Environmental Impact Assessment Report

Development of Two Data Halls and Ancillary Structures

on lands adjacent to Huntstown Power Station, Huntstown, North Road (R135), Finglas, Dublin 11.

Volume 2 – EIA Report

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Prepared for: Huntstown Power Company Limited

TABLE OF CONTENTS

		Page No.
EIA VOLUME 1 – Non-Technical summary		
Non-technical Summary		
EIA VOLUME 2 – Environmental Impact Assessment Report		
1.0	**INTRODUCTION**	
1.1	PROPOSED DEVELOPMENT	1
1.1.1	CONSULTATION AND SCOPING	2
1.2	RELEVANT LEGISLATIVE REQUIRMENTS	3
1.2.1	Environmental Impact Assessment	3
1.2.2	Habitats and Birds Directive	3
1.2.3	Emissions to Air	4
1.2.4	Seveso Directive / COMAH Regulations	4
1.2.5	Integrated Pollution Prevention and Control / Industrial Emissions Directive	5
1.3	FORMAT OF THIS ENVIRONMENTAL IMPACT ASSESSMENT REPORT	5
1.3.1	Contributors to the Environmental Impact Assessment Report	6
1.4	DESCRIPTION OF EFFECTS	9
1.5	ADDITIONAL ASSESSMENTS REQUIRED	10
1.6	FORECASTING METHODS AND DIFFICULTIES IN COMPILING THE SPECIFIED INFORMATION	10
2	**DESCRIPTION OF THE PROPOSED DEVELOPMENT**	
2.1	INTRODUCTION	11
2.2	SUBJECT SITE CHARACTERISTICS	11
2.3	DESCRIPTIONS OF THE CHARACTERISTICS OF THE PROPOSED DEVELOPMENT	13
2.3.1	Detailed Description	15
2.4	DATA CENTRE FACILITY	16
2.5	DESCRIPTION OF DEVELOPMENT INPUTS & OTHER RELATED PROJECTS	16
2.5.1	Power Supply	16
2.5.2	Surface Water	17
2.5.3	Water Supply	17
2.5.4	Foul Water	17
2.5.5	Irish Water Pre-Connection Enquiry	17
2.5.6	Off-Site Parking	18
2.5.7	Site Preparation Works and Establishment of Construction Services	18
2.6	Other Related Projects	18
2.6.1	Undergrounding of Overhead 110kV lines	18
2.6.2	220kV GIS Substation	18
2.6.3	10kV Overhead Lines	18
2.7	CONSTRUCTION/OPERATIONAL STAFF	18
2.8	DEVELOPMENT OUTPUTS	19
2.9	DESIGN/DEVELOPMENT RATIONALE	20
2.10	CHARACTERISTICS OF THE CONSTRUCTION AND OPERATION PHASES	21
2.11	DECOMMISSIONING	25
2.12	MITIGATION MEASURES	26
2.13	SEVEO SITE	26

2.14	NOISE	26
2.15	SUSTAINABILITY	27
2.15.1	Use of Existing Infrastructure	27
2.15.2	Renewable Energy Generation	27
2.16	CUMULATIVE IMPACTS	27
3	**Planning Context**	
3.1	GOVERNMENT STATEMENT ON THE ROLE OF DATA CENTRES IN IRELAND'S ENTERPRISE STRATEGY (2018)	29
3.2	PROJECT IRELAND - NATIONAL PLANNING FRAMEWORK (2040)	29
3.2.1	Compliance with Key National Policy Objectives	29
3.3	REGIONAL SPATIAL AND ECONOMIC STRATEGY (2019-2031)	30
3.4	FINGAL COUNTY DEVELOPMENT 2017-2023	32
3.4.1	Rationale for the Proposed Development and Zoning Compliance	34
3.4.2	Outer Airport Noise Zone	39
3.4.3	Seveso Site	39
3.4.4	Design Guidelines for Business Parks and Industrial Areas	40
3.4.5	Parking	43
3.4.6	Energy Strategy and Sustainability	44
4	**ALTERNATIVES**	
4.1	INTRODUCTION	47
4.2	ALTERNATIVE LOCATIONS	48
4.3	ALTERNATIVE DESIGN AND LAYOUTS	49
4.3.1	Option 1	50
4.3.2	Option 2	52
4.3.3	Option 3	54
4.3.4	Option 4 - Chosen	55
4.4	ALTERNATIVE PROCESSES	60
4.5	DO-NOTHING ALTERNATIVE	60
4.6	CONCLUSION	61
5	**HUMAN HEALTH AND POPULATION**	
5.1	INTRODUCTION	62
5.2	METHODOLOGY	62
5.2.1	Assessment of Significance & Sensitivity	63
5.2.2	Magnitude of Impact	63
5.2.3	Significance of Effects	64
5.2.4	Study Area	64
5.3	EXISTING BASELINE CONDITIONS	65
5.3.1	Development Site Context	65
5.3.2	Population and Demographics	65
5.3.3	Socio-economics	66
5.3.4	Health	70
5.3.5	Natural Resources	71
5.3.6	Tourism	72
5.3.7	Major Accidents/Hazards	72
5.3.8	Social Infrastructure	73
5.3.9	Summary of Baseline Conditions	75

5.4	POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT	75
5.4.1	Potential Impacts on Businesses and Residences	76
5.4.2	Potential Impacts on Amenity and Tourism	76
5.4.3	Potential Impacts on Natural Resources and Material Assets	76
5.4.4	Potential Impacts on Human Health from Air Quality and Climate	77
5.4.5	Potential Impacts on Human Health from Noise and Vibration	77
5.4.6	Potential Impacts on Human Health from Traffic and Transportation	77
5.4.7	Potential Impacts on Health and Safety	78
5.5	REMEDIAL AND MITIGATION MEASURES	79
5.5.1	Construction Phase	79
5.5.2	Operational Phase	79
5.6	RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT	80
5.6.1	Impacts on Businesses and Residences	80
5.6.2	Impacts on Amenity and Tourism	80
5.6.3	Impacts on Human Health from Air Quality and Climate	80
5.6.4	Impacts on Human Health from Noise and Vibration	81
5.6.5	Impacts on Human Health from Traffic and Transportation	82
5.7	MONITORING/ REINSTATEMENT	82
5.8	REFERENCES	83
6	**LAND, SOILS, GEOLOGY AND HYDROGEOLOGY**	
6.1	INTRODUCTION	84
6.2	METHODOLOGY	84
6.2.1	Criteria for rating of effects	84
6.2.2	Sources of Information	85
6.3	RECEIVING ENVIRONMENT	87
6.3.1	General Description of the Site	87
6.3.2	Land Use	88
6.3.3	Soils	90
6.3.4	Subsoils	91
6.3.5	Bedrock Geology	92
6.3.6	Regional Hydrogeology	93
6.3.7	Aquifer Vulnerability	94
6.3.8	Groundwater Wells and Flow Direction	96
6.3.9	Soil Quality	98
6.3.10	Groundwater Quality	101
6.3.11	Economic Geology	103
6.3.12	Geological Heritage	103
6.3.13	Radon	103
6.3.14	Geohazards	103
6.3.15	Areas of Conservation	104
6.3.16	Conceptual Site Model	104
6.3.17	Rating of Importance of Geological and Hydrogeological Attributes	106
6.4	CHARACTERISTICS OF THE PROPOSED DEVELOPMENT	107
6.5	POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT	109
6.5.1	Construction Phase	109
6.5.2	Operational Phase	111
6.6	REMEDIAL AND MITIGATION MEASURES	111

6.6.1	Construction Phase	111
6.6.2	Operational Phase	114
6.7	RESIDUAL IMPACTS OF THE PROPOSED	115
6.7.1	Construction Phase	115
6.7.2	Operation Phase	115
6.8	MONITORING OR REINSTATEMENT	115
6.8.1	Construction Phase	115
6.8.2	Operational Phase	115
7	**HYDROLOGY**	
7.1	INTRODUCTION	116
7.2	METHODOLOGY	116
7.2.1	Criteria for rating of effects	116
7.2.2	Sources of Information	117
7.3	RECEIVING ENVIRONMENT	117
7.3.1	Hydrology	117
7.3.2	Surface Water Quality	120
7.3.3	Flood Risk	122
7.3.4	Areas of Conservation	122
7.3.5	Rating of Importance of Hydrological Attributes	123
7.4	CHARACTERISTICS OF THE PROPOSED DEVELOPMENT	123
7.4.1	Construction Phase	124
7.4.2	Operational Phase	124
7.5	POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT	127
7.5.1	Construction Phase	127
7.5.2	Operational Phase	128
7.6	REMEDIAL AND MITIGATION MEASURES	129
7.6.1	Construction Phase	129
7.6.2	Operational Phase	132
7.7	RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT	133
7.7.1	Construction Phase	133
7.7.2	Operational Phase	133
7.8	MONITORING OR REINSTATEMENT	133
7.8.1	Construction Phase	133
7.8.2	Operational Phase	134
8	**Biodiversity**	
8.1	INTRODUCTION	135
8.2	METHODOLOGY	135
8.2.1	Policy and Guidance	135
8.2.2	Habitat Survey	136
8.3	RECEIVING ENVIRONMENT	138
8.3.1	Designated Conservation Areas	138
8.3.2	NON-DESIGNATED HABITATS	141
8.3.3	Invasive Species	142
8.3.4	Fauna	142
8.3.5	Habitat Evaluation	144
8.4	CHARACTERISTICS OF THE DEVELOPMENT	144

8.5	POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT	145
8.5.1	Construction Phase	147
8.5.2	Operational Phase	147
8.6	REMEDIAL AND MITIGATION MEASURES	147
8.7	RESIDUAL IMPACTS OF THE DEVELOPMENT	149
8.8	MONITORING/REINSTATEMENT	149
8.9	REFERENCES	150
9	**AIR QUALITY & CLIMATE**	
9.1	INTRODUCTION	151
9.2	METHODOLOGY	151
9.2.1	Criteria for Rating of Impacts	151
9.2.2	Construction Phase	154
9.2.3	Operational Phase	155
9.3	RECEIVING ENVIRONMENT	160
9.3.1	Baseline Air Quality	161
9.3.2	Climate Baseline	162
9.4	CHARACTERISTICS OF THE PROPOSED DEVELOPMENT	162
9.4.1	Construction Phase	162
9.4.2	Operational Phase	163
9.5	POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT	163
9.5.1	Construction Phase	163
9.5.2	Operational Phase	164
9.5.3	Do Nothing Scenario	164
9.6	REMEDIAL AND MITIGATION MEASURES	165
9.6.1	Construction Phase	167
9.6.2	Operational Phase	167
9.7	RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT	168
9.7.1	Construction Phase	168
9.7.2	Operational Phase	168
9.8	MONITORING/REINSTATEMENT	174
9.1	REFERENCES	175
10	**NOISE & VIBRATION**	
10.1	INTRODUCTION	177
10.2	METHODOLOGY	178
10.2.1	Methodology Overview	178
10.2.2	Fundamentals of Acoustics	179
10.2.3	Significance of Impacts	179
10.2.4	Construction Phase Guidance	179
10.2.5	Operational Phase – Noise Guidance	182
10.2.6	Operational Phase – Vibration Guidance	186
10.2.7	Forecasting Methods	186
10.3	RECEIVING ENVIRONMENT	186
10.3.1	Comment on Noise Levels	186
10.4	CHARACTERISTICS OF THE DEVELOPMENT	188
10.5	POTENTIAL IMPACTS OF THE DEVELOPMENT	189
10.5.1	Construction Phase	189

10.5.2	Operational Phase	199
10.6	REMEDIAL AND MITIGATION MEASURES	202
10.6.1	Construction Phase	202
10.6.2	Operational Phase	203
10.7	RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT	203
10.7.1	Construction Phase	203
10.7.2	Operational Phase	203
10.8	MONITORING/REINSTATEMENT	204
10.9	REFERENCES	205
11	**LANDSCAPE AND VISUAL IMPACT ASSESSMENT**	
11.1	INTRODUCTION	206
11.2	METHODOLOGY	206
11.3	RECEIVING ENVIRONMENT	206
11.3.1	Site Context and Description	206
11.3.2	Characteristics of the Site and Environs	208
11.3.3	Landscape Planning	209
11.3.4	Summary of Significance and Sensitivity of the Existing Landscape and Visual Environment	210
11.4	CHARACTERISTICS OF THE PROPOSED DEVELOPMENTS	210
11.5	POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT	211
11.5.2	Construction Phase	211
11.5.3	Operational Phase	212
11.5.4	Summary of Potential Impacts	213
11.6	REMEDIAL AND MITIGATION MEASURES	214
11.6.1	Incorporated Design Mitigation	214
11.6.2	Construction Phase Mitigation	214
11.6.3	Operational Phase Mitigation	214
11.7	RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT	215
11.8	MONITORING/REINSTATEMENT	220
12	**ARCHAEOLOGICAL, ARCHITECTURAL AND CULTURAL HERITAGE**	
12.1	INTRODUCTION	221
12.2	METHODOLOGY	221
12.2.1	Recorded archaeological sites and monuments	221
12.2.2	Recorded archaeological finds	222
12.2.3	Recorded archaeological excavations	222
12.2.4	Architectural heritage	222
12.2.5	Cartographic sources	222
12.2.6	Griffith’s valuation	223
12.2.7	Aerial photography	223
12.2.8	County development plan	223
12.2.9	Historical research	223
12.2.10	Previous assessment	223
12.2.11	On-going assessment	223
12.3	RECEIVING ENVIRONMENT	224
12.3.1	Archaeological, Architectural and Cultural Background	224
12.3.2	Geological Survey	232
12.3.3	Archaeological testing	233

12.4	CHARACTERISTICS OF THE DEVELOPMENT	235
12.5	POTENTIAL IMPACTS OF THE DEVELOPMENT	236
12.5.1	Construction Phase	236
12.5.2	Operational Phase	237
12.6	REMEDIAL AND MITIGATION MEASURES	237
12.6.1	Construction Phase	237
12.6.2	Operational Phase	237
12.7	PREDICTED IMPACTS OF THE DEVELOPMENT	237
12.7.1	Construction Phase	237
12.7.2	Operational Phase	238
12.8	MONITORING/REINSTATEMENT	238
12.11	REFERENCES	239
13	**TRAFFIC AND TRANSPORTATION**	
13.1	INTRODUCTION	240
13.2	METHODOLOGY	240
13.3	RECEIVING ENVIRONMENT	240
13.3.1	Existing Road Access	240
13.3.2	Existing Public Transport	242
13.3.3	Road Safety	243
13.3.4	Existing Traffic Flow	243
13.3.5	Committed Development	244
13.3.6	Proposed Road Network Improvements	245
13.4	CHARACTERISTICS OF THE DEVELOPMENT	246
13.4.1	Construction phase	246
13.4.2	Operational Phase	249
13.5	POTENTIAL IMPACTS OF THE DEVELOPMENT	252
13.5.1	Construction Phase	252
13.5.2	Junction Assessments	254
13.5.3	Operational Phase	258
13.6	REMEDIAL AND MITIGATION MEASURES	263
13.6.1	Construction Phase	263
13.6.2	Operational Phase	264
13.7	RESIDUAL IMPACTS OF THE DEVELOPMENT	264
13.7.1	Construction Phase	264
13.7.2	Operational Phase	265
13.8	MONITORING OR REINSTATEMENT	265
14	**MATERIAL ASSETS**	
14.1	INTRODUCTION	266
14.2	METHODOLOGY	266
14.3	RECEIVING ENVIRONMENT and CHARACTERISTICS OF THE PROPOSED DEVELOPMENT	267
14.3.1	Land Use, Property, and Access	267
14.3.2	Power, Electrical, and Gas Supply	267
14.3.3	Surface Water Infrastructure	268
14.3.4	Foul Drainage Infrastructure	269
14.3.5	Potable Water Supply	270
14.3.6	Telecommunications	271

14.4	POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT	271
14.4.1	Land Use, Property, and Access	271
14.4.2	Power and Electrical Supply	272
14.4.3	Surface Water Infrastructure	273
14.4.4	Foul Drainage Infrastructure	273
14.4.5	Water Infrastructure	274
14.4.6	Telecommunications	274
14.5	REMEDIAL AND MITIGATION MEASURES	274
14.5.1	Construction Phase	275
14.5.2	Operational Phase	275
14.6	RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT	275
14.6.1	Construction Phase	275
14.6.2	Operational Phase	275
14.7	MONITORING AND/OR REINSTATEMENT	276
15	**WASTE MANAGEMENT**	
15.1	INTRODUCTION	277
15.2	METHODOLOGY	277
15.2.1	Legislation and Guidance	278
15.3	RECEIVING ENVIRONMENT	278
15.4	CHARACTERISTICS OF THE DEVELOPMENT	279
15.4.1	Demolition Phase	280
15.4.2	Construction Phase	280
15.4.3	Operational Phase	282
15.5	POTENTIAL IMPACTS OF THE DEVELOPMENT	283
15.5.1	Construction Phase	283
15.5.2	Operational Phase	284
15.6	REMEDIAL AND MITIGATION MEASURES	285
15.6.1	Construction Phase	285
15.6.2	Operational Phase	286
15.7	RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT	287
15.7.1	Construction Phase	287
15.7.2	Operational Phase	287
15.8	MONITORING AND/OR REINSTATEMENT	287
15.8.1	Construction Phase	287
15.8.2	Operational Phase	288
15.8.3	Reinstatement	288
15.9	REFERENCES	289
16	**CUMULATIVE IMPACTS**	
16.1	INTRODUCTION	291
16.2	METHODOLOGY	291
16.3	RECEIVING ENVIRONMENT	292
16.3.1	Permitted Development and Existing Local Land Uses	292
16.3.2	Concurrent Development	294
16.3.3	Future Development	294
16.4	ASSESSMENT OF POTENTIAL CUMULATIVE IMPACTS	295
16.4.1	Human Health and Populations	295

16.4.2 Land, Soils, Geology and Hydrogeology 296
16.4.3 Hydrology 267
16.4.4 Biodiversity 268
16.4.5 Air Quality and Climate 299
16.4.6 Noise and Vibration 300
16.4.7 Landscape and Visual Impact 300
16.4.8 Archaeology and Cultural Heritage 301
16.4.9 Traffic and Transportation 301
16.4.10 Material Assets 302
16.4.11 Waste Management 303

17 INTERACTIONS – INTERRELATIONSHIPS BETWEEN THE ASPECTS
17.1 INTRODUCTION 305
17.2 DISCUSSION – POSITIVE IMPACTS 305
17.2.1 Planning and Alternatives on; 305
17.3 DISCUSSION – NEUTRAL IMPACTS 305
17.3.1 Population and Human Health and; 306
17.3.2 Land, Soils, Geology and Hydrogeology and: 307
17.3.3 Hydrology and; 308
17.3.4 Biodiversity and; 309
17.4 DISCUSSION – NEGATIVE IMPACTS 309
17.4.1 Population and Human Health and; 309
17.4.2 Biodiversity and; 310
17.5 SUMMARY 310
17.6 TABLE OF INTERACTIONS 311

EIA VOLUME 3 – EIA APPENDICES

Appendix 5.1 COMAH Land Use Planning Assessment
Appendix 6.1 NRA Criteria For Rating The Magnitude And Significance Of Impacts At EIA Stage
Appendix 6.2 Trial Pits and Borehole Logs
Appendix 6.3 Soil and Groundwater Quality Results
Appendix 6.4 Laboratory Results
Appendix 6.5 Outline Construction Environmental Management Plan
Appendix 7.1 Criteria for Rating the Magnitude and Significance of Impacts at EIA
Appendix 7.2 Flood Risk Assessment
Appendix 8.1 Appropriate Assessment Screening Report
Appendix 8.2 Bat Survey Report
Appendix 8.3 Amphibian Survey
Appendix 9.1 Description of the Aermod Model
Appendix 9.2 Description Of AERMET
Appendix 9.3 Operational Phase Cumulative Impact Assessment
Appendix 10.1 Glossary of Acoustic Terminology
Appendix 10.2 Baseline Noise Monitoring Survey
Appendix 10.3 Noise Modelling Details & Assumptions
Appendix 10.4 Indicative Construction Noise & Vibration Management Plan

Appendix 10.5 Noise Model Parameters
Appendix 11.1 Photomontage Production – Digital Dimensions.
Appendix 11.2 Arborist Report
Appendix 12.1 Recorded Archaeological Monuments
Appendix 12.2 Recorded Archaeological Finds
Appendix 12.3 Excavations
Appendix 12.4 Griffith's Valuation
Appendix 12.5 Method Statement Summary For Additional Archaeological Testing
Appendix 12.6 Copy of Licenses as Issued by The National Monuments Service
Appendix 13.1 Tracsis Traffic Data
Appendix 13.2 Traffic Data
Appendix 13.3 PICADY Report
Appendix 14.1 Pre-Connection Enquiry
Appendix 14.2 Engineering Planning Report – Drainage and Water Services
Appendix 15.1 Construction & Demolition Waste Management Plan

1.0 INTRODUCTION

1.1 PROPOSED DEVELOPMENT

This Environmental Impact Assessment Report (EIAR) has been prepared on behalf of Huntstown Power Company Limited herein referred as ‘the Applicant’ to accompany a planning application to Fingal County Council (FCC).

The proposal comprises the demolition of two residential properties fronting the R135 (North Road), and the development of 2 no. data hall buildings arranged over three storeys and associated structures and infrastructure.

The development will be accessed from the R135 (North Road) from the east. An emergency/secondary entrance will be provided via the Roadstone Huntstown Quarry and Huntstown Power Station access road to the south-west. Temporary access for construction works and to enable a phased delivery of the development is proposed through an existing site entrance off the North Road.

Associated structures and infrastructure including water treatment facility, sprinkler tanks, external plant equipment, emergency generators and diesel fuel storage, vehicular access roads, car and bicycle parking, attenuation ponds and sustainable urban drainage measures, underground foul and storm water drainage network, associated landscaping and boundary treatment works.

The Proposed Development site is c. 13.3 hectares of predominantly greenfield land to the north west of the M50 orbital ring in the townland of Johnstown and Coldwinters, North Road, Finglas, Dublin 11. The surrounding area is characterised by a variety of energy, industrial, commercial, quarrying, agricultural and residential uses. The subject site is generally bounded to the north by the Dogs Trust (Dog Rescue and Rehoming Charity), to the south by a vehicular entrance leading to the Huntstown Quarry and further south west by the Huntstown Bioenergy Plant, to the east by the North Road (R135) and two residential properties fronting the R135 which form part of the subject site and to the west by Huntstown Power Station.

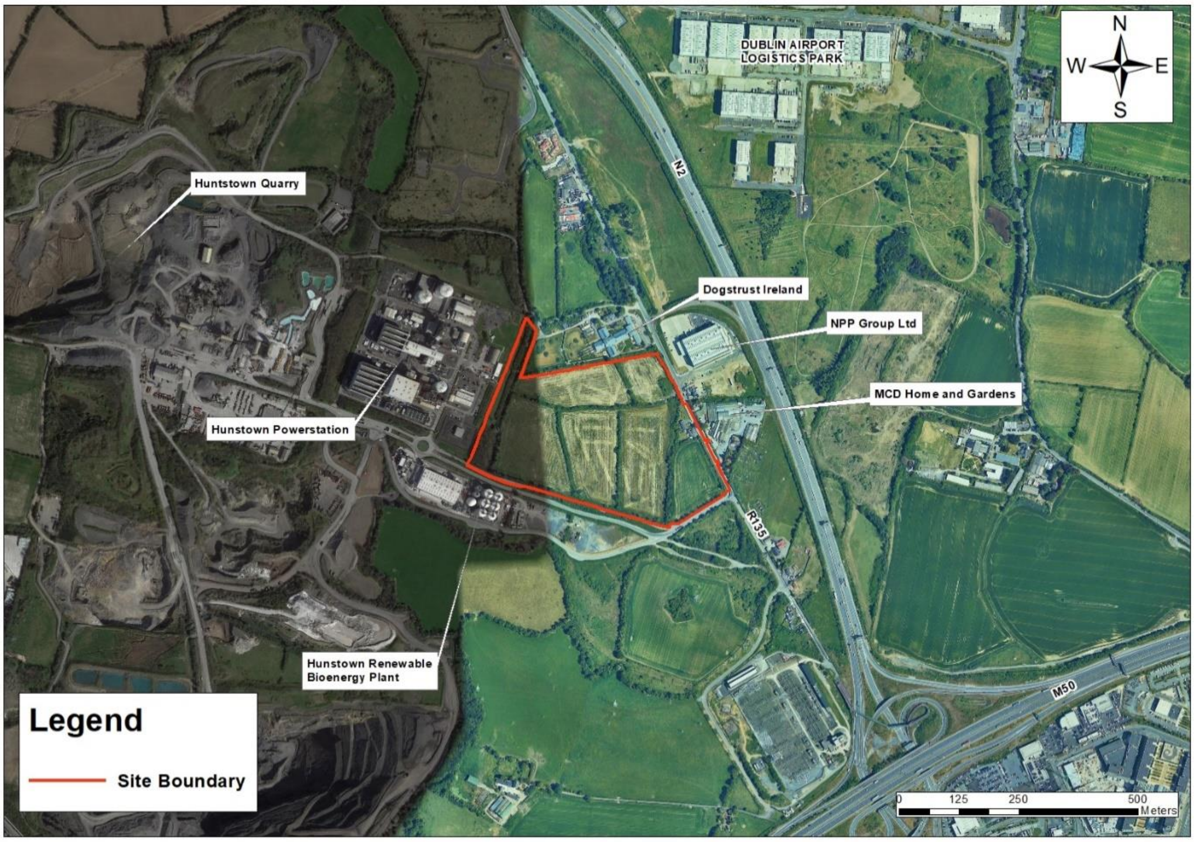

Figure 1.1 *Proposed Development Lands (Red boundary) (Source: Google Earth)*

A detailed description of the Proposed Development and the development site context is presented in: Chapter 2 (Description of Development), Chapter 3 (Planning and Development Context), and the included planning documentation. This EIAR should be read in conjunction with all the particulars of the planning applications.

The future 220kV substation compound and subsurface grid connection will form part of a separate Strategic Infrastructure Development (SID) application to An Bord Pleanála (ABP) any such application will be subject to EIA as required. Consultation has been undertaken with ABP reference number (ABP-306723-20) and they have confirmed that the proposed development falls within the scope of section 182A of the Planning and Development Act, 2000 as amended. ABP has determined that the 220kV substation and subsurface grid connection would be strategic infrastructure within the meaning of section 182A of the Planning and Development Act, 2000, as amended.

1.1.1 Consultation and Scoping

The current application has been subject to a formal pre-application consultation meeting with the Fingal County Council (FCC). The application reflects and responds to the points of discussion during the course of the pre-application consultations with FCC, Irish Water, Dublin Airport, National Monuments Service, Eirgrid, ESB, etc.

The scope of the EIAR has been defined at an early stage of the planning process in order to identify and ensure that the environmental studies address all the relevant issues. This included a review of the context of the development site, locality, and previously permitted development on site, and of the development proposed to identify the matters to be covered within this environmental impact assessment.

1.2 RELEVANT LEGISLATIVE REQUIREMENTS

1.2.1 Environmental Impact Assessment

An Environmental Impact Assessment (EIA) is the process of examining the anticipated environmental effects of a proposed project. The Environmental Impact Assessment Report (EIAR) is prepared by the developer and is submitted to a Planning Authority as part of the Planning Permission process.

The requirement for EIA for certain types and scales of development is listed in Annex I and Annex II of the EIA Directive (2011/92/EU and 2014/52/EU), and transposed into Section 5 (Parts 1 and 2) of the *Planning and Development Regulations 2001 to 2019*.

The EIA Directive lists projects for which an EIA is mandatory (Annex I) and those projects for which an EIA may be required (Annex II). The EU Member States can choose to apply thresholds for Annex II projects or use a case-by-case examination, or a combination of both, to assess where EIA is required. In Ireland, a combination of both has been applied. Annex I and Annex II of the EIA Directive has this has been Transposed to Schedule 5 of the *Planning and Development Regulations as amended*.

The proposed project and all components of the project have been reviewed against Schedule 5 (Parts 1 and 2) of the *Planning and Development Regulations 2001 as amended.* The development is not listed under Part 1; the most relevant threshold as set out in the Part 2 for the Proposed Development is:

10. Infrastructure projects

(b)(iv) Urban development which would involve an area greater than 2 hectares in the case of a business district, 10 hectares in the case of other parts of a built-up area and 20 hectares elsewhere.

Whereby, the Proposed Development exceeds 10 ha of development ‘in other built up areas’. This EIAR describes the findings of the EIA process to the Planning Authority, to help determine if consent should be granted. It also informs statutory consultees, other interested parties, and the public in general, about the likely effects of the project on the environment.

1.2.2 Habitats and Birds Directive

The Birds Directive (2009/147/EC) and the Habitats Directive (92/42/EEC) put an obligation on EU Member States to establish the Natura 2000 network of sites of highest biodiversity importance for rare and threatened habitats and species.

Natura 2000 sites in Ireland are European sites, including Special Protection Areas (SPAs), and Special Areas of Conservation (SACs).

The Directives set out a key protection mechanism to consider the possible nature conservation implications of any plan or project on the Natura 2000 site network before any decision is made to allow that plan or project to proceed; the process known as Appropriate Assessment (AA).

An AA (Stage 1) Screening comprises an initial impact assessment of a project; examining the direct and indirect impacts that it might have on its own or in combination with other plans and projects, on one or more Natura 2000 sites in view of the sites’ conservation objectives. An AA Screening has been undertaken for this the results of which are presented in the Appendix to Chapter 8 (Biodiversity).

1.2.3 Emissions to Air

Medium Combustion Plant Directive

The European Union (Medium Combustion Plant) Regulations 2017 were signed into Irish law in December 2017. Their purpose is to limit emissions to atmosphere from boilers and other stationary combustion plants in the 1-50 Megawatt Thermal Input (MWth) range. It covers all fuel types. The Regulations transpose the Medium Combustion Plant (MCP) Directive (EU 2015/2193) which was adopted in 2015.

The stationary combustion plants on site (emergency generators) will exceed 1 MWth, in accordance with the legislation this plant will be registered in advance of the commissioning phase as required with the Environmental Protection Agency (EPA).

Emissions Trading Directive

The EU committed to a reduction of greenhouse gas emissions; this is being implemented by the EU Emissions Trading Directive (Directive 2003/87/EC). The EPA has been given the responsibility for implementing the Emissions Trading Directive in Ireland. The Directive establishes an allowance-trading scheme for emissions to promote reductions of greenhouse gases, in particular carbon dioxide.

The trading scheme applies to facilities with:

Combustion installations with a rated thermal input exceeding 20 MW

The rated thermal input of relevant on-site fuel consuming equipment (emergency generators) will exceed 20 MWth; therefore, a Greenhouse Gas (GHG) Permit is required for the operational phase of the proposed development. The GHG permit will be applied for by the operator in advance of the commissioning phase, as and when the site fuel consuming equipment exceeds a rated thermal input of 20 MW.

1.2.4 Seveso Directive / COMAH Regulations

The Seveso Directive (Directive 82/501/EEC, Directive 96/82/EC, Directive 2012/18/EU) was developed by the EU after a series of catastrophic accidents involving major industrial sites and dangerous substances. Such accidents can give rise to serious injury to people or serious damage to the environment, both on and off the site of the accident. The Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (the "COMAH Regulations"), implement the latest Seveso III Directive (2012/18/EU).

The purpose of the COMAH Regulations is to transpose the Seveso Directive into Irish law and lay down rules for the prevention of major accidents involving dangerous substances, and to seek to limit as far as possible the consequences for human health and the environment of such accidents, with the overall objective of providing a high level of protection in a consistent and effective manner.

The Proposed Development is located directly adjoining to the combined cycle gas turbine power plant owned and operated by Gensys Power Ltd. The power station is a notified lower tier Seveso site, and the proposed development site is located within the consultation distance of this site.

The only substance stored at the Proposed Development site controlled under Seveso/COMAH will be diesel for the emergency generators. The amounts proposed do not exceed the relevant thresholds of the Seveso directive. The Proposed Development will not be a Seveso/COMAH facility or an extension of the existing facility. Under the COMAH directive a Land Use Planning assessment been developed and is included with the planning documentation.

1.2.5 Integrated Pollution Prevention and Control / Industrial Emissions Directive

The Integrated Pollution Prevention and Control (IPPC) Directive was transposed into Irish law by the Protection of the Environment Act, 2003, and the Industrial Emissions Directive 2010/75/EU under the European Union (Industrial Emissions) Regulations 2013, S.I. 138 of 2013.

These Regulations primarily amend the EPA Act 1992 to introduce a system of licensable activities from both the Integrated Pollution Prevention and Control (IPPC) and Industrial Emissions (IE) directives. First Schedule of EPA Act lists the activities that are licensable.

A review of the proposed development against the First Schedule of EPA Act 1992, and the EPA Licencing Teams interpretation of this schedule has determined that the operational phase of the proposed development is not IPPC or IE licensable activity. Therefore, the proposed developments will not require an EPA Licence.

1.3 FORMAT OF THIS ENVIRONMENTAL IMPACT ASSESSMENT REPORT

This EIA Report has been developed in accordance with the most relevant guidance, including:

- EIA Directive (2011/92/EU) as amended by EIA Directive (2014/52/EU)
- Planning and Development Act 2000 (as amended)
- Planning and Development Regulations 2001 (as amended)
- *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment* (Department of Housing, Planning and Local Government, 2018)
- *Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2017)
- *Guidance on the preparation of the Environmental Impact Assessment Report* (European Union, 2017)
- *Draft Advice Notes for Preparing Environmental Impact Statements* (EPA, 2015)

This report has been laid out using the grouped format structure, the EIA Report examines each environmental aspect in a separate chapter. Each specialist chapter generally covers the following for the construction and operational phases:

- Assessment Methodology;
- Receiving Environment;
- Characteristics of the Proposed Development;
- Potential Impacts of the Proposed Development;
- Remedial and Mitigation Measures;
- Predicted Impacts of the Proposed Development
- Monitoring or Reinstatement; and

A Non-Technical Summary of the findings of the EIA Report is provided as a separate document. Chapter 16 considers the potential cumulative impact of the proposed development with the any future development (as far as practically possible) on the site and the cumulative impacts with developments in the locality (including planned and permitted developments). Chapter 17 of this report shows where Interactions have been identified and how they have been addressed.

1.3.1 Contributors to the Environmental Impact Assessment Report

The preparation and co-ordination of this EIAR has been completed by AWN Consulting in conjunction with specialist subconsultants.

The table below indicates outlines the chapters of this EIAR and the specialist input for each chapter.

Table 1.1 *Roles and Responsibilities in the EIA Report*

Role	Contributor
Architectural	Henry J Lyon
Mechanical and Electrical Engineering	Ethos Engineering
Civil Engineering	CSEA
Planning Consultant	Brock McClure
Environmental Impact Assessment	AWN Consulting Limited

Chapter No.	Chapter Title	Consultant
	Non-Technical Summary	AWN – Input from each specialist
Chapter 1	Introduction	AWN – Jonathan Gauntlett
Chapter 2	Description of the Proposed Development	Brock McClure - Suzanne McClure
Chapter 3	Planning Context	Brock McClure - Suzanne McClure
Chapter 4	Alternatives	Brock McClure - Suzanne McClure
Chapter 5	Population and Human Health	AWN – Jonathan Gauntlett
Chapter 6	Land, Soils, Geology and Hydrogeology	AWN – Marcelo Allende
Chapter 7	Hydrology	AWN – Marcelo Allende
Chapter 8	Biodiversity (including AA Screening Report)	Moore Group – Ger O'Donohoe
Chapter 9	Air Quality and Climate	AWN – Edward Porter
Chapter 10	Noise and Vibration	AWN – Damian Kelly
Chapter 11	Landscape and Visual	KLFA – Kevin Fitzpatrick
Chapter 12	Archaeological, Architectural and Cultural Heritage	CRDS Ltd. – Dr Stephen Mandal
Chapter 13	Traffic and Transportation	CST – Phillip Bayfield
Chapter 14	Waste Management	AWN – Jonathan Gauntlett
Chapter 15	Material Assets	AWN – Jonathan Gauntlett
Chapter 16	Cumulative Impacts	AWN – Input from each specialist
Chapter 17	Interactions	AWN – Input from each specialist

Project Director, Dr Fergal Callaghan, Fergal is the Director with responsibility for Licensing with AWN Consulting. He undertakes consultancy in all aspects of environmental licensing and water quality, wastewater and sludge treatment with respect to water quality input to EIA. Extensive experience of soils assessment and contaminated land assessment, including site investigation strategies and risk assessment. Extensive experience of the impact of the Seveso III directive on the planning process. B.Sc. (Industrial Biochemistry) and Ph.D. Chemical Engineering (Waste and Wastewater Treatment). A Chartered Waste Manager (MCIWM), Associate Member of The Institution of Chemical Engineers (AMIChemE), Member of the Environmental Protection Subject Group, IChemE, Graduate Member of The Chartered Institute of Water and Environmental Management, a Member of the IChemE Water Group, a Member of the International Water Association (IWA) and a Member of the European Water Association. 27 years engineering and consultancy experience in the Irish, UK and European environmental industry.

EIA Co-ordinator/Selected Chapters, Jonathan Gauntlett Jonathan is an Environmental Consultant in AWN Consulting with ongoing roles in impact assessment, licensing, environmental compliance and project management. Recent projects include; SID and planning applications for ICT facilities; EPA Licence applications for biopharma and ICT facilities. Jonathan has over 9 years' experience in environmental compliance, planning and management of Environmental Impact Assessments, licensing, and urban planning. Jonathan has a BSocSc (Environmental Planning) and BBA (Economics) from the Waikato University in New Zealand and has experience working in the environmental consultancy, planning, and regulatory fields from Ireland, the UK and New Zealand.

Description of the Proposed Development, **Planning and Development Context**, **Alternatives**, **Suzanne McClure,** Suzanne is a founding partner of Brock McClure Consultants. With over 15 years planning experience in both the public and private sector, Suzanne has worked on a wide range of projects spanning across both statutory and strategic planning fields. Suzanne began her career in Local Government before moving to a Town Planning Consultancy in 2003. Suzanne's varied background allows her to bring commercial acumen and practical advice to all facets of the planning and development process. Suzanne has extensive experience in leading multi-disciplinary teams in the preparation of planning applications for large scale developments. She also has significant experience in the preparation of Environmental Impact Statements. Suzanne is a Corporate Member of the Irish Planning Institute and Royal Town Planning Institute.

Land, Soils, Geology, Hydrogeology and Hydrology, Marcelo Allende is an Environmental Consultant at AWN with over 15 years of experience in Environmental Consulting and water resources. Marcelo holds a degree in Water Resource Civil Engineering from the University of Chile. He has worked on a wide of range of projects including multi-aspect environmental investigations, groundwater resource management, hydrological and hydrogeological conceptual and numerical modelling, due diligence reporting, surface and groundwater monitoring and field sampling programmes on a variety of brownfield and greenfield sites throughout Ireland as well as overseas in Chile, Argentina, Peru and Panama.

Biodiversity/Appropriate Assessment, Ger O'Donohoe. Ger is a Consultant Ecologist with Moore Group. Ger graduated from GMIT in 1993 with a B.Sc. in Applied Freshwater and Marine Biology and completed an M.Sc. in Environmental Sciences, graduating from TCD in 1999. Ger has over 20 years of experience as an environmental consultant with experience in the planning and management of numerous complex Environmental Impact Assessments for large scale developments nationwide. He has wide ranging experience as an expert witness at public hearings.

Air Quality and Climate, Dr. Edward Porter is Director with responsibility for Air Quality with AWN Consulting. He holds a BSc from the University of Sussex (Chemistry), has completed a PhD in Environmental Chemistry (Air Quality) in UCD where he graduated in 1997 and is a Full Member of the Royal Society of Chemistry (MRSC CChem), the Institute of Environmental Sciences (MIEnvSc) and the Institute of Air Quality Management (MIAQM). He specialises in the fields of air quality, EIA and air dispersion modelling.

Noise and Vibration, Damian Kelly is a Director and Principal Acoustic Consultant holds a BSc from DCU and an MSc from Queens University Belfast. He has over fourteen years experience as an acoustic consultant. He is a member of the Institute of Acoustics. He has extensive knowledge in the field of noise modelling and prediction, having prepared the largest and most complex examples of road and industrial noise models currently in existence in Ireland. He was also co-author of the EPA document “Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities” (2012) and advised in relation to the noise limits applied to commercial developments by the various local authorities in the Dublin region.

Landscape and Visual Impact, Kevin Fitzpatrick, BA(Hons) Land Arch, MLA, MILI. Kevin is a corporate member of the Irish Landscape Institute. Kevin is the Principal of Kevin Fitzpatrick Landscape Architecture with over 15 years’ experience in landscape and visual Impact assessment for inclusion in EIAR. He has provided visual assessment and specialist landscape analysis and design input to numerous EIA Reports.

Archaeological, Architectural and Cultural Heritage, Dr Stephen Mandal (MIAI PGeo EurGeol) is co-founder (in 1997) and managing director of CRDS Ltd. Stephen holds an honours science degree in Geology (1991) and a PhD in Geoarchaeology He is professional member of the Institute of Archaeologists of Ireland, the Institute of Geologists of Ireland, and the European Federation of Professional Geologists. CRDS is an award-winning leader in undertaking the cultural heritage components of large-scale impact assessments and has a diverse project portfolio. CRDS has undertaken a wide variety of archaeological, architectural and cultural heritage assessments for quarries including desk-based studies, archaeological impact assessments, pre-development testing, monitoring and excavation.

Traffic and Transportation, Phillip Bayfield (BE MSc CEng MIEI MICE). Phillip is a Chartered Engineer with over 30 years’ experience in the industry. He has overseen civil and structural engineering design of variety of projects including several road and bridge schemes, commercial, educational, public and residential buildings as well as works in the public domain and has been responsible for project team management, resourcing, programming and account management. Projects include the Sutherland School of Law Enabling Works Contract on behalf of UCD, Thornton Hall Access Road and Thornton Hall Offsite Works projects on behalf of the Irish Prison Service, Scotch Hall Development, Kildare Civic Offices infrastructure and Beacon Gateway. Philip is also an experienced PSDP coordinator.

1.4 DESCRIPTION OF EFFECTS

The quality, magnitude and duration of potential impacts are defined in accordance with the criteria provided in the *Guidelines on Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2017) this criteria is duplicated in Table 1.2.

Table 1.2 *Schedule of Impacts following EPA Guidelines*

Characteristic	Term	Description
Quality of Effects	Positive	A change which improves the quality of the environment
	Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative	A change which reduces the quality of the environment
Describing the Significance of Effects	Imperceptible	An impact capable of measurement but without noticeable consequences
	Not significant	An effect which causes noticeable changes in the character of the environment but without noticeable 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 the majority of a sensitive aspect of the environment.
	Profound	An impact which obliterates sensitive characteristics
Describing the Extent and Context of Effects	Extent	Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.
	Context	Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)
Describing the Probability of Effects	Likely Effects	The effects that can reasonably be expected to occur as a result of the planned project if all mitigation measures are properly implemented.
	Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Describing the Duration and Frequency of Effects	Momentary Effects	Effects lasting from seconds to minutes
	Brief Effects	Effects lasting less than a day
	Temporary Effects	Effects lasting less than a year
	Short-term Effects	Effects lasting one to seven years.
	Medium-term Effects	Effects lasting seven to fifteen years
	Long-term Effects	Effects lasting fifteen to sixty years
	Permanent Effects	Effects lasting over sixty years
	Reversible Effects	Effects that can be undone, for example through remediation or restoration

Characteristic	Term	Description
	Frequency of Effects	Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)
Type of Effects	Indirect Effects	Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
	Cumulative	The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
	‘Do Nothing’	The environment as it would be in the future should no development of any kind be carried out
	`Worst case’ Effects	The effects arising from a project in the case where mitigation measures substantially fail
	Indeterminable	When the full consequences of a change in the environment cannot be described
	Irreversible	When the character, distinctiveness, diversity, or reproductive capacity of an environment is permanently lost
	Residual	Degree of environmental change that will occur after the proposed mitigation measures have taken effect
	Synergistic	Where the resultant impact is of greater significance than the sum of its constituents

1.5 ADDITIONAL ASSESSMENTS REQUIRED

This section addresses the additional approvals and assessments and reports required under other EU Directives, legislation, and the Planning Authority.

- **Land Use Planning (LUP) –** under the COMAH directive a LUP assessment has been produced and is included with the planning documentation and as Appendix 5.1 to Chapter 5 (Population and Human Health).
- **Flood Risk Assessment (FRA)** - A site specific FRA has been undertaken by CSEA and is included with the planning documentation and as Appendix 7.2 to Chapter 7 (Hydrology).
- **Appropriate Assessment (AA) Screening Report** has been undertaken and is included with the planning documentation and as Appendix 8.1 to Chapter 8 (Biodiversity).

1.6 FORECASTING METHODS AND DIFFICULTIES IN COMPILING THE SPECIFIED INFORMATION

Forecasting methods and evidence used to identify and assess the significant effects on the environment for each environmental aspect are set out in each chapter.

There were no significant difficulties in compiling the specified information for this EIA Report. Any issues encountered during the assessment of individual factors are noted within the relevant chapters.

2.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT

2.1 INTRODUCTION

This chapter provides a description of the subject site, receiving environment and proposed development.

A systematic approach in accordance with the Draft Guidelines on the Information to be Contained in EIARs (2017), Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018), and other EIA guidance documents was used to ensure all relevant aspects of the development are accurately and fully described. The objective is to provide a description of the proposed development in sufficient detail, which when taken together with the description of the existing environment provided, will allow an independent reader without acquired technical environmental knowledge, to understand the significant impacts likely to arise from the proposed development.

The description of the proposed development is described in this chapter in terms of those environmental topics that will form the basis of the impact assessment process and the characteristics of the proposed development which could potentially affect human beings, soil, water, climate, air, flora, fauna, landscape, archaeology, and cultural heritage. Chapter 16 specifically addresses interactions between all environmental factors in this regard.

The EIA Directive also requires that the description of the site, design, size or scale of the development, considers all relevant phases of the existence of the project from its construction through to its existence and operation (and where applicable its restoration or decommissioning).

This EIAR document fully reflects the key environmental factors of the proposed development which were recognised from the scoping carried out by the design team and the level of detail required will vary considerably according to the sensitivity of the existing environment and the potential of the project for significant effects.

2.2 SUBJECT SITE CHARACTERISTICS

The subject site is located to the north west of the M50 orbital ring in the townland of Huntstown, North Road, Finglas, Dublin 11. The overall site extends over 13.3 ha comprising of mainly greenfield (agricultural) lands and existing residential dwellings located within the administrative area of Fingal County Council (Blanchardstown Division).

The site features a hedgerow denoting the townland boundary between Johnstown and Coldwinters. Through iterative design much of this townland boundary has been retained, and where sections of removal are required onsite, perimeter planting comprising native shrub and tree species will compensate for the loss associated with the hedgerow removal.

The surrounding area is characterised by a variety of energy, industrial, commercial, quarrying, agricultural and residential uses. The subject site is generally bounded to the north by the Dogs Trust (Dog Rescue and Rehoming Charity), to the south by a vehicular entrance leading to the Huntstown Quarry and further southwest by an

Anaerobic Digestion Plant, to the east by the North Road (R135) and two residential properties fronting the R135 which form part of the subject site and to the west by Huntstown Power Station.

A number of large logistics warehouse parks are located to the northeast of the site including Dublin Airport Logistics Park and Vantage Business Park, Coldwinters, granted under Ref. F17A/0769 and further amended under Refs. FW19A/0053 and FW20A/0044. Several small scale commercial and service uses are scattered along the frontages of the R135 including: a garden centre; veterinary clinic and car repair facility.

The proposed development site is predominantly greenfield land and features two no. existing residential properties fronting onto the R135 North Road. The proposal includes the demolition of the. residential dwellings to clear the site so that the development potential of the site can be maximized to facilitate the future data centre.

The topography of the site falls slightly in an east west direction (77.5AOD - 79.5AOD). An archaeological feature is identified south of the northern site boundary. A series of hedgerows are located throughout the site including the site perimeter. There are no known protected structures on site, nor is the site located within an architectural conservation area.

A drainage ditch located on the western site boundary separates the subject site from the adjoining Huntstown Power Plant. A set of 110kv and 38kv overhead lines traverse the site in a north - south direction connecting to the Finglas 220Kv substation complex to the southeast of the site. It is proposed that these cables will be undergrounded to facilitate the development of the data centre on the site, subject to a separate planning application made to Fingal County Council.

The subject site is highly accessible to the national road network and is located less than 1km from the M50/N2 interchange and approximately 0.1km from the Coldwinters exit on the N2. The site is directly accessible from the R135 via a service road to the south leading to Huntstown Quarry and Power Station.

The subject site is identified in Figures 2.1 and 2.2 below.

Figure 2.1 Surrounding Site Context (subject site outlined in red)

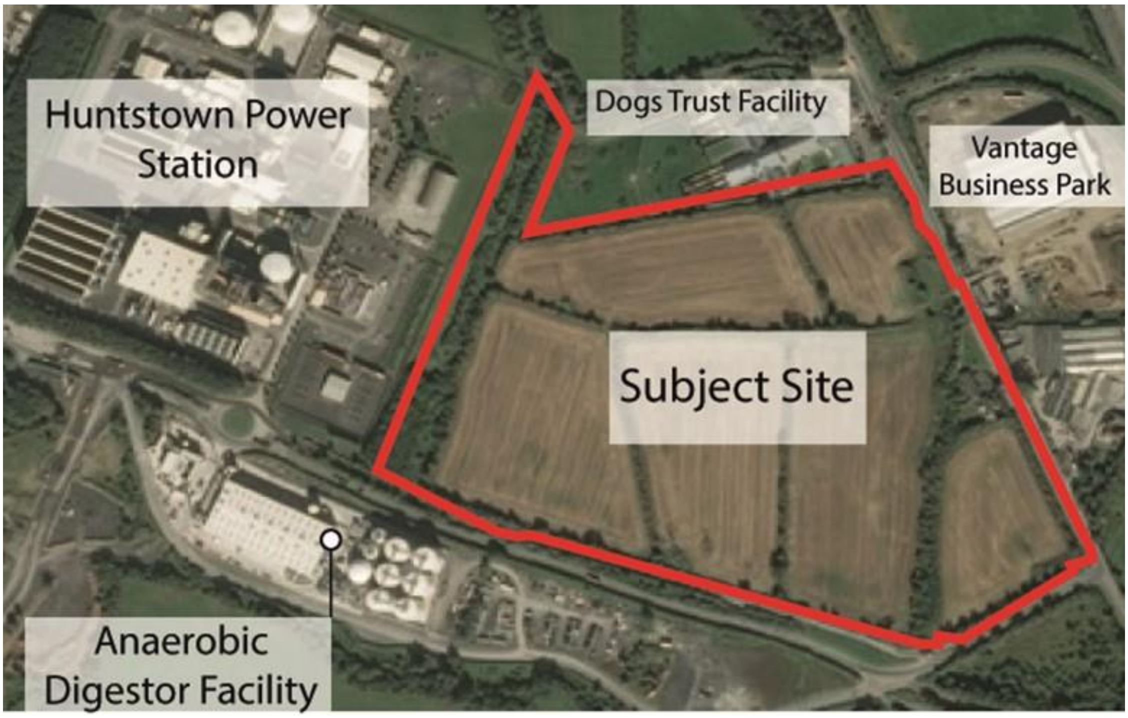

Figure 2.2 *Subject site outlined in red*

2.3 DESCRIPTION OF THE CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

Our client, Huntstown Power Company Limited, intends to seek permission for the development of 2 no. data hall buildings and ancillary structures on this site. The extent of the site layout is highlighted below.

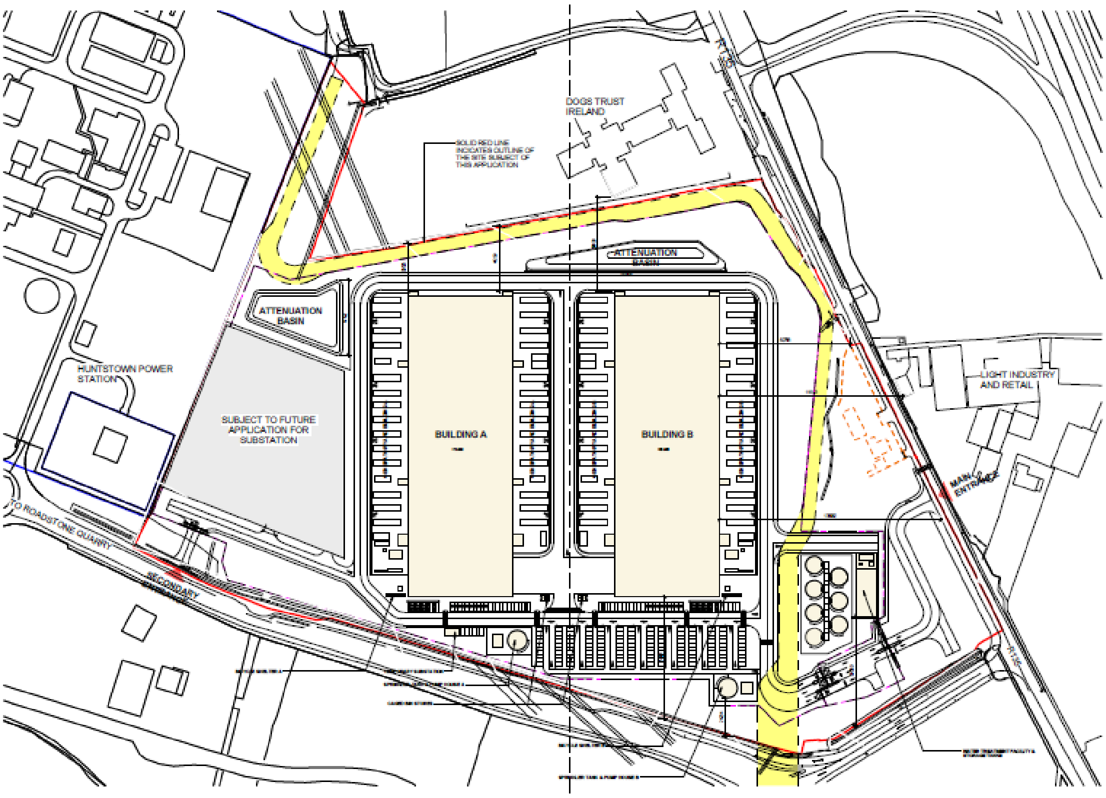

__Figure 2.3__ Proposed Site Masterplan

The proposed development is described as follows:

- Demolition of 2 no. existing residential dwellings and ancillary structures to the east of the site (c.344sqm total floor area);

- Construction of 2 no. data hall buildings (Buildings A and B) comprising data hall rooms, mechanical and electrical galleries, ancillary offices including meeting rooms, workshop spaces, staff areas including break rooms, toilets, shower/changing facilities, storage areas, lobbies, loading bays and docks, associated plant throughout, photovoltaic panels and screened plant areas at roof levels, circulation areas and stair and lift cores throughout;

- External plant and 58 no. emergency generators located within a generator yard to the east and west of Buildings A and B at ground level. The area is enclosed by a c.6.5m high louvred screen wall;

- The proposed data halls (Buildings A and B) are arranged over 3 storeys with a gross floor area of c.37,647sqm each;

- The overall height of the data hall buildings is c.28m to roof parapet level and c.32m including roof plant, roof vents and flues. The total height of Buildings A and B does not exceed 112m OD (above sea level);

- The proposed development includes the provision of a temporary substation (c.32sqm), water treatment building (c. 369sqm and c.7.5m high), 7 no. water storage tanks (8,200m3 and c.6.35m high), 2 no. sprinkler tanks (c.670m3 each and c.7.2m high) with 2 no. pump houses each (c.40sqm c. 6m high);

- The total gross floor area of the data halls and ancillary structures is c.75,775sqm;

- All associated site development works, services provision, drainage upgrade works, 2 no. attenuation basins, landscaping and berming (c.6m high), boundary treatment works and security fencing up to c.2.4m high, new vehicular entrance from the North Road, secondary access to the south west of the site from the existing private road, all internal access roads, security gates, pedestrian/cyclist routes, lighting, 2 no. bin stores, 2 no. bicycle stores serving 48 no. bicycle spaces, 208 no. parking spaces including 10 no. accessible spaces, 20 no. electric vehicle charging spaces and 8 no. motorcycle spaces;

- Existing electricity overhead lines traversing the site will be undergrounded under concurrent application Ref. FW21A/0144;

- A proposed 220kv substation located to the south west of this site will be subject of a separate Strategic Infrastructure Development application to An Bord Pleanála under section 182A of the Planning and Development Act 2000 (as amended);

- An Environmental Impact Assessment Report (EIAR) is submitted with this application.

2.3.1 Detailed Description

Building A

- 37,647sqm Gross Internal Floor Area
- 3 no. storeys with roof plant at third floor. 28.57m high to roof parapet and 32m including roof plant, roof vents and flues.
- Ground floor amenity/administrative areas and data hall, first and second floor data halls and third floor roof plant.
- 2 no. generator yards to the east and west of Building A containing 29 no. emergency generators and diesel belly fuel tanks (28 no. for the data hall and 1 no. for the administrative area).

Building B

- 37,647sqm Gross Internal Floor Area
- 3 no. storeys with roof plant at third floor. 28.57m high to roof parapet and 32m including roof plant, roof vents and flues.
- Ground floor amenity/administrative areas and data halls, first and second floor data halls and third floor roof plant.
- 2 no. generator yards to the east and west of Building B containing 29 no. emergency generators and diesel fuel belly tanks (28 no. for the data hall and 1 no. for the administrative area).

Ancillary Structures

- 481sqm Gross Internal Floor Area
- Water treatment facility and 6 no. storage tanks, 2 no. sprinkler tanks and 2 no. pump houses, temporary substation, 2 no. bicycle shelters, 2 no. bin stores and associated car parking.

Landscaping

- 2 no. attenuation basins, perimeter berming and boundary treatment works.

Lighting

- The internal access routes will be lined with street lighting. Bat-sensitive lighting techniques will be incorporated into the lighting plan, which will avoid or minimise any potential impacts of lighting on bats for the operational phase.

Access/Car Parking

- Main vehicular and pedestrian access to the east from the North Road with secondary access to the south on the privately owned road.
- Car parking provision for 208 no. spaces for the development to include for staff and visitor parking including 10 no. accessible spaces, 20 no. ev charging spaces and 8 no. motorcycle spaces within the proposed site.
- A total of 48 sheltered cycle spaces adjacent to the entrance of the buildings are provided on the basis that this number is considered to be commensurate with the staffing numbers proposed for the site.

It is envisioned that the development will be constructed on a phased basis as follows:

- Phase 1 of development includes the construction of Building B, ancillary structures, site infrastructure and landscaping works. The substation which is subject of a separate application will be carried out in tandem with the development of Phase 1.
- Phase 2 of development includes construction of Building A.

Having regard to potential alterations at construction stage, the phasing may vary from that which is set out above (i.e. Phase 1 to include Building A, and Phase 2 to include Building B), however in such an event, it is not expected to result in a departure from the assessment and conclusions set out in the accompanying EIAR.

2.4 DATA CENTRE FACILITY

The proposed data centre development is required to provide co-located information storage for individuals and businesses, at a central location. The data halls are arranged over three storeys and will be equipped with server cages and dedicated mechanical plant rooms.

The data halls will be free cooled using outside air cooling systems. The location of the facility in Ireland allows for the use this type of cooling without the need for excessive mechanical cooling. Air handling units will be direct evaporative (adiabatic) cooling type.

The administrative areas are located at ground floor level within Buildings A and B. These areas include offices, meeting rooms, staff break rooms, workshops, toilets and staff shower/changing areas.

2.5 DESCRIPTION OF DEVELOPMENT INPUTS

2.5.1 Power Supply

The proposed development will be powered via the proposed 220kV Substation to the western side of the site and underground cables connecting with the Corduff and Finglas cable routes (subject of a separate SID application to An Bord Pleanála). The applicant engaged in 2 no. pre-application consultations with An Bord Pleanála regarding this, on the 12th June 2020 and 30th November 2020 (ABP Ref. 306723-20).

The proposed development includes 58 diesel fuel belly tank storage (28 per building + 1 per administrative block) which serve as an emergency back-up power source to the data halls during a power failure event.

The generators are housed within a container with various designed control measures in place. There are drip trays at the diesel fill point for the generator belly tank with a maximum capacity of 45,000l per generator. The individual belly tanks are double skinned tanks, with level gauges (high and low) within the fuel tanks connected to an onboard controller which will alarm to prevent overfilling and identify a sudden loss of fuel within the tank. The containerised generator housing includes retention bunding in the base of the container, there are leak detection systems within the bund to alert in the event of a leak from the generator fuel tank or lubricating oil tank. This belly tank provides approximately 48 hours diesel storage.

2.5.2 Surface Water

The proposed surface water networks for the development collect runoff from roofs, roads and other hard standing areas in a sealed system of pipes and gullies. There are two separate surface water drainage networks in the proposed development which flow to separate surface water attenuation ponds from which attenuated flows are discharged, via carrier drains, to the adjacent ditch, adjacent to the northwest corner of the site.

2.5.3 Water Supply

Irish Water have advised that it is intended to install a 450mmØ watermain in the R135 has part of proposed network upgrades. It is proposed to connect a 250mmØ watermain to this 450mmØ pipe in the R135.

It is proposed to provide connections from the 250mmØ incoming water supply main to the admin area of the data centre buildings, the water treatment plant room, the two no sprinkler storage tanks and to the adjacent GIS substation.

2.5.4 Foul Water

The proposed foul water drainage network collects domestic foul water flows from the administration block of the proposed Data Storage Facilities and the adjacent GIS substation. A gravity sewer will flow in an easterly direction where it will discharge to a proposed pumping station. It will be necessary to pump foul flows to an agreed location on the Irish Water foul sewer network where capacity is available.

2.5.5 Irish Water Pre- Connection Enquiry

The applicant made a pre-connection enquiry to Irish Water regarding the viability of the proposed development connecting to the Irish Water Network. Irish Water advised that subject to a valid connection agreement being put in place, the proposed connection to the Irish Water Network can be facilitated. Correspondence between Irish Water and the applicant took place via email under connection reference no. CDS19008464.

2.5.6 Off-Site Parking

Overflow Parking (up to 500 no. vehicles) will be provided at an existing permitted parking area (DAA surface carpark or similar such established facility and operate as a park and ride facility for construction workers during peak construction periods. construction staffing personnel will arrive prior to 07.00am to mitigate against traffic peak. Site development and building works shall be carried only out between the hours of 08.00 to 19.00 Mondays to Fridays to ensure staggered start times between construction workers and the surrounding road network. Works shall take place between 08.00 to 14.00 on Saturdays. This additional parking facility will be provided during the construction phase to deal with the changing thresholds of on-site construction activity and extent of on-site construction operatives.

2.5.7 Site Preparation Works and Establishment of Construction Services

Preparation of the site requires limited works with minimal site clearance, establishing entranceways and haul roads for vehicles, surveying and setting out, setting up the construction site with fencing, site compounds etc.

The site will provide office, portable sanitary facilities, equipment storage, parking etc for contractors for the duration of the works. The construction compound will be fenced off for health and safety reasons so that access is restricted to authorized personnel only. All areas under construction will be fenced for security and safety purposes and temporary lighting supplied as necessary.

2.6 OTHER RELATED PROJECTS

2.6.1 Undergrounding of Overhead 110kV lines

The proposed data centre development will be facilitated via a separate planning application which proposes the removal of OETL and associated transmission masts which traverse the site to be replaced with underground cabling routed around the location of the data centre. This clears the central portion of the site to allow for development. Concurrent application Ref. FW21A/0144 refers.

2.6.2 220kV GIS Substation

The permanent power supply to the proposed data centre development will be provided via a proposed new 220kV Gas Insulated Switchgear (GIS) substation on the western side of the wider landholding. The GIS substation together with a subsurface grid connection is subject to a separate planning application.

2.6.3 10kV Overhead lines

A 10kV overhead line traverses the south/eastern section of the subject site. A small number of pole sets and associated cable will need to be moved. Future engagement with ESB will determine whether or not the cables will be undergrounded or remain overhead.

2.7 CONSTRUCTION/OPERATIONAL STAFF

The proposed development has potential for a positive impact with regards to increased job opportunities and improved accessibility to jobs during construction and operation in the Fingal and North Dublin area. During construction it is estimated to employ c. 1,050 no. construction workers at peak, with the average construction staff for one data hall building being 600 persons. It is estimated that up to 181 no. full time staff will be employed during the operational phase. Staff will be employed on a shift basis over a 24 hour period, seven days a week.

2.8 DEVELOPMENT OUTPUTS

Air

The stack heights of the back-up diesel generators for the Proposed Development have 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 beyond the site boundary (including background concentrations).

The 'Do-something' scenario involved the emergency operation of all 58 no. back-up diesel generations for 100 hours per year as well as a worst-case assumption of weekly testing of all 58 no. back-up generators.

The results indicate that the ambient ground level concentrations are in compliance with the relevant air quality standards for NO2. For the worst-case year modelled emissions from the site lead to an ambient NO2 concentration (including background) which is 59% of the maximum ambient 1-hour limit value (measured as a 99.8th percentile) (year 2017) and 80% of the annual limit value at the worst-case off-site receptor (year 2017). Concentrations decrease with distance from the site boundary with a peak at the eastern boundary of the site for both time periods.

The indirect CO_2 emissions from electricity to operate the facility will not be significant. The applicant has had due regard to the States CO_2 emissions targets. The applicant is committed to running its business in the most environmentally friendly way possible and has developed an approach which will (i) use existing infrastructure; and (ii) provide a mechanism which will aim to secure additional renewable energy generation.

USE OF EXISTING INFRASTRUCTURE	The Proposed Development has been strategically located to adjoin the Huntstown Power Station. Collocating power generation and electricity consumption on the same site is beneficial as it: • Minimises the need for national grid network improvements, including new high voltage wires and cables, that would otherwise be the case to transfer additional electricity to a new location, the cost of which would be partly paid for by all electricity users; and • Provides the most energy efficient location for the electricity consumer that minimises electrical losses that occur when transferring electricity longer distances In addition, this 'co-location' approach will avoid the requirement to build new on-site gas power generation, thus avoiding the potential introduction of additional new fossil fuel generations and associated greenhouse gas emissions. The development is also adjacent to the Huntstown Bioenergy plant and feasibility studies will be undertaken to understand the suitability of any excess heat generated from the Data Centre being used in the Anaerobic Digestion process at the neighbouring site, hence making both developments more efficient.

RENEWABLE ENERGY GENERATION	Working alongside the proposed development the applicant will obligate the facility end user, to enter into arrangements which are capable of underpinning new renewable energy generation calculated to offset the energy consumed by the proposed development from the electricity grid. These arrangements will: • Be in the form of Corporate Power Purchase Agreements between the applicant's group and the facility end user; • Provide for the establishment of new renewable energy generation projects by the applicant's group, that will not be supported by government or consumer subsidies – these new renewable energy projects will be: o Located throughout Ireland; o Phased over the expected ramp up of the energy demand of the proposed development; and o In total, are calculated to exceed the expected annual volume of energy consumed on site by the proposed development; Through these obligations, it is the goal of the applicant that for every unit of energy consumed by the data centre, a unit of new renewable energy generation would be despatched to the wider electricity system to off-set it thus delivering the objective of operating the proposed development on a net zero carbon basis that would not impact Ireland's overall climate targets. Any associated additional renewable energy supply would also increase energy security through indigenous energy sources.

Surface/Foul Water

The proposal will provide full attenuation for increase in hardstand area in compliance with the requirements of the Greater Dublin Strategic Drainage Study. A number of measures will be put in place to minimise the likelihood of any spills entering the water environment to include the design of the car park, fitting of refuelling areas with hydrocarbon interceptors and on-site speed restrictions

The generator yard passes through a petrol interceptor prior to connection to the onsite drainage networks. Petrol interceptors will be installed as part of the SuDS measures to capture any potential oil or hydrocarbon contamination prior to discharge into the attenuation system on site. This together with hardstand cover will minimise the potential for any impact to the watercourses receptors.

Waste Management

A detailed construction and demolition waste management plan accompanies this EIAR and ensures best practice is followed in the management of waste from the proposed development.

2.9 DESIGN/DEVELOPMENT RATIONALE

As outlined in Chapter 4 'Alternatives', the design of the proposed scheme has continued to evolve through consultation with environmental experts and the Local Authority – Fingal County Council. From the outset, we note that the various design team members have discussed the proposals submitted herewith at length with the various departments of Fingal County Council.

We note specifically that the proposals relating to the general mass, form, scale and design were discussed with Fingal County Council and the proposal submitted herewith is reflective of those discussions.

Furthermore, alternative designs and layouts considered throughout the design process are addressed, as appropriate, in each individual section of this EIAR.

2.10 CHARACTERISTICS OF THE CONSTRUCTION AND OPERATION PHASES

Pursuant to Section 2(a)(i) of S.I No 600 of 2001, a description of the physical characteristics of the proposed development and land use requirements during the construction and operation phases is provided below.

In order to reduce impacts on the soils and geology environment, a number of mitigation measures will be adopted as part of the construction works on site. The measures will address the main activities of potential impact which include:

- Control of soil excavation and export from site;
- Fuel and chemical handling, transport and storage; and
- Control of water during construction.

We refer to the Construction Environmental Management Plan prepared by CSEA for more information.

Construction works will include the following activities:

- Site preparation.
- Site clearance.
- Excavations and levelling of the site to the necessary base level for construction including archaeological testing.
- Surveying and setting out for structures and any rerouting of services/connections to services.
- Construction compound and fencing.
- Foundations and structures.
- Levelling/Cut and fill.
- Building envelopes and finish.
- Roads, services and landscaping.

Site Preparation

It is proposed that the accesses and haul roads for vehicles, the contractors' compound and fencing will be established for the proposed development utilising the existing entrance from the R135 road as the primary construction entrance for this development.

The construction compound will facilitate office, portable sanitary facilities, equipment storage, parking etc. for contractors. It will be used for the duration of the works.

The primary activities that will be required during the site preparation phase for the development will be site clearance, excavations and levelling of the site to the necessary base level for construction, surveying and setting out for structures and any rerouting of services/connections to services.

A combination of excavators, trucks and other soil shifting plant will commence the main site clearance and levelling aspects.

Demolition works involve removal of 2 no. existing single storey dwellings and associated outbuildings/sheds to the east of the site consisting the following: Cottage (129sqm) and associated shed (44sqm), Bungalow (154sqm) and associated shed (17sqm). The total demolition area is 344sqm.

Site Phasing

It is envisaged that the overall development will be constructed on a phased basis as set out below.

- Phase 1 of development includes the construction of Building B, ancillary structures, site infrastructure and landscaping works. The substation which is subject of a separate application will be carried out in tandem with the development of Phase 1.
- Phase 2 of development includes construction of Building A.

Having regard to potential alterations at construction stage, the phasing may vary from that which is set out above (i.e. Phase 1 to include Building A, and Phase 2 to include Building B), however in such an event, it is not expected to result in a departure from the assessment and conclusions set out in the accompanying EIAR.

Proposed Development/Construction of the First Building:

- Construction Start – Q3 2021
- Commence Operation of first data storage room – Q1 2024
- Full Operation – Q1 2025

Indicative Development/Construction of the Second Building:

- Construction Start – Q1 2024
- Commence Operation of first data storage room – Q4 2026
- Full Operation – Q4 2027

HV Substation:

- Construction Start – TBC* (subject to separate SID application)
- Construction Complete – TBC* (subject to separate SID application)

Construction Staff

It is anticipated that the worst case construction traffic impact for the proposed development would occur in Q4 2022, when Building B/A is at peak construction.

Construction traffic has been estimated using data obtained from a similar data storage facility development that used a similar construction methodology to the current development. The following construction data has been used to estimate peak daily construction traffic:

- Average construction staff for one data storage facility: 600;
- Peak construction staff for one data storage facility: 1,050;

- Average cars/ day for one data storage facility: 400 – with max 200 on site – shared with the proposed substation development to the south west of the site (subject of a separate application);
- Peak cars/day for one data storage facility: 700;
- Peak HGVs/day for one data storage facility: 110; and
- Peak LGVs/ day for one data storage facility: 30.

Construction Traffic and Site Access

The following measures will be put in place during the construction works:

- The contractor will be required to provide wheel cleaning facilities, and regular cleaning of the main access road;
- Temporary car parking facilities for the construction workforce will be provided within the site and the surface of the car park will be prepared and finished to a standard sufficient to avoid mud spillage onto adjoining roads;
- We propose that there will be 200 spaces available at he site for parking, with up to 500 no. off site at DAA surface car park or similar such established facility, as designated by the construction contractor. Allowing for car occupancy of 1.5 average – gives peak construction staff of 1,050. We have allowed for slightly lower proportion between average/peak – with average of 600 no. construction staff, or 400 no. cars/vans
- Monitoring and control of construction traffic will be ongoing during construction works. Construction Traffic Management will minimise movements during peak hours.
- Construction Traffic routes minimising traffic impact on surrounding residential development will be used by construction vehicles.
- During the off-road section of works, construction vehicles will access the site before 7.00 a.m. and all construction vehicles departing the site will do so before 7.00 p.m (Monday-Friday) and between 08:00-14:00 (Saturday) Construction activities will be carried out Monday to Saturday, with no on site construction activities to take place on Sundays or Bank Holidays. The above will be subject to any planning conditions restrictions imposed as part of the grant of permission.

Construction Waste

A project specific outline C&D WMP has been prepared in line with the requirements of the Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects guidance document issued by the Department of Environment, Heritage and Local Government (DoEHLG).

The following mitigation measures will be implemented:

- Building materials will be chosen with an aim to 'design out waste';
- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery – it is anticipated that the following waste types, at a minimum, will be segregated:
- Concrete rubble (including ceramics, tiles and bricks);
- Plasterboard;
- Metals;
- Glass; and
- Timber.

- Left over materials (e.g. timber off-cuts, broken concrete blocks/bricks) and any suitable construction materials shall be re-used on-site, where possible;
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A waste manager will be appointed by the main contractor(s) to ensure effective management of waste during the excavation and construction works;
- All construction staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered where possible to avoid material designated for disposal;
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licenced facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

These mitigation measures will ensure that the waste arising from the construction phase of the development is dealt with to ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will encourage sustainable consumption of resources.

Operational Waste

All waste materials will be segregated into appropriate categories and will be temporarily stored in appropriate bins or other suitable receptacles in a designated, easily accessible areas of the site.

Mitigation measures proposed to manage impacts arising from wastes generated during the operation of the proposed development are summarised below.

- On-site segregation of all waste materials into appropriate categories including (but not limited to):
- Dry Mixed Recyclables;
- Organic food/green waste;
- Mixed Non-Recyclable Waste;
- Batteries (non-hazardous and hazardous);
- Waste electrical and electronic equipment (WEEE) including computers, printers and other ICT equipment; and
- Cleaning chemicals (solvents, pesticides, paints, adhesives, resins, detergents, etc.).
- All waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly labelled with the approved waste type to ensure there is no cross contamination of waste materials;
- All waste collected from the development will be reused, recycled or recovered where possible, with the exception of those waste streams where appropriate facilities are currently not available;
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

These mitigation measures will ensure the waste arising from the development is dealt with to ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

Water/Drainage

The development includes 58 no. emergency generators and diesel fuel belly-tanks (28 for the data halls and 1 for the administration area, per data storage building). However, it is noted that any accidental discharge will more likely impact stormwater drainage due to the hardstand and drainage infrastructure proposed which include 2 no. petrol interceptors.

Water from the Generator yard passes through petrol interceptor prior to connection to the onsite drainage networks. Petrol interceptors will be installed as part of the SuDS measures to capture any potential oil or hydrocarbon contamination prior to discharge into the attenuation system on site. This together with hardstand cover will minimise the potential for any impact to the underlying aquifer.

Dust

The siting of construction activities and the limiting of stockpiling will take note of the location of sensitive receptors and prevailing wind directions in order to minimise the potential for significant dust nuisance. In addition, good site management will include the ability to respond to adverse weather conditions by either restricting operations on-site or using effective control measures quickly before the potential for nuisance occurs. 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; and
- The procedures put in place will be reviewed at regular intervals and monitoring conducted and recorded by the principal contractor. It is recommended that reviews are conducted on a monthly basis as a minimum.

2.11 DECOMMISSIONING

Given the nature of the proposed development, it is not envisaged that the proposed development will require closure or decommissioning in the short to medium future.

Regular maintenance and minor upgrade works will maintain the functional operation of the development over the medium to long term.

Upon closure, all equipment will be removed and re-used where appropriate.

Given the multi-storey nature of the development and combined flexibility of the large floor plates within Buildings A and B, the development could be readily reconfigured for another commercial or industrial use.

2.12 MITIGATION MEASURES

The outline Construction and Environmental Management Plan prepared by CSEA provides a framework from which a final Construction Management Plan will be developed to avoid, minimise or mitigate any construction effects on the environment prior to commencement on site.

The CEMP summarises the possible impacts and measures to be implemented and to guide the Contractor who will be required to develop and implement the Construction Management Plan on site.

The appointed contractor will be required to prepare a Construction Management Plan in advance of works commencing on site. This will incorporate all mitigation measures proposed within this EIAR for the protection of the environment and human health. Relevant conditions of planning will also be included within the plan.

Monitoring will be undertaken during the demolition and construction phase in line with the recommendations of the EIAR.

2.13 SEVESO SITE

The subject site is located directly adjacent to the Huntstown Power Station, Huntstown Quarry, Finglas, D11 Seveso site. This is a lower tier Seveso site with a consultation distance of 300m. It is concluded that the proposed data centre is located outside of the LUP Outer zone (1E-07) of Huntstown Power Station, therefore the level of individual risk at the proposed development is acceptable.

2.14 NOISE

During the construction phase of the proposed development there will be some impact on nearby noise sensitive receptors due to noise emissions from site traffic and other activities. The application of noise limits and hours of operation along with the implementation of appropriate noise control measures, detailed in chapter 10 Noise and Vibration, will ensure that noise impact will be kept to a minimum. It is noted that all construction noise impacts will be slight, negative and short term in nature. As the development progresses past initial ground works it is noted that noise impact will reduce from slight to not significant.

During the operational phase of the development, it has been noted that there will be a not significant, negative, long-term impact at the closest residences identified surrounding the site. The predicted change in background noise due to the development will be less than 1dB during night-time periods.

Proprietary noise and vibration control measures will be employed to ensure the noise emissions from building services plant do not exceed the adopted criterion at the façade of any nearby noise sensitive locations.

Any change in noise levels associated with vehicles at road junctions in the vicinity of the proposed development are considered to be imperceptible, neutral and long term.

A commissioning noise survey will be undertaken once the site is operational to ensure that the relevant noise criterion is complied with.

2.15 SUSTAINABILITY

2.15.1 Use of Existing Infrastructure

The proposed development has been strategically located to adjoin the Huntstown Power Station. The co-location of power generation and electricity consumption on the same site is beneficial as it minimizes the need for national grid network improvements, including new high voltage wires and cables that would otherwise be the case to transfer additional electricity to a new location, the cost of which would be partly paid for by all electricity users and provides the most energy efficient location for the energy consumer that minimizes electrical losses that occur when transferring electricity longer distances.

The co-location approach will avoid the requirement to build new on-site dispatchable gas power generation, avoiding the potential introduction of additional new fossil fuel generations and associated greenhouse gas emissions.

2.15.2 Renewable Energy Generation

Working alongside the proposed development the applicant will obligate the facility end user to enter into agreements which are capable of underpinning new renewable energy generation calculated to offset the energy consumed by the proposed development from the electricity grid.

The proposed data storage facility has been designed to consider the sustainable use of water and heat during its operational phase. During normal operation the data storage buildings will be air cooled which significantly reduces the requirement for water compared to mechanical chilling, or a fully water-cooled design.

2.16 CUMULATIVE IMPACTS

There are potential short-term nuisances such as dust, noise, as well as the potential for pollution of groundwater or the existing drainage ditches associated with demolition, excavations and construction. In advance of work starting on site, the works contractor will prepare a detailed Construction Environmental Management Plan (CEMP). The CEMP will set out the overarching vision of how the construction of the proposed development will be managed in a safe and organised manner by the Contractor.

There is an application currently under consideration by Fingal County Council relating to the proposed development lands Reg Ref. FW21A/0144 The application is for the removal of existing overhead lines and the installation of 2 no. underground cable circuits, associated underground ducting, joint bays and associated infrastructure between the existing ESB Finglas Substation and Huntstown Power Station. Due to the nature of the development i.e., underground cabling, there is no regular activities during operations, and as such it is unlikely to cumulatively create any potential impacts during the operations of the proposed development.

The permanent power supply to the proposed development will be provided by a proposed new 220 kV Gas insulated Switchgear (GIS) substation in the southwestern corner of the landholding site. The substation is subject to a separate planning application. Due to the nature of the development, substation and underground grid connection, there are no regular activities during operations, and thus unlikely to cumulatively create any potential impacts during the operations of the proposed development.

3.0 PLANNING CONTEXT

The subject lands are subject to national, regional, sub-regional, county/local planning policy.

3.1 GOVERNMENT STATEMENT ON THE ROLE OF DATA CENTRES IN IRELAND'S ENTERPRISE STRATEGY (2018)

The Department of Business, Enterprise and Innovation released a statement on the Role of Data Centres in Ireland in 2018 in which it sets out the role and significance of data centres in Ireland's wider enterprise policy objectives.

The statement outlines the presence of data centres in Ireland has raised the country's visibility internationally as a technology-rich, innovative economy. The statement goes on to state that data centres directly contribute to job creation and generate significant added economic benefit by providing a range of services to other firms.

A significant proportion of existing, permitted and proposed data centres are located in the Dublin Region. The statement notes that *"The potential cost benefits which could be provided by data centres are dependent on location, existing network capacity and the infrastructure required to supply the site."*

The statement goes onto note *"A consistent and supportive whole of government approach will be brought to the realisation of the transmission and distribution assets required to support the level of data centre ambition that we adopt."*

The Covid-19 pandemic has highlighted the urgent need for improvements in ICT and the roll-out of high speed broadband nationwide. Many bricks and mortar businesses are already trading and conducting business online to safeguard and continue daily operations. Across all sectors, work environments will be permanently altered with employees expected to continue working from home following the pandemic. The need for high quality data centres is therefore essential to the recovery of the Country and economy post-Covid-19.

3.2 PROJECT IRELAND - NATIONAL PLANNING FRAMEWORK (2040)

The National Planning Framework (NPF) is the Government's high-level strategic plan for shaping the future growth and development of our country out to the year 2040.

The NPF sets out that the Eastern and Midland part of Ireland will, by 2040, be a Region of around 2.85 million people, at least half a million more than today.

3.2.1 Compliance with Key National Policy Objectives

The following National Policy Objectives are considered to apply to the site.

National Policy Objective 55-

"Promote renewable energy use and generation at appropriate locations within the built and natural environment to meet national objectives towards achieving a low carbon economy by 2050."

<u>*National Policy Objective 64-*</u>

"Improve air quality and help prevent people being exposed to unacceptable levels of pollution in our urban and rural areas through integrated land use and spatial planning that supports public transport, walking and cycling as more favourable modes of transport to the private car, the promotion of energy efficient buildings and homes, heating systems with zero local emissions, green infrastructure planning and innovative design solutions."

Under the National Strategic Outcome 5 – A Strong Economy Supported by Enterprise, Innovation and Skills, Ireland is being prompted as a suitable international destination for ICT infrastructure.

"Ireland is very attractive in terms of international digital connectivity, climatic factors and current and future renewable energy sources for the development of international digital infrastructures, such as data centres. This sector underpins Ireland's international position as a location for ICT and creates added benefits in relation to establishing a threshold of demand for sustained development of renewable energy sources. There is also greater scope to recycle waste heat from data centres for productive use, which may be off-site."

It is our considered view that the current proposal complies with and exceeds the vision of the National Planning Framework on the following basis:

- The proposal makes the most efficient use of the site. The multi-storey nature Buildings A and B creates a compact and efficient development that utilises existing site services and road infrastructure.
- The overall development is appropriately located in West Dublin with excellent connectivity to the N2, N3 and M50.
- The proposal will contribute to the emerging digital infrastructure in Fingal County Council that helps to support a strong Irish economy through its enterprise, skills and innovation sectors.
- The proposal will continue to maintain high quality international connectivity, that Ireland is quickly becoming renowned for.

Having considered the above, it is submitted that the current proposal will deliver on key objectives contained within the NPF.

3.3 REGIONAL SPATIAL AND ECONOMIC STRATEGY (2019-2031)

The *Regional Spatial and Economic Strategy for Eastern and Midland Regional Assembly* (RSES) has recently been published and adopted.

The RSES provides a:

- Spatial Strategy - To manage future growth and ensure the creation of healthy and attractive places to live, work, study, visit and invest in.
- Economic Strategy - That builds on our strengths to sustain a strong economy and support the creation of quality jobs that ensure a good living standard for all.
- Metropolitan Strategy - To ensure a supply of strategic development areas for the sustainable growth and continued success and competitiveness of the Dublin Metropolitan Area.

- Investment Framework - To prioritise the delivery of key enabling infrastructure and services by government and state agencies.
- Climate Action Strategy - To accelerate climate action, ensure a clean and healthy environment and to promote sustainable transport and strategic green infrastructure.

Key RSES Provisions

Finglas/Fingal is identified as falling within the Dublin Region of the RSES.

The Growth Strategy for the Eastern and Midlands Region is to:

- Support the continued growth of Dublin as our national economic engine.
- Deliver sustainable growth to the Metropolitan area.
- Target growth to regional growth centres of Athlone, Drogheda and Dundalk
- Support vibrant rural areas with a network of towns and villages
- Facilitate the collaboration and growth of the Dublin – Belfast Economic Corridor
- Embed a network of Key Towns through the region to deliver sustainable regional development
- Support the transition to a low carbon, climate resilient and environmentally sustainable region.

One of the Guiding Principles for Investment Prioritisation in Placemaking for Enterprise Development is to *“Align to national strategy and approach for data centres – right location for use and energy demand.”*

RPO 8.25 of the RSES states that Local authorities shall:

- Support and facilitate delivery of the National Broadband Plan.
- Facilitate enhanced international fibre communications links, including full interconnection between the fibre networks in Northern Ireland and the Republic of Ireland.
- Promote and facilitate the sustainable development of a high-quality ICT network throughout the Region in order to achieve balanced social and economic development, whilst protecting the amenities of urban and rural areas.
- Support the national objective to promote Ireland as a sustainable international destination for ICT infrastructures such as data centres and associated economic activities at appropriate locations.
- Promote Dublin as a demonstrator of 5G information and communication technology.

It is submitted that the current proposal and wider development site is supportive of the growth strategy and growth enables for the metropolitan region of the RSES.

3.4 FINGAL COUNTY DEVELOPMENT 2017-2023

The Fingal County Development Plan 2017-2023 sets out the planning policy context for future development in the County. The Plan details the land use and development objectives, development control standards and policies and objectives for the protection of the built and natural environment of the County. It is the most relevant document pertaining to the future development of the subject lands.

