.

Operational Noise

The Proposed Development is predicted to have an imperceptible impact at the residential locations assessed. The potential for cumulative impact with the adjacent permitted development which has been granted but not yet constructed, is considered here. The planning conditions for SD19A/0222, Condition 9 states.

> *(a) Noise due to the normal operation of the Proposed Development, expressed as Laeq over 15 minutes at the façade of any noise sensitive location, shall not exceed the daytime background level i.e. 0700-1900 by more than 10 dB(A) and shall not exceed the background level for evening and night time (currently 19:00 - 07:00) as determined in S.I. No. 140/2006 - Environmental Noise Regulations 2006 . Clearly audible and impulsive tones at noise sensitive locations during evening and night as determined in S.I. No. 140/2006 - Environmental Noise Regulations 2006 shall be avoided irrespective of the noise level.*
>
> *(b) Noise levels from the Proposed Development shall not be so loud, so continuous, so repeated, of such duration or pitch or occurring at such times as to give reasonable cause for annoyance to a person in any residence, adjoining premises or public place in the vicinity.*

c) All mechanical plant and ventilation inlets and outlets should be sound insulated and/or fitted with sound attenuators as necessary to ensure that the noise level as expressed as LAeq over 15 minutes at 1 meter from the facade of any noise sensitive location does not exceed the background level by more than 10 dB(A) for daytime and shall not exceed the background level for evening and night time (currently 19:00 - 07:00) as determined in S.I. No. 140/2006 - Environmental Noise Regulations 2006.

Similarly, once the site complies with planning conditions in this regard, significant cumulative effects are not considered likely. It is emphasised that the nearest residential noise-sensitive locations (R15) is at a distance of over 300 m from the permitted development. There are a number of other existing commercial buildings providing acoustic screening between the development and the NSLs.

As Proposed Development is predicted to have an imperceptible impact on residential and commercial receptors identified in Figure 3, and as the adjacent project includes conditions to limit noise levels during operation, there is therefore no likelihood of significant cumulative effects on residential receptors.

9.0 CONCLUSION

The construction noise assessment has shown that in accordance with the 'significance' thresholds presented in the *British Standard BS 5228 – 1: 2009+A1:2014: Code of practice for noise and vibration control on construction and open sites – Noise* impacts during construction will be moderate to major at residential locations and will be controlled to operate within the relevant noise criteria.

The robust operational noise assessment of fixed plant associated with the proposed development has shown that the predicted change in background noise level is in the order of 2 to 3dB during the quietest night-time periods resulting in a not significant to slight noise impact. Ambient noise levels are and will continue to be dictated by road traffic noise in the area while a low level of plant noise is expected to be audible during lulls in other sources (e.g. distant traffic noise).

The operational noise assessment of vehicle movements associated with the site has shown that in accordance with the scale in the '*Guidelines on the Information to be contained in Environmental Impact Statements*' there will be an imperceptible impact off site noise sensitive locations considering existing traffic volumes on the local road network.

10.0 REFERENCES

- EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports, (2022);
- EPA Advice Notes for Preparing Environmental Impact Statements, (Draft, September 2015);
- Institute of Environmental Management and Assessment (IEMA) Guidelines for Environmental Noise Impact Assessment (2014);
- Environmental Protection Agencies Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) (2016);
- BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1 – Noise (2014);
- BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2 – Vibration (2014);
- BS 7385-2:1993 Evaluation and measurement for vibration in buildings. Guide to damage levels from groundborne vibration (1993);
- BS 6472: Guide to Evaluation of human exposure to vibration in buildings (1Hz to 80Hz) (1992);
- ISO 9613: Acoustics – Attenuation of sound outdoors – Part 2: General method of calculation. (1996);
- BS 4142: 2014+A1:2019: Methods for Rating and Assessing Industrial and Commercial Sound (2019);
- Design Manual for Roads and Bridges LA 111 Sustainability & Environmental Appraisal. Noise and Vibration Rev 2, Highways England (2020);
- ISO 1996-2:2017 Acoustics - Description, measurement and assessment of environmental noise – Part 2: Determination of environmental noise levels (2017);
- Transport Infrastructure Ireland Guidelines for the Treatment of Noise and Vibration in National Road Schemes (2014);
- Calculation of Road Traffic Noise (CRTN) issued by the Department of Transport in 1988.

APPENDIX A
GLOSSARY OF ACOUSTIC TERMINOLOGY

ambient noise — The totally encompassing sound in a given situation at a given time, usually composed of sound from many sources, near and far.

background noise — The steady existing noise level present without contribution from any intermittent sources. The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90 per cent of a given time interval, T ($L_{AF90,T}$).

broadband — Sounds that contain energy distributed across a wide range of frequencies.

dB — Decibel - The scale in which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the RMS pressure of the sound field and the reference pressure of 20 micro-pascals (20 μPa).

dB L_{pA} — An 'A-weighted decibel' - a measure of the overall noise level of sound across the audible frequency range (20 Hz – 20 kHz) with A-frequency weighting (i.e. 'A'–weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.

Hertz (Hz) — The unit of sound frequency in cycles per second.

$L_{Aeq,T}$ — This is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period (T). The closer the L_{Aeq} value is to either the L_{AF10} or L_{AF90} value indicates the relative impact of the intermittent sources and their contribution. The relative spread between the values determines the impact of intermittent sources such as traffic on the background.

L_{AFN} — The A-weighted noise level exceeded for N% of the sampling interval. Measured using the "Fast" time weighting.

L_{AFmax} — is the instantaneous slow time weighted maximum sound level measured during the sample period (usually referred to in relation to construction noise levels).

$L_{Ar,T}$ — The Rated Noise Level, equal to the L_{Aeq} during a specified time interval (T), plus specified adjustments for tonal character and impulsiveness of the sound.

L_{AF90} — Refers to those A-weighted noise levels in the lower 90 percentile of the sampling interval; it is the level which is exceeded for 90% of the measurement period. It will therefore exclude the intermittent features of traffic and is used to estimate a background level. Measured using the "Fast" time weighting.

L_{AT}(DW) — equivalent continuous downwind sound pressure level.

L_{fT}(DW) — equivalent continuous downwind octave-band sound pressure level.

L_{day} — L_{day} is the average noise level during the day time period of 07:00hrs to 19:00hrs

L_{night} — L_{night} is the average noise level during the night-time period of 23:00hrs to 07:00hrs.

low frequency noise — LFN - noise which is dominated by frequency components towards the lower end of the frequency spectrum.

noise sensitive location — NSL – Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.

octave band — A frequency interval, the upper limit of which is twice that of the lower limit. For example, the 1,000Hz octave band contains acoustical energy between 707Hz and 1,414Hz. The centre frequencies used for the designation of octave bands are defined in ISO and ANSI standards.

rating level — See $L_{Ar,T}$.

sound power level — The logarithmic measure of sound power in comparison to a referenced sound intensity level of one picowatt (1pW) per m^2 where:

$$Lw = 10Log\frac{P}{P_0}\ \text{dB}$$

Where: p is the rms value of sound power in pascals; and
P_0 is 1 pW.

sound pressure level — The sound pressure level at a point is defined as:

$$Lp = 20Log\frac{P}{P_0}\ \text{dB}$$

specific noise level — A component of the ambient noise which can be specifically identified by acoustical means and may be associated with a specific source. In BS 4142, there is a more precise definition as follows: 'the equivalent continuous A-weighted sound pressure level at the assessment position produced by the specific noise source over a given reference time interval ($L_{Aeq,T}$)'.

tonal — Sounds which cover a range of only a few Hz which contains a clearly audible tone i.e. distinguishable, discrete or continuous noise (whine, hiss, screech, or hum etc.) are referred to as being 'tonal'.

1/3 octave analysis — Frequency analysis of sound such that the frequency spectrum is subdivided into bands of one–third of an octave each

APPENDIX B
NOISE MODELLING DETAILS & ASSUMPTIONS

Noise Model

A 3D computer-based prediction model has been prepared in order to quantify the noise level associated with the proposed building. This section discusses the methodology behind the noise modelling process.

DGMR iNoise

Proprietary noise calculation software has been used for the purposes of this modelling exercise. The selected software, DGMR iNoise, calculates noise levels in accordance with ISO 9613: 1996 *Acoustics – Attenuation of sound during propagation outdoors, Part 2: General method of calculation.*

DGMR iNoise is a proprietary noise calculation package for computing noise levels in the vicinity of noise sources. iNoise calculates noise levels in different ways depending on the selected prediction standard. In general, however, the resultant noise level is calculated taking into account a range of factors affecting the propagation of sound, including:

- the magnitude of the noise source in terms of A weighted sound power levels (L_{WA});
- the distance between the source and receiver;
- the presence of obstacles such as screens or barriers in the propagation path;
- the presence of reflecting surfaces;
- the hardness of the ground between the source and receiver;
- Attenuation due to atmospheric absorption; and
- Meteorological effects such as wind gradient, temperature gradient and humidity (these have significant impact at distances greater than approximately 400m).

Brief Description of ISO9613-2: 1996

ISO9613-2:1996 calculates the noise level based on each of the factors discussed previously. However, the effect of meteorological conditions is significantly simplified by calculating the average downwind sound pressure level, $L_{AT}(DW)$, for the following conditions:

- wind direction at an angle of ±45° to the direction connecting the centre of the dominant sound source and the centre of the specified receiver region with the wind blowing from source to receiver, and;
- wind speed between approximately $1ms^{-1}$ and $5ms^{-1}$, measured at a height of 3m to 11m above the ground.

The equations and calculations also hold for average propagation under a well-developed moderate ground based temperature inversion, such as commonly occurs on clear calm nights. The basic formula for calculating $L_{AT}(DW)$ from any point source at any receiver location is given by:

$$L_{fT}(DW) = LW + Dc - A \qquad \textbf{Eqn. A}$$

Where:

$L_{fT}(DW)$ is an octave band centre frequency component of $L_{AT}(DW)$ in dB relative to $2x10^{-5}Pa$;
L_W is the octave band sound power of the point source;
D_c is the directivity correction for the point source;
A is the octave band attenuation that occurs during propagation, namely attenuation due to geometric divergence, atmospheric absorption, ground effect, barriers and miscellaneous other effects.

The estimated accuracy associated with this methodology is shown in Table B1 below:

Height, h*	Distance, d†	
	0 < d < 100m	100m < d < 1,000m
0<h<5m	±3dB	±3dB
5m<h<30m	±1dB	±3dB

Table B1 Estimated Accuracy for Broadband Noise of L_{AT}(DW)

* h is the mean height of the source and receiver. † d is the mean distance between the source and receiver.
N.B. These estimates have been made from situations where there are no effects due to reflections or attenuation due to screening.

Input Data and Assumptions

The noise model has been constructed using data from various source as follows:

Site Layout The general site layout has been obtained from the drawings forwarded by the project architects.

Local Area The location of noise sensitive locations has been obtained from a combination of site drawings provided by the project architects and others obtained from Ordinance Survey Ireland (OSI).

Heights The heights of buildings on site have been obtained from site drawings forwarded by the project architects. Off-site buildings have been assumed to be 6 m high with the exception of industrial buildings where a default height of 10 m has been assumed.

Contours In this instance the ground within the noise model is assumed to be flat.

The final critical aspect of the noise model development is the inclusion of the various plant noise sources. Details are presented in the following section.

Source Sound Power Data

The noise modelling competed indicates the following data in relation to various items of plant associated with the overall site development. Plant items will be selected in order to achieve the stated noise levels and or appropriate attenuation will be incorporated into the design of the plant/building in order that the plant noise emission levels are achieved on site (including any system regenerated noise).

The following sources have been modelled for data repository facility building:

- 12 no. cooling condenser units;
- 1 no. electrical room condenser units;
- 1 no. AHU located internally with inlet on north façade of building, and
- 1 no. backup generator.

Table B2 lists the sound power data modelled for each of the items listed above.

Source	L_w - Octave Band Centre Frequency								dB (A)
	63	125	250	500	1k	2k	4k	8k	
Condensers	77	80	76	76	77	73	68	64	81
Electrical Room Condenser	69	64	64	62	57	52	46	40	63
AHU Inlet	64	68	69	69	60	56	53	53	68
Generator Inlet	104	98	88	76	59	61	58	82	87
Generator Outlet	99	97	86	72	67	67	65	83	86
Generator Wall	102	102	94	82	71	66	56	61	89
Generator Roof	102	102	94	82	71	66	56	61	89
Generator Stack	87	92	88	84	83	83	82	75	90

Table B2 L_w levels Utilised in Noise Model

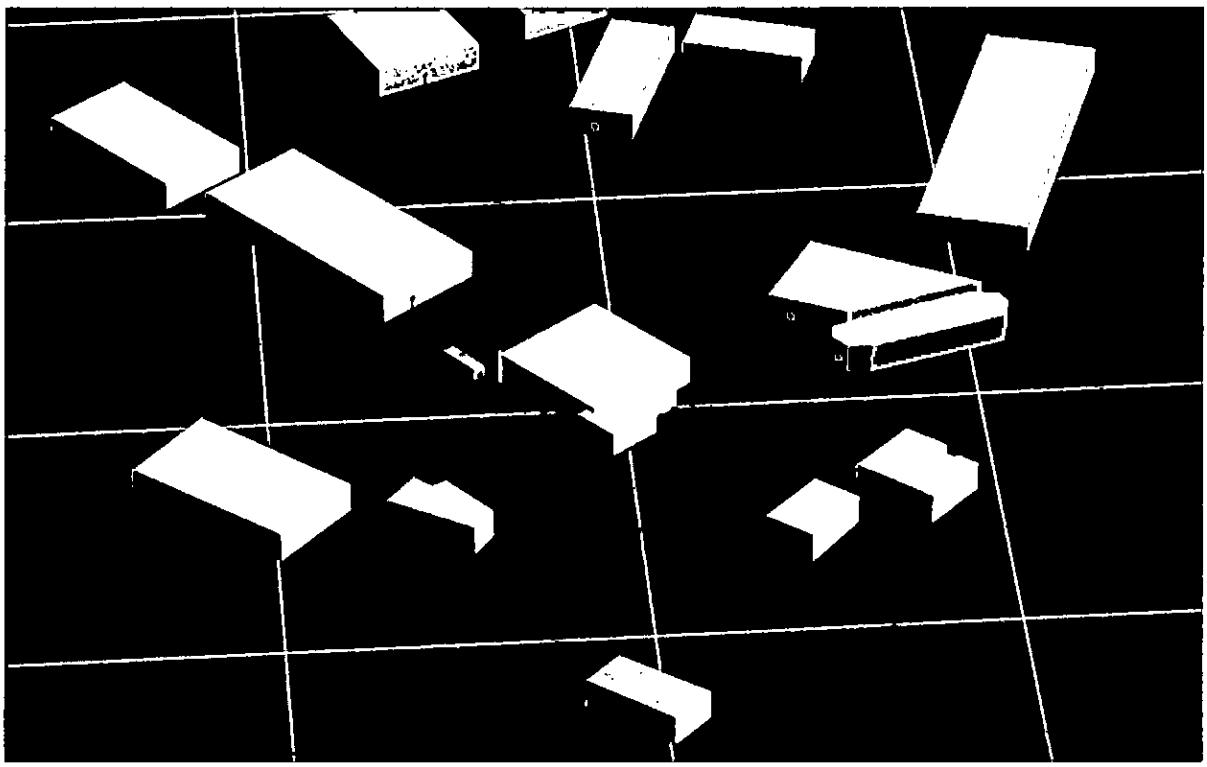


Figure B1 3D representation of noise model of site viewed from northwest

APPENDIX C
NOISE CONTOUR PLOTS

The calculated noise contour plots for each of the modelled scenarios are illustrated in Figures C1 and C2. The contours plots are calculated to a height of 4.0m above ground representing the height of a typical first-floor window in a residential noise-sensitive location

Figure C1 Noise contours for Scenario A – Day to Day operation

Figure C2 Noise contours for Scenario B - Emergency Operation and Scenario C - Generator Testing

Appendix D - Air Quality and Climate Impact Assessment

awnconsulting

The Tecpro Building,
Clonshaugh Business & Technology Park,
Dublin 17, Ireland.

