



Kilshane Energy Phase 2

Environmental Impact Assessment Report

Volume 3 – Appendices

CLIENT

Kilshane Energy

DATE

April 2026

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APPENDIX 2.1. PERMITTED/LIKELY FUTURE PROJECTS ASSESSED AS NOT BEING OF RELEVANCE TO THE PROPOSED DEVELOPMENT

Application Number	Development Description	Development Address	Decision	Grant Date
FW25A/0166E	<p>We, Earlsland Corporation Unlimited Company, intend to apply for planning permission for development on lands adjacent to Unit 900, Northwest Logistics Park, Ballycoolin, Dublin 15. The application site is located to the west of Unit 900, which is accessed from Kilshane Avenue, is situated to the south of Bay Lane, and is bound to the west by the lands where Ellipse Logistics Park is under construction.</p> <p>The proposed development is for an extension of the existing warehouse / logistics unit to provide an additional 9,080 sq.m of warehouse / logistics floor space, comprising one level with a maximum height of c. 17.09m. The proposal includes an extended service yard and dock levellers, plant rooms, PV panels at roof level, foul and surface water drainage, landscaping, boundary treatment, lighting and all associated works.</p>	Lands adjacent to Unit 900, Northwest Logistics Park, Ballycoolin, Dublin 15.	GRANT PERMISSION	16 Dec 2025
FW25A/0367E	<p>Planning permission is sought for:</p> <ul style="list-style-type: none"> • Demolition of an existing vacant dwelling house (with a maximum height of c. 5.4m) located in the southern portion of the Site. • Demolition of an existing outbuilding (with a maximum height of c. 6.5m) located in the northeastern portion of the Site. • Demolition of an existing gateway located at the southern site boundary and extension of fence to close the existing entrance. • Associated and ancillary site clearance works to make the site ready for potential future development. 	Bay Lane, Kilshane, Dublin 11	GRANT PERMISSION	25 Nov 2025
FW25A/0245E	<p>Permission for amendments to the development permitted under Reg. Ref : FW24A/0199E at a site (known as Site J) at Northwest Business Park, Kilshane Way, Ballycoolin, Dublin 15.</p> <p>Permission is sought to amend Condition No. 3 of the planning permission Reg. Ref.: FW24A/0199E to read as follows:</p> <p>"The proposed development shall comprise of 3 no. enterprise/light industrial/wholesale outlet units with associated offices. Reason: To clarify extent of the permission."</p>	Site (known as Site J) at Northwest Business Park, Kilshane Way, Ballycoolin, Dublin 15	GRANT PERMISSION	02 Sep 2025
FW25A/0157E	<p>Permission for Retention of alterations to the rear façade and marshalling yard of Industrial Logistics Warehouse. The alterations consist of the reconfiguration and relocation of permitted loading docks, and grade access doors under Register Ref. No. F16A/0128, and addition of 4 No. loading docks, a louvre grille, and associated reconfiguration of yard levels to rear of building, complete with grade access ramp, escape stair, dock surrounds, wheel guides, and ancillary site works for surface water yard drainage connection to existing site attenuation, on a site area of 0.1229 hectares.</p>	Unit 3.1, Osprey House, Dublin Airport Logistics Park, St. Margarets, Co. Dublin	GRANT PERMISSION FOR RETENTION	01 Jul 2025