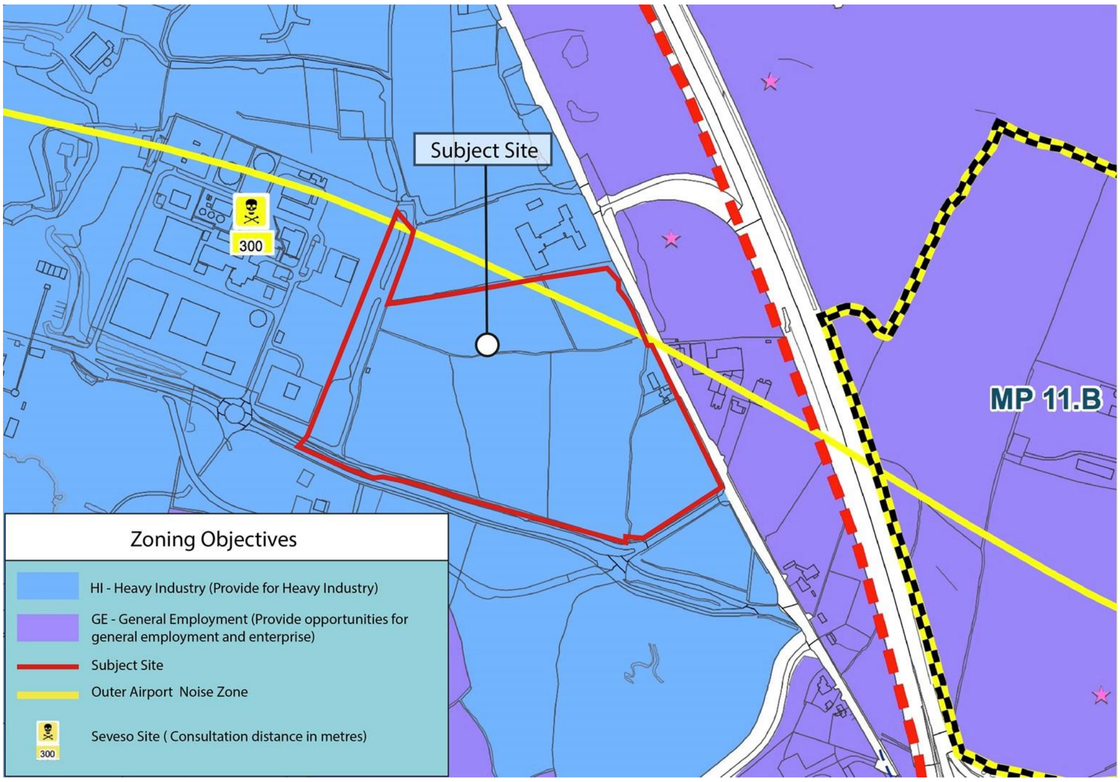

Figure 3.1 *Zoning Map*

The subject site and is zoned HI Heavy Industry under the current County Development Plan. The objective is “Provide for heavy industry”.

The vision for Heavy Industry is as follows;

> *‘Facilitate opportunities for industrial uses, activities and processes which may give rise to land use conflict if located within other zonings. Such uses, activities and processes would be likely to produce adverse impacts, for example by way of noise, dust or visual impacts. HI areas provide suitable and accessible locations specifically for heavy industry and shall be reserved solely for such uses.’*

The following uses are considered to be permitted in principle;

Permitted in Principle		
Abattoir	Concrete/Asphalt	Extractive Industry/Quarrying
Fuel Depot/Fuel Storage	Heavy Vehicle Park	Industry - High Impact
Office Ancillary to Permitted Use	Open Space	Plant Storage
Restaurant/Café[5]	Retail - Local < 150 sqm nfa[5]	Sustainable Energy Installation
Telecommunications Structures	Utility Installations	Waste Disposal and Recovery Facility (High Impact)

Figure 3.2 *Permissible Uses – HI Zoning*

The following uses are not permitted;

Not Permitted		
Aerodrome/Airfield	Agricultural Buildings	Agricultural Farm Supplies
Agricultural Machinery Sales and/or Maintenance	Agri-Tourism	Air Transport Infrastructure
Amusement Arcade	Bed and Breakfast	Betting Office
Boarding Kennels	Builders Provider/Yard	Burial Grounds
Car Hire Holding Area	Caravan Park – Holiday	Caravan Park – Residential
Cargo Yards	Carpark - Non-Ancillary	Casual Trading
Childcare Facilities	Civic Waste Facility	Community Facility
Conference Centre	Cultural Facility	Dancehall/Nightclub
Education	Enterprise Centre	Exhibition Centre
Fast Food Outlet/Take-Away	Farm Shop	Food, Drink and Flower Preparation/Processing
Funeral Home/Mortuary	Garden Centre	General Aviation
Golf Course	Guest House	Health Centre
Health Practitioner	High Technology Manufacturing	Holiday Home/Apartments
Home-Based Economic Activity	Hospital	Hotel
Industry – General	Industry – Light	Logistics
Office ≤100sqm	Office >100sqm and <1,000sqm	Office ≥1,000sqm
Park and Ride Facilities	Petrol Station	Place of Worship
Public House	Public Transport Station	Recreational Facility/Sports Club
Residential	Residential Care Home/ Retirement Home	Residential Institution
Retail - Convenience ≤ 500 sqm nfa	Retail - Comparison ≤ 500 sqm nfa	Retail - Comparison >500sqm nfa
Retail - Supermarket ≤ 2,500 sqm nfa	Retail - Superstore > 2,500 sqm nfa	Retail - Hypermarket > 5,000 sqm nfa
Retail - Factory Outlet Centre	Retail Warehouse	Retail - Warehouse Club
Retirement Village	Sheltered Accommodation	Taxi Office

Figure 3.3 *Non Permissible Uses – HI Zoning*

It is considered that as a sui generis use, the characteristics of this data centre project are most appropriately considered ‘industrial’ and therefore in accordance with the land use zoning objective. The County Plan provides for such instances where the use does not readily fit the categories provided:

Each land use zoning objective has a supporting Vision which elaborates on the zoning objective and sets the context for the type of development which would be acceptable. Uses which are neither ‘Permitted in Principle’ nor ‘Not Permitted’ will be assessed in terms of their contribution towards the achievement of the Zoning Objective and Vision.

The rationale for the site location and zoning strategy is discussed further in Section 5.2 of the Planning Report prepared by Brock McClure Planning and Development Consultants and it also set out below

3.4.1 Rationale for the Proposed Development and Zoning Compliance

3.4.1.1 Site Suitability

The subject site was identified as an ideal location for the proposed large scale data centre development based on the following key characteristics:

1) Utilising Existing Infrastructure

The site for this development has been strategically selected and designed to be adjacent to the two Huntstown power plants. The Huntstown power plants, located to the west of the proposed development site, have been operating since 2002/2007. These flexible and efficient power plants are integral to the transition from conventional to renewable energy generation in Ireland, by providing flexible solutions that meet the needs of the modern day grid and the economy. Both power plants are expected to continue to contribute to the security of supply of electricity for the Dublin area for their remaining technological life.

The proposal utilises the adjoining Huntstown Power Station together with existing EirGrid connection policy, to obtain grid power for the proposed development which makes the project viable. Section 4.2 of EirGrid's Data Centre Connection Offer Process and Policy, 2020 states that grid power will be provided in constrained areas where the customer undertakes to provide dispatchable generation to reduce the impact that their connection to the grid has on that constraint.

This is a unique location that utilises the power plant's existing infrastructure without the need to build additional thermal generation on site which would otherwise be the case.

Co locating the development adjacent to the power plants will:

- ensure the continuation of generation at this critical location in Dublin; and
- fulfils the criteria of the current Eirgrid data centre connection policy allowing the proposed development access to the electrical power it needs to operate.

The benefits of collocating existing power generation and electricity consumption as is proposed under the current planning application are set out below:

i. The proposed Data Centre would utilise the power plant's existing infrastructure ***without*** the need to build additional thermal generation on site which would otherwise be the case.
ii. Provides the most energy efficient location for the electricity consumer that minimises electrical losses that occur when transferring electricity longer distances.
iii. Minimises the need for national grid network improvements, including new high voltage wires and cables, that would otherwise be the case to transfer additional electricity to a new location, the cost of which would be partly paid for by all electricity users.

2) Large Data Centre Requirements

Large data centre developments by nature, are land intensive, requiring a significant landbank capable of accommodating large data hall structures with extensive electrical equipment.

The proposal comprises 2 no. 3-storey data hall buildings, external electrical plant areas, fuel back-up and water storage areas located on a site area of approximately 13.3ha. The overall gross floor area proposed is 75,775sqm.

The scale and size of the subject site is a specific capacity requirement of the proposed facility end user which is considered appropriate for this site.

3) Appropriate Transitional Use

The subject site is zoned as "HI" and is surrounded by HI zoning to the north, south and west of the site.

The zoning to the immediate east of the site is zoned for General Employment "GE" with residential properties also located within this zoning.

The subject site is located within what could be considered a "transitional zone" between the two land use zonings, The proposed site layout is cognisant of the transitional nature of the site from heavy industry (quarry, power plant) to residential and general employment.

The proposed data halls are located predominantly in the central portion of the site. The proposed future 220kv meshed GIS substation associated with the data centre (subject to a separate application with An Bord Pleanala) will be located on the western most portion of the site.

A generous green belt is proposed around the site providing a soft transition from sensitive neighbours and public roads. The proposed berming (up to 6m in height) with substantial native planting is proposed along the eastern portion of the site.

The more traditional existing heavy industry uses such as the power plant and quarry are located to the west of the site. The general site arrangement has been carefully assessed and is considered a suitable transition between land-use zonings.

All heavy industry uses associated with the proposed development are located within the western to central portions of the site, with softer uses located within the central to eastern areas.

Further detail in relation to the review alternative site layouts can be found in the Chapter 4 Consideration of Alternatives in the EIAR accompanying this planning application.

3.4.1.2 Compliance with Zoning Objective

Heavy Industry Zoning

Data centre use is considered sui generis (or 'of its own kind') in that it does not readily fit into the defined land use categories specified in the County Development Plan. Moreover, the Development Plan does not specify a definition of 'heavy industry' in its glossary of terms.

Data centre and substation uses are neither 'Permitted in Principle' nor 'Not Permitted' and will be assessed in terms of their contribution towards (i) the achievement of the Zoning Objective and Vision Statement and (ii) their compliance and consistency with the policies and objectives of the Development Plan.

(i) Zoning Objective and Vision Statement

Zoning Objective

Under the current County Development Plan, the zoning objective for the site is "Provide for heavy industry".

The Development Plan does not specify a definition of 'heavy industry' in its glossary of terms. However, it is noted that the Development Plan states that *"The purpose of the Heavy Industry (HI) zoning is to facilitate opportunities for industrial uses, activities and processes that may cause or result in adverse conditions to appropriate locations.*

Zoning Vision

The **vision** for the HI zoning is to: "**Facilitate opportunities for industrial uses, activities and processes which may give rise to land use conflict if located within other zonings**. Such uses, activities and processes would be likely to produce adverse impacts, for example by way of noise, dust or visual impacts. HI areas provide suitable and accessible locations specifically for heavy industry and shall be reserved solely for such uses."

Contribution Towards Achievement of Zoning Objective and Vision

Given the nature of the proposal at c.75,000sqm GFA on a site area of over 13ha, the scale of the required on site dispatchable generation, and having regard to the point (a) and (b) below, it is considered that the proposed development would give rise to such land use conflicts if located in other areas such as 'GE' and 'HT' zones:

a) the scale and size of ancillary plant required for a development of this scale (including cooling towers/flues; fuel tanks, transformers etc.), substation and electrical equipment; and
b) Co-locating the proposed development adjacent to the Huntstown power plants fulfils the criteria of the current EirGrid connection policy for data centres which allows the proposed development access to the electrical power it needs to operate. Without this co-location the proposed development could not operate.

   If a similar development was located elsewhere (and not co-located with existing power generation), under the current EirGrid policy for data centres that facilitates access to the electrical power needed to operate, the proposed development would need to include new dispatchable thermal power generation of the scale equivalent to the data centre campus power requirements. This new dispatchable power generation would have to be designed to run on a regular basis, run for long periods of time and would be in addition to any emergency back-up generation that may also be proposed.

   Given the EirGrid policy, the development of a data centre of this scale with co-located dispatchable thermal power generation in other land use zonings such as General Employment or High Technology, would be inappropriate as the necessary co-located dispatchable power generation plant required would be substantial and create land use conflicts due to noise, vibrations, fumes, appearance, etc. in for instance business park settings.

Having regard to other data centre developments located on lands zoned ‘GE’ and ‘HT’, the permissible uses in the tables below (Figure 3.1) are provided for comparative purposes and Table 3.1 indicates permissible uses listed under:

- Heavy Industry;
- General Employment; and
- High Technology

It is of particular note that ‘Industry - High Impact’ and ‘Plant Storage’ uses (highlighted in red) are an integral part of the proposed development but are omitted from the permitted in principle uses outlined under ‘GE’ and ‘HT’ zonings. Uses ancillary to the proposed development are highlighted in black for reference also.

The scale of the ‘Industry - High Impact’ components associated with the proposed data centre have not formed part of any previous data centre application in the Fingal region, which were primarily located within ‘GE’ and ‘HT’ zoned lands.

HI – ‘Heavy Industry’ – Permitted in Principle		
Abattoir	Concrete/asphalt	Extractive Industry/ Quarrying
Fuel Depot/Fuel Storage	Heavy Vehicle Park	**Industry High Impact**
Office Ancillary to Permitted Use	Open Space	**Plant Storage**
Restaurant/Café5	Retail - Local < 150 sqm nfa5	Sustainable Energy Installation
Telecommunications Structures	**Utility Installations**	Waste Disposal and Recovery Facility (High Impact)

GE – ‘General Employment’ – Permitted in Principle Uses		
Builders Provider/Yard	Civic Waste Facility	Enterprise Centre
Food, Drink and Flower Preparation/Processing	**Fuel Depot/Fuel Storage**	High Technology Manufacturing
Industry – General	Industry – Light	Logistics
Office Ancillary to Permitted Use	Open Space	Petrol Station
Research and Development	Restaurant/Café5	Retail - Local < 150 sqm nfa5
Road Transport Depot	Sustainable Energy Installation	Telecommunications Structures
Training Centre	**Utility Installations**	Vehicle Sales Outlet - Small Vehicles
Vehicle Sales Outlet - Large Vehicles	Vehicle Servicing/Maintenance Garage	Warehousing
Waste Disposal and Recovery Facility (Excluding High Impact)	Wholesale	

HT – ‘High Technology’ – Permitted in Principle Uses		
Enterprise Centre	High Technology Manufacturing	Hospital
Industry – Light	**Office Ancillary to Permitted Use**	Office ≤ 100sqm
Office > 100sqm and < 1,000sqm	Office ≥ 1,000sqm	Open Space
Research and Development	Restaurant/Café5	Retail - Local < 150 sqm nfa5
Sustainable Energy Installation	Telecommunications Structures	Training Centre
Utility Installations		

Figure 3.1 *Zoning Objectives permissible use*

Industry High Impact - The use of a building, or part thereof, or land for any industry which requires special assessment due to its potential for detrimental environmental effects.

Industry Light - The use of a building, or part thereof, or land for industry in which the processes performed, or the machinery installed, are such as could be carried on or installed adjacent to a residential area without detriment to the amenity of that area by reason of impacts such as noise, vibration, smell, fumes, smoke, soot, ash, dust or grit.

Industry General *- The use of a building, or part thereof, or land for any industry other than a light industry or high impact industry (explained below). Ancillary uses which* *are subservient to the main industrial use such as small office and car park are included in the use class.*

As illustrated in the tables above:

- 'Industry - High Impact' use is only permitted in principle under 'HI' zoning. The use is not listed under any other zonings identified in the County Plan.
- 'Plant Storage' use is only permitted under the 'HI' Heavy Industry and 'WD' Warehousing and Distribution zonings set out in the Plan.

Table 3.1 ***P****ermissible use and details of proposed development*

Permissible Uses	Proposed Development
Industry - High Impact (only available in HI zoning)	'Industry High Impact' is defined as "*The use of a building, or part thereof, or land for any industry which required special assessment due to its potential for detrimental environmental effects."* The proposed development is unique in that the site is co-located to an existing power plant, which is considered an 'industry – high impact' use. The development of data centres in other land use zonings (e.g. General Employment, High Technology) would be inappropriate in the case of the subject proposal, as the necessary dispatchable power generation assets required would create land use conflicts due to noise, vibrations, fumes, appearance, etc. in business park settings.
Plant Storage (Only available in 'HI' and 'WD' zoning)	'Plant Storage' is defined as *"The use of buildings or land for the storage of plant machinery, equipment or appliances."* The generator yard includes ancillary plant and 58 no. standby/back-up generators. This plant is vital to the operation of the data centre in the case of an emergency power outage on site. The plant areas contained within the proposed generator compounds equate to 15,430sqm.
Utility Installations	'Utility Installation' is defined as *"A structure composed of one or more pieces of equipment connected to or part of a structure and/ or a facility designed to provide a public utility service such as the provision of heat, electricity, telecommunications, water or sewage disposal and/or treatment*. Having regard to planning precedent set by established substation developments in the County, electricity substations and transmission lines fall broadly under the term utility installation. This is widely accepted by Fingal County Council and An Bord Pleanála in granting similar substation applications in the administrative area of Fingal. It is noted that a separate application for the proposed substation, which is considered Strategic Infrastructure Development, will be made directly to An Bord Pleanála.
Fuel Depot/Fuel Storage	'Fuel Depot/Fuel Storage' is defined as *"The use of land and/or structures for the storage and/or distribution of fuel."* 58 diesel fuel belly tank storage (28 per building + 1 per administrative block) to serve as a back-up power source to the data centre.
Office Ancillary to Permitted Use	'Office Ancillary to Permitted Use' is defined as *"A building or part thereof, where the office use is subordinate to, and associated with, the permitted land use on site."* 2,706sqm floor area offices space proposed.

(ii) Compliance and Consistency with the Policies and Objectives of the Development Plan

The Proposed Development is supported by and is consistent with a number of policies and objectives set out in the Fingal County Development Plan including:

- Objective EN02, EN03, EN04, EN06, EN09
- Objective ED109, Objective ED110, Objective ED112

- Objective DMS103

3.4.2 Outer Airport Noise Zone

The subject site is located along the boundary of the Outer Airport Noise Zone and objective DA07 states that:

> *"Strictly control inappropriate development and require noise insulation where appropriate within the Outer Noise Zone, and actively resist new provision for residential development and other noise sensitive uses within the Inner Noise Zone, as shown on the Development Plan maps, while recognising the housing needs of established families farming in the zone. To accept that time based operational restrictions on usage of second runway are not unreasonable to minimize the adverse impact of noise on existing housing within the inner and outer noise zone."*

The proposed use is wholly appropriate having regard to its location along the boundary of the Outer Airport Noise Zone. Mechanical plant is screened to attenuate noise a more sensitive locations to the east and north of the site, in accordance with Objective DA07 of the County Plan.

3.4.3 Seveso Site

Directive 2012/18/EU (The Seveso III Directive) provides that appropriate consultation distances must be put in place so as to ensure that before decisions are taken, technical advice is available to Planning Authorities in respect of relevant establishments. The Health and Safety Authority provides such advice, where appropriate, in respect of planning applications within a certain distance of the perimeter of these sites.

The subject site is located directly adjacent to the Huntstown Power Station, Huntstown Quarry, Finglas, D11 Seveso site. This is a lower tier Seveso Site with a consultation distance of 300m.

The following Development Plan objectives relate to the development management of Seveso Sites;

Objective DMS180 *Have regard to the provision of the 'Major Accident Directive' (Seveso III) (European Council Directive 2012/18/EU) and impose restrictions in consultation with the HSA, on developments abutting or within proximity of a Seveso site. The extent of restrictions on development will be dependent on the type of risk present and the quantity and form of the dangerous substance present or likely to be present.*

Objective DMS183 *In areas where Seveso sites exist in appropriate locations with low population densities, ensure that proposed uses in adjacent sites do not compromise the potential for expansion of the existing Seveso use and in particular the exclusion of developments with the potential to attract large numbers of the public.*

A Land-Use Planning report has been prepared by AWN Consulting and accompanies this planning application. This report examines hazards associated with Fuel Oil, LPG, and Natural gas installations on site.

The cumulative individual risk contours for Huntstown Power Station corresponding to the boundary of the inner, middle and outer land use planning zones are illustrated as follows.

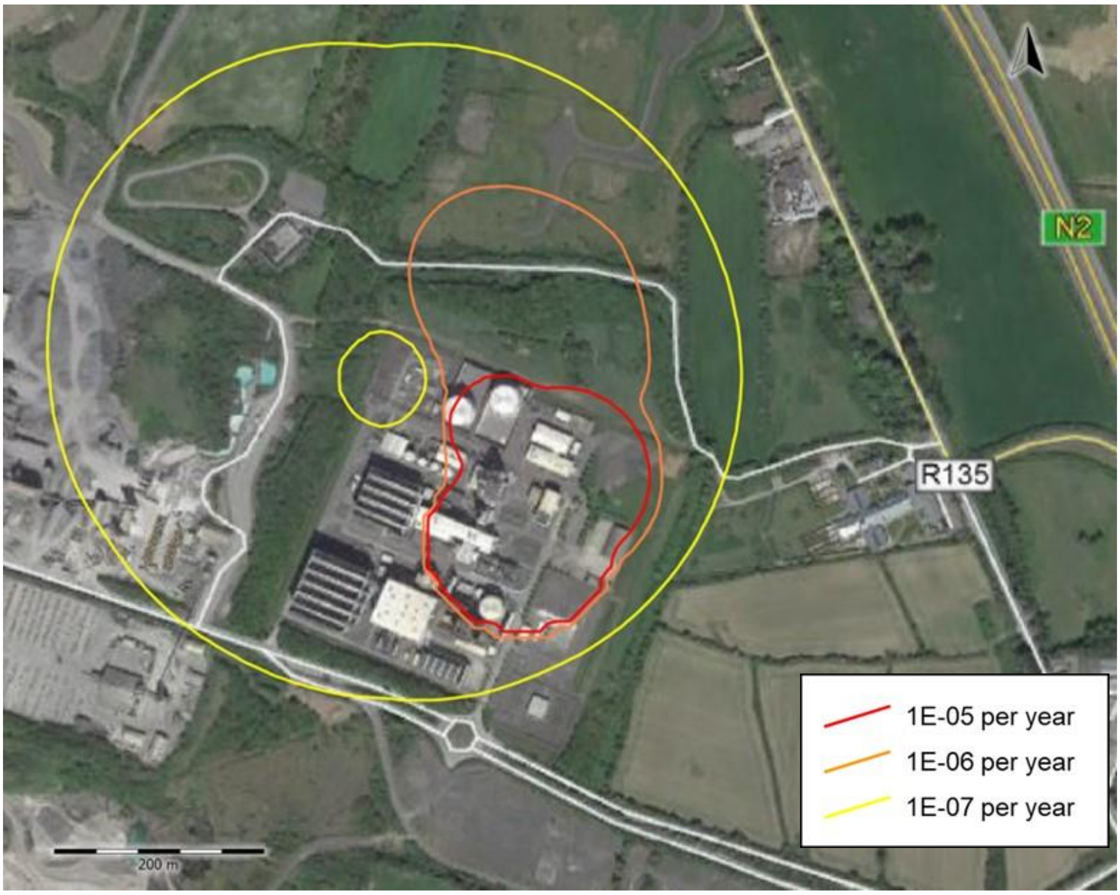

Figure 3.4 *Land-Use Planning Zones*

It is concluded that the proposed Data Centre is outside of the LUP Outer zone (1E-07) of Huntstown Power Station; therefore, the level of individual risk at the proposed development is acceptable.

3.4.4 Design Guidelines for Business Parks and Industrial Areas

The proposed development was designed with regard to the Design Guidelines for Business Parks and Industrial Areas.

Objective DMS103 states that it is a Council's objective to *"ensure that the design and siting of any new Business Parks and Industrial Areas conforms to the principles of Design Guidelines as outlined in Table 12.7."*

We refer the Planning Authority to the enclosed Design Rationale prepared by HJL Architects for the full details of the design approach to this project. We also particularly note the following in compliance with DMS103:

Access & Circulation

- The site layout has been developed to allow safe operational and fire tender access to all buildings

- The site circulation scheme is a ring road system accessed via the main vehicular and pedestrian entrance at the eastern boundary on North Road.

Pedestrian/Cycle Connection

- The site's main access is from the North Road. Pedestrian permeability between Building A and B's administrative blocks B is promoted through the simple parallel layout of the blocks.
- The internal layout encourages pedestrian and cyclist movement. Bicycle parking is facilitated near the administrative areas of Buildings A and B.

Permeability

- Internal permeability is promoted among on-site staff. Given the requirement for security of Data Centre facilities however, a permeable development with public interaction is not appropriate or encouraged in this instance.

Lighting

- Site lighting is provided along the internal access roads for safety and security purposes. Lighting is kept to a minimum along the northern boundary to minimise light spillage to the adjoining Dogs Trust Facility.

Loading/Service Areas

- Both data centre buildings will have a dedicated 4-bay loading facility. The frequency of heavy/long vehicles is light during normal operation at an average of 1-2 vehicles per day.

Setbacks

- The proposal has been subject of an extensive pre-planning process, aimed at minimising impacts on adjoining properties. Buildings A and B are situated in the centre of the site to provide visual relief to the adjoining properties.
- The northern and eastern boundaries are considered more sensitive than the west and southern boundaries having regard to the existing uses commercial and residential uses. We reiterate that the existing dwellings are proposed to be demolished under the subject application.
- The following setbacks are provided as follows:

North

Buildings A and B are set back from the northern boundary by c.27-68m.

East

Building B is set back from the eastern boundary by c.68-126m.

South

Buildings A and B are set back from the southern boundary by c.23-61m.

West

Building A is set back from the western boundary by c.159m.

Ancillary Structures

Ancillary structures including the temporary substation, sprinkler tanks are set back from the southern boundary by c.9-25m. The water treatment facility is setback from the eastern boundary by c.64m.

Signage

- Signage is not proposed as part of this planning application.

Public Art

- Public Art is not proposed as part of this planning application.
- The site will not be accessible to members of the public for operational and security concerns. As such, the Applicant welcomes a development contribution in lieu of a piece of public art, by way of condition.
- The high quality architectural approach to key elevations makes a positive contribution to the visual amenity of the overall site.

Sustainability

- A detailed energy strategy has been prepared for the development.
- SUDS principles have been employed in the drainage design.

Building Orientation & Road Frontage

- The eastern elevation of Building B, as the public facing elevation facing North Road presents an opportunity to create a distinctive contemporary structure within the lower order built environment of this predominantly industrial area. As such, Buildings A and B are orientated from north to south.

Massing and Form

- Due to the prominent nature of the site with a direct boundary with the North Road, the appearance of the proposed buildings and their elevational treatment is defined by high-quality design and finishes.

Appearance/Façade

- The main (south) elevations articulate the entrance to the facility through the administration block. The design is a weave of materials and colours articulated by a mosaic of square facade panels of varying depths and angles, powder coated to juxtapose the colour finish of the cladding face .
- A significant contrast is provided between the brighter and reflective upper half of the buildings and the darker tone used around the lower level. In combination with landscape mitigation this will contribute to the illusion of a lighter building volume with the darker lower strip and the equipment yards veiled by landscaping and planting.
- The façade features full storey height curtain wall glazing at the main entrance and offices areas. High-quality metal cladding panels provide the background material and define the prevalent colour for each building.
- A composition of square panels is carried around the side and rear elevations, providing texture, colour and contrast. The varying depths and angles play with

light and shadow on the façade, creating a sense of movement and effectively breaking up the perceived massing of the building.

Roofscape

- The design does not include for roof installations other than PV arrays. Roof vents are positioned at sufficient distance from the edge not to increase the perceived height of the building.

Solar, Utility, Electrical & Mechanical Equipment

- External plant installations adjacent to the building include screened back-up generator yards, sprinkler water and water treatment facilities. Plant installations are generally concealed within the core of the site. Green walls are provided in sensitive areas where additional screening is required to soften their visual impact.
- Outhouses will be clad with materials to match the main buildings to ensure continuity of finishes throughout the facility.

Building Entrances

- Buildings A and B are accessed to the south via the administrative areas. The ground floor is partially glazed to denote the entrance to the buildings. Accessible vehicular parking and cycle parking is conveniently located near the building entrances.

Parking

- Parking is confined to the south of the site for convenient access to Buildings A and B. 208 no. parking spaces are provided including 10 no. accessible spaces, 20 no. ev charging spaces and 8 no. motorcycle spaces.

Landscaping Boundary Treatment

- Planted berming along the northern and eastern perimeter provides multiple benefits including acoustic and visual screening to the adjoining properties as well as fulfilling security objectives for the proposed end user.

3.4.5 Parking

As set out in Section 2.3.1 of the County Plan, a maximum of 1 car parking space shall be provided for every 100 sq.m GFA for Data Centres.

It is proposed that the quantum of car parking provision at 208 no. spaces will serve staff and visitors alike. This figure is less than the maximum permissible figure of 757 spaces. Having regard to estimated employment figures on site, the number provided is sufficient to accommodate the peak parking demand.

It is proposed to provide a total of 10 no. accessible spaces within the proposed site, to comply with the FCDP. The mobility impaired spaces exceed the requirements set out in the WCC Development Plan.

The FCDP requires notes that "*One space or more per 100 spaces should be reserved for electric vehicles with charging facilities*.'' It is proposed to provide a total of 20 no. designated Electric Vehicle parking spaces and the associated sharing points. The electric vehicle spaces have been designed in accordance with the requirements set out in the FCDP.

The reduced car parking provision is in accordance with Policy DM113 of the plan which states: *"Limit the number of car parking spaces at places of work and education so as to minimise car-borne commuting."*

Table 12.9 of the FCDP requires cycle parking provision for a data centre facility at a rate of one space per 200 m^2 (minimum) with appropriate locker, shower and changing facilities. A total of 48 sheltered cycle spaces adjacent to the entrance of the buildings are provided on the basis that this number is considered to be commensurate with the staffing numbers proposed for the site.

We refer the Planning Authority to the enclosed Transport Assessment prepared by CST for more information.

3.4.6 Energy Strategy and Sustainability

This development underlines a commitment by the applicant to the Huntstown site and ensures long term occupancy. The proposal to develop the site will enhance the land use under the current Development Plan and contribute to the overall sustainability of the site.

As noted previously, the applicant, as it does in its day-to-day business, has had due regard to Ireland's Climate targets of achieving 70% of electricity generated from renewable sources by 2030. The applicant is also cognisant that the proposed development is collocated with two gas fired power plants.

The applicant is committed to running its business in the most environmentally friendly way possible and has developed an approach which will (i) use existing infrastructure; (ii) provide a mechanism which will aim to secure additional renewable energy generation.

Use Of Existing Infrastructure	The Proposed Development has been strategically located to adjoin the Huntstown Power Station. Co-locating power generation and electricity consumption on the same site is beneficial in the following ways: • Minimises the need for national grid network improvements, including new high voltage wires and cables, that would otherwise be the case to transfer additional electricity to a new location, the cost of which would be partly paid for by all electricity users; and • Provides the most energy efficient location for the electricity consumer that minimises electrical losses that occur when transferring electricity longer distances. • In addition, this 'co-location' approach will avoid the requirement to build new on-site dispatchable gas power generation, thus avoiding the potential introduction of additional new fossil fuel generations and associated greenhouse gas emissions. The development is also adjacent to the Huntstown Bioenergy plant and feasibility studies will be undertaken to understand the suitability of any excess heat generated from the Data Centre being used in the Anaerobic Digestion process at the neighbouring site, hence making both developments more efficient.
Renewable Energy Generation	Working alongside the proposed development, the Applicant will obligate the facility end user, to enter into arrangements

	which are capable of underpinning new renewable energy generation calculated to offset the energy consumed by the proposed development from the electricity grid. These arrangements will: • Be in the form of Corporate Power Purchase Agreements between the Applicant's group and the facility end user; • Provide for the establishment of new renewable energy generation projects by the Applicant's group, that will not be supported by government or consumer subsidies – these new renewable energy projects will be: o Located throughout Ireland; o Phased over the expected ramp up of the energy demand of the proposed development; and o In total, are calculated to exceed the expected annual volume of energy consumed on site by the proposed development; Through these obligations, it is the goal of the Applicant that for every unit of energy consumed by the data centre, a unit of new renewable energy generation would be despatched to the wider electricity system to off-set it, thus delivering the objective of operating the proposed development on a net zero carbon basis that would not impact Ireland's overall climate targets. Any associated additional renewable energy supply would also increase energy security through indigenous energy sources.

Other considerations:

In addition to the above points, the proposed development has incorporated highly efficient technologies and methodologies allowing for the a high degree of sustainability. Such measures include:

- The data halls will be air cooled by air handling units via free air cooling for the majority of the time with evaporative (adiabatic cooling) during unusual high temperature periods (temperatures typically greater than 25 degrees Celsius).
- During normal operation the data storage buildings will be air cooled which significantly reduces the requirement for water compared to mechanical chilling, or a fully water cooled design. The chosen design efficiencies significantly reduce water demand on site.
- The protection and enhancement of landscape and ecology will be of continuing benefit to the area. Substantial perimeter landscaping and permeable boundary fencing will provide an effective corridor for wildlife around the site., whilst providing a green edge to the development. The green edge will enhance visual amenity at the interface of the development with the public road and encourage its assimilation into the area.
- Waste management during and post-construction will actively control the generation, recycling and disposal of waste material.
- Roof surfaces will be finished with white cap sheets with a high solar reflectance index (SRI) to minimise heat absorption.
- Low/zero carbon technologies such as, low energy lighting, sensor lighting controls, variable speed pumps etc., are proposed to be included in the detailed design.
- The location of the facility in Ireland allows for the use of free-cooling media without the need for excessive mechanical cooling. To take advantage of this resource, the air handling units will be direct evaporative (adiabatic) cooling type.

- Airside heat recovery systems with air-to-air heat pumps shall be installed in the office areas. These systems are to accommodate the fresh air and heating/cooling requirements for the space.
- Energy efficient Direct Drive Electrically Commutated (EC) Fans and motors shall be utilized where possible and variable speed drives (VSD's) will be utilized when EC Fans are not viable. Premium Efficiency motors will be specified on all equipment.
- All other data storage engineering services installations proposed have been considered in detail from an energy perspective.
- The design can accommodate the installation of a heat recovery system to supply low heat energy to a potential future district heating scheme.
- With respect to Building Regulations, Technical Guidance Document (TGD) Part L notes that spaces with installed heat capacity of less than 10W/m2 are exempt from meeting the requirements of the TGD Part L document. As such the data storage operational space is exempt from TGD Part L 2017.

The office space is fully air conditioned and will meet the requirements of the TGD Part L 2017. Building Energy Rating BER A3 or higher is targeted for the office areas with the utilization of high efficiency VRF Air Conditioning and roof mounted PV Panels to generate on site renewable electricity to be compliant with nZEB "Nearly Zero Energy Buildings" requirements. Having regard to the above points, we submit that the proposal fully complies with the following objectives:

- **Objective EN03** - Consider the adaptability of buildings over time and seek to improve the efficiency of existing building stock and promote energy efficiency and conservation in the design and development of all new buildings in the County.
- **Objective EN04** - Encourage development proposals that are low carbon, well adapted to the impacts of Climate change and which include energy saving measures and which maximise energy efficiency through siting, layout and design.
- **Objective EN06** - Encourage and facilitate the development of renewable energy sources, optimising opportunities for the incorporation of renewable energy in large scale commercial and residential development.
- **Objective EN09** - Require details of the requirements for alternative renewable energy systems, for buildings greater than 1000sq m or residential schemes above 30 units, under SI 243 of 2012 European Communities (Energy Performance of Buildings) to be submitted at pre planning stage for consideration. These should take the form of an Energy Statement or Feasibility Study carried out by qualified and accredited experts.

4.0 ALTERNATIVES

4.1 INTRODUCTION

The requirement to consider alternatives within an EIAR is set out in Annex IV (2) of the EIA Directive (2014/52/EU) and in Schedule 6 of the Planning and Development Regulations, 2001, as amended (“the Regulations”), which state:

*“A description of the **reasonable alternatives** studied by the person or persons who prepared the EIAR, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the proposed development on the environment.”*

The Schedule 6(2)(b) of the Regulations implement this requirement by requiring the following information:

(b) “a description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the person or persons who prepared the EIAR, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects;”

Reasonable alternatives may include project design proposals, location, size and scale, which are relevant to the proposed development and its specific characteristics. The Regulations require that an indication of the main reasons for selecting the preferred option, including a comparison of the environmental effects to be presented in the EIAR.

The Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018) – states:

“The Directive requires that information provided by the developer in an EIAR shall include a description of the reasonable alternatives studied by the developer. These are reasonable alternatives which are relevant to the project and its specific characteristics. The developer must also indicate the main reasons for the option chosen taking into account the effects of the project on the environment.”

“Reasonable alternatives may relate to matters such as project design, technology, location, size and scale . The type of alternatives will depend on the nature of the project proposed and the characteristics of the receiving environment. For example, some projects may be site specific so the consideration of alternative sites may not be relevant. It is generally sufficient for the developer to provide a broad description of each main alternative studied and the key environmental issues associated with each. A ‘mini- EIA’ is not required for each alternative studied.”

As such, the consideration and presentation of the reasonable alternatives studied by the project design team is an important requirement of the EIA process.

This chapter provides an outline of the main alternatives examined during the design phase. It sets out the main reasons for choosing the development as proposed, taking into account and providing a comparison on the environmental effects.

This chapter assesses the evolution of development and the alternatives examined by the Applicant relating to the location, size and scale and project design and technology of the Proposed Development. This section provides a full justification for the proposed development and provides a comparison of the environmental effects of each alternative option.

The main alternatives examined throughout the design process are set out as follows:

- Alternative Locations
- Alternative Designs and Layouts
- Alternative Processes

The design of the proposed development was subject to a number of design alterations. Every effort was made, during the design evolution, to ensure that the development was sympathetic to the site conditions and contours, ecology and receiving environment.

4.2 ALTERNATIVE LOCATIONS

As noted in Section 4.13 of the 2018 Guidelines "some projects may be site specific so the consideration of alternative sites may not be relevant."

We refer to the Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA 2017), which states that in some instances alternative locations may not be applicable or available for a specific project which is identified for a specific location.

Having regard to these various environmental and development considerations, Huntstown was considered the most appropriate location for the proposed data centre having regard to:

- the co-locational benefits beside the power station, in line with 'Eirgrid's Data Centre Connection Offer Process and Policy, 2020' (which necessitates the provision of on-site dispatchable generation for firm capacity for data centres within the Greater Dublin Area);
- the short grid connection to the electricity network, thus decreasing energy losses associated with the transmission of energy and increasing the overall energy efficiency of the Proposed Development;
- excellent transport connections to the M50 and N2; and
- largescale data centre requirements relating to site scale and size.

Having Regard to the nature and design, it is considered that the proposed development is an effective and appropriate use for the site.

The proposed development contributes towards the achievement of the Zoning Objective and Vision Statement for HI zoning and is in accordance with other relevant policies and objectives of the Fingal County Development Plan 2017-2023.

We refer to the Planning Application Report, prepared by Brock McClure Planning and Development Consultants, enclosed herewith.

Having regard to the site specific nature of the development, further consideration of alternative site locations are not considered essential in respect of the EIAR legislation and guidance.

It is noted that extensive preliminary studies were carried out on site, prior to the development of the planning application as part of a due diligence process. These include the following assessments:

- Topographic Survey
- Ecological Assessment
- Soil Sampling
- Flood Risk Assessment
- Archaeological and Geophysical Surveys including test trenching
- Test Fit Studies

4.3 ALTERNATIVE DESIGNS AND LAYOUTS

Several design iterations were undertaken by HJL Architects to determine the most efficient design and layout having regard to the surrounding site context and requirements of the end user. We refer to the Design Statement prepared by HJL Architects for more information.

The alternative and final design chosen for the data centre were informed in terms of design and layout by the need to underground 110kV overhead power lines traversing the site and the location of a 220kV substation that will provide a permanent power supply to the data centre. Both of these projects will be subject to separate planning applications.

The design evolved as part of a multi-disciplinary process with input from the EIAR Team, design team, Applicant and advice received as part of the pre-planning process with representatives of Fingal County Council.

The process ensured that the proposal is fully site responsive and all environmental factors, including archaeology, architecture and cultural heritage, have been taken into account.

In the preparation for development at this location, a number of alternative arrangements and configurations for the main data centres buildings, attenuation features, roadways and parking arrangements were considered. The alternative designs and layouts for the site were considered and assessed with regard to environmental effects prior to the finalisation of the site layout plan and design of the proposed development by the design team in consultation with the Planning Authority.

The arrangements considered the environmental sensitivities associated with surrounding land use i.e. the proximity to the residential areas, the Dogs Trust, and the road frontage of the North Road (R135).

Site layout considerations were primarily made based on the following factors:

- Minimising potential impacts on the environmental and visual impact sensitivities associated with the surrounding land uses;
- Location of the proposed substation and its proximity to the future grid connection; and,
- Orientation of the main buildings to optimise the use of the space available and minimise visual and noise impact.

4.3.1 Option 1

Option 1 consisted of the following key elements:

- Buildings A, B and C arranged over three storeys with associated plant and ancillary structures total floor area of 101,275sqm.
- Plot ratio 0.79 and site overage 0.26 based on a site area of c.12.86ha
- Total footprint (excluding plant) 33,990sqm.

Option 1 of the proposed development shown in Figures 4.1 (alternative layout) and Figure 4-1 (alternative elevation) was presented to FCC during the first pre-planning consultation meeting on the 22 September 2020. This layout included for 3 no. data centre buildings occupying the majority of the site, with 2 no. large attenuation basins both in the north-east and south-west, with the water treatment plan building located to the south of Building A. The layout reserves space on the western boundary for the future substation development.

Buildings A and C are orientated in an east-west direction adjoining the eastern site boundary. Building B is orientated in a north-south direction adjoining the western boundary. The three buildings require individual external plant/generators with significant visual impact to the public road – North Road.

The substation is significantly smaller in Option 1 as it was developed prior to detailed design.

The following considerations required further analysis and appropriate solutions in the design iteration and development process:

- Concerns regarding the design and scale. Massing and building footprint is excessive.
- The scale and magnitude of the proposal will need to be addressed to allow the site to ‘breathe’. Perceived overdevelopment of the site.
- Pinch points identified between Buildings A and C to existing dwellings.
- Removal of townland boundary and tree removal should be compensated.
- Significant water supply and volume of storage noted.
- Parking located at three locations.
- Cycle areas should be proximate to administration buildings.

Figure 4.1 *Alternative Layout for the Proposed Development (Option 1)*

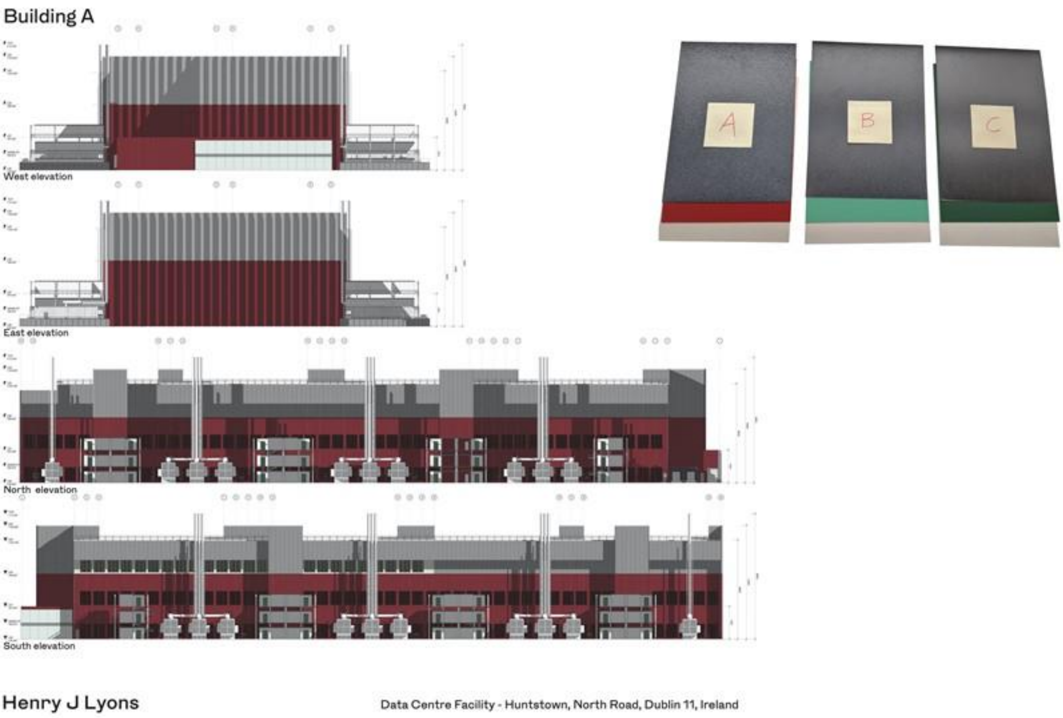

Figure 4.1 *Alternative Elevation for the Proposed Development (Option 1)*

4.3.2 Option 2

Option 2 consisted of the following key elements:

- Buildings A and B arranged over four storeys with associated plant and ancillary structures total floor area of 78,085sqm.
- Plot ratio 0.61 and site coverage 0.17 based on a site area of c.12.86ha
- Total footprint (excluding plant) 21,225sqm.

Option 2 shown in Figures 4.3 and 4.4 was presented to FCC during the second pre-planning consultation meeting on the 11 November 2020.

Changes incorporated in the current proposal can be summarised as follows:

The scale, massing and site coverage reduced from previously proposed in Option 1. The buildings are reduced from three to two buildings but the footprint and height remains largely as proposed.

The set-back distances from sensitive receptors are greatly improved. Although the overall height remains as proposed in Option 1, the revised building design provides an additional storey of accommodation.

A generous green belt is proposed around the site providing a soft transition from sensitive neighbours and public roads. Generous perimeter landscape mitigation allows the site to breathe. The proposed berming (up to 7m in height) with substantial native planting compensate for hedgerow removal and the integration of storm water attenuation and vehicle parking.

The revised masterplan provides mitigation to visual impact, noise and emissions with improved set-back distances and screening.

The following considerations required further analysis and appropriate solutions in the design iteration and development process:

- The re-design enhances the green buffer around the site perimeter and softens the proposal with the existing context.
- Significant design improvements made following the first pre-planning meeting but the façade finish was queried by FCC in relation to experimentation with light and shade to break up the perceived massing of the building.
- Consideration should be given to vertical panelling onto the building to reduce massing.
- Consideration should be given to green infrastructure and screening of the plant areas. The berming provides screening to the north and east.

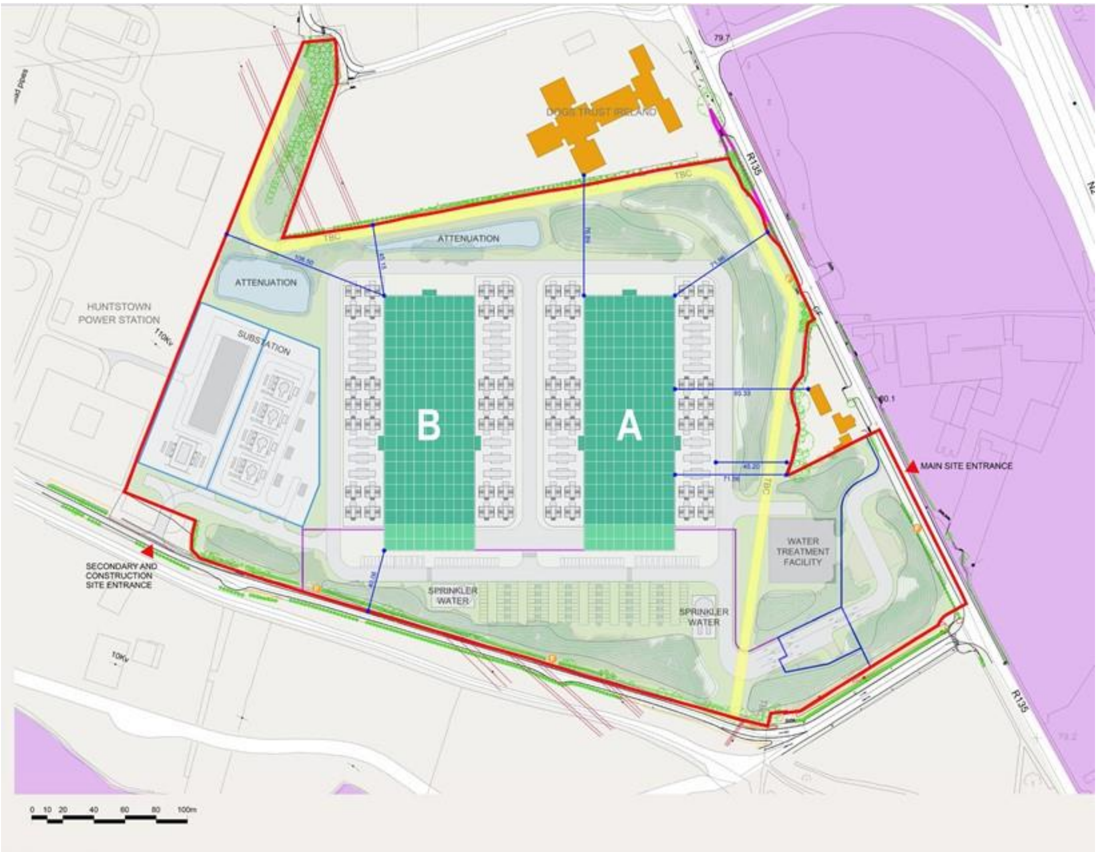

Figure 4.3 *Alternative Layout for the Proposed Development (Option 2)*

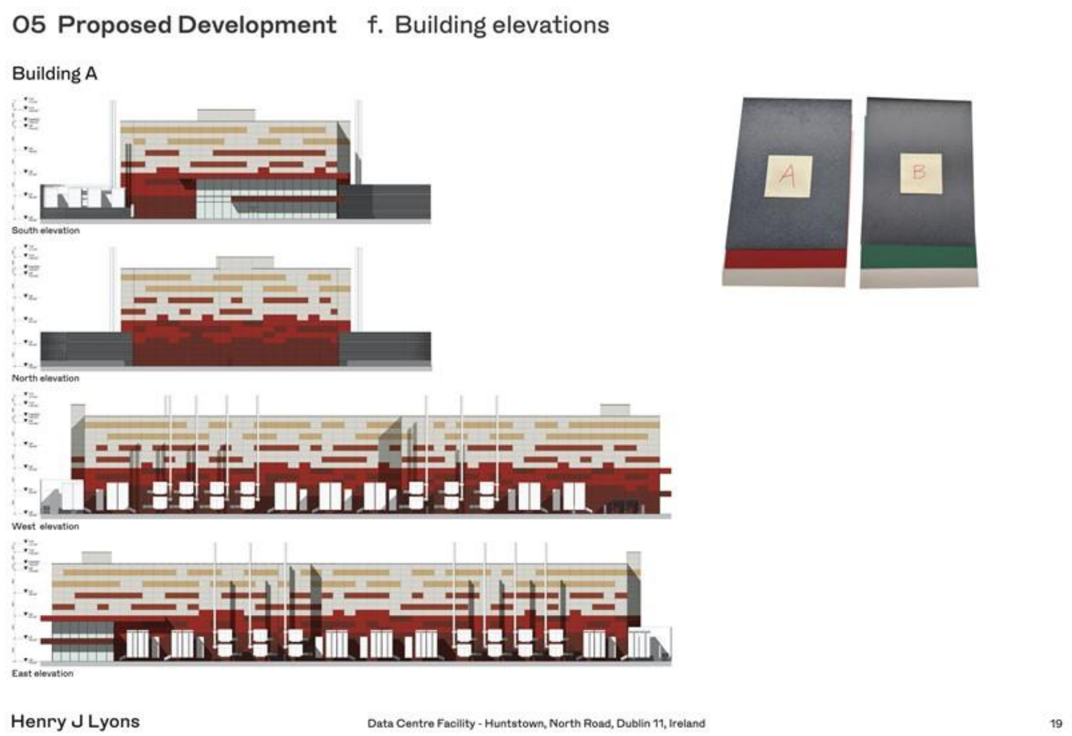

Figure 4.4 *Alternative Elevation for the Proposed Development (Option 2)*

4.3.3 Option 3

Option 3 shown in Figure 4.5 was sent to FCC Area Planner Deirdre Fallon via email on the 4 February 2021 for review. Option 3 consisted of the following key elements:

The general form, massing and siting of Buildings A and B remain as proposed at our pre-planning meeting 11 November 2020.

Design efficiencies reduce the number of storeys from 4 storeys to 3 storeys. The overall building height remains at 28m with an overall flue height of 32m in keeping with the proposal presented at pre-planning (November 2020). Overall flue heights are in accordance with aviation height limits.

The yellow wayleave lies parallel to the internal road as opposed to the site boundary line, previously proposed.

Design efficiencies significantly reduce water demand on site. The proposal will be cooled using a free air cooling system.

The redesign results in a slightly larger building footprint (c.25,336sqm) but the proposal maintains generous separation distances to the northern and eastern boundaries.

Building A is located c.64m from the eastern site boundary (at its closest point) and c.77m to the residential dwellings further east. Building A is located c.64m from the Dogs Trust Building to the north of the site.

Landscaped berming is provided along the site perimeter to enhance vegetative screening and tree cover when viewed from adjoining properties.

All access and wayleave requirements are incorporated into the proposed layout.

The following considerations required further analysis and appropriate solutions in the design iteration and development process:

It was advised that the layout should maximise the separation distances from adjoining properties and the previous iteration is considered more appropriate is this regard.

Figure 4.5 *Alternative Layout for the Proposed Development (Option 3)*

4.3.4 Option 4 – Chosen

Option 4 consisted of the following key elements:

- Buildings A and B arranged over three storeys with associated plant and ancillary structures total floor area of 75,775sqm.
- Plot ratio 0.57 and site coverage 0.20 based on a site area of c.13.3ha
- Total footprint (excluding plant) 26,321sqm.

The main alternative layouts considered are illustrated below in Figures 4.1 - 4.5. Figure 4.6 shows the chosen layout for the Proposed Development (Option 4 - chosen), this places two data centre buildings in a north south arrangement, with attenuation basins located on the northern boundary, and the water treatment plant in the south-east. The layout reserves space on the western boundary for the future substation development. The site now includes the two existing residential units, proposed for demolition as part of the subject application.

The building orientation and main site entrance is as proposed under the previous options.

Buildings and plant installations are tightly contained centrally to maximise landscaping mitigation around the full perimeter of the site in the form of a landscaping belt, and in particular along the most sensitive aspects to east (North Road) and north (Dogs Trust Ireland), softening transition areas and screening installations visible from site boundaries.

The perimeter berming has been further refined to enhance visual screening from the adjoining sites and the North Road. The separation distances created by the wayleaves and berming provide visual relief and noise attenuation to the adjoining properties, particularly to the north at the Dogs Trust facility.

All office areas within the site have a south aspect looking onto this landscaped belt along the southern and eastern site boundaries.

The revised external façade elevates the architectural quality of the data centre improving the visual appearance of building to the public facing North Road.

The façade comprises a mosaic of square panels of varying depths and angles, powder coated to juxtapose the colour finish of the cladding face. In this instance, the southern elevations of Buildings A and B act as the visual focal point of the site directing staff and visitors to the administration areas.

The data halls are free-cooled therefore reducing water consumption and storage on site, as agreed in principle with Irish Water.

Option 4 mitigates against visual impact, noise and emissions while protecting and enhancing the ecological value of the site.

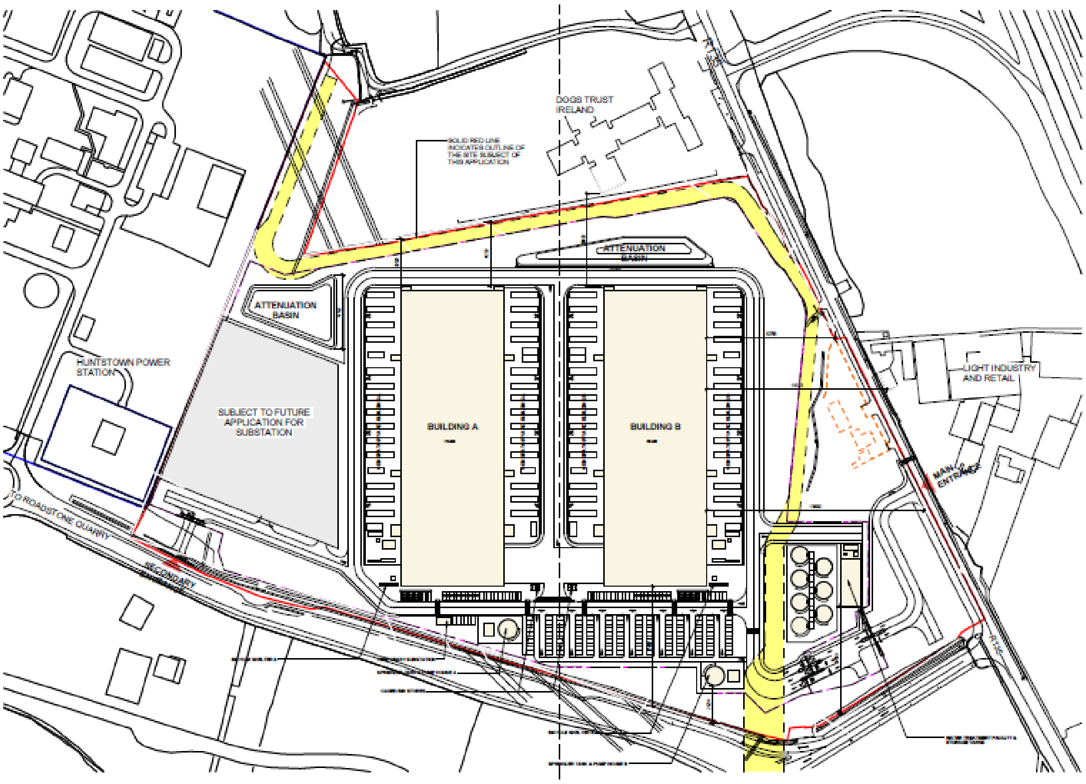

Figure 4.6 *Alternative Layout for the Proposed Development (Option 4 - Chosen)*

Figure 4.7 *Alternative Elevation for the Proposed Development (Option 4 - Chosen)*

Figure 4.8 *Alternative CGI for the Proposed Development (Option 4 – Chosen)*

Table 4.1 presents a comparison of the overall detail for the four options.

Option 4 (Chosen) was the preferred option from both visual and environmental perspectives. This option provides increased set back from sensitive receptors, provides a generous landscape buffer and significantly lower water consumption.

The proposed development layout has struck an appropriate balance between providing sufficient capacity on the site to make the development economically viable and providing a suitable layout for the environmental factors considered.

The proposed layout, with the two buildings, is considered to be the optimal design. The two building layout prevents the overdevelopment of the lands and allows for movement around the site and appropriate separation from the boundary and road frontage.

The configuration shown in Figure 4.6 represents the most practical configuration for reasons of the proposed development in relation to the environmental sensitivity of the site's surroundings.

The layout chosen provides provide the optimum arrangement for the operation of the facility and to minimise any environmental and landscape effects.

Table 4.1 *Comparison Table (Overall Detail)*

	Option 1	**Option 2**	**Option 3**	**Option 4 (chosen)**
Buildings	3 no. buildings	2 no. buildings	2 no. buildings	2 no. buildings
Storeys	3 storeys	4 storeys	3 storeys	3 storeys
Footprint (excl. plant)	33,990sqm.	21,225sqm	25,336sqm	26,312 sqm
Height	Height: 28m with an overall flue height of 32m	Height: 28m with an overall flue height of 32m	Height: 28m with an overall flue height of 32m	Height: 28m with an overall flue height of 32m
Ratio	Plot Ratio 0.79 and Site Coverage 0.26 based on a site area of c.12.86ha	Plot Ratio 0.61 and Site Coverage 0.17 based on a site area of c.12.86ha	Plot Ratio 0.61 and Site Coverage 0.17 based on a site area of c.12.86ha	Plot ratio 0.57 and site coverage 0.20 based on a site area of c.13.3ha
Buffer	Set back distance from road c.22m	Set back distance from road c.72m	Set back distance from road c.59m	Set back distance from road c.68m
Water	Process Water Usage: -	Process Water Usage: -	Process Water Usage: 60.2l/s 23,615 m^3/year Water storage (2,312m^3) for the cooling hours required in the worst case summer 48 hour period.	Process Water Usage: 56l/s 4,842 m^3/year Water storage (2,590m^3) for the cooling hours required in the worst case summer 48 hour period.

Table 4.2 presents a comparison of the environmental effects for both options considered. The Applicant has thoroughly evaluated building configurations that maximise efficiency while providing redundancies of operating systems (server hardware, network systems, cooling systems). The data centre building were orientated to maximise land use and minimise noise impact and visual impacts at the site boundaries for sensitive receptors.

Table 4.2 *Comparison of alternatives for the Proposed Development*

Environmental Factor	Option 1, 2, 3	Option 4 - Chosen
Biodiversity	All options would result in a loss of existing on site ditches and hedgerows. The lands as existing are in use for agriculture and overall have a low to moderate ecological value. The intensity of the development would have resulted in lower potential for the creation of small wildlife habitats.	All options would result in the loss of existing on site ditches and hedgerows. The lands as existing are in use for agriculture and overall have a low to moderate ecological value. The berms and bunds allow for the creation of small wildlife habitats and native species planting.
Land, Soils Geology, Hydrogeology	The building design would result in a greater quantity of emergency generators diesel storage and therefore greater potential risk of an accidental discharge. The intensity of the development would have resulted in increased top soil removal off site.	This layout represents a lesser increase in hardstanding across the site, resultant local impact on groundwater recharge and need for attenuation. The berms and bunds will allow for reuse of soil and minimise and no need for off-site disposal of soil.
Hydrology	No significant water courses located within the site. Therefore the potential impacts on surface water are low.	No significant water courses located within the site. Therefore the potential impacts on surface water are low.
Landscape and Visual Impacts	This proposed layout maximised the massing of buildings across the site and have a negative visual impact on the R135 and nearby residential properties. The maximisation of the buildings would have provided for larger employment numbers to the local area.	The proposed layout provides for a reduction in the massing of buildings as compared with Option 1 and reduces the visual impact from the R135 and nearby residential properties
Archaeology and Cultural Heritage	Archaeological geophysical survey has been completed for the development area. The development of these lands will require mitigation for underlying Archaeology.	Archaeological geophysical survey has been completed for the development area. The development of these lands will require mitigation for underlying Archaeology.
Air, noise, and human beings	This layout brought a larger number of noise and emission generating plant equipment into closer proximity to nearby residential receptors. The density of the option has greater potential in relation to noise and air emission impacts during construction.	This layout provides greater distance to residential properties relative to Option 1, 2 or 3, this reduces the potential for noise and air impacts. Duration of any dust and noise emissions during construction are reduced as construction time less than the previous iterations.
Material Assets, Traffic, and Waste	The larger building design would result in greater staff numbers and therefore the potential impacts on traffic and transportation would be greater.	As compared with Option 1 the proposed development represents a reduced impact on local traffic, waste generation, water and energy usage.

4.4 ALTERNATIVE PROCESSES

As noted in Section 4.5 above, the proposal is suitably located given its co-locational benefits with the adjoining Power Station. New on-site generation would be required if the proposal was placed at an alternative location.

The global development of data centres has seen significant design and construction improvements relating to energy efficiency of buildings. Use of alternative energy technologies were explored as part of the process.

The environmental impact of the proposal is minimised through energy saving technologies including: solar power/PV panels, low energy lighting, sensor lighting controls, variable speed pumps.

Airside heat recovery systems with air-to-air heat pumps shall be installed in the office areas.

Energy efficient Direct Drive Electrically Commutated (EC) Fans and motors shall be utilized where possible and variable speed drives (VSD's) will be utilized when EC Fans are not viable. Premium Efficiency motors will be specified on all equipment.

All other data storage engineering services installations proposed have been considered in detail from an energy perspective.

With respect to Building Regulations, Technical Guidance Document (TGD) Part L notes that spaces with installed heat capacity of less than 10W/m2 are exempt from meeting the requirements of the TGD Part L document. As such the data storage operational space is exempt from TGD Part L 2017.

The office space is fully air conditioned and will meet the requirements of the TGD Part L 2017. Building Energy Rating BER A3 or higher is targeted for the office areas with the utilization of high efficiency VRF Air Conditioning and roof mounted PV Panels to generate on site renewable electricity to be compliant with nZEB "Nearly Zero Energy Buildings requirements."

4.5 DO-NOTHING ALTERNATIVE

As highlighted above the site is zoned for 'HI' with an objective to *"Provide for heavy industry".* Consideration of an alternative location would equate to a 'do-nothing' alternative for the subject site. The lands would remain greenfield and would not maximise upon the development potential of the site, which would be contrary to the policy objectives of the County Plan which states:

"A demand for industrial and/ or manufacturing units is required by a number of economic sectors including the manufacturing sector, including healthcare and pharmaceutical related activities. Depending on the size of the enterprise, industrial and manufacturing accommodation in a ***range of formats, sizes, arrangements and locations can be required. Indeed, over the current Development Plan period demand is likely to emanate from the data centre,*** *biopharmaceutical, food production and logistics activities* ***that require specific facilities to meet their exacting requirements."***

Objective ED110 – *"**Proactively respond to the needs of enterprises undertaking** pharmaceutical**, data centre,** food production and logistics activities **that require bespoke building facilities to meet their specific manufacturing requirements."***

The County Development Plan allows for a proactive approach to data centres as per the above objectives. One of the bespoke building requirements for data centres is the need to have onsite generation in order to ensure that they have firm grid access. On-site generation such as gas turbines provided in Huntstown Power Station is more suitably located in areas zoned for Heavy Industry ‘HI’ use.

Furthermore, developing a data centre at this location would also derive the benefits and maximise upon existing infrastructure, which is supported by the County Development Plan.

4.6 CONCLUSION

The proposed development was carefully designed, taking into consideration the site context and existing neighboring commercial and residential properties to the north and east on North Road, the existing heavy industry uses to the west and the local environmental conditions including air quality, noise and vibration, visual impact and traffic considerations.

The development maximises the development potential of the site, adjoining an existing power station while improving natural screening through landscaping treatments along to site perimeter particularly along the northern and eastern boundaries.

5.0 HUMAN HEALTH AND POPULATIONS

5.1 INTRODUCTION

This chapter has been prepared to assess the likely impacts associated with Human Health for the proposed development. In accordance with the *Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2017), *Draft Advice Notes for Preparing Environmental Impact Statements* (EPA, 2015), and European Commission (EC), *Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report* (EU, 2017) this chapter has considered the *"existence, activities and health of people"* with respect to *"topics which are manifested in the environment such as employment and housing areas, amenities, extended infrastructure or resource utilisation and associated emissions"*.

- Population and Demographics;
- Socioeconomics;
- Population Health;
- Natural Resources;
- Tourism;
- Social Infrastructure;
- Health and Safety.

Impacts on humans from other issues such as natural hazards, soils, geology and hydrogeology, water, air quality, noise and vibration, traffic and landscape are discussed in their respective EIAR chapters:

- Chapter 6 - Soils, Geology and Hydrogeology;
- Chapter 7 –Hydrology;
- Chapter 9 –Air Quality and Climate;
- Chapter 10 –Noise and Vibration;
- Chapter 11 –Landscape and Visual Impact; and
- Chapter 13 – Traffic and Transportation.

Where these topics are dealt with in further detail elsewhere in this EIA Report, the relevant chapters have been cross referenced in this chapter.

5.2 METHODOLOGY

In accordance with the *EPA Guidelines* (EPA, 2017), this chapter has considered that:

> *"in an EIAR the assessment of impacts on population and human health should refer to the assessment of those factors under which human health effects might occur, as addressed elsewhere in the EIAR e.g. under environmental factors of air, water soil etc".*

As per Article 3 of Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment, as amended by Directive 2014/52/EU:

1) *The environmental impact assessment shall identify, describe, and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:*

a) *population and human health;*
b) *biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;*
c) *land, soil, water, air and climate;*
d) *material assets, cultural heritage and the landscape;*
e) *the interaction between the factors referred to in points (a) to (d).*

2) *The effects referred to in paragraph 1 on the factors set out therein shall include the expected effects deriving from the vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned."*

The 2017 publication by the European Commission (EC), *Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report*, considered that:

> *"Human health is a very broad factor that would be highly Project dependent. The notion of human health should be considered in the context of the other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air pollutants) are obvious aspects to study. In addition, these would concern the commissioning, operation, and decommissioning of a Project in relation to workers on the Project and surrounding population."*

This chapter will follow these EC guidelines, and will examine the health effects relevant to the proposed development as they relate to a relevant, defined study area. The effects of the proposed development on the population and human health are analysed in compliance with the requirements of the EPA Guidelines.

5.2.1 Assessment of Significance & Sensitivity

The assessment of significance is a professional appraisal based on the sensitivity of the receptor and the magnitude of effect.

Within any area, the sensitivity of individuals in a population will vary. As such, it would be neither representative of the population, nor a fair representation of the range of sensitivities in a population, were an overall sensitivity classification assigned to the population in question. As such, the precautionary principle has been adopted for this assessment, which assumes that the population within the study area is of a uniformly high sensitivity.

5.2.2 Magnitude of Impact

The magnitude of predicted impacts has been quantified in this assessment using the terms outlined in Table 5.1 below.

Table 5.1 *Description of magnitude of predicted impacts*

Magnitude	Description of Magnitude
High	Change in an environmental and/or socio-economic factor(s) as a result of the Proposed Development which would result in a major change to existing baseline conditions (adverse or beneficial)
Medium	Change in an environmental and/or socio-economic factor(s) as a result of the Proposed Development which would result in a moderate change to existing baseline conditions (adverse or beneficial)

Low	Change in an environmental and/or socio-economic factor(s) as a result of the Proposed Development which would result in a minor change to existing baseline conditions (adverse or beneficial)
Negligible	Change in an environmental and/or socio-economic factor(s) as a result of the Proposed Development which would not result in change to existing baseline conditions at a population level, but may still result in an individual impact (adverse or beneficial)
No change	No change would occur as a result of the Proposed Development which would alter the exiting baseline conditions (adverse or beneficial)

5.2.3 Significance of Effects

The assessment of significant effects in this assessment is a professional appraisal and has been based on the relationship between the magnitude of effects (Section 5.2.2) and the sensitivity of the receptor. Table 5.2 below provides a matrix on the measure of the significance of effects as determined by the relationship between the magnitude of impact and the sensitivity of receptors

Table 5.2 *Significance of effects and the sensitivity of the receptor*

		Magnitude of Impact			
		Negligible	Low	Medium	High
Sensitivity of Receptor	Negligible	Negligible	Negligible or minor	Negligible or minor	Minor
	Low	Negligible or minor	Negligible or minor	Minor	Minor or moderate
	Medium	Negligible or minor	Minor	Moderate	Moderate or major
	High	Minor	Minor or moderate	Moderate or major	Major

5.2.4 Study Area

The proposed development site is located in County Dublin, and in the Electoral Divisions (ED) of The Ward (ED 4041). The area selected for the assessment of the impact on human health has been defined as the ED of The Ward (ED 4041), Dubber (ED 4020), Finglas North A (ED 2051), Finglas North B (ED 2052), Finglas North C (ED 2053), Ballymun A (ED 2015) and Blanchardstown-Abbotstown (ED 4008).

The site is located within the Dublin region, as defined by the Nomenclature of Territorial Units for Statistics developed by Eurostat. The Dublin region comprises of the county of Dublin.

5.3 EXISTING BASELINE CONDITIONS

5.3.1 Development Site Context

The proposed development site is c. 13.3 hectares of predominantly agricultural land and is located in the townlands of Johnstown and Coldwinters, to the north of Finglas, County Dublin. The subject lands are zoned *'HI – Heavy Industry'* with the objective to: *'Provide for heavy industry'*. A detailed description of the development site planning context is presented in Chapter 3 (Planning and Development Context).

5.3.2 Population and Demographics

5.3.2.1 Population

The most recent census of population was carried out by the CSO on the 24th April 2016, and the previous census was undertaken on the 10th of April 2011. The census compiles data for the whole state as well as smaller individual areas including counties, cities, towns, and electoral divisions. Taking into consideration the location of the Proposed Development, the census information on population, age profile, employment, and social class, has been analysed in relation to the development site.

Table 5.3 denotes the population change for the State, and Electoral Division for the census years 2011 and 2016. The latest census data shows that the population surrounding the development site grew by 16.5% between the years 2011 and 2016 compared with only 3.8% nationally. The average rate of population growth across the study area was 14.4%.

Table 5.3 *Population Change 2011 – 2016 (Source: www.cso.ie)*

Area	2011	2016	% Change 2011-2016
State	4,588,252	4,761,865	3.8%
The Ward	8,241	9,602	16.5%
Dubber	6,359	7,372	15.9%
Finglas North A	3,227	3,319	2.9%
Finglas North B	2,809	2,874	2.3%
Finglas North C	3,247	3,464	6.7%
Ballymun A	3,678	4,765	29.6%
Blanchardstown-Abbotstown	4,870	6,195	27.2%

5.3.2.2 Age Profile

The age profile of the population in the area is an important parameter as it provides a good insight into the potential labour force, the demand for schools, amenities, other facilities, and the future housing demand. Table 5.4 shows the age profiles at State, and Electoral Division for the census year 2016.

Table 5.4 *Age profile 2016 (Source: www.cso.ie)*

Age	0-12	13-18	19-24	25-44	45-64	65+	Total Persons
State	18.48%	7.80%	6.96%	29.53%	23.84%	13.39%	4,761,865
The Ward	29.9	7.4	4.6%	43.0%	13.2%	2.0%	9,602
Dubber	24.7	5.8	5.6%	47.8%	12.9%	3.2%	7,372
Finglas North A	17.1	8.9	9.9%	26.5%	25.4%	12.1%	3,319
Finglas North B	15.7	8.8	8.9%	23.9%	27.5%	15.2%	2,874
Finglas North C	16.9	5.6	6.8%	29.7%	25.9%	15.1%	3,464

Age	0-12	13-18	19-24	25-44	45-64	65+	Total Persons
Ballymun A	21.4	8.2	7.4%	41.2%	16.2%	5.6%	4,765
Blanchardstown-Abbotstown	21.6	5.9	5.0%	44.7%	13.6%	9.3%	6,195

This table shows that both nationally and in the study area, the dominant age grouping is 25-44 at 29.53% of the total state population and an average of 36.7% of the study area, respectively. This also reflects that the overall labour force population (12-64 age group) in the study area is reflective of the national level. This is in keeping with census data from 2011 and 2006.

5.3.3 Socio-economics

5.3.3.1 Employment

Table 5.5 presents the employment statistics nationally and at the area surrounding the development site in 2016 compared with 2011. The data shows that unemployment decreased significantly in the study area, as well as nationally, reflecting the economic recovery in recent years.

Table 5.5 *Employment statistics 2011 and 2016 (Source: www.cso.ie)*

	At Work	Looking for first regular job	Unemployed having lost or given up previous job	Total in labour force	% Unemploy ment
2011 Labour Force					
State	1,807,360	34,166	390,677	2,232,203	19.03%
The Ward	3,781	76	675	4,532	16.57%
Dubber	3,207	40	581	3,828	16.22%
Finglas North A	942	39	483	1,464	35.66%
Finglas North B	839	30	343	1,212	30.78%
Finglas North C	1,318	24	282	1,624	18.84%
Ballymun A	1,493	47	489	2,029	26.42%
Blanchardstown -Abbotstown	2,225	62	417	2,704	17.71%
2016 Labour Force					
State	2,006,641	31,434	265,962	2,304,037	12.91%
The Ward	4,418	70	508	4,996	11.57%
Dubber	3,755	40	484	4,279	12.25%
Finglas North A	1,168	36	439	1,643	28.91%
Finglas North B	1,024	34	271	1,329	22.95%
Finglas North C	1,539	18	205	1,762	12.66%
Ballymun A	2,059	53	449	2,561	19.60%
Blanchardstown -Abbotstown	2,956	51	381	3,388	12.75%

The 2016 census data shows that the percentage of unemployed has decreased for the state and the area surrounding the development site since the 2011 census.

5.3.3.2 Education

Census data presenting the highest level of education completed for key educational levels by people living in the Fingal area and the area surrounding the development site is presented in Table 5.6. The table presents key milestone education and ignores people undertaking studies or where information was not stated.

Table 5.6 *Highest level of education in 2011 and 2016 (Source: www.cso.ie)*

Area	No formal education	Primary education	Secondary[1]	Higher Education[2]	Under-graduate Degree[3]	Post-graduate Degree[4]	Total Persons
Highest level of education in 2011							
Fingal	1,697	13,548	59,450	34,426	34,625	17,504	161,250
The Ward	28	174	1,315	1,050	1,018	440	4,025
Dubber	25	233	1,197	998	770	341	3,564
Finglas North A	64	609	893	229	68	22	1,885
Finglas North B	49	536	775	205	89	24	1,678
Finglas North C	33	467	880	437	252	97	2,166
Ballymun A	47	388	889	344	321	100	2,089
Blanchardstown -Abbotstown	63	239	728	501	780	367	2,678
Highest level of education in 2016							
Fingal	1,996	11,961	56,037	36,890	39,094	22,024	168,002
The Ward	42	157	1,243	1,043	1,050	483	4,018
Dubber	28	201	1,097	958	771	324	3,379
Finglas North A	69	549	901	330	102	38	1,989
Finglas North B	58	422	799	299	112	33	1,723
Finglas North C	40	381	867	480	340	141	2,249
Ballymun A	60	338	910	466	349	161	2,284
Blanchardstown -Abbotstown	79	282	774	581	899	558	3,173

5.3.3.3 Labour Force Survey

The Labour Force Survey (LFS) is a large-scale, nationwide survey of households in Ireland carried out every three months. It generates labour force estimates which include the official measure of employment and unemployment for the state.

The LFS results nationally for Q1 2021 showed that there were 2,401,100 people employed in the state with 170,500 registered as unemployed. The COVID-19 Adjusted Measure of Employment, or the lower bound for the number of employed persons aged 15 years and over, rose from 1,785,923 to 1,845,383 between the end of March 2021 and the end of April 2021. This was accompanied by a rise from 52.0% in March 2021 to 56.1% in the associated COVID-19 Adjusted Employment Rate, for those aged 15-64. In Q1 2021, the majority of people were employed in the broad occupations of 'Industry', 'Human health and social work activities' and 'wholesale and retail trade, repair of motor vehicles and motor cycles(www.cso.ie, 2020).

5.3.3.4 Income

The below data in Table 5.7 is obtained from CSO Statbank (CIA02), this demonstrates the levels of total income income per person in the Dublin area are 12-20% higher over

[1] Lower secondary and Upper secondary
[2] Higher Certificate, Advanced certificate/completed apprenticeship or Technical/vocational training
[3] Ordinary bachelor degree, Honours bachelor degree/professional qualification
[4] Postgraduate degree or Ph.D

the study years than the State in 2017. A similar pattern of income distribution is observed in data on disposable income per person.

Table 5.7 *Income per Person (Source: CSO Statbank CIA02)*

Area	Income	2015	2016	2017
State	Total Income per Person (€)	26,857	27,753	29,239
	Disposable Income per Person (€)	18,854	19,660	20,714
Dublin	Total Income per Person (€)	32,750	34,099	35,197
	Disposable Income per Person (€)	21,832	23,005	23,864

<u>5.3.3.5 Deprivation</u>

Deprivation in small areas is mapped using the Pobal HP Deprivation Index. This Index draws on data from censuses and combines three dimensions of relative affluence and deprivation: Demographic Profile, Social Class Composition and Labour Market Situation. Figure 5.1 below shows graphical representation of how the concepts of Demographic Growth, Social Class Composition and Labour Market Situation are measured by ten key socio-economic indicators from the Census of Population. In this EIA Report, the Relative Index Score is considered as the measure for deprivation, as these Relative Index Scores are rescaled such that the mean is 0 and standard deviation is 10 at each census wave. This allows for the provision of descriptive labels with the scores, which are grouped by standard deviation as seen in Table 5.8 below.

Graphical representation of how the concepts of Demographic Growth, Social Class Composition and Labour Market Situation are measured by ten key socio-economic indicators from the Census of Population.

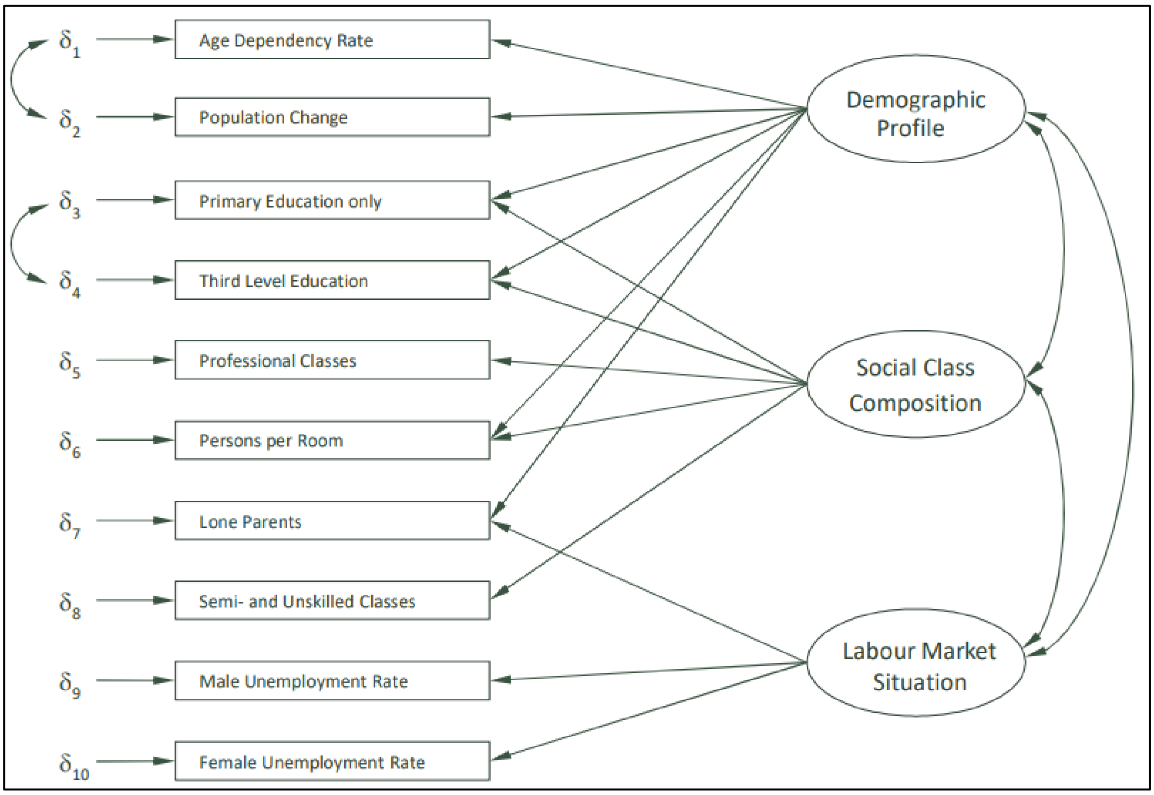

Figure 5.1 *Basic Model of the Pobal HP Deprivation Index*

Table 5.8 *Pobal HP Index Relevant Index Score labels (Source: Pobal HP Deprivation Index)*

Relative Index Score	Standard Deviation	Label
> 30	> 3	Extremely affluent
20 – 30	2 – 3	Very affluent
10 – 20	1 – 2	Affluent
0 – 10	0 – 1	Marginally above average
0 – -10	0 – -1	Marginally below average
-10 – -20	-1 – -2	Disadvantaged
-20 – -30	-2 – -3	Very disadvantaged
< -30	< -3	Extremely disadvantaged

The data in Table 5.9 shows the Pobal HP Index Relevant Index Score Figures at a local and County level (*Source: Pobal HP Deprivation Index).* The area can be generally classified as 'Marginally below average'. However, there is a large gap in relative affluence in nearby electoral divisions, as The Ward is classified as "Marginally above average" while Finglas North A and B classified as "Disadvantaged". The county of Dublin is classified as 'Marginally above average' for the year 2016. Figure 5.2 below presents the Pobal HP Index map illustrating the study area.

Table 5.9 *Pobal HP Index Relevant Index (Source: Pobal HP Deprivation Index)*

Area	Relative Index Score	Pobal HP Description 2016
Dublin	4.12	Marginally above average
The Ward	5.85	Marginally above average
Dubber	5.11	Marginally above average
Finglas North A	-16.64	Disadvantaged
Finglas North B	-14.40	Disadvantaged
Finglas North C	-2.48	Marginally below average
Ballymun A	-2.49	Marginally below average
Blanchardstown-Abbotstown	7.25	Marginally above average

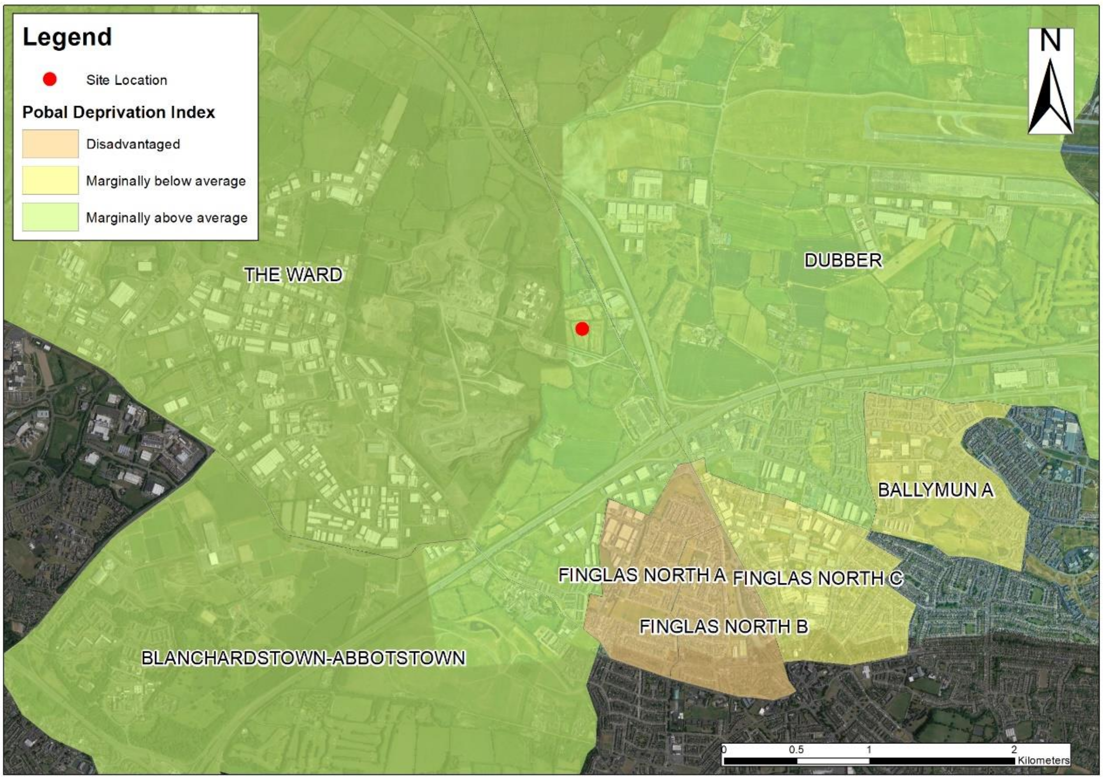

Figure 5.2 *Pobal HP Index Electoral Division, Site is indicated with a red dot (Source: Pobal HP Deprivation Index)*

5.3.4 Health

5.3.4.1 Physical Health

Life expectancy in Ireland by sex is a key metric for assessing population health; data for the study area is shown in Table 5.10. Dublin data shows that life expectancy for both males and females has increased consistently, with female life expectancy consistently higher than male.

Table 5.10 *Period Life Expectancy (Source: CSO Statbank VSA30 & VSA31)*

Period Life Expectancy in Ireland by sex				
Area	Sex	2006	2011	2016
Dublin	Male	76.7	78.3	80.1
	Female	81.2	82.7	83.4

Table 5.11 *shows* Circulatory Diseases Admission Rate per 100,000 Population at a National and County level *(Source: Public Health Well Community Profiles).* The rate of hospital admissions in Dublin tends to fall consistently below that of the State.