T: + 353 1 847 4220
F: + 353 1 847 4257
E: info@awnconsulting.com
W: www.awnconsulting.com

AIR AND CLIMATE IMPACT ASSESSMENT FOR A PROPOSED DATA REPOSITORY FACILITY, UNIT 1 M50 BUSINESS PARK, BALLYMOUNT, DUBLIN 12

Technical Report Prepared For

Creighton Properties LLC

Prepared By

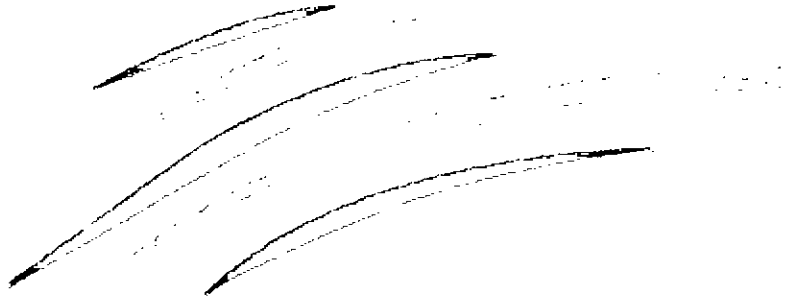
Dr. Edward Porter, Director (Air Quality)

Our Reference

EP/227501.0378AR01

Date of Issue

13 December 2022



Document History

Document Reference		Original Issue Date	
EP/227501.0378AR01		13 December 2022	
Revision Level	Revision Date	Description	Sections Affected

Record of Approval

Details	Written by	Approved by
Signature		
Name	Dr. Edward Porter	Ciara Nolan
Title	Director (Air Quality)	Senior Air Quality Consultant
Date	13 December 2022	13 December 2022

EXECUTIVE SUMMARY

This report presents the assessment of air quality and climate impacts for a proposed data repository facility (the "Proposed Development") at Unit 1, M50 Business Park, Ballymount, Dublin 12.

The installation requires a continuous supply of electricity to operate. During normal operations, the facility is supplied electricity from the national grid. Outside of normal operations, the facility is supplied electricity by the onsite backup generator. Outside of routine testing and maintenance, the operation of this back-up generator is typically only required under the following emergency circumstances:

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

The air dispersion modelling has been carried out using the United States Environmental Protection Agency's regulated model AERMOD. The AERMOD model has USEPA regulatory status and is one of the advanced models recommended within the air modelling guidance document 'Air Dispersion Modelling from Industrial Installations Guidance Note (AG4)' published by the EPA in Ireland. The modelling of air emissions is carried out to assess concentrations of nitrogen dioxide (NO_2) at a variety of locations beyond the site boundary.

The assessment has determined the ambient air quality impact of the site and any air quality constraints that may be present. The diesel generator will be used solely for emergency operation (i.e. less than 500 hours per year) and thus the emission limit values outlined in the Medium Combustion Plant Directive are not applicable to the diesel generator on site.

A number of modelling scenarios are investigated for the purposes of this assessment. Both normal day-to-day testing operations are considered as well as emergency operations. Normal testing operations involve the diesel generator operating for up to 30 minutes on a weekly basis at 25% load. Quarterly maintenance testing of the generator at 90% for 1-hour was also included in the modelling assessment. Emergency operation is based on 72 emergency hours modelled according to the USEPA methodology.

Assessment of The Facility

The assessment was carried out the determine the ambient air quality impact of the site. As the diesel generator will be used solely for emergency operation (i.e. less than 500 hours per year) thus the emission limit values outlined in the Medium Combustion Plant Directive are not applicable to the diesel generator on site.

The NO_2 modelling results at the worst-case location at and beyond the site boundary are based on the operation of the back-up diesel generations for 72 hours per year using the USEPA methodology outlined within the guidance document titled '*Additional Clarification Regarding Application of Appendix W Modelling Guidance for the 1-Hour National Ambient Air Quality Standard*' as well as considering scheduled weekly testing and quarterly maintenance testing of the back-up generator from the installation.

The results indicate that the ambient ground level concentrations are in compliance with the relevant air quality standards for NO_2. For the worst-case year, emissions from the site lead to an ambient NO_2 concentration (including background) which is 36% of the maximum ambient 1-hour limit value (measured as a 99.8th percentile) and 45% of the annual limit value at the worst-case off-site receptor.

The UK EA assessment methodology determined that in any year, the diesel generator can run for 8760 hours before there is a likelihood of an exceedance at the nearest residential receptor (at a 98th percentile confidence level).

Conclusion

In summary, emissions to atmosphere of NO_2, as the main polluting substance (as defined in the Schedule of EPA (Industrial Emissions) (Licensing) Regulations 2013, S.I. No. 137 of 2013) from the standby generator, 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.

In terms of impacts at nearby ecologically sensitive areas, the closest sensitive ecological area is the Grand Canal Proposed Natural Heritage Area (pNHA) (site code 002104) which is located c. 1.3 km north of the subject site. Dispersion modelling of NO_X emissions from the installation at this distance is not required as there is no potential for significant impacts to vegetation as a result of emissions from the installation at such a distance. Emissions from the back-up generator on site peak at the site boundary and fall off rapidly with increasing distance from the installation.

Once the mitigation measures outlined in this report are implemented, the residual impacts on air quality or climate from the construction of the proposed development will be ***short-term*** and ***imperceptible*** and for the operational phases of the proposed development will be ***long-term, negative*** and ranging from ***imperceptible*** to ***slight***.

In relation to cumulative impacts, given the distance from the proposed development to nearby facilities and given that the operational impact of emissions from the proposed development will be ***long-term***, ***localised***, ***negative*** and ***slight***, no significant cumulative impacts will occur.

CONTENTS

1.0 INTRODUCTION

This report presents the assessment of air quality and climate impacts for a proposed data repository facility (the "Proposed Development") at Unit 1, M50 Business Park, Ballymount, Dublin 12.

The installation requires a continuous supply of electricity to operate. During normal operations, the facility is supplied electricity from the national grid. Outside of normal operations, the facility is supplied electricity by the onsite backup generator. Outside of routine testing and maintenance, the operation of this back-up generator is typically only required under the following emergency circumstances:

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

The air dispersion modelling has been carried out using the United States Environmental Protection Agency's regulated model AERMOD. The AERMOD model has USEPA regulatory status and is one of the advanced models recommended within the air modelling guidance document 'Air Dispersion Modelling from Industrial Installations Guidance Note (AG4)' published by the EPA in Ireland. The modelling of air emissions is carried out to assess concentrations of nitrogen dioxide (NO_2) at a variety of locations beyond the site boundary.

The assessment has determined the ambient air quality impact of the site and any air quality constraints that may be present. The diesel generator will be used solely for emergency operation (i.e. less than 500 hours per year) and thus the emission limit values outlined in the Medium Combustion Plant Directive are not applicable to the diesel generator on site.

A number of modelling scenarios are investigated for the purposes of this assessment. Both normal day-to-day testing operations are considered as well as emergency operations. Normal testing operations involve the diesel generator operating for 30 minutes on a weekly basis at 25% load. Quarterly maintenance testing of the generator at 90% for 1-hour was also included in the modelling assessment. Emergency operation is based on 72 emergency hours modelled according to the USEPA.

2.0 ASSESSMENT CRITERIA

2.1 Ambient Air Quality Standards

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. These limit values or "Air Quality Standards" are health or environmental-based levels for which additional factors may be considered. The applicable standards in Ireland include the Air Quality Standards Regulations 2011, implement the obligations under Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe (see Table 1). The ambient air quality standards applicable for NO_2 are outlined in this Directive. Directive 2008/50/EC has also set limit values for other pollutants including SO_2. Levels of SO_2 emitted from the installation will be insignificant and have been screened out of the assessment.

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The standards outlined in Table 1 have been used in the current assessment to determine the potential impact of NO_2 emissions from the installation on ambient air quality.

Table 1 *Ambient Air Quality Standards*

Pollutant	Regulation [Note 1]	Limit Type	Value
Nitrogen Dioxide (NO_2)	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 µg/m^3
		Annual limit for protection of human health	40 µg/m^3
Nitrogen Oxides (NO_x)	2008/50/EC	Critical level for protection of vegetation (Annual)	30 µg/m^3 NO + NO_2
Sulphur Dioxide (SO_2)	2008/50/EC	Critical level for protection of vegetation (Annual & Winter)	20 µg/m^3 SO_2

Note 1 EU 2008/50/EC – Clean Air For Europe (CAFÉ) Directive replaces the previous Air Framework Directive (1996/30/EC) and daughter directives 1999/30/EC and 2000/69/EC

2.2 Industrial Emissions Directive and Medium Combustion Plant Directive

The Industrial Emissions Directive (IED) (Directive 2010/75/EU) was adopted on 7 January 2013 and is the key European Directive which covers the regulation of the majority of processes in the EU. As part of the IED Article 15, paragraph 2, requires that Emissions Limit Values (ELVs) are based on best available techniques (BAT) and the relevant sector Reference Document of Best Available Techniques (BREF documents).

The most relevant BAT sector document for the activities at the installation is the Best Available Techniques (BAT) Reference Document for Large Combustion Plants LCP. There are no ELVs set out in the LCP BAT that are applicable to the individual emergency back-up generators.

The emergency back-up generator is 1.3 MW_{th}, therefore the Medium Combustion Plant (MCP) Regulations (S.I No. 595 of 2017), which transposed the Medium Combustion Plant Directive ((EU) 2015/2193) is a relevant consideration in respect of the individual plant.

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

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

The diesel generator is for emergency back-up only and is not anticipated to operate in excess of 500 hours per annum. Therefore, the emergency generator as proposed

is exempt from complying with the relevant ELVs set out in the MCP Directive subject to Section 13(3) of the Medium Combustion Plant (MCP) Regulations.

The UK Environment Agency assessment methodology in Section 6.2 below determined that the standby generator could operate for 8760 hours before there is a likelihood of an exceedance of the ambient air quality standard (at a 98th percentile confidence level). However, the UK guidance recommends that there should be no running time restrictions placed on standby generators which provide power on site only during an emergency power outage.

2.3 Sensitive areas or areas of special interest

The AA Screening identifies that the lands in which the installation is located have no formal designations, and that the nearest European site to the Installation is the Glenasmole Valley SAC (Site Code 001209) located 6 km to the south.

Emissions of NO_X have the potential to impact vegetation and sensitive plant species. Directive 2008/50/EC has set limit values for vegetation effects as per Table 1. As such it is typical to assess the impact of NO_X emissions from a facility on any nearby sensitive ecological areas in close proximity to the site. There are no European sites within 1 km of the subject site as noted above. The closest sensitive ecological area is the Grand Canal Proposed Natural Heritage Area (pNHA) (site code 002104) which is located c. 1.3 km north of the subject site. Dispersion modelling of NO_X emissions from the installation at this distance is not required as there is no potential for significant impacts to vegetation as a result of emissions from the installation at such a distance. Emissions from the back-up generator on site peak at the site boundary and fall off rapidly with increasing distance from the installation.

2.4 Dust Deposition Guidelines

The concern from a health perspective is focused on particles of dust which are less than 10 microns and the EU ambient air quality standards have set ambient air quality limit values for PM_{10} and $PM_{2.5}$.

With regard to larger dust particles that can give rise to nuisance dust, there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development in Ireland.

With regard to dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission level for dust deposition of 350 mg/(m^2*day) averaged over a one year period at any receptors outside the site boundary. The TA-Luft standard has been applied for the purpose of this assessment based on recommendations from the EPA in Ireland in the document titled 'Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals)[20]. The document recommends that the Bergerhoff limit of 350 mg/(m^2*day) be applied to the site boundary of quarries. This limit value can be implemented with regard to dust impacts from construction of the proposed development.

2.5 Gothenburg Protocol

In 1999, Ireland signed the Gothenburg Protocol to the 1979 UN Convention on Long Range Transboundary Air Pollution. In 2012, the Gothenburg Protocol was revised to include national emission reduction commitments for the main air pollutants to be achieved in 2020 and beyond and to include emission reduction commitments for

$PM_{2.5}$. In relation to Ireland, 2020 emission targets are 25 kt for SO_2 (65% below 2005 levels), 65 kt for NO_X (49% reduction), 43 kt for VOCs (25% reduction), 108 kt for NH_3 (1% reduction) and 10 kt for $PM_{2.5}$ (18% reduction).