FW25A/00 86E	The replacement of approx. 251 m of existing 2.4 m high chainlink perimeter fencing and associated access / emergency gates with new 2.4 m high security fencing, gates and all associated site works.	Huntstown Powerstation , Huntstown, Co. Dublin	GRANT PERMISS ION	05 Jun 2025
FW24A/01 78E	<p>The subject site currently has planning permission for 4 no. buildings which are under construction. Units 3, 4 and 5 were granted under Reg. Ref. FW20A /0211 and Unit 6 was granted under FW22A/0068. All units are under construction with units 3, 4 and 5 substantially completed</p> <p>Retention permission is sought for:</p> <ul style="list-style-type: none"> Omission of green roof to offices (Units 3 & 4) Upgrade of Marshalling Yard Oil Interceptor from Bypass to Full Retention Separator (Units 3 & 4) Landscape works (ground profiling) to Unit 3 Omission of 1no. grade level access door on Unit 3 North-West Elevation 9sqm of precast concrete wall has been replaced with curtain walling on the Unit 5 Office North-West Elevation Hall parapet heights for Units 3,4,5,6 are 235mm lower than Hall parapet heights shown on the 'Permitted including compliance' Elevations <p>Permission is sought for:</p> <ul style="list-style-type: none"> Reduction in size of swale adjacent to Unit 3 and relocation of western swale northwards (unit 6) Amendment of car parking layout to the Unit 4 carpark (reduced from 64 to 63) and Unit 5 (reduced from 58 to 57) Omission of green roof to offices (units 5 and 6) Upgrade of Marshalling Yard Oil Interceptor from Bypass to Full Retention Separator (unit 5) The Vertical feature trims on unit 3, 4, 5 and 6 elevations are omitted All associated site works. 	Vantage Business Park, Coldwinters, St. Margarets, Co Dublin	GRANT PERMISS ION & GRANT RETENTI ON	10 Jan 2025
FW23A/02 69	Permission for extension (594 m2) to north east of existing industrial unit, extension to existing car parking area and relocation of existing vehicular access.	Unit 620 (off Kilshane Avenue), North West Logistics Park, Kilshane Avenue, Dublin, D15 Y263	GRANT PERMISS ION	13 Feb 2024
DCC: 4308/22	Planning permission is sought to construct new 2 bedroom L shaped bungalow in side garden of existing dwelling together with revised vehicular front entrance, new pedestrian entrance and provision of new off street car parking space.	76A, Cappagh Avenue, Finglas, Dublin 11	GRANT PERMISS ION	28 Jun 2023

FW23A/0052	<p>The development part amends a permitted warehouse development (as granted under FCC Reg. Ref. FW20A/0126, subsequently part amended by FCC Reg. Ref. FW22A/0108 (Unit No. 2), FCC Reg. Ref. FW22A/0193 (Unit No. 3), FCC Reg. Ref. FW22A/0199 (Unit No. 4) and FCC Reg. Ref. FW22A/0206 (Unit 1), and proposed to be part amended by a live application (FCC Reg. Ref. FW22A/0318 – Unit No. 1).</p> <p>The proposed development amendments will principally consist of: the provision of new entrance and wayfinding signage as follows: 1 No. totem sign at the southern entrance of the development (7 metres high), 1 No. totem sign at the northern entrance of the development (7 metres high), 1 No. totem sign at the gatehouse entrance towards the south of the site (3.5 metres high), 1 No. totem sign to the south-east of Unit No. 1 (2 metres high), 1 No. totem sign to the south-west of Unit No. 2 (2 metres high), 1 No. totem sign to the north-west of Unit No. 3 (2 metres high), 1 No. totem sign to the north-east of Unit No. 4 (2 metres high), 1 No. 'park and amenities' information sign to the north-east of Unit No. 4 (2 metres high), and 1 No. 'parks and amenities' directional sign located at the southern entrance to the running track (0.89 metres high); and all associated development works above and below ground.</p> <p>Retention permission is sought for the following modifications: a multi-use games area (MUGA) (c. 295 sq m) to the west of Unit No. 4 with an outdoor gym area (c. 135 sq m) and a perimeter gravel walkway; a running track along the western/north-western boundary of the site; alterations to the permitted gatehouse at the southern site entrance including the reorganisation of the internal layout, minor decrease in overall width from 3.4 metres to 3.33 metres (c. 67 mm reduction), minor decrease in overall length from 5.599 metres to 5.532 metres (c. 67 mm reduction), minor increase in overall height from 3.35 metres to 3.385 metres (c. 35 mm increase), elevational changes including the addition of 4 No. aluminium feature fins to the east elevation and relocation of the pedestrian entrance door on the east elevation to accommodate the internal layout changes, and modifications to the roof design to include the provision of an aluminium brise soleil surround to the perimeter of the gatehouse; and all associated development works above and below ground.</p>	Newtown, Kilshane Cross, Co. Dublin	GRANT PERMISS ION & GRANT RETENTI ON	09 Jun 2023
ABP: PL29N.311424 DCC: 3913/20	Change of use from retail to coffee shop at ground floor, and 2 duplex apartments with bin and bike store. Associated site works.	Unit 3, Block K, The River Centre, Rathborne Place, Dublin 15	Grant permission with revised conditions	31 Jan 2023