Table 5.11 *Circulatory Diseases (Source: Public Health Well Community Profiles)*

Circulatory Diseases Admission Rate per 100,000 Population					
Area	2010	2011	2013	2014	2015
State	4,308.6	4,026.8	4,495.6	4,644.6	3,794.9
Dublin	3,805.56	3,498.7	3,950.4	4,176.7	3,425.8

Respiratory Diseases Admission Rate per 100,000 Population at a National and County level are shown in Table 5.14. The rate of hospital admissions in county Dublin tends to fall broadly in line of that of the State.

Table 5.12 *Respiratory Diseases (Source: Public Health Well Community Profiles)*

Respiratory Diseases Admission Rate per 100,000 Population					
Area	2010	2011	2013	2014	2015
State	2,402.6	2,361.0	2,633.6	2,691.0	2,712.5
Dublin	2,483.76	2,349.73	2,585.7	2,693.7	2,597.9

5.3.4.2 Mental Health

The rates of death by suicide and intentional self-harm rate per 100,000 population is shown in Table 5.13 below. The rate in Dublin is much lower in 2017 compared with those in the State. The rate of death by suicide and intentional self-harm are generally decreasing year-on-year, this is generally in line with the pattern seen in the State.

Table 5.13 *Death by Suicide and Intentional Self Harm (Source: CSO Statbank DHA12)*

Death by Suicide and Intentional Self Harm Rate per 100,000 Population				
Area	2014	2015	2016	2017
State	10.46	9.07	9.22	8.18
Dublin	6.22	3.88	3.97	3.48

The number of admissions to hospital for anxiety or depression per 1,000 people (Table 5.14) in Dublin have followed the same pattern of the State, with the exception of 2015 where a large spike of admissions w (Table 5.14).

Table 5.14 *Number of admissions to hospital for anxiety or depression (Source: Public Health Well Community Profiles)*

Number of admissions to hospital for anxiety or depression per 1,000 people			
Area	2013	2014	2015
State	2	1.8	1.8
Dublin	2	1.4	24.9

5.3.4.3 Lifestyle

In terms of lifestyle, the population in the Dublin is broadly similar to those in the State, with regards to rates of smoking, consumption of alcohol and prevalence of eating 5 portions or more fruit or vegetables daily for persons aged 15 and over (Table 5.17).

Table 5.15 *Prevalence of smoking, drinking alcohol and consumption of fruit and vegetables of persons aged 15 and over (Source: CSO Statbank IH079)*

Area	Smoking daily	Smoking occasionally	Prevalence of drinking alcohol	Prevalence of eating 5 portions or more fruit or vegetables daily
State	15%	7%	81%	42%
Dublin	14%	8%	86%	42%

Activity levels in Dublin are slightly higher to those in the State, with the prevalence of individuals walking and cycling as a form of transport and levels of participation in sports, fitness or recreational physical activities being 28.6% and 10.2% higher than the State average, respectively (Table 5.18).

Table 5.16 *All persons aged 15 and over by Region, Year and Physical Activity Undertaken (Source: CSO Statbank IH072)*

Area	Walk to get to and from places	Cycle to get to and from places	Sports, fitness, or recreational physical activities	Muscle strengthening activities
State	86	14	49	34
Dublin	90	18	54	37

5.3.5 Natural Resources

Natural resources and land use in the hinterland of the proposed development have also been considered as they may have implications for the development of the lands.

There will be a loss of soil available for agricultural economic use due to the development. However, within the overall context of Ireland, the loss of available farmland is considered negligible. In addition, the employment created by the construction and operation of the proposed development counter-balances this economic loss to some extent.

In terms of extractive industries, there is one active quarry, the Roadstone Huntstown Quarry, located 0.5 km west of the proposed development site. The processing which happens at the quarry includes excavator, blasting, crushing, grading, fixed plant and mobile plant.

5.3.6 Tourism

Tourism continues to play a hugely influential role in Irelands economic success, however, the impact of the COVID-19 pandemic has greatly diminished the tourist industry in Ireland.

The development site is located in Fingal, close to Dublin City. It is close to several residential areas, retail centres and service industries. The *Fingal Development Plan 2017 – 2023* outlines the opportunities for tourism in the area:

> *Fingal is excellently placed to contribute to the achievement of national [tourism] targets due to the location of Dublin Airport in the County, the close proximity of Fingal to Dublin City, the primary driver of the country's tourism industry, and the wealth of Fingal's natural, cultural and built heritage offer.*

The development site is located next to an existing power station and is not located near any areas of significance or local tourism. The DIAS Dunsink Observatory is located to the south-west is the closest source of local tourism in the surrounding area. Tourism is not a major industry in the immediate environs of the site.

5.3.7 Major Accidents/Hazards

The Seveso Directive (Directive 82/501/EEC, Directive 96/82/EC, Directive 2012/18/EU) was developed by the EU after a series of catastrophic accidents involving major industrial sites and dangerous substances. Such accidents can give rise to serious injury to people or serious damage to the environment, both on and off the site of the accident.

The Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (the "COMAH Regulations"), implement the latest Seveso III Directive (2012/18/EU).

The purpose of the COMAH Regulations is to transpose the Seveso Directive into Irish law and lay down rules for the prevention of major accidents involving dangerous substances, and to seek to limit as far as possible the consequences for human health and the environment of such accidents, with the overall objective of providing a high level of protection in a consistent and effective manner.

The proposed development is located directly adjoining to the combined cycle gas turbine power plant operated by Gensys Power Limited. The Huntstown Power Station campus is a notified lower tier Seveso site (HSA, 2021) and is subject to the provisions of the Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations, 2015 (COMAH Regulations 2015). The proposed development site is located within the consultation distance of this site. The proposed development will not be a Seveso/COMAH facility or an extension of the existing facility.

According to the EPA (2021) there are two licensed activities currently active within the Huntstown Power Station campus these are; Viridian Power Limited (P077-02) Licence issued in 2006, and Huntstown Power Company (P0483-04) Licence issued in 2006. To the south of the development lands is also the Huntstown Bioenergy Limited site (P0993-02) License issued in 2020. There are also a number of IEL and IPPC facilities located in the wider study area. These are referred to as follows:

- Huntstown Quarry is a licensed inert waste recovery facility operating under license number W0277-03 issued in 2015
- Patrick Kelly Timber Limited, Kishane Cross, North Road, Finglas, Dublin 11. (PO474-01) Located circa 1.5 km to the north,
- Starrus Eco holdings Limited, Millennium Business Park, Grange, Ballycoolin, Dublin 11 (W0183-01). Located circa. 1.3 km to the southwest,
- Lagan Material Limited, Rosemount Business Park, Ballycoolin Road, Blanchardstown, Dublin 11 (P0081-2). Located circa 1.8 km southwest of the site, and;
- Starrus Eco Holdings Limited, Cappagh Road, Finglas, Dublin 11. (W0261-02). Located circa 1.75 km to the southwest.

5.3.8 Social Infrastructure

Social infrastructure covers a range of services and facilities that meet local and strategic needs and contribute towards a good quality of life. In this context it includes local business, residential areas, education, health facilities, emergency services, places of worship, and green infrastructure.

5.3.8.1 *Businesses*

The site is currently a greenfield land. It is bounded to the west by the Huntstown Power Station. The Dogs Trust rehoming charity is located directly to the north of the subject site. The centre which opened its doors in 2009 is Irelands largest dog welfare charity and employs upward of 83 staff members and volunteers.

Beech Vista M50 Garden and Paving Centre, MCD Home and Garden, Gardenrooms.ie, Woodkraft and NPP Group are located to the east of the site.

5.3.8.2 *Residential Dwellings*

The nearest residential sensitive locations are one-off houses, with the closet 150m from the proposed site to the south and east. There is also overnight staff accommodation located within the Dogs Trust Ireland located to the north.

Along the eastern boundary of the subject site there 2 no. single storey residential dwellings. It is proposed to demolish these dwellings as part of this application.

There are notable concentrations of residential settlements that occur to the south of the site, the beginnings of Finglas town centre on the other side of the M50 motorway, which is located 2 km south.

Figure 5.3 *Nearest Residential Dwellings shown as Noise Sensitive Locations (NSL)*

5.3.8.3 *Education*

There are a number of schools within a 5 km vicinity of the proposed development including:

- Saint Michael's School – 2km south
- Saint Luke's National School – 4.5 km east
- Beneavin De La Salle College – south-east
- Saint Margret's National School – 2.5km north-east

5.3.8.4 *Health*

The nearest hospital to the site is Connolly Hospital Blanchardstown located c. 8.9 km to the south-west of the site. The National Orthopaedic hospital Cappagh is located c. 4.1 km south of the site.

5.3.8.5 *Emergency Services*

The Finglas Garda Station and Finglas Fire Station located c. 2.8 km south of the site and 2.9 km north respectively.

5.3.8.6 Places of worship

There is one place of worship in the vicinity of the development; Bethlehem Christian Fellowship located 2.1 km south of the development site.

5.3.8.7 Green Infrastructure

In terms of landscape amenity, there are no listed or scenic views, no landscape or amenity designations or protected trees pertaining to the site, and no protected structures or National Monuments on the site.

There are no areas designated as amenity space by the Fingal Council in the immediate vicinity of the site.

The site is zoned as *HI – Heavy Industry*. The site is not considered to be significant or sensitive from a landscape and visual aspect.

5.3.9 Summary of Baseline Conditions

The sensitivity of the surrounding area has been considered based on the details of the published data. The local area has seen a population growth between the 2011 and 2016 census, there is a large proportion of the population within working age (24 – 44 years old) reflective of the national level. The area surrounding the site is divided between Electoral Divisions, such as The Ward with relatively low unemployment (11.57%), and a high proportion of residents with a university education (36.2%), and electoral divisions, such as Finglas North A with higher unemployment rate (28.71%) and a low percentage with university education (4.8%). The disposable income in the Dublin region is higher than average, relative to the national level. The Pobal HP Deprivation Index shows a disparity between adjacent electoral divisions with three ranking “marginally above average”, two ranking “marginally below average” and two ranking “disadvantaged”. The general health of the population is on trend with the state averages.

The initial analysis indicates the site has good access to social infrastructure and emergency services within 5 km of the site and in general a lack of vulnerable persons within the immediate vicinity (schools or public amenity). There are few residential receptors within close proximity to the site as the land is located beside the Huntstown Power Station and Huntstown Quarry.

It is important to note that the analysis and data used to inform this study has not fully reflected the impacts of COVID-19 this is primarily due to the time in which this data was collected. It is difficult to determine the long-term impacts of the COVID-19 pandemic will have on population, socio-economics and health. This study has assumed that when the business closures and associated restrictions once ended will see a return to the pre-restriction state.

5.4 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

The main potential impacts on population and human health from the proposed development are likely to comprise the potential for spills/leaks, air emissions, noise, visual, and traffic impacts. These aspects have been assessed in terms of the appropriate relevant standards within the corresponding specialist chapters; Chapter 6 (Soils, Geology and Hydrogeology); Chapter 7 (Hydrology); Chapter 9 (Air Quality and Climate), Chapter 10 (Noise and Vibration); Chapter 11 (Landscape and Visual); and Chapter 13 (Traffic and Transportation).

A summary of the potential impacts of construction, commissioning, operation and decommissioning of the proposed development is presented herein.

5.4.1 Potential Impacts on Businesses and Residences

The main potential impacts on local businesses and residences associated with the proposed development will be in relation to air quality, noise, visual impact and traffic.

The proposed development has potential for a positive impact within the Fingal area in regards to increased job opportunities and improved accessibility to jobs during construction and operation. During construction it is estimated to be c. 1050 no. construction workers at peak, and during the operational phase it is estimated that up to 181 no. full time staff will be employed.

It is also anticipated that the proposed development will have indirect positive impact on employment in terms of construction material manufacture, maintenance contracts, equipment supply, landscaping etc. Employment opportunities create an indirect positive impact on mental health and well-being.

The potential impacts on the local population in terms of residents and businesses are considered to be mainly positive in the sense of creating direct employment opportunities and indirect additional business, both during the construction and operational phases.

5.4.2 Potential Impacts on Amenity and Tourism

The location of the Proposed Development within lands zoned for heavy industry, adjacent to a national motorway the proposed development will have a minimal impact on the local landscape amenity. There will be no impact on the local parks.

It is not anticipated that the development will have a significant negative impact on local tourism or shopping amenities. The location of the site on greenfield agricultural land, means that the proposed development would potential have an impact on use of local amenity through the change from an agricultural environment to a built environment.

5.4.3 Potential Impacts on Natural Resources and Material Assets

The Proposed Development will require additional electrical power supply from the national grid, foul and water supply through mains connection, and diesel fuel during operations; the requirements for this supply have been detailed in Chapter 14 (Material Assets).

The power supply for the proposed development will be drawn directly from the national grid and there is no anticipated impact to local residential or business users. A connection to mains water can be facilitated by Irish Water. The anticipated diesel usage for the entire development during normal operation is minimal.

Chapter 6 (Land, Soils, Geology and Hydrogeology) discusses the potential impact on quarries in the vicinity of the site. There will be no impact to mineral resources in the area as a result of the Proposed Development.

There are no groundwater source protection zones in the immediate vicinity of the site, and the GSI Well Card Index does not show any wells drilled or springs at the site. Regardless, in order to reduce impacts on the soils and geology environment a number of mitigation measures will be adopted to prevent the contamination of groundwater during the construction and operational phase; as described in Chapter 6 (Land, Soils, Geology & Hydrogeology).

No significant impact to Natural Resources or Material Assets is predicted, other than loss of a small portion of greenfield land.

5.4.4 Potential Impacts on Human Health from Air Quality and Climate

The key elements of construction and operation of the proposed development with potential impacts on human health from air quality and climate impacts are:

- Potential fugitive dust emissions from general site preparation and construction activities;
- Potential fugitive dust emissions from trucks associated with construction;
- Engine emissions from construction vehicles and machinery.
- A change in traffic flows on road links nearby the proposed development.
- Air emissions associated with the operation of the on-site emergency generators.

The construction phase impacts will be negative, short-term and imperceptible, the potential impacts during the operational phase of the proposed development are deemed, localised, negative, slight and long-term.

5.4.5 Potential Impacts on Human Health from Noise and Vibration

Exposure to excessive noise is becoming recognised as a large environmental health concern. According to the 2015 European Commission report ‘Noise Impacts on Health’, (European Commission, 2015), the most common effects of noise on the vulnerable include;

- Annoyance
- Sleep Disturbance
- Heart and circulation problems
- Quality of Life
- Cognitive Process
- Hearing

It is acknowledged that humans are particularly sensitive to vibration stimuli and that any perception of vibration may lead to concern. In the case of road traffic, vibration is perceptible at around 0.5mm/s and may become disturbing or annoying at higher magnitudes. Noise and vibration impacts associated with the development have been fully considered within Chapter 10 of the EIA Report.

5.4.6 Potential Impacts on Human Health from Traffic and Transportation

The World Health Organisation Report ‘Health Effects and Risks of Transport Systems: The Hearts Project’ (World Health Organisation, 2006) states that road traffic is a major cause of adverse health effects - ranking with smoking and diet as one of the most important determinants of health in Europe. The report states;

> *“Traffic-related air pollution, noise, crashes and social effects combine to generate a wide range of negative health consequences, including increased mortality, cardiovascular, respiratory and stress-related*

diseases, cancer and physical injury. These affect not only transport users but also the population at large, with particular impact on vulnerable groups such as children and elderly people, cyclists and pedestrians"

In the Department of Communications, Climate Action & Environment document *Cleaning Our Air – Public Consultation to Inform the Development of a National Clean Air Strategy* vehicle emissions are included as a key source of health impacts in Ireland (DOCCA&E, 2017).

An assessment of the additional traffic movements associated with the proposed development during the construction and operational phases is presented in Chapter 13 (Traffic and Transportation).

5.4.7 Potential Impacts on Health and Safety

The proposed development has been designed with consideration given to the health and safety risks of people living and working in the vicinity. The facility has been designed by skilled personnel in accordance with internationally recognised standards, design codes, legislation, good practice and experience based on a number of similar existing facilities operated by the applicant.

The potential health and safety risks have been addressed for certain aspects including the vulnerability of the project to natural disasters, flooding and other hazards, air quality, noise and vibration, and traffic in Chapters 6, 9, 10 and 13 respectively.

The potential for major accidents has been considered with reference to Seveso/Control of Major Accident Hazards (COMAH) Regulations. The Proposed Development will not be a Seveso/COMAH facility. The only substance stored on site controlled under Seveso/COMAH will be diesel for generators and the amounts proposed do not exceed the relevant thresholds of the Seveso Directive.

Due to the proximity to the Huntstown Power Station that is notified to the Health and Safety Authority (HSA) as a Lower Tier COMAH site. A Land Use Planning Assessment under the COMAH directive has been prepared by AWN Consulting and is included as Appendix 5.1. The LUP report examines hazards associated with Fuel Oil, LPG, and Natural gas installations on the proposed development site. The LUP report concluded that the proposed development is outside of the LUP Outer zone (1E-07) of Huntstown Power Station; therefore, the level of individual risk at the proposed development is acceptable. The proposed development is located sufficiently far away from the lower tier Seveso site to have no effects with regard to COMAH related effects.

The proposed development has the potential for an impact on the health and safety of workers employed on the site, particularly during the construction phase. The activities of contractors during the construction phase will be carried out in accordance with the Safety, Health and Welfare at Work (Construction) Regulations 2013 (S.I. No. 291 of 2013) as amended to minimise the likelihood of any impacts on worker's health and safety. The health and safety planning for the construction phase of the proposed development will take into account any measure specifically in regards to Covid-19.

Potential impacts associated with electromagnetic fields (EMF) for 220kV electronic and magnetic fields are assessed by EirGrid in their policy documents. Substations produce small fields with the maximum values generally occurring where the line(s) and/or cable(s) enter and exit the substation. There are no significant impacts due to EMP anticipated.

There is a potential impact on the receiving environment as a result of minor accidents/leaks of fuel/oils during the construction and operational phases. However, the implementation of the mitigation measures set out in Chapter 6 (Land, Soils, Geology and Hydrogeology) and Chapter 7 (Hydrology) of the EIA Report will ensure the risk of a minor/accident is low and that the residual effect on the environment is imperceptible.

5.5 REMEDIAL AND MITIGATION MEASURES

5.5.1 Construction Phase

Any perceived nuisance impacts on the immediate local population will be short-term and temporary in nature due to the length of the construction process for the Proposed Development. No remedial or reductive measures are therefore required beyond normal landscaping, noise and construction mitigation that are outlined elsewhere within this EIA Report, and the Construction Environmental Management Plan (CEMP) included with the application documentation.

Best practice mitigation measures are proposed within the CEMP for the construction phase of the Proposed Development which will focus on the pro-active control of construction nuisances.

In accordance with the Safety, Health, and Welfare at Work (Construction) Regulations, a safety management system will be put in place on-site to minimise any risks to both construction personnel and site visitors. The site will not be accessible to the public and will have strict procedures in place for allowing entrance to visitors and contractors.

The remedial and mitigation measures to address the potential impacts on population and human health from the proposed development during construction have been largely assessed within the corresponding specialist chapters; Chapter 6 (Soils, Geology and Hydrogeology); Chapter 7 (Hydrology); Chapter 9 (Air Quality and Climate), Chapter 10 (Noise and Vibration); Chapter 11 (Landscape and Visual); and Chapter 13 (Traffic and Transportation). No additional remedial or mitigation measures are considered necessary.

5.5.2 Operational Phase

It is recommended that during the operational phase of the development, the operator will implement an Environmental Health and Safety (EH&S) Management System and associated procedures at the facility. Full training in the EH&S Management System and relevant procedures will be provided to all employees.

The remedial and mitigation measures to address the potential impacts on population and human health from the proposed development during operation have been largely assessed within the corresponding specialist chapters; Chapter 6 (Soils, Geology and Hydrogeology); Chapter 7 (Hydrology); Chapter 9 (Air Quality and Climate), Chapter 10 (Noise and Vibration); Chapter 11 (Landscape and Visual); and Chapter 13 (Traffic and Transportation). No additional remedial or mitigation measures are considered necessary.

5.6 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

5.6.1 Impacts on Businesses and Residences

Along the eastern boundary of the subject site there 2 no. single storey residential dwellings. It is proposed to demolish these dwellings as part of this application Demolition totalling c.344sqm in area. The likely demolition of these dwellings will no significantly alter the housing stock in Fingal, and would have been considered somewhat inevitable given the subject lands are zoned *'HI – Heavy Industry'* with the objective to: *'Provide for heavy industry'*.

The protection of the amenity of the Dogs Trust property has been a key consideration during the design process. The design team has endeavoured to achieve a balance between the amenity of sensitive receptors such as the Dogs Trust and the functional requirements of the proposal.

The proposed development will result in a ***positive***, ***moderate to major*****,** and ***long term*** impact in regard to increased job opportunities and improved accessibility to jobs during construction and operation to the Fingal area. The predicted impacts on local businesses and residences in relation to air quality, noise, visual impact, and traffic has been summarised below.

5.6.2 Impacts on Amenity and Tourism

No significant visual effects have been identified, and the proposal would contribute to the planned urbanisation of the area, where an expansion of business and industrial use is envisioned, with employment the predominant use.

There are a small number of residential properties in the area, which are exposed to the site and would unavoidably experience some reduction in visual amenity as a result of the development. The development would cause a shift in landscape character which may impact on Populations and Human Health. It is important to note that this effect is an inevitable result of the site's zoning and is a realisation of the development strategy for the area.

The predicted impact on local amenities and tourism with respect to human health***, will be neutral, not significant, and long-term.***

5.6.3 Impacts on Human Health from Air Quality and Climate

As outlined in Chapter 9 (Air Quality and Climate), 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 based on the protection of the environment as well as the protection of human health. Additional factors such as natural background levels, environmental conditions and socio-economic factors are also considered in the limit values which are set (see Chapter 9, Table 9.1).

5.6.3.1 Construction Phase

As detailed in Chapter 9 (Air Quality & Climate), best practice 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 and the environment. Therefore, the impact of construction of the proposed development is likely to be ***neutral, imperceptible*** and ***short-term*** with respect to human health.

5.6.3.2 Operational Phase

The indirect CO2 emissions from electricity to operate the facility will not be significant. The applicant has had due regard to the States CO2 emissions targets. As disused further in Chapter 9 (Air Quality & Climate) the applicant is committed to running its business in the most environmentally friendly way possible and has developed an approach which will (i) use existing infrastructure; and (ii) provide a mechanism which will aim to secure additional renewable energy generation.

The Proposed Development and the emergency generators will be regulated under the EU-wide Emission Trading Scheme (ETS). Electricity providers form part of the ETS and thus greenhouse gas emissions from these electricity generators are not included when determining compliance with the targeted 30% reduction in the non-ETS sector i.e. electricity associated greenhouse gas emissions will not count towards the Effort Sharing Decision target. Thus, any necessary increase in electricity generation due to data storage facility demand will have no impact on Ireland's obligation to meet the EU Effort Sharing Decision.

Air dispersion modelling was undertaken to assess the impact of the development with reference to EU ambient air quality standards which are based on the protection of human health. As demonstrated by the dispersion modelling results, pollutant concentrations with the proposed development operational are compliant with all National and EU ambient air quality limit values and, therefore, will not result in a significant impact on human health.

The air dispersion modelling assessment has considered the ambient air quality impact from the operation of the proposed development (the worst-case scenario) and a conservative approach was adopted when making assumptions for the air modelling inputs which over-estimates the actual levels that will arise. In relation to the spatial extent of air quality impacts from the site, ambient concentrations will decrease significantly with distance from the site boundary. Therefore, the impact of the operation of the proposed development on human health will be ***negative, slight,*** and ***long-term.***

5.6.4 Impacts on Human Health from Noise and Vibration

Noise and vibration impacts associated with the development have been fully considered through predictive modelling of construction and operational noise within Chapter 10 of the EIA Report. Commentary on the impact assessment and related noise levels are summarised below with respect to potential environmental health impacts.

5.6.4.1 Construction Phase

As detailed in Chapter 10 (Noise and Vibration), during the construction phase of the project there is the potential for short-term noise impacts on nearby noise sensitive properties due to noise emissions from site activities. The application of binding noise limits and hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration impact is kept to a minimum as far as practicable.

Noise impacts during the construction phase will be ***negative, slight,*** and ***short-term***. It is considered that as the proposed development progresses from initial ground works that construction noise impacts will reduce from moderate to ***not significant.*** The vibration impacts during the construction phase will be ***neutral, imperceptible*** and ***short-term***.

5.6.4.2 Operational Phase

As detailed in Chapter 10 (Noise and Vibration), proprietary noise control measures including an acoustic screen will be employed as part of design in order to ensure that noise emissions from building services plant do not exceed the adopted criterion at any nearby noise sensitive locations. The resultant noise impact is ***negative***, ***not significant*** and ***long-term***.

The Proposed Development will not generate any perceptible levels of vibration during operation and will have a negligible significance of effect with respect to human health. Therefore, there will be no impact from vibration on human health.

The predicted change in noise levels associated with additional traffic is expected to be ***neutral, imperceptable and long-term*** along the existing road network. Any change in noise levels associated with car parking on site are expected to be ***neutral, imperceptible, and long-term.***

Overall, the noise and vibration levels that are encountered at the nearest sensitive locations, shown in Figure 5.3 above, are predicted to be within relevant noise criteria that have been adopted here for the operation of the proposed data storage facilities and associated infrastructure. These criteria have been selected with due consideration to human health, therefore, will not result in a significant impact on human health.

5.6.5 Impacts on Human Health from Traffic and Transportation

An assessment of the additional traffic movements associated with the Proposed Development during the construction and operational phases is presented in Chapter 13 (Traffic and Transportation).

As part of the completion of Chapter 13, an assessment of collision statistics as published by the Road Safety Authority (RSA) was conducted. Collision statistics for 2005-2016 were reviewed. The collision statistics give information for fatal, serious or minor collisions. Inspection shows there have been one recorded collision recorded within the vicinity of the subject site. The results of the analysis identify one incident on the R135 North Road, the collision was recorded as a minor single motorcycle collision but does not indicate any reoccurring collision hotspots or traffic concerns with the existing road network.

The traffic assessment shows that the additional traffic movements associated with the Proposed Development were found to be ***neutral, insignificant,*** and ***short-term,*** for the construction phase and ***neutral, slight, and long-term*** for the operational phase.

The predicted impacts from noise, vibration and air quality associated with the increased traffic volumes during the construction and operational phases of development have been considered in the relative specialist chapters.

5.7 MONITORING/ REINSTATEMENT

Not applicable. No monitoring for human health, or reinstatement measures are proposed or required during the construction and operational phase of development.

5.8 REFERENCES

Central Statistics Office. Statbank Databases (Accessed March 2021, https://www.cso.ie/en/databases/)

Central Statistics Office. Census of Population, 2011 and 2016. (Accessed March 2021, https://www.cso.ie/en/census/)

Central Statistics Office. Labour Force Survey, 2020 (Accessed March 2021, www.cso.ie/en/statistics/labourmarket/labourforcesurveylfs)

Environmental Protection Agency (2021) Licenced Sites Accessed March 2021, http://www.epa.ie/licensing/)

Environmental Protection Agency (EPA). Draft Advice Notes for Preparing Environmental Impact Statements (EPA, 2015)

Environmental Protection Agency (EPA). Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2017),

European Commission (EC). Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (EU, 2017)

Fingal County Council. Fingal County Council Development Plan 2017-2023.

Pobal HP Deprivation Index (Accessed March 2021,https://data.gov.ie/dataset/pobal-hp-deprivation-index)

Seveso Directive (Directive 82/501/EEC, Directive 96/82/EC, Directive 2012/18/EU)

6.0 LAND, SOILS, GEOLOGY AND HYDROGEOLOGY

6.1 INTRODUCTION

This chapter assesses and evaluates the potential impacts of the development on the land, soil, geological and hydrogeological aspects of the site and surrounding area. In assessing likely potential and predicted effects, account is taken of both the importance of the attributes and the predicted scale and duration of the likely effects.

6.2 METHODOLOGY

6.2.1 Criteria for rating of effects

This chapter evaluates the effects, if any, which the development has had or will have on Land, Soils, Geology and Hydrogeology as defined in the Environmental Protection Agency (EPA) 'Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (EPA, 2017). The Draft EPA document entitled 'Advice Notes for Preparing Environmental Impact Statements' (EPA, 2015) is also followed in this geological and hydrogeological assessment and classification of environmental effects. Due consideration is also given to the guidelines provided by the Institute of Geologists of Ireland (IGI) in the document entitled Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements' (IGI 2013). In addition, the document entitled 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the National Roads Authority (NRA, 2009) is referenced where the methodology for assessment of impact is appropriate.

The rating of potential environmental effects on the land, soil, geological and hydrogeological environment is based on the standard EIAR impact predictions table included in Chapter 1 which takes account of the quality, significance, duration and type of effect characteristic identified (in accordance with impact assessment criteria provided in the Draft EPA Guidelines (2017) publication).

The duration of each effect is considered to be either momentary, brief, temporary, short-term, medium term, long-term, or permanent. Momentary effects are considered to be those that last from seconds to minutes. Brief effects are those that last less than a day. Temporary effects are considered to be those which are construction related and last less than one year. Short term effects are seen as effects lasting one to seven years; medium-term effects lasting seven to fifteen years; long-term effects lasting fifteen to sixty years; and permanent effects lasting over sixty years.

The TII criteria for rating the magnitude and significance of impacts on the geological related attributes and the importance of hydrogeological attributes at the site during the EIA stage are also relevant in assessing the impact and are presented in Tables 1-5 in Appendix 6.1.

The principal attributes (and effects) to be assessed include the following:

- Geological heritage sites in the vicinity of the perimeter of the subject site;
- Landfills, industrial sites in the vicinity of the site and the potential risk of encountering contaminated ground;

- The quality, drainage characteristics and range of agricultural uses of soil around the site;
- Quarries or mines in the vicinity, the potential implications (if any) for existing activities and extractable reserves;
- The extent of topsoil and subsoil cover and the potential use of this material on site as well or requirement to remove it off-site as waste for disposal or recovery;
- High-yielding water supply springs/ wells in the vicinity of the site to within a 2km radius and the potential for increased risk presented by the proposed development;
- Classification (regionally important, locally important etc.) and extent of aquifers underlying the site perimeter area and increased risks presented to them by the proposed development associated with aspects such as for example removal of subsoil cover, removal of aquifer (in whole or part), drawdown in water levels, alteration in established flow regimes, change in groundwater quality;
- Natural hydrogeological/karst features in the area and potential for increased risk presented by the activities at the site; and
- Groundwater-fed ecosystems and the increased risk presented by operations both spatially and temporally.

6.2.2 Sources of Information

Desk-based geological information on the substrata (both Quaternary deposits and bedrock geology) underlying the extent of the site was obtained through accessing databases and other archives where available. Data was sourced from the following:

- Geological Survey of Ireland (GSI) - on-line mapping, Geo-hazard Database, Geological Heritage Sites & Sites of Special Scientific Interest, Bedrock Memoirs and 1: 100,000 mapping;
- Teagasc soil and subsoil database;
- Ordnance Survey Ireland - aerial photographs and historical mapping;
- Environmental Protection Agency (EPA) – website mapping and database information;
- National Parks and Wildlife Services (NPWS) – Protected Site Register; and
- Fingal County Council - illegal landfill information.

Site specific data was derived from the following sources:

- Environmental Due Diligence (Phase 1). Huntstown, Dublin 11. AWN Consulting (April 2020);
- Environmental Due Diligence (Phase 2). Huntstown, Dublin 11. AWN Consulting (July 2020);
- Ground Investigation Report, Lands East of Huntstown Power Station North Co. Dublin. IGSL (July 2020);
- Engineering Planning Report – Drainage and Water Services. DUB 40. Clifton Scannell Emerson (March 2021);
- Flood Risk Assessment. DUB 40. Clifton Scannell Emerson (March 2021);
- Outline Construction Environmental Management Plan. DUB 40. Clifton Scannell Emerson (March 2021);
- Various design site plans and drawings; and
- Consultation with site engineers.

6.2.2.1 Site Investigation Works

Site investigations were carried out by AWN and IGSL during May-June 2020. These investigations included the following:

- Excavation of ten (10) no. trial pits across the large site area to examine soil conditions and if any infill or foreign material is present across the land (TP; depths up to 3 mbgl);
- The drilling of five (5) no. bedrock boreholes; (RC/BH; 80 mm diameter, depths up to 21.7 mbgl);
- Drilling of five (5) no. Cable Percussion Boreholes (CP; 200 mm diameter, depths up to 4.2 mbgl).
- Logging of the arisings from each trial pit in accordance with BS5930:2015, noting any field evidence of potential impact by hazardous substances;
- Collection of one (1) no. composite samples from each of the trial pit arisings with all being sent for laboratory analysis focusing on potential contamination and the classification of the materials for waste disposal purposes;
- Collection of three (3) groundwater samples for laboratory analysis,
- Ground gas measurement from gas wells installed at the cable percussion locations (CP);
- Waste Acceptance sampling with an asbestos fibre survey of all trial pit locations.

Trial pit and borehole logs are included in Appendix 6.2, which include a description of the lithologies observed in each excavation, depth to bedrock, type of bedrock and any water strikes encountered during the excavations.

Samples were collected from the arisings from all of the trial pits, which were considered representative of the material observed at the selected sampling location and were transferred directly into laboratory-supplied containers. The containers were then clearly labelled to identify the sample location and depth. Standard sampling techniques were used to collect the samples, which are designed to reduce the risk of cross contamination between sampling events. Appendix 6.3 presents tables with the soil and groundwater analytical test results. The full analytical laboratory reports are presented in Appendix 6.4.

The locations of trial pits and boreholes from which representative samples were collected are presented Figure 6.1 below.

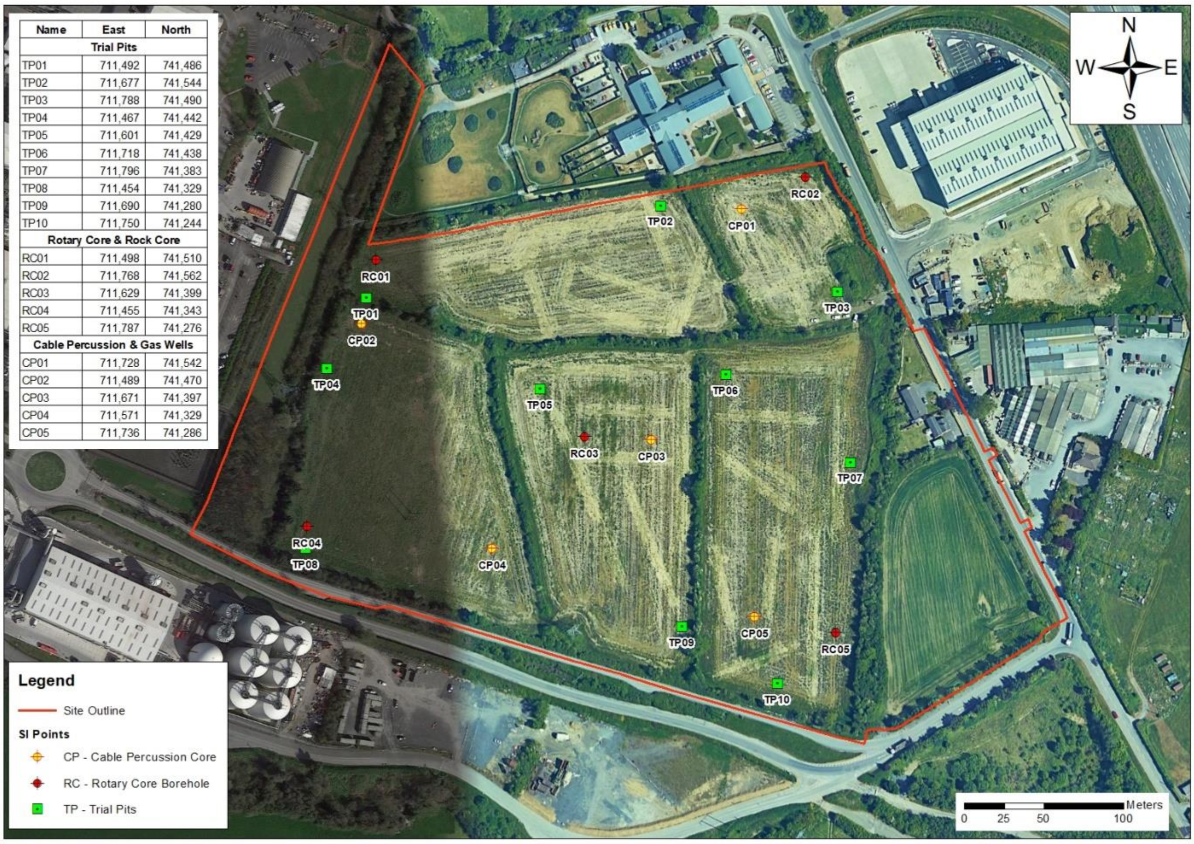

Figure 6.1 *Site Investigation Points (AWN, 2020)*

6.3 RECEIVING ENVIRONMENT

The receiving environment is discussed in terms of land geology, soils, hydrogeology and site history including potential for existing and historical contamination.

6.3.1 General Description of the Site

The proposed development site extends to c. 13.3 ha. of mainly greenfield (agricultural) lands and including two existing residential properties, the lands are zoned HI (Heavy Industry) under the Fingal Development Plan 2017-2023. The site is located in the townland of Johnstown and Coldwinters, North Road, Finglas, Dublin 11.

The site is bounded by the R135 (North Road) to the east, the Dogs Trust charity to the north, Huntstown Power Station to the west and the Roadstone Huntstown Quarry and Huntstown Power Station access road to the south (Refer to Figure 6.2).

The site falls from the east (79.5m AOD) to north-west (77.5m AOD). There is no drainage system currently within the site. The drainage network on site comprises a series of interconnected ditches. The local drainage ultimately flows in a northerly direction towards the Huntstown Stream (located c. 800 m to the north of the site). The Huntstown Stream joins the Ward River c. 5 km to the northeast of the site (at Saint Margaret Golf and Country Club). The Ward River flows towards Malahide Estuary, a Natura Site (SPA/SAC/pNHA) located over 15 km downstream of the site after joining the Broadmeadow River.

The lands are traversed by an 110kV and 38kV overhead line. An application to divert these lines has been made by TLI Group as discussed in Chapter 2 (Description of Development, Section 2.5.

Figure 6.2 *Site Location and Surrounding Activities (AWN, 2020)*

6.3.2 Land Use

The majority of the site is currently in use for arable agricultural activities, with the exception of the two residential properties. Immediately to the north of the site is the Dogs Trust Ireland compound with the eastern section of the site bounded by the R135. Directly to the east of the R135 (North Road) are some commercial units with the N2 on the other side of this. The south of the site is bounded by Huntstown quarry access road. Further south are more greenfield lands and the M50. Dublin Airport is 2.9 km to the northeast.

According to the EPA (2020) there are two licensed activities currently active within the Huntstown Power Station campus (west of the subject site) these are;

- Viridian Power Limited (P077-02) Licensed issued in 2006, and;
- Huntstown Power Company (P0483-04) Licensed issued in 2006

Directly to the south is Huntstown Bioenergy Limited (P0993-01). License issued in 2015 with the facility commencing activity in 2019. Huntstown quarry is a licensed inert waste recovery facility operating under license number W0277-03 issued in 2015. From a review of the Annual Environmental Reports and Licensee Reports related to the activities at the Huntstown Power Station and Huntstown Quarry on the EPA website a number of noncompliance issue were noted. However, there is no indication that these would result in adverse environmental impact on the subject site as it is located downgradient and therefore there would no effects on soils or groundwater underlying the subject site due to its operation (refer to Section 6.3.8 below).

There are also a number of IEL, and IPPC facilities located in the wider study area. These are referred to as follows:

- Patrick Kelly Timber Limited, Kishane Cross, North Road, Finglas, Dublin 11. (PO474-01) Located circa 1.5 km to the north,
- Starrus Eco holdings Limited, Millennium Business Park, Grange, Ballycoolin, Dublin 11 (W0183-01). Located circa. 1.3 km to the southwest,
- Lagan Material Limited, Rosemount Business Park, Ballycoolin Road, Blanchardstown, Dublin 11 (P0081-2). Located circa 1.8 km southwest of the site, and;
- Starrus Eco Holdings Limited, Cappagh Road, Finglas, Dublin 11. (W0261-02). Located circa 1.75 km to the southwest.

Consultation with Fingal County Council have confirmed that there are no known illegal/historic landfills within 500 metres of the site.

Historical Ordnance Survey maps were examined for the purpose of this environmental due diligence. O.S. maps were available from 1830 (the historic 6" maps) and 1900 from the historic 25" maps. The historic maps indicate that the subject site was greenfield up to the present (refer to Figure 6.3 below).

No evidence was noted to indicate industrial processes have been undertaken on the subject site. The subject site appears to be used for agricultural purposes possibly grazing and storing cattle. This purpose has not changed from 1830 to 2005 to present (refer to Figure 6.4 below).

Figure 6.3 *Historic 6" mapping. Site Outline indicative only (Source: OSi, 2021)*

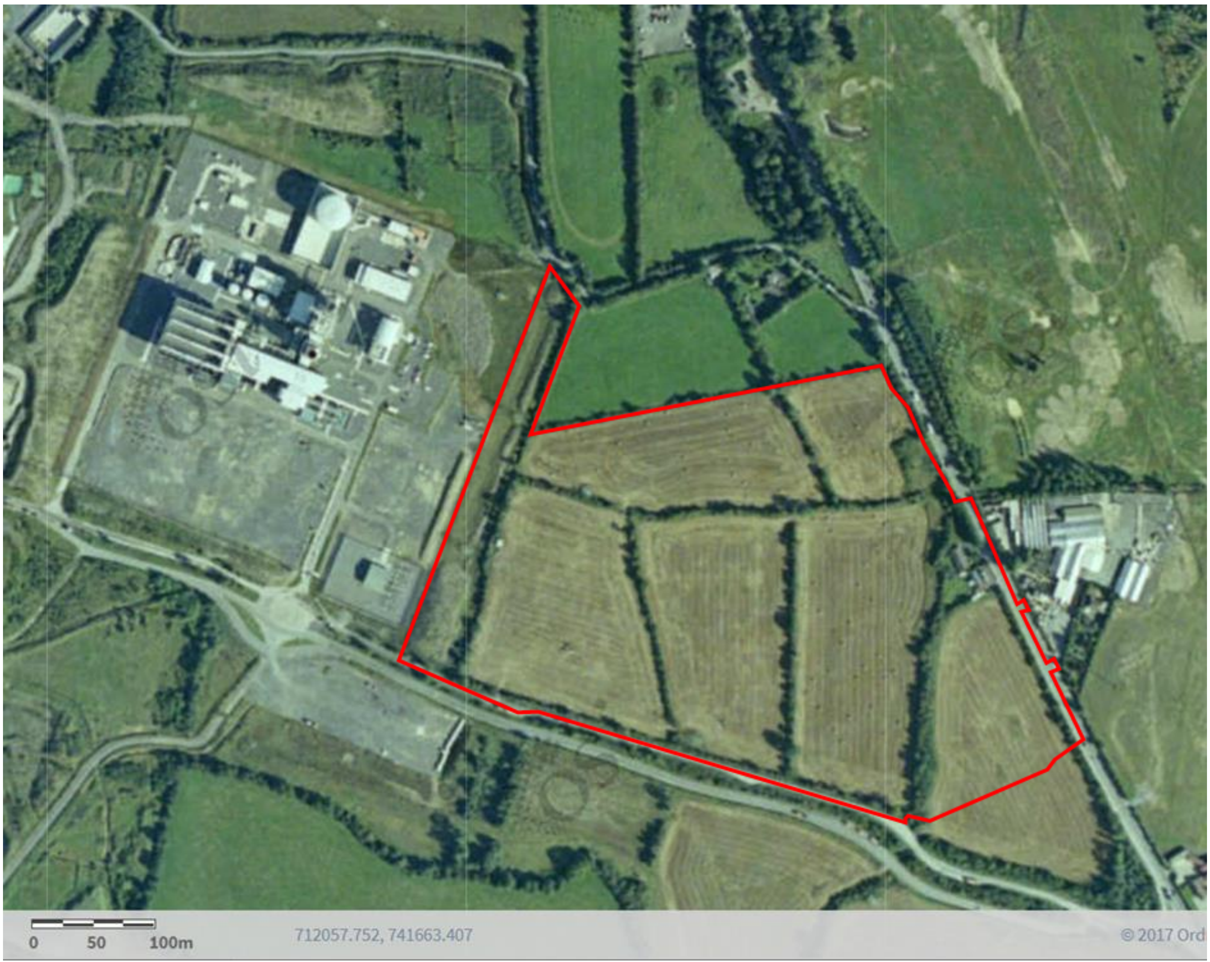

Figure 6.4 *Aerial 2005 Map. Site Outline indicative only (Source: OSi, 2021)*

6.3.3 Soils

The GSI/ Tegasc mapping shows that the soil type beneath the local area is composed of BminPD, mainly basic poorly drained soils and BMinDW mainly basic deep well-drained soils as presented in Figure 6.5 below.

Figure 6.5 *Soils Map (Source: Teagasc, 2021)*

6.3.4 Subsoils

The Quaternary geological period extends from about 1.5 million years ago to the present day and can be sub-divided into the Pleistocene Epoch, which covers the Ice Age period, and which extended up to 10,000 years ago and the Holocene Epoch, which extends from that time to the present day.

The GSI/ Teagasc mapping database of the subsoils in the area of the subject site indicates one principal soil type, as shown in Figure 6.6 below. The subsoil type present across the site is:

- LIMESTONE till Carboniferous (TLs). The whole subject site is composed of limestone TILL. This till is made up of glacial CLAYs which are less permeable than alluvium subsoils.

The EPA soil mapping indicates that the soils comprise primarily of fine loamy drift with limestones (BminPD). The EPA have classed this area as agricultural land used for complex cultivation patterns.

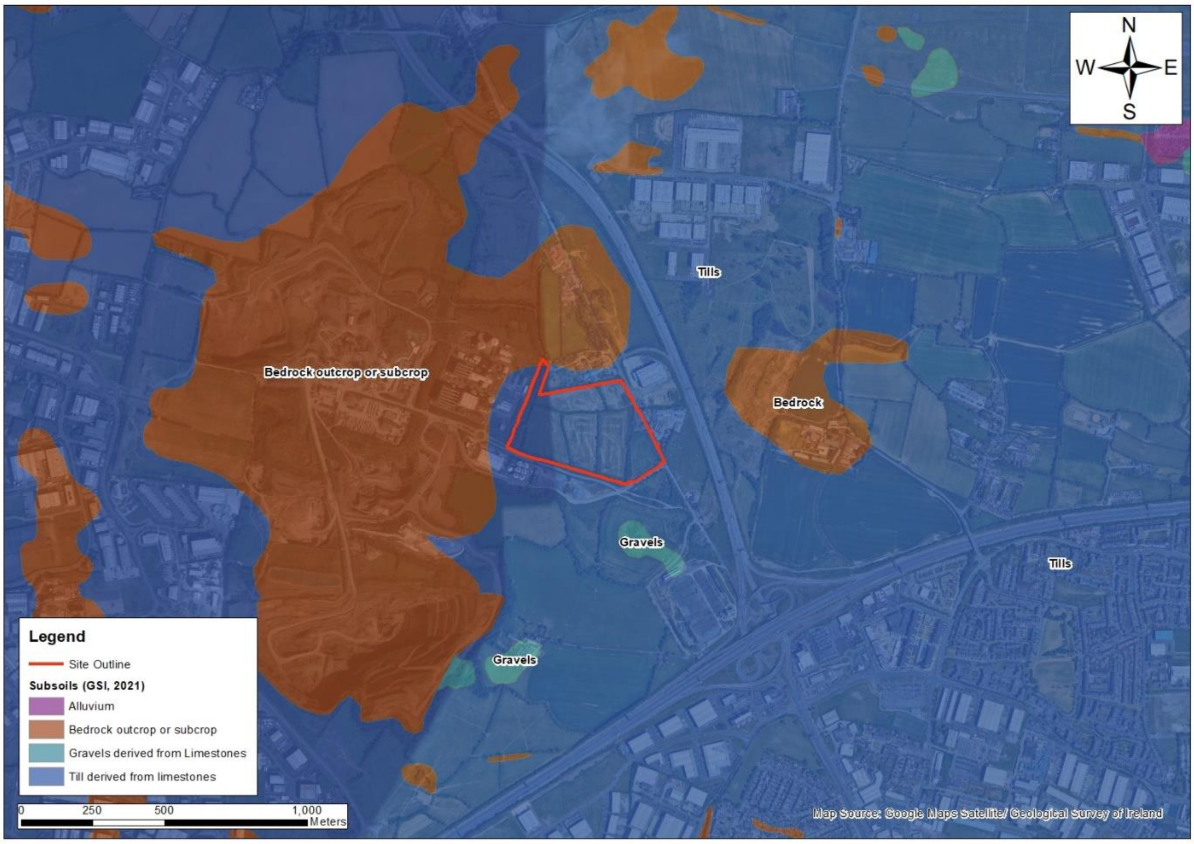

Figure 6.6 *Subsoils Map (Source: GSI, 2021)*

Historical investigations undertaken generally show bedrock depth decreasing from northeast to southwest of the site towards the Huntstown Quarry. The depth of overburden varies to match this with stiff sandy gravelly CLAYS to a depth of 5.3 metres below ground level (mbgl) noted to the northeast of the site, with the same stiff CLAY material noted to 2.00 mbgl to the southwest of the site (Causeway, 2018).

AWN undertook an environmental site investigation in 2020 at the subject site to establish the shallow soil and water conditions. The ten (10) no. trial pits (referenced as TP01 to TP10) were excavated using a 15-ton tracked excavator. The five (5) boreholes (referenced RC01 to RC05) were drilled using a rotary rig to a depth between 20.0 mbgl and 21.7 mbgl. Water strikes are detailed in the trial pit and borehole logs. The soil profile encountered can be summarised as follows (based on location RC03):

- Topsoil 0.0 m - > 0.3 mbgl.
- Subsoil 0.3 m - > 13.5 mbgl.
- Weathered Limestone Bedrock/ Bedrock 13.5 m - > 20.0 mbgl.

Refer to Figure 6.1 above for locations of trial pits and boreholes. Trial pit and borehole logs from 2020 AWN investigations can be viewed in Appendix 6.2.

6.3.5 Bedrock Geology

Inspection of the available GSI (2020) records (Data Sheet 16 and on-line mapping database) shows that the bedrock geology of the site and the surrounding area is dominated by rocks from the Late Chadian to Asbian age. The site is located over dark-grey, calcareous, commonly bioturbated mudstones and subordinate thin micritic limestones referred to as the Tober Colleen Formation (Rock Unit code: CDTOBE) (refer to Figure 6.7 below).

The regional area is highly geologically variable. GSI maps do show the site as overlying the Tober Colleen formation which is bordered to the southwest by Waulsortian Limestones (which have been noted to underly the Tober Colleen), further to the south by the Boston Hill Formation, to the southeast by the Lucan Formation and to the north by the Malahide Formation. Due to this variability the GSI (2020) bedrock geology map (100K structural database) indicates a number of faults in the study area with one bounding the sites to the southwest.

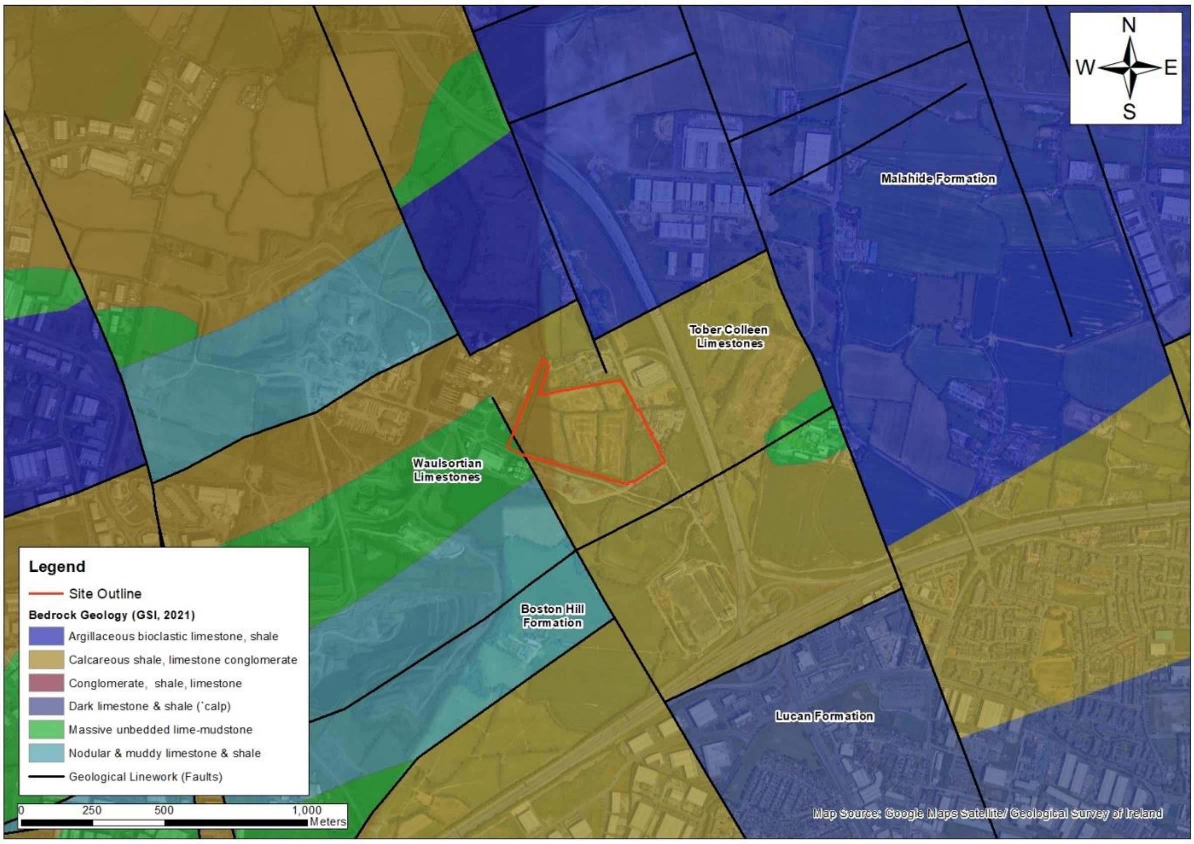

Figure 6.7 *Bedrock Geology Map (Source: GSI, 2021)*

Site investigations indicate bedrock depth is highly varied throughout the site with rockhead recorded at 3.00 mbgl at RC02 (northeast of the site), 13.5 mbgl at RC03 (middle of the site) and 10.45 mbgl at RC05 (southeast of the site). There does seem to be some uniformity in depth at the western boundary with bedrock depth recorded at 7.2 mbgl at RC01 and 6.00 mbgl at RC04. Bedrock was not encountered at any of the trial pit or cable percussion locations.

6.3.6 Regional Hydrogeology

The GSI has devised a system for classifying the bedrock aquifers in Ireland. The aquifer classification for bedrock depends on a number of parameters including, the area extent of the aquifer (km^2), well yield (m^3/d), specific capacity ($m^3/d/m$) and groundwater transmissivity (mm^3/d). There are three main classifications: regionally important, locally important and poor aquifers. Where an aquifer has been classified as regionally important, it is further subdivided according to the main groundwater flow regime within it. This sub-division includes regionally important fissured aquifers (Rf) and regionally important karstified aquifers (Rk). Locally important aquifers are sub-divided into those that are generally moderately productive (Lm) and those that are generally moderately productive only in local zones (Ll). Similarly, poor aquifers are classed as either generally unproductive except for local zones (Pl) or generally unproductive (Pu).

The bedrock aquifers underlying the subject site according to the GSI National Draft Bedrock Aquifer Map are classified dark-grey, calcareous, commonly bioturbated mudstones and subordinate thin micritic limestones. GSI mapping has shown the site overlies two aquifer classes, to the west mapping shows a Locally Important Aquifer (LI) which is moderately productive only in Local Zones and to the east by a Poor Aquifer (PI) - bedrock which is generally unproductive except for local zones (refer to Figure 6.8 below).

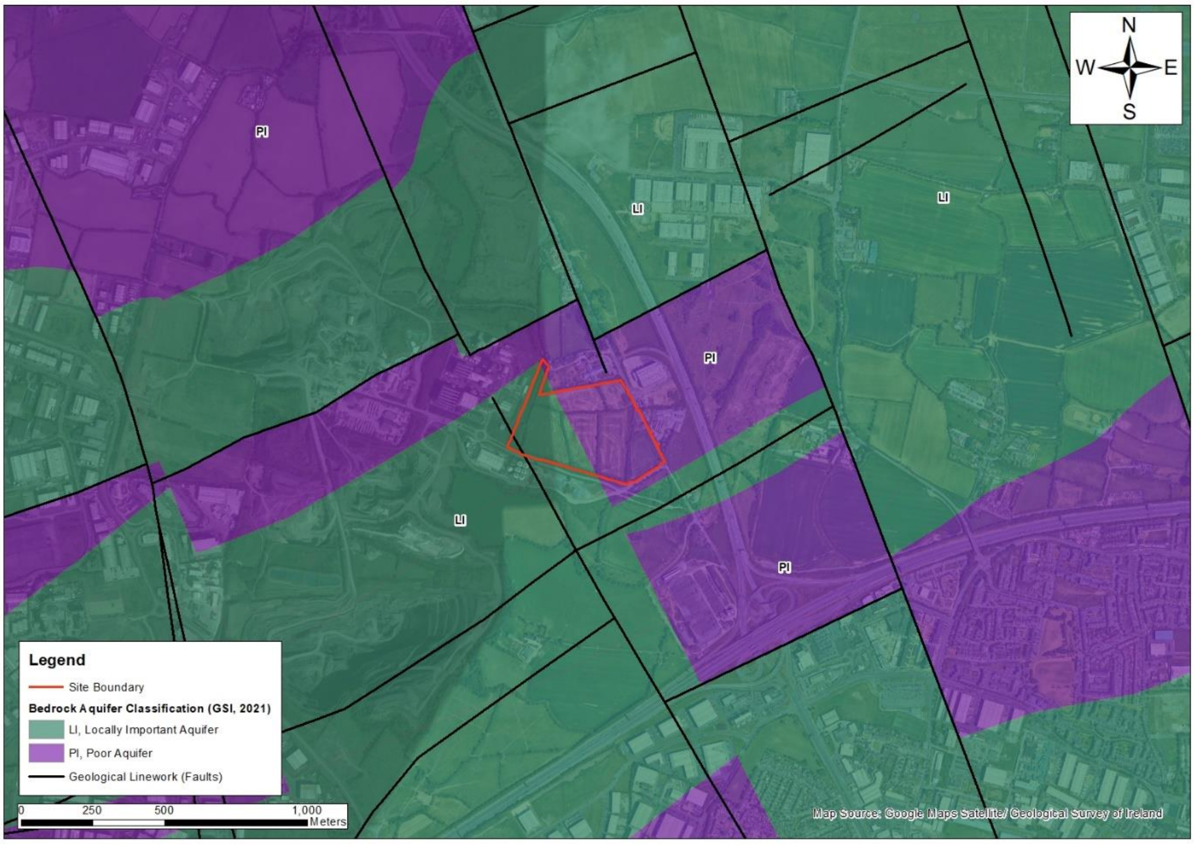

Figure 6.8 *Aquifer Classification Map (Source: GSI, 2021)*

6.3.7 Aquifer Vulnerability

Aquifer vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated generally by human activities. Due to the nature of the flow of groundwater through bedrock in Ireland, which is almost completely through fissures, the main feature that protects groundwater from contamination, and therefore the most important feature in protection of groundwater, is the subsoil (which can consist solely or of mixtures of peat, sand, gravel, glacial till, clays or silts).

The GSI currently classifies the aquifer vulnerability in the region as Extreme (E) to the north and western boundary and High (H) throughout the rest of the site. As can be seen from Table 6.1 below an Extreme vulnerability with clayey subsoil denotes a depth to bedrock of 0-3 mbgl with High vulnerability categorised as 3-5 mbgl.

The aquifer vulnerability class in the region of the site is presented below as Figure 6.9.

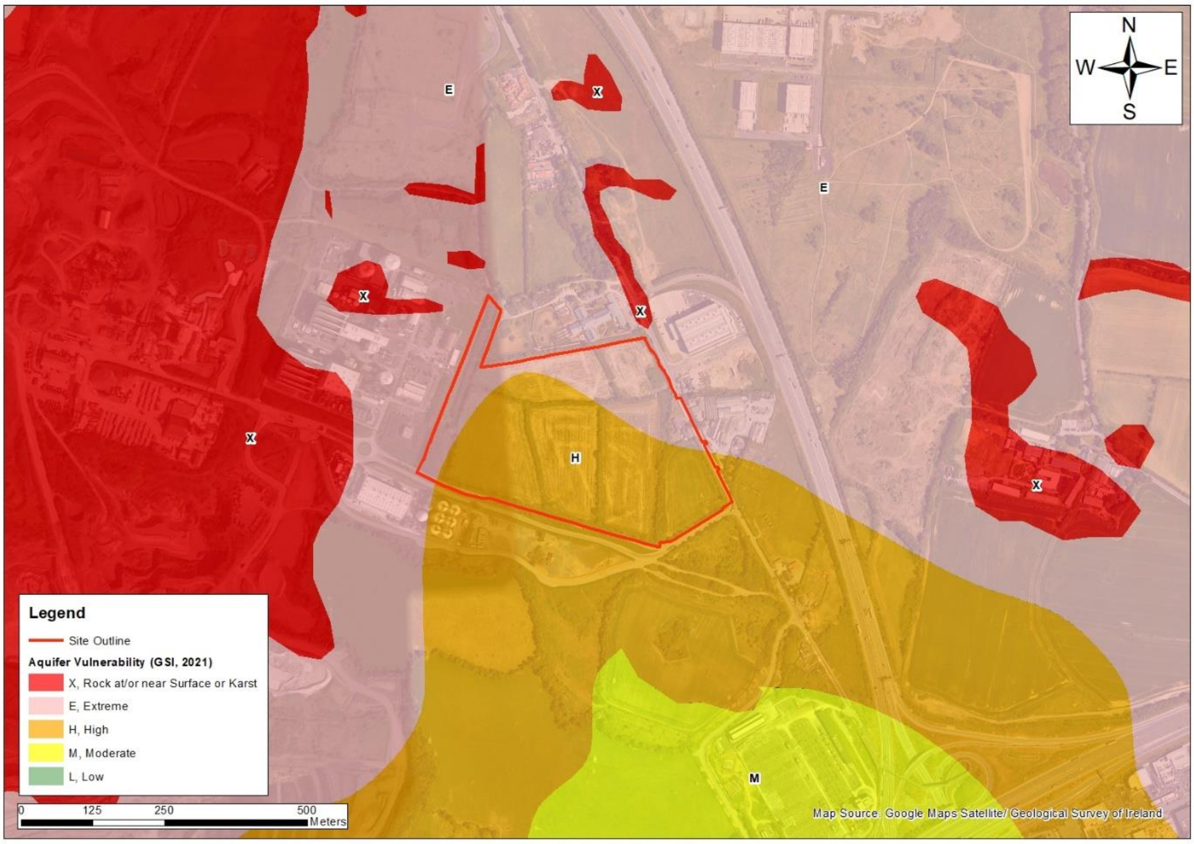

Figure 6.9 *Aquifer Vulnerability Map (Source: GSI, 2021)*

Table 6.1 *Vulnerability Mapping Guidelines (Source: GSI, 2021)*

Vulnerability Rating	Hydrogeological Condition				
	Subsoil Permeability (type) and Thickness			Unsaturated Zone	Karst Features
	High Permeability (sand/gravel)	Moderate Permeability (e.g., sandy subsoil)	Low Permeability (e.g., clayey subsoil, clay, peat)	(Sand/ gravel aquifers only)	(<30 m radius)
Extreme (E)	0 - 3 m	0 - 3 m	0 - 3 m	0 - 3 m	-
High (H)	> 3 m	3 - 10 m	3 - 5 m	> 3 m	n/a
Moderate (M)	n/a	> 10 m	5 - 10 m	n/a	n/a
Low (L)	n/a	n/a	> 10 m	n/a	n/a

Notes: (1) n/a: Not applicable

(2) Precise permeability values cannot be given at present

(3) Release point of contaminants is assumed to be 1-2 below ground surface

The site investigations carried out by AWN (2020) confirmed that the depth to bedrock throughout the site is >5.0, overlaid with low permeability clays (apart from RC02);

therefore, the site-specific vulnerability can be more accurately described as ‘High’ at the northeastern section and ‘Moderate’ to ‘Low’ throughout the rest of the site.

6.3.8 Groundwater Wells and Flow Direction

The GSI Well Card Index is a record of wells drilled in Ireland, water supply and site investigation boreholes. It is noted that this record is not comprehensive as licensing of wells is not currently a requirement in the Republic of Ireland. This current index does not show any wells drilled or springs at the site or surrounding area with the nearest recorded wells located 0.5 km to the east of the site (associated with the Balseskin Reception Centre). None of the wells listed are categorised as domestic use. The area is serviced by Local Authority mains therefore it is unlikely that any wells are used for potable supply. The site is not located near any public groundwater supplies or group schemes. There are no groundwater source protection zones in the immediate vicinity of the site. The closest is 10 km to the west (Dunboyne PWS) and the proposed site is outside of the zone of contribution of this supply.

Figure 6.10 below presents the GSI well search for the area surrounding the site (note this source does not include all wells) and Table 6.2 below summarises the details of recorded wells present within this search area.

Regional groundwater flow would most likely be to the south – southeast towards the River Tolka and Dublin Bay. However, it is understood that dewatering activates are taking place at Huntstown quarry and these will likely have a local influence on the groundwater flow at the subject site. In particular they will control any potential migration pathway from the quarry towards the subject site.

Local groundwater flow has been interpreted as flowing south-southeast (i.e., towards the Huntstown Quarry) by measuring the SWL at the boreholes RC01, RC02 & RC05 (refer to Figure 6.1 above).

Table 6.3 below shows the water level in metres above ordinance datum (mAOD) recorded in 2020.

Figure 6.10 *GSI Well Search Map (Source: GSI, 2021)*

Table 6.2 *Standing Water Levels (SWL) measured in June 2020 for onsite wells*

Well ID	SWL (mbgl)	SWL (m AOD)
RC01	4.07	73.43
RC02	1.85	77.20
RC05	8.30	70.50

Table 6.3 *GSI Well Card Index (Source: GSI, 2021)*

GSI Name	Depth (m)	Depth to Bedrock (m)	Townland	County	Use	Yield Class	Yield m^3/day
2923NEW025	0.6	0.6	BALSESKIN	Dublin			
2923NEW026	0.4	0.4	BALSESKIN	Dublin	Other		
2923NEW027	0.4	0.4	BALSESKIN	Dublin	Other		
2923NEW028	0.2	0.2	BALSESKIN	Dublin	Other		
2923NEW029	0.8	0.8	BALSESKIN	Dublin	Other		
2923NEW030	1.4	1.4	BALSESKIN	Dublin	Other		
2923NEW031	42.7	0.5	BALSESKIN	Dublin	Other	Moderate	83.8
2923NEW040			WARD LOWER	Dublin			
2923NEW041			TYRRELSTOWN	Dublin			
2923NEW043			KILSHANE	Dublin			
2923NEW047	22.5	2.3	TYRRELSTOWN	Dublin			
2923NEW048	12	2	TYRRELSTOWN	Dublin			
2923NEW049	22.2	2	TYRRELSTOWN	Dublin			
2923NEW050	23	2.8	TYRRELSTOWN	Dublin			
2923NEW051	23	2.9	TYRRELSTOWN	Dublin			
2923NEW052	24	4	KILMARTIN	Dublin			
2923NEW053	24.5	5.9	KILMARTIN	Dublin			
2923NEW054	23	3	HOLLYWOODRATH	Dublin			
2923NEW055	23.5	3.5	HOLLYWOODRATH	Dublin			
2923NEW056	23.5	7.5	POWERSTOWN	Dublin			
2923NEW057	23.6	6.2	POWERSTOWN	Dublin			
2923NEW059	6.8	6.8	TYRRELSTOWN	Dublin			
2923NEW060	3	3	HOLLYWOODRATH	Dublin			
2923NEW061	15.5	5.5	CHARLESTOWN	Dublin			
2923NEW062	9.5	4	CHARLESTOWN	Dublin			
2923NEW063	3.5	3.3	CHARLESTOWN	Dublin			
2923NEW064	2.8	2.6	CHARLESTOWN	Dublin			
2923SEW042			CARDIFFCASTLE	Dublin			
2923SEW047	3.8		CAPPOGE	Dublin			
2923SEW048	3.2		CAPPOGE	Dublin			
2923SEW049	3.6		CAPPOGE	Dublin			
2923NEW023			ST MARGARETS	Dublin	Unknown	Low Spring	
2923NEW024			ST MARGARETS	Dublin	Unknown	Low Spring	
2923NEW061	91.4	20	BALLYMUN	Dublin	Industrial use	Moderate	87
2923NEW062	122	23	BALLYMUN	Dublin	Industrial use	Good	200
2923SEW004	76.2		CAPPOGE	Dublin	Agri & domestic use	Good	109.1
2923NEW015	48.8		SANTRY	Dublin	Industrial use	Good	130
2923NEW017	9.1	4	ST MARGARETS	Dublin		Good	164
2923NEW033	150	12	TYRRELSTOWN	Dublin	Industrial use	Good	115
2923NEW035	60	13.5	DUBBER	Dublin	Unknown	Moderate	48.5
2923NEW036	91.4	20	BALLYMUN	Dublin	Industrial use	Moderate	87
2923NEW037	122	22	BALLYMUN	Dublin	Industrial use		
2923SEW003	24.4		FINGLAS EAST	Dublin	Agri & domestic use	Good	110
2923SEWO21	61		FINGLAS	Dublin	Industrial use	Good	174.6

6.3.9 Soil Quality

There are no legislated threshold values for soils in Ireland. As such soil samples were compared to a Generic Assessment Criteria (GAC) derived to be protective of human health, water bodies (including groundwater) and also ecology for a resident and commercial/industrial end use.

Generic Assessment Criteria in the UK has been derived using the Contaminated Land Exposure Assessment (CLEA) model to be protective of human health for a number of different land uses. LQM (Land Quality Management) and the CIEH (Chartered

Institute of Environmental Health) developed a document in July 2009 detailing their own research and derivation of their own 'LQM GACs'. A total of 82 substances including many organic substances had LQM GACs derived, for the standard land uses of residential, commercial/industrial and allotments. This was updated in 2015 following further research and the derived results are now called LQM/CIEH Suitable 4 Use Level (S4UL). The LQM/CIEH S4ULs are intended for use in assessing the potential risks posed to human health by contaminants in soil and as transparently derived and cautious "trigger values" above which further assessment of the risks or remedial action may be needed. For each contaminant S4ULs have been derived for six land use scenarios based on assessing exposure pathways in each planning scenario. In this instance the commercial scenario has been considered. Soil type and soil organic matter (SOM) has an influence on the behaviour of contaminants. S4ULs have been derived for three SOM contents (1%, 2.5% and 6%) to cover the likely range in soils. A prudent approach has been taken by considering the lower 1% SOM content.

The UK values do not have any legal standing within the Republic of Ireland and no statutory guidance for assessing the significance of soil contamination currently exists. However, the values do provide a means of placing the data within context when considering magnitude of risk and have been used in that capacity for this assessment.

In total, ten (10) soil samples were collected throughout the trial pitting exercise and sent to Element Environmental Laboratory in the UK for analysis of a range of parameters to examine the soil quality and to investigate any present and/or past contamination occurred across the subject site. Full laboratory result tables for the soil and groundwater samples are presented in Appendix 6.3.

The soil samples were analysed by Element Environmental in Deeside, UK for the following parameters:

- Metals (As, Cd, Cr, Pb, Se, Cu, Ni, and Zn);
- Polychlorinated Biphenyls (PCB);
- Total Petroleum Hydrocarbons Criteria Working Group (TPH CWG);
- Polycyclic Aromatic Hydrocarbons (PAHs);
- Waste Acceptance Criteria (WAC) for inert waste landfills in accordance with the 2002 European Landfill Directive (2002/33/EC). This suite of parameters includes the following (carried out on 5 samples including 2 from onsite stockpiles);
- Mineral oil;
- Polycyclic aromatic hydrocarbons (PAHs);
- Polychlorinated biphenyls (PCBs);
- BTEX compounds (benzene, toluene, ethylbenzene and xylenes) and methyl tert-butyl ether (MTBE);
- Total organic carbon (TOC); and
- Leachable component of a range of organic and inorganic parameters.

The full analytical laboratory report is presented in Appendix 6.4. For this due diligence, the soil results were compared to the Generic Assessment Criteria (GAC) concentrations. GACs are soil concentrations that have been derived for a defined set of generic assumptions and are used as trigger values in determining whether further risk management action is required in cases where detailed quantitative risk assessment is not being undertaken. There are no published Generic Assessment Criteria for soils in the Republic of Ireland. Instead, reliance is often placed on criteria from the UK and the Netherlands.

Soil sample analysis are summarised below. Detailed tables are presented in Appendix 6.3. These tables exhibit the soil quality across the site from the ten representative samples taken across the subject site.

Metals

All metal parameter concentrations recorded values below the most conservative threshold value for the LQM/CIEH for HHRA (Human Health Risk Assessment) Residential Threshold at 1% SOM. See Table 1 in Appendix 6.3.

Total Petroleum Hydrocarbon Criteria Working Group (TPH CWG)

All parameters recorded below the laboratory's limit of detection (LOD) for all soil samples collected across the subject site. Therefore, there are no exceedances recorded when these concentrations were compared to the most conservative threshold i.e., LQM/CIEH for HHRA Residential Threshold at 1% SOM.

PCBs

All parameters recorded below the laboratory's LOD for all samples collected across the subject site.

PAHs

All parameters recorded below the laboratory's LOD for all samples collected across the subject site. Therefore, there are no exceedances recorded when these concentrations were compared to the most conservative threshold i.e., LQM/CIEH for HHRA Residential Threshold at 1% SOM.

Waste Acceptance Criteria (WAC) Analysis

All ten (10) samples were analysed and compared against Waste Acceptance Criteria (WAC) set out by the adopted EU Council Decision 2003/33/EC which established criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 and Annex II of Directive 1999/31/EC (2002). There was no fill material noted during trial pit excavations with all samples being recorded as original clay subsoil.

The WAC analysis identifies that the representative samples are suitable for classification as Category A – Inert. Based on the laboratory results and parametric concentrations obtained from the site investigation, material from the sample locations would be acceptable at inert waste facilities (Category A). It should be noted that waste facilities develop facility specific criteria also and this should be considered should any soil/ material to be removed from site in the future. The comparison tables for the analysed samples against current WAC criteria can be seen in Table 2 in Appendix 6.3.

Asbestos

There were no asbestos containing materials (ACM) identified in any of the trial pit or stockpile samples taken.

Ground Gas Analysis

Gas wells and sample valves were installed at all of the cable percussion locations. These were measured using a Geotech Gas Analyser for a number of gases which can be generated on landfill sites. The results show little to no build-up of gas over a 3-month period in gas wells installed onsite. These results are presented in Table 3 in Appendix 6.3.

6.3.10 Groundwater Quality

6.3.10.1 Regional Scale

The Water Framework Directive (WFD) Directive 2000/60/EC was adopted in 2000 as a single piece of legislation covering rivers, lakes, groundwater and transitional (estuarine) and coastal waters. In addition to protecting said waters, its objectives include the attainment of 'Good Status' in water bodies that are of lesser status at present and retaining 'Good Status' or better where such status exists at present. 'Good Status' was to be achieved in all waters by 2015, as well as maintaining 'high status' where the status already exists. The EPA co-ordinates the activities of the River Basin Districts, local authorities and state agencies in implementing the directive, and operates a groundwater quality monitoring programme undertaking surveys and studies across the Republic of Ireland.

Presently, the groundwater body in the region of the site (Dublin GWB) is classified under the WFD Risk Score system (EPA, 2021) as 'under review". The Dublin GWB was given a classification of "Good" for the last WFD cycle (2013-2018).

6.3.10.2 Local Scale

During the AWN 2020 site investigation 5 no. groundwater wells constructed with 3 no. utilized for groundwater quality monitoring. 1 no. upgradient groundwater well (RC02) and 2 no. downgradient groundwater wells (RC01 & RC05). The groundwater flow is considered to be in a south - south-westerly direction towards the Huntstown Quarry. The groundwater wells are screened in the underlying limestone rock to a depth of c. 20 mbgl for RC01 & RC02 and 21.70 mbgl for RC05. Refer to Figure 6.1 above for borehole locations. Borehole logs and well installation details are presented in Appendix 6.2 at the end of this report.

Three (3) no. groundwater samples were collected across the site; one groundwater sample from each bedrock borehole. These groundwater samples were sent to Element Environmental Laboratory in the UK for analysis of a range of parameters to examine the groundwater quality and to investigate any present and/or past contamination occurred across the subject site. Appendix 6.3 presents tables with the soil and groundwater analytical test results. Full laboratory result tables for soil and groundwater are presented in Appendix 6.4.

The groundwater samples were analysed for the following parameters;

- TPH CWG,
- Phenols
- Metals (As, Cd, Cr, Pb, Se, Cu, Ni, and Zn,),
- Polychlorinated Biphenyls (PCB),
- Volatile Organic Compounds (VOC),
- Semi Volatile Organic Compounds (SVOC), and
- Chloride, Orthophosphate, Ammoniacal Nitrogen, Total Nitrogen

Groundwater samples were collected using best practice (BS1995:5930) guidelines for water sampling including sufficient well volume purging (i.e., achieved as a result of the combined pumping tests) prior to sample collection and following adequate aquifer formation recharge to each test well sampled.

Groundwater results were compared with Groundwater Threshold Value (Groundwater Directive S.I. No. 9 of 2010 and amendment; S.I. No. 366 of 2016) and EPA Interim Guidelines for groundwater where available.

The analytical testing was undertaken by Element Environmental (UK) Forensics Limited, a United Kingdom Accreditation Service (UKAS) accredited laboratory located in Deeside, England. The laboratory is accredited under UKAS 4225 as well as to ISO/IEC 17025:2005.

The reported analytical results for the groundwater samples are presented in Appendix 6.3 and compared primarily with the relevant Groundwater Regulations S.I. No. 9 of 2010, SI No. 366 of 2016 and EPA Interim Guideline Values (IGVs), 2003. A brief summary of principal results is presented below.

Metals

Table 4 in Appendix 6.3 summarises the metal parameter concentrations recorded at each of the three (3) no. wells during the groundwater sampling round. These measurements are assessed against the available Groundwater Regulations SI No. 9, 2010 (& 366 of 2016) as well as the EPA's Interim Guideline Values (IGVs) where available also.

The majority of the metal analysis suite recorded a concentration below the laboratory's LOD. There were no exceedances above Groundwater Regulations SI No. 9, 2010 (& 366 of 2016) or EPA's Interim Guideline Values (IGVs) other than a slight exceedance of arsenic at RC01 and RC05. Arsenic is naturally occurring in soils and the slightly elevated values recorded are most like not an indication of local contamination.

Hydrocarbons

Table 5 in Appendix 6.3 summaries the results of Hydrocarbon testing. In summary, there were no exceedances across the hydrocarbon suite of parameters in any of the three (3) no. groundwater samples.

General Suite

Table 6 in Appendix 6.3 summarises the general suite of parameters analysed at Element Environmental (UK) Limited. The table also included the results for polychlorinated biphenyls (PCBs). There was no exceedance of current regulatory thresholds. Slightly elevated levels were recorded for one analyte in wells RC02 (upgradient) and RC05 (downgradient):

- Chloride – a concentration of 40.1 & 41.8 mg/l was recorded in RC01 & RC05 respectively which slightly exceeds both the EPA Interim Guideline Values (IGVs), 2003 of 30 mg/l but does not exceed the groundwater regulations GTV upper limit of 187.5 mg/l.

There were no other exceedances recorded across the three (3) no. boreholes at the subject site. In addition, there were no exceedances recorded of available threshold values for field measurements in any of the groundwater samples collected (refer to Table 7 in Appendix 6.3)

VOCs & SVOCs

Tables 8 and 9 in Appendix 6.3 present the results of VOC & SVOC testing. In summary, there were no incidences reported for VOCs and SVOCs in any of the groundwater samples collected at the subject site apart from a single reading of 29 ug/l for chloroform (trichloromethane) at RC02 (upgradient well) this exceeded the IGV of 1 ug/l, there is no current groundwater regulation threshold level for this compound. The lack of other recorded VOCs in the samples may indicate that this result is laboratory anomaly.

6.3.11 Economic Geology

The GSI (2020) mineral database was consulted to determine whether there were any mineral sites close to the study area. As stated, the Huntstown Quarry is c. 0.3 km to the west of the site and is an active limestone quarry.

6.3.12 Geological Heritage

The Geological Survey of Ireland (GSI) Public Viewer (www.gsi.ie/mapping) was reviewed to identify sites of geological heritage for the site and surrounding area. The Huntstown Quarry (Site Code DF022) to the west is the closest audited site. The Phoenix Park and Glasnevin Cemetery are located over 5.13 km and 4.8 km to the east and south of the site respectively.

6.3.13 Radon

According to the EPA (now incorporating the Radiological Protection Institute of Ireland) the site location in Cruiserath is a Low Radon Area where is it estimated that less than 1% of dwellings will exceed the Reference Level of 200 Bq/m^3. This is the lowest of the five radon categories which are assessed by the EPA

6.3.14 Geohazards

Much of the Earth's surface is covered by unconsolidated sediments which can be especially prone to instability. Water often plays a key role in lubricating slope failure. Instability is often significantly increased by man's activities in building houses, roads, drainage and agricultural changes. Landslides, mud flows, bog bursts (in Ireland) and debris flows are a result. In general, Ireland suffers few landslides. Landslides are more common in unconsolidated material than in bedrock, and where the sea constantly erodes the material at the base of a cliff and leads to recession of the cliffs. Landslides have also occurred in Ireland in recent years in upland peat areas due to disturbance of peat associated with construction activities. The GSI landslide database was consulted and the nearest landslide to the proposed development was 2.5 km to the southwest of the site, referred to as the M3 J4 Clonee 2014 which occurred on 3rd February 2014. There have been no recorded landslide events at the site. Due to the local topography and the underlying strata, there is a negligible risk of a landslide event occurring at the site.

In Ireland, seismic activity is recorded by the Irish National Seismic Network. The Geophysics Section of the School of Cosmic Physics at the Dublin Institute for Advanced Studies (DIAS) has been recording seismic events in Ireland since 1978. The station configuration has varied over the years. Currently there are five permanent broadband seismic recording stations in Ireland and operated by DIAS. The seismic data from the stations comes into DIAS in real-time and are studied for local and regional events. Records since 1980 show that the nearest seismic activity to the proposed location was in the Irish sea (1.0 – 2.0 Ml magnitude) and ~55 km to the south in the Wicklow Mountains. There is a very low risk of seismic activity to the proposed development site.

There are no active volcanoes in Ireland so there is no risk from volcanic activity.

6.3.15 Areas of Conservation

According to the NPWS (2021) on-line database there are no special protected area on or in the vicinity of the subject site. The closest European listed sites are as follows;

- The Royal Canal (002103) pNHA - circa. 4.2 km to the north of the site.
- The Santry Demesne (00178) pNHA – circa 4.4 km to the east of the site

The site would have an indirect hydrological connection with the Malahide Estuary SPA/SAC/pNHA through the local drainage network, the Huntstown Stream and the Ward River.

Figure 6.11 below presents the location of these protected areas in the context of the Huntstown site.

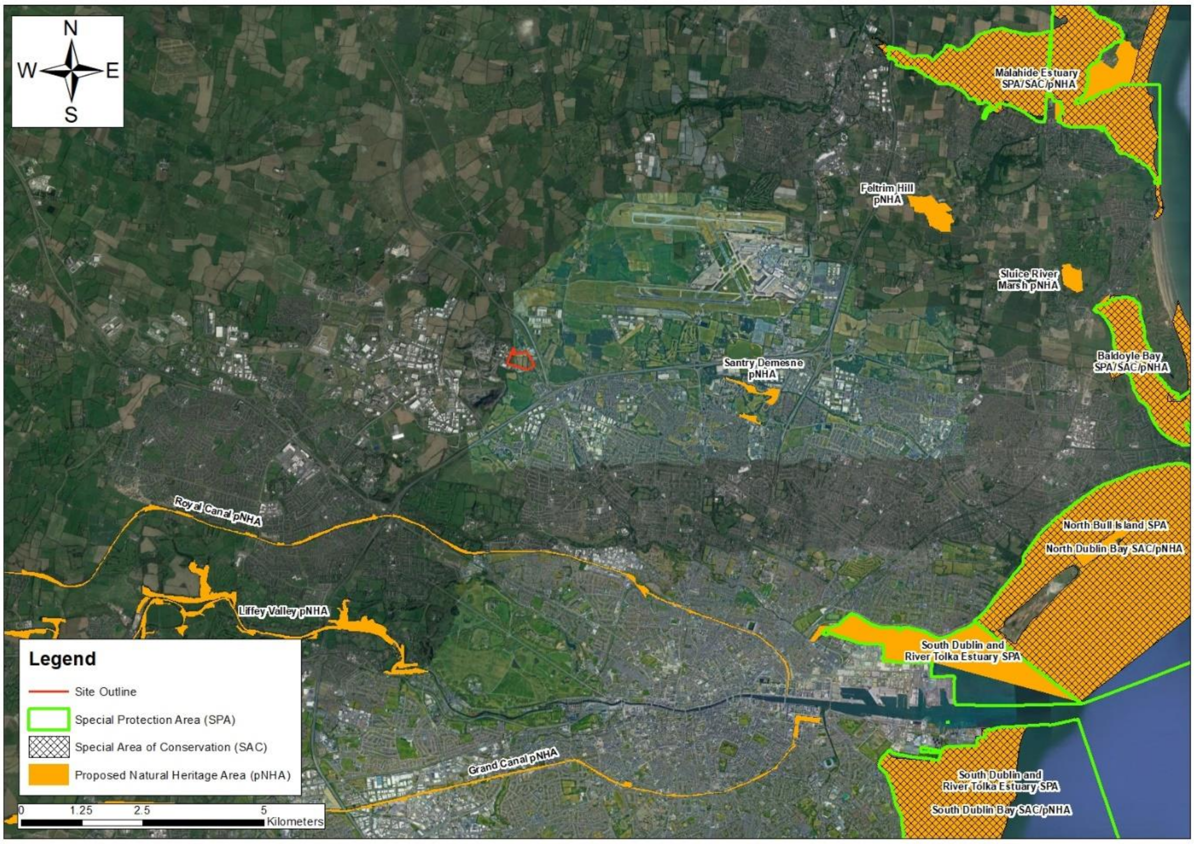

Figure 6.11 *Natura Sites in the Context of the Subject Site (Source: NPWS, 2021)*

6.3.16 Conceptual Site Model

The subsoil underlying the site is classified as Tills (generally low permeable) by the GSI and the underlying limestone aquifer (Locally Important aquifer to Poor aquifer) has a 'High' vulnerability at the northeastern section and 'Moderate' to 'Low' vulnerability throughout the rest of the site based on onsite investigations.

The soil profile encountered can be summarised as follows (based on location RC03):

- Topsoil 0.0 m - > 0.3 mbgl.
- Subsoil 0.3 m - > 13.5 mbgl.
- Weathered Limestone Bedrock/ Bedrock 13.5 m - > 20.0 mbgl.

However, bedrock depth is highly varied throughout the site, as can be seen in the following summary:

- 3.0 mbgl to the northeast of the site
- 13.5 mbgl in the middle of the site
- 10.45 mbgl to the southeast.
- Between 6.0-7.2 mbgl to the western boundary.

Recorded groundwater levels also vary throughout the site:

- 1.85 mbgl to the northeast of the site (i.e., where bedrock is shallower) t
- 4.07 mbgl to the west of the site;
- 8.30 mbgl to the southeast of the site.