European Commission Directive 2001/81/EC and the National Emissions Ceiling Directive (NECD), prescribes the same emission limits as the 1999 Gothenburg Protocol. A National EPA Programme for the progressive reduction of emissions of these four transboundary pollutants has been in place since April 2005. The data available from the EPA in 2021 indicated that Ireland complied with the emissions ceiling for SO_2 in recent years but failed to comply with the ceilings for NH_3, NO_X and NMVOCs. Directive (EU) 2016/2284 "On the Reduction of National Emissions of Certain Atmospheric Pollutants and Amending Directive 2003/35/EC and Repealing Directive 2001/81/EC" was published in December 2016. The Directive will apply the 2010 NECD limits until 2020 and establish new national emission reduction commitments which will be applicable from 2020 and 2030 for SO_2, NO_X, NMVOC, NH_3, $PM_{2.5}$ and CH_4. In relation to Ireland, 2020-29 emission targets are 25 kt for SO_2 (65% on 2005 levels), 65 kt for NO_X (49% reduction on 2005 levels), 43 kt for VOCs (25% reduction on 2005 levels), 108 kt for NH_3 (1% reduction on 2005 levels) and 10 kt for $PM_{2.5}$ (18% reduction on 2005 levels). In relation to 2030, Ireland's emission targets are 10.9 kt (85% below 2005 levels) for SO_2, 40.7 kt (69% reduction) for NO_X, 51.6 kt (32% reduction) for NMVOCs, 107.5 kt (5% reduction) for NH_3 and 11.2 kt (41% reduction) for $PM_{2.5}$.

2.6 Climate Agreements

Ireland is party to both the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. The Paris Agreement, which entered into force in 2016, is an important milestone in terms of international climate change agreements and includes an aim of limiting global temperature increases to no more than 2°C above pre-industrial levels with efforts to limit this rise to 1.5°C. The aim is to limit global GHG emissions to 40 gigatonnes as soon as possible whilst acknowledging that peaking of GHG emissions will take longer for developing countries. Contributions to GHG emissions will be based on Intended Nationally Determined Contributions (INDCs) which will form the foundation for climate action post 2020. Significant progress was also made in the Paris Agreement on elevating adaption onto the same level as action to cut and curb emissions.

In order to meet the commitments under the Paris Agreement, the EU enacted *Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013* (the Regulation). The Regulation aims to deliver, collectively by the EU in the most cost-effective manner possible, reductions in GHG emissions from the Emission Trading Scheme (ETS) and non-ETS sectors amounting to 43% and 30%, respectively, by 2030 compared to 2005. Ireland's obligation under the Regulation is a 30% reduction in non-ETS greenhouse gas emissions by 2030 relative to its 2005 levels.

Following on from the recently published European Climate Law[21], and as part of the EU's "*Fit for 55*" legislative package where the EU has recently committed to a domestic reduction of net greenhouse gas emissions by at least 55% compared to 1990 levels by 2020, the Effort Sharing Regulation is proposed to be strengthened with increased ambition by the year 2030. The proposal for Ireland is to increase the GHG emission reduction target from 30% to 42% relative to 2005 levels whilst the ETS market will also have more stringent reductions from the currently proposed reduction of 43% by 2030 compared to 2005 to a 61% reduction by 2030 based on annual

reductions of 4.2% compared to the previous annual reduction level of 2.2% per year (EU, 2021). In terms of the current operation of the ETS, the European Commission reported that the ETS Carbon Market reported a fall of 9% in emissions in 2019 relative to 2018 levels.

- The ETS is an EU-wide scheme which regulates the GHG emissions of larger industrial emitters including electricity generation, cement manufacturing, heavy industry and facilities which have greater than 20MW thermal input capacity (which is applicable to the Proposed Development). Under the ETS scheme, there are no country-specific targets. The non-ETS sector includes all domestic GHG emitters which do not fall under the ETS scheme and thus includes GHG emissions from transport, residential and commercial buildings and agriculture. In contrast to the ETS scheme, Ireland has a country-specific obligation under the Regulation of a 42% reduction in non-ETS GHG emissions by 2030 relative to its 2005 levels.
- In 2015, the Climate Action and Low Carbon Development Act 2015 (No. 46 of 2015) (Government of Ireland, 2015) was enacted (the 2015 Act). The purpose of the Act was to enable Ireland 'to pursue, and achieve, the transition to a low carbon, climate resilient and environmentally sustainable economy by the end of the year 2050' (3.(1) of No. 46 of 2015). This is referred to in the Act as the 'national transition objective'.
- The 2019 *Climate Action Plan* (CAP)[22], published in June 2019, outlined the current status across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and outlined the various broadscale measures required for each sector to achieve ambitious decarbonisation targets. The 2019 CAP also detailed the required governance arrangements for implementation including carbon-proofing of policies, establishment of carbon budgets, a strengthened Climate Change Advisory Council and greater accountability to the Oireachtas. The 2019 CAP set a built environment sector reduction target of 40 - 45% relative to 2030 pre-NDP (National Development Plan) projections.
- In June 2020, the Government published the Programme for Government – Our Shared Future[23]. In relation to climate, there is a commitment to an average 7% per annum reduction in overall greenhouse gas emissions from 2021 to 2030 (51% reduction over the decade) with an ultimate aim to achieve net zero emissions by 2050. Policy changes include the acceleration of the electrification of the transport system, including electric bikes, electric vehicles and electric public transport, alongside a ban on new registrations of petrol and diesel cars from 2030. In addition, there is a policy to ensure an unprecedented model shift in all areas by a reorientation of investment to walking, cycling and public transport.

The Climate Action and Low Carbon Development (Amendment) Act 2021 (the 2021 Climate Act) (No. 32 of 2021) was published in July 2021. The purpose of the 2021 Climate Act is to provide for the approval of plans *'for the purpose of pursuing the transition to a climate resilient, biodiversity rich and climate neutral economy by no later than the end of the year 2050'*. The 2021 Climate Act will also *'provide for carbon budgets and a sectoral emissions ceiling to apply to different sectors of the economy'*. The 2021 Climate Act removes any reference to a national mitigation plan and instead refers to both the Climate Action Plan, as published in 2019, and a series of National Long Term Climate Action Strategies. In addition, the Environment Minister shall request each local authority to make a 'local authority climate action plan' lasting five years and to specify the mitigation measures and the adaptation measures to be adopted by the local authority. The Act has set a target of a 51% reduction in the total amount of greenhouse gases over the course of the first two carbon periods ending 31

December 2030 relative to 2018 annual emissions. The 2021 Climate Act defines the carbon budget as 'the total amount of greenhouse gas emissions that are permitted during the budget period'

The Climate Action and Low Carbon Development (Amendment) Act 2021 (No. 32 of 2021) outlines a series of specific actions including:

- To make a strategy to be known as the 'National Long Term Climate Strategy' not less than once in every five-year period with the first to be published for the period 2021 to 2035 and with each subsequent Strategy covering the next three five-year carbon budgets and also include a longer term perspective of at least 30 years;
- To adopt a system of carbon budgets which will be determined as part of a grouping of three five-year periods calculated on an economy-wide basis, starting with the periods 2021 to 2025, 2026 to 2030, and 2031 to 2035;
- To introduce a requirement for Government to adopt "sectoral emission ceilings" for each relevant sector within the limits of each carbon budget;
- To request all local authorities to prepare climate action plans for the purpose of contributing to the national climate objective. These plans should contain mitigation and adaptation measures that the local authority intends to adopt;
- Increasing the power of the Advisory Council to recommend the appropriate climate budget and policies;
- Requiring the Minister to set out a roadmap of actions to include sector specific actions that are required to comply with the carbon budget and sectoral emissions ceiling for the period to which the plan relates; and
- Reporting progress with the CAP on an annual basis with progress including policies, mitigation measures and adaptation measures that have been adopted.

In terms of wider energy policy, as outlined in the EPA publication "*Ireland's Greenhouse Gas Projections 2021-2040*"[24] under the *With Additional Measures* scenario, emissions from the energy industries sector are projected to decrease by 48.9% to 4.5 Mt CO_{2eq} over the period 2020 to 2030 including the proposed increase in renewable energy generation to approximately 80% of electricity consumption:

- In this scenario it is estimated that renewable energy generation increases to approximately 80% of electricity consumption. This is mainly a result of further expansion in wind energy (comprising 5.0 GW offshore). Expansion of other renewables (e.g. solar photovoltaics) also occurs under this scenario.
- Under the *With Additional Measures*, one power station operates to the end of 2023 with 30% co-firing.
- In this scenario the Moneypoint power station is assumed to operate in the market up to end 2025 at which point it no longer generates electricity from coal.
- In terms of inter-connection, it is assumed that the Greenlink 500MW interconnector to the UK to come on stream in 2025 and the Celtic 700MW interconnector to France to come on stream in 2027[24].
- The 2021 *Climate Action Plan* (CAP)[25] provides a detailed plan for taking decisive action to achieve a 51% reduction in overall greenhouse gas emissions by 2030 and setting us on a path to reach net-zero emissions by no later than 2050, as committed to in the Programme for Government and set out in the Climate Act 2021. The plan outlines the current status across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and outlined the various broadscale measures required for each sector to achieve

ambitious decarbonisation targets. CAP 2021 also detailed the required governance arrangements for implementation including carbon-proofing of policies and establishment of sectoral emission ceilings and carbon budgets. The *CAP 2021* provides that emissions from industry sectors covered by the ETS are subject to EU-wide rather than national targets set out under EU Effort Sharing Decision. Box 2.1 states:

"emissions from electricity generation and large industry in the ETS are subject to EU-wide targets which require that emissions from these sectors be reduced by 43% by 2030, relative to 2005 levels".

- As part of the preparation of a 'local authority climate action plan', each local authority shall consult and co-operate with an adjoining local authority in making a local authority climate action plan and co-ordinate the mitigation measures and adaptation measures to be adopted, where appropriate. Each local authority is also required to consider any significant effects the implementation of the local authority climate action plan may have on the adjoining local authority.

Individual county councils in Ireland have also published their own Climate Change Strategies which outline the specific climate objectives for that local authority and associated actions to achieve the objectives. The Fingal Climate Action Plan[26] outlines a number of goals and plans to prepare for and adapt to climate change. There are five key action areas within the FCC Climate Action Plan: energy and buildings, transport, flood resilience, nature-based solutions and resource management.

2.7 Climate Criteria For The Rating Of Impacts

The Institute of Environmental Management and Assessment (IEMA) guidance note on "*Assessing Greenhouse Gas Emissions and Evaluating their Significance*"[27] states that "*the crux of significance regarding impact on climate is not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050*". Mitigation has taken a leading role within the Guidance compared to the previous edition published in 2017. Early stakeholder engagement is key and therefore mitigation should be considered from the outset of the project and continue throughout the project's lifetime in order to maximise GHG emissions savings.

The assessment aims to quantify the difference in GHG emissions between the proposed project and the baseline scenario (the alternative project/solution in place of the proposed project). This is done by calculating the difference in whole life net GHG emissions between the two options. The IEMA EIA guidance[27] does not recommend a particular approach for this due to variations of situations but instead it sets out advice for the key common components necessary for undertaking a GHG emissions assessment. During the assessment IEMA recommend use of a reasonable worst-case scenario rather than an absolute worst-case scenario. The IEMA Guidance[27] states that a GHG emissions assessment should incorporate the following steps into any climate assessment:

1. Set the scope and boundaries of the GHG assessment;
2. Develop the baseline;
3. Decide upon the emissions calculation methodologies;
4. Data collection;
5. Calculate/determine the GHG emissions inventory; and

6. Consider mitigation opportunities and repeat steps 4 & 5.

Activities that do not significantly change the result of the assessment can be excluded where expected emissions are less than 1% of total emissions, and where all such exclusions should be clearly stated and total a maximum of 5% of total emissions.

When considering the cumulative assessment, all global cumulative GHG sources are relevant to the effect on climate change. As a result, the effects of GHG emissions from specific cumulative projects therefore in general should not be individually assessed. This is due to the fact that there is no basis for selecting any particular (or more than one) cumulative project that has GHG emissions for assessment over any other. The following section details the specific appraisal methods utilised in order to complete the assessment in accordance with the IEMA Guidance[27].

3.0 ASSESSMENT METHODOLOGY

Emissions from the facility are modelled using the AERMOD dispersion model (Version 21112) which has been developed by the U.S. Environmental Protection Agency (USEPA)[1] and following guidance issued by the EPA[2]. The model is a steady-state Gaussian plume model used to assess pollutant concentrations associated with industrial sources and has replaced ISCST3[4] as the regulatory model by the USEPA for modelling emissions from industrial sources in both flat and rolling terrain[5-7]. The model has more advanced algorithms and gives better agreement with monitoring data in extensive validation studies[8-11]. An overview of the AERMOD dispersion model is outlined in Appendix I.

The air dispersion modelling input data consisted of information on the physical environment (including building dimensions and terrain features), design details from all emission points on-site and five years of appropriate hourly meteorological data. Using this input data the model predicted ambient ground level concentrations beyond the site boundary for each hour of the modelled meteorological years. The model post-processed the data to identify the location and maximum of the worst-case ground level concentration. This worst-case concentration is then added to the background concentration to give the worst-case predicted environmental concentration (PEC). The PEC is then compared with the relevant ambient air quality standard to assess the significance of the releases from the site.

The modelling aims to achieve compliance with the guidance outlined within the EPA *AG4 Guidance for Air Dispersion Modelling*[2]. Throughout this study a worst-case approach was taken. This will most likely lead to an over-estimation of the levels that will arise in practice. The worst-case assumptions are outlined below:

- Maximum predicted concentrations are reported in this study, even if no residential receptors are near the location of this maximum;
- Conservative background concentrations are used in the assessment;
- The effects of building downwash, due to on-site buildings, are included in the model;
- Emergency operations were assumed to occur for a maximum of 72 hours per year calculated according to USEPA methodology, in reality the generator is likely to be used for maintenance and testing purposes only.

3.1 Air Dispersion Modelling Methodology

The United States Environmental Protection Agency (USEPA) approved AERMOD dispersion model has been used to predict the ground level concentrations (GLC) of compounds emitted from the principal emission sources on-site.

The modelling incorporated the following features:

- Two receptor grids are included at which concentrations are modelled. Receptors are mapped with sufficient resolution to ensure all localised "hot-spots" are identified without adding unduly to processing time. The receptor grids are based on Cartesian grids with the site at the centre. The outer grid measured 10 x 10 km with the site at the centre and with concentrations calculated at 200m intervals. The inner grid measured 1 x 1 km with the site at the centre and with concentrations calculated at 50m intervals. Boundary receptor locations were also placed along the boundary of the site, at 25m intervals, giving a total of 3,064 calculation points for the model. The impact of the diesel generator was also measured at nearby residential receptors which were added to the model as discrete receptors.
- Discrete receptors are also added to the model to represent nearby residential receptors. Receptors were modelled at a height of 1.5m to represent breathing height.
- All on-site buildings and significant process structures are mapped into the computer to create a three dimensional visualisation of the site and its emission points. Buildings and process structures can influence the passage of airflow over the emission stacks and draw plumes down towards the ground (termed building downwash). The stacks themselves can influence airflow in the same way as buildings by causing low pressure regions behind them (termed stack tip downwash). Both building and stack tip downwash are incorporated into the modelling.
- Detailed terrain has been mapped into the model using SRTM data with 30m resolution. The site is located in an area of complex terrain. All terrain features have been mapped in detail into the model using the terrain pre-processor AERMAP[12].
- Hourly-sequenced meteorological information has been used in the model. Meteorological data over a five year period (Casement Aerodrome 2017 – 2021) is used in the model (see Figure 1 and Appendix II).
- The source and emissions data, including stack dimensions, gas volumes and emission temperatures have been incorporated into the model.

3.2 Terrain

The AERMOD air dispersion model has a terrain pre-processor AERMAP[12] which is used to map the physical environment in detail over the receptor grid. The digital terrain input data used in the AERMAP pre-processor is obtained from SRTM. This data is run to obtain for each receptor point the terrain height and the terrain height scale. The terrain height scale is used in AERMOD to calculate the critical dividing streamline height, H_{crit}, for each receptor. The terrain height scale is derived from the Digital Elevation Model (DEM) files in AERMAP by computing the relief height of the DEM point relative to the height of the receptor and determining the slope. If the slope is less than 10%, the program goes to the next DEM point. If the slope is 10% or greater, the controlling hill height is updated if it is higher than the stored hill height.

In areas of complex terrain, AERMOD models the impact of terrain using the concept of the dividing streamline (H_c). As outlined in the AERMOD model formulation[1] a

plume embedded in the flow below H_c tends to remain horizontal; it might go around the hill or impact on it. A plume above H_c will ride over the hill. Associated with this is a tendency for the plume to be depressed toward the terrain surface, for the flow to speed up, and for vertical turbulent intensities to increase.

AERMOD model formulation states that the model "captures the effect of flow above and below the dividing streamline by weighting the plume concentration associated with two possible extreme states of the boundary layer (horizontal plume and terrain-following). The relative weighting of the two states depends on: 1) the degree of atmospheric stability; 2) the wind speed; and 3) the plume height relative to terrain. In stable conditions, the horizontal plume "dominates" and is given greater weight while in neutral and unstable conditions, the plume traveling over the terrain is more heavily weighted"[1].

3.3 Meteorological Data

The selection of the appropriate meteorological data has followed the guidance issued by the USEPA[1]. A primary requirement is that the data used should have a data capture of greater than 90% for all parameters. Casement Aerodrome meteorological station, which is located approximately 6 km west of the site, collects data in the correct format and has a data collection of greater than 90%. Long-term hourly observations at Casement Aerodrome meteorological station provide an indication of the prevailing wind conditions for the region (see Figure 2 and Appendix II)[13]. Results indicate that the prevailing wind direction is predominantly south-westerly in direction over the period 2017 – 2021. The mean wind speed is approximately 5.5 m/s over the period 2017 - 2021.

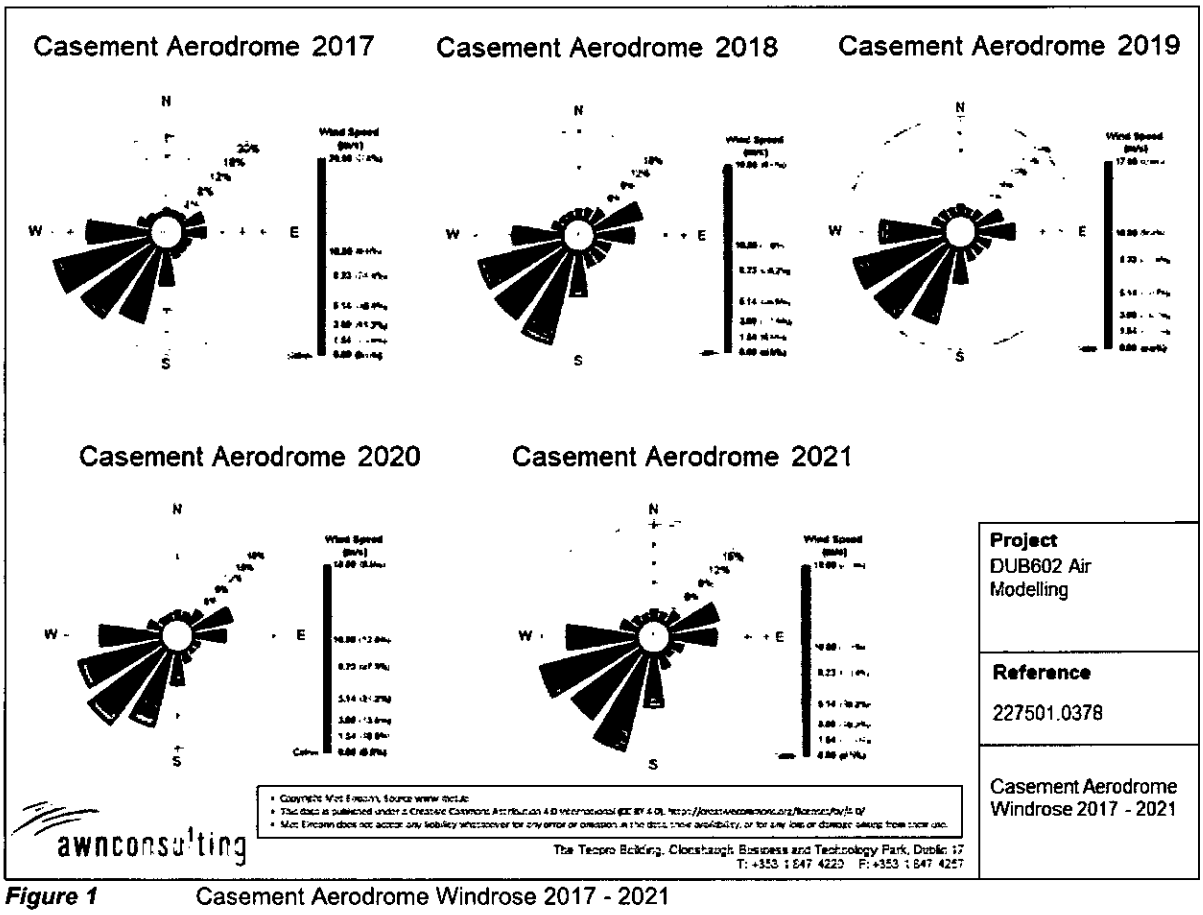


Figure 1 Casement Aerodrome Windrose 2017 - 2021

3.4 Geophysical Considerations

AERMOD simulates the dispersion process using planetary boundary layer (PBL) scaling theory[1]. PBL depth and the dispersion of pollutants within this layer are influenced by specific surface characteristics such as surface roughness, albedo and the availability of surface moisture. Surface roughness is a measure of the aerodynamic roughness of the surface and is related to the height of the roughness element. Albedo is a measure of the reflectivity of the surface whilst the Bowen ratio is a measure of the availability of surface moisture.

AERMOD incorporates a meteorological pre-processor AERMET[14] to enable the calculation of the appropriate parameters. The AERMET meteorological preprocessor requires the input of surface characteristics, including surface roughness (z_0), Bowen Ratio and albedo by sector and season, as well as hourly observations of wind speed, wind direction, cloud cover, and temperature. The values of albedo, Bowen Ratio and surface roughness depend on land-use type (e.g., urban, cultivated land etc) and vary with seasons and wind direction. The assessment of appropriate land-use type is carried out to a distance of 10km from the meteorological station for Bowen Ratio and albedo and to a distance of 1km for surface roughness in line with USEPA recommendations[14,15] as outlined in Appendix II.

In relation to AERMOD, detailed guidance for calculating the relevant surface parameters has been published[15]. The most pertinent features are:

- The surface characteristics should be those of the meteorological site (Casement Aerodrome) rather than the installation;
- Surface roughness should use a default 1km radius upwind of the meteorological tower and should be based on an inverse-distance weighted geometric mean. If land use varies around the site, the land use should be sub-divided by sectors with a minimum sector size of 30°;
- Bowen ratio and albedo should be based on a 10km grid. The Bowen ratio should be based on an un-weighted geometric mean. The albedo should be based on a simple un-weighted arithmetic mean.

AERMOD has an associated pre-processor, AERSURFACE[15] which has representative values for these parameters depending on land use type. The AERSURFACE pre-processor currently only accepts NLCD92 land use data which covers the USA. Thus, manual input of surface parameters is necessary when modelling in Ireland. Ordnance survey discovery maps (1:50,000) and digital maps such as those provided by the EPA, National Parks and Wildlife Service (NPWS) and Google Earth® are useful in determining the relevant land use in the region of the meteorological station. The Alaska Department of Environmental Conservation has issued a guidance note for the manual calculation of geometric mean for surface roughness and Bowen ratio for use in AERMET[16]. This approach has been applied to the current site with full details provided in Appendix II.

3.5 Building Downwash

When modelling emissions from an industrial installation, stacks which are relatively short can be subjected to additional turbulence due to the presence of nearby buildings. Buildings are considered nearby if they are within five times the lesser of the building height or maximum projected building width (but not greater than 800m).

The USEPA has defined the "Good Engineering Practice" (GEP) stack height as the building height plus 1.5 times the lesser of the building height or maximum projected

building width. It is generally considered unlikely that building downwash will occur when stacks are at or greater than GEP[17].

When stacks are less than this height, building downwash will tend to occur. As the wind approaches a building it is forced upwards and around the building leading to the formation of turbulent eddies. In the lee of the building these eddies will lead to downward mixing (reduced plume centreline and reduced plume rise) and the creation of a cavity zone (near wake) where re-circulation of the air can occur. Plumes released from short stacks may be entrained in this airflow leading to higher ground level concentrations than in the absence of the building.

The Plume Rise Model Enhancements (PRIME)[9,10] plume rise and building downwash algorithms, which calculates the impact of buildings on plume rise and dispersion, have been incorporated into AERMOD. The building input processor BPIP-PRIME produces the parameters which are required in order to run PRIME. The model takes into account the position of each stack relative to each relevant building and the projected shape of each building for 36 wind directions (at 10° intervals). The model determines the change in plume centreline location with downwind distance based on the slope of the mean streamlines and coupled to a numerical plume rise model[10].

Given that the stack is less than 2.5 times the lesser of the building height or maximum projected building width, building downwash was taken into account and the PRIME algorithm run prior to modelling with AERMOD. The dominant building for the stack will vary as a function of wind direction and relative building heights.

3.6 Construction Phase

The proposed development at the site will be constructed on a phased basis. For the purpose of the qualitative air quality assessment of the construction phase, the combined impact of concurrent construction at any one time at the site has been assumed.

The current assessment thus focused firstly on identifying the existing baseline levels of NO_2, PM_{10} and $PM_{2.5}$ in the region of the proposed development by an assessment of EPA monitoring data. Thereafter, the impact of the construction phase of the development on air quality was determined by a qualitative assessment of the nature and scale of dust generating construction activities associated with the proposed development.

The impact of the construction phase of the development on climate was determined by a qualitative assessment of the nature and scale of greenhouse gas generating construction activities associated with the proposed development.

4.0 BACKGROUND CONCENTRATIONS OF POLLUTANTS

Air quality monitoring programs have been undertaken in recent years by the EPA and Local Authorities[18,19]. The most recent annual report on air quality "*Air Quality in Ireland 2020*"[19], details the range and scope of monitoring undertaken throughout Ireland. As part of the implementation of the Framework Directive on Air Quality (1996/62/EC), four air quality zones have been defined in Ireland for air quality management and assessment purposes[18]. Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 23 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns

with a population of less than 15,000 is defined as Zone D. In terms of air monitoring, Belgard Road is categorized as Zone A[18].

In 2020 the EPA reported[19] that Ireland was compliant with EU legal air quality limits at all locations, however this was largely due to the reduction in traffic due to Covid-19 restrictions. The EPA report details the effect that the Covid-19 restrictions had on air monitoring stations, which included reductions of up to 50% at some monitoring stations which have traffic as a dominant source. The report also notes that CSO figures show that while traffic volumes are still slightly below 2019 levels, they have significantly increased since 2020 levels. 2020 concentrations are therefore predicted to be an exceptional year and not consistent with long-term trends. For this reason, they have not been included in the baseline section and previous data has been used to determine the baseline air quality in the region of the site.

NO_2

With regard to NO_2, continuous monitoring data from the EPA[18,19], at suburban Zone A background locations in Rathmines, Swords and Ballyfermot show that current levels of NO_2 are below both the annual and 1-hour limit values, with annual average levels ranging from 15 - 22 µg/m^3 in 2019 (see Table 2). Sufficient data is available for all stations to observe long-term trends since 2015[18], with annual average results ranging from 13 – 22 µg/m^3. The 1-hour concentrations, measured as a 99.8th percentile are also in compliance with the 1-hour limit value of 200 µg/m^3. Based on these results, an estimate of the current background NO_2 concentration in the region of the facility is 15 µg/m^3.

In relation to the annual average background, the ambient background concentration is added directly to the process concentration with the short-term peaks assumed to have an ambient background concentration of twice the annual mean background concentration.

The methodology for converting NO_X to NO_2 is based on the ozone limiting method (OLM) approach based on an initial NO_2/NO_X ratio of 0.1 and a background ozone level of 55 µg/m^3 based on a review of EPA data for similar Zone A locations[19].

Table 2 *Annual Mean and 99.8th Percentile 1-Hour NO_2 Concentrations In Zone A Locations (µg/m^3)*

Station	Averaging Period	Year				
		2015	2016	2017	2018	2019
Rathmines	Annual Mean NO_2 (µg/m^3)	18	20	17	20	22
	99.8th%ile 1-hr NO_2 (µg/m^3)	105	88	86	87	102
Swords	Annual Mean NO_2 (µg/m^3)	13	16	14	16	15
	99.8th%ile 1-hr NO_2 (µg/m^3)	93	96	79	85	80
Ballyfermot	Annual Mean NO_2 (µg/m^3)	16	17	17	17	20
	99.8th%ile 1-hr NO_2 (µg/m^3)	127	90	112	101	101

PM_{10}

Continuous PM_{10} monitoring carried out at the suburban background locations of Ballyfermot, Dun Laoghaire and Tallaght all showed annual mean concentrations ranging from 13 – 16 µg/m^3 in 2019, with a maximum of 7 exceedances of the daily limit value of 50 µg/m^3 (35 exceedances are permitted per year in accordance with the *Air Quality Standards Regulations 2011*) (see Table 3). PM_{10} results from the urban

background location in the Phoenix Park show similarly low levels over the period of 2015 – 2019 with concentrations ranging from 9 – 12 µg/m^3. Based on these results, an appropriate estimate of the background PM_{10} concentration in the region of the Proposed Development is 14 µg/m^3.