Review of the hydrogeology and geology in the surrounding region indicates that there are no sensitive receptors such as groundwater-fed wetlands, Council Water Supplies/ Group Water Schemes or geological heritage sites which could be impacted by this development. No evidence of disposal of waste material was identified the location area proposed for excavation. Collection and analysis of representative soil and groundwater samples for a wide range of parameters shows no evidence of contamination. The review of the groundwater quality data collected on site found that the groundwater beneath the site is of good quality.

A regional and a local geological cross section can be seen in Figure 6.12 and Figure 6.13 below.

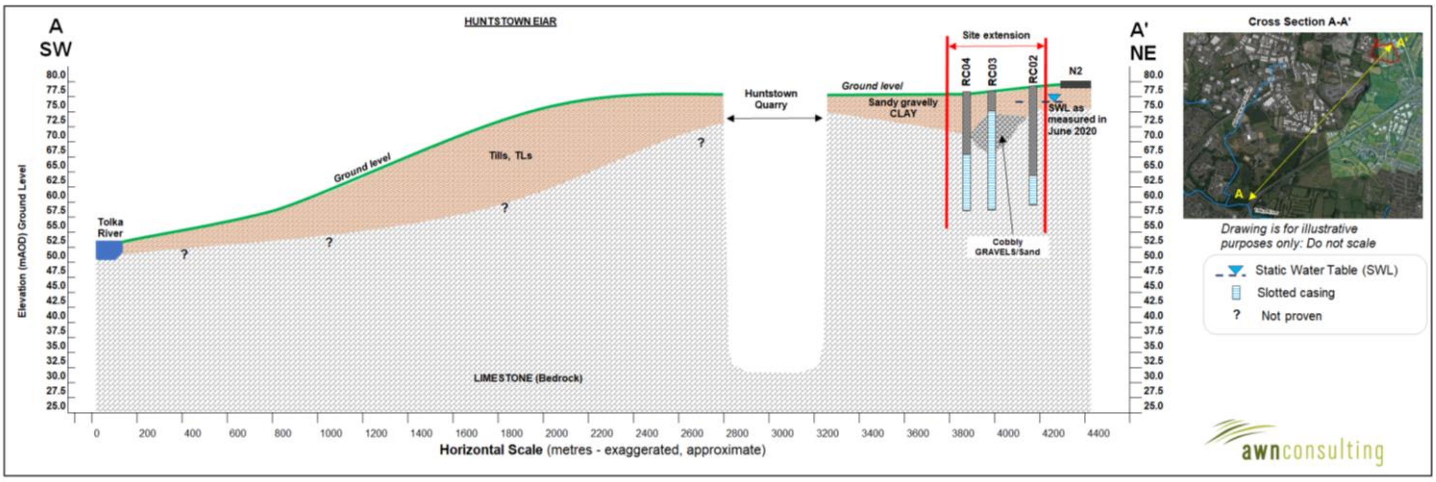

Figure 6.12 *Regional Cross Section*

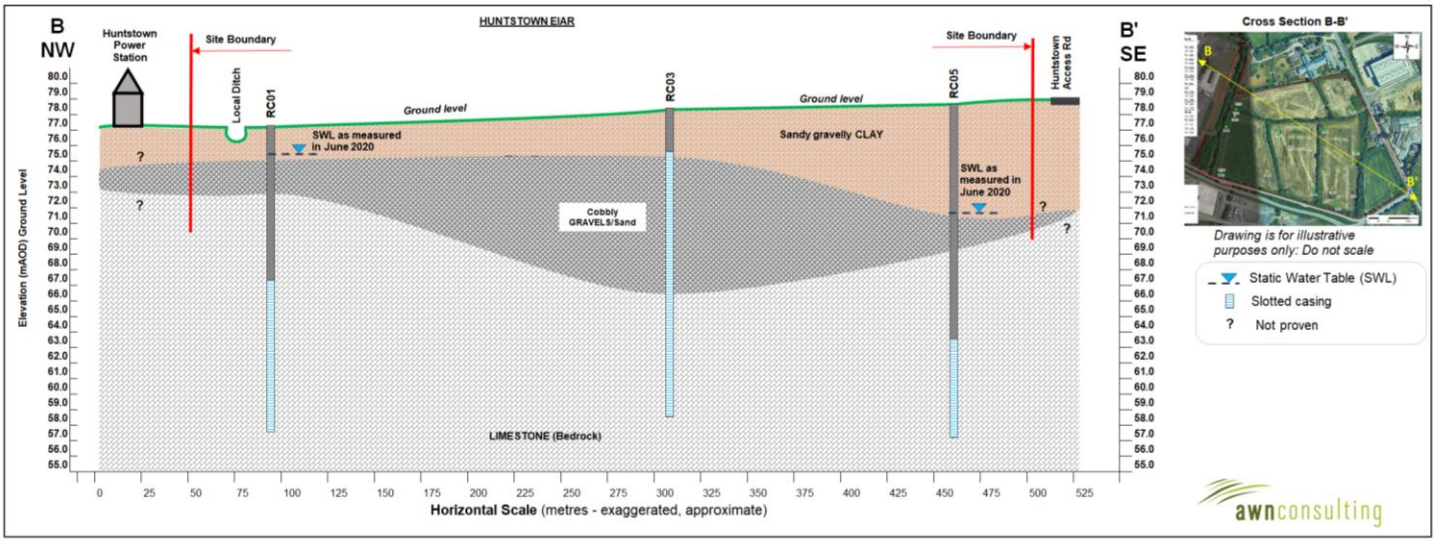

Figure 6.13 *Local Cross Section*

6.3.17 Rating of Importance of Geological and Hydrogeological Attributes

Based on the TII methodology (2009) (See Appendix 6.1), criteria for rating site importance of geological features, the importance of the bedrock and soil features at this site is rated as 'High importance' with high significance or value on a local scale. This is due to the existence of an existing quarry in the vicinity of the subject site (Huntstown quarry) which is located c. 300 m to the west of the site.

Based on the TII methodology (2009) (See Appendix 6.1) the importance of the hydrogeological features at this site is rated as 'Low importance' based on the assessment that the attribute has a medium quality significance or value on a local scale. The aquifer is a Locally Important to Poor Aquifer but is not widely used for public water supply or generally for potable use. In addition, there would not be direct or indirect hydrogeological connection between the site and any protected sites (SAC, SPA, NHA).

6.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development site is c. 13.3 hectares of predominantly greenfield land and includes two residential properties fronting the R135 (North Road), located to the northwest of the M50 orbital ring in the townland of Johnstown and Coldwinters, North Road, Finglas, Dublin 11. The proposal comprises the demolition of two residential properties fronting the R135 (North Road), and the development of 2 no. data hall buildings arranged over three storeys and associated structures and infrastructure.

Vehicular and pedestrian entrance with associated security installations, roadways and vehicle parking. The development will be accessed from the R135 (North Road) from the east. An emergency/secondary entrance will be provided via the Roadstone Huntstown Quarry and Huntstown Power Station access road to the south-west. Temporary access for construction works and to enable a phased delivery of the development is proposed through an existing site entrance off the North Road.

Associated structures and infrastructure including water treatment facility, sprinkler tanks, external plant equipment, emergency generators and diesel fuel storage, vehicular access roads, car and bicycle parking, attenuation ponds and sustainable urban drainage measures, underground foul and storm water drainage network, associated landscaping and boundary treatment works.

The future 220kV substation compound and subsurface grid connection will form part of a separate Strategic Infrastructure Development (SID) application to An Bord Pleanála (ABP).

The proposed development is described in further detail in Chapter 2 (Description of the proposed development). The details of the construction and operation of the development in terms of Land, Soils Geology and Hydrogeology is detailed in the Table 6.4 below.

Table 6.4 Summary of site activities

Phase	Activity	Description
Construction	Discharge to Ground	Run-off percolating to ground at the construction site.
	Earthworks: Excavation of Superficial Deposits	Excavations across the site are required for the site preparation and levelling works, to achieve foundation level and facilitate construction, along with arising from the installation of underground services. The project engineers have estimated that c. 35,616 m3 of material will require excavation for the data hall site, an additional excavation of c. 12,045 m3 will be required for the future substation development located within the site boundary. This volume comprises topsoil, subsoils, and (eventually) bedrock. It is envisaged that the majority of this material will be reused on site as part of the site levelling works. This will be used as back fill and to establish the proposed landscaping berms. The estimates will be refined prior to commencement of construction. In addition to this there is a net import of suitable engineering fill up to c. 81,929 m^3 data hall site, and c. 5,000 m^3 associated with the future substation development. These estimates will be refined prior to commencement of construction. Suitable soils and stones will be reused on-site as backfill in the grassed areas, where possible. It is predicted that the majority of the spoil generated during site preparation/levelling will be removed from site with some topsoil and spoil used in landscaped and bermed areas. The removal of localised overburden material will be required during preparation of the foundations and platform for the proposed structures. The foundations for the main buildings will be a mix of pad foundations and pile foundations to bedrock – depending on the underlying ground conditions. The planned earthworks foresee the excavations of up to depths of c. 3.5 mbgl, with

Phase	Activity	Description
		the removal of topsoil and some localised area of subsoil and bedrock if encountered.
	Storage of soils/aggregates	Aggregate materials such as sands and gravels will be stored in clearly marked receptacles within a secure compound area to prevent contamination. Temporary storage of spoil will be managed to prevent accidental release of dust and uncontrolled surface water run-off which may contain sediment and solid matter. Materials will be sent off site for recycling where possible and, if not suitable for recycling, materials will be disposed of to an appropriate permitted/licensed waste disposal facility.
	Storage of hazardous Material	Temporary storage of fuel required for on site for construction traffic. Liquid materials i.e., fuel storage will be located within temporary bunded areas, doubled skinned tanks or bunded containers (all bunds will conform to standard bunding specifications - BS8007-1987) to prevent spillage.
	Import/Export of Materials	Where possible soil will be reused for site levelling, roads, car parking areas, berms and other landscaping purposes. Excess soil/subsoil or rock not required for re-use on site will be transferred off site for re-use or disposal. Material removed from site may be re-used offsite for beneficial use on other sites with appropriate planning/waste permissions/derogations (e.g., in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011) as amended or will be reused, recovered and/or disposed off-site at appropriately authorised waste facilities. The removal of waste from the site will be carried out in accordance with Waste Regulations, Regional Waste Plan (Eastern Midland Region) and Waste Hierarchy/Circular Economy Principals. Refer to Chapter 14 Waste Management for further detail. The importation of fill will be required to establish the foundation level for the construction of the proposed roads, carparks and buildings. It is envisaged that an additional c. 85,568 m^3 of soil will be imported to complete the landscaping berms and foundation level.
	Dewatering	The deepest excavation is c. 3.5mbgl. According to site investigations, levels of groundwater from the aquifer beneath the site would range from 1.85 mbgl (northeast of the site) to 8.3 mbgl (southeast). Therefore, groundwater ingress can be expected if excavations below 1.85 mbgl are required to the northeast of the site. It is also expected during the excavation works that localised dewatering of the subsoils will be required to address perched groundwater.
Operation	Increase in hard standing area	The proposed surface water networks for the development collect runoff from roofs, roads and other hard standing areas in a sealed system of pipes and gullies. The proposed development represents an overall increase in hardstanding surfaces of c. 8.0 hectares. There are two separate surface water drainage networks in the proposed development which flow to separate surface water attenuation ponds from which attenuated flows are discharged, via carrier drains, to the adjacent ditch which is adjacent to the northwest corner of the site. This ditch ultimately discharges into the Huntstown Stream c. 800 m to the north of the site.
	Storage of hazardous Material	The development includes the storage of 29 no. emergency generators and diesel fuel belly-tanks with a maximum capacity of $45m^3$ of diesel fuel per data hall (28 for the data halls and 1 for the administration area),). The individual belly tanks are double skinned tanks, with level gauges (high and low) within the fuel tanks connected to an onboard controller which will alarm to prevent overfilling and identify a sudden loss of fuel within the tank. The containerised generator housing includes retention bunding in the base of the container, there are leak detection systems within the bund to alert in the event of a leak from the generator fuel tank or lubricating oil tank. There will also be 29 no. transformers per data building (28 no. per data hall and 1 no. for the administration area). The larger data hall transformers will be oil filled and require up to $4m^3$ of transformer oil each. The proposed transformers (bunded) and generators (double skinned diesel tanks) are situated at ground floor level within the generator compound, an area of continuous hardstanding, to the east and west of each building.

Phase	Activity	Description
		The risk to the aquifer is considered low due to the mitigation in place for containment, delivery and distribution and use of oil interceptors on the stormwater system downgradient of the offloading area and prior to discharge from the site.

The projected volumes of strip, cut and fill are presented in Table 6.5 below:

Table 6.5 *Projected Earthworks Volume*

Type	Soil	Min Level (mbgl)	Max Level (mbgl)	Volume (m^3)
Cut	Topsoil	-0.30	0.00	33,423
Cut	Subsoil/ Bedrock	-3.49	0.01	4,525
Fill	Infill	0.00	3.16	85,568

It is predicted that the majority of the spoil generated during site preparation/levelling will be removed from site with some topsoil and spoil used in landscaped and berm areas.

As outlined in Table 6.2 the activities required for the construction phase of the proposed development represents the greatest risk of potential impact on the geological environment. These activities primarily pertain to the site preparation, excavation, levelling and infilling activities required to facilitate construction of the proposed development.

6.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

An analysis of the potential impacts of the proposed development on the land, soils, geology and hydrogeological environment during the construction and operation is outlined below. Due to the inter-relationship between soils, geology and hydrogeology and surface water (hydrology) the following impacts discussed will be considered applicable to both Chapter 6 and 7 of the EIAR. Remediation and mitigation measures included in the design of this project to address these potential impacts are presented in Section 6.6 below.

6.5.1 Construction Phase

6.5.1.1 Excavation and Infilling

Due to the lack of previous development at the site and the historical residential and agricultural use at the site, the risk of contaminated soils being present onsite is low and this was confirmed by onsite soil sampling and analysis. Nonetheless material, which is exported from site, if not correctly managed or handled, could impact negatively on human beings (onsite and offsite) as well as water and soil environments.

The levelling of the ground and excavation for foundations for the main buildings will require the excavation of topsoil, subsoil and possibly bedrock (if encountered). The expected depth of bedrock ranges from 3.0 mbgl (northeast of the site) to 13.5 mbgl (in the middle of the site). The maximum excavation level would be c. 3.5 mbgl. Therefore, it is only towards the northeast of the site that bedrock could be exposed due to planned earthworks.

Excavated material will be reused on site for infilling and landscaping works where possible. Import of c. 85,568 m^3 of fill will be required.

Site investigation and laboratory analysis has not identified any existing contamination. However, if contaminated soil/water is encountered, it will be required to be removed by a licensed waste contractor. The excess of topsoil cut will be used for landscaping berms.

As it was described in Section 6.4, it is noted that the deepest excavation is c. 3.5mbgl. According to site investigations, levels of groundwater from the aquifer beneath the site would range from 1.85 mbgl (northeast of the site) to 8.3 mbgl (southeast).

Therefore, groundwater ingress can be expected and will require localised dewatering during the construction phase However, this groundwater volume would be minor given the ground condition of relatively impermeable clay overlying rock. As inflow rates are expected to be low, there will be a localised zone of contribution which will not likely extend beyond the site boundary. It is noted that the deepest excavation is c. 5mbgl. According to site investigations, levels of groundwater from the aquifer beneath the site would range from 1.85 mbgl (northeast of the site) to 8.3 mbgl (southeast). It is expected during the excavation works that localised dewatering of the subsoils will be required to address perched groundwater.

It can be expected minor ingress of rainfall in the excavation during construction phase.

6.5.1.2 Accidental Spills and Leaks

As with all construction projects there is potential for water (rainfall and/or groundwater) to become contaminated with pollutants associated with construction activity. Contaminated water which arises from construction sites can pose a significant short-term risk to groundwater quality for the duration of the construction if contaminated water is allowed percolate to the aquifer. The potential main contaminants include:

During construction of the development, there is a risk of accidental pollution incidences from the following sources:

- Suspended solids (muddy water with increase turbidity) – arising from excavation and ground disturbance;
- Cement/concrete (increase turbidity and pH) – arising from construction materials;
- Hydrocarbons (ecotoxic) – accidental spillages from construction plant or onsite storage;
- Wastewater (nutrient and microbial rich) – arising from accidental discharge from on-site toilets and washrooms.

Accidental spillages which are not mitigated may result in localised contamination of soils and groundwater underlying the site, should contaminants migrate through the subsoil’s and impact the underlying groundwater. Groundwater vulnerability at the site is currently classified as a ‘High’ to the northeastern section and ‘Moderate’ to ‘Low’ throughout the rest of the site. Any soil stripping will also further reduce the thickness of subsoil and the natural protection they provide to the underlying aquifer.

6.5.1.3 Loss of agricultural land

There will be local loss of agricultural soil however, the area of development is small in the context of the overall agricultural land available in the region. The entire site is zoned for development. Within the overall context of Ireland’s available farmland, the loss is negligible. There will be no impact to mineral resources in the area as a result of the proposed development.

6.5.2 Operational Phase

There are no discharges to ground included in the design and no abstractions from the aquifer. The development includes the storage and use of diesel fuel, as well as transformer oil. The diesel will be stored in double skinned belly-tanks situated at ground floor level within compound yards. The transformers are to be bunded within bunds capable of containing 110% of the storage capacity.

Any accidental hydrocarbon emissions during storage, transfer, or delivery or leakage in the car parks could cause localised contamination if the emissions enter the soil and groundwater environment without adequate mitigation. However, it is noted that any accidental discharge will more likely impact stormwater drainage due to the hardstand and drainage infrastructure proposed and any releases to drainage will be mitigated through hydrocarbon interceptors.

As above, in the event of an accidental leakage of transformer oil or a spill from the emergency generator, this will be intercepted by the drainage infrastructure. The generator yard drainage passes through a hydrocarbon interceptor prior to connection to the onsite drainage networks.

There will be an increase in hardstand as a result of the development of the facilities of c. 8.0 hectares. Incorporation of hard stand area on previous greenfield area and the use of SUDs techniques will have a minor effect on local recharge to ground; however, the impact on the overall groundwater regime will be insignificant considering the proportion of the site area in relation to the total aquifer.

6.6 REMEDIAL AND MITIGATION MEASURES

The design has taken account of the potential impacts of the development on the soils, geology and hydrogeology environment local to the area where construction is taking place and containment of contaminant sources during operation. Measures have been incorporated in the design to mitigate the potential effects on the surrounding soils, geology and hydrogeology. These are described below.

Due to the inter-relationship between soils, geology, hydrogeology and hydrology, the following mitigation measures discussed will be considered applicable to all. Waste Management is also considered an interaction in some sections.

6.6.1 Construction Phase

In order to reduce impacts on the soils and geology environment, a number of mitigation measures will be adopted as part of the construction works on site. The measures will address the main activities of potential impact which include:

- Control of soil excavation and export from site;
- Fuel and chemical handling, transport and storage; and
- Control of water during construction.

6.6.1.1 Construction Environment Management Plan

An Outline Construction Environmental Management Plan (CEMP, included as Appendix 6.5) has been prepared by Clifton Scannell Emerson Associates for the proposed development and is included with the planning documentation. In advance of work starting on site, the works Contractor will prepare a detailed Construction

Environmental Management Plan (CEMP). The detailed CEMP will set out the overarching vision of how the construction of the proposed development will be managed in a safe and organised manner by the Contractor. The CEMP will be a live document and it will go through a number of iterations before works commence and during the works. It will set out requirements and standards which must be met during the construction stage and will include the relevant mitigation measures outlined in the EIA Report and any subsequent planning conditions relevant to the proposed development.

As a minimum, the CEMP will be formulated in accordance with best international practice including but not limited to:

- CIRIA, (2001), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors;
- Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site (C650), 2005;
- BPGCS005, Oil Storage Guidelines;
- Eastern Regional Fisheries Board, (2006), Fisheries Protection Guidelines: Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites;
- CIRIA 697, The SUDS Manual, 2007; and
- UK Pollution Prevention Guidelines (PPG) UK Environment Agency, 2004.

6.6.1.2 Control of Soil Excavation

Site preparation, excavations and levelling works required to facilitate construction of foundations, access roads and the installation of services will require 81,929m3 of imported material. Suitable soils will be reused on site as backfill in the grassed areas, where possible. Contractors shall be required to submit and adhere to a method statement indicating the extent of areas likely to be affected and demonstrating that this is the minimum disturbance necessary to achieve the required works.

According to onsite investigations, the bedrock vulnerability is ‘High’ to the northeastern section and ‘Moderate’ to ‘Low’ throughout the rest of the site. Removal and reinstatement of subsoil cover will not alter the vulnerability category of the underlying bedrock. The deposition of infill soil would increase the overburden thickness (refer to Table 6.5 below) and thus may even decrease the groundwater vulnerability.

Temporary storage of soil will be carefully managed in such a way as to prevent any potential negative impact on the receiving environment and the material will be stored away from any open surface water drains. No soil storing will be allowed within 30 m of the open water where sufficient working areas are available within the site boundaries, which is in line with Inland Fisheries Ireland guidelines. Movement of material will be minimised in order to reduce degradation of soil structure and generation of dust.

Although there is no evidence of historical contamination in the proposed development area, all excavated materials will be visually assessed for signs of possible contamination such as staining or strong odours. Site investigations classified the subsoils as ‘inert’. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of possible contaminants in order to ensure that historical pollution of the soil has not occurred. Should it be determined that any of the soil excavated is contaminated, this will be disposed of by a licensed waste disposal contractor.

Stockpiles have the potential to cause negative impacts on air and water quality. The effects of soil stripping and stockpiling will be mitigated against through the implementation of appropriate earthworks handling protocol during construction. It is anticipated that any stockpiles will be formed within the boundary of the site and there will be no direct link or pathway from this area to any surface water body. Overburden material will be protected from exposure to wind by storing the material in sheltered parts of the site, where possible.

6.6.1.3 Sources of Fill and Aggregates

All fill and aggregate for the proposed development will be sourced from reputable suppliers. All suppliers will be vetted for:

- Aggregate compliance certificates/declarations of conformity for the classes of material specified for the proposed development;
- Environmental Management status; and
- Regulatory and Legal Compliance status of the Company.

It is anticipated that approximately 85,568 m^3 engineered fill will be required to facilitate construction. There will be no impact to mineral resources in the area as a result of the proposed development.

6.6.1.4 Fuel and Chemical Handling

To minimise any impact on the underlying subsurface strata from material spillages, all oils, solvents and paints used during construction will be stored within temporary bunded areas. Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be bunded to a volume of 110% of the capacity of the largest tank/container within the bunded area(s) (plus an allowance of 30 mm for rainwater ingress). Drainage from the bunded area(s) shall be diverted for collection and safe disposal.

Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in a designated area (or where possible off the site), this should be sensitivity located be away from surface water, gullies or drains. These refuelling areas are to be identified in the CEMP prepared by the construction contractor. In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment. Guidelines such as “Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors” (CIRIA 532, 2001) will be complied with.

Where feasible all ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil. Wash down and washout of concrete transporting vehicles will take place at an appropriate facility offsite.

In the case of drummed fuel or other chemical which may be used during construction, containers should be stored in a dedicated internally bunded chemical storage cabinet and labelled clearly to allow appropriate remedial action in the event of a spillage.

6.6.1.5 Control of Water during Construction

Care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts.

There may be localised pumping of surface run-off from the excavations during and after heavy rainfall events to ensure that the trenches are kept relatively dry. Any minor ingress of groundwater and collected rainfall in the excavation will be pumped out during construction. It is estimated that the inflow rate of groundwater will be low and limited to the northeast of the site. Due to the very low permeability of the Dublin Boulder Clay and the relative shallow nature for excavations, infiltration to the underlying aquifer is not anticipated.

Pre-treatment and silt reduction measures on site will include a combination of silt fencing, settlement measures (silt traps, 20 m buffer zone between machinery and watercourses, refuelling of machinery off site) and hydrocarbon interceptors. The use of slit traps and an oil interceptor (if required) will be adopted if the monitoring indicates the requirements for the same with no silt or contaminated water permitted to discharge to water. Extensive monitoring will be adopted to ensure that the water is of sufficient quality to discharge to water or sewer

6.6.2 Operational Phase

The development includes the storage of 29 no. emergency generators and diesel fuel belly-tanks per data hall (28 no. for each data hall building and 1 no. house generator per building). However, it is noted that any accidental discharge will more likely impact stormwater drainage due to the hardstand and drainage infrastructure proposed which include 2 no. hydrocarbon interceptors.

Generator yard passes through hydrocarbon interceptor prior to connection to the onsite drainage networks. Hydrocarbon interceptors will be installed as part of the SuDS measures to capture any potential oil or hydrocarbon contamination prior to discharge into the attenuation system on site. This together with hardstand cover will minimise the potential for any impact to the underlying aquifer.

An environmental management plan will apply to the overall development during the operational phase incorporating mitigation measures and emergency response measures.

Emergency Response Procedures

There should be a comprehensive emergency response procedures and standard operating procedures to respond to an onsite fuel spillage. All employees should be provided with such equipment, information, training and supervision as is necessary to implement the emergency response procedures and standard operating procedures.

Fuel Storage

The provision of spill kit facilities and training of operatives in use of same; should be undertaken at the operational stage in order to manage any leaks from fuel storage and vehicles resulting in soil and/or groundwater quality impacts:

The storage of fuel oil for the emergency generators should be restricted to the generator yard, the bulk fuel tanks, and belly tanks should be bunded, and the over ground delivery pipeline double lined. The final design for the diesel storage should either be contained within a bunded area or self-bunded in line with the requirements of the *Guidance to Storage and Transfer of Materials for Scheduled Activities* (EPA, 2005).

6.7 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

6.7.1 Construction Phase

The implementation of mitigation measures outlined above (Section 6.6) will ensure that the predicted impacts on the geological and hydrogeological environment do not occur during the construction phase and that the residual impact will be ***short-term-imperceptible-neutral****.* Following the TII criteria (refer to Appendix 6.1) for rating the magnitude and significance of impacts on the geological and hydrogeological related attributes, the magnitude of impact is considered ***negligible***.

6.7.2 Operational Phase

The implementation of mitigation measures highlighted above (Section 6.6) will ensure that the predicted impacts on the geological and hydrogeological environment do not occur during the operational phase and that the residual impact will be ***long-term-imperceptible-neutral***. Following the TII criteria (refer to Appendix 6.1) for rating the magnitude and significance of impacts on the geological and hydrogeological related attributes, the magnitude of impact is considered ***negligible***.

6.8 MONITORING OR REINSTATEMENT

6.8.1 Construction Phase

During construction phase the following monitoring measures will be considered:

- Regular inspection of surface water run-off and sediments controls e.g., silt traps will be carried during the construction phase.
- Soil sampling to confirm disposal options for excavated soils.
- Regular inspection of construction/mitigation measures will be undertaken e.g., concrete pouring, refuelling etc.

6.8.2 Operational Phase

There will be no requirement for groundwater monitoring as there is no likely discharge to ground. Maintenance of the surface water drainage system, including hydrocarbon interceptors, and foul sewers as per normal urban developments is recommended to minimise any accidental discharges to ground.

7.0 HYDROLOGY

7.1 INTRODUCTION

This chapter assesses and evaluates the potential impacts of the development on the hydrological aspects of the site and surrounding area. In assessing likely potential and predicted effects, account is taken of both the importance of the attributes and the predicted scale and duration of the likely effects.

7.2 METHODOLOGY

7.2.1 Criteria for rating of effects

This chapter evaluates the effects, if any, which the development has had or will have on Hydrology as defined in the Environmental Protection Agency (EPA) 'Draft Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (EPA, 2017). The Draft EPA document entitled 'Advice Notes for Preparing Environmental Impact Statements' (EPA, 2015) is also followed in this hydrological assessment and classification of environmental effects. In addition, the document entitled 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the National Roads Authority (NRA, 2009) is referenced where the methodology for assessment of impact is appropriate.

The rating of potential environmental effects on the hydrological environment is based on the standard EIAR impact predictions table included in Chapter 1 which takes account of the quality, significance, duration and type of effect characteristic identified (in accordance with impact assessment criteria provided in the Draft EPA Guidelines (2017) publication).

The duration of each effect is considered to be either momentary, brief, temporary, short-term, medium term, long-term, or permanent. Momentary effects are considered to be those that last from seconds to minutes. Brief effects are those that last less than a day. Temporary effects are considered to be those which are construction related and last less than one year. Short term effects are seen as effects lasting one to seven years; medium-term effects lasting seven to fifteen years; long-term effects lasting fifteen to sixty years; and permanent effects lasting over sixty years.

The TII criteria for rating the magnitude and significance of impacts and the importance of hydrological attributes at the site during the EIA stage are also relevant in assessing the impact and are presented in Tables 1-3 in Appendix 7.1.

The principal attributes (and effects) to be assessed include the following:

- River and stream water quality in the vicinity of the site (where available);
- Surface watercourses near the site and potential impact on surface water quality arising from proposed development related works including any discharge of surface water run-off;
- Localised flooding (potential increase or reduction) and floodplains including benefitting lands and drainage districts (if any); and
- Surface water features within the area of the site.

7.2.2 Sources of Information

Desk-based hydrological information in the vicinity of the site was obtained through accessing databases and other archives where available. Data was sourced from the following:

- Environmental Protection Agency (EPA) – website mapping and database information. Envision water quality monitoring data for watercourses in the area;
- River Basin Management Plan for Ireland 2018-2021.
- The Planning System and Flood Risk Management, Guidelines for Planning Authorities (Department of the Environment, Heritage and Local Government (DoEHLG) and the Office of Public Works (OPW));
- Office of Public Works (OPW) flood mapping data (www.floodmaps.ie)
- South Dublin City Council (2005), Greater Dublin Strategic Drainage Study: Technical Documents of Regional Drainage Policies. Dublin: Dublin City Council; and
- 'Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors' (CIRIA 532, 2001);
- National Parks and Wildlife Services (NPWS) – Protected Site Register.

Site specific data was derived from the following sources:

- Environmental Due Diligence (Phase 1). Huntstown, Dublin 11. AWN Consulting (April 2020);
- Environmental Due Diligence (Phase 2). Huntstown, Dublin 11. AWN Consulting (July 2020);
- Engineering Planning Report – Drainage and Water Services. DUB 40. Clifton Scannell Emerson (March 2021);
- Flood Risk Assessment. DUB 40. Clifton Scannell Emerson (March 2021);
- Outline Construction Environmental Management Plan. DUB 40. Clifton Scannell Emerson (March 2021);
- Various design site plans and drawings; and
- Consultation with site engineers.

7.3 RECEIVING ENVIRONMENT

The receiving environment is discussed in terms of surface water and hydrology including potential for existing and historical contamination. The Proposed Development site extends to c. 13.3 ha. of mainly greenfield (agricultural) lands and including two existing residential properties, the lands are zoned HI (Heavy Industry) under the Fingal Development Plan 2017-2023. The site is located in the townland of Johnstown and Coldwinters, North Road, Finglas, Dublin 11.

The site is bounded by the R135 (North Road) to the east, the Dogs Trust charity to the north, Huntstown Power Station to the west and the Roadstone Huntstown Quarry and Huntstown Power Station access road to the south. The site falls from the east (79.5m AOD) to north-west (77.5m AOD). There is no drainage system currently within the site.

7.3.1 Hydrology

The subject site is located within the former ERBD (now the Irish River Basin District), as defined under the European Communities Directive 2000/60/EC, establishing a framework for community action in the field of water policy – this is commonly known as the Water Framework Directive (WFD The subject site is located in the Eastern River Basin District (ERBD) and the River Tolka WMU (Water Management Unit).

According to the EPA maps, the proposed development site lies within the Liffey and Dublin Bay Catchment (Hydrometric Area 09) and the Tolka River sub-catchment (refer to Figure 7.1 below). The current EPA watercourse mapping does not include any existing streams within the subject site boundaries, a review of the historical mapping records provided within the GeoHive website do not indicate any watercourses within the site.

The site walkover conducted in June 2020 included a visual inspection of the drainage network on site and noted a series of shallow ditches running along the field boundaries. This visit concluded that these ditches consist of a series of local manmade drainage, with intermittent or ephemeral characteristics and likely fed from surface runoff. The local drainage ultimately flows in a northerly direction towards the Huntstown Stream (located c. 800 m to the north of the site, refer to Figure 7.2 below).

The existing onsite drainage ditches have been assessed in respect of the applicability of the Objective WQ05 within the Fingal County Development Plan 2017-2023. Objective WQ05 requires the establishment of a riparian corridors free from new development along all significant watercourses and streams in the County. The existing manmade ditches with intermittent or ephemeral characteristics are not considered to be a significant watercourse or stream, therefore Objective WQ05 is not considered to apply to any of the local drainage ditches on the site. Furthermore, Chapter 8 (Biodiversity) has assessed these onsite ditches for ecological value and concluded that due to their ephemeral nature have and they have no fisheries value and are also unfavourable for amphibians.

The Huntstown Stream leads to the Ward River c. 6.6km downstream and the Ward River discharges to the sea at Malahide Estuary over 15 river km downstream of the site. Therefore, the proposed development site has limited connectivity to the Malahide Estuary SAC or SPA.

Therefore, the subject site belongs to the Nanny Delvin Catchment (Hydrometric Area 08) and the Broadmeadows sub-catchment (WFD name: Broadmeadow_SC_010, Id 08_3) and would have an indirect hydrological connection with the Malahide Estuary SPA/SAC/pNHA through the local drainage network, the Huntstown Stream and the Ward River.

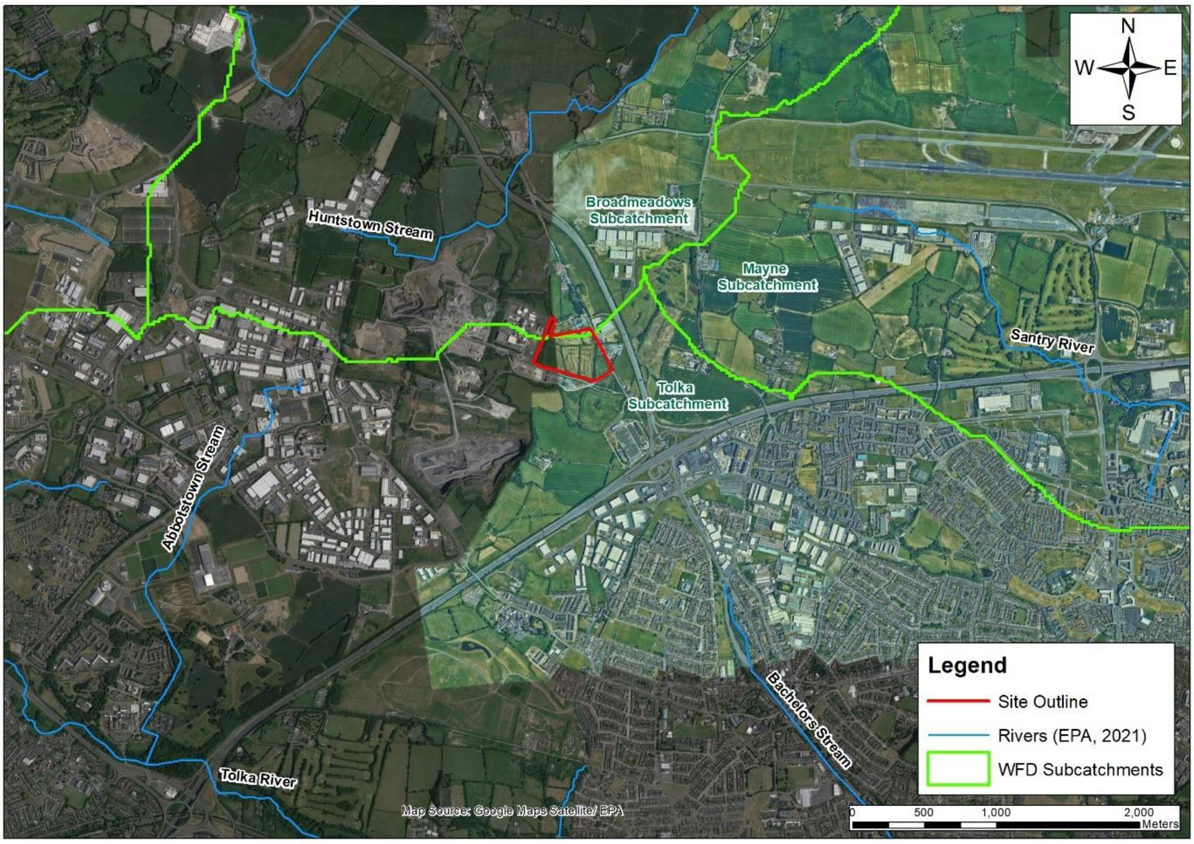

Figure 7.1 *Local Hydrological Environment (EPA, 2021)*

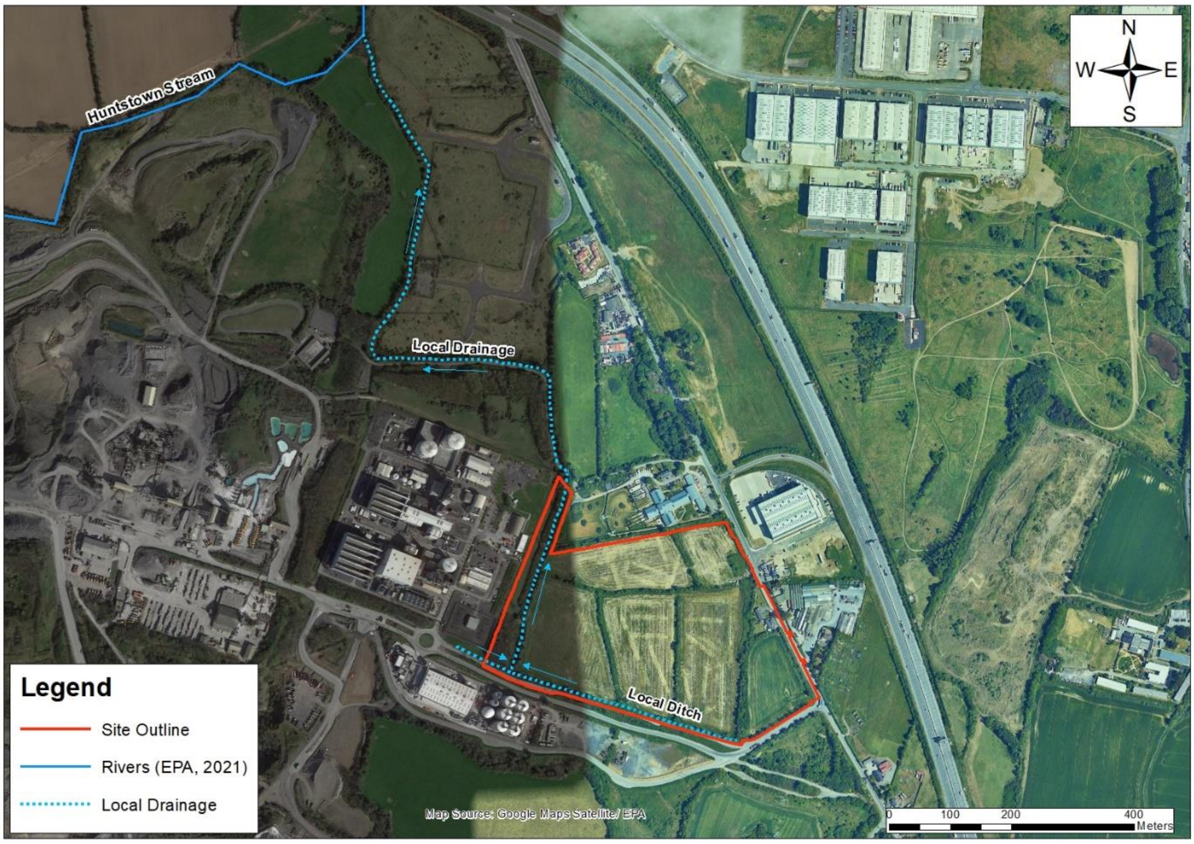

Figure 7.2 *Site Location and Local Drainage*

7.3.2 Surface Water Quality

The proposed development is located within the former ERBD (now the Irish River Basin District), as defined under the European Communities Directive 2000/60/EC, establishing a framework for community action in the field of water policy – this is commonly known as the Water Framework Directive (WFD). It is situated in Hydrometric Area No. 08 of the Irish River Network and is located within the Ward/Broadmeadows Catchment.

The WFD requires ‘Good Water Status’ for all European waters to be achieved through a system of river basin management planning and extensive monitoring by 2015 or, at the least, by 2027. ‘Good status’ means both ‘Good Ecological Status’ and ‘Good Chemical Status’. In 2009 the ERBD River Basin Management Plan (RBMP) 2009-2015 was published. In the ERBD RBMP, the impacts of a range of pressures were assessed including diffuse and point pollution, water abstraction and morphological pressures (e.g. water regulation structures). The purpose of this exercise was to identify water bodies at risk of failing to meet the objectives of the WFD by 2015 and include a programme of measures to address and alleviate these pressures by 2015. This was the first River Basin Management planning cycle (2010-2015). The second cycle river basin management plan for Ireland is currently in place and will run between 2018-2021 with the previous management districts now merged into one Ireland River Basin District (Ireland RBD).

This second-cycle RBMP aims to build on the progress made during the first cycle. Key measures during the first cycle included the licensing of urban waste-water discharges (with an associated investment in urban waste-water treatment) and the implementation of the Nitrates Action Programme (Good Agricultural Practice Regulations). In more general terms, three key lessons have emerged from the first cycle and the public consultation processes. These lessons have been firmly integrated into the development of the second cycle RBMP. Firstly, the structure of multiple RBDs did not prove effective, either in terms of developing the plans efficiently or in terms of implementing those plans. Secondly, the governance and delivery structures in place for the first cycle were not as effective as expected. Thirdly, the targets set were too ambitious and were not grounded on a sufficiently developed evidence base. The second cycle RBMP has been developed to address these points.

The strategies and objectives of the WFD in Ireland have influenced a range of national legislation and regulations. These include the following:

- European Communities (Water Policy) Regulations, 2003 (S.I. No. 722 of 2003);
- European Communities (Drinking Water) Regulations 2014 (S.I. 122 of 2014);
- European Communities Environmental Objectives (Surface Waters); Regulations, 2009 (S.I. No. 272 of 2009 as amended SI No. 77 of 2019)
- European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010 S.I. No. 366 of 2016);
- European Communities (Good Agricultural Practice for Protection of Waters) Regulations, 2010 (S.I. No. 610 of 2010); and
- European Communities (Technical Specifications for the Chemical Analysis and Monitoring of Water Status) Regulations, 2011 (S.I. No. 489 of 2011)
- Statutory Instrument (SI) No. 293 of 1988 European Communities (Quality of Salmonid Waters) Regulations 1988
- Local Government (Water Pollution) Acts 1977-1990
- SI No. 258 of 1988 Water Quality Standards for Phosphorus Regulations 1998

Surface water quality is monitored periodically by the EPA at various regional locations along with principal and other smaller watercourses. The EPA assess the water quality of rivers and streams across Ireland using a biological assessment method, which is regarded as a representative indicator of the status of such waters and reflects the overall trend in conditions of the watercourse. The biological indicators range from Q5 - Q1. Level Q5 denotes a watercourse with good water quality and high community diversity, whereas Level Q1 denotes very low community diversity and bad water quality.

In relation to the subject site, the nearest active EPA monitoring stations located in the Ward River catchment are:

- 'Br N of Killeek' (EPA Code: RS08W010300): located in the Ward River c. 1.2km downstream from its join with the Huntstown Stream. The most recent status recorded by the EPA (2017) is classified as *Q4/Good*.
- 'Coolatrath Br' (EPA Code: RS08W010070): located in the Ward River c. 3.3km upstream of the Huntstown Stream. The most recent status recorded by the EPA (2017) is classified as *Q3-4/Moderate*.

Refer to Figure 7.3 below for locations of these EPA quality monitoring points in the context of the site.

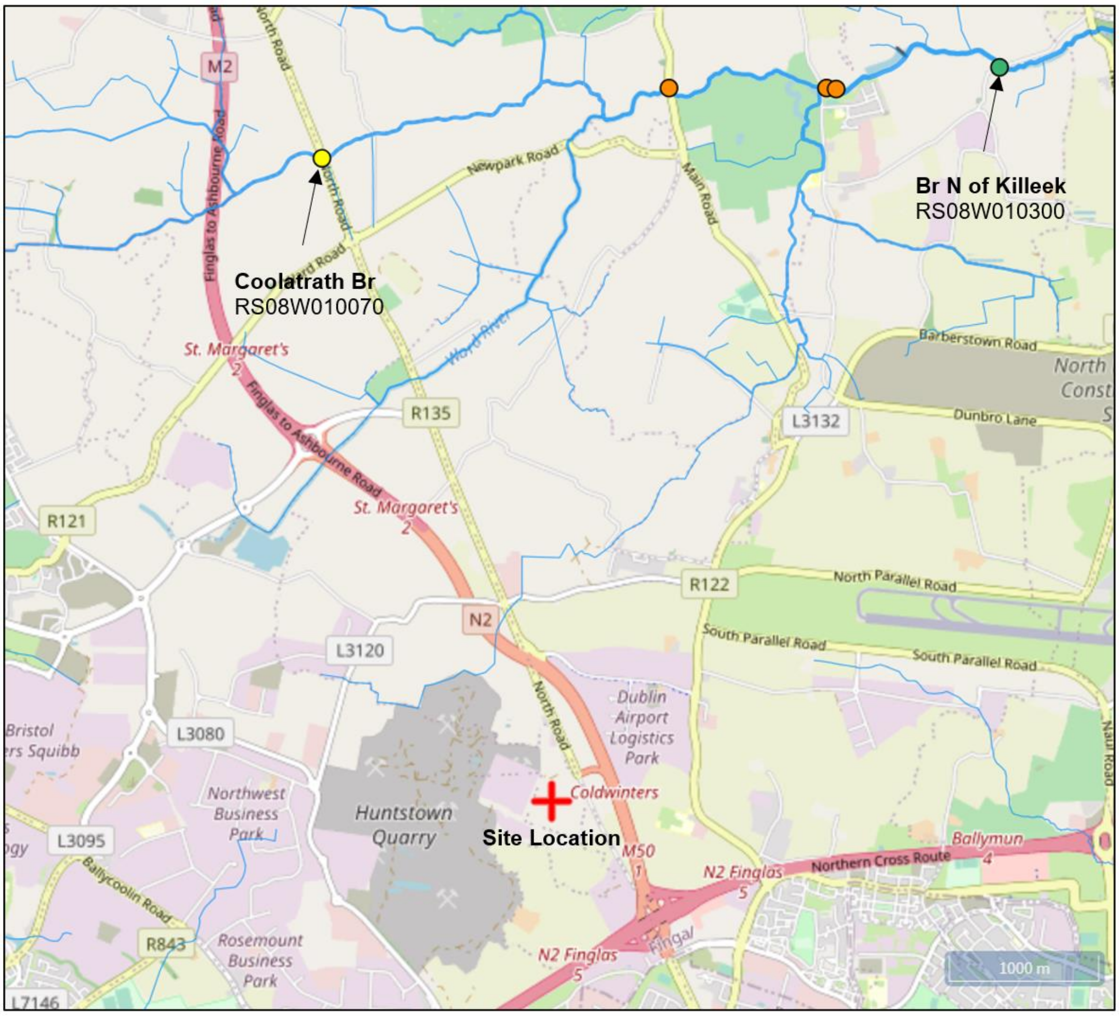

Figure 7.3 *EPA Surface Water Quality Stations (Source: EPA, 2021)*

The Water Framework Directive (WFD) Directive 2000/60/EC was adopted in 2000 as a single piece of legislation covering rivers, lakes, groundwater and transitional (estuarine) and coastal waters. In addition to protecting said waters, its objectives include the attainment of ‘Good Status’ in water bodies that are of lesser status at present and retaining ‘Good Status’ or better where such status exists at present. The WFD requires ‘Good Water Status’ for all European waters to be achieved through a system of river basin management planning and extensive monitoring. ‘Good status’ means both ‘good ecological status’ and ‘good chemical status’.

The Huntstown Stream belongs to the Ward_030 WFD surface water body, which currently, the EPA classifies as having ‘Moderate’ and is ‘*At risk of not achieving good status*’. This moderate status is related to the nitrogen (nitrate, specifically) and orthophosphate conditions measured in the Ward River.

7.3.3 Flood Risk

With reference to the Flood Risk Assessment carried out by Clifton Scannell Emerson Associates (2021), there is no risk of flooding affecting the site from fluvial or coastal sources, since the site lies within Flood Zone C (i.e., where the probability of flooding from rivers is less than 0.1% or 1 in 1000). This Flood Risk Assessment is included as Appendix 7.3.

However, as an existing ditch crosses the site (refer to Figure 7.2 above), this will need to be diverted. The diversion has been designed in accordance with OPW Guidelines in order to ensure there will be not impact on the site in terms of flood risk (refer to Section 7.4 below for further details).

7.3.4 Areas of Conservation

According to the NPWS (2021) on-line database there are no special protected area on or in the vicinity of the subject site. The closest European listed sites are listed in Chapter 8 (Biodiversity).

The site would have an indirect hydrological connection with the Malahide Estuary SPA/SAC/pNHA through the local drainage network, the Huntstown Stream and the Ward River. The Malahide Estuary is located over 15 river km downstream of the site.

Figure 7.4 below presents the location of these protected areas in the context of the Huntstown site.

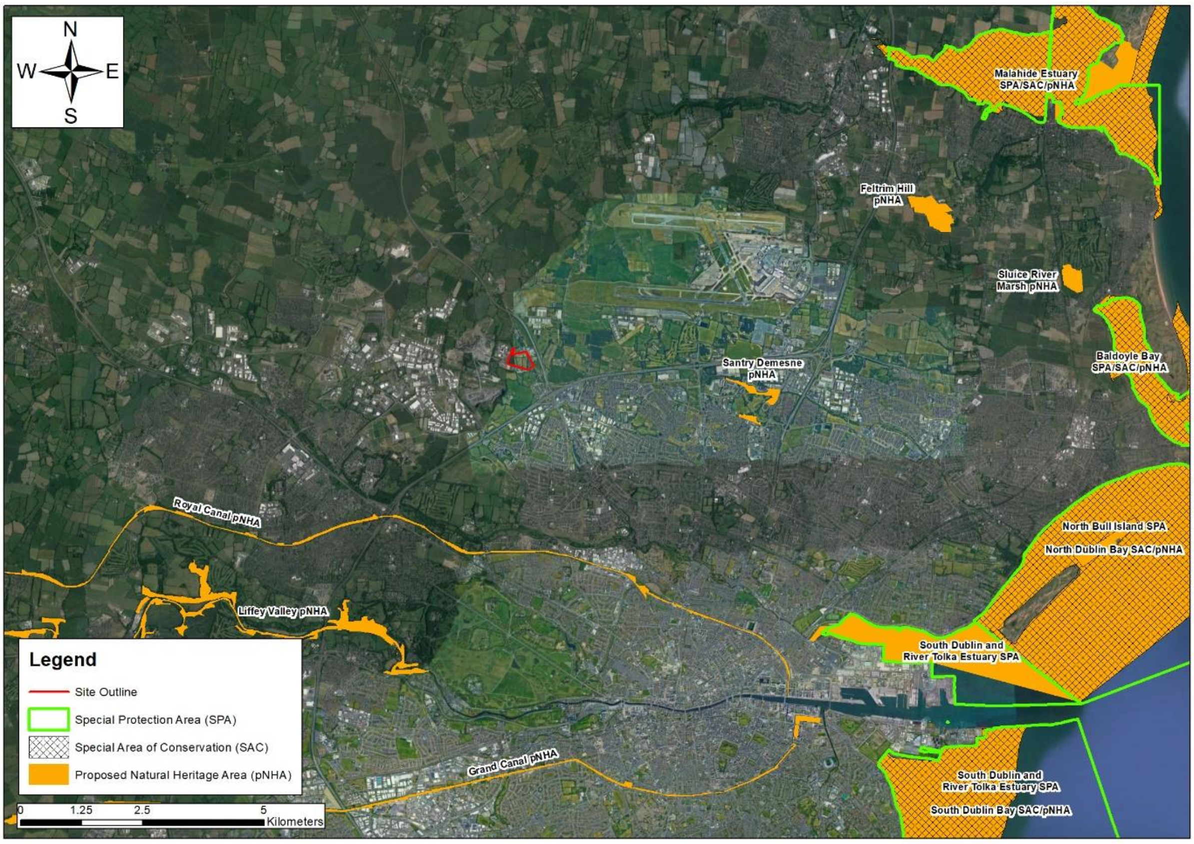

Figure 7.4 *Natura Sites in the Context of the Subject Site (Source: NPWS, 2021)*

7.3.5 Rating of Importance of Hydrological Attributes

Based on the TII methodology (2009) (See Appendix 7.1) the importance of the hydrological features at this site is rated as ‘Low importance’ based on the assessment that the attribute has a low quality significance or value on a local scale.

Although there would be an indirect hydrological connection between the site and Malahide Estuary protected sites (SAC, SPA, NHA), this is considered imperceptible due to the significant distance from the site (Malahide Estuary SAC is c.9.5 km).

7.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The Proposed Development site is c. 13.30 hectares of predominantly greenfield land, and includes two residential properties fronting the R135 (North Road), located to the north west of the M50 orbital ring in the townland of Johnstown and Coldwinders, North Road, Finglas, Dublin 11. The proposal comprises the demolition of two residential properties fronting the R135 (North Road), and the development of 2 no. data hall buildings arranged over three storeys and associated structures and infrastructure.

Vehicular and pedestrian entrance with associated security installations, roadways and vehicle parking. The development will be accessed from the R135 (North Road) from the east. An emergency/secondary entrance will be provided via the Roadstone Huntstown Quarry and Huntstown Power Station access road to the south-west. Temporary access for construction works and to enable a phased delivery of the development is proposed through an existing site entrance off the North Road.

Associated structures and infrastructure including water treatment facility, sprinkler tanks, external plant equipment, emergency generators and diesel fuel storage, vehicular access roads, car and bicycle parking, attenuation ponds and sustainable urban drainage measures, underground foul and storm water drainage network, associated landscaping and boundary treatment works.

The future 220kV substation compound and subsurface grid connection will form part of a separate Strategic Infrastructure Development (SID) application to An Bord Pleanála (ABP).

The proposed development is described in further detail in Chapter 2 (Description of the Proposed Development). The details of the construction and operation of the development in terms of Hydrology are detailed in the subsections below.

7.4.1 Construction Phase

The key civil engineering works which will have a potential impact on the water and hydrological environment during construction of the proposed development are summarised below.

- Excavations are required for foundations of the data hall buildings and installation of associated services included within the development.
- Possible discharge of collected rainwater/ dewatering during excavation works and groundworks (the extent of which is dependent on the time of year development works are carried out); and
- Construction activities will necessitate storage of cement and concrete materials, temporary oils, and fuels on site. Small localised accidental releases of contaminating substances including hydrocarbons have the potential to occur from construction traffic and vehicles operating on site.

7.4.2 Operational Phase

The key activities which will have a potential impact on the hydrological environment during operation of the proposed development are summarised below:

7.4.2.1 Increase in Hard Standing Area

The proposed development represents an overall increase in local hardstanding surfaces of c. 8 hectares.

7.4.2.2 Storage of Hazardous Materials:

The development includes the storage of 29 no. emergency generators and diesel fuel belly-tanks per data hall (28 no. for each data hall building and 1 no. house generator). The individualdiesel fuel belly-tanks have a maximum capacity of 45m^3 of diesel fuel. Subject to detailed design the individual belly tanks are intended to be double skinned tanks, with level gauges (high and low) within the fuel tanks connected to an onboard controller which will alarm to prevent overfilling and identify a sudden loss of fuel within the tank. The containerised generator housing includes retention bunding in the base of the container, there are leak detection systems within the bund to alert in the event of a leak from the generator fuel tank or lubricating oil tank.

There will also be 29 no. oil filled transformers per data hall building (28 no. per data hall building and 1 no. for the administration area) up to a maximum of up to 4m^3 of transformer subject to detailed design.

The proposed transformers and generators are situated at ground floor level within the generator compound, an area of continuous hardstanding, to the east and west of each building.

The risk to the aquifer is considered low due to the mitigation in place for containment, delivery and distribution and use of oil interceptors on the stormwater system downgradient of the offloading area and prior to discharge from the site.

7.4.2.3 Surface Water Management:

There are two separate surface water drainage networks in the proposed development which flow to separate surface water attenuation ponds from which attenuated flows are discharged, via carrier drains, to the adjacent ditch which is adjacent to the north west corner of the site. This ditch ultimately discharges into the Huntstown Stream c. 800 m to the north of the site.

The surface water network has been designed to provide sufficient capacity to contain and convey all surface water runoff associated with the 1 in 100 year event to the attenuation basins without any overland flooding including an additional allowance of 10% in rainfall intensities due to climate change. Discharge flow will be restricted to the greenfield equivalent runoff for the catchment area.

In addition to the management of rainwater runoff; in order to facilitate the proposed development includes infilling existing land drain along the western side of the site and replacing with a pipe. This existing land drain flows south to north and is proposed to be replaced with a new 900mmø pipe. The proposed ditch diversion is required to take account of the requirements of OPW Guidelines for the Construction, Replacement or Alteration of Bridges and Culverts (OPW Guidelines)) which are outline below:-

- Diversion pipe to be capable of passing a fluvial flood flow with a 1% annual exceedance probability (AEP) or 1 in 100 year flow without significantly changing the hydraulic characteristics of the watercourse;
- Diversion pipe to maintain a freeboard of 300mm;
- Diversion pipe capable of operating under the above design conditions without causing a hydraulic loss of no more than 300mm;
- Diameter must not be less than 900mm;
- All calculations have allowed for an additional allowance of 10% in rainfall intensities to allow for climate change as per Table 6.1 of Volume 2 of the GDSDS.

Refer to Infrastructure Report and Flood Risk Assessment (Clifton Scannell Emerson Associates, 2021) for further details.

7.4.2.4 Foul Water

The proposed foul water drainage network collects domestic foul water flows from the administration block of the proposed data hall buildings and the future 220kV substation. A gravity sewer will flow in an easterly direction where it will discharge to a proposed pumping station. An existing 225mm foul sewer located in the R135 Regional Road to the east of the site. It will be necessary to pump foul flows to a discharge manhole at the site boundary which will outfall by gravity to the existing 225mm diameter sewer in the R135.

In addition to the domestic foul sewer an additional Cooling Water Drainage (CWD) drainage network is required. This sewer will collect discharge from the AHU units and flows in a northerly direction towards a site pumping station which will pump CWD flows to the Water Treatment Plant where it will be treated and re-used. Typically discharge to the CWD drainage will be approximately 17 litres/sec. CWD Network calculations are provided in Engineering Planning Report – Drainage and Water Services (CSEA, 2021) (Appendix 14.2).

A pre-connection enquiry (PCE) form was submitted to Irish Water which addressed water and wastewater demand for the development. The reference number for the Pre-Connection Enquiry is CDS20004468. Irish water responded to this request on 31 March 2021 (Appendix 14.1). The PCE confirmed that the connection to the mains is feasible without infrastructure upgrade works. This is detailed further in the Engineering Planning Report – Drainage and Water Services (Appendix 14.2),

7.4.2.5 Water Supply

There is an existing 150mm diameter water main located in the R135. Irish Water are proposing updates to the network which will serve the development.

The proposed development shall have a requirement for water to cater for the potable demand (for drinking and sanitary facilities) as well as the water demand for the cooling system for the data hall air handling units (AHUs).

Domestic water supply demand for the proposed development has been estimated as 0.17 l/s (average demand) 0.85 l/s (peak demand).

The process water supply demand for the proposed development when temporary evaporative cooling is required has been estimated to have a peak demand of 56 l/s with the site at full load (CSEA, 2021). This estimate excludes periodic flushing and washdown. The peak process water demand will only occur during the extreme warm ambient days and as an estimate based on historical weather data for Dublin, this should be approximately 24 hours per annum. However, this maybe more if reentrainment of warm air occurs on the site, which could necessitate the requirement for additional evaporative cooling during the extreme warm ambient days. We are currently evaluating this through Computational Fluid Dynamic (CFD) simulations.

On-site storage will be provided as part of the development. Water storage (2590m3) will be provided for the evaporative cooling hours required in the worst case summer 48 hour period. The water fill from the Irish Water main can be adjusted to fill the system over this time period. Process water supply demand for the proposed development has been estimated as 4,842.4 (m3/year).

The design process considered an alternative water-cooled design technology with a significantly higher water demand. The evaporative cooling design has been chosen taking due regard to the potential impacts on water consumption; see Chapter 4 (Alternatives) for further information.

The proposed development will be served by a 250mmø fire hydrant main which is connected to two proposed sprinkler tanks (Each tank has a capacity of 670m3) and associated pump houses. The fire hydrants will be provided at appropriate locations in accordance with the specialist fire protection contractors design and Fingal County Council requirements.

A pre-connection enquiry (PCE) form was submitted to Irish Water which addressed water and wastewater demand for the development. The reference number for the Pre-Connection Enquiry is CDS 200004468. Irish water responded to this request on 16

March 2021 (Appendix 14.1) and have confirmed that the connection is feasible subject to additional off site upgrade works.

7.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

An analysis of the potential impacts of the proposed development on the hydrological environment during the construction and operation is outlined below. Due to the inter-relationship between soils, geology and hydrogeology and surface water the following impacts discussed will be considered applicable to both Chapter 6 and 7 of the EIAR. Remediation and mitigation measures included in the design of this project to address these potential impacts are presented in Section 6.6 below.

It should be noted that no impacts are expected on Malahide Estuary SAC/SPA. Given the potential loading and the distance from source to the Natura site (over 15 Km downstream) and associated dilution factor, this risk would be imperceptible as any accidental discharge of potential contaminant would be attenuated, diluted and dispersed below statutory guidelines (i.e., S.I. European Communities Environmental Objectives Regulations, 2009 [S.I. No. 272 of 2009 as amended by SI No. 77 of 2019]), even in the absence of best practices measures or mitigation measures outlined in Section 7.6 below, there will be no direct or indirect impacts on the conservation objectives of the Malahide Estuary SAC/SPA

7.5.1 Construction Phase

7.5.1.1 Increased Sediments Loading in Run-off

Surface water runoff during the construction phase may contain increased silt levels or become polluted from construction activities. Runoff containing large amounts of silt can cause damage to surface water systems and receiving watercourses. Silt water can arise from dewatering excavations, exposed ground, stockpiles and access roads.

During the construction phase at this site there is potential for an increase in run-off due to the compaction of soils. This will reduce the infiltration capacity and increase the rate and volume of direct surface run-off. The potential impact of this is a possible increase in surface water run-off and sediment loading which could potentially impact local drainage. Site investigations classified the subsoils as ‘inert’.

The internal shallow ditches running along the field boundaries are the closest surface water receptors. The local drainage ultimately flows in a northerly direction towards the Huntstown Stream (located c. 800 m to the north of the site).

7.5.1.2 Accidental Spills and Leaks

As with all construction projects there is potential for water (rainfall and/or groundwater) to become contaminated with pollutants associated with construction activity. Contaminated water which arises from construction sites can pose a significant short-term risk to groundwater quality for the duration of the construction if contaminated water is allowed percolate to the aquifer. The potential main contaminants include:

During construction of the development, there is a risk of accidental pollution incidences from the following sources:

- Suspended solids (muddy water with increase turbidity) – arising from excavation and ground disturbance;

- Cement/concrete (increase turbidity and pH) – arising from construction materials;
- Hydrocarbons (ecotoxic) – accidental spillages from construction plant or onsite storage;
- Wastewater (nutrient and microbial rich) – arising from accidental discharge from on-site toilets and washrooms.

Machinery activities on site during the construction phase may result in contamination of runoff/surface water. Potential impacts could arise from accidental spillage of fuels, oils, paints etc. which could impact surface water if allowed to infiltrate to runoff to surface water systems and/or receiving watercourses. However, implementation of the mitigation measures detailed below will ensure that this does not occur.

Concreting operations carried out near surface water drainage points during construction activities could lead to discharges to a watercourse. Concrete (specifically, the cement component) is highly alkaline and any spillage to a local watercourse would be detrimental to water quality and local fauna and flora. However, employment of the mitigation measures highlighted below will ensure that any impact will be mitigated.

7.5.2 Operational Phase

7.5.2.1 Direct or Indirect Discharges

Surface water drainage will discharge directly into an existing ditch which ultimately outfalls into the Huntstown Stream. The surface water network has been designed to provide sufficient capacity to contain and convey all surface water runoff associated with the 1 in 100 year event to the attenuation basins without any overland flooding including an additional allowance of 10% in rainfall intensities due to climate change. Discharge flow will be restricted to the greenfield equivalent runoff for the catchment area.

The proposed ditch diversion is required to take account of the requirements of OPW Guidelines for the Construction, Replacement or Alteration of Bridges and Culverts (OPW Guidelines)).

The development will be fully serviced with separate foul and stormwater sewers which will have adequate capacity for the facility and discharge limits as required by Irish Water licencing requirements. Discharge from the site to the public foul sewer will be sewage and grey water only due to the nature of the proposed development. The foul discharge from the site will join the public sewer and will be treated at the Irish Water Ringsend Wastewater Treatment Plant (WWTP) prior to subsequent discharge to Dublin Bay. This WWTP is required to operate under an EPA licence and meet environmental legislative requirements as set out its licence.

7.5.2.2 Accidental Spill and Leaks

The development includes the storage and use of diesel fuel, as well as transformer oil. The diesel will be stored in double skinned belly-tanks situated at ground floor level within compound yards. The transformers are to be bunded within bunds capable of containing 110% of the storage capacity.

Any accidental emissions of oil, petrol or diesel could cause contamination if the emissions enter the water environment unmitigated. In the event of an accidental leakage of transformer oil or a spill from the emergency generator, this will be intercepted by the drainage infrastructure; the generator yard passes through hydrocarbon interceptor prior to connection to the onsite drainage networks.

7.6 REMEDIAL AND MITIGATION MEASURES

The design has taken account of the potential impacts of the development on the hydrology environment local to the area where construction is taking place and containment of contaminant sources during operation. Measures have been incorporated in the design to mitigate the potential effects on the hydrology. These are described below.

The site is drained by a local network which is composed of ditches bordering the site. This network ultimately flows in a northerly direction towards the Huntstown Stream, which in turn joins the Ward River. The Ward River flows towards Malahide Estuary, a Natura Site (SPA/SAC/pNHA) located c. 15 km to the northeast of the site after joining the Broadmeadow River.

Thus, the site would have an indirect hydrological connection with the Malahide Estuary through the local drainage network, the Huntstown Stream and the Ward River.

As stated above, no impacts are expected on Malahide Estuary SAC/SPA, given the potential loading and the distance from source to the Natura site. The potential risk is considered to be imperceptible as potential contaminant would be attenuated, diluted and dispersed below statutory guidelines (i.e., S.I. European Communities Environmental Objectives Regulations, 2009 [S.I. No. 272 of 2009 as amended by SI No. 77 of 2019]).

Due to the inter-relationship between soils, geology, hydrogeology and hydrology, the following mitigation measures discussed will be considered applicable to all. Waste Management is also considered an interaction in some sections.

7.6.1 Construction Phase

In order to reduce impacts on the hydrological environment, a number of mitigation measures will be adopted as part of the construction works on site.

7.6.1.1 Construction Environment Management Plan

An Outline Construction Environmental Management Plan (CEMP) has been prepared by Clifton Scannell Emerson Associates for the proposed development and is included with the planning documentation (See Appendix 6.5). In advance of work starting on site, the works Contractor will prepare a detailed Construction Environmental Management Plan (CEMP). The detailed CEMP will set out the overarching vision of how the construction of the proposed development will be managed in a safe and organised manner by the Contractor. The CEMP will be a live document and it will go through a number of iterations before works commence and during the works. It will set out requirements and standards which must be met during the construction stage and will include the relevant mitigation measures outlined in the EIA Report and any subsequent planning conditions relevant to the proposed development.

As a minimum, the CEMP will be formulated in accordance with best international practice including but not limited to:

- CIRIA, (2001), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors, (C532) Construction Industry Research and Information Association;
- CIRIA (2002) Control of water pollution from construction sites: guidance for consultants and contractors (SPI56) Construction Industry Research and Information Association
- CIRIA (2005), *Environmental Good Practice on Site* (C650); Construction Industry Research and Information Association
- BPGCS005, Oil Storage Guidelines;
- Eastern Regional Fisheries Board, (2006), Fisheries Protection Guidelines: Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites;
- CIRIA 697, The SUDS Manual, 2007; and
- UK Pollution Prevention Guidelines (PPG) UK Environment Agency, 2004.

7.6.1.2 Surface Water Run-Off

As there is potential for run-off to enter current stormwater systems and indirectly discharge to a watercourse, mitigations will be put in place to manage run-off during the construction phase.

Care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts.

Should any discharge of construction water be required during the construction phase, discharge will be to foul sewer. Pre-treatment and silt reduction measures on site will include a combination of silt fencing, settlement measures (silt traps, 20 m buffer zone between machinery and watercourses, refuelling of machinery off site) and hydrocarbon interceptors.

Any minor ingress of groundwater and collected rainfall in the excavation will be pumped out during construction. It is estimated that the inflow rate of groundwater will be low and limited to the northeast of the site. It is therefore proposed that the water be discharged via the existing stormwater sewer network. Extensive monitoring will be adopted to ensure that the water is of sufficient quality to discharge to the sewer. The use of slit traps and an oil interceptor (if required) will be adopted if the monitoring indicates the requirements for the same with no silt or contaminated water permitted to discharge to the sewer. There may be localised pumping of surface run-off from the excavations during and after heavy rainfall events to ensure that the excavations are kept relatively dry. Due to the very low permeability of the Dublin Boulder Clay and the relative shallow nature for excavations, infiltration to the underlying aquifer is not anticipated.

Run-off water containing silt will be contained on site via settlement tanks and treated to ensure adequate silt removal. Silt reduction measures on site will include a combination of silt fencing and settlement measures (silt traps, silt sacks and settlement tanks/ponds).

The temporary storage of soil will be carefully managed. Stockpiles will be tightly compacted to reduce runoff and graded to aid in runoff collection. This will prevent any potential negative impact on the stormwater drainage and the material will be stored away from any surface water drains. Movement of material will be minimised to reduce the degradation of soil structure and generation of dust. Excavations will remain open for as little time as possible before the placement of fill. This will help to minimise the potential for water ingress into excavations. Soil from works will be stored away from existing drainage features to remove any potential impact.

Weather conditions will be considered when planning construction activities to minimise the risk of run-off from the site and the suitable distance of topsoil piles from surface water drains will be maintained.

7.6.1.3 Fuel and Chemical Handling

To minimise any impact on the underlying subsurface strata from material spillages, all oils, solvents and paints used during construction will be stored within temporary bunded areas. Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be bunded to a volume of 110% of the capacity of the largest tank/container within the bunded area(s) (plus an allowance of 30 mm for rainwater ingress). Drainage from the bunded area(s) shall be diverted for collection and safe disposal.

Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in a designated area (or where possible off the site) which will be away from surface water gulleys or drains. In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment. Guidelines such as “Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors” (CIRIA 532, 2001) will be complied with.

Where feasible all ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil. Wash down and washout of concrete transporting vehicles will take place at an appropriate facility offsite.

In the case of drummed fuel or other chemical which may be used during construction, containers should be stored in a dedicated internally bunded chemical storage cabinet and labelled clearly to allow appropriate remedial action in the event of a spillage.

Emergency response procedures will be outlined in the detailed CEMP. All personnel working on the site will be suitably trained in the implementation of the procedures.

7.6.1.4 Soil Removal and Compaction

Temporary storage of soil will be carefully managed in such a way as to prevent any potential negative impact on the receiving environment. The material will be stored away from any surface water drains (see Surface Water Run-off section above). Movement of material will be minimised to reduce degradation of soil structure and generation of dust.

All excavated materials will be visually assessed for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of potential contaminants to ensure that historical pollution of the soil has not occurred. Should it be determined that any of the soil excavated is contaminated, this will be segregated and appropriately disposed of by a suitably permitted/licensed waste disposal contractor.

Site investigations carried out at the site in 2020 (Refer to Chapter 6) found no residual contamination on site. Nonetheless, all excavated materials will be visually assessed for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of potential contaminants to ensure that historical pollution of the soil has not occurred. Should it be determined that any of the soil excavated is contaminated, this will be segregated and appropriately disposed of by a suitably permitted/licensed waste disposal contractor.

7.6.2 Operational Phase

The development includes the storage of 29 no. emergency generators (per data hall) and diesel fuel belly-tanks. However, it is noted that any accidental discharge will more likely impact stormwater drainage due to the hardstand and drainage infrastructure proposed which include 2 no. hydrocarbon interceptors.

Generator yard passes through hydrocarbon interceptor prior to connection to the onsite drainage networks. Hydrocarbon interceptors will be installed as part of the SuDS measures to capture any potential oil or hydrocarbon contamination prior to discharge into the attenuation system on site. This together with hardstand cover will minimise the potential for any impact to the watercourses receptors.

An environmental management plan will apply to the overall development during the operational phase incorporating mitigation measures and emergency response measures.

Emergency Response Procedures

There should be a comprehensive emergency response procedures and standard operating procedures to respond to an onsite fuel spillage. All employees should be provided with such equipment, information, training and supervision as is necessary to implement the emergency response procedures and standard operating procedures.

Environmental Procedures

During operation the site will operate in compliance with the requirements of an Irish Water (IW) licence for discharge to sewer. The following containment measures are included within the design to reduce potential for environmental impact. There will be comprehensive emergency response procedures and standard operating procedures to respond to chemical spillage all types. All employees will be provided with such equipment, information, training and supervision as is necessary to implement the emergency response procedures and standard operating procedures.

Fuel Storage

The provision of spill kit facilities and training of operatives in use of same; should be undertaken at the operational stage in order to manage any leaks from fuel storage and vehicles resulting in soil and/or groundwater quality impacts:

The storage of fuel oil for the emergency generators should be restricted to the generator yard, the bulk fuel tanks and belly tanks should be bunded, and the over ground delivery pipeline double lined. The final design for the diesel storage should either be contained within a bunded area or self-bunded in line with the requirements of the *Guidance to Storage and Transfer of Materials for Scheduled Activities* (EPA, 2005).

Storm Water & Foul Sewer Drainage

The proposed development will provide a significant improvement to the local drainage catchment as it is proposed to provide full attenuation for increase in hardstand area in compliance with the requirements of the Greater Dublin Strategic Drainage Study. A number of measures will be put in place to minimise the likelihood of any spills entering the water environment to include the design of the car park, fitting of refuelling areas with hydrocarbon interceptors and on-site speed restrictions. Refer to the Infrastructure Report for further details (Clifton Scannell Emerson, 2021).

It is proposed to ultimately discharge surface water from the proposed development, post attenuation and outflow restrictions into the existing local drainage.

With regarding to the culverted ditch, the OPW Guidelines requires culverts to be capable of passing a fluvial flood flow with a 1% annual exceedance probability (AEP) or 1 in 100 year flow without significantly changing the hydraulic characteristics of the watercourse.

7.7 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

7.7.1 Construction Phase

The implementation of mitigation measures outlined above (Section 7.6) will ensure that the predicted impacts on the hydrological environment do not occur during the construction phase and that the residual impact will be ***short-term-imperceptible-neutral***. Following the TII criteria (refer to Appendix 7.1) for rating the magnitude and significance of impacts on the geological and hydrogeological related attributes, the magnitude of impact is considered ***negligible***.

7.7.2 Operational Phase

The implementation of mitigation measures highlighted above (Section 7.6) will ensure that the predicted impacts on the hydrological environment do not occur during the operational phase and that the residual impact will be **l*ong-term-imperceptible-neutral***. Following the TII criteria (refer to Appendix 7.1) for rating the magnitude and significance of impacts on the hydrological related attributes, the magnitude of impact is considered ***negligible***.

7.8 MONITORING OR REINSTATEMENT

7.8.1 Construction Phase

During construction phase the following monitoring measures will be considered:

- Regular inspection of surface water run-off and sediments controls e.g. silt traps will be carried during the construction phase.
- Soil sampling to confirm disposal options for excavated soils in order to avoid contaminated run-off.
- Regular inspection of construction/mitigation measures will be undertaken e.g. concrete pouring, refuelling etc.

7.8.2 Operational Phase

Maintenance of the surface water drainage system, including hydrocarbon interceptors, and foul sewers as per normal urban developments is recommended to minimise any accidental discharges to surface water.

8.0 BIODIVERSITY; FLORA & FAUNA

8.1 INTRODUCTION

This chapter provides an assessment of the impacts of the proposed development on the ecological environment, i.e. flora and fauna. It has been compiled in compliance with 2014 EIA Directive, the Planning and Development Act 2000 as amended, and the European Commission's guidance on the preparation of the EIA Report, and follows the revised EPA Draft EIA Report Guidelines 2017).

The development site is predominately comprised of fallow farmland of relatively low local ecological value. Hedgerows and mature trees present opportunities for roosting and commuting bats.

The subject site is drained by internal ditches which primarily drain to ground and during extended periods of rain into a large deep drainage ditch adjacent to the Huntstown Power Facility at the western perimeter. This larger ditch is intermittently hydraulically linked to the Huntstown Stream depending on flow rates, which is a tributary of the Ward River, which flows northeast to Malahide Estuary over 15 river km downstream. Malahide Estuary is designated as both an SAC and SPA.

8.2 METHODOLOGY

This chapter of the EIAR concentrates on ecological features within the development area of particular significance, primarily designated habitats and species. This includes habitats/species listed in Annex I, II and IV of the EU Habitats Directive, rare plants listed in the Flora Protection Order and other semi-natural habitats of conservation value.

The obligation to undertake appropriate assessment derives from Article 6(3) and 6(4) of the Habitats Directive. The first test is to establish whether, in relation to a particular plan or project, appropriate assessment is required. This is termed AA screening. Its purpose is to determine, on the basis of a preliminary assessment and objective criteria, whether a plan or project, alone and in combination with other plans or projects, could have significant effects on a Natura 2000 site in view of the site's conservation objectives.

Appropriate Assessment was undertaken by Moore Group for the proposed development and a Report for AA Screening prepared, which is presented as Appendix 8.1 to this chapter.

8.2.1 Policy & Guidance

8.2.1.1 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 and lists certain habitats and species that must be protected within wildlife conservation areas, considered to be important at a European as well as at a national level. A "Special Conservation Area" or SAC is a designation under the Habitats Directive. The Habitats Directive sets out the protocol for the protection and management of SACs.

The Directive sets out key elements of the system of protection including the requirement for “Appropriate Assessment” of plans and projects.

8.2.1.2 EU Birds Directive

The “Birds Directive” (Council Directive 79/409/EEC amended by Council Directive 2009/147/EC on the Conservation of Wild Birds) provides for a network of sites in all member states to protect birds at their breeding, feeding, roosting and wintering areas. This Birds Directive identifies species that are rare, in danger of extinction or vulnerable to changes in habitat and which need protection (Annex I species). Appendix I indicates Annex I bird species as listed on the Birds Directive. A “Special Protection Area” or SPA, is a designation under The Birds Directive.

Special Areas of Conservation and Special Protection Areas form a pan-European network of protected sites known as Natura 2000 sites and any plan or project that has the potential to impact upon a Natura 2000 site requires appropriate assessment.

8.2.1.3 Wildlife Acts (1976 - 2012)

The primary domestic legislation providing for the protection of wildlife in general, and the control of some activities adversely impacting upon wildlife is the Wildlife Act of 1976. The aims of the wildlife act according to the National Parks and Wildlife Service 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 bird species are protected under the Wildlife Act 1976. The Wildlife (Amendment) Act of 2000 amended the original Wildlife Act 1976 to improve the effectiveness of the Wildlife Act 1976 to achieve its aims.

Both the Habitats Directive and the Birds Directive have been transposed into Irish law by one set of regulations (i.e. The European Communities (Birds and Natural Habitats) Regulations 2011 to 2015 as amended).

8.2.2 Habitat Survey

The habitat survey was carried out in three stages, firstly through desktop research to determine existing records in relation to habitats and species present in the study area as defined by the area of the proposed development, site boundaries and surrounding buffer zones up to 150 m away. This included research on the National Parks and Wildlife Service (NPWS) metadata website, the National Biodiversity Data Centre (NBDC) database and a literature review of published information on flora and fauna occurring in the proposed development area.

Other environmental information for the area was reviewed, e.g. in relation to soils, geology, hydrogeology and hydrology (Chapter 7 and Chapter 8). Interactions in terms of the Chapters on these topics presented in this EIAR were important in the determination of source vector pathways and links with potentially hydrologically connected areas outside the proposed development site.

The second phase of the survey 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 17 September 2019 and again on 2 December 2020 by conducting a study area walkover covering the main ecological areas identified in the desktop assessment. The first survey date is at the end of the survey period for botanical species but adequate given the improved nature of the farmland and the second date is appropriate for surveying for badgers. A photographic record was made of features of interest.

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.

Bat surveys were undertaken in August 2019 and focused on the arable crop fields bordered by mature tree lines and hedgerows. The bat report is presented as Appendix 8.2 to this chapter.

A survey of amphibians was undertaken on 19 September 2019 and the report is presented as Appendix 8.3 to this chapter.

Birds were surveyed using standard transect methodology and signs were recorded where encountered during the field walkover surveys. Signs of Winter Bird usage were assessed during the December 2020 site visit.

Following desktop assessment an evaluation of the development area and determination of the potential impacts on the flora and fauna of the area is based on the following guidelines and publications:

- EPA Draft EIA Report Guidelines 2017;
- European Commission Guidance on the Preparation of the EIA Report (2017) as well as the European Commission Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (2013);
- Assessment of plans and projects significantly affecting Natura 2000 sites (EC, 2002);
- Managing Natura 2000 Sites (EC, 2000) Guidance document on Article 6(4) of the Habitats Directive 92/43/EEC (EC, 2000);
- Managing Natura 2000 Sites (EC, 2018) Guidance document on Article 6(4) of the Habitats Directive 92/43/EEC (EC, 2018);
- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (DEHLG, Rev. Feb. 2010); and
- Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2019).

The following resources assisted in the production of this chapter of the report:

- Ordnance Survey Ireland maps;
- OSI, Google and Bing Aerial photography (1995 – 2021);
- NPWS Mapviewer: http://www.npws.ie/en/MapsData/;
- Designated sites (SACs, SPAs, NHAs);

- Records of protected species from 10km squares; and
- National Biodiversity Data Centre Records and Maps.

Other environmental information for the area was reviewed, e.g., in relation to soils, geology, hydrogeology and hydrology. Interactions in terms of the chapters on these topics presented in this EIA Report were important in the determination of source vector pathways and links with potentially hydrologically connected areas outside the proposed development site.

8.3 RECEIVING ENVIRONMENT

The site essentially comprises six fields of farmland in northwest Co. Dublin, five previously used for arable crops and one for silage. The field systems are relatively small and intervening outgrown hedgerows are either low and scrubby or gappy and of locally low value.

The internal ditches primarily drain to ground and during extended periods of rain into a large deep drainage ditch adjacent to the Huntstown Power Facility at the western perimeter. This larger ditch is intermittently hydraulically linked via the Huntstown Stream depending on flow rates, and eventually leads north converging with several other streams to the Ward River, which flows into northeast to Malahide Estuary over 15 river km downstream.

The following is a description of the flora and fauna of the existing environment in the study area.

8.3.1 Designated Conservation Areas

Department of Environment, Heritage and Local Government (2009) Guidance on Appropriate Assessment recommends an assessment of European sites within a Zone of Influence (ZoI) of 15km. This distance is a guidance only and a zone of influence 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. This should be established on a case-by-case basis using the Source- Pathway-Receptor framework and not by arbitrary distances (such as 15 km).

The Zone of Influence may be determined by connectivity to the Proposed Development in terms of:

- Nature, scale, timing and duration of works and possible impacts, nature and size of excavations, storage of materials, flat/sloping sites;
- Distance and nature of pathways (dilution and dispersion; intervening 'buffer' lands, roads etc.); and
- Sensitivity and location of ecological features.

The potential for source pathway receptor connectivity is firstly identified and detailed information is then provided on sites with connectivity. European sites that are located within 15km of the Proposed Development are listed in Table 1 and presented in Figures 8.1 and 8.2, below. Spatial boundary data on the Natura 2000 network was extracted from the NPWS website (www.npws.ie) on the 26th of February 2020 and updated on 12 April 2021.

Table 8.1 *European Sites located within the potential zone of impact[1] of the Project.*

Site Code	Site name	Distance (km)[2]
000199	Baldoyle Bay SAC	11.53
000205	Malahide Estuary SAC	9.53
000206	North Dublin Bay SAC	10.47
000208	Rogerstown Estuary SAC	12.63
000210	South Dublin Bay SAC	10.74
001398	Rye Water Valley/Carton SAC	11.97
004006	North Bull Island SPA	10.46
004015	Rogerstown Estuary SPA	13.24
004016	Baldoyle Bay SPA	11.58
004024	South Dublin Bay and River Tolka Estuary SPA	8.08
004025	Malahide Estuary SPA	9.57

The internal ditches primarily drain to ground and during extended periods of rain into a large deep drainage ditch adjacent to the Huntstown Power Facility at the western perimeter. This larger ditch is intermittently hydraulically linked via the Huntstown Stream depending on flow rates, and eventually leads north converging with several other streams to the Ward River, which flows into northeast to Malahide Estuary over 15 river km downstream.

The Huntstown Stream leads to the Ward River c. 6.6km downstream and the Ward River discharges to the sea at Malahide Estuary over 15 river km downstream of the site. Therefore, the proposed development site has limited connectivity to the Malahide Estuary SAC or SPA.

There is no potential for connectivity to any other European sites.

[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 and the European site boundary, as made available by the NPWS. Connectivity along hydrological pathways may be significantly greater.

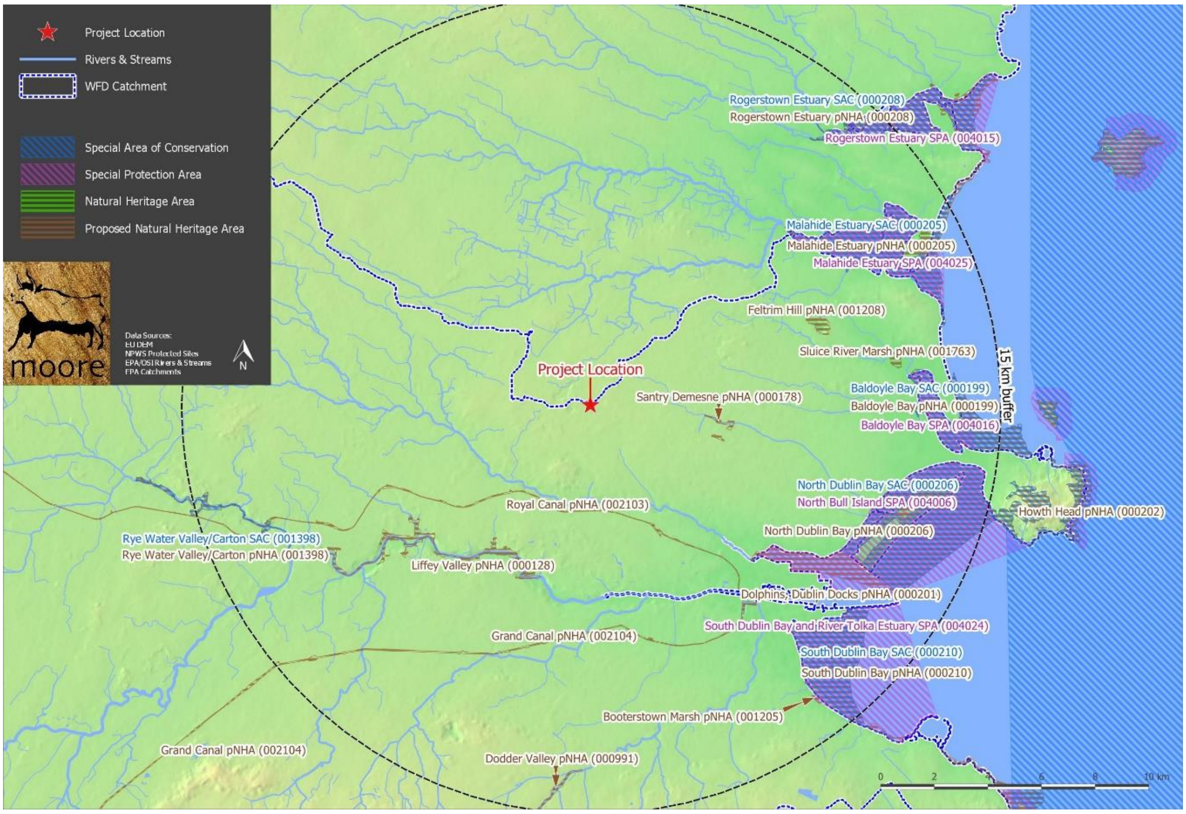

Figure 8.1 *Site Location in relation to nearby European sites.*

Figure 8.2 *Detail of site Location in relation to nearby designated sites.*

8.3.2 Non-Designated Habitats

The proposed development area is improved farmland with open former arable fields having been left fallow and recolonising with tall herbs. There are internal treelines and associated drainage ditches and surrounding outgrown hedgerows.