Table 3 *Annual Mean and 90.4th Percentile 24-Hour PM_{10} Concentrations In Zone A Locations (µg/m^3)*

Station	Station Classification Council Directive 96/62/EC	Averaging Period	Year				
			2015	2016	2017	2018	2019
Ballyfermot	Suburban Background	Annual Mean PM_{10} (µg/m^3)	12	11	12	16	14
		24-hr Mean > 50 µg/m^3 (days)	3	0	1	0	7
Dún Laoghaire	Suburban Background	Annual Mean PM_{10} (µg/m^3)	13	13	12	13	12
		24-hr Mean > 50 µg/m^3 (days)	3	0	2	0	2
Tallaght	Suburban Background	Annual Mean PM_{10} (µg/m^3)	14	14	12	15	12
		24-hr Mean > 50 µg/m^3 (days)	4	0	2	1	3
Phoenix Park	Urban Background	Annual Mean PM_{10} (µg/m^3)	12	11	9	11	11
		24-hr Mean > 50 µg/m^3 (days)	2	0	1	0	2

Source: EPA (2021) 'Air Quality Monitoring Report 2020'

$PM_{2.5}$

Continuous $PM_{2.5}$ monitoring carried out at the Zone A location of Rathmines showed an average concentration of 10 µg/m^3 in 2019. Based on this information, the ratio of $PM_{2.5}$ to PM_{10} is estimated to be in the region of 0.60 with a representative background concentration of 10 µg/m^3 estimated for the region of the Proposed Development.

4.1 Climate Baseline

Anthropogenic emissions of greenhouse gases in Ireland included in the EU 2020 strategy are outlined in the most recent review by the EPA which details emissions up to 2020[28]. The data published in 2020 states that Ireland exceeded its 2020 annual limit set under the EU's Effort Sharing Decision (ESD), 406/2009/EC1. Ireland's annual limit for 2020 is 37.65 Mt CO_{2eq}. Ireland's final 2020 greenhouse gas ESD emissions are 44.40 Mt CO_{2eq}, 6.75 Mt CO_{2eq} more than the annual limit for 2020. Agriculture is the largest contributor in 2020 at 37.1% of the total, with the transport sector accounting for 17.8% of emissions of CO_2.

The EPA 2021 GHG Emissions Projections Report for 2021 – 2040[24] notes that there is a long-term projected decrease in greenhouse gas emissions as a result of inclusion of new climate mitigation policies and measures that formed part of the National Development Plan (NDP) which was published in 2018 and the Climate Action Plan published in 2021. Implementation of these are classed as a "*With Additional Measures scenario*" for future scenarios. A change from generating electricity using coal and peat to wind power and diesel vehicle engines to electric vehicle engines are envisaged under this scenario. While emissions are projected to decrease in these areas, emissions from agriculture are projected to grow steadily due to an increase in animal numbers. However, over the period 2021 to 2030 Ireland is projected to cumulatively

exceed its compliance obligations with the EU's Effort Sharing Regulations (Regulation (EU) 2018/842) 2030 targets by approximately 52.3MtCO_2eq under the "With Existing Measures" scenario. However, the projections indicate that Ireland can meet its non-ETS EU targets over the period 2021 – 2030 assuming full implementation of the Climate Action Plan and the use of the flexibilities available[24].

5.0 CONSTRUCTION AND OPERATIONAL PROCESS EMISSIONS

5.1 Construction Phase

The proposed development will comprise construction of a new data repository facility and associated ancillary development. The key civil engineering works which will have a potential impact on air quality and climate during construction are summarised below:

(i) During construction, an amount of soil will be generated as part of the site preparation works and during excavation for installation of foundations, drainage services and ancillary infrastructure where necesary;

(ii) Following completion of the building shell, commissioning of the mechanical and electrical equipment is undertaken;
(iii) Infilling and landscaping will be undertaken. Spoil generated during site preparation will be re-used where possible;
(iv) Temporary storage of construction materials and fuels; and
(v) Construction traffic accessing the site will emit air pollutants and greenhouse gases during transport.

The estimated construction duration for the proposed development is 36 weeks. This includes all site works, building upgrade works and full building fit-out and will all be constructed in a single phase. It is envisaged that construction will commence in March 2023 and will be complete in December 2023, subject to grant of planning.

As outlined in Section 7.1, a dust minimisation plan will be formulated for the construction phase of the proposed development to ensure no dust nuisance occurs at nearby sensitive receptors.

5.2 Operational Phase

The installation has no major emissions to air and only has potential (emergency generator) emissions that will generate quantities of air pollutants listed as a Principal Pollution Substance (*S.I. No. 137/2013 - Environmental Protection Agency (Industrial Emissions) (Licensing) Regulations 2013*).

The data storage facility has 1 no. back-up diesel generator. The generator has an associated stack the height of which was designed in an iterative fashion to provide for adequate dispersion of pollutants. The stack is vertical and is 12.7m above ground level.

Modelling for NO_2 was undertaken in detail. In relation to CO, PM_{10} and $PM_{2.5}$ no detailed modelling was undertaken. Emissions of these pollutants are significantly lower than the NO_X emissions from the generator relative to their ambient air quality standards and thus ensuring compliance with the NO_2 ambient limit value will ensure compliance for all other pollutants. For example, the emission of CO from the generator is at least eight times lower than NO_X whilst the CO ambient air quality standard is 10,000 $\mu g/m^3$ compared to the 1-hour NO_2 standard of 200 $\mu g/m^3$. Similarly, levels of $PM_{10}/PM_{2.5}$ emitted from the generator will be significantly lower than NO_X emissions whilst the ambient air quality standards are comparable.

Two testing regimes for the back-up generator has also been included in the model as outlined below, all testing was assumed to occur from 8am to 5pm, Monday to Friday only.

- **Test 1:** Testing once per week of the back-up generator at 25% load for a maximum of 30 minutes each.
- **Test 2:** The back-up generator will be periodically tested at 90% load for a maximum of four hours per year. This is incorporated into the dispersion model, at 90% load, for one full hour, once per week during every quarter (assumed to be January, April, June and October for the purpose of this assessment).

5.3 Emergency Operations

The diesel generator will operate in an emergency scenario when there is a power outage in the area. In addition, testing of the generator will be required as outlined above.

There are two methodologies used to determine the impact from the operation of the diesel generator on ambient air quality. Both methodologies from the USEPA and UK Environment Agency have been used in this assessment, this follows the guidance outlined in Appendix K of the Irish EPA document AG4[2]. Emission details can be seen in Table 4.

USEPA Guidance suggests that for emergency operations, an average hourly emission rate should be used rather than the maximum hourly rate[3]. As a result, the maximum hourly emission rates from the diesel generator is reduced by $\frac{72}{8760}$ and the diesel generator is modelled over a period of one full year.

A second methodology has been published by the UK Environment Agency. The consultation document is entitled "*Diesel Generator Short-Term NO_2 Impact Assessment*"[29]. The methodology is based on considering the statistical likelihood of an exceedance of the NO_2 hourly limit value (18 exceedances are allowable per year before the air standard is deemed to have been exceeded). The assessment assumes a hypergeometric distribution to assess the likelihood of exceedance hours coinciding with the emergency operational hours of the diesel generator. The cumulative hypergeometric distribution of 19 and more hours per year is computed and the probability of an exceedance determined. The guidance suggests that the 95th percentile confidence level should be used to indicate if an exceedance is likely. More recent guidance[30] has recommended this probability should be multiplied by a factor of 2.5 and therefore the 98th percentile confidence level should be used to indicate if an exceedance is likely. The guidance suggests that the assessment should be conducted at the nearest residential receptor or at locations where people are likely to be exposed and that there should be no running time restrictions on the generator when providing power on site during an emergency.

Both the methodology advised in the USEPA guidance as well as the approach described in the UK EA guidance have been applied for the emergency scenario modelled in this study to ensure a robust assessment of predicted air quality impacts from the diesel generator. This also follows the guidance outlined in Appendix K of the EPA AG4 guidance[2].

Table 4 *Summary of Process Emission Information Associated with the Facility*

Stack Reference	Height Above Ground Level (m)	Exit Diameter (m)	Cross-Sectional Area (m^2)	Temp (K)	Volume Flow (Nm^3/hr at 15% Ref. O_2)	Exit Velocity (m/sec actual)	NO_x	
							Concentration (mg/Nm^3 at 15% Ref. O_2)	Mass Emission (g/s)
Emergency Operation and Load-banking of Diesel Generator (100% load)	12.7	0.4	0.13	783.15	9,141	34.6	1,262	0.026 Note 1 / 3.20 Note 2
Testing of Generator (25% load)	12.7	0.4	0.13	783.15	2,285	8.65	1,262	0.80 Note 3

Note 1 Reduced emission rates based on USEPA protocol (assuming 72 hours / annum) used to model emissions during emergency operation of generator (100% load)

Note 2 Maximum emission rates for diesel generator (based on 100% load) used to model emissions during emergency operation of generator for UK EA assessment methodology and for load-banking for USEPA assessment methodology

Note 3 Emission rates used to model emissions during scheduled testing at 25% load conducted once per week for 30 minutes.

5.4 Climate & Transboundary Pollution

The diesel generator modelled for the purpose of this assessment will only be used in the event of a power failure at the site. In reality and based on recent experience over the past number of years, generators are rarely used other than during testing and maintenance. During normal operations at the facility, the electricity will be supplied from the national grid so there will be no direct emissions of CO_2 or transboundary pollutants from the site.

When assessing significance, the 2010 IEMA Principles Series on Climate Change Mitigation & EIA[31] defines three overarching principles:

- The GHG emissions from all projects will contribute to climate change, the largest interrelated cumulative environmental effect;
- The consequences of a changing climate have the potential to lead to significant environmental effects on all topics in the EIA Directive (e.g. human health, biodiversity, water, land use, air quality); and
- GHG emissions have a combined environmental effect that is approaching a scientifically defined environmental limit; as such any GHG emissions or reductions from a project might be considered to be significant. The environmental limit is the national global GHG emission budget that defines a level of dangerous climate change, and any GHG emission that contributes to exceedance of that budget or threatens efforts to stay within it can be considered as significant.

The 2022 Guidance[27] document builds on those principles with three points:

- When evaluating significance, all new GHG emissions contribute to a negative environmental impact; however, some projects will replace existing development or baseline activity that has a higher GHG profile. The significance of a project's emissions should therefore be based on its net impact over its lifetime, which may be positive, negative or negligible;
- Where GHG emissions cannot be avoided, the goal of the EIA process should be to reduce the project's residual emissions at all stages; and
- Where GHG emissions remain significant, but cannot be further reduced, approaches to compensate the project's remaining emissions should be considered.

The criteria for determining the significance of effects are a two-stage process that involves defining the magnitude of the impacts and the sensitivity of the receptors. In relation to climate, there is no project specific assessment criteria, but the project will be assessed against the recommended IEMA[27] significance determination. This takes account of any embedded or committed mitigation measures that form part of the design which should be considered.

- Major or moderate adverse impact (significant): A project that follows a 'business-as-usual' or 'do minimum' approach and is not compatible with the

net zero[1] trajectory by 2050 or sectoral based transition to net zero targets, results in a significant adverse effect. It is down to the consultant completing the assessment to differentiate between the 'level' of significant adverse effects e.g. 'moderate' or 'major' adverse effects. A project's impact can shift from significant adverse to nonsignificant effects by incorporating mitigation measures that substantially improve on business-as-usual and meet or exceed the science-based emissions trajectory of ongoing but declining emissions towards net zero. Meeting the minimum standards set through existing policy or regulation cannot necessarily be taken as evidence of avoiding a significant adverse effect. This is particularly true where policy lags behind the necessary levels of GHG emission reductions for a science based 1.5°C compatible trajectory towards net zero.

- Minor adverse impact (not significant): A project that is compatible with the budgeted, science based 1.5°C trajectory (in terms of rate of emissions reduction) and which complies with up-to-date policy and 'good practice' reduction measures to achieve that has a minor adverse effect that is not significant. The project may have residual impacts but is doing enough to align with and contribute to the relevant transition scenario. A 'minor adverse' or 'negligible' non-significant effect conclusion does not necessarily refer to the magnitude of GHG emissions being carbon neutral[2] (i.e. zero on balance) but refers to the likelihood of avoiding severe climate change and achieving net zero by 2050. A 'minor adverse' effect or better is a high bar and indicates exemplary performance where a project meets or exceeds measures to achieve net zero earlier than 2050.

- Negligible Impact (not significant): A project that achieves emissions mitigation that goes substantially beyond the reduction trajectory, or substantially beyond existing and emerging policy compatible with that trajectory, and has minimal residual emissions, is assessed as having a negligible effect that is not significant.

- Beneficial Impact (significant): A project that causes GHG emissions to be avoided or removed from the atmosphere has a beneficial effect that is significant. Only projects that actively reverse (rather than only reduce) the risk of severe climate change can be judged as having a beneficial effect.

The impact of the operational phase of the proposed development on climate was determined by an assessment of the indirect CO_2 emissions associated with the electricity supplied from the national grid. The details and results of the assessment are provided in Section 6.4.

Climate change has the potential to alter weather patterns and increase the frequency of rainfall in future years. As a result of this there is the potential for flooding related impacts on site in future years. A detailed flood risk assessment has been undertaken as part of this planning application and adequate attenuation and drainage have been

[1] Net Zero: *"When anthropogenic emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period."* Net zero is achieved where emissions are first educed in line with a 'science-based' trajectory with any residual emissions neutralised through offsets.

[2] Carbon Neutral: *"When anthropogenic emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period irrespective of the time period or magnitude of offsets required."*

provided for to account for increased rainfall in future years. Therefore, the impact will be imperceptible.

In terms of the operation of the proposed development, there are several important factors which should be taken into account. Firstly, in the wider context, data repository facilities are at least 84% more efficient than on-premises servers and the associated GHG savings associated have not been accounted for in the current analysis[3].

Secondly, the carbon intensity of electricity is predicted to decrease from 296 gCO_2/kWh in 2020 to less than 100 gCO_2/kWh in 2030 as a result of the increase in renewables to near 80% of the electricity market by 2030.

The first carbon budget programme proposed by the Climate Change Advisory Council, approved by Government and adopted by both Houses of the Oireachtas comprises three successive 5-year carbon budgets. The total emissions allowed under each budget is set out below in Table 5, as well as the average annual reduction for each 5-year period.

Table 5 *5-Year Carbon Budgets 2021-2025, 2026-2030 and 2031-2025*

Period	Mt CO2eq	Emission Reduction Target
2021-2025	295 Mt CO2eq	Reduction in emissions of 4.8% per annum for the first budget period.
2026-2030	200 Mt CO2eq	Reduction in emissions of 8.3% per annum for the second budget period.
2031-2035	151 Mt CO2eq	Reduction in emissions of 3.5% per annum for the third provisional budget.

The CAP 2021 provides that the economy-wide carbon budgets will be supplemented by sectoral emissions ceilings, setting the maximum amount of GHG emissions that are permitted in a given sector of the economy during each five-year carbon budget.

6.0 CONSTRUCTION AND OPERATIONAL IMPACT ASSSESSMENT

6.1 Construction Phase

The greatest potential impact on air quality during the construction phase of the proposed development is from construction dust emissions as a result of excavation works, infilling and landscaping activities and storage of soil in stockpiles. This leads to the potential for nuisance dust. While construction dust tends to be deposited within 200m of a construction site, the majority of the deposition occurs within the first 50m[(32)]. The extent of any dust generation depends on the nature of the dust (soils, peat, sands, gravels, silts etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction.

Fuels will be stored in sealed containers and emissions to air are likely to be minimal. Therefore, there is unlikely to be an impact to air quality as the result of the temporary storage of fuels for the construction phase.

[3] https://blog.aboutamazon.eu/aws/amazon-announces-new-project-in-ireland-as-part-of-commitment-to-be-100-powered-by-renewable-energy-by-2025

Construction traffic would be expected to be the dominant source of greenhouse gas emissions as a result of the Proposed Development. Construction vehicles and machinery will give rise to CO_2 and N_2O emissions during construction of the Proposed Development. The Institute of Air Quality Management document '*Guidance on the Assessment of Dust from Demolition and Construction*'[32] states that site traffic and plant is unlikely to make a significant impact on climate.

Initial commissioning activities will involve testing of the generator on site in a similar manner to the operational phase testing, i.e. the first testing sequence will be commissioning of the generator. The operational modelling has considered testing of the generator on a weekly and an annual basis and this does not result in a significant impact to air quality. Therefore, it is predicted that the initial commissioning tests will result in a ***temporary*** *(effects lasting less than a year)* ***imperceptible*** impact to air quality.

It is important to note that the potential impacts associated with the construction phase of the proposed development are short-term in nature. When the dust minimisation measures detailed in the mitigation section (see Section 7.1) of this report are implemented, fugitive emissions of dust from the site will not be significant and will pose no nuisance at nearby receptors. Due to the duration and nature of the construction activities, CO_2 and N_2O emissions from construction vehicles and machinery will have a ***temporary*** *(effects lasting less than a year)*and ***imperceptible*** impact on climate.

6.2 Emergency Operations (USEPA Methodology)

The NO_2 modelling results at the worst-case location at and beyond the site boundary are detailed in Table 6 based on the operation of the back-up diesel generation for 72 hours per year using the USEPA methodology outlined within the guidance document titled '*Additional Clarification Regarding Application of Appendix W Modelling Guidance for the 1-Hour National Ambient Air Quality Standard*'[3] as well as considering scheduled weekly testing and quarterly maintenance testing of the back-up generator.

The results indicate that the ambient ground level concentrations are within the relevant air quality standards for NO_2. For the worst-case year modelled, emissions from the site lead to an ambient NO_2 concentration (including background) which is 36% of the maximum ambient 1-hour limit value (measured as a 99.8th percentile) and 45% of the annual limit value at the worst-case off-site receptor. Concentrations decrease with distance from the site boundary. The geographical variations in the 1-hour mean (99.8th percentile) and annual mean NO_2 ground level concentrations are illustrated as concentration contours in Figures 2 and 3. The locations of the maximum concentrations for NO_2 are close to the boundary of the site with concentrations decreasing with distance from the facility.

Table 6 *Dispersion Model Results for Nitrogen Dioxide (NO_2) – Emergency Operations & Scheduled Testing*

Pollutant / Year	Background ($\mu g/m^3$)	Averaging Period	Process Contribution ($\mu g/m^3$)	Predicted Environmental Concentration ($\mu g/m^3$)	Standard ($\mu g/m^3$) Note 1
NO_2 / 2017	34	99.8th%ile of 1-Hr Means	41.7	71.7	200
	17	Annual mean	1.6	16.6	40
NO_2 / 2018	34	99.8th%ile of 1-Hr Means	40.7	70.7	200
	17	Annual mean	2.8	17.8	40
NO_2 / 2019	34	99.8th%ile of 1-Hr Means	42.8	72.8	200
	17	Annual mean	1.8	16.8	40
NO_2 / 2020	34	99.8th%ile of 1-Hr Means	41.9	71.9	200
	17	Annual mean	2.6	17.6	40
NO_2 / 2021	34	99.8th%ile of 1-Hr Means	41.7	71.7	200
	17	Annual mean	2.5	17.5	40

Note 1 Air Quality Standards 2011 (from EU Directive 2008/50/EC and S.I. 180 of 2011)

6.3 Emergency Operations (UK EA Methodology)

Emissions from the standby generator was assessed using the UK Environment Agency methodology. The methodology, based on considering the statistical likelihood of an exceedance of the NO_2 hourly limit value assuming a hypergeometric distribution, has been undertaken at the worst-case residential receptor. The methodology, based on considering the statistical likelihood of an exceedance of the NO_2 hourly limit value assuming a hypergeometric distribution, has been undertaken at the worst-case residential / sensitive receptor. The cumulative hypergeometric distribution of 19 and more hours per year is computed and the probability of an exceedance determined. The results have been compared to the 98th percentile confidence level to indicate if an exceedance is likely at various operational hours for the diesel generator. The results (Table 7 and Figure 4) indicate that in the worst-case year, the diesel generator can operate for the 8760 hours per year before there is a likelihood of an exceedance of the ambient air quality standard (at a 98th percentile confidence level).

Table 7 *Hypergeometric Statistical Results at Worst-case Residential Receptor – Emergency Operations Scenario*

Pollutant / Year / Scenario	Hours of operation (Hours) (98th%ile) Allowed Prior To Exceedance Of Limit Value	UK Guidance – Probability Value = 0.02 (98th%ile) Note 1
NO_2 / 2017	8760	0.02
NO_2 / 2018	8760	
NO_2 / 2019	8760	
NO_2 / 2020	8784	
NO_2 / 2021	8760	

Note 1 Guidance Outlined In UK Environment Agency (2019) Emissions from specified generators - Guidance on dispersion modelling for oxides of nitrogen assessment from specified generators

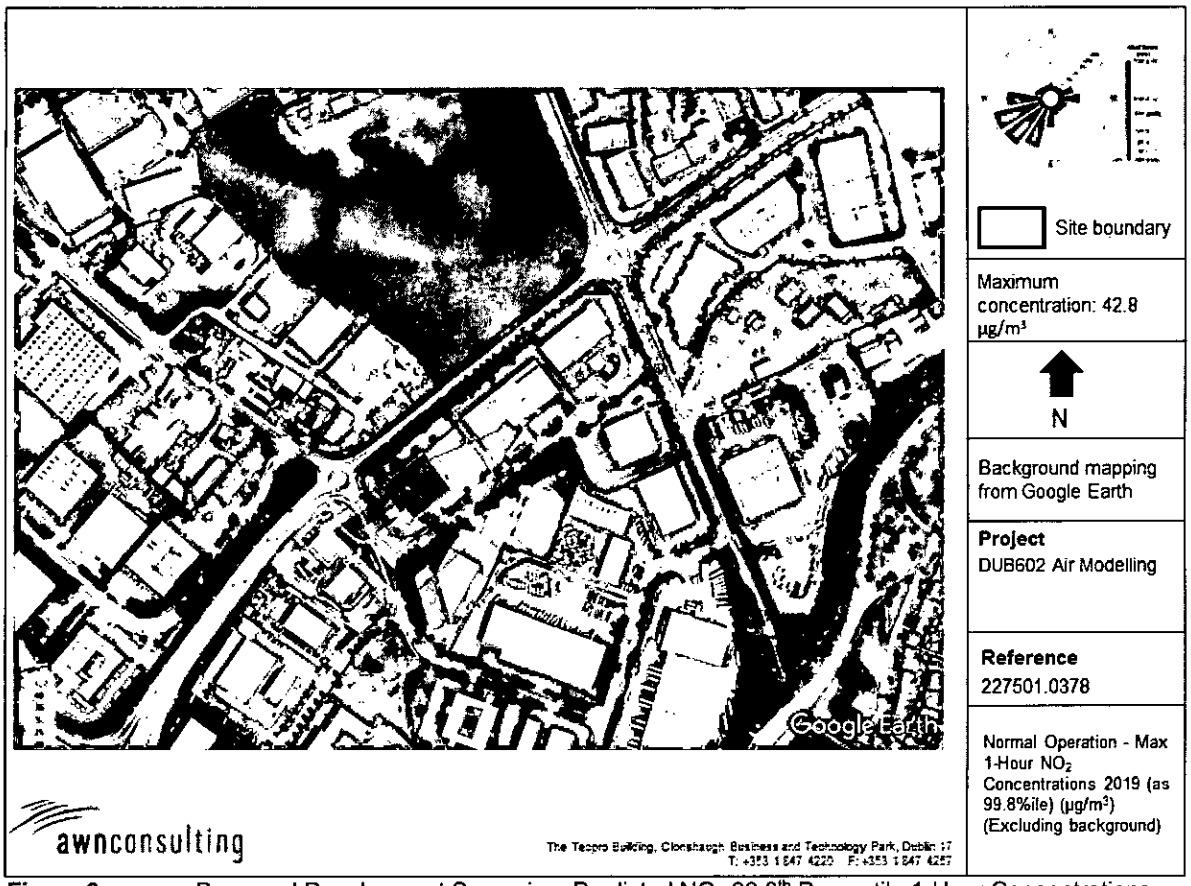


Figure 2 Proposed Development Scenario – Predicted NO_2 99.8th Percentile 1-Hour Concentrations

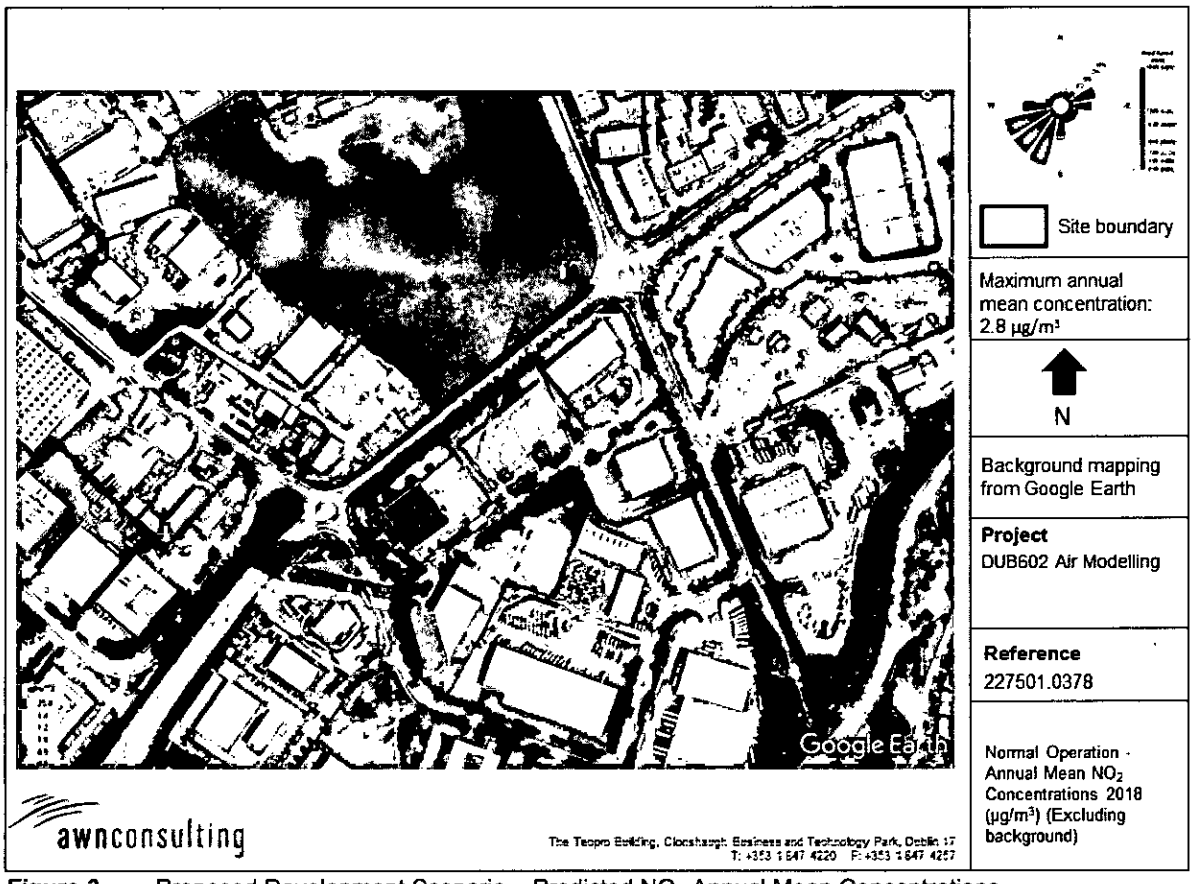


Figure 3 Proposed Development Scenario – Predicted NO_2 Annual Mean Concentrations

6.4 Climate

Climate change has the potential to alter weather patterns and increase the frequency of rainfall in future years. As a result of this there is the potential for flooding related impacts on site in future years. A detailed flood risk assessment has been undertaken as part of this planning application and adequate attenuation and drainage have been provided for to account for increased rainfall in future years. Therefore, the impact will be imperceptible.