The main habitats are presented on the recent aerial photography in Figure 8.3. A list of habitats recorded and their corresponding Fossitt codes is presented in Table 8.2.

Table 8.2 *Details of habitats recorded and their corresponding Fossitt codes.*

Habitat	Habitat Category	Habitat Type
(F) Freshwater	(FW) Watercourses	(FW4) Drainage ditches
(G) Grassland	(GA) Improved grassland	(GA1) Improved agricultural grassland
(W) Woodland and Scrub	(WS) Scrub and transitional woodland	(WS1) Scrub
	(WL) Linear woodland	(WL1) Hedgerows

Figure 8.3 *Habitats recorded at the proposed development site at Huntstown.*

<u>8.3.2.1 (FW4) Drainage ditches</u>

This habitat classification applies to drainage ditches within the site associated with outgrown hedgerows. Draining ditches are generally shallow and stagnant being self-contained draining to ground.

Species presents include Great willowherb (*Epilobium hirsutum*), Meadowsweet (*Filipendula ulmaria*), Buttercup (*Ranunculus acris*) and Nettle (*Urtica dioica*). Short stagnant sections contained Duckweed (*Lemna minor*).

The large ditch to the west of the site was observed during site visits to contain either stagnant grey water or no water depending on the season and has no fisheries value.

The existing onsite drainage ditches have been assessed in respect of the applicability of the Objective WQ05 within the Fingal County Development Plan 2017-2023. Objective WQ05 requires the establishment of a riparian corridors free from new development along all significant watercourses and streams in the County. The existing manmade ditches with intermittent or ephemeral characteristics are not considered to be a significant watercourse or stream, therefore Objective WQ05 is not considered to apply to any of the local drainage ditches on the site.

8.3.2.2 (GA1) Improved agricultural grassland

This habitat refers to those arable and fallow grassland areas which comprise the former managed fields on the site. Species present include Cocks foot (*Dactylis glomerata*), Bent (*Agrostis* spp.), and Meadow grass (*Poa* spp.). Ribwort plantain (*Plantago lanceolata*), Buttercup (*Ranunculus acris*), Daisy (*Bellis perennis*), and Nettle (*Urtica dioica*) are common along with Dandelion (*Taraxacum* spp.). The fields have been fallow for at least one growing season and a succession of Willowherb (*Epilobium hirsutum*), Thistles (*Cirsium* spp.) and Nettle (*Urtica dioica*) is occurring.

8.3.2.3 (WL1) Hedgerows

This habitat refers the site boundaries and four internal dividing field boundaries. The predominant species present is Hawthorn (*Crataegus monogyna*) and Ash (*Fraxinus excelsior*) along with Alder (*Alnus glutinosa*), Blackthorn (*Prunus spinosa*) and Willow (*Salix* spp).

The field boundary hedgerows are generally poorly maintained and have large gaps and are succeeding to scrub in places. Sections that have understorey flora includes Nettle stands and Bramble scrub.

8.3.2.4 (WS1) Scrub

This habitat was recorded in areas where succession of habitats has occurred from spreading Bramble adjacent to field boundaries and in field corners.

8.3.3 Invasive Species

An area of Japanese Knotweed c. 40 m sq. was record during preliminary site visits by Mott MacDonald in May 2019. The area is located inside the farm access gate on the main road to the east. The spread was treated and an eradication programme by Dig & Dump method completed by Knotweed Control Ireland in March 2020.

8.3.4 Fauna

8.3.4.1 Badgers

There were no badger setts along field boundaries which would be disturbed and no signs of badgers in the study area.

8.3.4.2 Otters

There were no signs of otters in the site or along the drainage ditches which have no fisheries value.

8.3.4.3 Bats

Two mature Ash trees showed definite bat roosting potential. Other trees initial assessed as having bat roost potential were examined at height and their potential revised down after the survey, see Appendix 8.2 for the full bat report.

The results of the walked bat transects showed that three confirmed bats species were present; Common pipistrelle (*Pipistrellus pipistrellus*), Soprano pipistrelle (*Pipistrellus pygmaeus*) and Leisler's bat (*Nyctalus leisleri*). The majority of calls were recorded from the central east-west hedgerow.

These species were again conformed from the results a static detector survey with the addition of a fourth species; Nathusius's pipistrelle (*Pipistrellus nathusii*).

8.3.4.4 Other mammals

There were signs of fox recorded along with rabbits. These species are of low ecological concern and are not protected.

8.3.4.5 Birds

Species recorded included regular passerines such as Great Tit (*Parus major*), Chaffinch (*Fringilla coelebs*), Blackbird (*Turdus merula*), Wren (*Troglodytes troglodytes*).

A list of breeding bird species recorded during fieldwork in September 2020 is presented in Table 8.3.

Table 8.3 *Details of birds encountered during fieldwork in February 2020*

Birds	Scientific name	BWI Status	Habitat Type
Blackbird	*Turdus merula*	Green	Dense woodland to open moorland, common in gardens
Rook	*Corvus frugilegus*	Green	Open woodland and farmland
Chaffinch	*Fringilla coelebs*	Green	Hedgerows, gardens and farmland
Magpie	*Pica*	Green	Farmland, open country with scattered trees or bushes, increasingly in urban areas
Robin	*Erythacus rubecula*	Green	Woodland, gardens and parks
Woodpigeon	*Columba palumbus*	Green	Gardens, woods, hedges
Wren	*Troglodytes*	Green	Low cover anywhere, especially woodlands

There were no signs of winter bird species using the site during the December survey of habitats. This is not surprising given the succession of tall herbs on the site having lain fallow.

There were no signs of Peregrine falcon feeding over the proposed development areas on any of the surveys dates.

8.3.4.6 Amphibians

The smooth newt, *Lissotriton vulgaris* (formerly *Triturus vulgaris*), hereafter newt, is a species of carnivorous amphibian that is found throughout continental Europe and is Ireland's only native newt species.

The ICUN categorises the species as of least concern, as their populations are stable throughout their range (ICUN 2008), although the loss of suitable terrestrial habitats for overwintering or refuge remains a concern. Newt are protected under the Wildlife Acts (1976 and 2000) and are also listed under Annex III of the Bern Convention. It is an offence to capture or kill a newt in Ireland without a licence.

At the time of survey the drainage ditches surveyed were not found to support ecological conditions favourable to newt or frogs. This was considered given the existing drainage ditch networks running north south and east west were steep sided (between 1 to 2.5m deep) and were heavily shaded with overhanging hedgerow. They did not contain water at the time of the survey within the site boundary. The adjoining heavily managed and compacted soils in the adjoining tillage areas provided poor terrestrial habitat for newts. No evidence of newt was found within the study area despite searching terrestrial refugia (deadwood, small boulders, leaf litter etc.).

8.3.5 Habitat Evaluation

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). Additionally, the TII Guidelines (formerly NRA) for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009) outlines the methodology for evaluating ecological impacts Judgements on the evaluation were made using geographic frames of reference, e.g. European, National, Regional or Local.

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.

The Huntstown Stream leads to the Ward River c. 6.6km downstream and the Ward River discharges to the sea at Malahide Estuary over 15 river km downstream of the site. Therefore, the proposed development site has limited connectivity to the Malahide Estuary SAC or SPA.

Additionally, the proposed development design includes SuDS features to attenuate surface water. Thus the potential for downstream impacts is considered highly unlikely.

There is no potential for connectivity to any other European sites.

Given the above analysis, it is considered that there will be no potential for significant effects on any of the European sites considered and therefore potential effects on European sites can be excluded at a preliminary screening stage.

The open field habitats are considered of low biodiversity value at a local level as are the internal hedgerows.

There are no rare or protected habitats recorded in the study areas inside the licenced areas. Overall, the proposed development area is of Low Local Ecological Value.

8.4 CHARACTERISTICS OF THE DEVELOPMENT

The Proposed Development site is c. 13.3 hectares of predominantly greenfield land, and includes two residential properties fronting the R135 (North Road), located to the north west of the M50 orbital ring in the townland of Johnstown and Coldwinters, North Road, Finglas, Dublin 11. The proposal comprises the demolition of two residential properties fronting the R135 (North Road), and the development of 2 no. data hall buildings arranged over three storeys and associated structures and infrastructure.

Vehicular and pedestrian entrance with associated security installations, roadways and vehicle parking. The development will be accessed from the R135 (North Road) from the east. An emergency/secondary entrance will be provided via the Roadstone Huntstown Quarry and Huntstown Power Station access road to the south-west. Temporary access for construction works and to enable a phased delivery of the development is proposed through an existing site entrance off the North Road.

Associated structures and infrastructure including water treatment facility, sprinkler tanks, external plant equipment, emergency generators and diesel fuel storage, vehicular access roads, car and bicycle parking, attenuation ponds and sustainable urban drainage measures, underground foul and storm water drainage network, associated landscaping and boundary treatment works.

The future Gas Insulated Switchgear (GIS) substation compound and subsurface grid connection will form part of a separate Strategic Infrastructure Development (SID) application to An Bord Pleanála (ABP).

A full description of the proposed development is provided in Chapter 2 (Description of the Proposed Development).

8.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

8.5.1 Construction Phase

8.5.1.1 Habitats

There will be a minor loss of arable and modified grassland habitats. The potential effects on local ecology are ***neutral*** and ***imperceptible*** for the construction phase.

It is predicted that there would be a loss of c. 730m of internal hedgerow and that c. 1.7 km of hedgerow would be retained and conserved in situ. The hedgerows are predominantly low value Hawthorn with semi-mature Ash and occasional mature trees. The potential effects on local ecology are ***neutral*** and ***imperceptible*** for the construction phase.

Deterioration in water quality as a result of elevated suspended solids or from chemical pollution has the potential to significantly impact on downstream habitats and ultimately species. However, the potential for downstream effects is unlikely given the distance of removal and potential for dilution prior to reaching the Ward River. While best practice construction methods are included, these are not required to avoid or reduce any effects on a European site. These measures are not relied upon to reach a conclusion of no likely significant effects on any European site.

Thus, there will be no impacts on the large drainage ditch to the west or downstream to Huntstown Stream or the Ward River.

8.5.1.2 Fauna

Badgers

There were no badger setts along field boundaries which would be disturbed and no signs of badgers in the study area.

Otters

There were no signs of otters and no suitable habitats for otters in the proposed development area. There is no potential for impacts on otters.

Bats

The bat survey provides a preliminary study of bat usage of crop fields in the proposed development site. As none of the trees showed any sign of bat occupation the impact assessment primarily considers feeding habitat rather than roosting.

- Disturbance

Works associated with development or building work are likely to lead to an increase in human presence at the site, extra noise and changes in the site layout and local environment.

- Loss of feeding habitat

The redevelopment of this site involves the removal of hedgerows that represent landscape features used primarily by Pipistrelle species and Leister's bats.

Activity by Myotis and brown long-eared bat was low. No evidence of commuting bats was noted from the survey. Given the amount of hedgerow features located in the surroundings the loss of the internal treelines and hedgerows will result in a low level permanent reduction of this habitat for local bat populations.

- Loss of potential roosting habitats.

Although no bats were found within the trees on the site it is possible bats will occupy trees prior to feeling. The at height search revealed most of the potential roost features on the trees consist of ivy of low potential. Two trees were ranked category 2; capable of hosting bat roosts for low numbers of bats.

Other mammals

There were signs of fox recorded along with rabbits. These species are of low ecological concern and are not protected.

Birds

Species recorded included regular passerines such as Great Tit, Chaffinch, Blackbird, Wren and typical farmland species such as Rook, Magpie and Wood pigeon.

There were no signs of Peregrine falcon feeding over the proposed development areas on any of the surveys dates. The site does not provide typical roosting habitat for Peregrine falcon and the succession of arable and grassland fields to tall herbs and scrub patches further reduces the potential of the site to foraging Peregrine falcons.

Potential impacts on nesting birds may occur as a result of vegetation cutting. The potential effects on local bird populations is not significant and can be avoided.

Amphibians

There is no potential for impact on amphibians during the construction phase.

8.5.2 Operational Phase

8.5.2.1 Habitats

Deterioration in water quality as a result of elevated suspended solids or from chemical pollution has the potential to significantly impact on downstream habitats and ultimately species. However, this will be avoided by the inclusion of SuDS design features such as swale drainage and attenuation.

Thus, there will be no impacts downstream on the Huntstown Stream or the Ward River. While best practice features such as SuDS are included, these are not required to avoid or reduce any effects on a European site. These measures are not relied upon to reach a conclusion of no likely significant effects on any European site.

8.5.2.2 Fauna

Badgers

There were no badger setts along field boundaries which would be disturbed and no signs of badgers in the study area. There is no potential for impacts on badgers.

Otters

There were no signs of otters and no suitable habitats for otters in the proposed development area. There is no potential for impacts on otters.

Bats

Guidance on lighting has been based on the Bats & Lighting document; (BCI , 20 the Bats and artificial lighting in the UK Guidance Note 08/18 (BC T, 2018) and Guidelines for consideration of bats in lighting projects. EUROBATS Publication Series No. 8 (Voigt, 2018). Lighting can alter the behaviour of bats and the insects they prey on.

Other mammals

There were signs of fox recorded along with rabbits. These species are of low ecological concern and are not protected.

Birds

Species recorded included regular passerines such as Great Tit, Chaffinch, Blackbird, Wren and typical farmland species such as Rook, Magpie and Wood pigeon.

Potential impacts on nesting birds may occur as a result of vegetation cutting. The potential effects on local bird populations is not significant and can be avoided.

Amphibians

There is no potential for impact on amphibians during the construction phase.

8.6 REMEDIAL AND MITIGATION MEASURES

Potential impacts on birds will be avoided by cutting of vegetation outside the bird nesting season March 1st to August 31st. If this cannot be enforced then the site will be surveyed for the presence of nesting birds and/or nests prior to cutting and if none are recorded the vegetation may be removed within 48 hours.

Mature trees, which are to be removed, shall be felled in the period early September to late October, or early November, in order to avoid the disturbance of any roosting bats as per Transport Infrastructure Ireland (TII and formerly the National Roads Authority) guidelines (NRA 2006a and 2006b). Tree felling shall be completed by Mid-November at the latest because bats roosting in trees are vulnerable to disturbance during their hibernation period (November – April). Ivy-covered trees, once felled, shall be left intact on-site for 24 hours prior to disposal to allow any bats beneath the foliage to escape overnight.

A bat specialist will survey the trees to be felled for roosting bats prior to felling and will provide detailed measures for any roosts found at that time.

The mature trees that are to be removed, should, due to the passage of time, again be surveyed for bat presence by a suitably experienced specialist on the day of felling. If several bats are found within any one tree, that specific tree should be left in-situ while an application for a derogation licence is made to the National Parks and Wildlife Service to allow its legal removal.

The trees identified as having potential for use by bats should be felled carefully to avoid hard shocks which may injure any bats within. Large mature trees with bat roosting potential such as those onsite should essentially be felled by gradual dismantling by tree surgeons. Care should be taken when removing larger branches as removal of loads may cause cracks or crevices to close, crushing any animals within. Such cracks should be wedged open prior to load removal. If single bats are found during tree felling operations, they should be transferred to the previously erected bat boxes onsite (see below).

Loss of linear habitats within and surrounding the site will be partially compensated for by the provision of alternative linear habitats around the site boundary to ensure connectivity with surrounding ecological corridors. It is predicted that there would be a loss of c. 730m of internal hedgerow and that c. 1.7 km of hedgerow would be retained and conserved in situ.

In addition to retention of existing hedgerows where feasible, the proposed development includes a Landscape Strategy which provides for increased biodiversity through the additional planting.

The protection and enhancement of the existing landscape is an important aspect of the overall landscape strategy. The landscape strategy proposes to enhance and strengthen the existing hedgerow using native hedgerow and woodland species, while retaining the existing trees planted in and around the hedgerow. In addition to strengthening the remnants of the existing hedgerow, planting of a new native hedgerow is also proposed. Through selective management of the hedgerows, the network of existing ecological corridors will be strengthened to support the local wildlife of the surrounding area.

All of the various landscape spaces and typologies in this development have been designed to consider local biodiversity and ecology. Maintaining and creating natural habitats for native flora and fauna and creating ecological networks is an essential element of the landscape strategy.

Retaining and strengthening existing native hedgerows, as well as proposing new native hedgerows, creates biodiverse native habitats and ecological green corridors which run through the site and link with external landscape features.

Woodland planting along site boundaries and on earth berms create dense belts of native woodland spaces which act as native habitat and similarly to the native hedgerows, form ecological corridors which connect with other landscape elements throughout the site.

In order to minimise the extent of light spill onto perimeter habitats, all lights that are pole mounted will be directional and/or cowled to ensure that light is directed downward and inwards. Lights will be programmed or otherwise to be off unless required.

8.7 RESIDUAL IMPACTS OF THE DEVELOPMENT

Specific local mitigation measures include the avoidance of cutting of vegetation during the bird nesting season with regard to the construction phase. The remaining hedgerow habitat to be conserved in site is estimated to be c. 1.7km in length. There will be a loss of relatively low value local habitats including sections of hedgerow up to 730m, scrub, grassland and stagnant overgrown drainage ditches. The overall effect is considered ***neutral, imperceptible, and long-term.***

The outer perimeter boundary of the site provides good commuting and feeding opportunity for bats and this habitat will be retained for the operational phase of the Proposed Development. 'Bat-sensitive' lighting techniques have been incorporated into the lighting plan, which will avoid or minimise any potential impacts of lighting on bats for the operational phase.

It is a significant element of the proposal to maintain and enhance the ecological value of the site through a substantial green belt around the northern, eastern and southern boundaries and the integration of surface water attenuation ponds, landscaping and planting to provide a wild life corridor and a soft transition to neighbouring sites and the public realm.

With the employment of appropriate mitigation measures with regard to local biodiversity, the Proposed Development will have a ***neutral, imperceptible*** and ***long-term effect*** on biodiversity.

8.8 MONITORING/REINSTATEMENT

No ecological monitoring is required during the construction phase of development. The mitigation measures specifying review of the lighting plan by a bat ecologist may require additional surveys and monitoring during site construction and operation. The Local Authority may propose additional monitoring in order to address this.

No reinstatement measures are proposed.

8.9 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. Institute of Ecology and Environmental Management.
- Department of the Environment, Heritage and Local Government (2010) Guidance on Appropriate Assessment of Plans and Projects in Ireland (as amended February 2010).
- EC (2000) Managing Natura 2000 sites: the provisions of Article 6 of the ‘Habitats’ Directive 92/43/EEC.
- EC (2018) Managing Natura 2000 sites: the provisions of Article 6 of the ‘Habitats’ Directive 92/43/EEC.
- EC (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.
- EC (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.
- EPA (2017) Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports. EPA, May 2017.
- 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.
- 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.

9.0 AIR QUALITY AND CLIMATE

9.1 INTRODUCTION

This chapter evaluates the impacts which the Proposed Development may have on Air Quality & Climate during the construction and operational stages as defined in the Environmental Protection Agency (EPA) documents *Guidelines on the Information to be contained in Environmental Impact Statements* (EPA, 2017) and *Advice Notes for Preparing Environmental Impact Statements* (EPA, 2015).

An assessment of the likely dust related impacts as a result of construction activities was undertaken and used to inform a series of mitigation measures. Air dispersion modelling of operational stage emissions from the diesel-powered emergency backup generators was carried out using the United States Environmental Protection Agency's regulated model AERMOD as recommended by the EPA (EPA, 2020a). The modelling of air emissions from the site was carried out to assess concentrations of nitrogen dioxide (NO_2) at a variety of locations beyond the site boundary. The modelling was undertaken to assess the impact to ambient air quality from scheduled testing of the standby generators and the infrequent emergency operation of the standby generators.

The Proposed Development (Building A and Building B) will have 56 no. back-up generators in addition to two house generators, both of which will be less than 1MW each. The cumulative impact of the Proposed Development and the nearby Huntstown Power Station has been considered within this chapter in terms of potential air quality and climate impacts.

9.2 METHODOLOGY

9.2.1 Criteria for Rating of Impacts

<u>9.2.1.1 Ambient Air Quality Standards</u>

In order to reduce the risk to health from poor air quality, the Department of the Environment, Heritage and Local Government in Ireland and the European Parliament and Council of the European Union 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. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set (see Table 9.1).

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland include the Air Quality Standards Regulations 2011, which incorporate European Commission Directive 2008/50/EC which has set limit values for the pollutants NO_2, PM_{10}, and $PM_{2.5}$ relevant to this assessment. Council Directive 2008/50/EC combines the previous Air Quality Framework Directive (96/62/EC) and its subsequent daughter directives (including 1999/30/EC and 2000/69/EC) and also includes ambient limit values relating to $PM_{2.5}$.

Table 9.1 *Air Quality Standards Regulations 2011 (based on EU Council Directive 2008/50/EC)*

Pollutant	Regulation Note 1	Limit Type	Value
Nitrogen Dioxide	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 μg/m^3 NO_2
		Annual limit for protection of human health	40 μg/m^3 NO_2
Particulate Matter (as PM_{10})	2008/50/EC	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 μg/m^3 PM_{10}
		Annual limit for protection of human health	40 μg/m^3 PM_{10}
$PM_{2.5}$	2008/50/EC	Annual limit for protection of human health	25 μg/m^3 $PM_{2.5}$

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*

9.2.1.2 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 outlined in section 9.2.1.1 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) (EPA, 2006). The document recommends that the Bergerhoff limit of 350 mg/(m^2*day) be applied to the site boundary of quarries. This limit value shall be implemented with regard to dust impacts from construction of the Proposed Development.

9.2.1.3 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 (DEHLG, 2004; 2007). The data available from the EU in 2020 (EPA, 2020b) indicated that Ireland complied with the emissions ceilings for SO_2 in recent years but failed to comply with the ceilings for NMVOCs, NH_3 and NO_X. 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 applies 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, emission targets applicable from 2020 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 $PM_{2.5}$.

9.2.1.4 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.

In 2015, the Climate Action and Low Carbon Development Act 2015 (No. 46 of 2015) (Government of Ireland, 2015) was enacted (the 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 Act makes provision for a national mitigation plan, and a national adaptation framework. In addition, the Act provided for the establishment of the Climate Change Advisory Council with the function to advise and make recommendations on the preparation of the national mitigation and adaptation plans and compliance with existing climate obligations.

The *Climate Action Plan* (CAP) (Government of Ireland, 2019), published in June 2019, outlines the current status across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and outlines the various broadscale measures required for each sector to achieve ambitious decarbonisation targets. The CAP also details 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 CAP has set a built environment sector reduction target of 40 - 45% relative to 2030 pre-NDP (National Development Plan) projections.

Following on from Ireland declaring a climate and biodiversity emergency in May 2019 and the European Parliament approving a resolution declaring a climate and environment emergency in Europe in November 2019, the Government approved the publication of the General Scheme for the Climate Action (Amendment) Bill 2019 in December 2019 (Government of Ireland, 2020a). The General Scheme was prepared for the purposes of giving statutory effect to the core objectives stated within the CAP. It is expected that the new Climate Action (Amendment) Bill (the Bill) will be published before the end of 2021.

In October 2020, the Climate Action and Low Carbon Development (Amendment) Bill 2020 (Government of Ireland, 2020b) was published in draft format (draft 2020 Climate Act) which amends and enhances the 2015 Climate Act. Once approved, the purpose of the 2020 Climate Act is to provide for the approval of plans '*for the purpose of pursuing the transition to a climate resilient and climate neutral economy by the end of the year 2050'*. The 2020 Climate Act will also '*provide for carbon budgets and a decarbonisation target range for certain sectors of the economy'*. The 2020 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.

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 County Council (FCC) Climate Action Plan (FCC and Codema 2019) outlines FCC's goals to mitigate GHG emissions and plans to prepare for and adapt to climate change. The FCC Climate Action Plan highlights the risks that climate change poses to the transportation network with risks mainly associated with extreme weather events and sea level rise. The FCC Climate Action Plan, in relation to energy and built environment, has a target of a 33% improvement in energy efficiency by 2020 and a 40% reduction in council's GHG emissions by 2030. Additional measures include an energy master plan for the Dublin region and upgrades in buildings using Energy Performance Contracts.

9.2.2 Construction Phase

<u>9.2.2.1 Air Quality</u>

The current assessment focused firstly on identifying the existing baseline levels of NO_2, PM_{10} and $PM_{2.5}$ in the region of the Proposed Development (as defined in Chapter 2 of this EIAR) by an assessment of EPA monitoring data. Thereafter, the impact of the construction phase on air quality was determined by a qualitative assessment of the nature and scale of dust generating construction activities associated with the Proposed Development.

9.2.2.2 Climate

The impact of the construction phase of the Proposed 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.

9.2.3 Operational Phase

9.2.3.1 Air Quality

Air dispersion modelling was carried out by AWN Consulting Ltd. using the United States Environmental Protection Agency's regulated model AERMOD (Version 19191). AERMOD is recommended as an appropriate model for assessing the impact of air emissions from industrial facilities in the EPA Guidance document "*Air Dispersion Modelling from Industrial Installations Guidance Note (AG4)*" (2020a).

The modelling of air emissions from the site was carried out to assess the concentrations of nitrogen dioxide (NO_2) beyond the site boundary and the consequent impact on human health.

The assessment was undertaken in order to quantify the impact of the Proposed Development and the existing baseline level of pollutants on ambient air quality concentrations. In addition to the assessment of the Proposed Development, a further cumulative scenario has been modelled to assess the combined impact from the Proposed Development and the back-up diesel generators associated with an indicative future data storage building at the same site, to be located to the north of the Proposed Development (see Appendix 9.3).

To obtain all the meteorological information required for use in the model, data collected during 2015 – 2019 from the Met Éireann meteorological station at Dublin Airport has been incorporated into the modelling. The air dispersion modelling input data consisted of information on the physical environment, design details for all emission points on-site and five full years of meteorological data. Using this input data, the model predicted ambient concentrations beyond the site boundary for each hour of the meteorological year. This study adopted a conservative approach which will lead to an over-estimation of the actual levels that will arise.

AERMOD is a "new-generation" steady-state Gaussian plume model used to assess pollutant concentrations associated with industrial sources. The model is an enhancement of the Industrial Source Complex-Short Term 3 (ISCST3) model which has been widely used for emissions from industrial sources. Details of the model are given in Appendix 9.1. Fundamentally, the model has made significant advances in simulating the dispersion process in the boundary layer. This will lead to a more accurate reflection of real-world processes and thus considerably enhance the reliability and accuracy of the model particularly under those scenarios which give rise to the highest ambient concentrations.

Due to the proximity to surrounding buildings, the PRIME Building Downwash Program (BPIP Prime) has been incorporated into the model to determine the influence (wake effects) of these buildings on dispersion in each direction considered.

The AERMOD model incorporated the following features:

A receptor grid and discrete receptors were identified at which concentrations would be modelled. Receptors were mapped with sufficient resolution to ensure all localised “hot-spots” were identified without adding unduly to processing time. The receptor grids were based on a Cartesian grid with the site at the centre. The outer grid measured 9 x 9 km with the site at the centre and with concentrations calculated at 300m intervals. The inner grid measured 2.5 x 2.5 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 3,613 calculation points for the model. The impact of the back-up diesel generators was also measured at nearby residential receptors which were added to the model as discrete receptors.

All on-site buildings and significant process structures were 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 were incorporated into the modelling.

Hourly-sequenced meteorological information has been used in the model covering the years 2015 – 2019 from the Met Éireann meteorological station at Dublin Airport as shown in Figure 9.1 (www.met.ie). AERMOD incorporates a meteorological pre-processor AERMET 7 which allows AERMOD to account for changes in the plume behaviour with height using information on the surface characteristics of the site. AERMET 7 calculates hourly boundary layer parameters for use by AERMOD, including friction velocity, Monin-Obukhov length, convective velocity scale, temperature scale, convective boundary layer (CBL) height, stable boundary layer (SBL) height, and surface heat flux (see Appendix 9.2).

Terrain has been mapped out in the model as using SRTM (Shuttle Radar Topography Mission) data with 30m resolution. All terrain features have been mapped in detail into the model using the terrain pre-processor AERMAP.

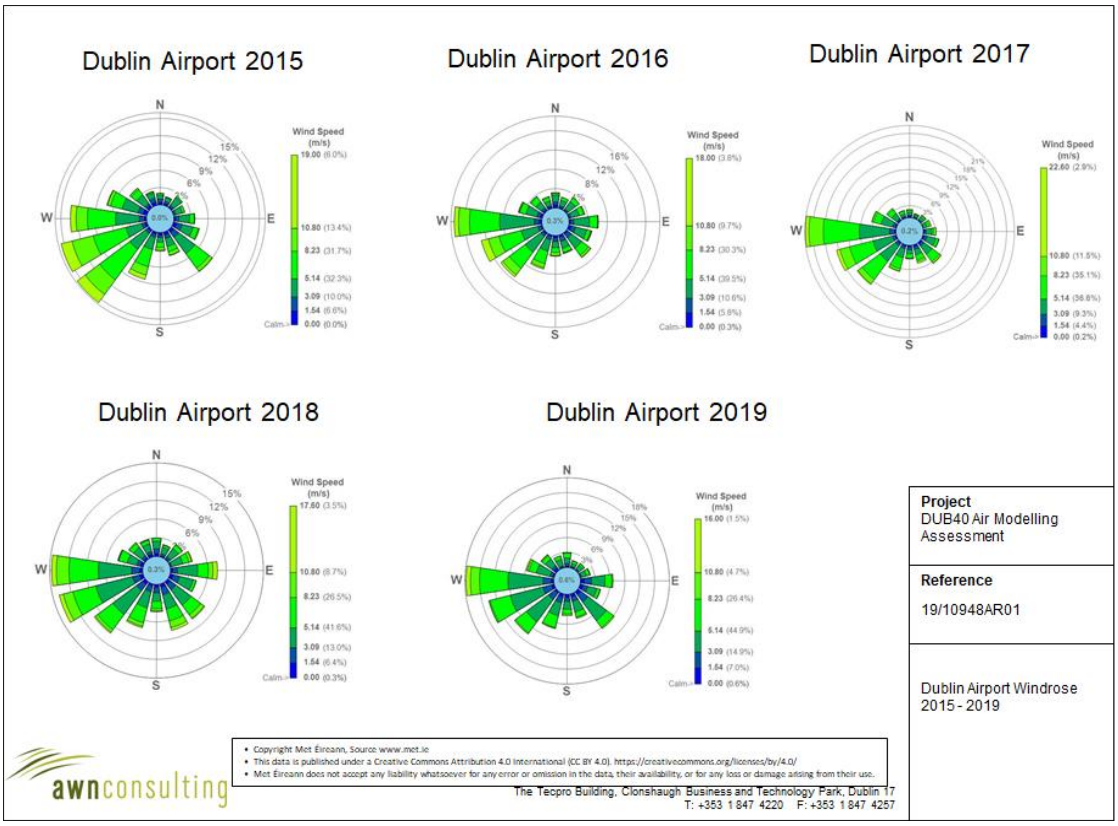

Figure 9.1 *Dublin Airport Windrose 2015 - 2019*

Process Emissions

The Proposed Development (Building A and Building B) will have 56 no. back-up generator with associated stacks which will be built to a height of 31m above ground level. For the purpose of this assessment all back-up generators associated with Building A and Building B have been modelled running simultaneously at 75% loading.

In addition to the back-up generators which will power the data halls in the event of a power failure, there will also be two small back-up generators which will power the Administration Buildings at the site in the event of a power failure. These back-up generators for the Administration Buildings have been scoped out of this air modelling assessment as it is not expected that they would cause any significant impacts on ambient air quality considering their smaller scale (compared to the data hall back-up generators), the likelihood that there will only be 2 of each of these types of generators for the proposed development and the infrequent and unpredictable usage of these generators.

In order for the generators to be kept in good condition, ready to be started at full load during an emergency power failure, it is necessary to carry out a controlled maintenance programme, which includes periodic testing. All testing is assumed to only occur between 8am and 5pm, Monday to Friday. The maintenance plan for the proposed development comprises the following two tests:

- Test 1: testing once per monthly of all 56 no. back-up generators at no load for a maximum of 30 minutes each, one generator at a time, sequentially;
- Test 2: each generator will be periodically tested at up to 70% load for 30 minutes for a maximum of 4 hours per year one generator at a time, sequentially;

- Test 3: 2 hours at 100% load, one generator at a time, sequentially, once per year.

USEPA Guidance suggests that for emergency operations, an average hourly emission rate should be used rather than the maximum hourly rate (USEPA, 2011). For modelling purposes only, a worst case/conservative figure of 100 hours in total per year of operation has been applied to the Proposed Development. However, in reality, and based on recent experience over the past number of years, generators are rarely used other than during testing and maintenance described above. As a result, the maximum hourly emission rates from all the back-up generators were reduced by a factor of (100/8760) to give an average hourly emission rate (in line with USEPA protocol) and the generators were modelled over a period of one full year.

A second methodology for modelling back-up generators has been published by the UK Environment Agency. The consultation document is entitled "*Diesel Generator Short-Term NO_2 Impact Assessment*" (UK EA, 2016). 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 operational hours of the back-up generators. 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 (UK EA, 2019) 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 these generators when providing power on site during an emergency. An annual power interruption test where power is failed, and all generators run for up to 1.5 hours will occur. This will be captured in the EA modelling assessment as described above.

Both the methodology advised in the USEPA guidance as well as the approach described in the UK EA guidance have been applied in this study to ensure a robust assessment of predicted air quality impacts from the back-up generators. The methodology for converting NO_X to NO_2 was 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 $\mu g/m^3$ based on a review of EPA data for similar Zone A locations.

The modelling was undertaken to assess the impact to ambient air quality from the following emergency operations scenarios:

- **Proposed Development Scenario:** This comprises the emission points associated with the Proposed Development (Building A and Building B). This scenario involved the emergency operation of all 56 no. diesel generators (at 75% loading). The scenario also includes a worst-case approach to testing of all 56 generators. The process emissions used for the Proposed Development Scenario (Buildings A and B) are outlined in Table 9.2.
- **Cumulative Impact Scenario:** The cumulative impact scenario assessed the combined impact of the Proposed Development as outlined above as well as the nearby Huntstown Power Station (see Appendix 9.3).

Table 9.2 *Summary of Process Emission Information for Buildings A & B – Proposed Development Scenario*

Stack Reference	Stack 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)
Building A & B Emergency Operation for Back-up Diesel Generators (75% load)	31m	0.6	0.28	706.05	20.441	35.4	720.6	0.047 [Note 1] / 4.09 [Note 2]
Building A & B Worst-case Testing for Back-up Diesel Generators (weekly testing at 30% load)	31m	0.6	0.28	661.75	8659	9.3	580.4	1.40 [Note 3]

Note 1 *Reduced emission rates based on USEPA protocol (assuming 100 hours / annum) used to model emissions during emergency operation of generators (75% load)*

Note 2 *Maximum emission rates for diesel generators (based on 75% load) used to model emissions during emergency operation of generators for UK EA assessment methodology*

Note 3 *Emission rates used to model emissions during testing at 30% load assumed to occur once per week, per generator as a worst-case.*

9.2.3.2 Climate & Transboundary Pollution

The back-up diesel generators 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 described in Section 9.2.3.1. 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.

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 9.7.2.3.

9.3 RECEIVING ENVIRONMENT

9.3.1 Baseline Air Quality

Air quality monitoring programs have been undertaken in recent years by the EPA and Local Authorities. The most recent annual report on air quality '*Air Quality in Ireland 2019*' (EPA 2020c) 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 as outlined within the EPA document titled 'Air Quality Monitoring Report 2018 (EPA 2020c). 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, the Proposed Development is within Zone A as explained with the EPA document titled '*Air Quality in Ireland 2019'* (EPA 2020c).

NO_2

With regard to NO_2, continuous monitoring data from the EPA (EPA 2020c), 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 the station in Swords to observe long-term trends since 2015, with annual average results ranging from 13 – 16 µg/m^3. The 1-hour concentrations, measured as a 99.8th percentile were 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 proposed development is 15 µg/m^3.

In relation to the annual average background, the ambient background concentration was 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 was 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 [(18)].

Table 9.3 Annual Mean NO_2 Concentrations in Zone A Locations ($\mu g/m^3$)

Year	Ballyfermot	Rathmines	Swords
2015	16	18	13
2016	17	20	16
2017	16	17	14
2018	17	20	16
2019	20	22	15
Average	17	19	15

PM_{10}

Continuous PM_{10} monitoring carried out at the Ballyfermot, Rathmines, Tallaght and Phoenix Park Zone A locations in 2015 - 2019 showed annual mean concentrations ranging from 9 to 16 µg/m^3, with at most 5 exceedances (in Rathmines) of the 24-hour limit value of 50 µg/m^3 (35 exceedances are permitted per year) (EPA, 2020c). Based on this EPA data, an estimate of the background PM_{10} concentration in the region of the development is 14 µg/m^3.

Table 9.4 Background PM10 Concentrations in Zone A Locations (µg/m3)

Station	Averaging Period	Year				
		2015	2016	2017	2018	2019
Ballyfermot	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
Tallaght	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
Rathmines	Annual Mean PM_{10} (µg/m^3)	15	15	13	15	15
	24-hr Mean > 50 µg/m^3 (days)	5	3	5	2	9
Phoenix Park	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

$PM_{2.5}$

Continuous $PM_{2.5}$ monitoring at the Zone A location of Rathmines over the period 2015 – 2019 (EPA, 2020c) indicated an average $PM_{2.5}/PM_{10}$ ratio ranging from 0.53 – 0.68. Based on this information, a conservative ratio of 0.70 was used to generate a background $PM_{2.5}$ concentration of 9.8 µg/m^3.

9.3.2 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 provisional emissions up to 2019 (EPA, 2020d). The data published in 2020 states that Ireland will exceed its 2019 annual limit set under the EU's Effort Sharing Decision (ESD), 406/2009/EC1 by an estimated 6.98 Mt. For 2019, total national greenhouse gas emissions are estimated to be 59.90 million tonnes carbon dioxide equivalent (Mt CO_2eq) with 45.71 MtCO_2eq of emissions associated with the ESD sectors for which compliance with the EU targets must be met. Agriculture is the largest contributor in 2019 at 35.3% of the total, with the transport sector accounting for 20.3% of emissions of CO_2.

GHG emissions for 2019 are estimated to be 4.5% lower than those recorded in 2018. Emission reductions have been recorded in 6 of the last 10 years. However, compliance with the annual EU targets has not been met for four years in a row. Emissions from 2016 – 2019 exceeded the annual EU targets by 0.29 MtCO_2eq, 2.94

$MtCO_2eq$, 5.57 $MtCO_2eq$ and 6.98 $MtCO_2eq$ respectively. Agriculture is consistently the largest contributor to emissions with emissions from the transport and energy sectors being the second and third largest contributors respectively in recent years.

The EPA 2019 GHG Emissions Projections Report for 2018 – 2040 (EPA, 2019) 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. Implementation of these is 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 2013 – 2020 Ireland is projected to cumulatively exceed its compliance obligations with the EU's Effort Sharing Decision (Decision No. 406/2009/EC) 2020 targets by approximately 10 Mt CO_2eq under the "*With Existing Measures*" scenario and 9 Mt CO_2eq under the "*With Additional Measures*" scenario (EPA, 2019).

9.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The Proposed Development site is c. 13.3 hectares of predominantly greenfield land and includes two residential properties fronting the R135 (North Road), located to the northwest of the M50 orbital ring in the townland of Johnstown and Coldwinters, North Road, Finglas, Dublin 11. The proposal comprises the demolition of two residential properties fronting the R135 (North Road), and the development of 2 no. data hall buildings arranged over three storeys and associated structures and infrastructure.

Vehicular and pedestrian entrance with associated security installations, roadways and vehicle parking. The development will be accessed from the R135 (North Road) from the east. An emergency/secondary entrance will be provided via the Roadstone Huntstown Quarry and Huntstown Power Station access road to the south-west. Temporary access for construction works and to enable a phased delivery of the development is proposed through an existing site entrance off the North Road.

Associated structures and infrastructure including water treatment facility, sprinkler tanks, external plant equipment, emergency generators and diesel fuel storage, vehicular access roads, car and bicycle parking, attenuation ponds and sustainable urban drainage measures, underground foul and storm water drainage network, associated landscaping and boundary treatment works.

The future Gas Insulated Switchgear (GIS) substation compound and subsurface grid connection will form part of a separate Strategic Infrastructure Development (SID) application to An Bord Pleanála (ABP).

A detailed description of the proposed development is presented in Chapter 2 (Description of Development) and the included planning documentation. The proposed characterises specific to this chapter are summarised below.

9.4.1 Construction Phase

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 construction of roads, car parking areas, foundations, installation of drainage services and ancillary infrastructure;

(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

(v) Construction traffic accessing the site will emit air pollutants and greenhouse gases during transport.

As outlined in Section 9.6, 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.

9.4.2 Operational Phase

The key works which will have a potential impact on air quality and climate during operation of the Proposed Development are summarised below:

(i) The scheduled testing (Test 1, Test 2 and Test 3) for maintenance of the back-up diesel generators in the data storage facility will release air pollutant emissions (primarily NO_x emissions);

(ii) The infrequent emergency operation of the back-up diesel generators for the data storage facility in the event of a power outage would release air pollutant emissions (primarily NO_x emissions). A review of operational data from similar operational data storage facilities in Ireland indicates that those standby generators are rarely used other than during the scheduled maintenance and testing.

(iii) Road traffic accessing the site will emit air pollutants and greenhouse gases. However, the operational phase of the Proposed Development is not expected to contribute a significant volume of additional traffic on the local road network (see Chapter 13). Therefore, no local air quality assessment of the traffic impact is required for this development; and

(iv) The indirect impact of emissions from electricity to operate the data storage facilities will have an impact on climate and regional air quality. However, it is predicted that these will not be significant in relation to Ireland's national emission ceiling limits for CO_2, NO_X, SO_2 and NMVOCs.

9.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

9.5.1 Construction Phase

9.5.1.1 Air Quality & Climate

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 350m of a construction site, the majority of the deposition occurs within the first 50m. 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.

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'* (IAQM, 2014) states that site traffic and plant is unlikely to make a significant impact on climate.

Initial commissioning activities will involve testing of the back-up generators on site in a similar manner to the operational phase testing, i.e., the first testing sequence will be commissioning of the standby generators. The operational modelling has considered testing of the generators on a weekly and 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 an ***imperceptible*** impact to air quality in the ***short-term***.

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 9.6) of this chapter 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 ***short-term*** and ***imperceptible*** impact on climate.

9.5.2 Operational Phase

9.5.2.1 Air Quality

As outlined in Section 9.6, an iterative stack height determination was undertaken as part of the air dispersion modelling study to ensure that an adequate release height was selected for all emission points to aid dispersion of the plume and ensure compliance with the ambient air quality limit values beyond the site boundary.

9.5.2.2 Climate

The back-up diesel generators modelled for the purpose of this assessment will only be used in the event of a power failure at the site and for testing purposes. During normal operations at the facility, the electricity will be supplied from the national grid. Electricity to operate the facility will be purchased from the available energy suppliers including power stations and renewable generation sources such as wind power. The Electricity Supplier for the site currently holds a Commission for Regulation of Utilities (CRU) certified fuel mix disclosure, guaranteeing every megawatt-hour (MWh) that they supply in the market is generated from renewable sources.

9.5.3 Do Nothing Scenario

Under the Do-Nothing Scenario no construction works will take place and the previously identified impacts of fugitive dust and particulate matter emissions and emissions from equipment and machinery will not occur. The ambient air quality at the site will remain as per the baseline and will change in accordance with trends within the wider area (changes in road traffic, etc.) until such time as an alternative development consistent with the land use zoning is granted permission and constructed. Therefore, this scenario can be considered ***neutral*** in terms of both air quality and climate.

The Do-Nothing Scenario in the operational stage is assessed in Section 9.7.2.1.

9.6 REMEDIAL AND MITIGATION MEASURES

9.6.1 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).

9.6.1.1 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 9.1 for the wind rose for Dublin Airport). 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 (USEPA, 1986). Particular care should be taken during periods of high winds (gales) as these are periods where the potential for significant dust emissions is 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; and
- The procedures put in place will be reviewed at regular intervals and monitoring conducted and recorded by the principal contractor. It is recommended 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.

9.6.1.2 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% (UK Office of Deputy Prime Minister, 2002).

- 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% (USEPA, 1997). 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.

9.6.1.3 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.

9.6.1.4 Storage Piles

The location and moisture content of storage piles are important factors which determine their potential for dust emissions. The following measures will be implemented to minimise dust formation from storage piles:

- 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 (UK Office of Deputy Prime Minister, 2002); 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.

9.6.1.5 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; and
- 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.

9.6.1.6 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.

9.6.2 Operational Phase

The stack heights of the back-up diesel generators for the Proposed Development have 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 beyond the site boundary (including background concentrations). No additional mitigation measures are proposed for the operational phase of the development.

9.7 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

9.7.1 Construction Phase

9.7.1.1 Air Quality

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 ***negative***, ***short-term*** and ***imperceptible*** in nature, posing no nuisance at nearby receptors.

9.7.1.2 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 ***negative***, ***short-term*** and ***imperceptible*** in nature in relation to Ireland's obligations under the EU 2030 target.

9.7.1.3 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.

9.7.2 Operational Phase

9.7.2.1 Air Quality

Do Nothing Scenario

Under the Do-Nothing Scenario no operations will occur and the previously identified impacts of air emissions. The ambient air quality at the site will remain as per the baseline and will change in accordance with trends within the wider area (including influences from new developments in the surrounding industrial estates, changes in road traffic, etc.). Therefore, this scenario can be considered neutral in terms of both air quality and climate.

Do Something Scenario

The NO_2 modelling results at the worst-case location at and beyond the site boundary are detailed in Table 9.5 for the Do Something Scenario 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*' (USEPA, 2011). This scenario involved the emergency operation of all 56 no. back-up diesel generations for 100 hours per year as well as a worst-case assumption of weekly testing of all 56 no. back-up generators.

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 modelled, emissions from the site lead to an ambient NO_2 concentration (including background) which is 59% of the maximum ambient 1-hour limit value (measured as a 99.8th percentile) (year 2017) and 80% of the annual limit value at the worst-case off-site receptor (year 2017). Concentrations decrease with distance from the site boundary with a peak at the eastern boundary of the site for both time periods.

The operational phase impact of the Do Something Scenario is considered ***long-term***, ***localised***, ***negative*** and ***slight***.

Table 9.5 *NO2 Dispersion Model Results – Do Something Scenario*

Pollutant / Year	Background Concentration (µg/m^3)	Averaging Period	Process Contribution NO_2 (µg/m^3)	Predicted Environmental Concentration NO_2 (µg/m^3)	Limit Value (µg/m^3) Note 1
NO_2 / 2015	30	99.8th%ile of 1-Hr Means	81.2	111.2	200
	15	Annual mean	15.3	30.3	40
NO_2 / 2016	30	99.8th%ile of 1-Hr Means	80.0	110.0	200
	15	Annual mean	14.3	29.3	40
NO_2 / 2017	30	99.8th%ile of 1-Hr Means	86.9	116.9	200
	15	Annual mean	16.9	31.9	40
NO_2 / 2018	30	99.8th%ile of 1-Hr Means	82.0	112.0	200
	15	Annual mean	13.9	28.9	40
NO_2 / 2019	30	99.8th%ile of 1-Hr Means	88.1	118.1	200
	15	Annual mean	14.8	29.8	40

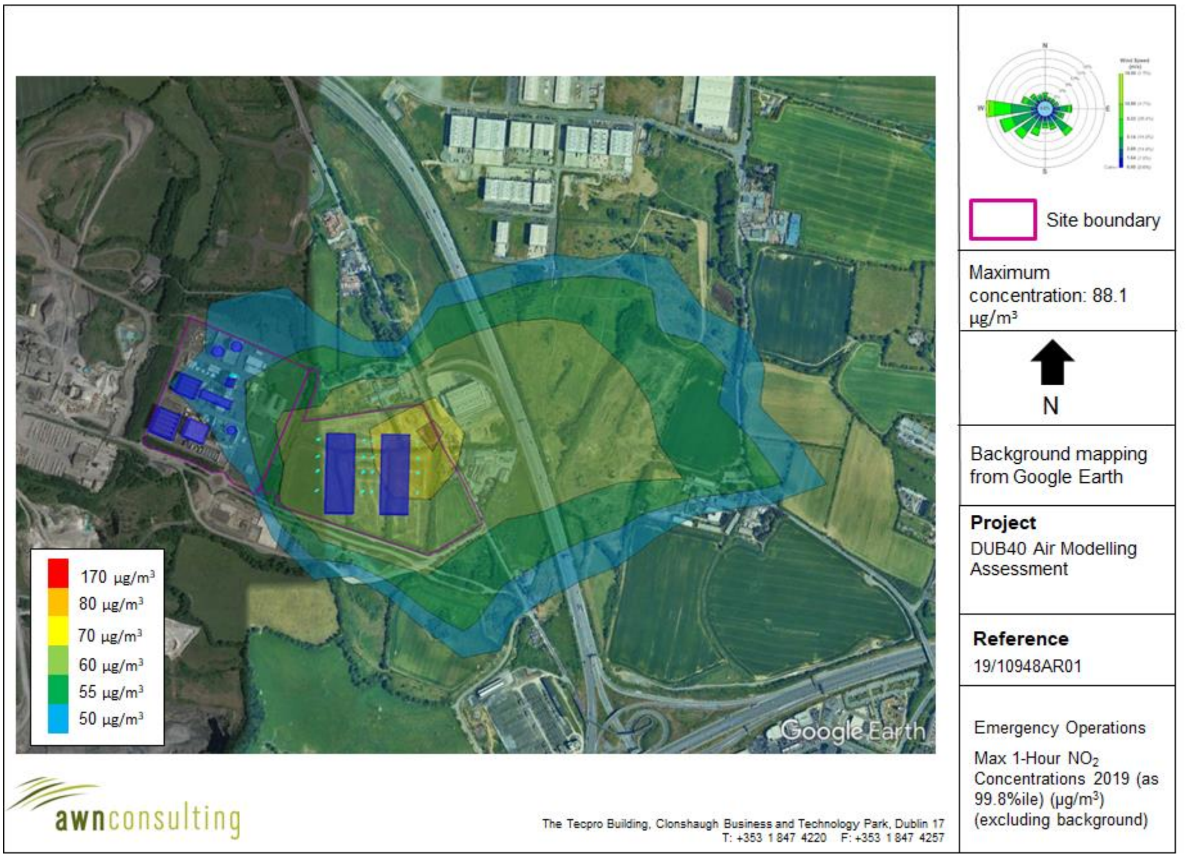

Figure 9.2 *Maximum 1-Hour NO_2 Concentrations 2019 (as 99.8th percentile) (µg/m³) (excluding background concentrations) – Proposed Development Scenario*

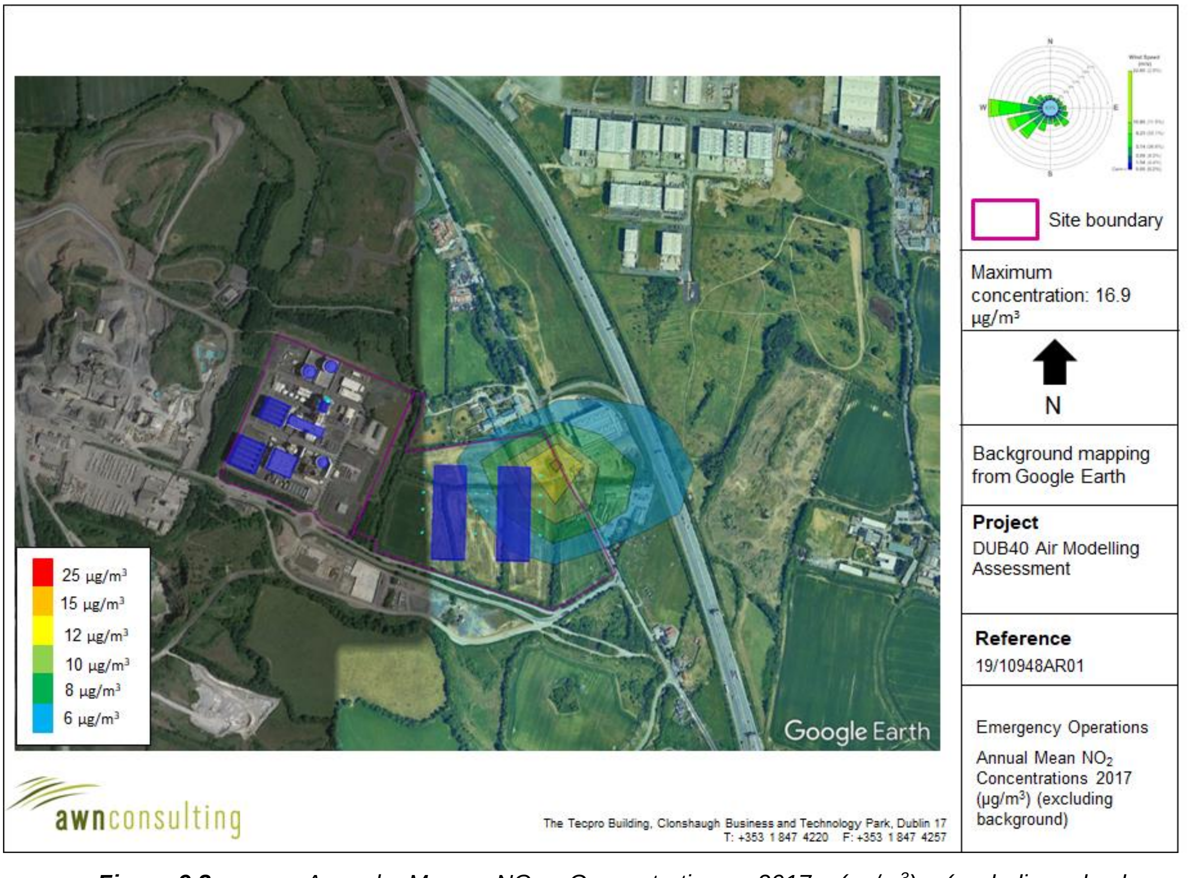

Figure 9.3 *Annual Mean NO_2 Concentrations 2017 (µg/m³) (excluding background concentrations) – Proposed Development Scenario*

Proposed Development Scenario (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 for the Proposed Development Scenario. This scenario involved the emergency operation of all 56 no. back-up generators on the site for Buildings A and B.

The cumulative hypergeometric distribution of 19 and more hours per year is computed and the probability of an exceedance determined as outlined in Table 9.6. The results have been compared to the 98th percentile confidence level to indicate if an exceedance is likely at various operational hours for the back-up diesel generators. The results indicate that in the worst-case year, the emergency generators for the Proposed Development can operate for up to 33 hours per year before there is a likelihood of an exceedance of the ambient air quality standard (at a 98th percentile confidence level). Figure 9.4 shows the statistical distribution predicted for the 98th percentile (based on 33 hours of operation per year). However, the UK guidance recommends that there should be no running time restrictions placed on back-up generators which provide power on site only during an emergency power outage.

Table 9.6 *Hypergeometric Statistical Results at Worst-case Residential Receptor – NO2 Proposed Development Scenario*

Pollutant / Meteorological Year	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 / 2016	40	0.02
NO_2 / 2017	40	
NO_2 / 2018	33	
NO_2 / 2019	43	
NO_2 / 2020	39	

Note 1 *Guidance Outlined in UK EA publication “Diesel Generator Short-term NO_2 Impact Assessment” (EA, 2016)*

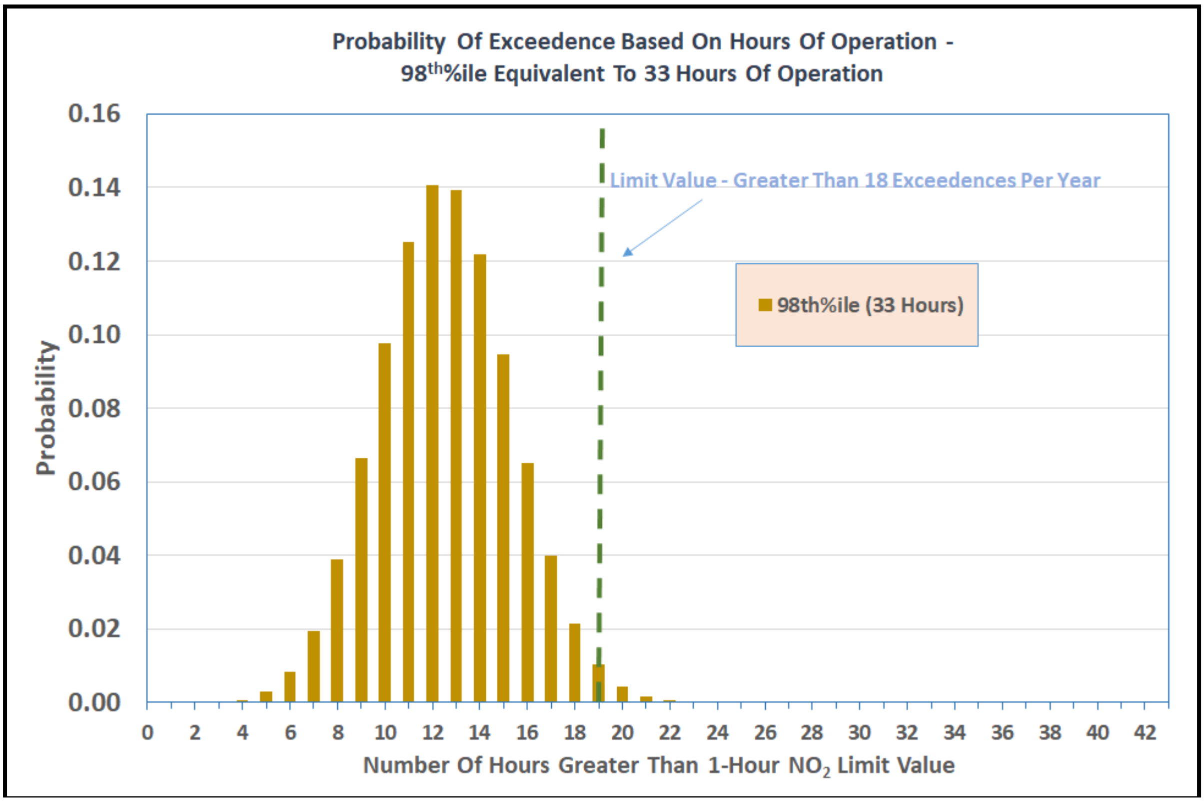

Figure 9.4 *Probability of Exceedance of 1-Hour NO_2 Ambient Air Quality Limit Value based on Hours of Operation for Emergency Generators for Proposed Development*

9.7.2.2 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. A Report titled '*Energy Related CO_2 Emissions in Ireland 2005 – 2018 (2019 Report)*' published by the Sustainable Energy Authority of Ireland (SEAI, 2020) states the average CO_2 emission factor for electricity generated in Ireland was 375 gCO_2/kWh in 2018. This average CO_2 emission factor is based on the national power generating portfolio. On the basis that the Proposed Development will consume 150MW of power this equates to 1,310 GWh annually based on the assumption of the national fuel mix. This translates to approximately 490,000 tonnes of CO_2eq per year. Without any commitments from the applicant, this will have an ***indirect***, ***long-term, negative*** and ***slight*** impact on climate. However, the applicant is committed to running its business in the most environmentally friendly way possible and has developed an approach which will (i) use existing infrastructure; and (ii) provide a mechanism which will aim to secure additional renewable energy generation. These commitments will enable new renewable energy generation calculated to offset the energy consumed by the proposed development from the electricity grid.

USE OF EXISTING INFRASTRUCTURE	The Proposed Development has been strategically located to adjoin the Huntstown Power Station. Collocating power generation and electricity consumption on the same site is beneficial as it: • Minimises the need for national grid network improvements, including new high voltage wires and cables, that would otherwise be the case to transfer additional electricity to a new location, the cost of which would be partly paid for by all electricity users; and • Provides the most energy efficient location for the electricity consumer that minimises electrical losses that occur when transferring electricity longer distances In addition, this 'co-location' approach will avoid the requirement to build new on-site gas power generation, thus avoiding the potential introduction of additional new fossil fuel generations and associated greenhouse gas emissions. The development is also adjacent to the Huntstown Bioenergy plant and feasibility studies will be undertaken to understand the suitability of any excess heat generated from the Data Halls being used in the Anaerobic Digestion process at the neighbouring site, hence making both developments more efficient.
RENEWABLE ENERGY GENERATION	Working alongside the proposed development the applicant will obligate the facility end user, to enter into arrangements which are capable of underpinning new renewable energy generation calculated to offset the energy consumed by the proposed development from the electricity grid. These arrangements will: Be in the form of Corporate Power Purchase Agreements between the applicant's group and the facility end user; Provide for the establishment of new renewable energy generation projects by the applicant's group, that will not be supported by government or consumer subsidies – these new renewable energy projects will be: • Located throughout Ireland; • Phased over the expected ramp up of the energy demand of the proposed development; and • In total, are calculated to exceed the expected annual volume of energy consumed on site by the proposed development; Through these obligations, it is the goal of the applicant that for every unit of energy consumed by the Data Halls, a unit of new renewable energy generation would be despatched to the wider electricity system to off-set it thus delivering the objective of operating the proposed development on a net zero carbon basis that would not impact Ireland's overall climate targets. Any associated additional renewable energy supply would also increase energy security through indigenous energy sources.

As the Proposed Development is over 20 MW, a greenhouse gas emission permit will be required for the facility which will be regulated under the EU-wide Emission Trading Scheme (ETS). Electricity providers form part of the ETS and thus greenhouse gas emissions from these electricity generators are not included when determining compliance with the targeted 30% reduction in the non-ETS sector i.e., electricity associated greenhouse gas emissions will not count towards the Effort Sharing Decision target. Thus, any necessary increase in electricity generation due to data storage facility demand will have no impact on Ireland's obligation to meet the EU Effort Sharing Decision. On an EU-wide basis, where the ETS market in 2018 was approximately 1,655 million tonnes CO_2eq, the impact of the emissions associated with the Proposed Development will be less than 0.03% of the total EU-wide ETS market which is imperceptible.

In addition, as outlined above, the applicant will enter into arrangements to provide new renewable energy generation which will have a greater power generation capacity than that consumed by the proposed development. Thus, the amount of renewable energy available to the non-ETS sector will not be diminished as a result of the proposed development.

9.7.2.3 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 $PM_{2.5}$ as detailed in Section 9.2.1.3.

Assuming that 150 MW is generated using the national fuel mix for Buildings A and B, the NO_X emissions associated with this electricity over the course of one year (i.e., 1,310 GWh based on 150MW for 8,760 hours per annum) will equate to 284 tonnes per annum which is 0.48% of the National Emission Ceiling limit for Ireland from 2020 onwards. Similarly, SO_2 emissions associated this electricity over the course of one year (1,310 GWh) will equate to 129 tonnes per annum which is 0.31% of the National Emission Ceiling limit for Ireland from 2020. Additionally, NMVOC emissions associated this electricity over the course of one year (1,310 GWh) will equate to 521 tonnes per annum which is 0.95% 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.

9.7.2.4 Human Health

Air dispersion modelling was undertaken to assess the impact of the development with reference to EU ambient air quality standards which are based on the protection of human health. As demonstrated by the dispersion modelling results, emissions from the site, assuming scheduled testing as well as emergency operation of the back-up generators, are compliant with all National and EU ambient air quality limit values and, therefore, will not result in a significant impact on human health. In relation to the spatial extent of air quality impacts from the site, ambient concentrations will decrease significantly with distance from the site boundary.

9.8 MONITORING/REINSTATMENT

Monitoring is not proposed for the construction phase of the proposed development as impacts are predicted to be imperceptible. There is a negligible risk of dust soiling and human health impacts as a result of the construction phase. Once the dust mitigation measures outlined in the mitigation section are implemented construction dust emissions will be imperceptible.

There is no monitoring recommended for the operational phase of the development.

9.9 REFERENCES

BRE (2003) *Controlling Particles, Vapours & Noise Pollution from Construction Sites*

DEHLG (2004) *National Programme for Ireland under Article 6 of Directive 2001/81/EC for the Progressive Reduction of National Emissions of Transboundary Pollutants by 2010*

DEHLG (2007) *Update and Revision of the National Programme for Ireland under Article 6 of Directive 2001/81/EC for the Progressive Reduction of National Emissions of Transboundary Pollutants by 2010*

Environmental Protection Agency (2006) *Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals)*

Environmental Protection Agency (2015) *Advice Notes for Preparing Environmental Impact Statements – Draft September 2015*

Environmental Protection Agency (2017) *Guidelines on the Information to be contained in Environmental Impact Statements* - Draft August 2017

Environmental Protection Agency (2019) GHG Emissions Projections Report - Ireland's Greenhouse Gas Emissions Projections 2018 – 2040

Environmental Protection Agency (2020a) *Air Dispersion Modelling from Industrial Installations Guidance Note (AG4)*

Environmental Protection Agency (2020b) Ireland's Air Pollutant Emissions 1990 – 2030

Environmental Protection Agency (2020c) *Air Quality Monitoring Report 2018* (& previous annual reports)

Environmental Protection Agency (2020d) Ireland's Provisional Greenhouse Gas emissions 1990 - 2019

Environmental Protection Agency (2021) EPA Website: http://www.epa.ie/whatwedo/monitoring/air/

European Parliament & European Council (2018) Regulation 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, 2018/842

Fingal County Council (2019) Climate Action Plan

German VDI (2002) *Technical Guidelines on Air Quality Control – TA Luft*

Government of Ireland (2015) Climate Action and Low Carbon Development Act

Government of Ireland (2019) Climate Action Plan 2019

Government of Ireland (2020a) Draft General Scheme of the Climate Action (Amendment) Bill 2019

Government of Ireland (2020b) Climate Action and Low Carbon Development (Amendment) Bill 2020

IAQM (2014) *Guidance on the Assessment of Dust from Demolition and Construction*

Met Éireann (2021) Met Eireann website: https://www.met.ie/

The Scottish Office (1996) *Planning Advice Note PAN50 Annex B: Controlling the Environmental Effects of Surface Mineral Workings Annex B: The Control of Dust at Surface Mineral Workings*

UK Environment Agency (2016) *Diesel Generator Short-term NO_2 Impact Assessment (Consultation Draft)*

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

USEPA (1999) *Comparison of Regulatory Design Concentrations: AERMOD vs. ISCST3 vs. CTDM PLUS*

USEPA (2017) *AERMOD Description of Model Formulation and Evaluation*

USEPA (2004) *User's Guide to the AERMOD Meteorological Preprocessor (AERMET)*

USEPA (2005) *Guidelines on Air Quality Models*, Appendix W to Part 51, 40 CFR Ch.1

USEPA (2011) *Additional Clarification Regarding Application of Appendix W Modelling Guidance for the 1-Hour National Ambient Air Quality Standard*

UK Office of Deputy Prime Minister (2002) *Controlling the Environmental Effects of Recycled and Secondary Aggregates Production Good Practice Guidance*

USEPA (1997) *Fugitive Dust Technical Information Document for the Best Available Control Measures*

USEPA (1986) *Compilation of Air Pollutant Emission Factors, AP-42*, Fifth Edition (periodically updated)

10.0 NOISE AND VIBRATION

10.1 INTRODUCTION

This chapter evaluates the impacts which the proposed development may have on Noise and Vibration during the construction and operational stages as defined in the Environmental Protection Agency (EPA) documents *Guidelines on the Information to be contained in Environmental Impact Statements* (EPA, 2017) and *Advice Notes for Preparing Environmental Impact Statements* (EPA, 2015).

The Proposed Development site is illustrated in Figure 10.1 below. The nearest noise sensitive locations are located to the east of the site in the form of a number of private residences along the R135 and the Dogs Trust buildings located to the north. The western boundary of the site is shared with the existing Huntstown power station.

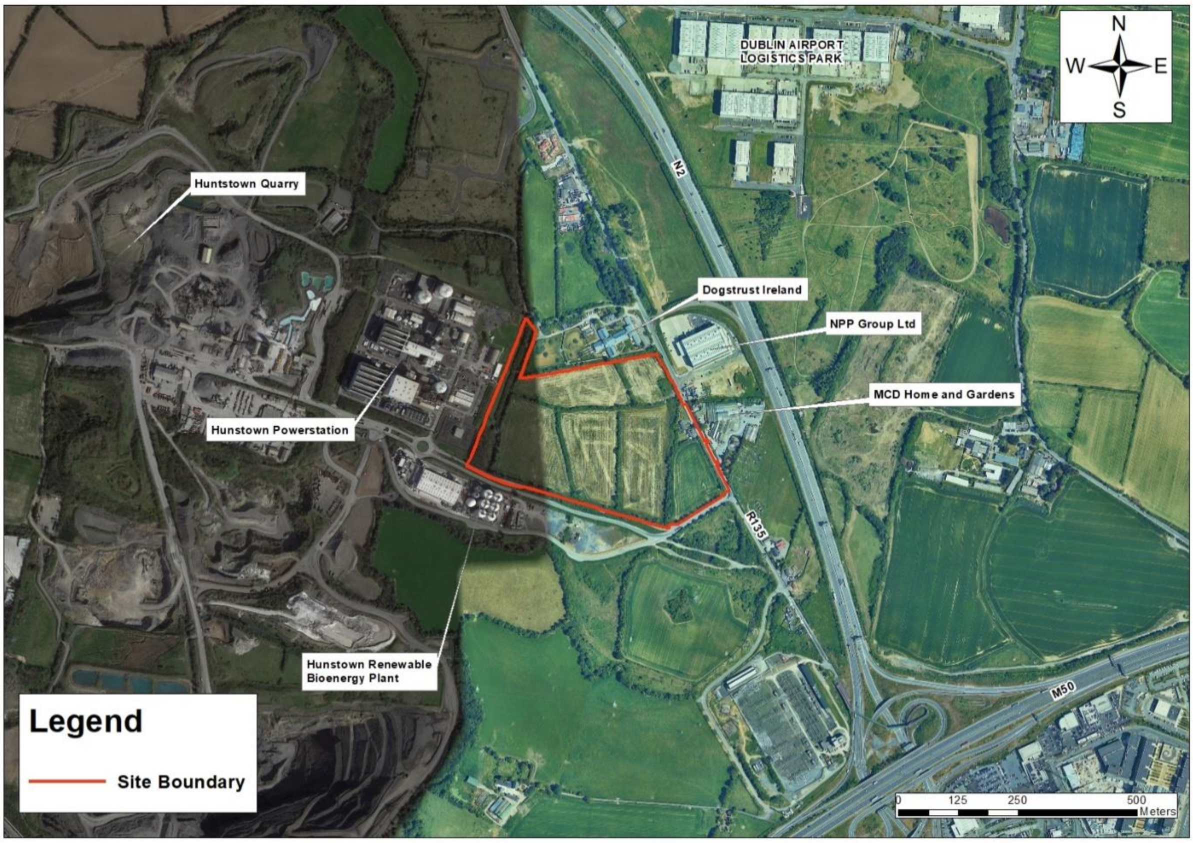

Figure 10.1 *Site Location and Context*

The proposed development will consist of the construction of two data hall buildings and associated elements will include internal air handling plant and 28 no. emergency stand-by generators with each data hall and 1 per administrative building.

A glossary of the acoustic terminology used in this chapter is presented in Appendix 10.1.

10.2 METHODOLOGY

10.2.1 Methodology Overview

The following methodology has been adopted for this assessment:

- review appropriate guidance, typical local authority planning conditions, etc. in order to identify appropriate noise criteria for the site operations;
- carry out noise monitoring at a number of locations (e.g., in the vicinity of nearest sensitive properties/boundaries) to identify existing levels of noise in the vicinity of the development;
- development of a detailed 3D noise model to consider the Proposed Development; and
- comment on predicted levels against the appropriate criteria and existing noise levels and outline required mitigation measures (if any).

Appendix 10.1 of this document presents a glossary of the acoustic terminology used throughout this document. In the first instance it is considered appropriate to review some basic fundamentals of acoustics.

10.2.2 Fundamentals of Acoustics

In order to provide a broader understanding of some of the technical discussion in this report, this section provides a brief overview of the fundamentals of acoustics and the basis for the preparation of this noise assessment.

A sound wave travelling through the air is a regular disturbance of the atmospheric pressure. These pressure fluctuations are detected by the human ear, producing the sensation of hearing. In order to take account of the vast range of pressure levels that can be detected by the ear, it is convenient to measure sound in terms of a logarithmic ratio of sound pressures. These values are expressed as Sound Pressure Levels (SPL) in decibels (dB).

The audible range of sounds expressed in terms of Sound Pressure Levels is 0dB (for the threshold of hearing) to 120dB (for the threshold of pain). In general, a subjective impression of doubling of loudness corresponds to a tenfold increase in sound energy which conveniently equates to a 10dB increase in SPL. It should be noted that a doubling in sound energy (such as may be caused by a doubling of traffic flows) increases the SPL by 3dB.

The frequency of sound is the rate at which a sound wave oscillates and is expressed in Hertz (Hz). The sensitivity of the human ear to different frequencies in the audible range is not uniform. For example, hearing sensitivity decreases markedly as frequency falls below 250Hz. In order to rank the SPL of various noise sources, the measured level has to be adjusted to give comparatively more weight to the frequencies that are readily detected by the human ear. Several weighting mechanisms have been proposed but the 'A-weighting' system has been found to provide one of the best correlations with perceived loudness. SPLs measured using 'A-weighting' are expressed in terms of dB(A). An indication of the level of some common sounds on the dB(A) scale is presented in Figure 10.2.

The 'A' subscript denotes that the sound levels have been A-weighted. The established prediction and measurement techniques for this parameter are well developed and widely applied. For a more detailed introduction to the basic principles of acoustics, reference should be made to an appropriate standard text.

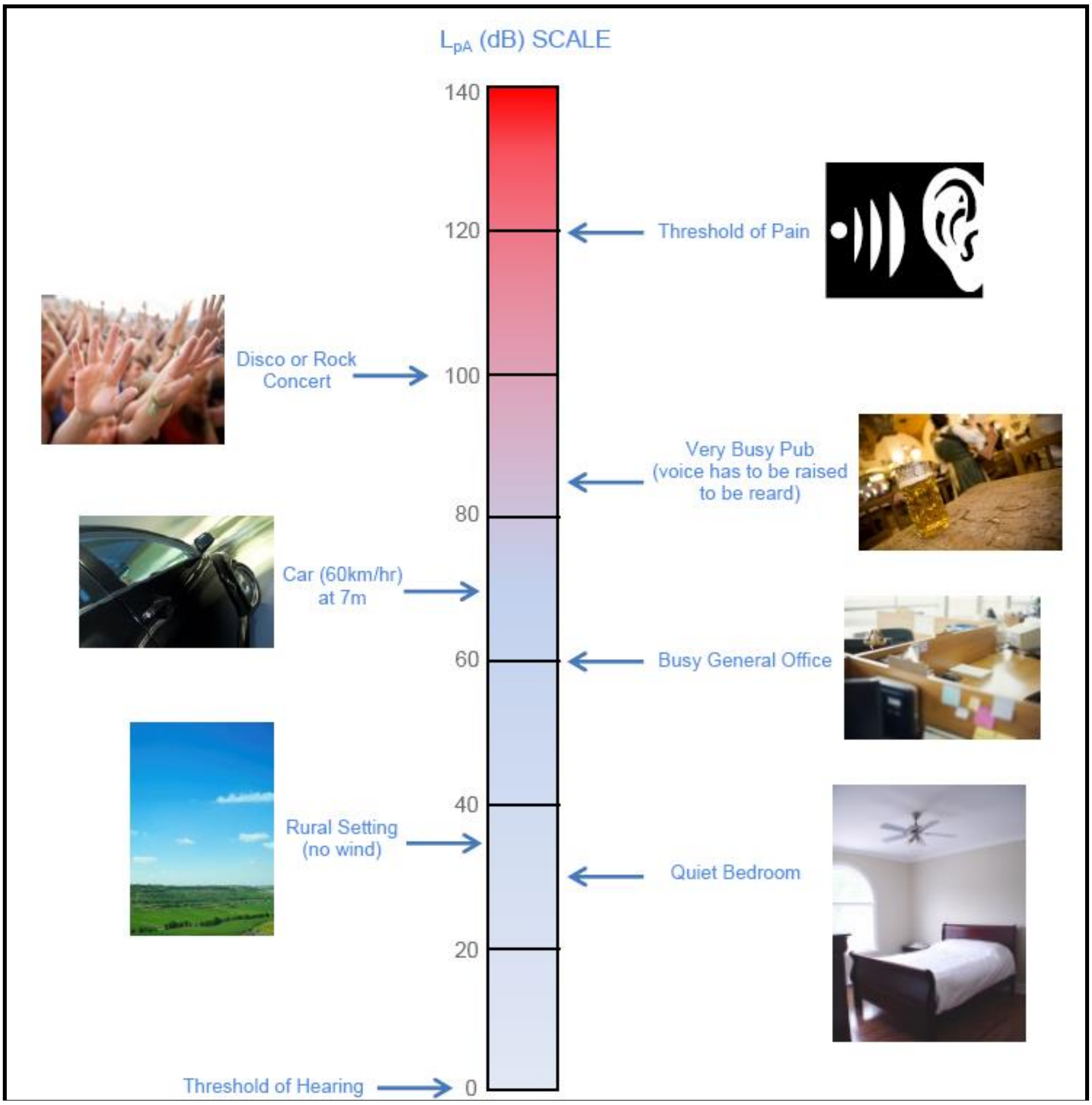

Figure 10.2 *dB(A) Scale & Indicative Noise Levels – (EPA: Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4 – 2016))*

10.2.3 Significance of Impacts

The significance of noise and vibration impacts has been assessed in accordance with the *Guidelines on Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2017) see Tables 1.2 in Chapter 1 (introduction). As these guidelines do not quantify the impacts in decibel terms further reference has been made to the '*Guidelines for Environmental Noise Impact Assessment' produced by the Institute of Environmental Management and Assessment* (IEMA) (2014).

10.2.4 Construction Phase Guidance

<u>Criteria for Rating Noise Impacts</u>

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 approach adopted in BS5228 – 1 call for the designation of a noise sensitive location into a specific category (A, B or C) based on existing ambient noise levels in the absence of construction noise. This then sets a threshold noise value that, if exceeded at this location, indicates a significant noise impact is associated with the construction activities.

BS5228 – 1 sets out guidance on permissible noise levels relative to the existing noise environment. Table 10.1 sets out the values which, when exceeded, signify a significant effect at the facades of residential receptors as recommended by BS 5228 – 1. These are construction noise levels only and not the cumulative noise level due to construction plus existing ambient noise.

Table 10.1 *Example Threshold of Significant Effect at Dwellings*

Assessment category and threshold value period (L_{Aeq})	Threshold value, in decibels (dB)		
	Category A Note A	Category B Note B	Category C Note C
Night-time (23:00 to 07:00hrs)	45	50	55
Evenings and weekends Note D	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75

Note A) *Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.*

Note B) *Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values.*

Note C) *Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than category A values.*

Note D) *19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays.*

It should be noted that this assessment method is only valid for residential properties.

For the appropriate periods (i.e., daytime, evening and night-time) the ambient noise level is determined and rounded to the nearest 5 dB. Baseline monitoring carried out as part of this assessment would indicate that the categories detailed in Table 10.2 are appropriate in terms of the nearest noise sensitive locations being considered in this instance.

Table 10.2 *Rounded Baseline Noise Levels and Associated Categories*

Period	Baseline Noise Category	Construction Noise Threshold Value $L_{Aeq,1hr}$ (dB)
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	A	65
Evening (19:00 to 23:00hrs)	C	65
Night time (23:00 to 07:00hrs)	C	55

See Section 10.5.1 for the assessment in relation to this site. If the construction noise level exceeds the appropriate category value, then a significant effect is deemed to occur.

This assessment process determines if a significant construction noise impact is likely. Notwithstanding the outcome of this assessment, the overall acceptable levels of construction noise are set out in the Transport Infrastructure Ireland (TII) publication *Guidelines for the Treatment of Noise and Vibration in National Road Schemes*[1], which should not be exceeded at noise sensitive locations during the construction phase of the development. Table 10.3 sets out these levels.

Table 10.3 *Maximum Permissible Noise Levels at the Facade of Dwellings during Construction*

Days and Times	Noise Levels (dB re. $2x10^{-5}$ Pa)	
	$L_{Aeq(1hr)}$	L_{Amax}
Monday to Friday 07:00 to 19:00hrs	70	80
Monday to Friday 19:00 to 22:00hrs	60*	65*
Saturdays 08:00 to 16:30hrs	65	75
Sundays & Bank Holidays 08:00 to 16:30hrs	60*	65*

Note * Construction activity at these times, other than that required for emergency works, will normally require the explicit permission of the relevant local authority.

In exceptional circumstances there may be a requirement that certain construction works are carried out during night-time periods. In these instances, the relevant evening (65 dB L_{Aeq1hr}) and night-time (55 dB $L_{Aeq,1hr}$) will apply.

Therefore, based on the above the following construction noise criteria are proposed for the site in relation to day to day works during the stated construction hours:

70 dB $L_{Aeq,1hr}$ at noise sensitive location

75 dB $L_{Aeq,1hr}$ at commercial property

1 *Guidelines for the Treatment of Noise and Vibration in National Road Schemes, Revision 1, 25 October 2004*, Transport Infrastructure Ireland

Criteria for Rating Vibration Impacts

Vibration standards come in two varieties: those dealing with human comfort and those dealing with cosmetic or structural damage to buildings. In both instances, it is appropriate to consider the magnitude of vibration in terms of Peak Particle Velocity (PPV).

It is acknowledged that humans are particularly sensitive to vibration stimuli and that any perception of vibration may lead to concern. In the case of road traffic, vibration is perceptible at around 0.5 mm/s and may become disturbing or annoying at higher magnitudes. However, higher levels of vibration are typically tolerated for single events or events of short duration. For example, rock breaking and piling, two of the primary sources of vibration during construction, are typically tolerated at vibration levels up to 12 mm/s and 2.5 mm/s respectively. This guidance is applicable to the daytime only; it is unreasonable to expect people to be tolerant of such activities during the night.

Guidance relevant to acceptable vibration within buildings is contained in the following documents:

- British Standard BS 7385: 1993: Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration, and;
- British Standard BS 5228-2: 2009+A1:2014: Code of practice for noise and vibration control on construction and open sites – Vibration.

BS 7385 states that there should typically be no cosmetic damage if transient vibration does not exceed 15 mm/s at low frequencies rising to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above. These guidelines relate to relatively modern buildings and should be reduced to 50% or less for more critical buildings.

BS 5228 recommends that, for soundly constructed residential property and similar structures that are generally in good repair, a threshold for minor or cosmetic (i.e., non-structural) damage should be taken as a peak component particle velocity (in frequency range of predominant pulse) of 15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above. Below these values minor damage is unlikely. Where continuous vibration is such as to give rise to dynamic magnification due to resonance, the guide values may need to be reduced by up to 50%. BS 5288-2 also comments that important buildings which are difficult to repair might require special consideration on a case-by-case basis.

The TII document *Guidelines for the Treatment of Noise and Vibration in National Road Schemes* also contains information on the permissible construction vibration levels as follows:

Table 10.4 *Allowable Vibration during Construction Phase*

Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of		
Less than 10 Hz	10 to 50 Hz	50 to 100 Hz (and above)
8 mm/s	12.5 mm/s	20 mm/s

10.2.5 Operational Phase – Noise Guidance

Reference has been made to the publication *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)*

2016, which is used to set operational noise limits from activities under the control of the EPA (manufacturing, industrial, waste management etc.). This document sets out a procedure for applying appropriate operational noise limits from this type of facility at the nearest noise sensitive receptors taking account of the background noise environment. Table 10.5 summarises the criteria applied, depending on the prevailing background noise environment.

Table 10.5 External Noise Limits from Licenced Sites[2]

Location	Day, dB $L_{Ar,T}$[3] (07:00 to 19:00hrs)	Evening, dB $L_{Ar,\ T}$ (19:00 to 23:00hrs)	Night, dB $L_{Aeq,\ T}$[4] (23:00 to 07:00hrs)
Areas of Low Background Noise	45	40	35
All Other Areas	55	50	45

In order to establish whether the noise sensitive receptors in the vicinity of the site would be considered a 'low background noise' area, the noise levels measured during the environmental noise survey need to satisfy the following criteria:

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

On review of the noise survey results (refer to Section 10.3), the background noise levels measured are above the assessment criteria outlined in Table 10.5. In this instance, the operational noise limits for areas of low background noise would therefore not be applicable for the proposed development.

The following noise criteria are appropriate for this development at the nearest noise sensitive locations:

Table 10.6 *Proposed Operational Noise Criteria*

Day (07:00 to 19:00hrs)	Evening (19:00 to 23:00hrs)	Night (23:00 to 07:00hrs)
55dB $L_{Ar\ (15mins)}$	50dB $L_{Ar\ (15mins)}$	45dB $L_{Aeq\ (15mins)}$

The noise limits stated above apply to all noise emissions from the Proposed Development. Plant will be selected such that there are not audible tonal emissions at noise sensitive locations off site.

2 Source: Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) 2016

3 The Rated Noise Level, $L_{A,r,T}$ is equal to the L_{Aeq} during a specified time interval (T), plus specified adjustments for tonal character and/or impulsiveness of the sound

4 During night time periods the L_{Aeq} parameter is applicable as no tonal or impulsive noise from the facility should be clearly audible or measurable at any NSL.

Assessment of Significance

The '*Guidelines for Environmental Noise Impact Assessment*' produced by the Institute of Environmental Management and Assessment (IEMA) (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 10.7 below and is based on an example scale within the IEMA guidelines. The corresponding significance of impact presented in the Draft '*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*' (EPA, 2017) is also presented.

Table 10.7 *Noise Impact Scale*

Noise Level Change dB(A)	Subjective Response	Impact Guidelines for Noise Impact Assessment Significance (Institute of Acoustics)	Impact Guidelines on the Information to be contained in EIA Report's (EPA)
0	No change	None	Imperceptible
0.1 – 2.9	Barely perceptible	Minor	Not Significant
3.0 – 4.9	Noticeable	Moderate	Slight, Moderate
5.0 – 9.9	Up to a doubling or halving of loudness	Substantial	Significant
10.0 or more	More than a doubling or halving of loudness	Major	Very Significant, Profound

The criteria above reflect the key benchmarks that relate to human perception of sound. A change of 3 dB(A) is generally considered to be the smallest change in environmental noise that is perceptible to the human ear. A 10 dB(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.

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 $L_{Aeq,15min}$. This criterion has been derived with consideration of BS 8233:2014 *Guidance on sound insulation and noise reduction for buildings* which recommends that for *Study and work requiring concentrations* in an

Executive office a design range of 35 to 40 dB L_{Aeq} is desirable internally. Arriving at an external noise level of 55 dB $L_{Aeq,15min}$ would ensure that this range of noise levels internally will be achieved.

Emergency Operation

In order to provide continuity of service a number of back-up emergency generators will be provided as part of the current proposal. These generators will only operate in the event of a loss of power supply i.e., temporary grid blackout, diesel powered back-up generators will be provided to maintain power supply. It is anticipated, based on the Operator's experience, that back-up generators will rarely be used. They will be tested periodically to maintain operational readiness (See Chapter 9 for testing regime). Routine testing will be conducted during regular weekday daytime periods only. 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'.

It is therefore considered that the proposed noise criterion of 55 dB $L_{Aeq,1hr}$ 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. In relation to commercial properties an emergency operation criterion of 65 dB $L_{Aeq,1hr}$ is proposed.

Recommended Criteria

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

Table 10.8 *Review of Adopted Noise Limits*

Activity	Noise Limit dB $L_{Aeq,15min}$ per Period			Source
	Day 07:00 – 19:00hrs	Evening 19:00 – 23:00hrs	Night 23:00 – 07:00hrs	
Day to Day Operations	55	50	45	EPA NG4
Generator Testing	55 Note A	--	--	EPA NG4
Emergency Operation (NSL)	55			EPA NG4
Emergency Operation (Commercial)	65			--

Note A Testing of the emergency generators shall take place between the hours of 08:00 and 17:00 Monday to Friday, testing shall not be permitted on Saturdays, Sundays or public holidays.

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

10.2.6 Operational Phase – Vibration Guidance

Criteria for Rating Vibration Impacts

It should be noted that the Proposed Development will not give rise to any significant levels of vibration off site and therefore the associated impact is not significant.

10.2.7 Forecasting Methods

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 operational building services noise, car park activity and vehicle movements on site have been conducted generally in accordance with ISO 9613 (1996): *Acoustics – Attenuation of sound during propagation 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.

10.3 RECEIVING ENVIRONMENT

A series of baseline noise surveys have been undertaken as part of the EIA Report preparation for the Proposed Development. Table 10.9 reviews the findings of these surveys. Full details of the noise monitoring campaign are presented in Appendix 10.2.

10.3.1 Comment on Noise Levels

Figure 10.3 illustrates the noise sensitive locations in the vicinity of the Proposed Development site at which noise monitoring was undertaken as part of the current assessment.

Figure 10.3 *Noise Monitoring Locations*

Location A Located along the northern boundary of the site and representative of the existing noise environment in the vicinity of the Dogs Trust.

Location B Located along the eastern boundary of the site in proximity of the nearest private residential locations to the site.

Location C Located at private residential locations situated off the R135 to the southeast of the site. The noise levels at this location would be comparable to those expected at the private residence located on the opposite side of the R135 to Location B.

Location D Located at the nearest private residence located to the south of the site.

Road traffic noise, both distant and local was noted as the most significant source of noise and typically dictated ambient noise levels (i.e. $L_{Aeq,\,T}$) at the nearest noise sensitive locations to the site during daytime and night-time periods.

Background noise levels (e.g. $L_{A90,\,T}$) at the various locations were typically dictated by local and distant road traffic noise. These levels fell as would be expected into the early hours of the morning when the volume of traffic on the local and wider road network reduced.

Table 10.9 reviews the typical ambient and background noise levels at the sample locations discussed above.

Table 10.9 *Review of Typical Noise Levels*

Location	Period	Average Measured Noise Level over Survey Period	
		$L_{Aeq, T}$	$L_{A90, T}$
A	Day (07:00 – 19:00hrs)	61	52
	Evening (19:00 – 23:00hrs)	58	49
	Night (23:00 to 07:00hrs)	55	48
B	Day (07:00 – 19:00hrs)	61	54
	Evening (19:00 – 23:00hrs)	57	50
	Night (23:00 to 07:00hrs)	54	48
C	Day (07:00 – 19:00hrs)	62	56
	Evening (19:00 – 23:00hrs)	59	53
	Night (23:00 to 07:00hrs)	55	48
D	Day (07:00 – 19:00hrs)	59	55
	Evening (19:00 – 23:00hrs)	58	54
	Night (23:00 to 07:00hrs)	54	49

Traffic noise from the R135, the M2 and other roads in the study area dictated noise levels at all locations during the survey periods in question.

These typical noise levels have been considered when discussing appropriate noise criteria in relation to the development as outlined in Table 10.8. It is considered that these assumptions ensured and will ensure that appropriate noise criteria are applied to Proposed Development.

10.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The Proposed Development site is c. 13.3 hectares of predominantly greenfield land, and includes two residential properties fronting the R135 (North Road), located to the north west of the M50 orbital ring in the townland of Johnstown and Coldwinters, North Road, Finglas, Dublin 11. The proposal comprises the demolition of two residential properties fronting the R135 (North Road), and the development of 2 no. data hall buildings arranged over three storeys and associated structures and infrastructure.

Vehicular and pedestrian entrance with associated security installations, roadways and vehicle parking. The development will be accessed from the R135 (North Road) from the east. An emergency/secondary entrance will be provided via the Roadstone Huntstown Quarry and Huntstown Power Station access road to the south-west. Temporary access for construction works and to enable a phased delivery of the development is proposed through an existing site entrance off the North Road.

Associated structures and infrastructure including water treatment facility, sprinkler tanks, external plant equipment, emergency generators and diesel fuel storage, vehicular access roads, car and bicycle parking, attenuation ponds and sustainable urban drainage measures, underground foul and storm water drainage network, associated landscaping and boundary treatment works.

The future 220kV substation compound and subsurface grid connection will form part of a separate Strategic Infrastructure Development (SID) application to An Bord Pleanála (ABP).

When considering a development of this nature, the potential noise and vibration impact on the surroundings must be considered for each of two distinct stages:

- construction phase, and;
- operational phase.

As stated, the construction phase will involve excavation, general site preparation over the development site and the erection of the new building over a phased construction period. Comment will also be presented in the following sections in relation to construction traffic on local roads in terms of noise and vibration.

The primary sources of 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.

A detailed description of the proposed development is presented in Chapter 2 (Description of Development) and the included planning documentation. The proposed characterises specific to this chapter are summarised below.

10.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

10.5.1 Construction Phase

It is predicted that the construction programme will create typical construction activity related noise on site. During the construction phase of the Proposed Development, a variety of items of plant will be in use, such as excavators, lifting equipment, dumper trucks, compressors and generators.

The proposed general construction works hours are 08:00 to 19:00hrs, Monday to Friday and 08:00 to 14:00hrs on Saturdays. Occasional weekday evening works may also be required; however evening activities will be significantly reduced in order to manage any associated noise impacts in an appropriate manner and a more stringent construction noise criteria (as per Table 10.3) will be applicable during any evening works that may be required. As a result, noise emissions from evening activities are expected to be significantly lower than for other general daytime activities.

Due to the nature of daytime activities undertaken on a construction site of this nature, there is potential for generation of significant levels of noise. The flow of vehicular traffic to and from a construction site is also a potential source of relatively high noise levels. The potential for vibration at neighbouring sensitive locations during construction is typically limited to excavation works and lorry movements on uneven road surfaces. Due to the proximity of sensitive locations to site works however, there is little likelihood of structural or even cosmetic damage to existing neighbouring dwellings as a result of vibration.

Due to the fact that the construction programme has been established in outline form only, it is difficult to calculate the actual magnitude of noise emissions to the local environment. However, it is possible to predict typical noise levels using guidance set out in BS 5228-1. Table 10.10 outlines typical plant items and associated noise levels that are anticipated for various phases of the construction programme.

For the purposes of the assessment, we have assumed that standard good practice measures for the control of noise from construction sites will be implemented. These issues are commented upon in further detail in the mitigation section of this report.

Table 10.10 *Typical Noise Levels associated with Construction Plant Items (BS5228-1)*

Phase	Item of Plant (BS 5228-1 Ref.)	Construction Noise Level at 10m Distance (dB $L_{Aeq,1hr}$)
1 – Site Preparation	Rock Breaker (C9.12)	85
	Wheeled Loader Lorry (C2 28)	74
	Tracked Semi-Mobile Crusher (C9.14)	90
	Track Excavator (C2 22)	72
	Dozer (C2.13)	78
	Dump Truck (C4.2)	78
2 – Foundations	Tracked Excavator (C3.24)	74
	Concrete Pump (C3.25)	78
	Compressor (C3 19)	75
	Poker Vibrator (C4 33)	78
3 – Steel Erection	Tower Crane (C4.48)	76
	Sarens SCG 120 Crane	86
	Articulated lorry (C11.10)	77
4 – General Construction	Hand tools	81
	Pneumatic Circular Saw (D7.79)	75
	Internal fit – out	70
5 - Landscaping	Dozer (C2.13)	78
	Dump Truck (C4.2)	78
	Surfacing (D8.25)	68

A number of representative noise sensitive locations have been considered in relation to the Proposed Development as illustrated in Figure 10.4.

Table 10.11 *Review of Assessment Locations*

Ref.	Description
NSL01	Private residence / office located to the southeast of the development site along the R135
NSL02	Private residence / office located to the southeast of the development site along the R135
NSL03	Private residence / office located to the southeast of the development site along the R135
NSL04	Assumed to be a private residence located on the far side of the R135 beyond the eastern boundary of the site.
NSL05	Nearest façade of the Dogs Trust centre located on the far side of the northern boundary of the development site.
NSL06	Private staff residences located on the Dog's Trust site.
NSL07	Assumed to be a private residence located on the far side of the R135 beyond the eastern boundary of the site.
NSL08	Nearest residential location to the south of the site at some 640m distance.

Table 10.12 presents the predicted construction noise levels in the vicinity of the site. Note for the purposes of this assessment it has been assumed that construction works are concentrated on the southern end of the site (i.e., where the proposed data hall buildings will be located).

Table 10.12 *Review of Potential Daytime Construction Noise Impact*

Location	Construction Phase (dB $L_{Aeq,1hr}$)				
	Site Preparation	Foundations	Steel Erection	General Construction	Landscaping
NSL01	50	42	42	47	41
NSL02	50	41	41	46	40
NSL03	49	40	40	45	39
NSL04	50	40	42	47	39
NSL05	68	60	59	63	58
NSL06	53	44	46	50	43
NSL07	57	48	48	53	46
NSL08	46	37	38	42	37

There is no item of plant that would be expected to give rise to noise levels that would be considered out of the ordinary or in exceedance of the levels outlined in Table 10.3 or give rise to a significant impact through the process outlined in Table 10.2 with the exception of Location NSL05 in relation to site preparation works. The impact on the noise environment due to construction activities will be transient and short-term in nature and mitigation measures will be implemented to minimise the impact of construction activities on the noise environment.

Figures 10.5 to 10.9 present indicative contours for the various construction phases identified for the construction of the Proposed Development.

The indicative predicted noise levels in the vicinity of the Dogs Trust are in the range of 58 to 68 dB $L_{Aeq,1hr}$ in relation to potential construction noise activities. These predicted noise levels should be considered in terms of existing ambient noise levels in the vicinity of the Dogs Trust. Average ambient noise levels measured at Location A along the boundary of the Dogs Trust site were the order of 61 dB $L_{Aeq,16hrs}$. The hourly $L_{Aeq,1hr}$ values during daytime periods at this location ranged between 54 to 70 dB. The predicted levels of construction noise are directly comparable to existing ambient noise levels captured in the vicinity of the facility.

As part of mitigation, in order to manage noise and vibration impacts the appointed contractor will liaise with nearby sensitive locations in order to advise periods when noise and vibration levels may be elevated due to works and will implement the measures outlined in the draft construction noise and vibration management plan outlined in Appendix 10.4.

It is anticipated that the construction of the facility will be completed during normal construction working hours i.e., 08:00 to 19:00hrs Monday to Friday and 08:00 to 14:00hrs on Saturdays. However, it is possible that the contractor may wish to carry out certain operations outside these hours i.e., evening hours during long summer days etc. Such occurrences will be kept to a minimum and take place over a short timeframe and as such are unlikely to cause excessive disturbance. A more stringent construction noise criterion (as per Table 10.6) will be applicable during any evening works that may be required.

Figure 10.4 *Sample Sensitive Locations Considered for Assessment*

Figure 10.5 *Construction Noise Contour – Site Preparation*

Figure 10.6 *Construction Noise Contour – Foundations*

Figure 10.7 *Construction Noise Contour – Steel Erection*

Figure 10.8 Construction Noise Contour – General Construction

Figure 10.9 *Construction Noise Contour – Landscaping*

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 with various phases of the development, as outlined in the relevant sections of Chapter 13 will not result in a significant noise impact.

Review of Construction Impacts

In terms of noise associated with these construction activities the associated effect is stated to be ***negative, moderate,*** and ***short term***

In terms of vibration due to the distance of activities from the site to the nearest sensitive locations and controlling vibration levels to those detailed in Table 10.4 the associated effect is stated to be ***neutral, not significant,*** and ***short term.***

10.5.2 Operational Phase

The primary sources of 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. See Appendix 10.3 for details of the noise modelling undertaken for this assessment and associated assumptions.

Building Services Noise / Emergency Site Operation

Three scenarios have been developed to consider the noise impact of the proposed operations. These are as follows:

- Scenario A – Proposed Data Storage Facility – Day to Day
- Scenario B – Proposed Data Storage Facility – Emergency
- Scenario C – Proposed Data Storage Facility – Generator Testing

Scenario A would be considered to be the most representative of the day-to-day operation. Scenario B is 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 considers the impact associated with the occasional testing of proposed back-up emergency generators on the site. Typically, only two generator units will be tested at any one time. The assessment presented here assumes the closest generators to existing noise sensitive locations are running when presenting expected noise levels associated with the generator testing.

Figure 10.4 highlights the nearest noise sensitive locations at which predictions have been carried out. Various noise contours are also presented for scenarios A, B and C in order to demonstrate the noise impact of the Proposed Development over a wider area.

The results of the iterations of the noise model are presented in Table 10.13. Note all plant will be selected such that no tonal noise emissions are evident at noise sensitive locations.

Table 10.13 *Predicted Plant Noise Levels for Various Scenarios*

Location	Predicted dB $L_{Aeq, T}$		
	Scenario A	Scenario B	Scenario C
NSL01	28	44	35
NSL02	28	44	33
NSL03	27	43	33
NSL04	31	49	38
NSL05	37	55	40
NSL06	33	48	36
NSL07	38	55	48
NSL08	35	41	35

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 10.16 have been compared to the relevant daytime noise criteria as adopted for this assessment, presented in Table 10.11. It should be noted that the back-up generator testing shall take place only between 08.00 and 17.00hrs. Residents of the adjacent dwelling houses shall be provided with adequate prior warning of the proposed testing times exceeding 1 hour in duration.

Table 10.14 *Comparison of Predicted Noise Levels vs. Adopted Noise Criteria*

Location	Period	Scenario A			Scenario B			Scenario C		
		Predicted dB $L_{Aeq,T}$	Criterion dB $L_{Aeq,T}$	Complies?	Predicted dB $L_{Aeq,T}$	Criterion dB $L_{Aeq,T}$	Complies?	Predicted dB $L_{Aeq,T}$	Criterion dB $L_{Aeq,T}$	Complies?
NSL01	Day	28	55	✓	44	55	✓	35	55	✓
	Evening		50	✓					--	
	Night		45	✓						
NSL02	Day	28	55	✓	44	55	✓	33	55	✓
	Evening		50	✓					--	
	Night		45	✓						
NSL03	Day	27	55	✓	43	55	✓	33	55	✓
	Evening		50	✓					--	
	Night		45	✓						
NSL04	Day	31	55	✓	49	55	✓	38	55	✓
	Evening		50	✓					--	
	Night		45	✓						
NSL05	Day	37	55	✓	55	55	✓	40	55	✓
	Evening		50	✓					--	
	Night		45	✓						
NSL06	Day	33	55	✓	48	55	✓	36	55	✓
	Evening		50	✓					--	
	Night		45	✓						
NSL07	Day	38	55	✓	55	55	✓	48	55	✓
	Evening		50	✓					--	
	Night		45	✓						
NSL08	Day	35	55	✓	41	55	✓	35	55	✓
	Evening		50	✓					--	
	Night		45	✓						

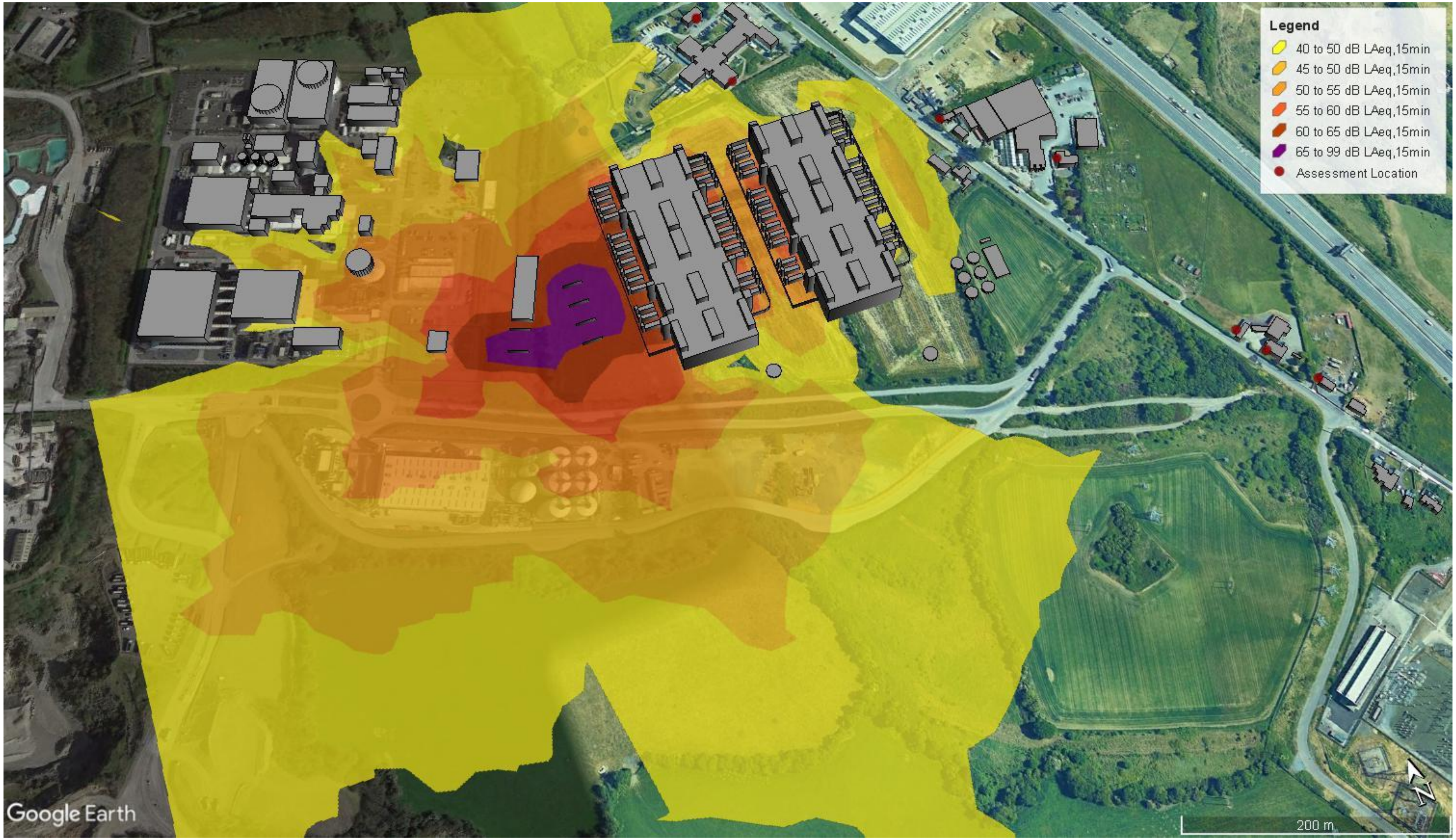

Figure 10.10 *Scenario A – Proposed Data Storage Facility (current planning application) – Day to Day Noise Contour (Extent of 40 dB(A))*

Comment *All locations are within the relevant adopted daytime and evening limits by a significant margin. All locations comply with the adopted criteria in relation to day to day operations.*

Figure 10.11 *Scenario B – Proposed Data Storage Facility (current planning application) – Emergency Noise Contour (Extent of 50 dB(A))*

Comment *All locations are within the relevant adopted emergency operation limit in the rare event that a power loss to the site occurs.*

Figure 10.12 *Scenario C – Proposed Data Storage Facility (current planning application) – Generator Testing Noise Contour (Extent of 50 dB(A))*

Comment *All locations are within the relevant adopted daytime limits by a significant margin during periods when two generators are undergoing routine testing..*

<u>Scenario A</u> All locations are within the relevant adopted limits by a clear margin. All locations comply with the adopted criteria in relation to day to day operations. Figure 10.10 presents a noise contour for Scenario A.

<u>Scenario B</u> All locations are within the relevant adopted emergency operation limit in the rare event that a power loss to the site occurs. Figure 10.11 presents a noise contour for Scenario B.

<u>Scenario C</u> All locations are within the relevant adopted daytime limits by a during periods when two generators are undergoing routine testing. Figure 10.12 presents a noise contour for Scenario C.

<u>Summary</u>

Scenario A is representative of the typical day to day operations envisioned for the site. Review of the predicted noise levels and associated noise contours confirms that the site-specific levels comply with the noise criterion adopted for this assessment.

Scenario B is representative of emergency situations such as a power outage on the national grid. Review of the predicted noise levels and associated noise contours confirm that the site-specific levels comply with the noise criterion that has been adopted for these situations following review of relevant guidance.

<u>Review of Increases in Noise Level</u>

Table 10.15 presents the predicted changes in noise level associated with the development at the nearest noise sensitive locations to the site.

Review of the predicted increases in noise level at the nearest noise sensitive locations conclude that the associated impact is '*not significant'* at all locations for Scenario A – Typical Operation for day, evening and night-time periods. An '*imperceptible'* impact is predicted during all periods and all locations assessed. In essence the existing soundscapes that are encountered at the nearest noise sensitive locations are predicted to remain unchanged in terms of ambient noise levels with the development of the data storage facility introducing a low level of plant noise.

Table 10.15 *Review of Predicted Changes in Existing Noise Levels*

Loc.	Scenario A – Typical Operation Daytime				
	Predicted dB $L_{Aeq,T}$	Background Level dB $L_{A90,T}$	Cumulative Noise Level (dB(A))	Change in Noise Level (dB)	EPA Glossary of Impacts
NSL01	28	56	56	0	Imperceptible
NSL02	28	56	56	0	Imperceptible
NSL03	27	56	56	0	Imperceptible
NSL04	31	54	54	0	Imperceptible
NSL05	37	52	52	0	Imperceptible
NSL06	33	52	52	0	Imperceptible
NSL07	38	54	54	0	Imperceptible
NSL08	35	55	55	0	Imperceptible
Loc.	Scenario A – Typical Operation Evening				
	Predicted dB $L_{Aeq,T}$	Background Level dB $L_{A90,T}$	Cumulative Noise Level (dB(A))	Change in Noise Level (dB)	EPA Glossary of Impacts
NSL01	28	53	53	0	Imperceptible
NSL02	28	53	53	0	Imperceptible
NSL03	27	53	53	0	Imperceptible
NSL04	31	50	50	0	Imperceptible
NSL05	37	49	49	0	Imperceptible
NSL06	33	49	49	0	Imperceptible
NSL07	38	50	50	0	Imperceptible
NSL08	35	54	54	0	Imperceptible
Loc.	Scenario A – Typical Operation Night				
	Predicted dB $L_{Aeq,T}$	Background Level dB $L_{A90,T}$	Cumulative Noise Level (dB(A))	Change in Noise Level (dB)	EPA Glossary of Impacts
NSL01	28	48	48	0	Imperceptible
NSL02	28	48	48	0	Imperceptible
NSL03	27	48	48	0	Imperceptible
NSL04	31	48	48	0	Imperceptible
NSL05	37	48	48	0	Imperceptible
NSL06	33	48	48	0	Imperceptible
NSL07	38	48	48	0	Imperceptible
NSL08	35	49	49	0	Imperceptible

In terms of noise associated with day to day activities the associated effect is stated to be as follows, ***negative, not significant*** and ***long term.***

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. The resultant noise impact is ***neutra**l, **imperceptible*** and ***long-term***.

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 sensitive locations. In terms of these the operational phase of the development the associated effect is stated to be ***neutral, imperceptible*** and ***long term***.

10.6 REMEDIAL AND MITIGATION 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.

10.6.1 Construction Phase

With regard to construction activities, reference has been 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. As an example, the following measures will be implemented on site:

- limiting the hours during which site activities likely to create high levels of noise or vibration are permitted;
- 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 critical sensitive locations; and
- all site access roads will be kept even so as to mitigate the potential for vibration from lorries.

Furthermore, a variety of practicable noise control measures will be employed, such as:

- 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 Table 10.7. 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%.

Note Appendix 10.4 presents an indicative construction noise and vibration management plan that will be implemented in terms of the day-to-day operation of the site. This will focus on opening up and maintaining lines of communication with the local community to address issues in relation to noise and/or vibration and to advise the community of periods where specific activities take place (e.g. rock breaking) that have an increased potential in giving rise to issues off site (Note: no rock breaking is anticipated as part of the Proposed Development).

10.6.2 Operational Phase

Building Services Noise / Emergency Site Operation

Noise from external plant will be minimised by the following measures:

- Purchasing low noise generating equipment, and;
- Incorporating appropriately specified in line attenuators for stacks and exhausts 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.

Additional Vehicular Traffic on Public Roads

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

10.7 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

This section summarises the likely noise and vibration impact associated with the Proposed Development, taking into account the mitigation measures.

10.7.1 Construction Phase

During the construction phase of the Proposed Development there will be some impact on nearby noise sensitive properties due to noise emissions from site traffic and other activities. The application of noise limits and hours of operation (i.e. as per Table 10.5, 10.6 and Section 10.2.4), along with implementation of appropriate noise and vibration control measures (as summarised in Section 10.6.1), will ensure that noise and vibration impact is kept to a minimum. Also, it is reiterated that any construction noise impacts will be ***slight, negative*** and ***short-term*** in nature. Also, it is considered that as the Proposed Development progresses from initial ground works that construction noise impacts will reduce from slight to ***not significant.***

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* there is not a significant impact at residential locations, subject to the implementation of the mitigation measures outlined in Section 10.6.1.

10.7.2 Operational Phase

The robust analysis of potential operational phase plant has shown that in accordance with the scale in the EPA Draft EIA Report Guidelines 2017 there will be a ***not significant, negative, long term*** impact at the closest residences identified on Figure 10.4. The predicted change in background noise level due to current application is less than 1dB during night-time periods. 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).

In terms of the nearest commercial properties***, negative, not significant and long-term*** impacts are predicted as the character of the noise environment in the vicinity of this location will not be altered.

Building Services Noise / Emergency Site Operation

Proprietary noise and vibration control measures will be employed in order to ensure that noise emissions from building services plant do not exceed the adopted criterion at the façade of any nearby noise sensitive locations. In addition, noise emissions should be broadband in nature and should not contain any tonal or impulsive elements. The resultant noise impact is ***negative***, ***not significant*** and ***long-term***.

Additional Vehicular Traffic on Public Roads

Any change in noise levels associated with vehicles at road junctions in the vicinity of the Proposed Development is expected to be ***imperceptible*. ** The resultant noise impact is ***neutral, imperceptible*** and ***long-term.***

The operational noise assessment of vehicle movements associated with the site has shown that in accordance with the scale in the EPA Draft EIA Report Guidelines 2017 there will be an ***imperceptible, neutral, long-term*** impact off site noise sensitive locations considering existing traffic volumes on the local road network.

10.8 MONITORING/REINSTATEMENT

Noise and vibration monitoring will be considered at critical location during construction periods where elevated noise and/or vibration levels may be expected. This will be done as part of the construction noise and vibration management plan that will be developed for the project, a draft of which is presented in Appendix 10.4

It is considered appropriate that a commissioning noise survey be undertaken once the site becomes operational in order to ensure that the relevant noise criteria put forward in this document are complied with.

Reinstatement is not applicable in respect of noise and vibration.

10.9 REFERENCES

- EPA Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIA Reports) (2017) and draft revised Guidelines on information to be contained in Environmental Impact Statements; and Advice Notes for preparing EIS (2015).
- '*Guidelines for Environmental Noise Impact Assessment*' produced by the Institute of Environmental Management and Assessment (IEMA) (2014).
- British Standard BS 5228 – 1: 2009+A1:2014: Code of practice for noise and vibration control on construction and open sites – Noise.
- Transport Infrastructure Ireland (TII) publication Guidelines for the Treatment of Noise and Vibration in National Road Schemes.
- British Standard BS 7385: 1993: Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration.
- British Standard BS 5228-2: 2009+A1:2014: Code of practice for noise and vibration control on construction and open sites – Vibration.
- BS 8233:2014: Guidance on sound insulation and noise reduction for buildings.
- Environmental Protection Agencies Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) (January 2016).
- ISO 1996-2:2017 Acoustics - Description, measurement and assessment of environmental noise – Part 2: Determination of environmental noise levels.
- ISO 9613 (1996): Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation.
- *Calculation of Road Traffic Noise (CRTN)* issued by the Department of Transport in 1988.
- BS EN 1793-1:1998: Road traffic noise reducing devices – Test method for determining the acoustic performance – Part 1: Intrinsic characteristics of sound absorption
- BS EN 1793-2:1998: Road traffic noise reducing devices – Test method for determining the acoustic performance – Part 2: Intrinsic characteristics of airborne sound insulation.
- BS EN 1794-1:2003: Road traffic noise reducing devices. Non-acoustic performance. Mechanical performance and stability requirements
- BS EN 1794-2:2003: Road traffic noise reducing devices. Non-acoustic performance. General safety and environmental requirements.

11.0 LANDSCAPE AND VISUAL

11.1 INTRODUCTION

The purpose of this assessment is to analyse the existing landscape and to assess the likely potential visual impacts arising from the proposed development on the existing landscape and any mitigation measures proposed. The criteria as set out in the current EPA Guidelines on Information to be contained in Environmental Impact Assessment Reports (2017, Draft) are used in the assessment of the likely impacts.

The significance of impacts on the perceived landscape will depend partly on the number of people affected, but also on judgments about how much the changes will matter and in relation to other senses i.e. sound, feeling, etc., experienced by those concerned.

11.2 METHODOLOGY

The assessment was carried out by analysis of the proposals through photomontages, plans, aerial photographs, tree survey by 'Rik Pannett, Arboriculture Consultant.', historic maps and by reference to the 'Fingal Development Plan 2017-2023', including specific reference to Section 9.4 'Landscape Character Assessment'.

This chapter has been prepared having regard to the following guidelines:

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018);
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017)
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports – Draft (EPA, 2017); and
- Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (Landscape Inst. + IEMA 2013).

11.3 RECEIVING ENVIRONMENT

11.3.1 Site Context and Description

The subject site is located in the townland of Huntstown, north of Finglas West and west of Dublin Airport in North-West Dublin. Dogs Trust Ireland HQ is located to the immediate North of the subject lands along with some low-density commercial development, farmland and the N2 Motorway, which also extends to the east of the lands to meet the M50 Motorway. Directly to the East of the subject lands are the R135 Road and some larger scale industrial units. The south of the site is bound by south by a vehicular entrance leading to the Huntstown Quarry and to the south west is the Huntstown Bioenergy Plant. Huntstown Power Station and Roadstone Quarries are located to the East of the subject lands, while an associated access road is located to the immediate South.

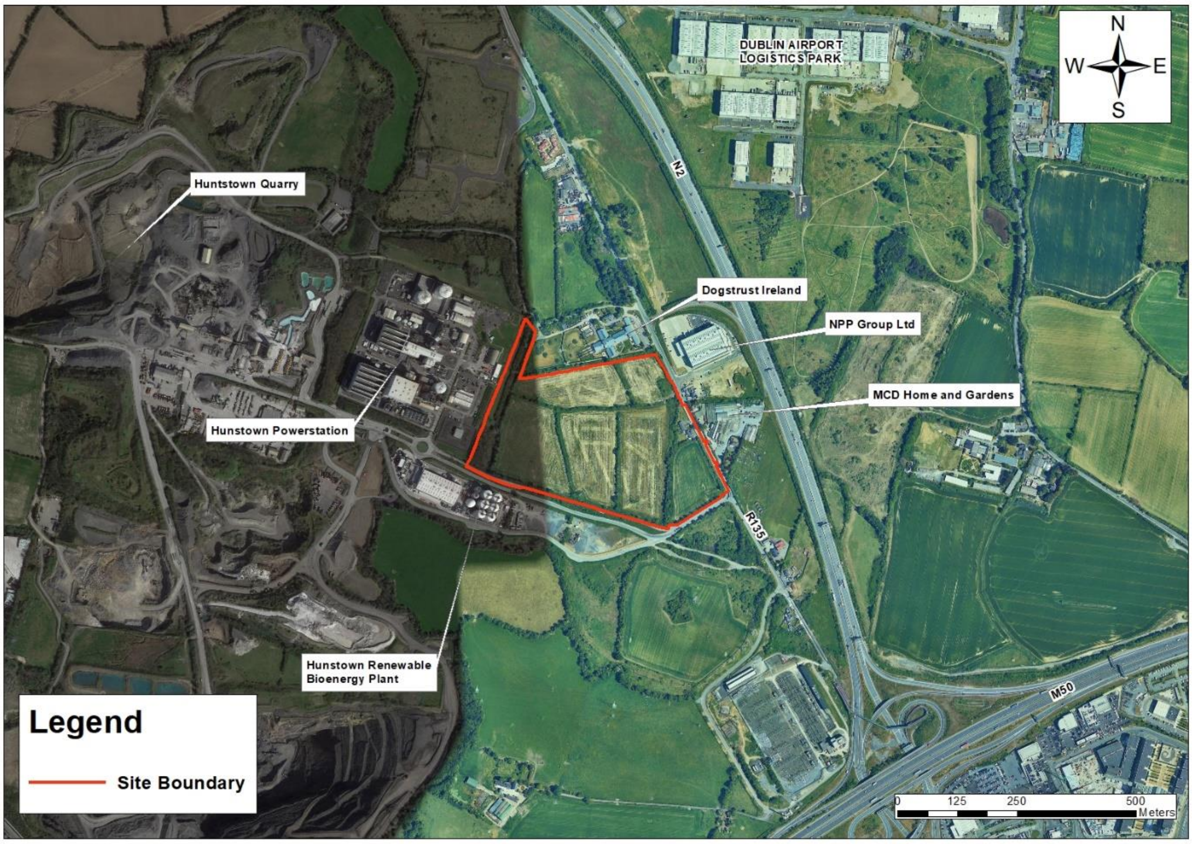

Figure 11.1 *Wider Landscape Context*

The subject lands would be considered to have the character of an agricultural field with traditional hedgerow boundaries both around and within the site. The subject lands are bounded by existing hedgerow vegetation along all site boundaries except for a portion of the boundary with the R135. Two former residences are in this location and the perimeter boundary is formed by low garden walls.

General Landscape Setting

In the wider landscape the site is located in a generally flat area between four landscape typologies. The land to the North would be that associated with the flat agricultural land of North County Dublin, displaying traditional field patterns and hedgerow boundaries. Beyond the M50 Motorway to the South, development is mainly residential, typified by areas such as Finglas West, Ashtown and Glasnevin. Lands to the East are dominated by Dublin Airport and its ancillary infrastructure and buildings. To the West of the site, development is predominantly industrial and commercial, characterised by very large built developments. Huntstown Power Station, Roadstone Quarries and Rosemount and North West Business Parks are examples of this.

Trees and Vegetation

A tree survey was undertaken as part of this application. This has informed the design and layout of the proposed development and the location of the proposed buildings and site services. According to the Tree Survey and Report, by the Rik Pannett, Arboriculture Consultant (included in Appendix 11.2) the tree cover on the site is primarily contained within the hedgerows on the perimeter of the site and the field boundaries with the site. The trees and hedgerows on site are primarily former agricultural stock proof field boundaries. The trees are mostly Ash but with pockets of

Wych Elm and Sycamore. Most of the trees in these hedgerows are considered small in stature and are therefore not visually prominent. On the western side of the site an unmanaged shelter belt is recorded to contain a mix of Beech, Oak, Ash and pine but it is considered in the report to offer little amenity value.

The report also finds the hedgerows are generally in good condition and offer moderate to high wildlife value. Most appear to have a normal native species make up with Hawthorn and Blackthorn dominant.

There are no category A trees recorded on the site and 5 Category B tree groups comprising of Silver Birch. The remaining 36 trees and 4 tree groups recorded in the survey are considered to be category C, low quality. There are also 17 Category C Hedgerows on the site.

11.3.2 Characteristics of the Site and Environs

The character of the site and its environs has largely been determined by the following:

- the flat topography of the subject site and its surrounding environs
- landscape history of agricultural use with grassland and traditional hedgerow field boundaries.
- a number of large trees within hedgerow boundaries.
- a small number of individual residences located in the local area.
- the number of large-scale industrial and commercial built developments in the local area.
- the extent of large-scale infrastructure in the local area

The proposed development site has the character of an agricultural field with traditional hedgerow field boundaries.

The surrounding environment can be split into two landscape types. The landscape to the North with its historic field patterns would be considered an ‘agricultural landscape’. The landscape to the South, East and West typified by large scale industrial and commercial developments and associated transport centres and infrastructure would be considered an ‘industrial landscape’.

From a study and analysis of various historical map series; OSI 6-inch maps (1837-42) and OSI 25-inch maps (1888-1913), conclusions could be drawn on the landscape history of the local lands. The regional R135 Road in existence today is evident on historic maps as ‘North Road’ and appears to have been an important transport link at the time of mapping. The subject lands although now considered to be in Huntstown were at the time of mapping in the townland of Johnstown. Location of a number of the existing hedgerows on the lands can be traced back to the above maps. Due to the extent of industrial development in the local area many of the hedgerow boundaries on surrounding lands have been either removed or modified in recent times. It is clear from the historic mapping that at the time, the local lands were rural areas with scattered residential settlement in the form of rural villages, the closest to the subject lands being that of ‘Williamsville’ located to the East of the subject lands.

The landscape of the subject lands has no inherent aesthetic qualities of note.

Existing Views and Visibility

Due to the topography on subject and local lands, the lack of any vertical features on subject lands and the significant number of trees and hedgerows in the area, the subject lands are not visible from many locations in the wider landscape. Where partial or distant views are possible it is the trees and the existing built developments in the local area which are most visible and prominent.

The location from which the subject lands are most visually noticeable is along the R135 Road, however views here are glimpsed and occur where there are breaks or low points in the existing hedgerow boundaries.

11.3.3 Landscape Planning

Within the Fingal Development Plan 2017-2023 there is 1 no. specific landscape objective that applies to the subject lands ‘Objective NH36’ as listed below. There are additionally a number of objectives that apply to the general environs of the site.

Green infrastructure objectives

- GI Objective 1 states: ‘Create an integrated and coherent green infrastructure for the County by requiring the retention of substantial networks of green space in urban, urban fringe and adjacent countryside areas to serve the needs of communities now and in the future including the need to adapt to climate change.
- GI Objective 7 states: ‘Integrate the provision of green infrastructure with infrastructure provision and replacement, including walking and cycling routes, as appropriate, while protecting biodiversity and other landscape resources.’
- GI Objective 19 states: ‘Require all new development to contribute to the protection and enhancement of existing green infrastructure and the delivery of new green infrastructure, as appropriate’
- GI Objective 23 states: ‘Ensure biodiversity conservation and/or enhancement measures, as appropriate, are included in all proposals for large scale development such as road or drainage
- GI Objective 35 states: ‘Ensure green infrastructure provision responds to and reflects landscape character including historic landscape character, conserving, enhancing and augmenting the existing landscapes and townscapes of Fingal which contribute to a distinctive sense of place.’

Landscape Character Assessment Objectives

- Objective NH31 states: ‘Ensure development reflects and, where possible, reinforces the distinctiveness and sense of place of the landscape character types, including the retention of important features or characteristics, taking into account the various elements which contribute to their distinctiveness such as geology and landform, habitats, scenic quality, settlement patter, historic heritage, local vernacular heritage, land-use and tranquility.’
- Objective NH36 states: ‘Protect skylines and ridgelines from development.’

There are **no protected trees or tree groups** within the subject lands listed in the Fingal Development Plan 2017-2023.

There are **no views or prospects** that include the subject lands listed in the Fingal Development Plan 2017-2023.

In the Landscape Character Assessment of Fingal, which can be found in Section 9.4 of the Fingal Development Plan 2017-2023, the subject lands are designated as having a ‘Low Lying Character Type’ which is characterised by agricultural pasture and arable land, with limited protected views or prospects. This area is listed as having a low landscape sensitivity and where appropriate screening and mitigation is proposed can tolerate a certain amount of built development.

Some of the ‘Principles for Development’ which apply to the proposed development are listed below:

- The skyline should be protected’
- ‘Existing tree belts should be retained and managed and older stands of trees restocked. Roadside hedging should be retained and managed. Proposals necessitating the removal of extensive field and roadside hedgerows or trees should not be permitted. Strong planting schemes using native species, to integrate development into these open landscapes, will be required.’

11.3.4 Summary of Significance and Sensitivity of the Existing Landscape and Visual Environment

The flat topography of the wider area reduces the opportunity for expansive views over the landscape. The visual sensitivity is reduced further by the large industrial facilities close to the site, most notably the power station abutting the site to the west. The area is zoned in the development plan for Industrial uses as it considered in planning terms to be an extension of the surrounding industrial landscape. The industrial development general infrastructure in the area have created a landscape where there are no views of any notable landscape value in local and wider area. There are also no landscape planning objectives that relate specifically to the site

11.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development site is c. 13.3 hectares of predominantly greenfield land, and includes two residential properties fronting the R135 (North Road), located to the north west of the M50 orbital ring in the townland of Johnstown and Coldwinters, North Road, Finglas, Dublin 11. The proposal comprises the demolition of two residential properties fronting the R135 (North Road), and the development of 2 no. data hall buildings arranged over three storeys and associated structures and infrastructure.

Vehicular and pedestrian entrance with associated security installations, roadways and vehicle parking. The development will be accessed from the R135 (North Road) from the east. An emergency/secondary entrance will be provided via the Roadstone Huntstown Quarry and Huntstown Power Station access road to the south-west. Temporary access for construction works and to enable a phased delivery of the development is proposed through an existing site entrance off the North Road.

Associated structures and infrastructure including water treatment facility, sprinkler tanks, external plant equipment, emergency generators and diesel fuel storage, vehicular access roads, car and bicycle parking, attenuation ponds and sustainable urban drainage measures, underground foul and storm water drainage network, associated landscaping and boundary treatment works.

The future 220kV substation compound and subsurface grid connection will form part of a separate Strategic Infrastructure Development (SID) application to An Bord Pleanála (ABP).

A detailed description of the proposed development is presented in Chapter 2 (Description of Development) and the included planning documentation. The proposed characterises specific to this chapter are summarised below.

A full description of the proposed development, including phasing, is provided in Chapter 2 (Description of Development), and illustrated in the drawings accompanying the application. The proposed development involves the following works that have the potential to impact on the landscape. The characteristics listed below are in accordance with the proposed plans outlined as part of the drawings submitted as part of the planning application and can be summarised as:

- construction of 2 large data hall buildings at 32m above ground level;
- external plant consisting of standby generators with the flues extending 31m above ground level;
- access road, service yard, footpaths, perimeter fencing, attenuation ponds, water tank and external lighting; and
- creation of native woodlands, native woodland scrub corridors, native grassland meadow and earth modelling.
- demolition of two existing single storey residences;

11.5 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

Landscape assessments measure the sensitivity of specific landscape types and features and describe the nature and significance of changes to that landscape occurring because of a proposed development. In general, it can be assumed that landscape and visual impacts are intrinsically linked however both types of impacts are assessed separately in this study where a development characteristic may result in a starkly different type, quality or magnitude of impact in landscape or visual terms. The assessment of likely significant impacts has been made on the basis that all incorporated design mitigation measures are included.

Character, for the purposes of this assessment refers to the interaction of elements in the landscape that combine to give the area its identity. In this context, impacts on character include the effect on existing land uses and responses that are felt towards the combined effects of the new development.

11.5.1 Construction Phase

The change of use of the site from its current state to that of a construction site has the potential to result in the following impacts:

- Visual impacts due to the introduction of new structures, access roads, machinery, materials storage, associated earthworks, car parking, lighting and hoarding.
- Change of character due to the change in use.
- Visual impacts due to the removal of trees and vegetation.
- Visual impacts as a result of change in ground level and earthworks.

Removal of vegetation.

As detailed in the Arborists package several of the existing trees are to be removed to accommodate the development. The majority of the trees to be removed are in the centre of the site within the internal field boundary hedgerows. These are primarily category C and of a small stature. The loss of any trees will normally result in a negative impact on the landscape character. The impact in this instance has been mitigated by design measures taken to ensure that the trees that are more visually prominent, around the perimeter, are retained and protected adequately during construction. The impact would be considered negative, long term in duration and significant.

Change in use to a construction site.

The change of use of the site from its existing use to that of a construction site will result in an impact on the landscape character. The initial construction operations created by the clearance of the site and the construction of the buildings and plant will give rise to short-term impacts on the landscape character, through the introduction of new structures, machinery, ancillary works etc., There will also be a change to the landscape character as a result of a land-use change.

The proposed development site is located in close proximity to the Huntstown Power Station and Roadstone Quarry. Consequently, the visual elements associated with construction would be considered part of a developing industrial landscape.

With the above considered the impact on the landscape character during construction would be negative and considered significant in magnitude and short-term in its duration.

11.5.2 Operational phase

The proposed development has the potential to result in the following impacts:

- Visual impacts due to the introduction of new buildings and built structures.
- Visual impacts due to the introduction of new roads, parking, mechanical plant and lighting.
- Change of character due to the change in use.
- Visual impact of landscape proposals associated with the Permitted Development– earth modelling, hard surfaces, installation of new trees and vegetation.

Impact on Landscape Character

The operational phase will give rise to a noticeable change in the landscape character. The initial impact of the built development on the landscape character would be perceived as negative in the short-term due to the change in type from a field to a built development.

The landscape measures that form part of this development will significantly improve the quality of the landscape character of this area. The significant amount of native woodland, scrub and grassland habitats to be created would have a positive impact on the landscape character of this area and the wider environment. In the long term the level of this impact will continue to reduce further as the habitats establish and become integrated into the surrounding landscape.

The subject lands are specifically zoned for this type of development and there have been recent large-scale developments in the local vicinity. Many of these built developments are visible from the proposed development site. In this context the proposed development would be considered a continuation of existing trends in the local area.

The overall impact on the landscape character would therefore be considered ***negative, long-term and moderate in magnitude***, however over time this impact will reduce as the planting scheme matures. Habitats and green infrastructure networks will become more established, and screening of the buildings will increase.

Landscape and visual impacts due to the introduction of a new landscape.

The proposed scheme includes a comprehensive landscape scheme (refer to KFLA drawings 101, 102, 103 and 104 along with Doc 001 – Landscape Report) which includes the retention and enhancement of the hedgerows around the perimeter, and the creation of significant belts of native woodland linking the existing hedgerows and trees into a much larger ecological habitat, including native grassland meadows. Most of the existing trees and hedgerows will be retained and improved by the additional native planting proposed and invasive species management. The level of tree cover and woodlands proposed will significantly increase the ecological value of the site and create strong ecological corridors through the site and connecting to wider landscape. The berms on which much of the woodland will be created will be visible from the surrounding landscape and will result in a positive impact on these views. The impact of the proposed landscape scheme would be considered positive, long-term, and significant in magnitude.

Visual impacts due to the introduction of new buildings and built structures;

The extent of potential visual impact of the proposed development on the built environment from 9 representative view locations around the proposed development is discussed in section 5.8.3. The view locations assessed are representative of locations from which it was suggested by mapping analysis that development might be visible. The view locations chosen for assessment were agreed with Fingal County Council Planning Department after the desktop study and an initial assessment of visibility in the local landscape. Photomontages prepared by Digital Dimension Ltd. from these locations are included with this submission, as a separate A3 document.

The overall visual impact of the proposed development would be considered negative, long-term and moderate due to the extent of screening associated with the development paired with the level of similar scale development in the surrounding area.

11.5.2.1 *Impact on Landscape Planning*

The Green Infrastructure objectives that apply to the site and its environs, described under section 11.3.2 above, are mostly general objectives aimed at the protection of the existing green infrastructure network and strengthening ecological links in the wider landscape. The proposed landscape will create significant belts of native woodland linking the existing hedgerows and trees into a much larger ecological habitat. Most of the existing trees and hedgerows will be retained and improved and strengthened by the additional native planting proposed and invasive species management. The level of tree cover and woodlands proposed will significantly increase the ecological value of the lands and create strong ecological corridors through the site and connecting to the wider environment. The proposal would be considered in accordance with these policy objectives.

11.5.3 *S*ummary of potential Impacts

Table 11.1 *Impacts During Construction accounting for Incorporated Design Mitigation only*

Impact	Quality	Significance	Extent	Probability	Duration
Removal of Vegetation	Negative	Significant	Local	Likely	Long Term

Change of Landscape Type	Negative	Significant	Local	Likely	Long Term

Table 11.2 *Impacts During Operation accounting for Incorporated Design Mitigation only*

Impact	Quality	Significance	Extent	Probability	Duration
Landscape Character	Negative	Moderate	Local	Likely	Long Term
Visual Impact of New Landscape	Positive	Significant	Local	Likely	Long Term
Visual Impact of Built Structures	Negative	Moderate	Local	Likely	Long Term

11.6 REMEDIAL AND MITIGATION MEASURES

11.6.1 Incorporated Design Mitigation

- Retention and enhancement of stands of perimeter trees and hedgerows
- Alternative design options were considered as part of the early design process in consultation with Fingal County Council. Mitigation of visual impacts on local residents was considered and was a significant factor in the decision to reduce the number buildings proposed to 2 and reduce the general scale and massing of the structures. Refer to chapter 4 (Alternatives) for further detail on this process and alternative designs considered.
- Building blocks, services and roads have been arranged set back from all perimeters to maximise space for a vegetation buffer and reduce visual impact
- Façade treatment of the buildings have been designed to reduce the visual impact
- Earth modelling and large tree planting reinforced with woodland whip planting in belts has been proposed to provide a high level of visual screening of the most sensitive views of the development

11.6.2 Construction Phase Mitigation

- The protection of existing trees and other vegetation to be retained to BS 5837:2012 standards with the Root Protection Area (RPA) securely protected by fencing for the duration of the construction process.
- Implementation and monitoring of a well-managed and organised construction site, with control of construction activity, traffic, materials storage and lighting with due consideration for neighbouring residences

11.6.3 Operational Phase Mitigation

- Implementation and monitoring of a landscape management plan for the full duration of the defects liability period to ensure successful establishment of all proposed trees and vegetation.
- Periodic tree surveys and implementation of a tree management plan for the mature trees on site to ensure their continuing sustainability.

11.7 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

The operational phase will give rise to a noticeable change in the landscape character. The initial impact of the built development on the landscape character would be perceived as negative in the short-term due to the change in type from a field to a built development.

Implementation of the Landscape Plan would – meaningfully reduce any negative visual effects on the small number of affected residential properties around the site. The establishment of significant areas of native woodland in ecological corridors would also impact positively on the local biodiversity.

11.7.1.1 *Summary of Residual Impacts*

Table 11.2 *Impacts During Construction accounting for Incorporated Design Mitigation only*

Impact	Quality	Significance	Extent	Probability	Duration
Removal of Vegetation	Negative	Significant	Local	Likely	Long Term
Change of Landscape Type	Negative	Significant	Local	Likely	Long Term

Table 11.2 *Impacts During Operation accounting for Incorporated Design Mitigation only*

Impact	Quality	Significance	Extent	Probability	Duration
Landscape Character	Negative	Moderate	Local	Likely	Long Term
Visual Impact of New Landscape	Positive	Significant	Local	Likely	Long Term
Visual Impact of Built Structures	Negative	Moderate	Local	Likely	Long Term

11.7.1.2 *Visual Impacts from Specific Locations*

The extent of potential visual impact of the proposed development on the surrounding environment from 9 representative view locations around the proposed development. The photomontages on which the following assessments is based are provided in a separate document.

Figure 11.2 *Specific View Locations*

Locations from which the proposed development will not be visible

The development is not visible from the selected view location listed below:

View 7: From the R135 to the north of Kilshane Cross

View 8: From the R135 to the south of 'The White House', public house

Locations from which the proposed development will be visible

View 1	**From the N2 slip road at the R135**
Existing View : A relatively expansive view over the site with the hedgerows on site forming part of the visual ridgeline. The road is slightly elevated above the site however it is not visually prominent. The view has no significant aesthetic qualities and would be quite common in the vicinity. The dogs trust building is prominent in the foreground.	
Proposed View : The proposed data hall buildings are visible and prominent in this view. The buildings obstruct the current expansive view and alter most of the visual ridgeline. The earth berms and woodland belt create a visual screen which reduces the area of building that is visible, notably in the north-east corner of the site, with the existing trees providing additional screening. The level of screening provided by the proposed woodland will increase as the trees mature and the magnitude of the visual impact will reduce accordingly as a significant visual screen is established. This view is from a location directly adjacent to the development and this level of impact is limited to a small area of public road.	
Predicted impact at Construction Phase	A significant and short-term negative visual impact
Predicted impact during Operation	A significant and long term negative visual impact. As the woodland screening matures the negative impact will reduce to a moderate long-term visual impact.

View 2	**From the R135 on the eastern perimeter of the site**
Existing View : A relatively expansive view from the R135 over the site with the hedgerows on site forming part of the visual ridgeline. The pylons and power lines associated with the power station are visible along the skyline and the existing dwellings and associated low boundary walls are prominent in the foreground. The view has no significant aesthetic qualities and would be quite common in the vicinity.	
Proposed View : The upper portion of one of the proposed data hall buildings is visible on the right side of the view. The section of building intrudes into the view and alters a small part of the visual ridgeline. The existing trees and vegetation are visually prominent and create a strong visual screen which reduces the area of building that is visible significantly. The proposed boundary hedgerow also adds some screening value. This view offers a direct view of the proposed landscape treatment, displaying native hedgerow, wildflower meadow and copses of native trees The level of screening provided by the proposed woodland, located behind the existing trees, will increase as the trees mature and the magnitude of the visual impact will reduce accordingly. This view is from a location directly adjacent to the development and this level of impact is limited to a small area of public road.	
Predicted impact at Construction Phase	A significant and short-term negative visual impact
Predicted impact during Operation	A moderate and medium-term negative visual impact. As the woodland screening matures the negative impact will reduce to a slight long-term visual impact.

View 3	From the R122 to the east
Existing View : A relatively expansive view over agricultural lands towards the site. The N2 dual carriageway and the R135 lies between this location and the site. No part of the subject lands is visible in this view.	
Proposed View : The existing hedgerow and trees form the background and visual ridgeline of this view. The proposed development, although viewed from a distance, is visible through the partial screening of the existing trees. Glimpsed views of the building are possible in winter however due to the distance to the development any element that is visible is only a very small part of the overall view. Buildings of a similar industrial/commercial use are also visible in the background, therefore the proposed development reads as a continuation of the existing built landscape. The level of screening provided by the woodland will increase as the trees mature and the magnitude of the small visual impact will reduce further.	
Predicted impact at Construction Phase	A significant and short-term negative visual impact
Predicted impact during Operation	A moderate and medium-term negative visual impact. As the woodland screening matures the negative impact will reduce further.

View 4	From the pedestrian fly over at M50, junction 5
Existing View : A relatively expansive view over industrial landscape with some remnants of the agricultural landscape. The view is of no aesthetic value and consists of industrial clutter and detritus. No part of the subject lands is distinguishable in this view.	
Proposed View : The upper sections of the proposed data hall buildings are visible in the background of the view. The buildings intrude into the view and alter a small part of the visual ridgeline. The Due to the amount of industrial development in this view the proposed development reads as a continuation of the existing built landscape. Existing trees and vegetation between the viewpoint and site boundary also screen the lower elements of the proposed buildings from view. This view is from an elevated walkway and is not reflective of the views offered in this area. The area from where this expansive view is offered is extremely limited.	
Predicted impact at Construction Phase	A moderate and short-term negative visual impact
Predicted impact during Operation	A moderate and long-term negative visual impact.

View 5	From the roundabout at Cappagh Road at the M50
Existing View : A relatively expansive view over agricultural lands towards the site. The Roadstone Quarry lies between this location and the site. The boundary railings are prominent in the foreground of the view and the woodland to the south of the quarry form the background and ridgeline of the view. No part of the subject lands is visible in this view.	
Proposed View : The woodland trees form the background and visual ridgeline of this view. The proposed development is mostly screened from view by these trees and the railings in the foreground. Some partial glimpsed views of the building are possible, especially in winter however due to the distance to the development any element that is visible is only a very small part of the view. The level of screening provided by the existing and proposed woodland will increase as the trees mature and the magnitude of the small visual impact will reduce further.	
Predicted impact at Construction Phase	A not significant and short-term negative visual impact
Predicted impact during Operation	A not significant and long-term negative visual impact.

View 6	From the roundabout at Cappagh Road to the west
Existing View : The Roadstone Quarry lies between this location and the site. The boundary railings and temporary road barriers are prominent in the foreground of the view and the woodland to the west of the quarry form the background and ridgeline of the view. No part of the subject lands is visible in this view.	
Proposed View : The existing woodland trees form the background and visual ridgeline of this view. The proposed development is mostly screened from view by these trees and the railings in the foreground. Some partial glimpsed views of the building are possible, especially in winter however due to the distance to the development any element that is visible is only a very small part of the view. The level of screening provided by the existing and proposed woodland will increase as the trees mature and the magnitude of the small visual impact will reduce further.	
Predicted impact at Construction Phase	A not significant and short-term negative visual impact
Predicted impact during Operation	A not significant and long-term negative visual impact.

View 9	**From the N2 fly over at Kilshane Cross**
Existing View : A wide expansive view from an elevated location over the N32 and over the landscape towards the site. The N32 and surrounding hedgerows and trees are prominent in this view. The view of value in this vicinity is towards the mature trees to the east of the N2 at Kilshane Cross. No part of the subject lands is visible in this view.	
Proposed View : The upper sections of the buildings are visible in the background of this view. The buildings intrude into the ridgeline, however due to the distance to the development this is only a small part of the view. The Pylons and power lines associated with the power station are visible to the right of the proposed development. The level of screening provided by the existing and proposed woodland will increase as the trees mature and the magnitude of the small visual impact will reduce over time.	
Predicted impact at Construction Phase	A slight and short-term negative visual impact
Predicted impact during Operation	A slight and long-term negative visual impact.

11.8 MONITORING OR REINSTATEMENT

Contracts will ensure good working practices to reduce any negative impacts arising from construction to the lowest possible level and to ensure that all machinery operates within clearly defined construction areas. Storage areas will be located to avoid impacting on sensitive views, trees, hedgerows, drainage patterns etc. and such areas will be fully re-instated prior to, and at the end of the construction contract. The works will also have continuous monitoring so as to ensure adequate protection of areas outside of the construction works.

The developer should appoint an Arboriculturist who will oversee tree protection measures for the duration of the project. The arboriculturist will make regular site visits to ensure continued compliance, as well as to respond to project specific issues as they arise.

On completion of sections of the proposed scheme, side slopes including cuttings and embankments, verges and other soft areas will be prepared for soil, top-soiled and planted using appropriate native tree and hedgerow species.

12.0 ARCHAEOLOGICAL, ARCHITECTURAL AND CULTURAL HERITAGE

12.1 INTRODUCTION

The following chapter assesses the predicted impacts of the Proposed Development on archaeological, architectural and cultural heritage. The development is located in the townlands of Huntstown and Johnstown in the Civil Parish of Castleknock and Coldwinters in the Civil Parish of Finglas, in the Barony of Castleknock, in the County of Dublin (ITM 685595, 718923; see Figure 12.1). The study area comprised a buffer of approximately 1.5km from the site, incorporating the following townlands: Balseskin, Coldwinters, Dubber, Grange, Huntstown, Kildonan, Kilshane and Newtown.

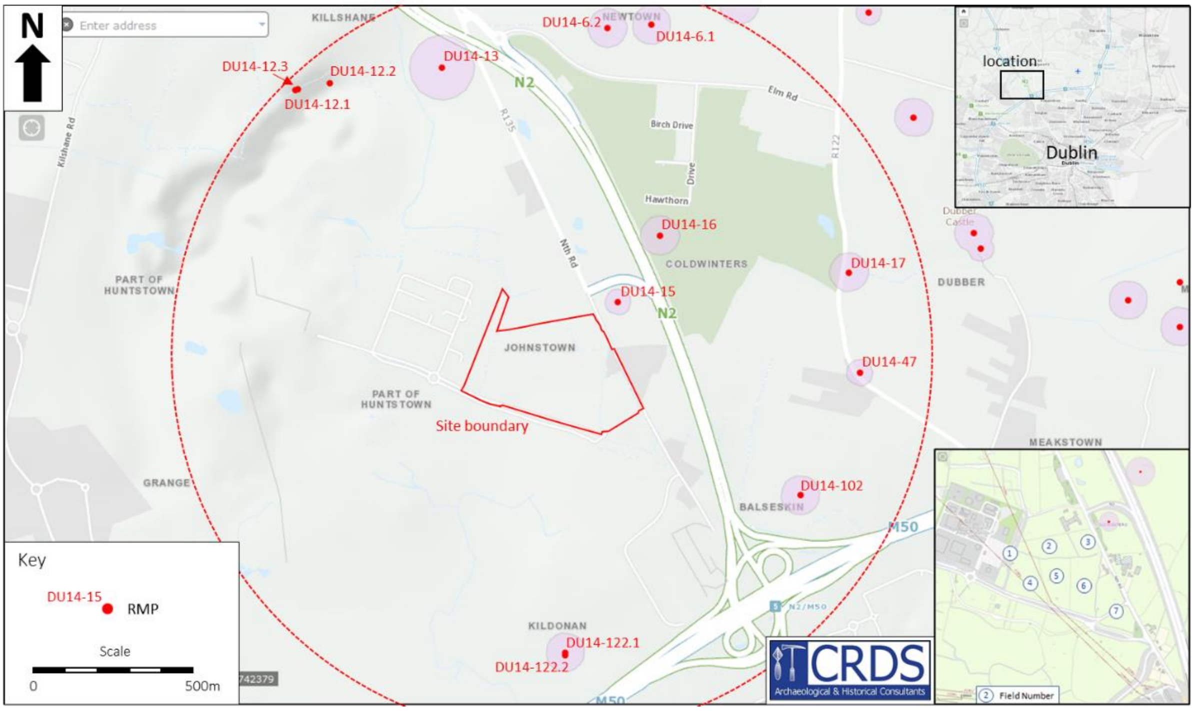

Figure 12.1 Site location map showing Recorded archaeological monuments within c. 1.5km of the Proposed Development. Field numbers are also shown (insert) (source: www.archaeology.ie)

12.2 METHODOLOGY

To set the proposed development within its wider archaeological, architectural and cultural heritage landscape, and to assess the potential of encountering such features on the site, a paper survey of archaeological, architectural heritage, historical and cartographic sources was undertaken. The following townlands were assessed: Balseskin, Coldwinters, Dubber, Grange, Huntstown, Kildonan, Kilshane and Newtown.

12.2.1 Recorded archaeological sites and monuments

The Record of Monuments and Places (RMP), comprising the results of the Archaeological Survey of Ireland, is a statutory list of all recorded archaeological monuments known to the National Monuments Service. The RMP was established under the National Monuments (Amendment) Act, 1994. The relevant files for these sites contain details of documentary sources and aerial photographs, early maps, OS memoirs, the field notes of the Archaeological Survey of Ireland and other relevant publications. Sites included on the RMP all receive statutory protection under the National Monuments Acts 1930 - 2004. The information contained within the RMP is derived from the earlier non-statutory Sites and Monuments Record (SMR); some entries, however, were not transferred to the statutory record as they refer to features that on inspection by the Archaeological Survey were found not to merit inclusion in that record or could not be located with sufficient accuracy to be included. Such sites however remain part of the SMR. The record is a dynamic one and is updated so as to take account of on-going research. The RMP was consulted in the Archives of the Department of Culture, Heritage and the Gaeltacht. There are no recorded archaeological monuments located within the site boundary. There are fourteen recorded archaeological monuments within the study area which comprises a distance of c. 1.5km from the Proposed Development (see Figure 12.1 and Appendix 12.1).

12.2.2 Recorded archaeological finds

The topographical files in the National Museum of Ireland were not available for consultation at the time of the study, due to the Covid-19 outbreak. This is the National archive of all known finds recorded by the National Museum. It relates primarily to artefacts but also includes references to monuments and has a unique archive of records of previous excavations. Published catalogues of prehistoric material were studied: Raftery (1983 - Iron Age antiquities), Eogan (1965; 1993; 1994 - bronze swords, Bronze Age hoards and goldwork), Harbison (1968; 1969a; 1969b - bronze axes, halberds and daggers) and the Irish Stone Axe Project Database (Archaeology Dept., U.C.D.). The Heritage Maps website (http://www.heritagemaps.ie/) was also assessed. Only one archaeological find was recorded in these sources (Appendix 12.2). However, it is important to note that numerous artefacts would have been recorded during the excavation of archaeological sites as listed below (see Section 12.3.3

12.2.3 Recorded archaeological excavations

The excavations bulletin website (www.excavations.ie) was consulted to identify previous excavations that have been carried out within the study area. This database contains summary accounts of excavations carried out in Ireland from 1970 to 2019. The townlands within the study area were assessed and the results given in Appendix 12.3.

12.2.4 Architectural heritage

The National Inventory of Architectural Heritage (NIAH) is a systematic programme of identification, classification, and evaluation of the architectural heritage of the State. The Minister for Arts, Heritage and the Gaeltacht is currently using the Inventory as the basis for making recommendations for the NIAH. There are no structures included in the NIAH within c. 1.5km of the proposed development lands. There are also no structures identified in the Record of Protected Structures within the study area.

12.2.5 Cartographic sources

Cartographic sources were used to identify additional potential archaeological and cultural heritage constraints. Analysis of cartographic sources is important in tracing the development of the site. Sources included:

- William Petty's 1660 map (Figure 12.2)
- Rocque's 1760 map (Figure 12.3)
- Ordnance Survey 1st Edition – Scale 6 inches: 1 mile (1838-1842). The first comprehensive series of maps covering the whole of Ireland, which was the first country in the world to be mapped in this manner (Figure 12.4).
- Ordnance Survey 25-inch Maps: Scale 25-inches: 1 mile. Mostly date from the 1890s up to c. 1915 with later printings (Figure 12.5)

12.2.6 Griffith's valuation

Griffiths Valuation was the first full-scale valuation of property in Ireland, overseen by Richard Griffith and published between 1847 and 1864. It is one of the most important surviving 19th century genealogical sources (http://www.askaboutireland.ie/griffith-valuation/; see Figure 12.6 and Appendix 12.4).

12.2.7 Aerial photography

Available online sources for aerial photography were consulted, including the Ordnance Survey, Geological Survey and National Monuments Service collections (see Figures 12.7-8).

12.2.8 County development plan

The Fingal Development Plan 2017-2023 was also consulted. The plan includes policy objectives for the protection of the County's archaeological, architectural and cultural heritage. The Record of Protected Structures (RPS) contained within the plan includes every structure which is of special architectural, archaeological, artistic, cultural, scientific, social or technical interest within the county boundaries.

12.2.9 Historical research

The baseline historical research utilised sources including Lewis' Topographical Dictionary of Ireland (Lewis 1837), the Proceedings of the Royal Irish Academy and the Journal of the Royal Society of Antiquaries. See Bibliography for full list of references used.

12.2.10 Previous assessment

A significant portion of the Proposed Development lands have been subjected to geophysical survey by J.M. Leigh Surveys Ltd (License No. 19R0159), and archaeological testing by IAC Ltd (License No. 19E0645). These have been reviewed in the context of the Proposed Development.

12.2.11 On-going assessment

A further phase of archaeological testing is being undertaken as agreed with the National Monuments Service in order to fully assess the archaeological potential of the site and allow an excavation strategy of identified archaeological features to be implemented in a phased approach (Licence no. 21E0185 & 21R0064; see Section 12.3.3).

12.3 RECEIVING ENVIRONMENT

12.3.1 Archaeological, Architectural and Cultural Background

The proposed development lands comprise three townlands in the Barony of Castleknock, County Dublin (Fingal County), Huntstown, Coldwinters and Johnstown. Huntstown is in the Electoral Division of Blanchardstown, in Civil Parish of Castleknock, in the Barony of Castleknock, in the County of Dublin. The Irish name for Huntstown is Baile an Huntaigh. Coldwinters is in the Electoral Division of Finglas, in Civil Parish of Finglas, in the Barony of Castleknock, in the County of Dublin. The Irish name for Coldwinters is Buaile an Gheimhridh. Johnstown is in the Electoral Division of Blanchardstown, in Civil Parish of Castleknock, in the Barony of Castleknock, in the County of Dublin. The Irish name for Johnstown is Baile Sheáin.

The recorded archaeology within approximately 1.5km of the proposed development lands is shown below in Tables 1 and 2 (see also Figure 12.1 and Appendices 12.1 – 12.3).

Table 12.1 *Recorded archaeological monuments and places within c. 1.5km of the proposed development lands (source www.archaeology.ie; see Figure 12.1 and Appendix 12.1)*

Record No.	Townland	Classification
DU014-006001-	NEWTOWN (Coolock By., Finglas ED)	Ringfort - unclassified
DU014-006002-	NEWTOWN (Coolock By., Finglas ED)	Ringfort - unclassified
DU014-012001-	KILSHANE	Church
DU014-012002-	KILSHANE	Burial ground
DU014-012003-	KILSHANE	Ritual site - holy well
DU014-013----	NEWTOWN (Coolock By., Finglas ED)	Castle - motte and bailey
DU014-015----	COLDWINTERS (Castleknock By.)	Ring-ditch
DU014-016----	COLDWINTERS (Castleknock By.)	Enclosure
DU014-017----	DUBBER	Enclosure
DU014-047----	DUBBER	Inn
DU014-102----	BALSESKIN	Enclosure
DU014-122001-	KILDONAN	Enclosure
DU014-122002-	KILDONAN	Kiln - corn-drying

Prehistory (c. 8000 BCE – 400 AD)

Although recent discoveries may provide evidence for human occupation of Ireland in the Upper Palaeolithic (Dowd and Carden 2016), the Mesolithic period is the earliest time for which there is clear evidence of prehistoric activity in Ireland. During this period people hunted, foraged and gathered food and appear to have had a mobile lifestyle. The most common evidence indicative of Mesolithic activity at a site comprises of scatters of worked flint material; a by-product from the production of flint implements (Stout & Stout 1997). Outside of the coastal areas, County Dublin has so far yielded little archaeological evidence dating to the Mesolithic period. Nonetheless, it has been suggested that the riverine landscapes of the Liffey were likely to have been inhabited towards the early part of the Mesolithic period (Kador 2007).

The Neolithic period saw the introduction and adoption of agriculture to Ireland. To facilitate farming, the landscape was altered dramatically, with forest clearance and the construction of field boundaries. Settlement become more permanent and pottery was produced, possibly for the first time.

Table 12.2 *Recorded archaeological excavations within c. 1.5km of the proposed development lands (source www.excavations.ie; see Appendix 12.3)*

Excavation	Location	SMR	Licence	Site type
1988:18	Kilshane	N/A	—	Christian Cemetery
1999:253	Kilshane	DU14-48	99E0220	Unenclosed cemetery
1999:269	Newtown	N/A	99E0028	Cultivation furrows
2001:430	Huntstown	N/A	01E1108	No archaeological significance
2001:456	Newtown	DU14-13	01E1214	Site of motte and bailey
2002:636	Newtown	DU14-13	01E1214 ext.	Near motte and bailey
2003:475	Coldwinters	N/A	02E1353 ext.	No archaeological significance
2003:476	Coldwinters	N/A	03E1450	No archaeological significance
2004:612	Kilshane	N/A	03E1359 ext.	Neolithic segmented enclosure, Early Bronze Age activity
2004:613	Kilshane	N/A	04E1191	No archaeological significance
2004:631	Newtown	N/A	03E1450 ext.	Burnt spread
2005:409	Coldwinters/ Newtown	N/A	05E0236	Prehistoric/medieval
2008:384	Coldwinters	N/A	05E0236	Testing
2008:481	Newtown	N/A	08E0043	Monitoring
2010:280	Kildonan	N/A	10E0462	Kildonan Corn-drying kilns and enclosure site
2017:424	Coldwinters	DU14-16	17E0285	Enclosure; Cremation
2018:257	Newtown	DU14-6.1	17E0569	Ringfort
2018:258	Newtown	DU14-6.2	17E0570	Ringfort
2018:259	Newtown	DU14-6.1	17E0569 ext.	Ringfort
2018:820	Huntstown	N/A	18E0561	No archaeology found

A concern for territory on which to farm contributed to the construction of megalithic tombs. These communal burial places would have required great planning and cooperation to construct and likely also served as a focus of ceremonial activities for the communities that built them. There are four types of megalithic tomb; court cairn, portal, passage and wedge tombs.

While the uplands of Dublin feature a number of megalithic tombs there are no sites of this type, or recorded habitation sites, located within the vicinity of the proposed development area.

The Bronze Age is marked for the production and use of metal in Ireland of the first time. Megalithic tombs were replaced in favour of individual, subterranean cist or pit burials that were either created in isolation or in small cemeteries. These burials contained inhumed or cremated remains and were often, but not always, accompanied by a pottery vessel. Different forms of burial barrows were being constructed during this period, as well as large scale ceremonial monuments such as henges. A ring ditch (DU014-015) is located 75m northeast of the proposed development area. The monument is recorded as c. 15m in diameter and was identified on an aerial photograph. A review of satellite imagery has shown that the monument was subject to archaeological testing in 2017 (Stirland 2017). The monument was located during testing, with a circular slot trench possibly representing a structure/round house, rather than a burial monument. No dating evidence was recovered during the investigation.

Bronze Age activity is often clearly identifiable in the landscape by the presence of fulachta fiadh or burnt mounds. Over 4,500 fulachta fiadh have been recorded in Ireland making them the most common prehistoric monument in Ireland. These sites were used to heat water using hot stones. They have been interpreted as places where cooking, dyeing, brewing or bathing took place (O'Kelly 1954; Quinn and Moore 2009). A fulacht fiadh (DU014-050) was identified c. 1.3km west-southwest of the proposed development area during investigations for a gas pipeline in 1988. In the wider landscape, a bronze axehead was discovered c. 1.5km north-northeast in the townland of Newtown (NMI Ref.: 1962:259).

The Iron Age is period is traditionally known as a period for which we have little evidence. However, there is increasing evidence for Iron Age settlement and activity in recent years as a result of development-led excavations as well as projects such as LIARI (Late Iron Age and Roman Ireland). Large defensive structures and earthworks known as promontory or hill forts are characteristic of the period. The former is a banked and ditched structure located above a steep cliff or bluff and often found in coastal areas. Whilst a number of promontory forts are located along the coast of north County Dublin, there are no known Iron Age sites located within the vicinity of the proposed development area.

Early Medieval (c. 400 – 1100 AD)

Ireland at this time was a patchwork of larger and smaller kingdoms known as túath and trícha cét respectively. During this period, Ireland is depicted in the surviving historical sources as entirely rural. Huntstown and Johnstown were part of territory of Brega and earliest historical records note that the Síl nÁedo Sláine, a dynasty of the southern Uí Néill, were the dominant rulers during the early medieval period (Byrne 1973, 88). They likely paid tribute and gave fealty to the King of Tara.

Secular habitation sites in the early medieval period include crannógs, cashels and ringforts, which are largely defined as circular enclosures surrounded by banks and ditches. In addition to these, there is some evidence for unenclosed settlements which are more difficult to identify in the archaeological record. The ringfort or ráth is considered to be the most common indicator of settlement during the early medieval period. Ringforts are strongly associated with agricultural land and, as such, are rarely situated at higher altitudes. Ringforts and potential ringforts - often recorded as enclosures - are the most common archaeological sites recorded across the Irish landscape. There are two recorded ringforts in the study area (DU014-006.1 & DU014-006.2) and four enclosures (DU014-16, DU014-017, DU014-102 & DU014-122.1). The enclosure (DU014-016), located c. 310m to the northeast of the proposed development, was subject to test excavations in 2005 (Excavation No. 2017:424; see Appendix 2), but the feature was not located.

Later Medieval (c. 1100 – 1600 AD)

The Anglo-Norman's arrived in Ireland in 1169, to support the deposed king of Leinster, Diarmuid MacMurchadha. By the end of the 12th century the Anglo-Normans had succeeded in gaining control over much of the country (Stout & Stout 1997, 53). Leinster, including Dublin and Meath, was 'sub-infuedated', meaning that great swathes of land were parcelled out among the Anglo-Norman elites. The Anglo-Norman tenurial system more or less appropriated the older established land units known as túaths in the early medieval period but described the territories as manors (MacCotter 2008). The feudal barony of Coolock was originally part of the Lordship of Meath until Hugh de Lacy granted the barony to the Tyrell family in the 12th century.

This time period is synonymous with castle-building, both masonry and earthwork, as well as the creation of new towns and enlargement of older urban centres. A motte and bailey castle in the townland of Dunsoghly known as Connaberry Moat (DU014-005003) is located c. 1.5km north of the proposed development area. Another motte and bailey (DU014-013) was situated c. 790m to the north until its destruction in 1952. A burial ground (DU014-048) was uncovered in advance of a gas pipeline in 1988 c. 1.7km to the northwest. The excavation revealed 123 skeletons aligned east- west in the Christian manner, some of which had 'pillowstones' indicating a 9th-13th century date.

During the later medieval period, tower houses emerged in Ireland. In the Dublin area, especially along the 'frontier zone', there are a substantial number of tower houses and fortified buildings. This may be in part due to the presence of The Pale, which was defined as a hinterland around the centre of Anglo-Norman rule based in Dublin. During the 15th century the 'Subsidised Castles Act' provided grants of ten pounds to encourage the construction of castles to defend the Pale against the native Irish. Dubber Castle (DU014-018), thought to have been constructed between 1582 and 1611, is likely to represent such a building. It is located c. 1.2km east-northeast of the proposed development area to the immediate north of Dubber House.

Post Medieval (c. 1600 – 1900 AD)

The 17th century witnessed the systematic reduction of all of Ireland to English authority, largely through conflicts and the forced settlements, 'The Plantations'. As part of the process of achieving colonial dominion a number of surveys and mapping programmes were completed throughout the post-medieval period. Simington's Civil Survey of 1654–56, was an inquisition that visited each barony (land division) and took depositions from landholders based on parish and townland, with written descriptions of their boundaries to facilitate the transfer of lands.

Figure 12.2. *Extract from William Petty's (1660) map of Dublin (source http://www.dublinhistoricmaps.ie/maps/1600-1799/index.html).*

Subsequent to the Civil Survey, a project known as the Down Survey 1656–58, used the collected cadastral information to map all forfeited lands. This survey was overseen by the surgeon-general of the English army, William Petty and a number of former soldiers. It was not just a project of mapping but of social engineering that was underpinned by a massive transfer in landownership from Irish Catholics to English Protestants. This survey is the first ever detailed land survey on a national scale anywhere in the world and gives great insight in Ireland at this time. The Old Red Lion Inn (DU014-047), first mentioned in the Finglas Vestry Books of 1675, is located c. 790m to the east of the area under assessment in Dubber (see Figure 12.2).

John Rocque's map of West Dublin (1760) shows the site as located in open pasture, comprising a small number of large fields, with a stream system originating within the lands. The site is located roughly equidistant from the settlements of Red Lyon, Killodin and Newtown (see Figure 12.3).

Figure 12.3. *Extract from Rocque's (1760) map of West Dublin (source http://www.dublinhistoricmaps.ie/maps/1600-1799/index.html).*

The first (Figure 12.4) and second (Figure 12.5) editions of the Ordnance Survey maps dating to the early 19th and early 20th century respectively, also show the site as being in agricultural land comprising a small number of fields. Portions of the townland boundary between Huntstown and Johnstown and Johnstown and Coldwinters runs through the Proposed Development site.

A single elongate building is shown on the first edition Ordnance Survey map, in the northeast corner of the Proposed Development lands. This building is shown but is slightly altered, on the second edition Ordnance Survey map. An additional small building is depicted on the second edition map in the triangular field in the east of the Proposed Development lands. A number of drainage ditches are also depicted in the second edition map along field boundaries.

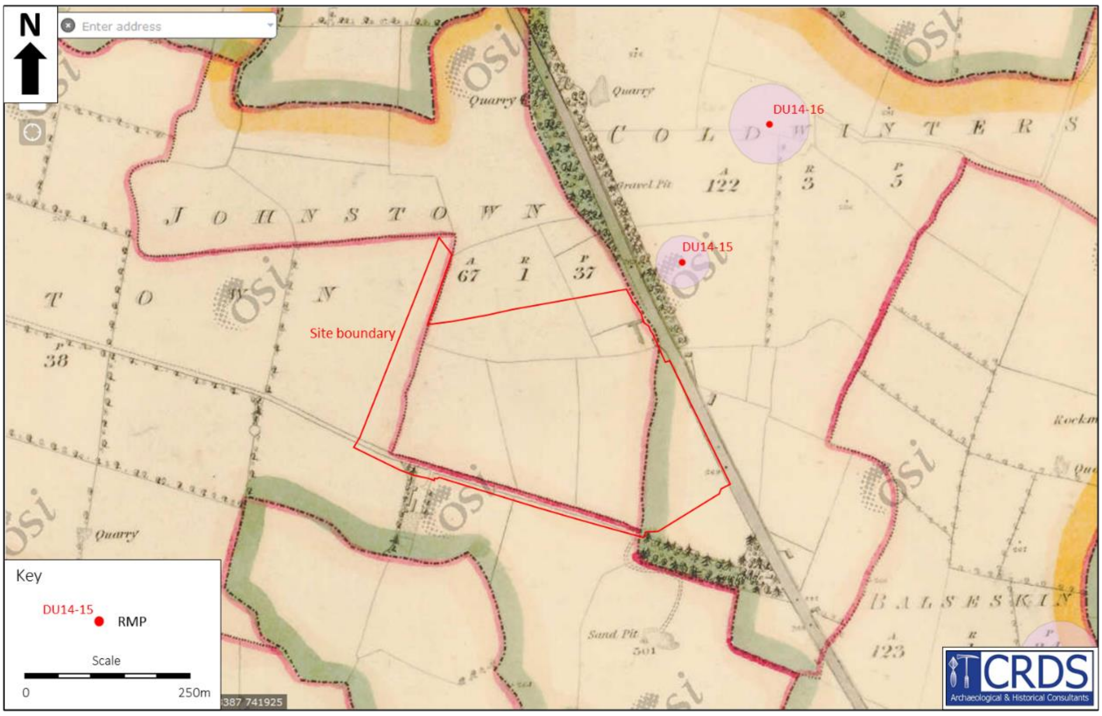

Figure 12.4. *Extract from 1st edition Ordnance Survey map (1830s; source www.archaeology.ie).*

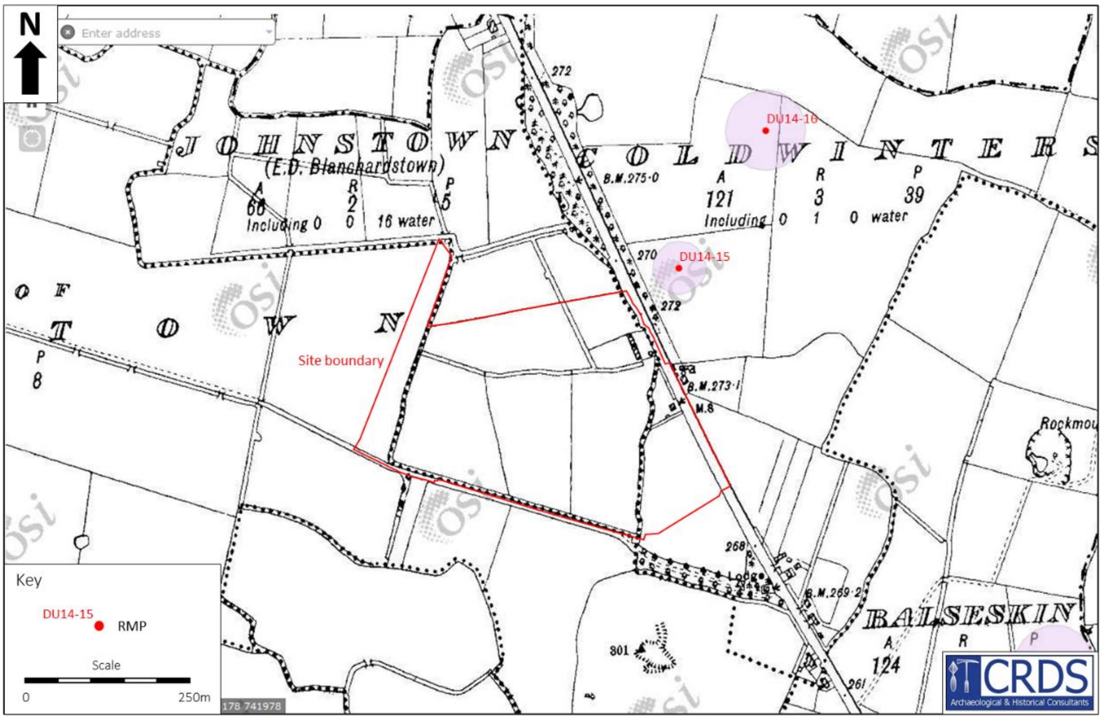

Figure 12.5. *Extract from 2nd edition Ordnance Survey map (1910s; source www.archaeology.ie).*

The Griffith's Valuation shows two occupiers of Huntstown townland and four in Coldwinters but does not record any occupants in Johnstown townland (see Figure 12.6 and Appendix 12.5). Inbterestingly, Christopher Kelly is listed as the occupier of land holding 4 (within the Proposed Development lands) of Coldwinters and land holding 2 of Huntstown.

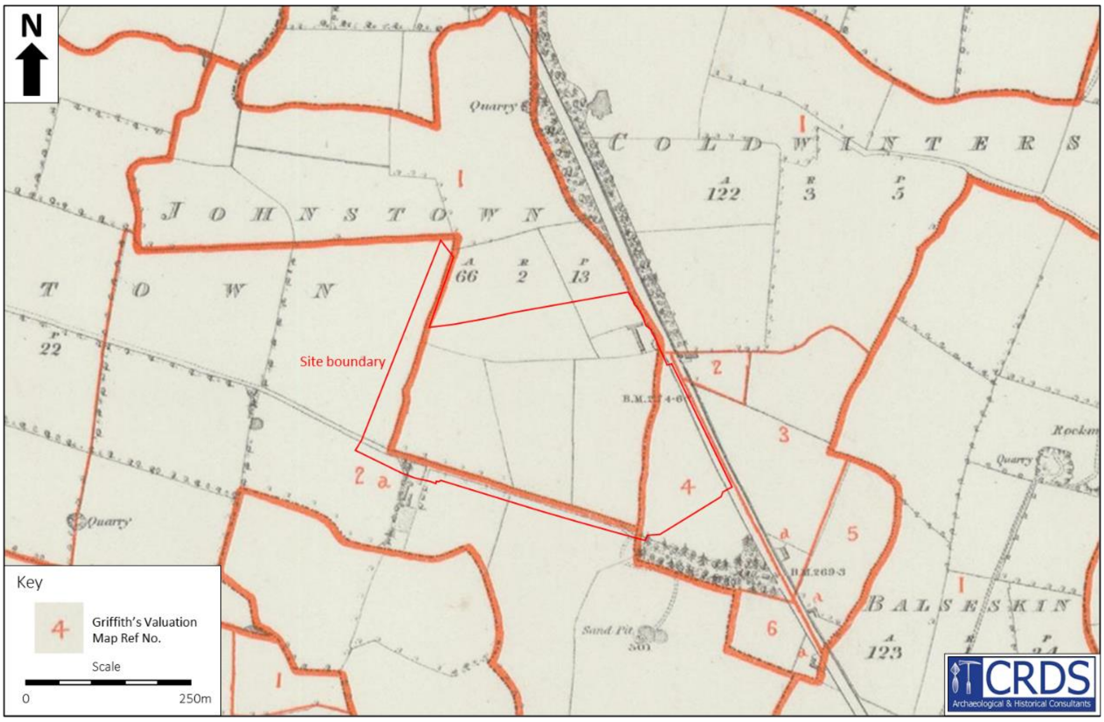

Figure 12.6. *Extract from 1st edition Ordnance Survey map showing Griffith's Valuation land holdings (http://www.askaboutireland.ie/griffith-valuation/).*

In modern times there has been significant development in the surrounding lands, but the Proposed Development lands remain in open pasture, with the field boundaries as depicted on the first and second edition Ordnance Survey maps intact as mature hedgerows. There is considerable development in the wider in the area (see Figure 12.7). Traces of a circular enclosure are visible in the northwesternmost field of the proposed development lands as a cropmark (see Figure 12.8).