The indirect CO_2 emissions from electricity to operate the facility will not be significant in relation to Ireland's national annual CO_2 emissions. The Sustainable Energy Authority of Ireland states on its website that the average CO_2 emission factor for electricity generated in Ireland was 296 gCO_2/kWh in 2020. This average CO_2 emission factor is based on the national power generating portfolio. On the basis that the Proposed Development will consume 1.3MW of power this equates to 11.4 GWh annually based on the assumption of the national fuel mix. This translates to approximately 3,370 tonnes of CO_2eq per year. Thus, given that the use of electricity to power the facility will achieve net zero by 2050 and the commitment to offset all interim fossil fuel derived GHG emissions by the purchase of CPPAs the predicted impact to climate is deemed to be ***indirect***, ***long-term, negative*** and ***slight***.

6.5 *Regional Air Quality*

Directive (EU) 2016/2284 "*On The Reduction Of National Emissions Of Certain Atmospheric Pollutants And Amending Directive 2003/35/EC And Repealing Directive 2001/81/EC*" was published in December 2016. The Directive will apply the 2010 National Emission Ceiling Directive limits until 2020 and establish new national emission reduction commitments which will be applicable from 2020 and 2030 for SO_2, NO_X, NMVOC, NH_3 and $PM_{2.5}$.

Assuming that 1.3MW is generated using the national fuel mix for the Proposed Development, the NO_X emissions associated with this electricity over the course of one year (i.e. 11.4 GWh based on 1.3MW for 8,760 hours per annum) will equate to 1.9 tonnes per annum which is 0.003% of the National Emission Ceiling limit for Ireland from 2020 onwards. Similarly, SO_2 emissions associated this electricity over the course of one year (11.4 GWh) will equate to 0.45 tonnes per annum which is 0.001% of the National Emission Ceiling limit for Ireland from 2020. Additionally, NMVOC emissions associated this electricity over the course of one year (11.4GWh) will equate to 0.70 tonnes per annum which is 0.0013% of the National Emission Ceiling limit for Ireland from 2020.

Thus, the NO_X, SO_2 and NMVOC indirect emissions associated with the operation of the Proposed Development are ***indirect***, ***long-term, negative*** and ***slight*** with regards to regional air quality.

The Electricity Supplier's fuel mix consists of energy from wind farms they own and operate, third party renewable energy projects that they have long term power purchase agreements in place with and Guarantees of Origin (GOs) as described in Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009. Therefore, renewable energy sources will be used to provide electricity to the site thereby reducing the indirect pollutant emissions from electricity generation.

7.0 MITIGATION MEASURES

7.1 Construction Phase

The objective of dust control at the site is to ensure that no significant nuisance occurs at nearby sensitive receptors. In order to develop a workable and transparent dust control strategy, the following management plan has been formulated by drawing on best practice guidance from Ireland, the UK and the USA based on the following publications:

- 'Guidance on the Assessment of Dust from Demolition and Construction' (IAQM, 2014);
- 'Planning Advice Note PAN50 Annex B: Controlling The Environmental Effects Of Surface Mineral Workings Annex B: The Control of Dust at Surface Mineral Workings' (The Scottish Office, 1996);
- 'Controlling the Environmental Effects of Recycled and Secondary Aggregates Production Good Practice Guidance' (UK Office of Deputy Prime Minister, 2002);
- 'Controlling Particles, Vapours & Noise Pollution From Construction Sites' (BRE, 2003);
- 'Fugitive Dust Technical Information Document for the Best Available Control Measures' (USEPA, 1997); and
- 'Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition' (periodically updated) (USEPA, 1986).

Site Management

The aim is to ensure good site management by avoiding dust becoming airborne at source. This will be done through good design and effective control strategies.

At the construction planning stage, the siting of activities and storage piles will take note of the location of sensitive receptors and prevailing wind directions in order to minimise the potential for significant dust nuisance (see Figure 1 for the windrose for Casement Aerodrome). As the prevailing wind is predominantly westerly to south-westerly, locating construction compounds and storage piles downwind (to the east or north-east) of sensitive receptors will minimise the potential for dust nuisance to occur at sensitive receptors.

Good site management will include the ability to respond to adverse weather conditions by either restricting operations on-site or quickly implementing effective control measures before the potential for nuisance occurs. When rainfall is greater than 0.2mm/day, dust generation is generally suppressed (UK Office of Deputy Prime Minister (2002), BRE (2003)). The potential for significant dust generation is also reliant on threshold wind speeds of greater than 10 m/s (19.4 knots) (at 7m above ground) to release loose material from storage piles and other exposed materials[33]. Particular care should be taken during periods of high winds (gales) as these are periods where the potential for significant dust emissions are highest. The prevailing meteorological conditions in the vicinity of the site are favourable in general for the suppression of dust for a significant period of the year. Nevertheless, there will be infrequent periods where care will be needed to ensure that dust nuisance does not occur. The following measures shall be taken in order to avoid dust nuisance occurring under unfavourable meteorological conditions:

- The Principal Contractor or equivalent will monitor the contractors' performance to ensure that the proposed mitigation measures are implemented, and that dust impacts and nuisance are minimised;

- During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions;
- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board will also include head/regional office contact details;
- Community engagement shall be undertaken before works commence on site explaining the nature and duration of the works to local residents and businesses;
- A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out;
- It is the responsibility of the contractor at all times to demonstrate full compliance with the dust control conditions herein;
- The procedures put in place will be reviewed at regular intervals and monitoring conducted and recorded by the principal contractor. It is recommend that reviews are conducted on a monthly basis as a minimum.

The dust minimisation measures shall be reviewed at regular intervals during the works to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practice and procedures. In the event of dust nuisance occurring outside the site boundary, site activities will be reviewed and satisfactory procedures implemented to rectify the problem. Specific dust control measures to be employed are described below.

Site Roads / Haulage Routes

Movement of construction trucks along site roads (particularly unpaved roads) can be a significant source of fugitive dust if control measures are not in place. The most effective means of suppressing dust emissions from unpaved roads is to apply speed restrictions. Studies show that these measures can have a control efficiency ranging from 25 to 80%[34].

- A speed restriction of 20 km/hr will be applied as an effective control measure for dust for on-site vehicles using unpaved site roads;
- Access gates to the site shall be located at least 10m from sensitive receptors where possible;
- Bowsers or suitable watering equipment will be available during periods of dry weather throughout the construction period. Research has found that watering can reduce dust emissions by 50%[35]. Watering shall be conducted during sustained dry periods to ensure that unpaved areas are kept moist. The required application frequency will vary according to soil type, weather conditions and vehicular use; and
- Any hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only.

Land Clearing / Earth Moving

Land clearing / earth-moving works during periods of high winds and dry weather conditions can be a significant source of dust.

- During dry and windy periods, and when there is a likelihood of dust nuisance, watering shall be conducted to ensure moisture content of materials being moved is high enough to increase the stability of the soil and thus suppress dust; and
- During periods of very high winds (gales), activities likely to generate significant dust emissions shall be postponed until the gale has subsided.

Storage Piles

The location and moisture content of storage piles are important factors which determine their potential for dust emissions;

- Overburden material will be protected from exposure to wind by storing the material in sheltered regions of the site. Where possible storage piles should be located downwind of sensitive receptors;
- Regular watering will take place to ensure the moisture content is high enough to increase the stability of the soil and thus suppress dust. The regular watering of stockpiles has been found to have an 80% control efficiency[35]; and
- Where feasible, hoarding will be erected around site boundaries to reduce visual impact. This will also have an added benefit of preventing larger particles from impacting on nearby sensitive receptors.

Site Traffic on Public Roads

Spillage and blow-off of debris, aggregates and fine material onto public roads will be reduced to a minimum by employing the following measures:

- Vehicles delivering or collecting material with potential for dust emissions shall be enclosed or covered with tarpaulin at all times to restrict the escape of dust;
- At the main site traffic exits, a wheel wash facility shall be installed. All trucks leaving the site must pass through the wheel wash. In addition, public roads outside the site shall be regularly inspected for cleanliness, as a minimum on a daily basis, and cleaned as necessary.

Summary of Dust Mitigation Measures

The pro-active control of fugitive dust will ensure that the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released, will contribute towards the satisfactory performance of the contractor. The key features with respect to control of dust will be:

- The specification of a site policy on dust and the identification of the site management responsibilities for dust issues;
- The development of a documented system for managing site practices with regard to dust control;
- The development of a means by which the performance of the dust minimisation plan can be regularly monitored and assessed; and

- The specification of effective measures to deal with any complaints received.

7.2 Operational Phase

The stack height of the diesel generator for the proposed development has been designed in an iterative fashion to ensure that an adequate height was selected to aid dispersion of the emissions and achieve compliance with the EU ambient air quality standards at all off-site locations (including background concentrations). No additional mitigation measures are proposed for the operational phase of the development.

8.0 PREDICTED IMPACT OF PROPSOED DEVELOPMENT

8.1 Construction Phase

Air Quality

Dust and Particulate Matter
When the dust mitigation measures detailed in the mitigation section (section 9.6.1) of this report are implemented, fugitive emissions of dust and particulate matter from the site will be ***neutral***, ***short-term*** and ***not significant*** in nature, posing no nuisance at nearby receptors.

Impacts on Human Health
Best practice mitigation measures are proposed for the construction phase of the proposed development which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of construction of the proposed development is likely to be ***neutral, short-term*** and ***imperceptible*** with respect to human health.

Climate

The Institute of Air Quality Management document '*Guidance on the Assessment of Dust from Demolition and Construction*' (IAQM, 2014) states that site traffic and plant is unlikely to make a significant impact on climate. Based on the scale and temporary nature of the construction works and the intermittent use of equipment, the potential impact on climate change and transboundary pollution from the proposed development is deemed to be ***short-term, negative*** and ***not significant*** in relation to Ireland's obligations under the EU 2030 target.

8.2 Operational Phase

Air Quality

The Proposed Development Scenario comprises the operation of the diesel generator for 72 hours per year. The scenario also included weekly testing and quarterly load-banking of the diesel generator. The process emissions used for the Proposed Development Scenario are outlined in Table 4.

The NO_2 modelling results at the maximum location at and beyond the site boundary are detailed in Table 6 based on the operation of the diesel generator for 72 hours per year in addition to the scheduled weekly testing and quarterly load-banking of the generator from the Proposed Development.

The results indicate that the ambient ground level concentrations are within the relevant air quality standards for NO_2. For the maximum year modelled, emissions from the site lead to an ambient NO_2 concentration (including background) which is 36% of the maximum ambient 1-hour limit value (measured as a 99.8th percentile) and 45% of the annual limit value at the maximum off-site receptor. Concentrations decrease with distance from the site boundary. The geographical variations in the 1-hour mean (99.8th percentile) and annual mean NO_2 ground level concentrations for the Proposed Development Scenario are illustrated as concentration contours in Figures 2 and 3.

The operational phase impact of the Proposed Development is considered ***long-term***, ***localised***, ***negative*** and ***slight***.

9.0 CUMULATIVE IMPACTS

9.1 Construction Phase

There is one development on the neighbouring site to the south, Ref. SD19A/0222, which has been granted but not yet constructed. The development contains an extension to an existing warehouse.

Should the construction of this neighbouring development and the proposed development overlap, cumulative construction impacts will not be significant as the proposed development will undertake the construction dust mitigation measures which have been outlined in Section 7.1 leading to a ***neutral***, ***short-term*** and ***not significant*** impact.

9.2 Operational Phase

A review of the EPA Maps for Industry sites: IPPC; Waste Facility; and IE Licenced Sites; has been undertaken to identify an initial list of potential emissions sources. Facilities within 1 km of the facility boundary include:

- Galco Steel Limited an IPPC site (EPA Ref P0284-02) located c. 350 m north of the proposed development.
- Heiton Buckley Limited site for preservation of wood (EPA Ref P0340-01) located c. 580 m east of the proposed development.
- Starrus Eco Holdings Limited (Ballymount) waste disposal activities Licenced site (EPA Ref W0039) located c. 280 m north of the proposed development.
- Ballymount Baling Station waste disposal activities Licenced site (EPA Ref W0003) located c. 280 m east of the proposed development.
- Starrus Eco Holdings Limited waste disposal activities Licenced site (EPA Ref W0238) located c. 280 m east of the proposed development.

The Heiton Buckley Limited site for preservation of wood (EPA Ref P0340-01), and Starrus Eco Holdings Limited (EPA Ref W0238) produces no outward emissions of environmental significance that may be capable of combing with the proposed development to result in cumulative effects.

The Licenced Galco Steel Limited an IPPC site (EPA Ref P0284-02) produces Lead, Zinc, Cadmium, Particulate matter, Chloride (as HCl), Ammonium Chloride Emissions to Atmosphere that are not capable of combing with the proposed development to result in cumulative effects.

The Licenced waste disposal activities Starrus Eco Holdings Limited (Ballymount) (EPA Ref W0039), and Ballymount Baling Station (EPA Ref W0003), produces dust emissions during operation that may be capable of combining with the proposed development to result in cumulative effects.

However, given the distance from the proposed development to these nearby facilities and given that the operational impact of emissions from the proposed development will be ***long-term***, ***localised***, ***negative*** and ***slight***, no significant cumulative impacts will occur.

10.0 ASSESSMENT SUMMARY

The assessment was carried out the determine the ambient air quality impact of the site. As the diesel generator will be used solely for emergency operation (i.e. less than 500 hours per year) thus the emission limit values outlined in the Medium Combustion Plant Directive are not applicable to the diesel generator on site.

The NO_2 modelling results at the worst-case location at and beyond the site boundary are based on the operation of the back-up diesel generations for 72 hours per year using the USEPA methodology outlined within the guidance document titled '*Additional Clarification Regarding Application of Appendix W Modelling Guidance for the 1-Hour National Ambient Air Quality Standard*' as well as considering scheduled weekly testing and quarterly maintenance testing of the back-up generator from the installation.

The results indicate that the ambient ground level concentrations are in compliance with the relevant air quality standards for NO_2. For the worst-case year, emissions from the site lead to an ambient NO_2 concentration (including background) which is 36% of the maximum ambient 1-hour limit value (measured as a 99.8th percentile) and 45% of the annual limit value at the worst-case off-site receptor.

The UK EA assessment methodology determined that in any year, the diesel generator can run for 8760 hours before there is a likelihood of an exceedance at the nearest residential receptor (at a 98th percentile confidence level).

In summary, emissions to atmosphere of NO_2, as the main polluting substance (as defined in the Schedule of EPA (Industrial Emissions) (Licensing) Regulations 2013, S.I. No. 137 of 2013) from the standby generator, 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.