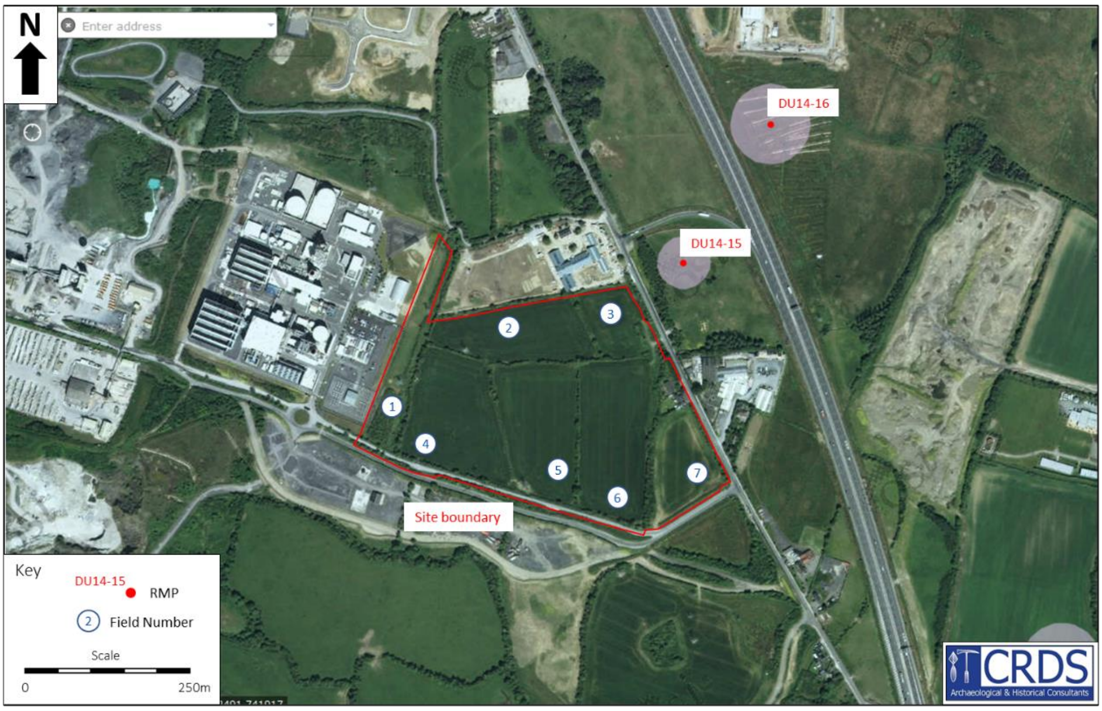

Figure 12.7. *Aerial photograph (digital globe) of the proposed development lands; Field numbers are shown (source www.archaeology.ie).*

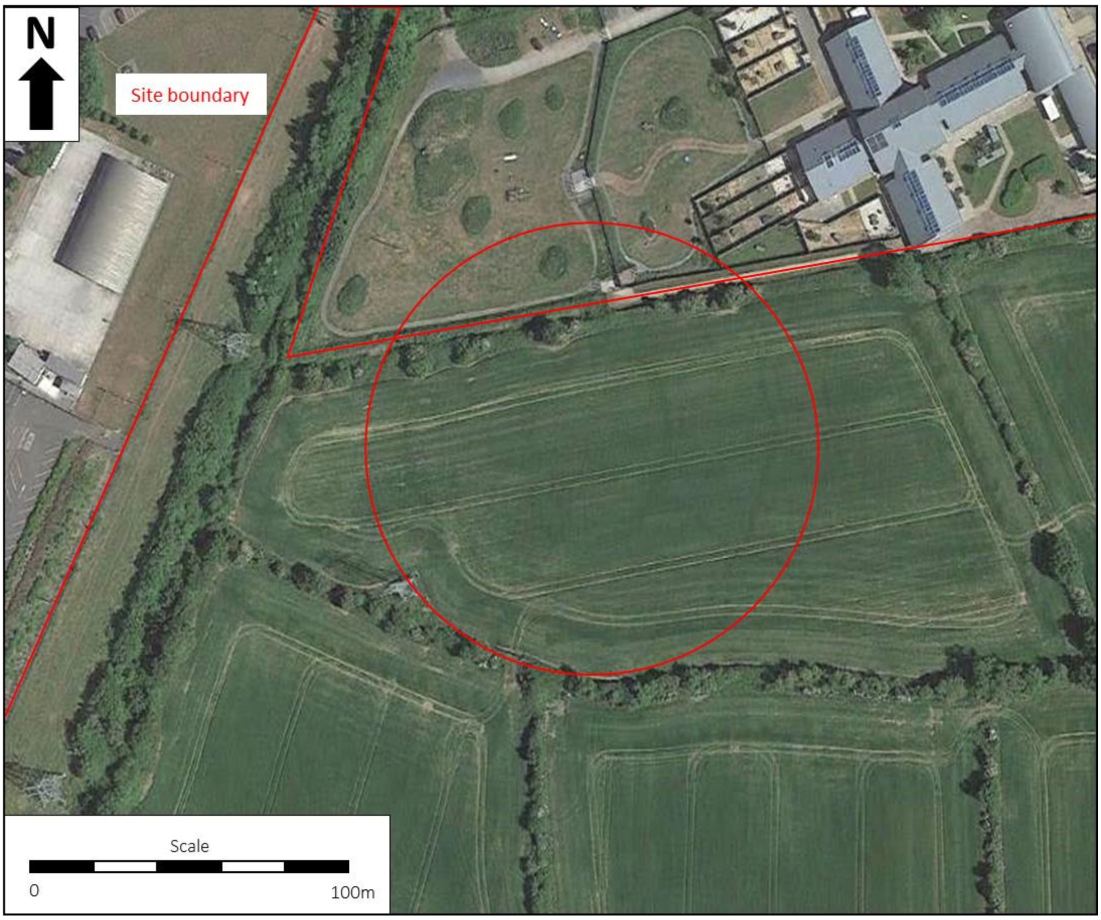

Figure 12.8. *Aerial photograph of the proposed development lands showing enclosure (source Google 2018).*

12.3.2 Geophysical survey

An archaeo-geophysical survey of the lands proposed for development was undertaken by J.M. Leigh Surveys Ltd in 2019 (License No. 19R0159). A summary of the results are shown in Figure 12.8 and are summarised below.

The geophysical survey identified the probable remains of an oval enclosure measuring c.42m x 50m with a possible entranceway to the south. Within the enclosure are numerous responses and trends, most likely representing the remains of pits and ditches. To the east of the enclosure is another curvilinear ditch-type response and numerous trends, suggesting a possible outer ditch and associated field system.

The field to the east of the enclosure comprises of modern responses. However, two broad responses within the modern disturbance may represent the remains of burnt or fired material. In the field to the south west of the enclosure are further broad responses. These may also represent burnt or fired features. However, interpretation is cautious as they may equally represent more recent activity.

Two clusters of isolated responses are evident in the southern half of the application area. These may represent the remains of plough damaged archaeology. The responses have a magnetic signature suggestive of pit-type features and an archaeological interpretation must be considered.

Figure 12.9. *Summary of results of geophysical survey undertaken by J.M. Leigh Surveys Ltd (License no. 19R0159).*

12.3.3 Archaeological testing

Pre-development archaeological testing was undertaken by IAC Ltd based on the results of the above geophysical survey in 2019 (License No. 19E0645). The results are shown in Figures 12.9 and are summarised below.

Archaeological testing across the site confirmed the results of the geophysical survey that indicated the presence of an enclosure and associated linear features and pits. This enclosure is located in the north/northwest of the site area and measures c. 42m x 50m in width. The testing determined that the enclosing ditch is 3.6m wide and 1.3m deep.

In the interior of the enclosure, two linear features and two probable pits were recorded. These confirm the results of the geophysical survey and suggest the presence of further archaeological features in the interior of the enclosure.

External to the enclosure ditch, one curvilinear feature and eight linear features were identified that may be related to an outer enclosure and associated field system. The extent of AA1 covers 130m east-west by 75m north-south.

An isolated pit, possibly unrelated to the activity associated with the enclosure, was identified c. 50m to the southeast of the main area of activity. The composition of the fill of this pit was similar to that found in burnt mound activity. No evidence of an associated burnt mound was identified, so it is possible that this feature had a ‘’pot boiler’’ type function.

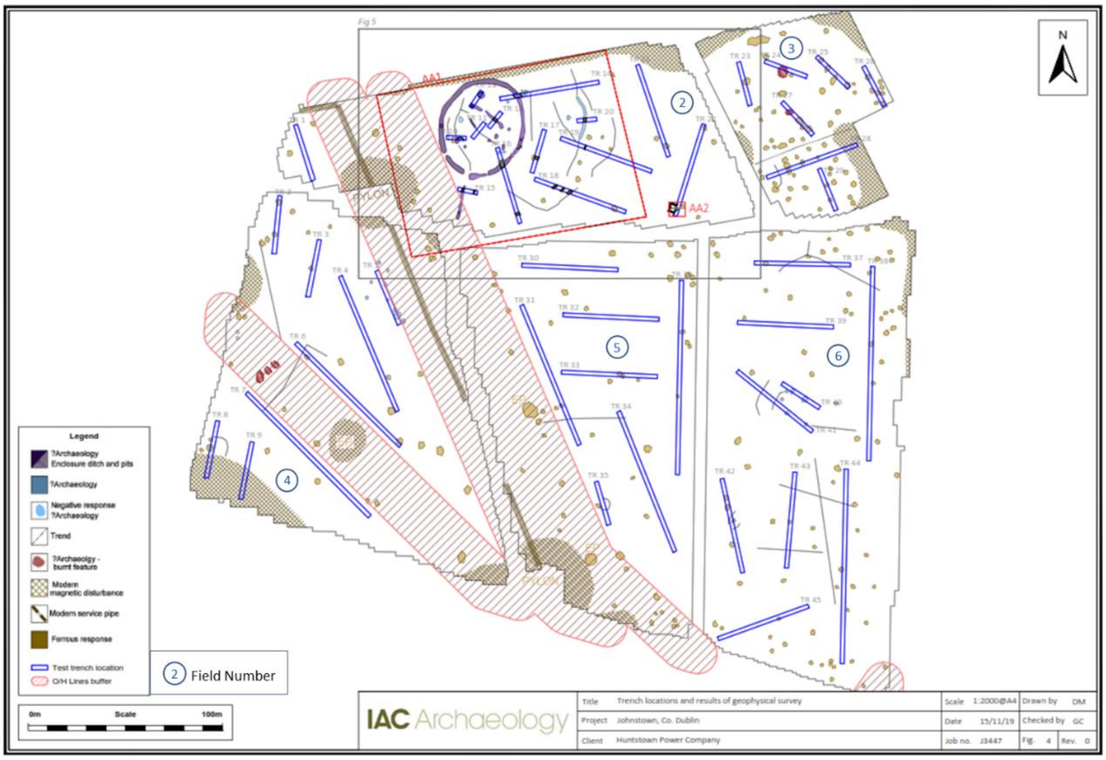

Figure 12.10*. Summary of results of archaeological testing undertaken by IAC Ltd (License no. 19E0645).*

In order to fully assess the potential for archaeological remains across the lands, including the financial, time and logistical impacts of excavating these remains in advance of construction, a further, more detailed programme of pre-development archaeological testing was undertaken by AMS Ltd, under license to the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht Gaeltacht (see Appendix 12.5).

This is being undertaken in areas accessible for testing, shown as Fields 1-7 in Figure 12.11. It is anticipated that areas where the geophysical survey has not identified anything of potential archaeological significance, and have been subject to intensive testing, and no archaeology is found, that these areas would be considered archaeologically resolved.

The programme comprised the following:

- In total (including the test trenching undertaken by IAC Ltd (License No. 19E0645), the trenches covered approximately 9–10% of Fields 2-7 (see Figure 12.11..
- Trenches were dug by a tracked excavator equipped with a 1.8 m wide toothless ditching bucket. Each trench was excavated to the surface of archaeological features, deposits or structures, or to the surface of the undisturbed natural soil or bedrock (typically less than 75cm). Topsoil was removed from the test trenches in horizontal levels of not more than 0.20 m in thickness until sterile subsoil was reached.
- Archaeological or architectural heritage features, deposits or structures be uncovered during these were cleaned by hand, investigated and recorded.
- This testing strategy was approved by the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht (License no. 21E0185 & 21R0064; see Appendix 12.6).

Figure 12.11. Additional archaeological testing as agreed with the National Monuments Service (License no. 21E0185 & 21R0064)

The testing strategy confirmed the results of the IAC testing in confirming the presence of a sub-surface enclosure in Field 2. It gave additional information regarding the nature and depth of the archaeology present, and importantly, confirmed the limits of archaeological potential around this feature. Testing also identified a second area of archaeological features in Field 3, confirming depth, nature and extent of the archaeological features present. These archaeological areas are shown as pink in Figure 12.11 and labelled Archaeological Area 1 and Archaeological Area 2 respectively.

No additional features of archaeological potential were identified in the remainder of the site (Fields 2-7). Please note that Field 1 showed evidence of previous ground disturbance and was heavily overgrown. Due to the overgrown nature of the ground, it was not possible to access the field to undertake testing.

12.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The Proposed Development site is c. 13.3 hectares of predominantly greenfield land, and includes two residential properties fronting the R135 (North Road), located to the north west of the M50 orbital ring in the townland of Johnstown and Coldwinters, North Road, Finglas, Dublin 11. The proposal comprises the demolition of two residential properties fronting the R135 (North Road), and the development of 2 no. data hall buildings arranged over three storeys and associated structures and infrastructure.

Vehicular and pedestrian entrance with associated security installations, roadways and vehicle parking. The development will be accessed from the R135 (North Road) from the east. An emergency/secondary entrance will be provided via the Roadstone Huntstown Quarry and Huntstown Power Station access road to the south-west. Temporary access for construction works and to enable a phased delivery of the development is proposed through an existing site entrance off the North Road.

Associated structures and infrastructure including water treatment facility, sprinkler tanks, external plant equipment, emergency generators and diesel fuel storage, vehicular access roads, car and bicycle parking, attenuation ponds and sustainable urban drainage measures, underground foul and storm water drainage network, associated landscaping and boundary treatment works.

The future 220kV substation compound and subsurface grid connection will form part of a separate Strategic Infrastructure Development (SID) application to An Bord Pleanála (ABP).

A detailed description of the proposed development is presented in Chapter 2 (Description of Development) and the included planning documentation.

12.5 POTENTIAL IMPACTS OF THE DEVELOPMENT

12.5.1 Construction Phase

The archaeological, architectural and cultural heritage impact at the site can be summarised as follows:

- There are no recorded archaeological sites or monuments within the proposed development lands, as listed in the Record of Monuments and Places for Co. Dublin.
- There are thirteen recorded archaeological sites within c. 1.5km of the proposed development lands. None of these sites will be impacted, either directly or indirectly, by the proposed development works. However, they are indicative of the landscape having been densely populated since at least the Early Medieval Period (ringforts and enclosures).
- Archaeological excavations in the area in advance of development works over the past two decades has also revealed a number of significant previously unrecorded archaeological sites. The results of the excavation of these sites further indicate substantial prehistoric and medieval settlement and activity in the area.
- A desk-top survey of the lands proposed for development, particularly of aerial photography, identified the sub-surface potential remains of a bivallate ringfort. This was confirmed by geophysical survey and archaeological testing. As well as other archaeological features dating to the medieval period and potentially earlier.
- There are identified archaeological sites located within the boundary of the Proposed Development, most notably in (but not limited to) Field 2, and the Proposed Development works will have ***direct, negative and profound impacts*** on these sub-surface features.
- However, these sub-surface features would not have been known had archaeological testing not been undertaken.
- The excavation of these features in advance of the Proposed Development, although resulting in their removal, will add to the academic understanding of the history of the area through archaeological research and reporting. Therefore, the overall impact of the proposed development on the archaeological heritage is deemed to be ***neutral*** and ***not significant***, and ***long term***.
- It is possible to mitigate against the risks of encountering and impacting on archaeological or architectural features during the course of development (see Section 12.6 below).

There will be no impacts on architectural heritage associated with the Proposed Development.

12.5.2 Operational Phase

There are no potential impacts on archaeological, architectural and cultural heritage expected as a result of the operational phase of the Proposed Development.

12.6 REMEDIAL AND MITIGATION MEASURES

12.6.1 Construction Phase

In order to mitigate against the archaeological risks of developing this site and determine with certainty the financial, time and logistical costs of archaeology, a comprehensive archaeological mitigation strategy is recommended as follows:

Although considered of low archaeological risk, an archaeological monitoring brief should be implemented during construction works in Field 1 (the field in which archaeological testing was not possible). If it is confirmed that this field has been subjected to disturbance in past such that the risk of encountering archaeology in negligible, then further monitoring in this field will not be required.

Archaeological excavation and preservation by record of features, deposits or structured identified is recommended, under license to the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht. This covers the archaeological features encountered to date, as shown as Archaeological Area 1 and Archaeological Area 2 on Figure 12.11, and any further archaeological features, if encountered during the monitoring brief in Field 1.

Archaeological excavation works should comprise:

- Phase 1 archaeological excavation
- Phase 2 post-excavation analysis
- Phase 3 reporting and publication of the results.

It is recommended the archaeological excavation of features is undertaken in full, but on a phased basis to facilitate a sequential development of the Heavy Industry zoned lands.

12.6.2 Operational Phase

No mitigation measures are required for archaeological, architectural and cultural heritage during the operational phase of the Proposed Development.

12.7 PREDICTED IMPACT OF THE DEVELOPMENT

12.7.1 Construction Phase

The construction of the Proposed Development will not impact directly on any sites included in the RMP. However, the baseline survey, geophysical survey and archaeological testing has identified archaeological sites located within the boundary of the Proposed Development, most notably in (but not limited to) Field 2.

The Proposed Development works will have ***direct, negative and profound impacts*** on these sub-surface features.

However, these sub-surface features would not have been known had archaeological testing not been undertaken.

The implementation of mitigation measures detailed in Section 12.6.1, will facilitate the excavation of these features in advance of the Proposed Development. Although the excavations will result in the removal of these archaeological features, the excavation will add to the academic understanding of the history of the area through archaeological research and reporting.

Therefore, the overall impact of the proposed development on the archaeological heritage is deemed to be ***neutral*** and ***not significant***, and ***long term***.

12.7.2 Operational Phase

The operational phase of the Proposed Development is not predicted to have any impact on archaeological, architectural and cultural heritage.

12.8 MONITORING/REINSTATEMENT

No further archaeological monitoring will be required once construction is completed and the site is operational.

Reinstatement is not applicable in respect of archaeological, architectural and cultural heritage.

12.9 REFERENCES

- Byrne, F. J. 1973. Irish kings and high-kings. London: Batsford.
- Dowd, M. & Carden, R. 2016. First evidence of a Late Upper Palaeolithic human presence in Ireland. Quaternary Science Reviews 139, 158–63.
- Eogan, G., 1965. A catalogue of Irish Bronze swords. Dublin.
- Eogan, G., 1983.Hoards of the Irish Later Bronze Age. Dublin.
- Eogan, G., 1994. The Accomplished Art, Gold and Gold working in Britain and Ireland during the Bronze Age (c. 2300 - 650 BC). Oxbow Monograph **42**, Oxford.
- Harbison, P. 1992 Guide to the National and Historic Monuments of Ireland. Dublin. Gill and Macmillan.
- Harbison, P., 1968. Catalogue of Irish Early Bronze Age associated finds containing copper or bronze. *Proceedings of the Royal Irish Academy* **67C**, 35-91.
- Harbison, P., 1969a. *The daggers and the halberds of the Early Bronze Age in Ireland*. Prähitorische Bronzefunde, Abteilung **VI**, Band 1.C. H. Beck, Munich.
- Harbison, P., 1969b. *The axes of the Early Bronze Age in Ireland*. Prähitorische Bronzefunde, Abteilung **IX**, Band 1.C. H. Beck: Munich.
- Kador, T. 2007. 'Where are we going? Movement and mobility in Mesolithic research'. Internet Archaeology, (22).
- MacCotter, P. 2008. Medieval Ireland: Territorial, Political and Economic Divisions. Four Courts Press, Dublin.
- O'Kelly, M.J. 1954. Excavations and experiments in ancient Irish cooking places. Journal of the Royal Society of Antiquaries of Ireland 84, 105–55.
- Quinn, B. & Moore, D. 2009. Fulachta fiadh and the beer experiment. In M. Stanley, E. Danaher and J. Eogan (eds) Dining and Dwelling: Proceedings of a public seminar on archaeological discoveries on national road schemes, August 2008. National Roads Authority Monograph Series No.6. Dublin. National Roads Authority, 43–53.
- Raftery, B., 1983. A catalogue of Irish iron age antiquities. Marburg
- Stirling, J., 2017. Archaeological Assessment (test trenching) of a proposed Commercial/Industrial Development, Pre-Planning Assessment at Coldwinters, North County Dublin, Licence No. 17E0436
- Stout, G. & Stout, M. 1997. 'Early Landscapes: from Prehistory to Plantation' In Aalen, F.H.A et al (eds) 1997 Atlas of the Irish Rural Landscape Cork University Press

13.0 TRAFFIC AND TRANSPORTATION

13.1 INTRODUCTION

This Chapter of the EIA Report undertakes a full Traffic and Transportation Assessment (TTA) of any likely or significant impacts associated with traffic and transportation issues arising from the Proposed Development. The report presents an assessment of both the operational and construction stages in terms of vehicular, pedestrian and cycle access.

13.2 METHODOLOGY

This chapter has been prepared taking the following documents into account:

- NRA's (now TII) Traffic and Transport Assessment Guidelines (May 2014);
- Fingal County Development Plan (2017 – 2023) (FCDP);
- Design Manual for Urban Roads and Streets, DMURS, May 2019 (Department of Transport, Tourism and Sport/ Department of Environment, Community & Local Government);
- Geometric Design of Junctions (priority junctions, direct accesses, roundabouts, grade separated and compact grade separated junctions), DN-GEO-03060, (TII, June 2017).
- Greater Dublin Area Cycle Network Plan.

The methodology used to conduct the assessment includes:

- Establishing baseline conditions – The existing conditions will be recorded including existing site location and use, surrounding road network, public transport services;
- Defining the development – This includes size, use, parking, staffing, trip distribution for the construction and operational stages of the development;
- Assess the potential impact of the development on the existing local transport network and its ability to carry the development traffic;
- Mitigation measures will then be proposed to offset any impacts that may result from the development.
- As the development will be phased there will be a need to assess the traffic impact for three different scenarios – Phase 1 construction; Phase 1 operational with Phase 2 Construction; and complete development operational.

13.3 RECEIVING ENVIRONMENT

13.3.1 Existing Road Access

The existing road network within the vicinity of the application site is illustrated in Figure 13-1 and is described further below.

The existing road network around the application site is defined by:

- The R135 regional road to the east, which previously served as the N2 National Primary Road (up to 2006). This road is known locally as the North Road. It intersects with the N2 Dual carriageway at the Cherryhound Interchange to the north and forms a cul-de-sac to the south;

- The Roadstone Quarry and Huntstown Power Station access road which lies south of the site.

The N2 Dual Carriageway between the M50 Motorway and Cherryhound Interchange runs immediately east of the R135 North Road. It continues northwards from the Cherryhound Interchange as the M2 Motorway to the north of Ashbourne Co. Meath. From there, it becomes the N2 National Primary Road and continues northwards as a single carriageway road through the counties of Meath, Louth and Monaghan to the border with Northern Ireland.

The M50 3+3 lane motorway runs to the south of the site. This road provides the main circulatory ring road around Dublin.

In relation to the local road network, the application site is located to the north of the M50 motorway, west of the R135 North Road and the N2 dual carriageway.

The existing R135 North Road comprises of a single carriageway road generally of about 7.5m width with hard shoulders of varying width. The alignment essentially runs straight from the existing site entrance northwards up to the N2/M2 motorway at the Cherryhound interchange and southwards to the point at which it is severed by the M50 motorway at Finglas.

The Huntstown Quarry and Power Station access road comprises a private single carriageway road, bifurcating to two single carriageways from the R135 North Road into the respective sites.

A speed limit of 50kph applies along the existing R135 North Road and to the Quarry/Power Station access road.

Existing Site Access

The development lands are currently accessed via agricultural entrances from the R135 North Road approximately 120 metres south of the Dublin Dogs Trust site exit and also from the Quarry/Power Station access road approximately 130m west of its junction with North Road

Pedestrian Facilities

A footpath approximately 1.5m wide runs along the east side of the R135 North Road opposite the development site. This footpath connects to a pedestrian/cycle facility over the M50 to the south with onward connection with footpaths on the city side of the motorway. To the north of the development site the footpath terminates immediately south of the N2 off slip junction, with a short section continuing on the west side of the North Road to the CIE bus stop.

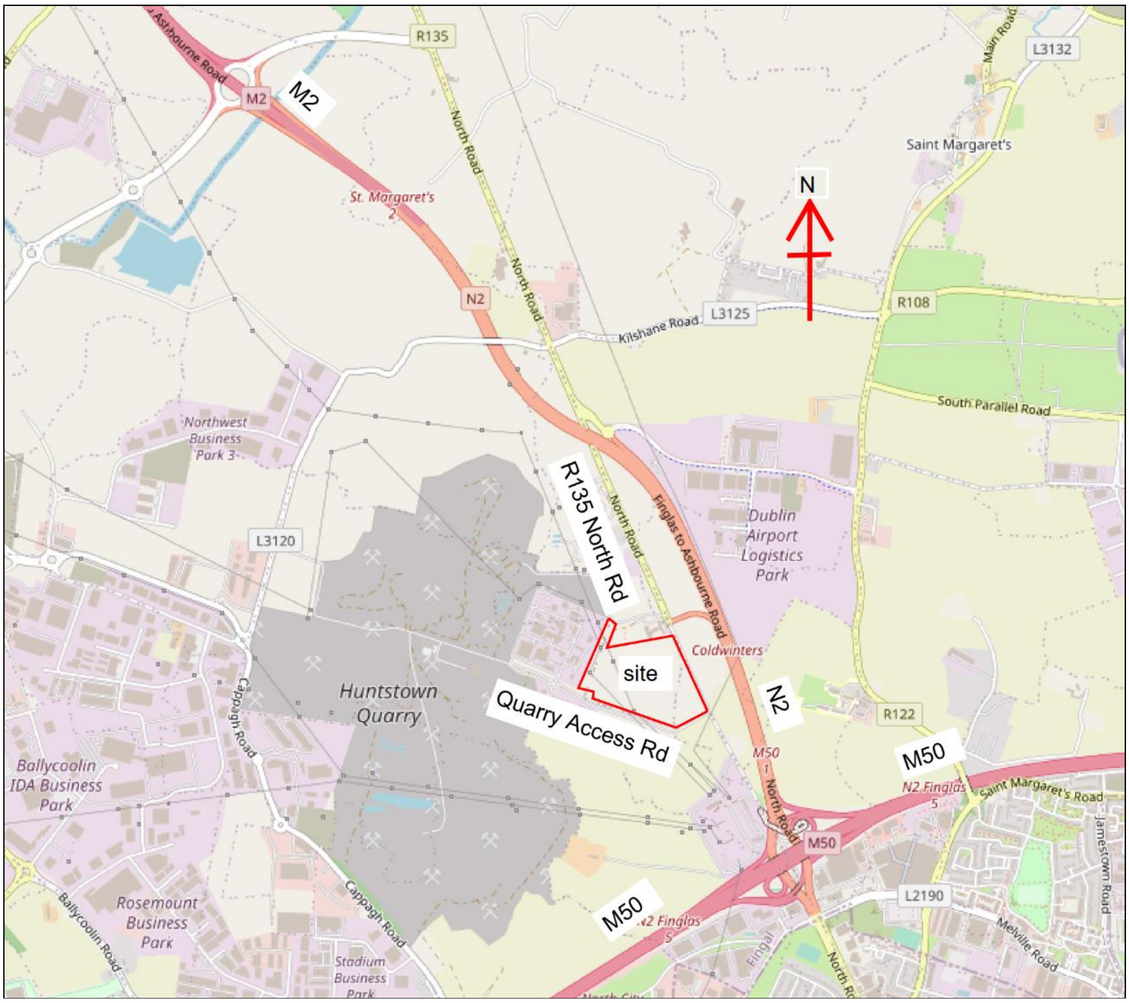

Figure 13.1 *Location Plan (Source: © Openstreetmap Contributors)*

13.3.2 Existing Public Transport

The closest bus stop to the application site is situated on the North Road, to the north of the N2 off-slip. The bus stop is a simple flag-post stop serves northbound routes which is served by the Number 103 and 105X services operated by Bus Eireann. Both of the routes that service the bus stop run from Dublin to surrounding towns and villages. A bus stop serving southbound routes is located a further one kilometre north on the R135.

The Number 103 service runs between Dublin City and Ashbourne / Ratoath. The service operates 7 days a week and begins at 06:30 in the morning and runs at approximately 20 minute intervals throughout the day until approximately midnight.

The Number 105X service runs between Ratoath and Dublin City. The service operates 5 days a week and begins at 07:00 in the morning and runs three services, city bound in the morning and return in the evenings.

As identified above the local bus service is limited; however there are regular 20 minute services available from central Dublin throughout the day, seven days per week. Individual travel by bus to the application site is therefore available as an alternative to the car.

13.3.3 Road Safety

As part of the completion of this chapter, an assessment of collision statistics as published by the Road Safety Authority (RSA) was conducted. Collision statistics for 2005-2016 were reviewed. The collision statistics give information for fatal, serious or minor collisions.

Inspection shows there have been one recorded collision recorded within the vicinity of the subject site. The results of the analysis identify one incident On the R135 North Road, the collision was recorded as a minor single motorcycle collision but does not indicate any reoccurring collision hotspots or traffic concerns with the existing road network.

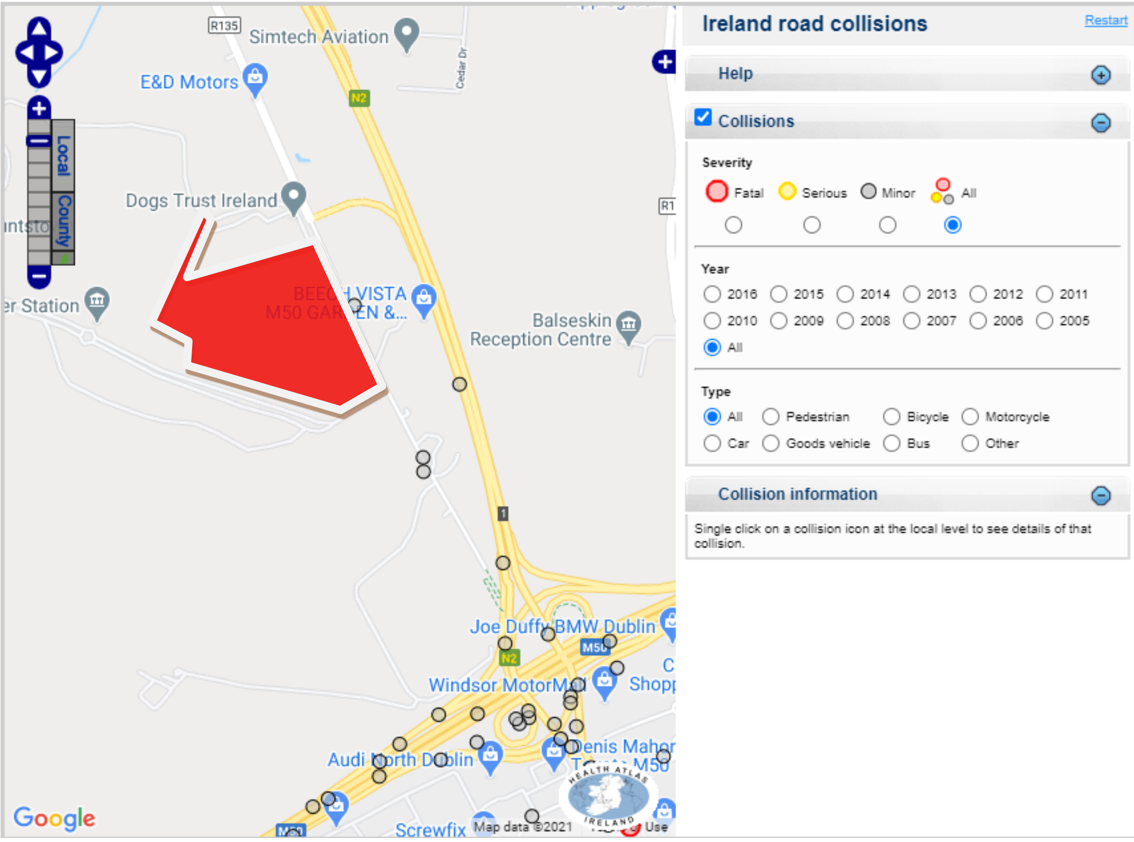

Figure 13.2 *Collision Locations*

13.3.4 Existing Traffic Flow

In order to establish the existing local road network's traffic characteristics and subsequently enable the identification of the potential impact of the proposed development, traffic surveys (weekday classified junction turning counts) were conducted over a 12hr survey period from 07:00 – 19:00 on Thursday 5th September 2019 at the following locations:

- J1 R135 / N2 Slip Road - Priority Junction
- J2 R135 / Elm Road - Signalised Junction
- J3 R135 / L3125 Kilshane Cross Roads - Signalised Junction
- J4 R135 / N2 Junction 2 Link Road - Roundabout Junction

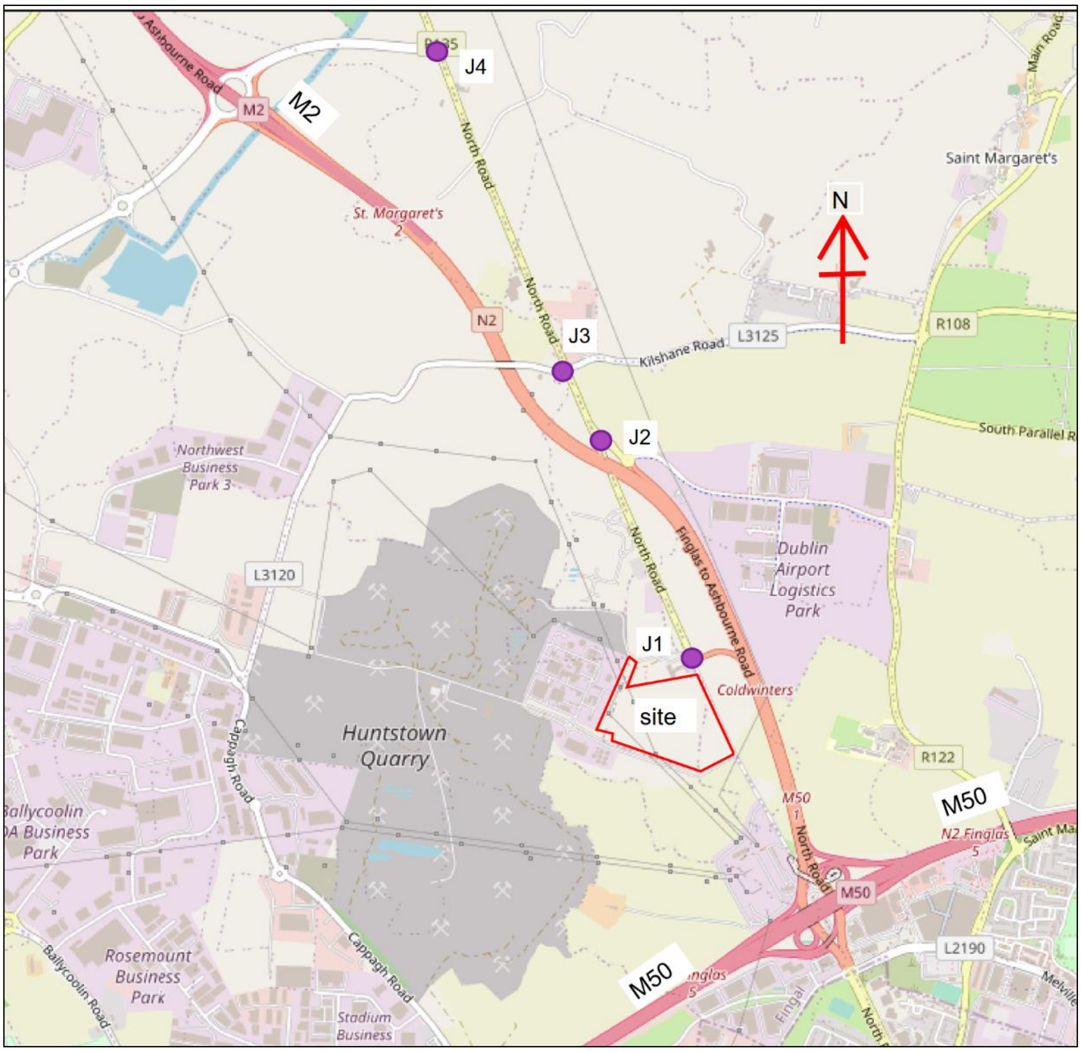

Figure 13. 3 *Traffic Survey Junction Locations. (Source: © Openstreetmap Contributors)*

The traffic survey established that the local AM and PM peak hours occur between 08.00-09.00 and 16:30 –17:30, respectively. Traffic survey information is set out in Appendix 13.1

13.3.5 Committed Development

There are a number of developments that were committed at the time of the traffic survey plus a number that have received planning permission since the survey was carried out. The following developments have been assessed in terms of committed development:

- **F16A/0128** - Rohan Holdings Ltd. Dublin Airport Logistics Park, St. Margaret's Road, St. Margaret's, Co. Dublin. Four single storey units for industrial and/or warehouse use with ancillary two storey office with a gross floor area of 15,692 square metres. This speculative development was near completion at the time of the traffic survey but not occupied.

- **F17A/0769** - Coldwinters Devco Ltd. Coldwinters, St. Margaret's, Co. Dublin. Development will consist of the construction of two single storey units for industrial and/or warehousing use with ancillary two storey offices with a gross floor area of 9422sq.m. This development was under construction at the time of the traffic survey.

- **SID/02/18 -** Irish Water. Newtown, North Road (R135), Dublin 11. Provision of 2no. biosolids storage buildings, each approximately 50m wide, 105m long and 15m in height, including solar panels on the roof of one building. These buildings have a combined capacity to store up to 48,000 cubic metres of biosolids waste at any one time.

- **FW20/0211 –** Coldwinters Devco Ltd. Lands between the N2 and R135 (north of the N2-R135 link road), at Coldwinters, St. Margaret's, Co. Dublin. The development will consist of 3 no. buildings for industrial/warehouse/logistics use (Units 3,4 and 5) with gross floor area of 24,356sq.m.

- **F18A/0146** - Killeen Properties Ltd. Newtown, Kilshane Cross, Co Dublin. A storage and distribution centre for new imported vehicles with a total capacity for 5,951 no. vehicles and comprises vehicle storage, internal circulation roadways, vehicle loading and unloading area and transporter parking spaces.

The occupation and operation of the above listed facilities will ramp up over the duration of the construction of the data centre site. For the purposes of analysis it was assumed that Nos 1-4 all are fully operational at the time of commencement of construction i.e. 2022 (the additional peak hour traffic movements associated with No 5 are negligible and will not have a significant impact on the junctions counted and are considered to be accounted for in background traffic growth). This is considered a conservative approach as it would not be expected that the developments 3 and 4 will be completed until c. 2024.

Development Under Consideration

The following development is currently under consideration by the local authority, and considered in respect of cumulative development within Chapter 16.

- **FW21A/0144 –** TLI Group. Permission has been sought for the installation of two underground cable circuits of approximately 1.2km length (110kV) and one circuit 1.2km length (38kV) and associated underground ducting, joint bays and associated infrastructure between the existing ESB Finglas substation and Huntstown Power Station.

13.3.6 Proposed Road Network Improvements

Fingal County Council has published proposals to provide a future link road, the Western Access Route, from the existing R135/N2 roundabout (J4 above) to Dublin Airport.

It is envisaged that existing traffic flows at the R135/L3125 Kilshane Crossroad signalised junction (J3 above) will significantly reduce following construction of the Western Access Route scheme as a result of re-distribution of traffic flows.

Additionally, there are improvements to the Kilshane Cross Road junction as part of development proposals by Killeen Properties (F18A/0146) which will provide additional lane on the eastern arm of the junction, together with a left filter lane and pedestrian and cyclist facility improvements. It is currently not known what the timeline is for the implementation of those works.

FCC have also identified that the N2/R135 priority junction (J1 above) has capacity issues and will require upgrading to a signalised junction in the near future.

It is also understood that consideration is being given to upgrading the existing Huntstown quarry access road/R135 North Road priority junction to a signalised facility. The background to this is to improve safety at this junction by reinforcing the flow priority on the R135 North Road.

The Greater Dublin Cycle Network Plan also provides for the implementation of an inter-urban cycle route (no. F8) along the R135 from Dublin to Ashbourne. This facility would pass along the eastern boundary of the development site. No further information regarding implementation of this proposed cycle route network is available at present.

13.4 CHARACTERISTICS OF THE DEVELOPMENT

The Proposed Development site is c. 13.3 hectares of predominantly greenfield land, and includes two residential properties fronting the R135 (North Road), located to the north west of the M50 orbital ring in the townland of Johnstown and Coldwinters, North Road, Finglas, Dublin 11. The proposal comprises the demolition of two residential properties fronting the R135 (North Road), and the development of 2 no. data hall buildings arranged over three storeys and associated structures and infrastructure.

Vehicular and pedestrian entrance with associated security installations, roadways and vehicle parking. The development will be accessed from the R135 (North Road) from the east. An emergency/secondary entrance will be provided via the Roadstone Huntstown Quarry and Huntstown Power Station access road to the south-west. Temporary access for construction works and to enable a phased delivery of the development is proposed through an existing site entrance off the North Road.

Associated structures and infrastructure including water treatment facility, sprinkler tanks, external plant equipment, emergency generators and diesel fuel storage, vehicular access roads, car and bicycle parking, attenuation ponds and sustainable urban drainage measures, underground foul and storm water drainage network, associated landscaping and boundary treatment works.

The future 220kV substation compound and subsurface grid connection will form part of a separate Strategic Infrastructure Development (SID) application to An Bord Pleanála (ABP).

A detailed description of the proposed development is presented in Chapter 2 (Description of Development) and the included planning documentation. The proposed characteristics specific to this chapter are summarised below.

13.4.1 Construction Phase

The development site comprises gently sloping farm land. Construction activities will be contained within the boundary of the site. There will be a requirement for haulage of fill material to the site, however this will be minimised through optimisation of site levels. Construction materials will need to be brought to the site as will specialist plant. It is anticipated that these deliveries will occur throughout the day.

It is proposed that a separate construction access will be provided off the R135 North Road approximately 150 metres north of the permanent site access. The access will be in the form of a priority junction and will enable the completed Phase 1 site to operate with necessary separation from the adjacent Phase 2 construction site. As visibility to this access is limited it is proposed that banksmen will be utilised for exiting traffic. The construction access is discussed further under separate Outline CEMP accompanying the application.

A dedicated onsite parking area will be provided for construction vehicles. In order to mitigate the impact of the construction traffic on the surrounding road network on site parking will be limited to 200 no. spaces. Overflow parking will be provided at an existing permitted parking area (DAA surface car park or similar such established facility) and operate as a park and ride facility for construction workers during peak construction periods. Further, the arrival of staff operatives will take place prior to 07.00 hours daily to ensure staggered start times between the Phase 1 operational workforce and the surrounding road network. Although staff will arrive early, to ensure the impact of construction traffic on the receiving environment is minimised, it is anticipated that construction works will not commence until 0800hrs.

The various phases of construction generate different thresholds of on-site construction activity and the extent of on-site construction operatives. Table 13.1 below sets out the various stages within the site and likely extent of on-site operatives and associated parking demand. During Stage 1 – Site Preparation construction operatives would be involved in setting up compounds, site clearance work, site levelling and excavation, importation of materials and engineering fill for foundation construction. During the peak construction at Stage 2 building frame and shell, siteworks and landscaping would occur – this phase would have the highest demand on parking resources. The commissioning and handover Stages 3 and 4 would involve specialist contractors and consultants accessing the site to install technical equipment. These latter phases would require lower parking demand.

Table 13.1 *Construction Stages*

Stage	Type of Work	Operative Demand	Temporary Parking Demand
1	Site Preparation	Low	Low
2	Construction	Medium to High	High
3	Commissioning	Low	Low to Medium
4	Handover	Low	Low

It is envisioned that the development will be constructed on a phased basis as follows:

- Phase 1 of development includes the construction of Building B, ancillary structures, site infrastructure and landscaping works. The substation which is subject of a separate application will be carried out in tandem with the development of Phase 1.
- Phase 2 of development includes construction of Building A.

Having regard to potential alterations at construction stage, the phasing may vary from that which is set out above (i.e. Phase 1 to include Building A, and Phase 2 to include Building B), however in such an event, it is not expected to result in a departure from the assessment and conclusions set out.

The estimated number of staff are set out as below:

Construction traffic would consist of the following:

- Private vehicles belonging to site construction staff and site security staff;
- Private vehicles belonging to professional staff (i.e. design team, utility companies);
- Delivery of building materials and equipment and removal of waste from site development works.

The following construction data has been used to estimate peak daily construction traffic:

- Average construction staff 600, with peak of 1,050 no.;
- Average cars/light vehicles per day 400, with peak of 700 no. of which up to 500 no. will use an off-site parking area – with workers being transported to and from the site by bus.
- Peak HGVs - 110 and LGVs - 30 per day with numbers spread throughout the working day – 07.00hrs to 17.00 hours.

The breakdown of start and finish times of construction staff will be as follows:

- Start 07.00 - 80%;
  08.00 - 10%
  09.00 – 10%
- Finish 15.30-16.30 - 80%;
  16.30-17.30 – 10%;
  17.30-18.30 – 10%

These figures give peak hour flows of in Table 13.2 below.

Table 13.2 *2022 Construction Traffic – Peak Hour Generation*

Type	PCU factor	AM Peak (PCU's)		PM Peak (PCU's)	
		In	Out	In	Out
Construction staff vehicles 200/day	1	20	0	0	20
Construction staff – bus	2	4	4	4	4
HGV's	2	22	22	11	11
LGV's	1	3	3	3	3
Peak Hour Totals		49	29	14	34
Two Way Traffic (PCU's)		78		48	

Construction phase work will occur over a period of approximately 36 months with Phase 1 being completed 2024 and Phase 2 2027.

Development Trip Distribution

The trip distribution for the development has been derived based on the surveyed traffic volumes at each junction under consideration.

As the R135 North Road south of the site is effectively a cul-de-sac it will be expected that all arrivals and departures will be to and from the north. The distribution of trips has been assessed on the basis of the surveyed arrivals to the R135 North Road at Junction 2. The total arrivals from the N2 Slip Road total 70% and 68% of the AM and PM peaks. Therefore for the assessment 70% of arrivals to the site will be from the N2 slip road (ie the M50/N2 south and associated road network), with 30% of all traffic arriving from R135 North Road – ie from Elm Road/Kilshane Cross roads/N2 north. It is assumed that all departures will be to destinations based on the same proportions – ie 70% to M50/N2 south, with the remainder to other destinations to the north. The turning proportions for the Junctions 2-4 are based on the relative proportions of traffic turning to and from the N135 North Road. The turning proportions are summarised in Figure 13.4 below.

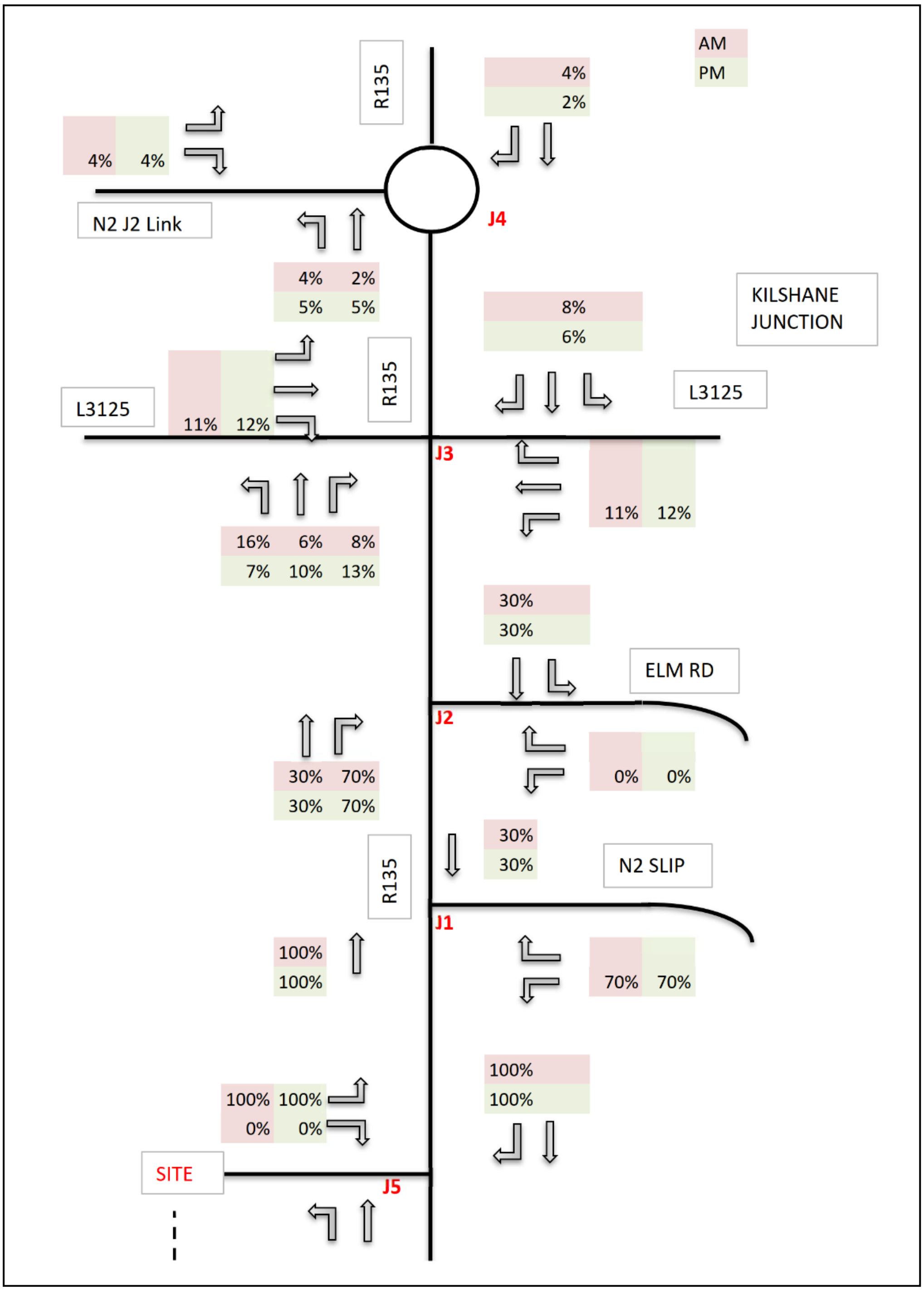

Figure 13.4 *Turning Proportions*

The resultant traffic flows are set out in the figures in Appendix 13.2.

13.4.2 Operational Phase

Access to the site will be via two no. vehicular accesses. The primary access will be via a priority junction with the R135 North Road approximately 110 metres north of the

Huntstown Quarry/Power station access road junction. The junction has been located to ensure that possible future signalisation of the North Road/Quarry access road junction can be facilitated. The proposed site access junction will be utilised for everyday use. Sightlines providing 90m x 2.4m envelope will be achieved at this junction.

A secondary access will be provided off the Quarry/Power Station exit carriageway. This junction will operate as a left-in/left-out junction only being used for access to the future substation (separate SID application) and for emergency access to the development site. A 90m x 2.4m sight envelope will be achieved at this access also.

Internal roads servicing the various buildings will be 9.0 metres wide to accommodate two-way vehicular movements together with HGV access. The main site access road will be 10 metres wide.

The secondary access will be 7.5 metres wide. 2.0m wide footpaths are provided adjacent to internal roads to facilitate connectivity.

Both data centre buildings will have a dedicated 4-bay loading facility. Swept path analyses have been carried out for articulated HGV's for assessing the loading docks within the development. These indicate that the design of the development access and it internal layout can accommodate these vehicles where required. The frequency of heavy/long vehicles is light during normal operation at an average of 1-2 vehicles per day.

Car Parking

The parking standard is presented within the FCDP Table 12.8 for a data storage facility requires a maximum of 1 space per 100m^2 GFA (maximum) of development.

It is proposed that the quantum of car parking provision is 202 no. spaces (101 per building) for the development to include for staff and visitor parking. This figure is less than the maximum permitted figure of 752 spaces. The number provided is sufficient to accommodate the peak parking demand for the site.

It is proposed to provide a total of 10 mobility spaces within the proposed site. The mobility impaired spaces exceed the requirements set out in the FDCP.

The FCDP requires notes that "*One space or more per 100 spaces should be reserved for electric vehicles with charging facilities*.'' It is proposed to provide a total of 20 no. designated Electric Vehicle parking spaces and the associated sharing points. The electric vehicle spaces have been designed in accordance with the requirements set out in the FCDP.

Cycle Parking

Table 12.9 of the FCDP requires cycle parking provision for a data centre facility at a rate of one space per 200 m^2 (minimum) with appropriate locker, shower and changing facilities. A total of 48 sheltered cycle spaces adjacent to the entrance of the buildings are provided on the basis that this number is considered to be appropriate for the staffing numbers proposed for the site. The number provided represents approximately one space per four staff members. Census figures (2016) for the area have previously established that only c.3% of workers in the area cycle to work. Cycle parking will be arranged to enable expansion of the facilities when demand increases.

Male and female changing / locker rooms complete with shower facilities have been proposed in the submitted layouts to facilitate those wishing to avail of alternative modes of transport to the development.

Traffic

At operational stage the site will be run on a 24-hour basis with varying shifts. Considering the location of the site it has been conservatively assumed that all staff will travel by private vehicle to and from site.

The breakdown of operational staff using the site, together with the shifts is in Table 13.3 below.

Table 13.3 *Operational Traffic – Peak Hour Generation*

Type	Shift	Total	AM Peak (08.00-09.00) (PCU's)		PM Peak (16.30-17.30) (PCU's)	
			In	Out	In	Out
Office/Management	08.00-17.00	98	-	-	-	98
FOC	07.00-19.00	3				
	19.00-07.00	3				
Service/Logistic	08.00-17.00	55				55
	06.00-14.30	3				
	14.30-24.00	3				
	24.00-06.00	3				
DCPS	07.00-19.00	9				
	19.00-07.00	4				
Visitors	08.00-17.00	75	8	8	4	4
Peak Hour Totals			8	8	4	157
Two Way Traffic (PCU's)			16		161	

It is proposed that the Phase 1 development will commence operation on completion in 2024. It has been assumed conservatively that the staff totals for the initial operational phase will be the same as that of the fully operational development.

The resultant traffic from this combined scenario is set out in Table 13.4 below.

Table 13.4 *2024 Phase 2 Construction Traffic + Phase 1 Operational – Peak Hour Generation*

Type	AM Peak (PCU's)		PM Peak (PCU's)	
	In	Out	In	Out
Peak Construction Traffic	49	29	14	34
Operational Traffic	8	8	4	157
Peak Hour Totals	**57**	**37**	**18**	**191**
Two Way Traffic (PCU's)	94		209	

The trip distribution will be the same proportions as set out for the construction phase above.

13.5 POTENTIAL IMPACTS OF THE DEVELOPMENT

13.5.1 Construction Phase

The delivery to site of materials will be spread throughout the day and its impact on the existing road infrastructure is considered to be negligible. All vehicles will have sufficient space within the site to manoeuvre and turn around. Parking for construction operatives will be within the site.

The impacts of site operative and construction vehicles on the peak hours on the surrounding road network will be reduced by the offset nature of trips from that of the receiving road network.

The traffic flows from the 2019 survey on the surrounding road network have been grown to 2022 rates in order to set the baseline traffic for each of the junctions that were surveyed for the peak hours. These figures were then compared to the assigned additional flows arising from the Phase 1 construction traffic.

Proportional changes in Traffic Flows

The table below sets out the total and proportional changes in peak hour traffic flows that result from the construction stage traffic at each of the surveyed junctions.

Table 13.5 *Percentage Impact on the adjacent road network – Construction Phase 1 (2022)*

Junction	Baseflow Traffic (PCU)		Additional Flow thru Junction (PCU)		Proportional Increase (%)	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
J1	1180	746	78	48	**6.6**	**6.4**
J2	1230	1147	44	38	**3.6**	**3.3**
J3	1895	1879	23	14	1.2	0.8
J4	880	997	6	4	0.6	0.4

On the basis of the TII Traffic and Transport Guidelines (May 2014), if the impact on a junction does not exceed 10% of the existing two-way traffic flow (or 5% at sensitive locations), then modelling is not required for the junction. Fingal Co Co have highlighted that some of the junctions in the vicinity of the development have capacity issues, therefore for completeness a lower threshold of 2.5% has been used in the case of Junctions 1, 2 and 3. On this basis J1 AM & PM and J2 AM & PM assessments are warranted together with J6 – the construction access.

Additionally, the impact of Phase 2 construction concurrent with Phase 1 operational traffic warrant consideration – for the intermediate 2024 year.

The resultant number of peak hour trips due to the development for the 2024 year are set out in the table below.

Table 13.6 *Percentage Impact on the adjacent road network – 2024 Phase 1 Operational + Construction Phase 2*

Junction	Baseflow Traffic (PCU)		Additional Flow thru Junction (PCU)		Proportional Increase (%)	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
J1	1180	746	94	209	**8.0**	**28.0**
J2	1230	1147	54	196	**4.4**	**17.1**
J3	1895	1879	28	63	1.5	**3.3**
J4	880	997	7	20	0.8	2.0

On the basis of the lower threshold of 2.5% described above J1 AM and PM, J2 AM and PM, J3 PM assessments are carried out together with J5 and J6 – the respective operational and construction accesses.

It should also be noted that permitted restoration works at the adjacent Huntstown Quarry are anticipated to be complete by 2023, which represents some 1.5 million tonnes of material currently being transported along the R135 per annum, being removed from the local road network by the time that this phase of works at the development occurs. However no account of this decrease has been considered in the assessments of the junctions.

13.5.2 Junction Assessments

Junction 1

The operational assessment of the local road network at Junction 1 – R135 North Road/ N2 Off Slip priority junction was undertaken using the Transport Research Laboratory (TRL) Junctions 9 for non-signalised junctions. Full output from all junction assessments is set out in Appendix 13.3.

Table 13.7 *Junction 1 – Construction Phases Junction Assessment*

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	Network Residual Capacity	Queue (PCU)	Delay (s)	RFC	Network Residual Capacity
2022 Do Nothing								
Stream B-C	38.2	517	1.23	-26%	1.4	11.7	0.26	16%
Stream B-A	69.4	504	1.24		10.1	18.6	0.70	
2022 Do Something								
Stream B-C	53.8	664	1.30	-28%	0.4	12.5	0.29	14%
Stream B-A	88.3	628	1.31		2.4	20.0	0.71	
2024 Do Nothing								
Stream B-C	48.4	641	1.28	-28%	1.2	13.0	0.29	12%
Stream B-A	87.9	629	1.30		12.7	20.9	0.73	
2024 Do Something								
Stream B-C	68.3	816	1.36	-31%	0.6	17.1	0.37	4%
Stream B-A	110.5	808	1.37		3.4	28.1	0.79	

Where

- Arm A – R135 N
- Arm B – N2 Slip
- Arm C – R135 S

The parameters shown in the tables are defined as follows:

- **Ratio of Flow to Capacity (RFC)** is a factor indicating the flow on a junction arm relative to its capacity. An RFC of 1.0 means the junction has reached its ultimate capacity and an RFC of 0.85 means that the junction has reached its reserve capacity.
- **Queue** is the average number of vehicles queued over the time period on the junction approach.
- **Queue delay** is the maximum value of average delay per arriving vehicle.
- **Network Residual Capacity** indicates the amount by which network flow could be increased before a threshold of 0.85 RFC is met.

From the above assessment it can be seen that Junction 1 without development is overcapacity during the AM peak. This results in queuing on the N2 off slip which is consistent with Fingal Co Co Traffic section comments. The junction modelling assumes that a single lane is utilised up to the yield line. However, the width between kerbs totals 6 metres so the length of total queuing may be lower. The relative decrease in network residual capacity however due to the development traffic is small.

For the PM peak the junction will operate within capacity for both the Phase 1 construction and Phase 2 construction/Phase 1 operational phases.

Junction 2

Capacity assessments using the computer programme Linsig have also been carried out on the nearby signalised junction – J2 R135 / Elm Road

Table 13.8: *Junction 2 – Construction Phase Junction Assessment*

Arm	AM			PM		
	% Saturation	Mean Max Q	PRC %	% Saturation	Mean Max Q	PRC %
2022 Do Nothing						
R135 North Left Ahead	53.9%	4.9	61.3	51.9%	6.2	73.4
Elm Road Left	2.2%	0.1		0.2%	0	
Elm Road Right	14.9%	0.7		40.6%	2.2	
R135 South Ahead Right	55.8%	7.1		51.5%	5.7	
2022 Do Something						
R135 North Left Ahead	57.5%	5.0	55.7	52.2%	6.2	67.0
Elm Road Left	2.2%	0.1		0.2%	0	
Elm Road Right	14.9%	0.7		40.6%	2.2	
R135 South Ahead Right	57.8%	7.6		53.1%	6.2	
2024 Do Nothing						
R135 North Left Ahead	56.0%	5.2	55.8	53.9%	6.5	66.8
Elm Road Left	2.2%	0.1		0.2%	0	
Elm Road Right	15.7%	0.8		41.4%	2.2	
R135 South Ahead Right	57.8%	7.3		53.3%	5.9	
2024 Do Something						
R135 North Left Ahead	60.2%	5.4	49	62.6%	7.5	41.2
Elm Road Left	2.2%	0.1		0.1%	0	
Elm Road Right	15.7%	0.8		37.6%	2.2	
R135 South Ahead Right	60.4%	8		63.7%	8.6	

The parameters shown in the tables are defined as follows:

- **Max Degree of Saturation (%)** is a ratio of demand to capacity on each approach to the junction, with a value of 100% meaning that demand and capacity are equal and no further traffic is able to progress through the junction. Values over 90% are typically regarded as suffering from traffic congestion, with queues of vehicles beginning to form.
- **Mean Max Queue at end of Red** is the number of vehicles queued on the approach arm at the end of red.
- **Practical Reserve Capacity** is the capacity available relative to a capacity of 90%. A positive PRC indicates that a junction has spare capacity and may be able to accept more traffic. A negative PRC indicates that the junction is over capacity and is suffering from traffic congestion.

From the above assessment it can be seen that Junction 2 will operate below capacity for both construction scenarios.

Junction 3

Capacity assessments using the computer programme Linsig have been carried out on nearby signalised junction - J3 R135 / L3125 Kilshane Cross

Table 13.9: *Junction 3 – Constructions Phase Junction Assessment*

Arm	AM			PM		
	% Saturation	Mean Max Q	PRC %	% Saturation	Mean Max Q	PRC %
2024 Do Nothing						
L3125 East Left Ahead Right	102.8%	41	-14.2	115.1%	67.5	-27.9
R135 South Right Left Ahead	100.4%	27.3		111.7%	48.6	
L3125 West Ahead Right Left	102.6%	23.3		113.7%	59.9	
R135 North Left	75.0%	10.5		74.1%	7.8	
R135 North Ahead Right	37.3%	4.7		74.7%	3.4	
2024 Do Something						
L3125 East Left Ahead Right	103.8%	43.8	-16.3	118.7%	75.9	-31.9
R135 South Right Left Ahead	102.6%	32.2		115.9%	65	
L3125 West Ahead Right Left	104.7%	26.4		117.8%	69.1	
R135 North Left	75.0%	10.5		74.1%	7.8	
R135 North Ahead Right	38.8%	4.8		35.0%	3.4	

From the above assessment it can be seen that Junction 3 without development is overcapacity during both the AM and PM peaks in 2024. For the Phase 2 construction/Phase 1 operational stage the relative decrease in junction reserve capacity however due to the development traffic is small in the case of the AM peak. Due to the greater proportional increase of traffic associated with the development traffic for the PM peak the decrease in reserve capacity at the junction is slightly greater. These impacts would be expected to be short term in nature.

It should be noted that the above assessment has not taken account of the proposed Western Access Road and junction improvements associated with the Killeen Development as the construction timeline is currently unknown. With the opening of the Western Access Road from the R135 / N2 roundabout to Dublin Airport, the impact on the R135 / L3125 signalised junction would reduce.

Junction 5

The operational assessment of the local road network at Junction 5 – R135 North Road/ site access priority junction was undertaken using the Transport Research Laboratory (TRL) Junctions 9 for non-signalised junctions.

Table 13.10 *Junction 5 – Construction Phase Junction Assessment*

	AM				PM			
	Queue (PCU)	**Delay (s)**	**RFC**	**Network Residual Capacity**	**Queue (PCU)**	**Delay (s)**	**RFC**	**Network Residual Capacity**
2024 Do Something								
Stream B-AC	0	6.16	0.01	226% [Stream C-AB]	0.4	8.32	0.19	131% [Stream B-AC]
Stream C-AB	0	4.27	0.02		0	5.09	0.01	

Where

- Arm A – R135 S
- Arm B – Site Access
- Arm C – R135 N

This shows that the junction will operate significantly below capacity during both the AM and PM peaks.

Junction 6

The operational assessment of the local road network at Junction 6 – R135 North Road/ site construction access priority junction was undertaken using the Transport Research Laboratory (TRL) Junctions 9 for non-signalised junctions.

Table 13.11 *Junction 6 – Construction Phases Junction Assessment*

	AM				PM			
	Queue (PCU)	**Delay (s)**	**RFC**	**Network Residual Capacity**	**Queue (PCU)**	**Delay (s)**	**RFC**	**Network Residual Capacity**
2022 Do Something								
Stream B-AC	0.1	7.0	0.06	151% [Stream C-AB]	0.1	6.9	0.07	383% [Stream B-AC]
Stream C-AB	0.3	4.6	0.12		0	5.2	0.03	
2024 Do Something								
Stream B-AC	0.1	7.1	0.06	141% [Stream C-AB]	0.1	7.5	0.07	247% [Stream B-AC]
Stream C-AB	0.3	4.6	0.13		0	5.5	0.03	

Where
- Arm A – R135 S
- Arm B – Site Access
- Arm C – R135 N

This shows that the junction will operate significantly below capacity during both the AM and PM peaks for both the 2022 and 2024 years.

13.5.3 Operational Phase

Future Year Background Traffic Growth

The operational impact of traffic on the road network with the proposed development is assessed for the following years:

2021 Baseline Year

2027 Proposed Opening Year (full development)

2032 5 years after opening

2042 Design year

Background traffic survey data was grown using rates set out in the Transport Infrastructure Ireland (TII) ‘Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (May 2019)’.

The growth rates used are as per TII document Transport Infrastructure Ireland (TII) ‘Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections (PE-PAG-02017 - May 2019) . A weighting was applied to the Central Growth Rates – for LV and HV’s on the basis of the relative proportions of these vehicle types on the local network (76% LV, 24% HV). Medium growth rates were used to generate future traffic for the year of opening and two horizon years – 5 and 15 years after opening of the development.

Table 13.12: *Traffic Growth Factors*

Period	LV Growth Rate	HV Growth Rate	Weighted Growth Rate
2016-2030	1.10162	1.0295	1.0194
2031-2040	1.0051	1.0136	1.0071
2041-2050	1.0044	1.0162	1.0072

These growth rates have been applied to a pre COVID-19 survey figures and do not account for changes to work patterns and associated reduction in traffic growth of a pre pandemic survey that would be anticipated.

Background Traffic Growth Factors

2019	1.000
2021	1.039
2022	1.059
2024	1.101
2027	1.166
2032	1.253
2042	1.346

The resultant traffic flows are set out in the figures in Appendix 13.2.

As previously noted permitted restoration works at the adjacent Huntstown Quarry are anticipated to be complete by 2023, which represents some 1.5 million tonnes of material currently being transported along the R135 per annum, being removed from the local road network by the time that the fully operational phase the development occurs. However no account of this decrease has been considered in the assessments of the junctions or the background traffic growth.

Proportional changes in Traffic Flows

The table below sets out the total and proportional changes in peak hour traffic flows that result from the construction stage traffic at each of the surveyed junctions.

Table 13.13 *Percentage Impact on the adjacent road network – Operational 2027*

Junction	Baseflow Traffic (PCU)		Additional Flow thru Junction (PCU)		Proportional Increase (%)	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
J1	1180	746	16	163	1.4	21.8
J2	1230	1147	10	160	0.8	13.9
J3	1895	1879	5	49	0.3	2.6
J4	880	997	1	16	0.1	1.6

On the basis of the TII Traffic and Transport Guidelines (May 2014), if the impact on a junction does not exceed 10% of the existing two-way traffic flow (or 5% at sensitive locations), then modelling is not required for the junction. On this basis J1 and J2 PM assessments are warranted together with J5 – the operational access.

13.5.3.1 Junction Assessments

Development traffic was derived from an assessment of the operational and maintenance staffing, together with anticipated shift patterns. It is noted that the staffing levels of data centres is relatively low overall considering the relatively large footprints that they have.

The grown background traffic was combined with development flows and added to those on the local network.

Junction 1

The operational assessment of the local road network at Junction 1 – R135 North Road/ N2 Off Slip priority junction was undertaken using the Transport Research Laboratory (TRL) Junctions 9 for non-signalised junctions in the same manner as set out in Section 13.5.2.

Table 13.14 Operational Phase Junction 1 Assessment

PM				
	Queue (PCU)	Delay (s)	RFC	Network Residual Capacity
2021 Baseline				
Stream B-C	1.4	11.16	0.24	18% [Stream B-A]
Stream B-A	9.1	17.76	0.68	
2027 Do Nothing				
Stream B-C	0.5	16.11	0.34	6% [Stream B-A]
Stream B-A	3.3	25.57	0.78	
2027 Do Something				
Stream B-C	0.7	21.16	0.41	1% [Stream B-A]
Stream B-A	4.2	33.34	0.82	
2032 Do Nothing				
Stream B-C	0.3	18.14	0.23	2% [Stream B-A]
Stream B-A	4.3	31.13	0.82	
2032 Do Something				
Stream B-C	1.7	49.22	0.43	-6% [Stream B-A]
Stream B-A	7.1	52.92	0.90	
2042 Do Nothing				
Stream B-C	3	87.49	0.81	-7% [Stream B-A]
Stream B-A	9	62.08	0.93	
2042 Do Something				
Stream B-C	6.3	170.56	0.99	-11% [Stream B-A]
Stream B-A	14.9	98.87	0.99	

Where

- Arm A – R135 N
- Arm B – N2 Slip
- Arm C – R135 S

From the above assessment it can be seen that Junction 1 without development exceeds desirable capacity only some time beyond the 2032 horizon during the PM peak.

For the PM peak the junction will operate within capacity at the opening year, but will slightly exceed reserve capacity in the 2032 horizon with ultimate capacity being exceeded in the 2042 year.

It was noted in previous sections that the local authority proposes to upgrade the junction to being signalised in response to existing capacity issues particularly during the AM peak. A sensitivity check was carried out to assess benefit of signalisation of the junction for the 2042 Do Something scenario, set out in the table below. It shows that the signalised junction would operate with sufficient capacity for scenarios up to the design year.

Table 13.15 2042 Junction 1 Signalised

Arm	AM			PM		
	% Saturation	Mean Max Q	PRC	% Saturation	Mean Max Q	PRC
R135 North Ahead	33.5%	4.9	3	7.1%	1.2	36.8
N2 Slip Right Left	87.4%	31.2		65.8%	16	
R135 South Ahead	84.9%	16.2		64.6%	14.6	

The above assessment demonstrates that signalisation of the existing priority junction would ensure sufficient operational capacity for the design year of the development.

Junction 2

Capacity assessments using the computer programme Linsig has been carried out on the J2 R135 / Elm Road signalised junction –

Table 13.16 *Operational Phase Junction 2 Assessment*

PM			
Arm	**% Saturation**	**Mean Max Q**	**PRC %**
2021 Baseline			
R135 North Left Ahead	50.9%	5.9	76.8
Elm Road Left	0.2%	0	
Elm Road Right	40.3%	2.2	
R135 South Ahead /R	50.7%	5.6	
2027 Do Nothing			
R135 North Left Ahead	57.0%	7	57.9
Elm Road Left	0.2%	0	
Elm Road Right	42.5%	2.3	
R135 South Ahead/R	56.2%	6.5	
2027 Do Something			
R135 North Left Ahead	63.4%	7.8	40.5
Elm Road Left	0.2%	0	
Elm Road Right	42.5%	2.3	
R135 South Ahead/R	64.1%	8.6	
2032 Do Nothing			
R135 North Left Ahead	59.3%	7.6	47.3
Elm Road Left	0.2%	0	
Elm Road Right	44.0%	2.4	
R135 South Ahead/R	61.1%	7.2	
2027 Do Something			
R135 North Left Ahead	68.2%	8.9	31.9
Elm Road Left	0.2%	0	
Elm Road Right	44.0%	2.4	
R135 South Ahead/R	67.4%	9.2	
2042 Do Nothing			
R135 North Left Ahead	63.7%	8.5	37.9
Elm Road Left	0.2%	0	
Elm Road Right	45.9%	2.5	
R135 South Ahead Right	65.3%	7.9	
2042 Do Something			
R135 North Left Ahead	70.5%	9.6	24.1
Elm Road Left	0.2%	0	
Elm Road Right	45.9%	2.5	
R135 South Ahead/ R	72.5%	10.1	

This shows that the junction will operate below capacity during the PM peak for all scenarios up to the 2042 design year.

Junction 5

Table 13.17 *Operational Phase Junction 5 Assessment*

	AM				PM			
	Queue (PCU)	**Delay (s)**	**RFC**	**Network Residual Capacity**	**Queue (PCU)**	**Delay (s)**	**RFC**	**Network Residual Capacity**
2027 Do Something								
Stream B-AC	0	6.24	0.02	210% [Stream C-AB]	0.4	8.4	0.29	127% [Stream B-AC]
Stream C-AB	0	4.24	0.02		0	5.08	0.01	
2032 Do Something								
Stream B-AC	0	6.33	0.02	191% [Stream C-AB]	0.4	8.52	0.29	122% [Stream B-AC]
Stream C-AB	0	4.18	0.02		0	5.28	0.01	
2042 Do Something								
Stream B-AC	0	6.41	0.02	259% [Stream C-AB]	0.4	8.65	0.29	117% [Stream B-AC]
Stream C-AB	0	4.52	0.02		0	5.28	0.01	

Where
- Arm A – R135 S
- Arm B – Site Access
- Arm C – R135 N

This shows that the junction will operate significantly below capacity during both the AM and PM peaks for all scenarios up to the 2042 design year.

13.6 REMEDIAL AND MITIGATION MEASURES

13.6.1 Construction Phase

A Construction Environmental Management Plan (CEMP) will be prepared by the contractor. This document will expand on the outline document submitted as part of this application. The plan will include measures to minimise the impacts associated with the construction phase upon the peak periods on the surrounding road network. The measures will include;

- use of site wheel cleaning facilities,
- regular cleaning of the main access road;
- surface of the car park will be prepared and finished to a standard sufficient to avoid mud spillage onto adjoining roads;
- monitoring and control of construction traffic during construction works.
- Construction Traffic Management Plan to minimise movements during peak hours.

- Material deliveries and collections from site will be planned, scheduled and staggered to avoid unnecessary build-up of construction works related traffic.

HGV trips are anticipated to arrive and depart the site at a uniform rate throughout the day, to avoid pressure on the morning and evening peak hour periods.

Where importation of fill materials are required the materials are likely to be sourced from the adjacent quarry. The routing of associated HGV's would not be via the junctions north of the site – and therefore impact on these would be reduced. However, in the assessment of the junctions a conservative approach was taken with the assumption that materials would be sourced from more distant quarries.

A limited number of contractors vehicles will be facilitated to park within the development site area, in order to mitigate the impact of traffic movements on the surrounding road network. A park and ride facility utilising an existing approved surface car park will be used to accommodate Excess construction staff vehicles with buses transiting works to and from the site.

Monitoring and control of construction traffic will be ongoing during construction works. Construction traffic will minimise movements during peak hours of the surrounding road network. Early starts on site will mitigate the impact of construction traffic on the surrounding junctions for the AM peak when the junctions in the vicinity of the site are most under capacity pressure relative to the PM peak. For Phase 2 Construction / Phase 1 Operational stage further measures such as staggering of start and finish times at each of the section of development will be used.

13.6.2 Operational Phase

The subject site will be highly accessible to staff from the surrounding road network. Pedestrians will be given priority within the internal site layout to ensure desire lines within the site are accommodated providing a good level of service and ensure the risk of vehicle/pedestrian conflict with vehicles is minimised.

Pedestrian linkages will be provided from the site footpaths to comparative facilities on the surrounding road.

The provision of one number main access locations situated at the eastern boundary of the site along the R135 North Road ensures pedestrian permeability for potential pedestrian travel desire lines to/from the site. Within the confines of the site, 2-metre wide footpaths are provided along with uncontrolled crossings by means of blister strip paving and drop kerbs at all crossing locations throughout the site.

A secondary junction on the quarry/power station access road will provide emergency access and access to the future substation.

13.7 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

13.7.1 Construction Phase

Construction works will include site levelling works at the site, and these will largely be contained within the site. There will be materials required for the building works, and deliveries will spread throughout the working day. Construction operatives will travel to and from the site, but the timing of trips will be offset from the worst peak times on the local road network. Additionally, remote off site overflow parking will be provided and will operated as a park and ride system. Additionally, construction shift times will be staggered from the peak hours of the local road network and Phase 1 operational development. Based on the assessment of the network junctions there will be slight impacts on the receiving traffic and transportation environments. The impact of construction works will be ***short term, slight and negative***.

13.7.2 Operational Phase

The proposed development will have a slight impact on the road network, in particular the junctions in the proximity of the development. Overall the impact of the development will be ***long term*** in duration of ***slight negative*** effect.

13.8 MONITORING OR REINSTATEMENT

During the construction phases monitoring of construction traffic will be carried out with a view to ensuring that movements are kept to a minimum during the peak periods on the surrounding road network. Movements will be scheduled to be concentrated during the inter peak periods. The procedures and actions will be developed through the Construction Traffic Management Plan which will be a contractual requirement.

The proposals include for the provision of a construction access. The access will be used during both of the construction phases. When all construction phase works are completed the access will be removed and the existing road kerbs and verge will be reinstated to local authority requirements.

As described in the accompanying MMP Framework document, a Mobility Management Coordinator will be appointed for the Proposed Development, with the remit to implement and oversee an ongoing Mobility Management Plan (MMP). In conjunction with this, the Mobility Manager will be responsible for monitoring the travel habits of development occupants and visitors.

An MMP is a dynamic process whereby a package of measures and campaigns is identified, piloted, and then monitored on an ongoing basis. The MMP will identify specific targets against which the effectiveness of the plan can be assessed at each review; these will typically take the form of target modal splits for journeys to and from a site. The Mobility Management Coordinator will gather data on travel patterns, for instance by conducting periodic travel surveys of development occupants.

14.0 MATERIAL ASSETS

14.1 INTRODUCTION

This chapter prepared evaluates the potential impacts, from the proposed development on Material Assets as defined in the EPA Guidelines '*Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports* (EPA, 2017), Advice Notes *Draft Advice Notes for Preparing Environmental Impact Statements* (EPA, 2015), and *European Commission Guidance on Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report* (2017)

14.2 METHODOLOGY

The Directive 2011/92/EU defined Material Assets as '*resources that are valued and that are intrinsic to specific places; they may be of either human or natural origin'* this included architectural and archaeological heritage. The Directive 2014/52/EU included architectural and archaeological heritage as components of cultural heritage; this EIA report has also done so within in Chapter 12 Archaeological, Architectural and Cultural Heritage.

The EPA Guidelines (2017) state that material assets are taken to mean "*built services and infrastructure, roads and traffic and waste management"*. The EPA Advice Notes (2015) also gives examples of material assets including; assimilative capacity of air and water; ownership and access; and tourism and recreational infrastructure. The European Commission Guidance (2017) refers to a number of examples of material assets including buildings, other structures, mineral resources and water resources.

In this EIA Report, the impacts on some of the material assets described in the above guidance have already been considered in the following chapters and therefore these aspects will not be addressed in specific detail within this chapter.

- Chapter 5, Population and Human Health;
- Chapter 6, Land, Soils, Geology & Hydrogeology;
- Chapter 7, Hydrology;
- Chapter 9, Air Quality & Climate;
- Chapter 12, Cultural Heritage
- Chapter 13, Traffic & Transportation; and
- Chapter 15, Waste Management.

This chapter assesses ownership and access, built services and infrastructure, which have not already been addressed elsewhere in this EIA Report. The subsequent sections address built services and infrastructure. The potential impacts on built services and infrastructure, if any, are assessed in under the following subheadings:

- Land Use, Property, and Access
- Power and Electrical Supply;
- Surface water infrastructure;
- Foul drainage infrastructure;
- Water supply; and
- Telecommunications.

The associated built services and infrastructure in the vicinity of the site are summarised in the following sections; further detail is provided within the planning application documentation including details of consultation with utility suppliers.

14.3 RECEIVING ENVIRONMENT AND CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

14.3.1 Land Use, Property, and Access

The majority of the proposed development site is under third party ownership, the applicant has an options agreement between the existing landowners for future purchase of the site. A right of way exists at the secondary entrance that is to be established from the Huntstown Quarry entrance road. Letters of consent, to apply for development on the lands from the site owners are included with the planning documentation.

The proposed development site is c. 13.30 hectares of predominantly agricultural land and 2 no. existing residential properties located to the north west of the M50 orbital ring in the townland of Johnstown and Coldwinters, North Road (R135), Finglas, Dublin 11.

The lands are zoned *HI – Heavy Industry* under the *Fingal County Council Development Plan 2017-2023.* HI zoning is to facilitate opportunities for industrial uses, activities and processes that may cause or result in adverse conditions to appropriate locations. The HI zoned lands include the surrounding Huntstown Quarry and Huntstown Power Station complex. The context of the site is described further in Chapter 2 (Description of Development) and Chapter 3 (Planning and Development Context).

The site currently accessed via 3 no. existing entrances; one agricultural entrance from North Road (R135); one agricultural entrance located between the Dogs Trust (Dog Rescue and Rehoming Charity) and the existing residential properties along the R135; and 2 no. entrances associated with the existing residential properties along the R135.

It is proposed that the new development will be accessed via a newly developed entrance from the R135 located opposite an existing Home & Garden store, this will be the main entrance also serving pedestrian and cyclists. A Secondary entrance is to be established via a right-of-way from the Huntstown Quarry entrance road that will also serve the lands reserved for the future substation development. The access points are discussed further in Chapter 13 (Traffic and Transportation).

These entrances will be through an access-controlled entrance as the main buildings will be fully secured. Internal roads servicing the various buildings will accommodate two-way vehicular movements together with HGV access.

14.3.2 Power and Electrical Supply

Currently there is no significant electrical connections located within the subject site. The lands are traversed by 110kV and 38kV overhead lines. An application to divert these lines has been made by TLI Group under Planning Reg. Ref.: FW21A/0144. The site is strategically located directly to the east of the exiting Huntstown Power Station, and the existing Finglas 220 / 110 kV substation is located to the south.

A 10kV overhead line traverses the south/eastern section of the subject site (see drawing 950772-HJL-S00-ZZ-DR-A-0002). A small number of pole sets and associated cable will need to be moved. Future engagement with ESB will determine whether or not the cables will be undergrounded or remain overhead.

During construction, contractors will require power for onsite accommodation, and construction equipment /plant. The power requirements will be relatively minor. There will be a requirement for a temporary and single storey substation to be located in the south west of the site, a connection to the grid will be made subject to relevant applications and approvals.

During the operational phase the data centre, IT hardware require a consistent electrical supply to operate. Once completed is anticipated to require 150MW to operate.

As detailed in Chapter 2 (Description of the Proposed Development) the proposed development provides allowance for the installation of a new 220 kV electrical substation within the overall boundary of the site; the grid connection cable routes are proposed to be located within private land, the existing quarry road, and land within the ownership of the applicant to the adjacent 220 kV Huntstown ESB substation. This development will be subject to a Strategic Infrastructure Development (SID) application to An Bord Pleanála (ABP).

The future 220 kV electrical substation and the underground cable connections to the adjacent ESB substation will be designed to support power demand for the full development of the Proposed Development of the site and will ultimately be owned and operated by ESB Networks. A connection agreement has been reached with EirGrid for the proposed development.

The power from the primary substation will distribute underground via a private network arrangement to service the two principal buildings, water treatment plant, gate house and office areas.

In the event of a loss of power to the site diesel-powered back-up generators will be activated to provide power pending restoration of mains power.

14.3.3 Surface Water Infrastructure

The site is currently agricultural land, and stormwater currently discharges through a series of land drains into the onsite ditches and flows northwards towards the Huntstown Stream, and the Ward River. There is no existing public surface water infrastructure available on the site.

During construction run-off into excavations/earthworks cannot be prevented entirely and is largely a function of prevailing weather conditions. Earthwork operations will be carried out such that surfaces, as they are being raised, shall be designed with adequate drainage, falls and profile to control run-off and prevent ponding and flowing along with mitigation measures in place to ensure that any impacts on surface water is minimised at source. Any discharge water will be treated using a silt-buster or similar to removed suspended solids prior to discharge.

The proposed development will capture rainwater runoff from building roofs, yards and the internal road network and divert into the newly constructed gravity stormwater drainage network. There are two separate surface water drainage networks in the proposed development which flow to separate surface water attenuation basins. The attenuation basins will discharge into the existing land drain in the north-west and flow northwards towards the Huntstown Stream, and the Ward River replicating the exiting drainage regime. Prior to discharging, the surface water runoff will be reduced to the existing greenfield runoff via hydro-brake flow control or similar approved device. The proposed development will have no connection to local surface water drainage infrastructure.

The surface water network has been designed to provide sufficient capacity to contain and convey all surface water runoff associated with the 1 in 100 year event to the attenuation basins allowing for 20% climate change, following the Greater Dublin Strategic Drainage Strategy (GDSDS) guidelines. The design measures will ensure that the development does not contribute to flooding on neighbouring properties.

In addition to the management of rainwater runoff; the proposed development includes infilling existing land drain along the western side of the site and replacing with a pipe In order to facilitate the development. This existing land drain flows south to north and is proposed to be replaced with a new 900mmø pipe. This replacement pipe has been designed in accordance with OPW Guidelines that requires pipes to be capable of passing a fluvial flood flow with a 1% annual exceedance probability (AEP) or 1 in 100 year flow without significantly changing the hydraulic characteristics of the watercourse.