In terms of impacts at nearby ecologically sensitive areas, the closest sensitive ecological area is the Grand Canal Proposed Natural Heritage Area (pNHA) (site code 002104) which is located c. 1.3 km north of the subject site. Dispersion modelling of NO_X emissions from the installation at this distance is not required as there is no potential for significant impacts to vegetation as a result of emissions from the installation at such a distance. Emissions from the back-up generator on site peak at the site boundary and fall off rapidly with increasing distance from the installation.

Once the mitigation measures outlined in this report are implemented, the residual impacts on air quality or climate from the construction of the proposed development will be ***short-term*** and ***imperceptible*** and for the operational phases of the proposed development will be ***long-term, negative*** and ranging from ***imperceptible*** to ***slight***.

In relation to cumulative impacts, given the distance from the proposed development to nearby facilities and given that the operational impact of emissions from the proposed development will be ***long-term***, ***localised***, ***negative*** and ***slight***, no significant cumulative impacts will occur.

11.0 REFERENCES

(1) USEPA (2021) AERMOD Description of Model Formulation and Evaluation
(2) EPA (2020) Air Dispersion Modelling from Industrial Installations Guidance Note (AG4)
(3) USEPA (2011) Additional Clarification Regarding Application of Appendix W Modelling Guidance for the 1-Hour National Ambient Air Quality Standard
(4) USEPA (1995) User's Guide for the Industrial Source Complex (ISC3) Dispersion Model Vol I & II
(5) USEPA (2017) Guidelines on Air Quality Models, Appendix W to Part 51, 40 CFR Ch.1
(6) USEPA (2000) Seventh Conference on Air Quality Modelling (June 2000) Vol I & II
(7) USEPA (1998) Human Health Risk Assessment Protocol, Chapter 3: Air Dispersion and Deposition Modelling, Region 6 Centre for Combustion Science and Diesel Engineering
(8) USEPA (1999) Comparison of Regulatory Design Concentrations: AERMOD vs. ISCST3 vs. CTDM PLUS
(9) Schulman, L.L; Strimaitis, D.G.; Scire, J.S. (2000) Development and evaluation of the PRIME plume rise and building downwash model. Journal of the Air & Waste Management Association, 50, 378-390.
(10) Paine, R & Lew, F. "Consequence Analysis for Adoption of PRIME: an Advanced Building Downwash Model" Prepared for the EPRI, ENSR Document No. 2460-026-450 (1997).
(11) Paine, R & Lew, F. "Results of the Independent Evaluation of ISCST3 and ISC-PRIME" Prepared for the EPRI, ENSR Document No. 2460-026-3527-02 (1997).
(12) USEPA (2019) AERMAP Users Guide
(13) Met Éireann (2022) Met Éireann Website: www.met.ie
(14) USEPA (2019) User's Guide to the AERMOD Meteorological Preprocessor (AERMET)
(15) USEPA (2008) AERSURFACE User's Guide
(16) Alaska Department of Environmental Conservation (2008) ADEC Guidance re AERMET Geometric Means (http://dec.alaska.gov/air/ap/modeling.htm)
(17) USEPA (1985) Good Engineering Practice Stack Height (Technical Support Document For The Stack Height Regulations) (Revised)
(18) EPA (2022) http://www.epa.ie/whatwedo/monitoring/air/
(19) Environmental Protection Agency (2021) Air Quality in Ireland 2020 (& earlier reports)
(20) EPA (2006) Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals)
(21) EU (2021) European Climate Law
(22) Government of Ireland (2019) 2019 Climate Action Plan
(23) Government of Ireland (2020) Programme for Government – Our Shared Future
(24) EPA (2021) *Ireland's Greenhouse Gas Projections 2021-2040*
(25) Government of Ireland (2021) 2021 Climate Action Plan
(26) Fingal CC (2019) Fingal Climate Action Plan
(27) IEMA (2022) Assessing Greenhouse Gas Emissions and Evaluating their Significance
(28) EPA (2021) *Ireland's Greenhouse Gas Emissions 2020*
(29) UK Environment Agency (2016) Air Quality Modelling and Assessment Unit – Diesel Generator Short Term NO_2 Impact Assessment
(30) UK Environment Agency (2019) Emissions from specified generators - Guidance on dispersion modelling for oxides of nitrogen assessment from specified generators
(31) IEMA (2010) Principles Series on Climate Change Mitigation & EIA
(32) IAQM (2014) Guidance on the Assessment of Dust from Demolition and Construction
(33) USEPA (1986) Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition (periodically updated)
(34) UK Office of Deputy Prime Minister (2002) Controlling the Environmental Effects of Recycled and Secondary Aggregates Production Good Practice Guidance
(35) USEPA (1997) Fugitive Dust Technical Information Document for the Best Available Control Measures

APPENDIX I

Description of the AERMOD Model

The AERMOD dispersion model has been developed in part by the U.S. Environmental Protection Agency (USEPA)[1,5]. The model is a steady-state Gaussian model used to assess pollutant concentrations associated with industrial sources. The model is an enhancement on the Industrial Source Complex-Short Term 3 (ISCST3) model which has been widely used for emissions from industrial sources.

Improvements over the ISCST3 model include the treatment of the vertical distribution of concentration within the plume. ISCST3 assumes a Gaussian distribution in both the horizontal and vertical direction under all weather conditions. AERMOD with PRIME, however, treats the vertical distribution as non-Gaussian under convective (unstable) conditions while maintaining a Gaussian distribution in both the horizontal and vertical direction during stable conditions. This treatment reflects the fact that the plume is skewed upwards under convective conditions due to the greater intensity of turbulence above the plume than below. The result is a more accurate portrayal of actual conditions using the AERMOD model. AERMOD also enhances the turbulence of night-time urban boundary layers thus simulating the influence of the urban heat island.

In contrast to ISCST3, AERMOD is widely applicable in all types of terrain. Differentiation of the simple versus complex terrain is unnecessary with AERMOD. In complex terrain, AERMOD employs the dividing-streamline concept in a simplified simulation of the effects of plume-terrain interactions. In the dividing-streamline concept, flow below this height remains horizontal, and flow above this height tends to rise up and over terrain. Extensive validation studies have found that AERMOD (precursor to AERMOD with PRIME) performs better than ISCST3 for many applications and as well or better than CTDMPLUS for several complex terrain data sets[7].

Due to the proximity to surrounding buildings, the PRIME (Plume Rise Model Enhancements) building downwash algorithm has been incorporated into the model to determine the influence (wake effects) of these buildings on dispersion in each direction considered. The PRIME algorithm takes into account the position of the stack relative to the building in calculating building downwash. In the absence of the building, the plume from the stack will rise due to momentum and/or buoyancy forces. Wind streamlines act on the plume leads to the bending over of the plume as it disperses. However, due to the presence of the building, wind streamlines are disrupted leading to a lowering of the plume centreline.

When there are multiple buildings, the building tier leading to the largest cavity height is used to determine building downwash. The cavity height calculation is an empirical formula based on building height, the length scale (which is a factor of building height & width) and the cavity length (which is based on building width, length and height). As the direction of the wind will lead to the identification of differing dominant tiers, calculations are carried out in intervals of 10 degrees.

In PRIME, the nature of the wind streamline disruption as it passes over the dominant building tier is a function of the exact dimensions of the building and the angle at which the wind approaches the building. Once the streamline encounters the zone of influence of the building, two forces act on the plume. Firstly, the disruption caused by the building leads to increased turbulence and enhances horizontal and vertical dispersion. Secondly, the streamline descends in the lee of the building due to the reduced pressure and drags the plume (or part of) nearer to the ground, leading to higher ground level concentrations. The model calculates the descent of the plume as a function of the building shape and, using a numerical plume rise model, calculates the change in the plume centreline location with distance downwind.

The immediate zone in the lee of the building is termed the cavity or near wake and is characterised by high intensity turbulence and an area of uniform low pressure. Plume mass captured by the cavity region is re-emitted to the far wake as a ground-level volume source. The volume source is located at the base of the lee wall of the building, but is only evaluated near the end of the near wake and beyond. In this region, the disruption caused by the building downwash gradually fades with distance to ambient values downwind of the building.

AERMOD has made substantial improvements in the area of plume growth rates in comparison to ISCST3[4,8]. ISCST3 approximates turbulence using six Pasquill-Gifford-Turner Stability Classes and bases the resulting dispersion curves upon surface release experiments. This treatment, however, cannot explicitly account for turbulence in the formulation. AERMOD is based on the more realistic modern planetary boundary layer (PBL) theory which allows turbulence to vary with height. This use of turbulence-based plume growth with height leads to a substantial advancement over the ISCST3 treatment.

Improvements have also been made in relation to mixing height[4,8]. The treatment of mixing height by ISCST3 is based on a single morning upper air sounding each day. AERMOD, however, calculates mixing height on an hourly basis based on the morning upper air sounding and the surface energy balance, accounting for the solar radiation, cloud cover, reflectivity of the ground and the latent heat due to evaporation from the ground cover. This more advanced formulation provides a more realistic sequence of the diurnal mixing height changes.

AERMOD also has the capability of modelling both unstable (convective) conditions and stable (inversion) conditions. The stability of the atmosphere is defined by the sign of the sensible heat flux. Where the sensible heat flux is positive, the atmosphere is unstable whereas when the sensible heat flux is negative the atmosphere is defined as stable. The sensible heat flux is dependent on the net radiation and the available surface moisture (Bowen Ratio). Under stable (inversion) conditions, AERMOD has specific algorithms to account for plume rise under stable conditions, mechanical mixing heights under stable conditions and vertical and lateral dispersion in the stable boundary layer.

AERMOD also contains improved algorithms for dealing with low wind speed (near calm) conditions. As a result, AERMOD can produce model estimates for conditions when the wind speed may be less than 1 m/s, but still greater than the instrument threshold.

APPENDIX II
Meteorological Data - AERMET

AERMOD incorporates a meteorological pre-processor AERMET[14]. AERMET allows AERMOD to account for changes in the plume behaviour with height. AERMET calculates hourly boundary layer parameters for use by AERMOD, including friction velocity, Monin-Obukhov length, convective velocity scale, convective (CBL) and stable boundary layer (SBL) height and surface heat flux. AERMOD uses this information to calculate concentrations in a manner that accounts for changes in dispersion rate with height, allows for a non-Gaussian plume in convective conditions, and accounts for a dispersion rate that is a continuous function of meteorology.

The AERMET meteorological preprocessor requires the input of surface characteristics, including surface roughness (z_0), Bowen Ratio and albedo by sector and season, as well as hourly observations of wind speed, wind direction, cloud cover, and temperature. A morning sounding from a representative upper air station, latitude, longitude, time zone, and wind speed threshold are also required.

Two files are produced by AERMET for input to the AERMOD dispersion model. The surface file contains observed and calculated surface variables, one record per hour. The profile file contains the observations made at each level of a meteorological tower, if available, or the one-level observations taken from other representative data, one record level per hour.

From the surface characteristics (i.e. surface roughness, albedo and amount of moisture available (Bowen Ratio)) AERMET calculates several boundary layer parameters that are important in the evolution of the boundary layer, which, in turn, influences the dispersion of pollutants. These parameters include the surface friction velocity, which is a measure of the vertical transport of horizontal momentum; the sensible heat flux, which is the vertical transport of heat to/from the surface; the Monin-Obukhov length which is a stability parameter relating the surface friction velocity to the sensible heat flux; the daytime mixed layer height; the nocturnal surface layer height and the convective velocity scale which combines the daytime mixed layer height and the sensible heat flux. These parameters all depend on the underlying surface.

The values of albedo, Bowen Ratio and surface roughness depend on land-use type (e.g., urban, cultivated land etc) and vary with seasons and wind direction. The assessment of appropriate land-use types is carried out in line with USEPA recommendations[5] and using the detailed methodology outlined by the Alaska Department of Environmental Conservation[16]. AERMET has also been updated to allow for an adjustment of the surface friction velocity (u*) for low wind speed stable conditions based on the work of Qian and Venkatram (BLM, 2011). Previously, the model had a tendency to over-predict concentrations produced by near-ground sources in stable conditions.

Surface Roughness

Surface roughness length is the height above the ground at which the wind speed goes to zero. Surface roughness length is defined by the individual elements on the landscape such as trees and buildings. In order to determine surface roughness length, the USEPA recommends that a representative length be defined for each sector, based on geometric mean of the inverse distance area-weighted land use within the sector, by using the eight land use categories outlined by the USEPA. The area-weighted surface roughness length derived from the land use classification within a radius of 1km from Casement Aerodrome is shown in Table A1.

Table A1 Surface Roughness based on an inverse distance area-weighted average of the land use within a 1km radius of Casement Aerodrome

Sector	Area Weighted Land Use Classification	Spring	Summer	Autumn	Winter[Note 1]
0-360	100% Grassland	0.050	0.100	0.010	0.010

Note 1: Winter defined as periods when surfaces covered permanently by snow whereas autumn is defined as periods when freezing conditions are common, deciduous trees are leafless and no snow is present (Iqbal (1983)). Thus for the current location autumn more accurately defines "winter" conditions at the proposed facility.

Albedo

Noon-time Albedo is the fraction of the incoming solar radiation that is reflected from the ground when the sun is directly overhead. Albedo is used in calculating the hourly net heat balance at the surface for calculating hourly values of Monin-Obuklov length. The area-weighted arithmetic mean albedo derived from the land use classification over a 10km x 10km area centred on Casement Aerodrome is shown in Table A2.

Table A2 Albedo based on an area-weighted arithmetic mean of the land use over a 10km x 10km area centred on Casement Aerodrome

Area Weighted Land Use Classification	Spring	Summer	Autumn	Winter[Note1]
0.5% Water, 30% Urban, 0.5% Coniferous Forest 38% Grassland, 19% Cultivated Land	0.155	0.180	0.187	0.187

Note 1: For the current location autumn more accurately defines "winter" conditions at the proposed facility.

Bowen Ratio

The Bowen ratio is a measure of the amount of moisture at the surface of the earth. The presence of moisture affects the heat balance resulting from evaporative cooling which, in turn, affects the Monin-Obukhov length which is used in the formulation of the boundary layer. The area-weighted geometric mean Bowen ratio derived from the land use classification over a 10km x 10km area centered on Casement Aerodrome is shown in Table A3.

Table A3 Bowen Ratio based on an area-weighted geometric mean of the land use over a 10km x 10km area centred on Casement Aerodrome

Area Weighted Land Use Classification	Spring	Summer	Autumn	Winter[Note1]
0.5% Water, 30% Urban, 0.5% Coniferous Forest 38% Grassland, 19% Cultivated Land	0.549	1.06	1.202	1.202

Note 1: For the current location autumn more accurately defines "winter" conditions at the proposed facility.