Further information in relation to surface water infrastructure is detailed in the Engineering Planning Report – Drainage and Water Services (Appendix 14.2) and the included drainage drawings 20_099-CSE-00-XX-DR-C–2110 to 2112, which accompanies the planning application. Further reference is made to surface water drainage and flood risk in Chapter 7 (Hydrology).

14.3.4 Foul Drainage Infrastructure

There is an existing 225mm ø foul sewer located in the R135 Regional Road to the north-east of the site.

Welfare facilities will be provided for the contractors via portable sanitary facilities within the construction compound site during the construction works. It is an anticipated that initially, waste collected by tanker and disposed of appropriately, and that temporary connections to the existing services will be established to provide service and utilities subject to relevant applications and approvals.

The effluent from the proposed development will comprise domestic sanitary waste and cooling water discharge. It is planned that domestic effluent arising from occupation of the buildings, and cooling water discharge from the data hall cooling systems will be collected in a newly constructed foul drainage network and directed to an on-site pumping station. The pumping station will feed to a rising main with the connection point off site along the R135, the details of the connection point is subject to agreement with Irish Water.

In addition to the domestic foul sewer an additional Cooling Water Drainage (CWD) drainage network is required. This sewer will collect discharge from the AHU units and flows in a northerly direction towards a site pumping station which will pump CWD flows to the Water Treatment Plant where it will be treated and re-used. Typically discharge to the CWD drainage will be approximately 17 litres/sec. CWD Network calculations are provided in Engineering Planning Report – Drainage and Water Services (CSEA, 2021) (Appendix 14.2).

The proposed development will be served by a 250mmø fire hydrant main which is connected to two proposed sprinkler tanks (Each tank has a capacity of 670m3) and associated pump houses. The fire hydrants will be provided at appropriate locations in accordance with the specialist fire protection contractors design and Fingal County Council requirements.

A pre-connection enquiry (PCE) form was submitted to Irish Water which addressed water and wastewater demand for the development. The reference number for the Pre-Connection Enquiry is CDS20004468. Irish water responded to this request on 31 March 2021 (Appendix 14.1). The PCE confirmed that the connection to the mains is feasible without infrastructure upgrade works. This is detailed further in the Engineering Planning Report – Drainage and Water Services (Appendix 14.2), and the surface water drainage drawing set, which accompanies the planning application. Further reference is made to foul water drainage in Chapter 7 (Hydrology).

14.3.5 Potable Water Supply

There is an existing 150mm diameter water main located in the R135. Irish Water are proposing updates to the network which will serve the development.

Welfare facilities (canteens, toilets etc.) will be available within the construction compound on site. Temporary connections to the existing estate services in the existing estate road will be utilised to provide service and utilities subject to relevant applications and approvals.

The proposed development shall have a requirement for water to cater for the potable demand (for drinking and sanitary facilities) as well as the water demand for the cooling system for the data hall air handling units (AHUs).

Domestic water supply demand for the proposed development has been estimated as 0.17 l/s (average demand) 0.85 l/s (peak demand).

The process water supply demand for the proposed development when temporary evaporative cooling is required has been estimated to have a peak demand of 56 l/s with the site at full load (CSEA, 2021). This estimate excludes periodic flushing and washdown. The peak process water demand will only occur during the extreme warm ambient days and as an estimate based on historical weather data for Dublin, this should be approximately 24 hours per annum. However, this maybe more if reentrainment of warm air occurs on the site, which could necessitate the requirement for additional evaporative cooling during the extreme warm ambient days. We are currently evaluating this through Computational Fluid Dynamic (CFD) simulations.

On-site storage will be provided as part of the development. Water storage (2590m3) will be provided for the evaporative cooling hours required in the worst case summer 48 hour period. The water fill from the Irish Water main can be adjusted to fill the system over this time period. Process water supply demand for the proposed development has been estimated as 4,842.4 (m3/year).

The design process considered an alternative water-cooled design technology with a significantly higher water demand. The evaporative cooling design has been chosen taking due regard to the potential impacts on water consumption; see Chapter 4 (Alternatives) for further information.

A pre-connection enquiry (PCE) form was submitted to Irish Water which addressed water and wastewater demand for the development. The reference number for the Pre-

Connection Enquiry is CDS 200004468. Irish water responded to this request on 16 March 2021 (Appendix 14.1) and have confirmed that the connection is feasible subject to additional off site upgrade works.

Irish Water has confirmed that the extent of these works include the upgrade of approx 1500m of new 450mm diameter main, and the upgrade of pumps at Ballycoolen Highlands Tower. These works located in public domain and will be undertaken by Irish Water, thus there is no requirement for third-party consent to undertake such works. The Irish Water Confirmation of Feasibility (CoF) notes that the developer is to fund a portion of the upgrade works. It is proposed to connect a new 250mmØ watermain to the proposed 450mmØ water main in the R135. These works are detailed further in the Engineering Planning Report – Drainage and Water Services (Appendix 14.2).

Water storage, is proposed to be provided for 48 hours for the evaporative cooling system. The evaporative cooling water will be sourced predominately from the mains supply with a small supplement via rainwater harvesting. The design includes rainwater harvesting system which will be used for flushing toilets etc in the office areas, and for the evaporative cooling system. The design include sprinkler tanks provided to store the firefighting water requirement. Water storage is detailed further in the Engineering Planning Report – Drainage and Water Services (Appendix 14.2).

Further detail in relation to water supply infrastructure is presented in the Engineering Planning Report – Drainage and Water Services (Appendix 14.2) and the surface water drainage drawing set, which accompanies the planning application. Further reference is made to water supply in Chapter 7 (Hydrology).

14.3.6 Telecommunications

Telecommunications including fibre required during the construction phase will be provided via a mobile connection or temporary connection to the nearby telephone network.

There are telecommunication lines in existence for telephone and broadband services in the area. A fibre optic cable distribution network will be installed with a separate incoming fibre infrastructure and provided to each building via underground fibre ducts. There are existing underground carrier ducts adjacent to the site that will be utilised for the development. The connection into the wider telecommunications network will be undertaken by a statutory telecommunications operator.

The installation of a new fibre optic cable network on the site will be carried out in accordance with best practice standards.

14.4 POTENTIAL IMPACTS OF THE PROPOSED DEVELOPMENT

14.4.1 Land Use, Property, and Access

During the construction phase there are potential short-term nuisances such as dust, noise, as well as the potential for pollution of groundwater or the existing drainage ditches associated with demolition, excavations and construction. In advance of work starting on site, the works contractor will prepare a detailed Construction Environmental Management Plan (CEMP) to manage potential nuisance impacts on nearby residential receptors. The potential impact associated with land use and property for the construction phase will be ***localised***, ***negative, not significant*** and ***short term***.

During the operational phase the proposed development is not anticipated to generated significant air (including odour), noise or water emissions during normal operating conditions; these have been discussed further in the respective EIAR chapters, Chapter 7 (Hydrology), Chapter 9 (Air Quality & Climate) and Chapter 10 (Noise and Vibration) Chapters.

The proposed development will store diesel for the emergency generators, but the volume stored will be under the thresholds for a lower tier SEVESO site. The proposed development is within the consultation distance of the adjacent Huntstown Power Station Seveso site, a Land Use Planning Assessment (Appendix 5.1) has been with the planning documentation.

The majority of the land is zoned '*HI – Heavy Industry'*, the presence of a generally low impact activity would remove uncertainly in the minds of landowners with regard to the potential of a more onerous developments on the site in the future. The proposed development represents a loss of agricultural land however in the overall context of Ireland's available agricultural land the loss is negligible.

Due to the zoning of these lands, the overall potential impact associated with land use and property for the operational phase will be a localised ***neutral, slight,*** and ***long term***.

14.4.2 Power and Electrical Supply

During construction, contractors will require power for onsite accommodation, and construction equipment/plant. The power requirements for the construction phase will be relatively minor. A construction compound and temporary power supply will be established in consultation with the utility suppler. Any excavations within the vicinity of existing electrical services will be carried out in consultation with EBS Networks to ensure there is no impact on existing users. The electrical connection should have no disruptions to the national grid during connection works.

The potential impact associated with power and electrical supply for the construction phase will be a ***neutral, imperceptible*** and ***short term.***

During operations, the proposed development will be powered through an onsite substation, the development layout allows provision for this future substation compound which together with a subsurface grid connection will form part of a separate SID application to ABP.

It has been confirmed by EirGrid through a Transmission Connection Agreement that there is sufficient power available from the existing area network to facilitate the Proposed Development. EirGrid as the national authority for the grid has the requirement to ensure that the connection will not impact or reduce the capacity available within the local network to support the neighbouring area. If there was a potential impact or inadequate capacity this would have been confirmed to the developer during consultation.

The proposed development requires an emergency generator to provide back-up power in the event of loss of the main electrical supply to ensure continuity to its customers. The potential impacts of the proposed backup generators have been addressed in Chapter 9 (Air quality and Climate) and Chapter 10 (Noise and Vibration).

As detailed in Chapter 2 (Description of the Proposed Development) details the sustainable energy measures which have been considered and incorporated into the design of the proposed development.

There is a potential impact on material assets during the operational phase of the proposed development is ***neutral, slight*** and ***long term.***

14.4.3 Surface Water Infrastructure

During the construction phase, there is potential for an increase in run-off due to the introduction of impermeable surfaces and the compaction of soils. This will reduce the infiltration capacity and increase the rate and volume of direct surface run-off. The potential impact of this is a possible increase in surface water run-off and sediment loading which could potentially impact local drainage. Run-off containing large amounts of silt can cause damage to surface water systems and receiving watercourses.

With appropriate and standard mitigation in place, as outlined in the CEMP, the potential impact on surface water for the construction phase is ***neutral imperceptible,*** and ***short term.***

The operational phase of the development represents an increase in hardstanding area that, if not properly mitigated, has the potential to cause an increase in surface water run-off and flooding offsite and downstream of the development site. In addition silty water or water contaminated with hydrocarbons can arise from hardstand areas and carparks. During operations the potential exists for chemical spills or leaks during loading, unloading, movement of chemicals and their containers within buildings on the proposed development site.

The design of the site as included measures to attenuate surface water to acceptable flows and treat stormwater prior to discharge. In addition, the design of the culvert for the western side of the site meets OPW guidance and is not anticipated to significantly change the hydraulic characteristics of the watercourse.

The potential impact associated with surface water for the operational phase is ***neutral, imperceptible, and long term.***

There is no connection to any public surface water infrastructure proposed during the construction or operational phase, there are therefore no potential impacts on the existing surface water infrastructure.

14.4.4 Foul Drainage Infrastructure

Welfare facilities will be provided for the construction workers on site during the construction works and wastewater will be of domestic origin only. The works contractor will be required to apply to Irish Water for connection to discharge any contaminated surface water which collects in excavations, if it is required. The works contractor will be obliged to comply with any conditions of the discharge license to control discharge quality and rate of flow.

The potential impact on foul drainage for the construction phase is ***negative, imperceptible,*** and ***short term.***

During the operational phase the wastewater discharged from the site will ultimately discharge to the Ringsend WWTP. Irish water have confirmed through the PCE that there is available capacity in the network.

The potential impact on foul drainage for the operational phase is ***neutral, imperceptible,*** and ***long term.***

14.4.5 Water Infrastructure

During the construction phase the general contractor will be required to provide suitable water arrangements for the construction staff either through a temporary connection agreement or delivered via road tanker. This will serve the construction compound, welfare facilities and any other construction activities for the duration of construction works on the proposed development. The construction contractor in discussion with Irish Water / Fingal County Council will ensure that any potential impact on the existing water supply network is minimised.

The potential impact on potable water infrastructure for the construction phase is ***neutral, imperceptible,*** and ***short term.***

The proposed data storage facility has considered the sustainable use of water within its design. The data halls will be air cooled by air handling units via free air cooling for the majority of the time with evaporative (adiabatic cooling) during unusual high temperature periods (temperatures typically greater than 25 degrees Celsius). During normal operation the data storage buildings will be air cooled which significantly reduces the requirement for water compared to mechanical chilling, or a fully water cooled design. The adiabatic water requirement will vary with the seasons and as the water is used for the cooling process, the discharge of cooling water will be minimal.

Irish water have confirmed through the PCE that there is available supply within the network. Irish Water is the National Authority for water management and should there have been an inadequate supply this would have been confirmed to the developer during consultation.

The potential impact on potable water infrastructure for the operational phase is ***neutral, imperceptible,*** and ***long term.***

14.4.6 Telecommunications

The proposed development will not make a connection to public network, a dedicated direct connection to services will be provided, and therefore there is no perceptible impact on the existing telecommunications infrastructure. It is assumed that there is sufficient capacity available in the network to accommodate the development, so there are no potential impacts associated with telecommunications for the proposed development for the operation phase.

There are no potential impacts associated with telecommunications for the proposed development for the construction phase.

14.5 REMEDIAL AND MITIGATION MEASURES

14.5.1 Construction Phase

Ongoing consultation with the Irish Water, EirGrid, ESB Networks, and other relevant service providers within the locality and compliance with any requirements or guidelines they may have will ensure a smooth construction schedule without disruption to local and business community. The works contractor will be obliged to put best practice measures in place to ensure that there are no interruptions to these utilities, unless this has been agreed in advance.

Coordination and consultation should be had between the project team and ESB and Irish Water and other relevant service providers within the locality as the design progresses. This is to ensure a smooth construction schedule without disruption to the local and business community. It is not anticipated that connections to these would have any significant offsite impact.

An outline Construction Environment Management Plan (CEMP) has been provided with the planning documentation, and it is anticipated that a detailed will be developed by the construction contractor this will be required to detail surface water protection measures including silt control features and measure for the management of spills. In order to mitigate any impact on surface water runoff, the new drainage network should be constructed on a phased basis and consideration will be given to the construction of temporary pipes and detention ponds, if required.

During construction liquid materials should be stored within temporary bunded areas, doubled skinned tanks or bunded containers.

14.5.2 Operational Phase

It is envisaged that consultation with the Irish Water, EirGrid, ESB Networks, and other relevant service providers within the locality and compliance with any requirements or guidelines they may have will ensure that there will be no ongoing impacts on material assets.

The stormwater system has been designed to collect rainwater runoff from the impermeable areas of the site, roofs and road/car park and directed to an appropriate SuDS and attenuation system. The discharge from site will pass through hydrocarbon interceptors to remove any hydrocarbons and screen rubbish, debris and sediment from the surface water.

No further remedial or mitigation measures are required in relation the operational phase.

14.6 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

14.6.1 Construction Phase

The works contractor will be obliged to put best practice measures to ensure that there are no interruptions to service from the existing telecommunications network, watermain, sewer and electrical grid. Any planned interruptions will be agreed in advance with the utilities suppliers. Strict quality control measures will be undertaken while laying pipes to minimise or eradicate infiltration and ex-filtration. The predicted impact will be ***neutral, imperceptible,*** and ***short term*** for the construction phase.

The implementation of mitigation measures within each chapter, and detailed in Section 14.5.1 will ensure that the predicted impacts on the material assets will be ***neutral, imperceptible,*** and ***short -term*** for the construction phase.

14.6.2 Operational Phase

It has been confirmed by EirGrid that there is sufficient power available from the existing area network for the proposed development. Therefore, there are no predicted impacts associated with power and electricity supply. There are no predicted impacts associated with telecommunications for the proposed development for the operational phase.

The operator has engaged with Irish Water and FCC to ensure that there is sufficient capacity in the public sewer and watermain to cater for the Proposed Development. Irish water have confirmed that there is adequate capacity. On-site water storage will be provided at each of the proposed data centre facilities, which buffers demand on the public watermain infrastructure. It is not anticipated that connections to these would have any significant offsite impact. The predicted impact will be ***neutral, imperceptible, and long-term*** for the operational phase.

The implementation of mitigation measures within each chapter, and detailed in Section 14.5.2 will ensure that the predicted impacts on the material assets during the operational phase will be ***neutral, imperceptible*** and ***short-term***.

14.7 MONITORING AND/OR REINSTATEMENT

Monitoring arrangements will be reached with utility suppliers. No additional monitoring or reinstatement is required.

15.0 WASTE MANAGEMENT

15.1 INTRODUCTION

This chapter has been prepared to address the potential issues associated with waste management during the construction and operational phases of the Proposed Development, in the townland of Johnstown and Coldwinters, North Road, Finglas, Dublin 11. Waste will be generated during the construction phase and to a lesser extent during the operational phase of the project.

A site-specific Construction & Demolition Waste Management Plan (C&D WMP) has been prepared to deal with waste generation during the construction phase of the proposed development and is included as Appendix 15.1. The C&D WMP has been prepared in accordance with the *Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects* (DoEHLG & NCDWC, 2006).

The C&D WMP along with the mitigation measures in Section 15.6 will ensure the sustainable management of wastes arising at the development in accordance with legislative requirements and best practice standards.

15.2 METHODOLOGY

The assessment of the impacts of the proposed development arising from the consumption of resources and the generation of waste materials, was carried out taking into account the methodology specified in relevant guidance documents (as set out in Section 15.2.1), along with an extensive document review to assist in identifying current and future requirements for waste management including national and regional waste policy, waste strategies, management plans, legislative requirements and relevant reports. A summary of the documents reviewed, and the relevant legislation, is provided in Appendix 15.1 C&D WMP.

This Chapter is based on the proposed development, as described in Chapter 2 (Description of the Development) and considers the following aspects:

- Legislative context;
- Construction phase (including site preparation, excavation and levelling); and
- Operational phase.

A desk study was carried out which includes the following tasks:

- Review of applicable policy and legislation which creates the legal framework for resource and waste management in Ireland;
- Description of the typical waste materials that will be generated during the construction and operational phases; and
- Identification of mitigation measures to prevent waste generation and promote management of waste in accordance with the waste hierarchy.

Estimates of waste generation during the construction and operational phases of the proposed development have been calculated. The waste types and estimated quantities are based on published data by the EPA in *National Waste Reports*, data recorded from similar previous developments, Irish and US EPA waste generation research.

Mitigation measures are proposed in Section 15.6 to minimise the effect of the proposed development on the environment during the construction and operational phases, to promote efficient waste segregation and to reduce the quantity of waste requiring disposal.

A detailed review of the existing ground conditions on a regional, local and site-specific scale and the environmental quality of soils which will have to be excavated to facilitate construction of the proposed development is presented and in Chapter 6 (Land, Soils, Geology and Hydrogeology).

15.2.1 Legislation and Guidance

Waste management in Ireland is subject to EU, national and regional waste legislation which defines how waste materials must be managed, transported and treated. The overarching EU legislation is the Waste Framework Directive (2008/98/EC) which is transposed into national legislation in Ireland. The cornerstone of Irish waste legislation is the Waste Management Act 1996 (as amended).

In addition, the Irish government issues policy documents which outline measures aimed to improve waste management practices in Ireland and help the country to achieve EU targets in respect of recycling and disposal of waste. The most recent policy document Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland was published in 2020 and shifts focus away from waste disposal and moves it back up the production chain. The move away from targeting national waste targets is due to the Irish and international waste context changing in the years since the launch of the previous waste management plan, “A Resource Opportunity” in 2012. The need to embed climate action in all strands of public policy aligns with the goals of the European Green Deal.

The strategy for the management of waste from the construction phase is carried out in line with the requirements of the *Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects* (DoEHLG, 2006), and the Construction and Demolition Waste Management – A Handbook for Contractors and Site Managers (CIF & FAS, 2002).

There are currently no Irish guidelines on the assessment of operational waste generation and guidance is taken from industry guidelines, British Standards and other relevant studies and reports including BS 5906:2005 Waste Management in Buildings – Code of Practice (2005), the Eastern-Midland Region Waste Management Plan 2015 – 2021 (Dublin City Council, 2015), the EPA National Waste Database Reports 1998 – 2018 and the EPA National Waste Statistics Web Resource.

15.3 RECEIVING ENVIRONMENT

The proposed development is located within the Local Authority area of Fingal County Council (FCC) as the local authority responsible for setting and administering waste management activities in the area. This is governed by the requirements set out in the *Eastern-Midlands Region (EMR) Waste Management Plan 2015 – 2021*. The EMR *Waste Management Plan* has three main overarching performance targets for waste management in the region:

- A 1% reduction per annum in the quantity of household waste generated per capita over the period of the plan;
- Achieve a recycling rate of 50% of managed municipal waste by 2020; and
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill (from 2016 onwards) in favour of higher value pre-treatment processes and indigenous recovery practices.

The Regional Plan sets out the strategic targets for waste management in the region and sets a specific target for C&D waste of "70% preparing for reuse, recycling and other recovery of construction and demolition waste" (excluding natural soils and stones and hazardous wastes) to be achieved by 2020. While this date has passed the EPA are yet to release an update on these targets. The new Waste Action Plan for a Circular Economy continues with this target of keeping the reuse, recycling and other recovery of construction and demolition waste at or above 70%.

The National Waste Statistics update published by the EPA in August 2020 identifies that Ireland's current progress against this C&D waste target is at 77% and our progress against 'Preparing for reuse and recycling of 50% by weight of household derived paper, metal, plastic & glass (includes metal and plastic estimates from household WEEE)' is at 51%. Both of these targets are required to be met by 12 December 2020 in accordance with the requirements of the Waste Framework Directive, however the EPA are yet to confirm that these were met.

The FCC Development Plan 2017 – 2023 also sets policies and objectives for the FCC area which reflect those set out in the regional waste management plan.

In terms of physical waste infrastructure, FCC no longer operates any municipal waste landfill in the area. There are a number of waste permitted and licensed facilities located in the Eastern-Midlands Waste Region for management of waste from the construction industry as well as municipal sources. These include soil recovery facilities, inert C&D waste facilities, hazardous waste treatment facilities, municipal waste landfills, material recovery facilities, waste transfer stations and two waste-to-energy facilities.

15.4 CHARACTERISTICS OF THE DEVELOPMENT

The proposed development works will include site clearance and preparation, demolition of two residential properties fronting the R135 and the development of two no. data facility buildings (Building DUB40, Building DUB41) arranged over 3 storeys and associated structures and infrastructure including a water treatment facility, sprinkler tanks, diesel generators and diesel fuel storage, associated plant, vehicular access roads, car and bicycle parking, attenuation ponds and sustainable urban drainage measures, underground foul and storm water drainage network associated landscaping and boundary treatment works.

The future substation compound on the site will form part of a separate Strategic Infrastructure Development (SID) application to An Bord Pleanála (ABP).

A detailed description of the proposed development and a site layout is presented in Chapter 2 (Description of Development) and the included planning documentation. The details of the construction and operation of the development in terms of waste management are detailed in this section.

15.4.1 Demolition Phase

There will be waste materials generated from the demolition of the 2 no. existing single storey dwellings and associated outbuildings; located along the North Road. The volume of waste generated from demolition will be more difficult to segregate than waste generated from the construction phase, as many of the building materials will be bonded together or integrated i.e. plasterboard on timber ceiling joists, steel embedded in concrete etc.

Further detail on the waste materials likely to be generated during the excavation and construction works are presented in the project-specific C&D WMP included as Appendix 15.1. The C&D WMP provides an estimate of the main waste types likely to be generated during the demolition phase of the proposed development and these are summarised in Table 15.1

Table 15.1 *Estimated off-site reuse, recycling and disposal estimates for demolition waste*

Waste Type	Tonnes	Reuse		Recycle/Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Glass	18.6	0	0.0	85	15.8	15	2.8
Concrete, Bricks, Tiles, Ceramics	105.3	30	31.6	65	68.4	5	5.3
Plasterboard	8.3	30	2.5	60	5.0	10	0.8
Asphalts	2.1	0	0.0	25	0.5	75	1.5
Metals	31.0	5	1.5	80	24.8	15	4.6
Slate	16.5	0	0.0	85	14.0	15	2.5
Timber	24.8	10	2.5	60	14.9	30	7.4
Total	**206.4**		**38.1**		**143.3**		**25.0**

15.4.2 Construction Phase

During the construction phase, waste will be produced from site preparation works and wastes will also be produced from construction activities including surplus materials such as broken or off-cuts. Waste from packaging (cardboard, plastic, timber) and oversupply of materials may also be generated.

Further detail on the waste materials likely to be generated during the excavation and construction works are presented in the project-specific C&D WMP included as Appendix 15.1.

Topsoil, Subsoil and Stones from Excavations

Site preparation, excavations and levelling works required to facilitate construction of foundations , along with the installation of underground services. The project engineers have estimated that c. 35,614 m^3 of material will require excavation, with an additional c. 12,045 m^3 associated with the future substation development located within the site boundary. It is envisaged that the majority of this material will be topsoil and will be reused on site as back fill and in landscaping berms. The estimates will be refined prior to commencement of construction.

If the material that requires removal from site is deemed to be a waste, removal and reuse/recycling/recovery/disposal of the material will be carried out in accordance with the Waste Management Act 1996 (as amended), the Waste Management (Collection Permit) Regulations 2007 (as amended) and the Waste Management (Facility Permit & Registration) Regulations 2007 (as amended). The volume of waste requiring recovery/disposal will dictate whether a Certificate of Registration is required.

In order to establish the appropriate reuse, recovery and/or disposal route for the soils and stones to be removed off-site, it will first need to be classified. Waste material will initially need to be classified as hazardous or non-hazardous in accordance with the EPA publication Waste Classification –List of Waste & Determining if Waste is Hazardous or Non-Hazardous. Environmental soil analysis will be carried out prior to removal of the material on a number of the soil samples in accordance with the requirements for acceptance of waste at landfills (Council Decision 2003/33/EC Waste Acceptance Criteria). This legislation sets limit values on landfills for acceptance of waste material based on properties of the waste including potential pollutant concentrations and leachability. It is anticipated that the surplus material will be suitable for acceptance at either inert or non-hazardous soil recovery facilities/landfills in Ireland or, in the unlikely event of hazardous material being encountered, be transported for treatment/recovery or exported abroad for disposal in suitable facilities.

In the event that any excavated material is removed off-site for reuse as a by-product (and not as a waste), it will be done in accordance with Article 27 of the *European Communities (Waste Directive) Regulations 2011*. Article 27 requires that certain conditions are met and that by-product decisions are made to the EPA via their online notification form. However, it is not currently anticipated that any excavated material will be removed offsite for reuse as a by-product. Similarly, if any soils/stones are imported onto the site from another construction site as a by-product, this will also be done in accordance with Article 27.

Construction Waste Materials

During the construction phase, some waste will be generated including surplus steel and metal materials and broken/off-cuts of timber, plasterboard, concrete, tiles, bricks, etc. Waste from packaging (cardboard, plastic, timber) and oversupply of materials are also likely to be generated. On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery. The construction contractor will be required to ensure that oversupply of materials is kept to a minimum and opportunities for reuse of suitable materials is maximised.

Waste will also be generated from construction workers e.g. organic/food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and potentially sewage sludge from temporary welfare facilities provided onsite during the construction phase. Waste printer/toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently from site offices.

The C&D WMP provides an estimate of the main waste types likely to be generated during the construction phase of the proposed development and these are summarised in Table 15.3.

Table 15.2 *Estimated off-site reuse, recycling and disposal estimates for construction waste*

Waste Type	Tonnes	Reuse		Recycle/Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D Waste	1488	10	149	80	1190	10	149
Timber	1262	40	505	55	694	5	63
Plasterboard	451	30	135	60	271	10	45
Metals	361	5	18	90	325	5	18

Waste Type	Tonnes	Reuse		Recycle/Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Concrete	271	30	81	65	176	5	14
Other (includes cabling, ducting, conduits, packaging and plastics)	676	20	135	60	406	20	135
Total	**4509**		**1023**		**3061**		**424**

It should be noted that until final materials and detailed construction methodologies have been confirmed it is difficult to predict with a high level of accuracy the construction waste that will be generated from the construction of the proposed development as the exact materials and quantities may be subject to some degree of change and variation during the construction process. However, the above estimates are considered to be the worst-case scenario.

The appointed contractor(s) will be required to prepare a detailed Construction Environmental Management Plan (CEMP) and C&D WMP prior to commencement of construction which will refine the above waste estimates.

15.4.3 Operational Phase

The proposed development will give rise to a variety of waste streams during the operational phase, i.e. when the project is completed, and fully operational. The majority of waste will be generated from packaging for equipment deliveries to the facility which is likely to be at its peak in the early months of operation but will reduce as the data halls are filled with servers and other equipment. Waste will also be generated from the occupants of the building during operations. These waste types will mainly be non-hazardous. The main non-hazardous and hazardous waste expected to be generated from the operational phase is summarised below.

All waste materials will be segregated into appropriate categories and will be stored in appropriate bins or other suitable receptacles in a designated, easily accessible area of the site. Table 15.3 below summarises the anticipated management strategy to be used for typical wastes to be generated at the data storage facilities.

Table 15.2 *Anticipated Onsite Waste Management*

Waste Type	Hazard	On-site Storage/Treatment Method (anticipated)	Method of Treatment or Disposal (offsite)
Packaging Waste	N	Segregated bins/skips	Recycle
Office Waste	N	Segregated bins/skips	Recycle
General Non-Hazardous Waste	N	Segregated bins/skips	Recovery
Empty Containers	N	Segregated bins/skips	Disposal to landfill
Kitchen Waste	N	Segregated bins for compost, mixed recyclable and general waste	Compost food waste. Recycle mixed dry recyclable waste. Recovery of other general waste
Non-hazardous WEEE	N	Segregated bins for waste electric and electronic equipment	Recovery
Landscaping waste	N	Composting bins	Composting
Waste Oil	Y	Oil drum in external waste storage area	Recovery

Waste Type	Hazard	On-site Storage/Treatment Method (anticipated)	Method of Treatment or Disposal (offsite)
Waste sludge from oil separator	Y	Storage tank connected to oil separator	Recovery or disposal
(Wet) Batteries	Y	Specialised container in waste storage area	Return to supplier
(Dry) Batteries	Y	Specialised container in waste storage area	Recovery

Hazardous Waste

Hazardous waste may be generated from batteries, contaminated drums and other packaging. If the drums are found to be unsuitable for re-use, they will be classed as a waste. Any waste classed as hazardous will be stored in a designated (bunded) area and will be removed off site by a licensed hazardous waste contractor(s).

Oil interceptors will require cleaning at stages throughout the lifetime of the facility. This will be undertaken by a licenced contractor and all wastes are to be transported offsite and disposed of appropriately.

Management of Wastes Moving Offsite

All waste leaving site will be recycled or recovered, with the exception of those waste streams where appropriate recycling facilities are currently not available.

All waste leaving the site will be transported by suitably permitted contractors and taken to suitably licensed or permitted facilities. All waste leaving the site will be recorded and copies of relevant documentation maintained.

15.5 POTENTIAL IMPACTS OF THE DEVELOPMENT

This section details the potential waste impacts associated with the proposed development.

15.5.1 Construction Phase

As detailed in Section 154, the Proposed Development will generate surplus excavated material, as well as waste from the welfare facilities and site office at the site compound.

There is a quantity of material (made ground and soils and stones) which will need to be excavated to facilitate the Proposed Development. Clean inert soils and stones excavated will be reused on site as backfill, where practical. The reuse of suitable clean inert excavated material onsite, where practical, will reduce consumption of natural quarry resources.

Surplus excavated material classified as waste will be segregated at source and transferred directly from site by a suitably permitted waste contractor(s) to suitably authorised receiving facilities. In the event that potentially contaminated material is encountered, correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on the health and safety of workers as well as on the receiving environment, both on and off-site. Contaminated material will need to be removed off-site for appropriate treatment and/or disposal. In the absence of mitigation measures the effect on the local environment is likely to be ***short term, significant,*** and ***negative***.

Waste materials generated at the site compound from the welfare facilities and site office will be temporarily stored in dedicated receptacles at the site compound pending collection by a suitably permitted waste contractor(s). The waste storage area will need to be easily accessible to waste collection vehicles.

If waste material is not managed and stored correctly on the site or at the site compound, it is likely to lead to litter or pollution issues at site, site compound and/or on adjacent properties. The knock-on effect of litter issues is the presence of vermin on the site, site compound and the surrounding areas. Waste material will be appropriately managed on site so as to avoid these issues. In the absence of mitigation measures the effect on the local environment is likely to be ***short term, significant,*** and ***negative***.

The use of non-permitted waste contractors for transportation or unauthorised receiving facilities could give rise to inappropriate management of waste and result in negative environmental impacts or pollution. In the absence of mitigation measures the effect on the local environment is likely to be ***short term, significant,*** and ***negative***.

Wastes collected by a suitably permitted contractor(s) will be transferred to suitably registered/permitted/licenced waste facilities for processing and segregation, reuse, recycling, recovery and/or disposal. There are numerous authorised waste facilities in the Leinster region which can accept non-hazardous and hazardous waste materials and acceptance of waste from the Proposed Development would be in line with daily activities at these facilities. At present, there is sufficient capacity for the acceptance of the predicted construction waste materials at facilities in the region. In the absence of mitigation measures the effect on the local environment is likely to be ***short term, significant,*** and ***negative***.

Where offsite reuse of the wastes generated is not feasible, recycling and/or recovery of the waste will be carried out where possible. Recovery and recycling of construction waste has a positive impact on sustainable resource consumption, for example where waste trees/shrubbery is mulched into a landscaping product or waste asphalt is recycled for use in new pavements. The use of recycled materials, where suitable, reduces the consumption of natural resources.

In the absence of mitigation measures the potential impact of construction waste generation from the development is considered to be ***short term, significant,*** and ***negative***.

15.5.2 Operational Phase

The potential impacts on the environment of improper, or a lack of, waste management during the operational phase would be a diversion from the priorities of the waste hierarchy which would lead to small volumes of waste being sent unnecessarily to landfill. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, significant and negative.**

The nature of the development means the generation of waste materials during the operational phase is unavoidable. Networks of waste collection, treatment, recovery and disposal infrastructure are in place in the region to manage waste efficiently from this type of development. Waste which is not suitable for recycling is typically sent for energy recovery. There are also facilities in the region for segregation of municipal recyclables which is typically exported for conversion in recycled products (e.g. paper mills and glass recycling).

If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development and on adjacent developments. The knock-on effect of litter issues is the presence of vermin within the development and the surrounding areas. However, in the absence of mitigation, the effect on the local environment is likely to be **long term, significant and negative**.

Waste contractors will be required to service the development on a regular basis to remove waste. The use of non-permitted waste contractors or unauthorised facilities could give rise to inappropriate management of waste and result in negative environmental impacts or pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. However, in the absence of mitigation, the effect on the local environment is likely to be **long term, significant and negative**.

In the absence of mitigation measures the potential impact of operational waste generation from the development is considered to be **long-term, not significant and negative.**

15.6 REMEDIAL AND MITIGATION MEASURES

This section outlines the measures that will be employed in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle the waste in such a manner as to minimise the effects on the environment.

15.6.1 Construction Phase

A project specific outline C&D WMP has been prepared in line with the requirements of the Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects guidance document issued by the Department of Environment, Heritage and Local Government (DoEHLG).

Adherence to the high-level strategy presented in the C&D WMP enclosed in Appendix 15.1 will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the construction phase of the proposed development. Prior to commencement of construction, the contractor(s) will be required to refine/update this document to detail specific measures to minimise waste generation and resource consumption and provide details of the proposed waste contractors and destinations of each waste stream.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen with an aim to 'design out waste';
- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery – it is anticipated that the following waste types, at a minimum, will be segregated:
  - Concrete rubble (including ceramics, tiles and bricks);
  - Plasterboard;
  - Metals;
  - Glass; and
  - Timber.

- Left over materials (e.g. timber off-cuts, broken concrete blocks/bricks) and any suitable construction materials shall be re-used on-site, where possible;
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A waste manager will be appointed by the main contractor(s) to ensure effective management of waste during the excavation and construction works;
- All construction staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered where possible to avoid material designated for disposal;
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licenced facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

Soil/stones will be generated from the excavations required to facilitate construction. The main contractor will endeavour to ensure that surplus material is reused on site. It is not anticipated that there will be surplus material that will require removal from site. In the event that there is excess soils/stones requiring removal from site, any nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material, which requires removal off-site.

If any of the material is to be reused on another site as by-product (and not as a waste), this will be done in accordance with Article 27 of the EC (Waste Directive) Regulations (2011) as previously referred to and detailed in the C&D WMP (Appendix 15.1).

These mitigation measures will ensure that the waste arising from the construction phase of the development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations, the Litter Pollution Act 1997 to 2009 and the EMR Waste Management Plan (2015 - 2021). It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will encourage sustainable consumption of resources.

15.6.2 Operational Phase

All waste materials will be segregated into appropriate categories and will be temporarily stored in appropriate bins or other suitable receptacles in a designated, easily accessible areas of the site.

Mitigation measures proposed to manage impacts arising from wastes generated during the operation of the proposed development are summarised below.

- On-site segregation of all waste materials into appropriate categories including (but not limited to):
    - Dry Mixed Recyclables;
    - Organic food/green waste;
    - Mixed Non-Recyclable Waste;
    - Batteries (non-hazardous and hazardous);
    - Waste electrical and electronic equipment (WEEE) including computers, printers and other ICT equipment; and

    - Cleaning chemicals (solvents, pesticides, paints, adhesives, resins, detergents, etc.).
- All waste materials will be stored in colour coded bins or other suitable receptacles in designated, easily accessible locations. Bins will be clearly labelled with the approved waste type to ensure there is no cross contamination of waste materials;
- All waste collected from the development will be reused, recycled or recovered where possible, with the exception of those waste streams where appropriate facilities are currently not available;
- All waste leaving the site will be transported by suitable permitted contractors and taken to suitably registered, permitted or licensed facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

These mitigation measures will ensure the waste arising from the development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations, the Litter Pollution Act 1997 and the EMR Waste Management Plan (2015 - 2021). It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

15.7 RESIDUAL IMPACTS OF THE PROPOSED DEVELOPMENT

This section describes the residual Impacts of the proposed development the final or intended effects which occur after the proposed mitigation measures have been implemented.

15.7.1 Construction Phase

A carefully planned approach to waste management as set out in Section 15.6.1 and adherence to the C&D WMP during the construction and demolition phase will ensure that the impact on the environment will be ***short-term, neutral*** and ***imperceptible***.

15.7.2 Operational Phase

During the operational phase, a structured approach to waste management as set out in Section 15.6.2 will promote resource efficiency and waste minimisation. Provided the mitigation measures are implemented and a high rate of reuse, recycling and recovery is achieved, the predicted impact of the operational phase on the environment will be ***long-term, neutral*** and ***imperceptible***.

15.8 MONITORING AND/OR REINSTATEMENT

15.8.1 Construction phase

The objective of setting targets for waste management is only achieved if the actual waste generation volumes are calculated and compared. This is particularly important during the construction phase where there is a potential for waste management to become secondary to progress and meeting construction schedule targets. The C&D WMP specifies the need for a waste manager to be appointed who will have responsibility to monitor the actual waste volumes being generated and to ensure that contractors and sub-contractors are segregating waste, as required. Where targets are not being met, the waste manager should identify the reasons for targets not being achieved and work to resolve any issues. Recording of waste generation during the project will enable better management of waste contractor requirements and identify trends. The data should be maintained to advise on future projects.

15.8.2 Operational phase

During the operational phase, facility management personnel should monitor waste generation volumes against the predicted waste volumes outlined earlier. There may be opportunities to reduce the equipment and number of bins required for the development where estimates have been too conservative. Reductions in equipment/bin requirements will reduce waste contractor costs. Waste legislation and FCC Waste Bye-Laws should also be consulted on a regular basis in case of any changes which may impact on waste management procedures.

15.8.3 Reinstatement

In the event that the proposed data centre development is discontinued, there is not likely to be any significant impacts on waste management at the site. Where contaminated soil is encountered and excavated at the site with the intention of removal from site for off-site treatment or disposal, a management plan should be put in place in the event that the work is stopped and the contamination is left exposed to the public and the environment.

15.9 REFERENCES

Department of Environment, Heritage and Local Government (DoEHLG) & National Construction and Demolition Waste Council (NCDWC). Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (July, 2006).

Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (Waste Framework Directive)

Waste Management Act 1996 (No. 10 of 1996) as amended. Sub-ordinate and associated legislation includes:

- European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011) as amended.
- Waste Management (Collection Permit) Regulations 2007 (S.I. No. 820 of 2007) as amended.
- Waste Management (Facility Permit and Registration) Regulations 2007 (S.I No. 821 of 2007) as amended.
- Waste Management (Licensing) Regulations 2000 (S.I No. 185 of 2000) as amended.
- European Union (Packaging) Regulations 2014 (S.I. No. 282 of 2014) as amended.
- Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997) as amended.
- Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015)
- European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014)
- European Union (Batteries and Accumulators) Regulations 2014 (S.I. No. 283 of 2014) as amended.
- Waste Management (Food Waste) Regulations 2009 (S.I. No. 508 of 2009) as amended.
- European Union (Household Food Waste and Bio-waste) Regulations 2015 (S.I. No. 191 of 2015)
- Waste Management (Hazardous Waste) Regulations 1998 (S.I. No. 163 of 1998) as amended.
- Waste Management (Shipments of Waste) Regulations 2007 (S.I. No. 419 of 2007) as amended.
- European Communities (Transfrontier Shipment of Waste) Regulations 1994 (SI 121 of 1994)
- European Communities (Shipments of Hazardous Waste exclusively within Ireland) Regulations 2011 (S.I. No. 324 of 2011)
- European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (S.I. No. 233 of 2015) as amended.

Department of the Environment, Climate and Communications (DoECC*), A Resource Opportunity – Waste Management Policy in Ireland* (2012).

Department of Communications, Climate Action and Environment. *A Waste Action Plan for a Circular Economy - Ireland's National Waste Policy 2020-2025,* (2020).

Department of Environment, Heritage and Local Government (DoEHLG). *Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects* (2006).

Construction Industry Federation (CIF)/FAS. Construction and Demolition Waste Management – A Handbook for Contractors and Site Managers (2002).

British Standard BS 5906:2005 Waste Management in Buildings – Code of Practice (2005).

Dublin City Council. Eastern-Midlands Region Waste Management Plan 2015 – 2021 (2015).

Environmental Protection Agency (EPA), National Waste Database Reports 1998 – 2012.

Environmental Protection Agency (EPA), National Waste Statistics. Accessed: https://www.epa.ie/nationalwastestatistics/

Fingal County Council (FCC), Fingal County Council Development Plan 2017 – 2023.

Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended.

Environmental Protection Agency, Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous (2015)

Council Decision 2003/33/EC, establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC.

16.0 CUMULATIVE IMPACTS

16.1 INTRODUCTION

This chapter considers the potential cumulative impact of the proposed development with any future development (as far as practically possible) on the site and the cumulative impacts with developments in the locality (including planned and permitted developments). As described in Chapter 2 (Description of the proposed development), the proposed development will comprise 2 no. data hall buildings and associated ancillary development on the site.

Cumulative impacts are those impacts that relate to incremental / additive impacts of the planned development in addition to historical, present or foreseeable future actions. 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.

Changes to the environment that are caused by activities/projects in combination with other activities/projects.

16.2 METHODOLOGY

The cumulative effects are assessed in this chapter in accordance with the most relevant guidance, including:

- EIA Directive (2011/92/EU) as amended by EIA Directive (2014/52/EU)
- Planning and Development Act 2000 (as amended)
- Planning and Development Regulations 2001 (as amended)
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government, 2018)
- Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2017)
- Guidance on the preparation of the Environmental Impact Assessment Report (European Union, 2017)
- Draft Advice Notes for Preparing Environmental Impact Statements (EPA, 2015)
- Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions, European Commission, 1999

The EPA guidelines (2017) defines cumulative impacts as "*The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects".* The guidance is clear this assessment is required because a single activity can have a minor impact on its own, however, when combined with other impacts (minor or significant), it can have a cumulative impact that is collectively significant. It may also be relevant to consider the possible potential environmental loadings resulting from the development of zoned lands in the planned project's immediate vicinity.

European Union guidance (2017) states that *"It is important to consider effects not in isolation, but together; that is, cumulatively."* Cumulative effects are changes to the environment that are caused by an action in combination with other actions. They can arise from:

- the interaction between all of the different Projects in the same area; and
- the interaction between the various impacts within a single Project

The European Union guidance (2017) is also clear that the effects to be assessed in the EIA should be determined to be significant. This ensures that effort is not wasted on insignificant effects.

This assessment considers the potential cumulative impact of the proposed development with any future development related to the application as identified within Chapter 2 (Description of Development) and the potential cumulative impact with planned and permitted developments in the locality of the site.

The potential cumulative effects are considered and assessed for each environmental aspect in Section 16.4. Where the cumulative effects are also addressed within the relevant Chapters, this has been crossed referenced as applicable.

16.3 RECEIVING ENVIRONMENT

16.3.1 Permitted Development and Existing Local Land Uses

The proposed development site is c. 13.3 hectares of predominantly greenfield land, and two residential properties fronting the R135 (North Road), located to the north west of the M50 orbital ring in the townland of Johnstown and Coldwinters, North Road, Finglas, Dublin 11.

The surrounding area is characterised by a variety of energy, industrial, commercial, quarrying, agricultural and residential uses. The subject site is generally bounded to the north by the Dogs Trust (Dog Rescue and Rehoming Charity), to the south by a vehicular entrance leading to the Huntstown Quarry and further south west by the Huntstown Renewables Bioenergy Plant, to the east by the North Road (R135) and to the west by Huntstown Power Station. Located across the R135 to the east is the existing MCD Garden centre and NPP Group Ltd (warehousing) development.

The wider area is characterised by a variety of energy, industrial, commercial, quarrying, agricultural and residential uses. The Dublin Airport Logistic Park located to the north east, Balseskin Direct Provisions Estate (reception centre for international asylum seekers) is located to the east across the N2, and an area of commercial development and Charlestown Shopping Centre is located further to the south of the M50.

The lands are zoned HI – Heavy Industry under the *Fingal County Council Development Plan 2017-2023.* HI zoning is to '*facilitate opportunities for industrial uses, activities and processes that may cause or result in adverse conditions to appropriate locations*'. The HI zoned lands include the surrounding Huntstown Quarry and Huntstown Power Station complex. The HI zoned lands are surrounded almost exclusively by GE – General Employment, with GB - Green Belt lands located to the north, as well as a small area of are of WD - Warehousing and Distribution.

As part of the assessment of the cumulative impact of the proposed development, account has been taken of any relevant developments that are currently permitted, or under construction and substantial projects for which planning has been submitted within the surrounding areas, as well as existing local land uses discussed above and shown on Figure 16.1 below.

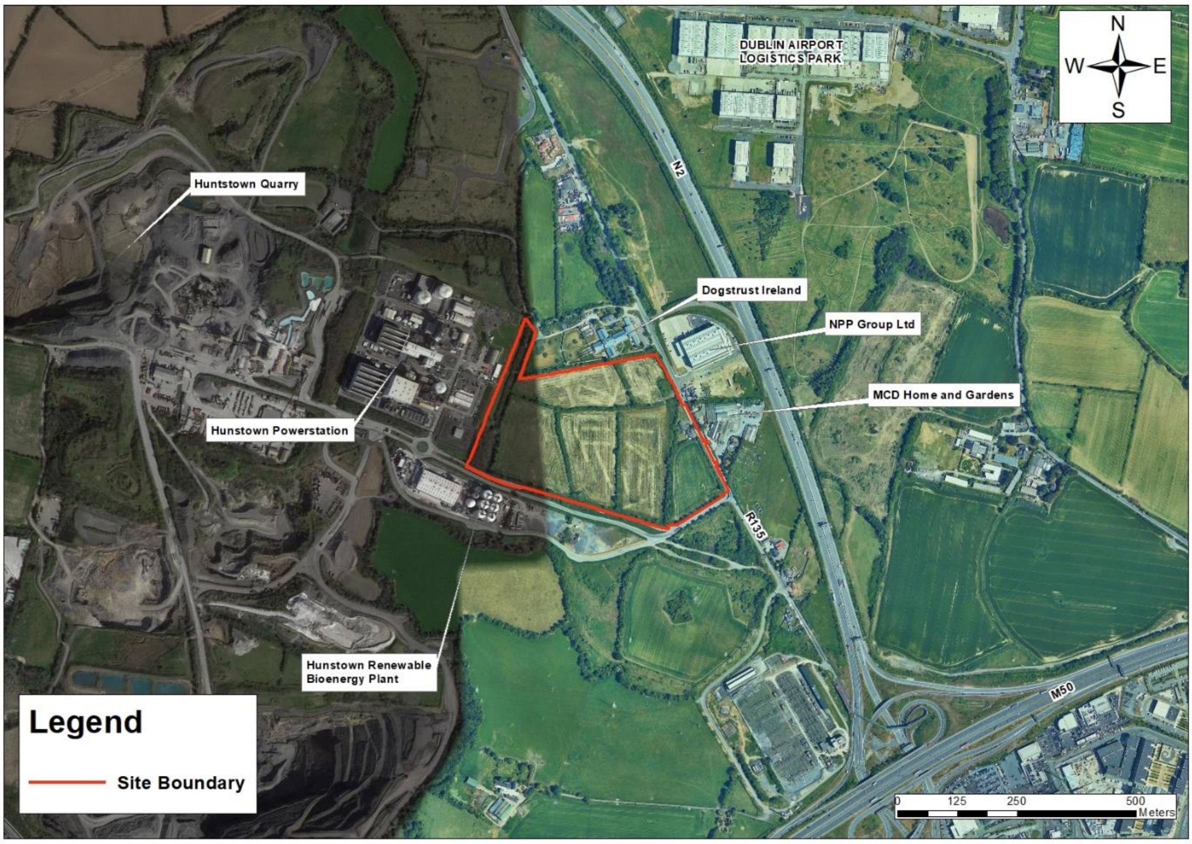

Figure 16.1 *Existing local land uses*

Permitted developments with the potential for cumulative impacts with proposed development, either under construction or not yet implemented, within the immediate vicinity of the site are listed below:

FW20/0211 – Coldwinters Devco Ltd. Lands between the N2 and R135 (north of the N2-R135 link road), at Coldwinters, St. Margarets, Co. Dublin. The development will consist of 3 no. buildings for industrial/warehouse/logistics use (Units 3,4 and 5) with gross floor area of 24,356sq.m.

SID/02/18 - Irish Water, Newtown, North Road (R135), Dublin 11. Provision of 2no. biosolids storage buildings, each approximately 50m wide, 105m long and 15m in height, including solar panels on the roof of one building. These buildings have a combined capacity to store up to 48,000 cubic metres of biosolids waste at any one time.

F18A/0146 - Killeen Properties Ltd. Newtown, Kilshane Cross, Co Dublin. A storage and distribution centre for new imported vehicles with a total capacity for 5,951 no. vehicles and comprises vehicle storage, internal circulation roadways, vehicle loading and unloading area and transporter parking spaces.

F17A/0769 - Coldwinters Devco Ltd. Coldwinters, St. Margaret's, Co. Dublin. Development will consist of the construction of two single storey units for industrial and/or warehousing use with ancillary two storey offices with a gross floor area of 9422sq.m.

F16A/0128 - Rohan Holdings Ltd. Dublin Airport Logistics Park, St. Margaret's Road, St. Margaret's, Co. Dublin. Four single storey units for industrial and/or warehouse use with ancillary two storey office with a gross floor area of 15,692 square metres.

The review of the existing and permitted development within the surrounding noted a significant number of small extensions, changes of use, retention and other minor alterations as the Dublin Airport Logistics Park and Vantage Business Park. These permissions were for established business within the vicinity of the development and have been considered as a part of the overall project impact to not be significant.

It is important to note that each project currently permitted is subject to an EIA and/or planning conditions which include appropriate mitigation measures to minimise environmental impacts. Any new development proposed on the lands after the submission of the proposed development would be accompanied by an EIA, or EIA Screening as required and the take into consideration the development of this site.

16.3.2 Concurrent Development

As described in Section 2.5 of Chapter 2 (Description of the proposed development), there is an application currently under consideration by Fingal County Council relating to the proposed development lands Reg. Ref**:** FW21A/0144. The application is for the removal of existing overhead towers and the installation of two underground cable circuits of 1.2km length (110kV) and one circuit 1.2km length (38kV) and associated underground ducting, joint bays and associated infrastructure between the existing ESB Finglas substation and Huntstown Power Station.

Subject to planning approval and based on the expected construction programme, it is proposed that the construction works for the proposed development will commence in Q1-Q2 2022. Based on the applicant's current timelines, it is unlikely that the construction of the proposed development will directly coincide with the works associated with the undergrounding of overhead line, which is expected to be scheduled between Q4 2021 and Q2 2022.

However, it is submitted that these timelines may be subject to change outside the applicant's control. In the unlikely event of construction overlap, it is likely that such an overlap would include works associated with the end stages of the undergrounding (i.e. connecting of lines and retirement of masts) and the initial site preparation of the data centre (i.e. surveying, setting out for structures, rerouting of services and setting up of the construction site with fencing, site compounds etc). In the event that there is any overlap between the construction phase of the proposed data centre and the construction phase of the undergrounding of cables, it is considered that any potential overlap would be for temporary in duration.

Due to the nature of the development i.e. underground cabling, there are no regular activities during operations, and as such unlikely to cumulatively create any potential impacts during the operations of the proposed development.

16.3.3 Future Development

16.3.3.1 Future Substation and Surface Grid Connection Development

The permanent power supply to the above Data Centre Development will be provided via a proposed new 220kV Gas Insulated Switchgear (GIS) substation in the western side of the wider landholding site. The GIS substation together with a subsurface grid connection is subject to a separate Strategic Infrastructure Development (SID) application to An Bord Pleanála.

This separate future application for the substation and subsurface grid connection will be subject to Environmental Impact Assessment as required.

Cumulative Impact – Construction Phase

Subject to planning approval and based on the expected construction programme, it is proposed that the construction works for the future substation will commence in Q4 2021, and be fully operational by Q4 2023. Therefore, it is anticipated that the construction of the proposed development will coincide with the construction and commissioning works for the substation and underground grid connection.

The overlap between the construction phase of the proposed development and the construction phase of the substation is anticipated to be ***short-term*** in duration.

Cumulative Impacts – Operational Phase

Once constructed, the future substation installation will not require regular any staff to operate it. Instead, EirGrid and ESB Networks will operate the transmission and distribution circuits remotely from their control centres in accordance with their statutory Licences. and ESB Networks will carry out any local operations on Eirgrid's behalf. ESB Networks maintenance staff will carry out a routine inspection of the asset.

Due to the nature of the development, substation and underground grid connection, there are no regular activities during operations, and unlikely to cumulatively create any potential impacts during the operations of the proposed development.

16.3.3.2 Future 10kV overhead line Diversion

A short section of 10kV overhead line traverses the south/eastern section of the subject site. A small number of pole sets and associated cable will need to be moved. Future engagement with ESB will determine whether or not the cables will be undergrounded or remain overhead.

16.4 ASSESSMENT OF POTENTIAL CUMULATIVE IMPACTS

16.4.1 Human Health and Populations

The proposed development has been designed to ensure there are no significant effects on human health during construction and operation, when taking into account the surrounding land uses and population, once appropriate mitigation measures as outlined in each chapter and summarised in the following sections of this EIA Report are implemented.

The proposed development, concurrent development and associated future development will create additional short-term employment in the area during construction phase. Any future development will be required to incorporate appropriate mitigation measures (e.g. noise management, dust management, traffic management, management of water quality in run-off water, landscape, etc) during the construction phase as such any cumulative development will not have a significant effect on human health.

As demonstrated by the noise modelling results presented in Chapter 10 (Noise and Vibration), the predicted cumulative noise emissions on the site during the operational phases are compliant with the adopted noise limit values which are based with due consideration of the effect on human health. The cumulative noise model considered the future 220kV Substation, and through the baseline noise assessment considered existing developments in the locality. In essence, the cumulative assessment in relation to noise levels that are encountered at the nearest noise sensitive locations are predicted to be within relevant noise criteria.

Aside from the proposed development and the future 220kV Substation, the permitted developments and existing facilities listed above within the vicinity of the proposed development site are considered to have a negligible impact on the local population. There is no predicted significant cumulative impact associated with the construction or operational phases of the permitted developments with the proposed development once appropriate mitigation measures are implemented.

Overall, it is concluded that once appropriate mitigation measures are put in place any cumulative effects on population and human health (in relation to quality) will be ***long-term***, ***positive*** in terms of employment and ***long-term, neutral*** in terms of environmental factors in relation to human health and and ranging from ***imperceptible*** to ***slight*** significance.

16.4.2 Land, Soils, Geology and Hydrogeology

In relation to the potential cumulative impact on the geological or hydrogeological environment during the construction phases, those key engineering works which could result in cumulative impact if not adequately mitigated include:

- The removal of topsoil and subsoil cover during construction, which will further increase the vulnerability of the underlying bedrock, and;
- Accidental spillages and leakage from construction traffic and construction materials may occur, which could result in localised contamination of soils and groundwater underlying the site.

Contractors for the proposed development will be contractually required to operate in compliance with the CEMP which includes the mitigation measures outlined in this EIA report. In respect of the other permitted developments, the concurrent development, and the future CEMP for these projects will include mitigation measures to protect soil and water quality in compliance with legislative standards for receiving water quality (European Communities Environmental Objectives (Groundwater) Regulations (S.I. 9 of 2010 and S.I. 266 of 2016). As a result, there will be minimal cumulative potential for change in soil quality or the natural groundwater regime. The cumulative impact is considered to be neutral and imperceptible.

In relation to the current Huntstown Quarry operation which lies c. 300 m to the west (i.e., downgradient), it is understood that dewatering activities are taking place at the quarry. This dewatering is likely to have a local influence on the groundwater flow within the bedrock underlying the subject site.

However, given the projected excavation depths during Construction Phase (3.5 mbgl) the bedrock aquifer will not be affected by the proposed development (only localised dewatering from the subsoils is expected to collect perched groundwater). Therefore, no cumulative effects on the groundwater regime are expected in relation to the simultaneous operation of the Huntstown Quarry and the proposed development.

In addition to the Huntstown Quarry aforementioned, there are no other large projects proposed within this area of the aquifer so no cumulative impact on recharge to the aquifer will occur. All developments are required to manage groundwater discharges in accordance with S.I. 9 of 2010 and S.I. 266 of 2016 amendments. As such there will be no cumulative impact to groundwater quality and therefore there will be no cumulative impact on the Groundwater Body Status. The operation of the proposed development is concluded to have a long-term, imperceptible significance with a neutral impact on soil and water quality.

In relation to the potential cumulative impacts from the operational stages, the following could result in a cumulative impact if not adequately mitigated:

- Overall increase in hardstanding: Cumulatively these developments will result in localised reduced recharge to ground and increase in surface water run-off.
- Accidental releases from fuel storage/unloading could contaminate groundwater or soil environments.

The proposed development, and the future 220kV Substation development will incorporate containment measures for oil tanks and include interceptors in car park areas and refuelling areas. These developments are required to ensure they do not have an impact on the receiving water environment in accordance with the relevant legislation (primarily the Local Government (Water Pollution) Act, 1977 and 1990 as amended).

The residual cumulative impacts on land, soils, geology and hydrogeology for the construction and operation phases are anticipated to be ***long-term***, ***neutral*** in terms of quality and of ***imperceptible*** significance, once the appropriate mitigation measures, such as those outlined in Chapter 6 for the proposed development, are put in place for each development on the site.

16.4.3 Hydrology

The potential for cumulative impact due to contaminated runoff impact on local surface water quality during construction is low as there is no direct hydrological pathway. The current Huntstown Quarry operation lies c. 300 m to the west (i.e., downgradient). However, this operation lies within the Tolka River sub-catchment and the subject site belongs to the Nanny Delvin Catchment (refer to Chapter 7, Section 7.3.1 for further details).

It is understood that dewatering activities are taking place at the Huntstown quarry. This dewatering is likely to have a local influence on the groundwater flow within the bedrock underlying the subject site which is not connected to the subject site, as bedrock aquifer will not be affected by the proposed development (refer to Chapter 6 for further details). Therefore there would be no hydrological connection between the two operations and no in-combination effects are expected.

Contractors for the proposed development will be contractually required to operate in compliance with the CEMP which includes the mitigation measures outlined in this EIA report. In respect of the concurrent development, and the future development the CEMP for these projects will include mitigation measures to protect water quality. These other developments will have to incorporate measures to protect water quality in compliance with legislative standards for receiving water quality (European Communities Environmental Objectives (Surface Water) Regulations (S.I. 272 of 2009 and S.I. 77 of 2019). As such there will be no cumulative impact to groundwater quality and therefore there will be no cumulative impact on the Surface Waterbody Status. As a result, there will be minimal cumulative potential for change in the natural hydrological regime. The cumulative impact is considered to be neutral and imperceptible.

During operation of the proposed development there is no potential for increase in flooding as each permitted development, concurrent and future development which receives permission from the Local Authority is required to comply with the Greater Dublin Strategic Drainage Strategy (GDSDS) and Local Authority requirements by providing suitable attenuation on site to ensure greenfield run-off rates and ensure that there is no increase in off-site flooding as a result of development. Any increased risk of accidental releases from fuel storage/delivery is mitigated adequately by incorporating bunded of all oil tanks and incorporating interceptors in car parking and fuel unloading areas. There are no other large projects proposed within this area (other than the Huntstown Quarry mentioned above) that are anticipated to have a cumulative impact on hydrological regime.

Increase in wastewater loading and water supply requirement is an impact of all development: Every development will require approval from Irish Water (IW) confirming available capacity in the water and wastewater infrastructure. The surface water and foul drainage infrastructure and water supply requirements for the permitted development has been designed to accommodate the proposed development, and the future proposed GIS Substation.

The residual cumulative impact on water and hydrology for the construction and operational phases is anticipated to be ***long-term***, ***neutral*** in terms of quality and of ***imperceptible*** significance, once appropriate mitigation measures to manage water quality runoff in compliance with legislative requirement are put in place for each development.

16.4.4 Biodiversity

As part of the Screening for an Appropriate Assessment (AA), in addition to the proposed development, other relevant projects and plans in the region must also be considered at this stage. This step aims to identify at this early stage any possible significant cumulative effects / impacts of the proposed development with other such plans and projects.

A review of the National Planning Application Database was undertaken. The first stage of this review confirmed that there were no data outages in the area where the proposed development is located. The database was then queried for developments granted planning permission within 500m of the proposed development within the last three years.

The Fingal County Development Plan (2017-2023) 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 (AA) 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 proposed development area and surrounding townlands in which the proposed development site is located, would be avoided.

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

The existing and permitted development considered in the AA Screening in combination with the proposed development will have no predicted impacts on European sites and cumulative impacts can be ruled out for both the construction and operational stages of the proposed development. The concurrent adjacent application for the removal of existing overhead towers and the installation of two underground cable circuits and the future adjacent application for a proposed new 220kV Gas Insulated Switchgear (GIS) substation have been assessed by Moore Group and reports for AA Screening report found that the proposed development will not have a significant effect on any Natura 2000 site within a 15km radius of the subject site. No in-combination effects are predicted.

16.4.5 Air Quality and Climate

There is the potential for cumulative dust emissions from the proposed development and the simultaneous construction of future developments within 350m of the site, according to the IAQM guidance (2014). As the predicted impacts to air quality and climate are deemed short-term and not significant for construction of the proposed development assuming dust mitigation measures are implemented, the cumulative impacts from simultaneous construction of the proposed development, the concurrent development, and the future developments within 350m of the site are deemed short-term and not significant with appropriate mitigation measures in place. The mitigation measures and conclusions presented in Chapter 9 will apply for the proposed development and any future developments on the site.

The cumulative impact scenario presented in Chapter 9 (Air Quality and Climate) assessed the combined operational phase impact of Buildings A and B as outlined in this chapter as well as the nearby Huntstown Power Station.

Cumulative Impact Assessment (USEPA Methodology)

The NO_2 cumulative modelling scenario involved the emergency operation of the relevant 56 no. back-up diesel generations associated with Building A and Building B for 100 hours per year as well as considering worst-case scheduled testing for all 56 no. back-up generators on site in addition to continuous operation of the Huntstown Power Station at the IED Licence limits.

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 all back-up generators lead to an ambient NO_2 concentration (including background) which is 59% of the maximum ambient 1-hour limit value (measured as a 99.8^{th} percentile) and 81% of the annual limit value at the worst-case off-site receptor.

In conclusion, the results of the cumulative impact scenario are in compliance with the relevant ambient air quality limit values at all locations at or beyond the site boundary. This results in a ***long-term***, ***slight***, ***negative*** impact to air quality.

Cumulative Impact Assessment (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 for the Cumulative Impact Scenario. This scenario involved the emergency operation of the relevant 56 no. back-up generators on the site for Buildings A and B in addition to continuous operation of the Huntstown Power Station at the IED Licence limits.

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 back-up diesel generators. The results indicate that in the worst-case year, the emergency generators for the Cumulative Scenario can operate for up to 33 hours per year 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 back-up generators which provide power on site only during an emergency power outage.

16.4.6 Noise and Vibration

During construction of the proposed development it is anticipated that construction work on the proposed development site will be the dominant noise source for the identified receptors to the east and north of the site as detailed in Section 10.1 of Chapter 10. Any construction being completed at other sites within the vicinity of the proposed development site, whilst potentially significant in their own right, will effectively be masked by the nearer noise sources on the proposed development site. Once the mitigation measures outlined in Section 10.6 of Chapter 10 are implemented there should be no significant cumulative impact with permitted, future or existing developments as a result of the proposed development.

The environmental noise survey takes account of noise emissions from existing developments. It was noted that the existing ambient noise levels in the area were dominated primarily by road traffic on the surrounding road network. The potential cumulative noise emissions during the operational phase of the proposed development together with future 220kV substation have been modelled with cumulative predicted noise levels presented in Table 10.14 and Figure 10.10 in Chapter 10. In addition a cumulative assessment, identifying expected increases in noise level is presented in Table 10.15 of Chapter 10. In terms of noise associated with day-to-day activities the associated effect is stated to be as follows, ***negative***, ***not significant*** and ***long term***."

16.4.7 Landscape and Visual Impact

Additional cumulative effects may arise from the combined effects of this scheme and other developments. The combined effects of these developments with the subject development may result in increased impacts. In relation to the subject development there are two proposals that would be currently considered to combine with this site to create a cumulative landscape and visual impact.

Most relevant is the associated Strategic Infrastructure Development application for permission to develop a substation in the south west section of the subject lands. The proposed development is located between this subject development and the existing power station. The substation building is considerably lower than the proposed data halls and will therefore not be visible in views from the surrounding area. It may be partially visible in views from the south but will read visually as a part of the built mass of the data halls and power station.

Also of consideration is the concurrent development to underground the existing overhead lines in the vicinity of the Huntstown Power Station. If the scheme is permitted and will proceed the result will be the removal of some of the visual clutter caused by the pylon structures and the powerlines in surrounding views. Whilst this on its own would result in a generally positive visual impact the resulting impact of this scheme would be to make it more visually prominent by removing some of the existing built elements from views. With this considered, the photomontages have shown the pylons and lines removed and this has been included in the resulting visual assessment.

While the schemes described above, combined with the proposed development, will further alter the landscape character and views and visual amenity in the area. The resultant impact would be consistent with existing and emerging trends and has been considered where deemed appropriate in the assessment. Therefore, the cumulative impact of this scheme and the surrounding recent developments would not significantly affect the fabric of the landscape beyond the impacts outlined in this study.

16.4.8 Archaeology and Cultural Heritage

An assessment of the potential for cumulative impacts on archaeological, architectural and cultural heritage to arise was undertaken by assessing planning applications in the vicinity of the proposed development, the concurrent development (underground grid line), and the future GIS Substation.

These developments were subject to archaeological, architectural and cultural heritage impact assessment as part of their associated environmental impact assessment and/or planning processes. Previously unrecorded archaeological features have been discovered as part of the assessment process. A method statement and license to undertake the archaeological excavation (preservation by record) of these features will be agreed with the National Monuments Service. These excavations will record (through preservation by record) these features in full, thereby contributing to the academic and cultural understanding of the area. Therefore, the cumulative impact of development is neutral and significant.

There are no potential impacts on archaeological, architectural and cultural heritage expected as a result of the operational phase of the proposed development. Therefore there are no cumulative impacts expected.

16.4.9 Traffic and Transportation

The potential for impact on transportation during construction primarily arises from additional trips due to the works associated with the development. There are permitted developments that are likely to be carried out concurrently with the construction of the development within the stated timeline. The operational traffic for those developments have been accounted for in the background traffic flows and as the construction phase traffic volumes would be higher than operational volumes, as such the generated traffic is considered to have been accounted for. There will however, be a cumulative effect from when they are added to one another.

Additionally, separate associated works for the future 220kV substation which serves the development will be constructed (subject to permission). Programming for that development will account for the peak construction associated with the development under consideration in this report to mitigate the impact. The substation development construction will share the on-site construction car parking facility which will have a limited capacity. Extra car parking demand will be facilitated at the off-site parking facility and workers will be transported by bus to the substation construction site, thus mitigating the cumulative adverse impact on the local road network.

Contractors for the proposed development will be contractually required to operate in compliance with a Construction Environmental Management Plan CEMP which will include the mitigation measures outlined in this EIA report. As a result, there will be a minimal impact on the receiving environment. The cumulative impact is considered to be ***short term, negative and slight.***

The proposed development will necessitate additional movements of vehicles on the local road network. The scheme includes measures to provide onsite cycle and pedestrian facilities to align the works with improvements for such facilities in the broader transportation environment. Development in the immediate vicinity of the site of other general development is accounted for in background traffic flows as well as growth. The operation of the future 220kV substation development will generate minimal traffic and therefore minimal cumulative impact with this development. The proposed development will have a cumulative impact on the broader transportation environment. Even accounting for background traffic growth the development will not have a significant impact capacity of the local network. The operation of the proposed development is concluded to have a ***long term, slight negative*** impact on traffic and transportation in the local environment.

16.4.10 Material Assets

The lands are zoned *HI – Heavy Industry* under the *Fingal County Council Development Plan 2017-2023.* HI zoning is to facilitate opportunities for industrial uses, activities and processes that may cause or result in adverse conditions to appropriate locations. The HI zoned lands include the surrounding Huntstown Quarry and Huntstown Power Station complex.

The proposed development entails minimal use of material assets during construction. Coordination and consultation should be had between the project team and ESB and Irish Water and other relevant service providers within the locality as the design progresses. In respect of the concurrent development, and the future development the works contractor will be obliged to put best practice measures to ensure that there are no interruptions to service from the existing telecommunications network, watermain, sewer and electrical grid. Any planned interruptions will be agreed in advance with the utilities suppliers.

Once operational, the proposed development will result in minimal impact on surface water, foul drainage and water infrastructure. The concurrent development, the removal of existing overhead towers and the installation of two underground cable circuits will have no demand on water or wastewater infrastructure and therefore no cumulative impacts. As noted in Chapter 14 a pre connection enquiry form was submitted to IW which addressed water and wastewater demand for these developments. Irish Water (IW) have confirmed that a foul water and water supply connection to IW is feasible. In respect of the future 220kV Substation has already been considered in terms of the design of the infrastructure for the proposed Development (refer to the *Engineering Services Report* prepared by CSEA). Irish Water have confirmed through the PCE (ref: CDS20004468) that there is available supply within the network. Irish Water is the National Authority for water management and should there have been an inadequate supply this would have been confirmed to the developer during consultation.

The proposed development will have a maximum operational electrical demand of 150MW. It has been confirmed by EirGrid through the Transmission Connection Agreement that there is sufficient power available from the existing area network to facilitate the proposed development. EirGrid as the national authority for the grid has the requirement to ensure that the connection will not impact or reduce the capacity available within the local network to support the neighbouring area. If there was a potential impact or inadequate capacity this would have been confirmed to the developer during consultation.

Based on the above, it is predicted that the cumulative impact of the proposed development with other permitted, planned and existing developments is considered to be ***short-term*** and ***not significant*** during the construction phase and ***long-term*** and ***not significant*** during the operational phase.

16.4.11 Waste Management

The construction of the proposed development and other surrounding, permitted, concurrent and future developments will require site clearance, excavations and levelling, which will generate a requirement for soil removal and/or import, works on these sites occurring concurrently will also generate additional C&D Waste in the local area. An increased density of construction activities in the short term will impact in respect to waste on increased traffic from waste contractors, but overall is likely to provide an improvement in the efficiencies of waste collections in the area and will be short term.

The construction of the proposed development, concurrent development and the future development within the overall landholding will require site clearance, excavations and levelling which will generate additional waste, as discussed in Chapter 15. Mitigation measures as outlined in Chapter 15 will be implemented for the proposed development alongside a project-specific Construction and Demolition Waste Management Plan (C&D WMP). The C&D WMP aims to ensure maximum recycling, re-use and recovery of waste with diversion from landfill, where possible. It also seeks to provide guidance on the appropriate collection and transport of waste to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil or water resources).

Provided mitigation measures set out in the planning permissions / EIA Reports for these developments are implemented during construction of the proposed development, the cumulative effect will be and ***neutral, not significant,*** and ***short-term***.

There are existing residential properties close by these developments which will generate similar waste types. Authorised waste contractors will be required to collect waste materials segregated, at a minimum, into recyclables, organic waste and non-recyclables. An increased density of development in the area is likely to provide an improvement in the efficiencies of waste collections in the area.

The proposed development and other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise/mitigate any potential cumulative effects associated with waste generation and waste management.

The waste quantities to be generated from the operation of the proposed development, and the future 220kV Substation within the site are anticipated to be relatively small based on the nature of the operation, as discussed in Chapter 15. The proposed development will implement the mitigation measures outlined in Chapter 15, which will ensure the waste arising from the proposed development is dealt with in compliance with the provisions of the *Waste Management Act 1996*, as amended, associated Regulations, the *Litter Pollution Act 1997* and the *EMR Waste Management Plan (2015 - 2021)*, as well as ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved. As such, the predicted impact of the operational phase will be ***long term*** and ***imperceptible***.

Other proposed or permitted developments will be required to manage waste in compliance with national and local legislation, policies and plans which will minimise/mitigate any potential cumulative impacts associated with waste generation and waste management. As such it is considered that the cumulative impact relating to waste management will be ***long-term, neutral*** and ***imperceptible.***

17.0 INTERACTIONS – INTERRELATIONSHIPS BETWEEN THE ASPECTS

17.1 INTRODUCTION

This chapter has been produced following the guidance within the EIA Directive, the *Planning and Development Act 2000* (as amended), the *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2017) and EPA Draft *Advice Notes for Preparing Environmental Impact Statements* (EPA, 2015).

In accordance with the guidance not only are the individual significant impacts required to be considered when assessing the impact of a development on the environment, but so must the interrelationships between these factors be identified and assessed.

The majority of the EIA Report chapters have already included and described assessments of potential interactions between aspects, considered by the various specialists contributing to this impact assessment. The quality, magnitude and duration of potential impacts are defined in accordance with the criteria provided in the EPA 2017 Guidance as outlined in Chapter 1 (Introduction). This section of the assessment presents a summary and assessment of the identified interactions.

Section 171A of the Planning and Development Act requires that the interactions between the following be assessed:

- Population and human health;
- Land, soil, water, air and climate;
- Biodiversity, with particular attention to species and habitats protected under the Habitats Directive and the Birds Directive; and
- Material assets, cultural heritage, and the landscape;

17.2 DISCUSSION – POSITIVE IMPACTS

The reasoning behind the interactions that are considered to have a positive effect (i.e. a change which improves the quality of the environment) is outlined in this section.

17.2.1 Planning and Alternatives on:

Population and Human Health

The proposed development will create up to 181 no. permanent full-time jobs and up to 1050 temporary jobs during the construction phase, which will have a ***long-term*, *positive*** and ***short-term, positive*** effect on employment in the local area.

17.3 DISCUSSION – NEUTRAL IMPACTS

The reasoning behind the interactions that are considered to have a neutral effect (i.e. no effects or effects that are imperceptible, within the normal bounds of variation or within the margin of forecasting error) is outlined in this section.

17.3.1 Population and Human Health and:

Land, Soils, Geology and Hydrogeology

There will be a loss of soil available for agricultural use due to the development. However, within the overall context of Ireland’s available farmland, the loss is considered negligible. The employment created by the construction and operation of the proposed development counterbalances this economic loss to some extent.

The proposed system is not anticipated to impact on domestic wells or any groundwater protection areas. The impact is ***long-term, imperceptible*** and ***neutral***.

Hydrology

The proposed development represents an increase in hardstand, the proposed sustainable drainage measures and flood risk assessment undertaken demonstrates that the development not result in offsite flooding or impact on on surface water flows in the local area.

The proposed development will generate wastewater emissions (foul water) from the site. Wastewater will be collected in a newly constructed foul drainage network discharge to the Local Authority wastewater treatment plant (WWTP) at Ringsend for offsite treatment.

There are no other interactions. The effect is considered to be ***long-term, imperceptible*** and ***neutral***.

Archaeological, Architectural and Cultural Heritage

Archaeological assessment for the proposed development has identified features of archaeological interest on the site. Further, aspects of the proposed development have the potential to impact on unidentified archaeological features during construction works. The ability to excavate these sites through the construction phase will provide data to the archaeological community from the potential subsurface sites. The potential to gain knowledge outweighs the negative impact. And the mitigation measures detailed Chapter 12 (Archaeological, Architectural and Cultural Heritage) including a comprehensive programme of archaeological excavation, will ensure that the effect is ***long-term, imperceptible*** and ***neutral***.

Material Assets, including Transport and Waste

The proposed development will have an impact on material assets such as surface water drainage, water supply, wastewater drainage, power supply and road infrastructure. The individual chapters of this EIA Report (Chapter 13 (Traffic and Transportation) and Chapter 14 (Material Assets)) have assessed the capacities of the available infrastructure to accommodate the proposed development and the implementation of the mitigation measure proposed in these chapters will ensure there are no residual negative impacts on the local population. The predicted effect is therefore ***imperceptible*** to ***not significant*** and ***neutral***.

Hydrocarbon sludge, waste, and debris will be generated in the hydrocarbon interceptors and hydrodynamic solid separator which will treat the surface water run-off from the proposed development during the operational phase. This waste stream will be managed in accordance with the relevant legislation identified in Chapter 15

(Waste Management) such that the effect of the waste generation will be ***long-term, imperceptible*** and ***neutral***.

17.3.2 Land, Soils, Geology and Hydrogeology and:

Hydrology

The main potential impact of the construction works proposed is on surface water quality (due to sediment laden run-off, material spillages) and groundwater quality (due to removal of protective soil) in the environs of the construction area; however, the implementation of a CEMP as detailed in Chapter 7 (Hydrology) will ensure the effect will be ***short-term, imperceptible,*** and ***neutral****.*

The main potential impact of the operational phase of the proposed development on surface water quality is accidental spills of fuels and other chemicals. However, with the implementation of comprehensive emergency response procedures and standard operating procedures to respond to chemical spillage and training, the effect will be ***long-term, imperceptible,*** and ***neutral****.*

Biodiversity

The construction phase will result in significant land disturbance during cut and fill activity that may impact on indigenous flora and fauna. Appropriate mitigations have been implemented to reduce the impact on indigenous flora and fauna which will be **neutral**, **short term**, and **imperceptible.**

Although the operational phase will alter the existing agricultural habitat to a built environment, it is not envisioned that there will be any long-term impact on overall biodiversity. Appropriate mitigations have been implemented to reduce the impact on indigenous flora and fauna. The development is located in an area of low local ecological value and, as such, is predicted to have a **neutral** and **imperceptible** effect on biodiversity.

Archaeological, Architectural and Cultural Heritage

Archaeological assessment for the proposed development has identified features of archaeological interest on the site. Further, aspects of the proposed development have the potential to impact on unidentified archaeological features during construction works. The ability to excavate these sites through the construction phase will provide data to the archaeological community from the potential subsurface sites. The potential to gain knowledge outweighs the negative impact. And the mitigation measures detailed Chapter 12 (Archaeological, Architectural and Cultural Heritage) including a comprehensive programme of archaeological excavation, will ensure that the effect is ***long-term, imperceptible*** and ***neutral***.

Material Assets, including Transport and Waste

As detailed in Chapter 15 (Waste Management), excavated soil and stone will be generated from the site preparation, excavations and levelling works required to facilitate construction. Any spoil which cannot be reused on site will be removed off site for reuse or recovery, where practical, with disposal as last resort.

Adherence to the mitigation measures in Chapter 15 and the requirements C&D Waste Management Plan (included as Appendix 15.1), will ensure the effect is ***short-term, imperceptible*** and **neutral.**

17.3.3 Hydrology and:

Biodiversity

Mitigation measures will be in place during construction and operation to ensure that any accidental emissions to the local environment are controlled.

The proposed development will result in increased surface water run-off. Any surface water run-off will be attenuated to the greenfield runoff rate. The proposed sustainable drainage measures include hydrocarbon interceptors, attenuation storage and flow control device will ensure emissions are treated and controlled. The proposed will not have areas of permanently standing water the proposal includes dry detention basis means it is unlikely to attract flocks of waterfowl, and therefore considered unlikely to pose a significant hazard to aviation.

There is no direct connectivity to any national or internationally designated sites. The predicted effect will be ***neutral, imperceptible, and long-term.***.

Air Quality and Climate

Mitigation measures implemented during the construction phase will ensure that the deposition of dust is minimised and therefore the predicted effect from air (including dust) on the hydrological environment during construction is ***short-term, imperceptible*** and ***neutral***.

The operational procedures and other general site maintenance regime will ensure that the impact of the facility complies with all ambient air quality legislative limits and therefore the predicted impact from air (including dust) on the hydrological environment is ***long term, imperceptible*** and ***neutral***.

Land, Soils, Geology and Hydrogeology

As there is potential for silt laden run-off to enter current stormwater systems and indirectly discharge to a watercourse, mitigations will be put in place to manage run-off during the construction phase. Run-off water containing silt will be contained on site via settlement tanks and treated to ensure adequate silt removal. Silt reduction measures on site will include a combination of silt fencing and settlement measures (silt traps, silt sacks and settlement tanks/ponds). The effect will be ***short-term***, ***imperceptible*** and ***neutral***.

There are no significant surface watercourses on the site so there will be no impact on the natural hydrological regime from the addition of hardstanding across the site. Any surface water run-off will be attenuated to the greenfield runoff rate.

Material Assets, including Transport and Waste

Hydrocarbon sludge waste and debris will be generated in the hydrocarbon interceptors will treat the surface water run-off from the proposed development during the operational phase. This waste stream will be managed in accordance with the relevant legislation identified in Chapter 15 such that the effect of the waste generation will be ***long-term, imperceptible*** and ***neutral***.

The proposed development will result in changes to surface water drainage, water supply and wastewater networks. However, a combination of mitigation measures to be implemented as detailed in Chapter 7 (Hydrology), as well as the capacity already built into these networks, will ensure that these changes will result in a ***long-term, imperceptible*** and ***neutral*** impact.

17.3.4 *Biodiversity and:*

<u>Air Quality and Climate</u>*:*

There is a potential for the construction activity to impact on air quality in terms of dust generated but mitigation measures outlined in both Chapter 6 (Land, Soils, Geology & Hydrogeology) and Chapter 9 (Air Quality & Climate) of this EIA Report, implemented through the CEMP, will ensure that the impact on biodiversity is **short-term**, **neutral and imperceptible.**

Air dispersion modelling was undertaken as set out in Chapter 9 (Air Quality and Climate) and the results from the modelling of air emissions including emissions from back-up generators during the operational phase show that the emissions from the facility will comply with the relevant air quality legislative limits, and as such there will be a ***long-term, imperceptible, neutral*** effect on biodiversity.

<u>Landscape and Visual</u>

There will be a minor loss of hedgerow and modified grassland habitats as part of the proposed development during the construction phase. The proposed will not have areas of permanently standing water the proposal includes dry detention basis means it is unlikely to attract flocks of waterfowl, and therefore considered unlikely to pose a significant hazard to aviation. Overall, the operational development and the Implementation of the Landscape Plan would also have significant (positive) biodiversity benefits due to the change from a monoculture agriculture environment to one of higher biodiversity. Resulting in a ***neutral*** interaction overall.

17.4 DISCUSSION – NEGATIVE IMPACTS

The reasoning behind the interactions that are considered to have a negative effect (i.e. a change which reduces the quality of the environment) is outlined in this section.

17.4.1 Population and Human Health and:

<u>Air quality and climate</u>

The potential for dust during construction will be managed through dust control measures to minimise the impact on human health. Therefore the impact of the proposed development in terms of dust soiling or particulate matter emissions will be ***negative, imperceptible*** and ***short-term*** at nearby receptors.

Air dispersion modelling was undertaken as set out in Chapter 9 (Air Quality and Climate) to assess the impact of the development with reference to EU ambient air quality standards which are based on the protection of human health. The modelling results indicated that the pollutant concentrations during the operational phase of the proposed development are compliant with all National and EU ambient air quality limit values and, therefore, will not result in a significant impact on human health. Therefore, the impact on human health will be, ***negative, not significant,*** and ***long-term.***

The mitigation measures set out in Chapter 9 (Air Quality and Climate) that will be put in place at the proposed facility will ensure that the impact of the facility complies with all ambient air quality legislative limits and therefore the predicted impact is ***long term, imperceptible*** *to* ***slight*** and ***negative.***

Noise and Vibration

The potential interaction of noise on the local population is discussed in Chapter 5 (Population and Human Health) and Chapter 10 (Noise & Vibration). During the construction phase of the proposed development there will be some impact on nearby noise sensitive properties due to noise emissions from site traffic and other activities. The application of noise limits and hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration impact is kept to a minimum. Any construction noise impacts will be ***slight, negative*** and ***short-term*** in nature. Also, it is considered that as the proposed development progresses from initial ground works that construction noise impacts will reduce from slight to ***not significant.***

As detailed in Chapter 10 (Noise and Vibration), proprietary noise and vibration control measures will be employed as part of detailed design in order to ensure that noise emissions from building services plant do not exceed the adopted criterion at any nearby noise sensitive locations. The predicted change in noise levels associated with Building Services and Plant during the operational phase is expected to be ***negative***, ***not significant*** **to** ***moderate*** and ***long-term***.

Landscape and Visual Impact

The number and distribution of potential visual receptors in the receiving environment, and their degree of exposure to the site, is relatively limited. Nonetheless, there are a small number of residential properties in the area, which are exposed to the site and would unavoidably experience some reduction in visual amenity as a result of the development. The development would cause a shift in landscape character, from the current peri-urban condition towards employment-dominated urban, which may impact on Populations and Human Health. It is important to note that this effect is an inevitable result of the site's zoning and is a realisation of the development strategy for the area. Overall, the interactions between Landscape and Visual Impact, and Population and Human Health are ***slight, negative and long term***.

17.4.2 Biodiversity and:

Noise and vibration

Noise and vibration generated during the construction phase of the proposed development will have a **short-term, negative** impact on fauna which are likely to be displaced during construction works.

17.5 SUMMARY

In summary, the interactions between the environmental factors and impacts discussed in this EIA Report have been assessed and the majority of interactions are neutral.

There are no significant negative impacts are predicted from the interactions of the constituent elements of the proposed development when viewed in the light of their associated mitigation measures.

17.6 TABLE OF INTERACTIONS

Table 17.1 Summary of interrelationships Between the Aspects

	Planning and Alternatives		**Population & Human Health**		Land, Soils and Hydrogeology		Hydrology		Biodiversity		Air Quality and Climate		Noise and Vibration		Landscape and Visual Impact		Cultural Heritage		Material Assets, including Transport and Waste	
	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.
Planning and Alternatives			+	+	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
Population & Human Health					o	o	o	o	×	×	-	-	-	-	-	-	o	×	o	o
Land, Soils and Hydrogeology							o	o	o	o	×	×	×	×	×	×	o	×	o	o
Hydrology									o	o	o	o	×	×	×	×	×	×	o	o
Biodiversity											o	×	-	×	o	o	×	×	×	×
Air Quality and Climate													×	×	×	×	×	×	×	×
Noise and Vibration															×	×	×	×	×	×
Landscape and Visual Impact																	o	×	×	×
Cultural Heritage																			×	×
Material Assets, including Transport and Waste																				

Con.	Construction Phase	**+**	Positive Interaction
Op.	Operational Phase	**o**	Neutral Interaction
×	No Interaction	**-**	Negative Interaction