FW22A/0206	Permission for development and retention permission for development at this c. 3.71Ha. site at Newtown, Kilshane Cross, Co. Dublin. The development amends a permitted warehouse development (as granted under FCC Reg. Ref. FW20A}o126, subsequently part amended by FCC Reg. Ref. FW22A/0108 (Unit No. 2) and proposed to be part amended by two live applications (FCC Reg. Ref. FW22A/0193 - Unit No. 3 and FCC Reg. Ref. FW22A/0199 - Unit No. 4). The subject application pertains to lands relating to Unit No.1.	Newtown, Kilshane Cross, Co Dublin	GRANT PERMISS ION & GRANT RETENTI ON	12 Dec 2022
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	<p>The proposed amendments will principally consist of the following modifications to permitted Warehouse Unit No. 1: Revisions to the marshalling office and ancillary office layouts including the increase in size of the marshalling office from c. 65.9 sq.m m to c. 211-4 sq.m m and the increase of the first floor mezzanine plant room in the ancillary office from c. 44.25 sq.m m to c. 60.50 sq.m m (these changes will result in a decrease to the ground floor warehouse area from c.17,242.58 sq.m m to c. 17,202.8 sq.m m - no change to the total permitted gross floor area), and the replacement of office space, toilet blocks, staff facility, changing rooms and tea station with 'grey box' area (space that is subject to future tenant fit-out), with associated addition of an internal door to the staircore and to the warehouse modification of the roof design including a minor increase of the ancillary office parapet height from 11.85 metres s to 11.9 metres (50mm increase), revised PV panel layout, revisions to the roof light layout including provision of additional roof lights, provision of additional AOVs (Automatic Opening Vents), addition of roof access hatch/ladders, and amendments to the roof hip pitch; revisions to HGV entrance/exit layout to the east comprising the addition of traffic islands, bi-fold gates and fencing; reduction of HGV spaces from 21 No. to 19 No.; amendments to paving and landscaping; the addition of covered bike spaces in lieu of previously uncovered stands (no change to total spaces provided); modifications to boundary treatments including the addition of a security gate to the fire tender access to the west; addition of 2 No. sprinkler tanks (c. 56.7 sq.m m each) and a pump room (c. 72 sq.m m); revised Variable Refrigerant Flow Heat Pump compound location and layout; provision of an additional backup generator plinth slab (c. 22 sq.m m); addition of external protection bollards; elevational changes including the removal of 4 No. standard loading docks, addition of 2 No. graded access doors to loading bays, repositioning of 2 No. graded access doors, reduction of concrete facade on the eastern elevation, amended glazing arrangement, repositioning of fire escape doors, the addition of fire escape doors, and the repositioning of green walls; and all associated development works above and below ground.</p> <p>Retention permission is sought for the following modifications to permitted Warehouse Unit No.1: Revised ESB substation/switch room location (no change to permitted size) and the addition of a transformer room (c. 22.76 sq.m m)i provision of an acoustic soil berm and acoustic timber fencing (overall height is c. 5.010 metres) in lieu of permitted 4 metre high acoustic gabion wall; and all associated development works above and below ground.</p>			
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FW21A/02 33	Alterations to an existing building granted under planning reg. no. F07A/1297 consisting of an external extension of 190 sq.m at ground and first floor level consisting of a training room, stairwell and offices.	Unit 622, Phase 3 Northwest Business Park, Kilshane Avenue, Ballycoolin, Dublin 15, D15 VN36	GRANT PERMISS ION	08 Mar 2022
FW21A/01 46	<p>We, Hantise Limited, intend to apply for planning permission for development at a site (known as Site A) located to the north of Northwest Logistics Park (NWLP), Ballycoolin, Dublin 1 (formerly known as Northwest Business Park), The application site is located to the west of Kilshane Avenue, to the south of Bay Lane and is bound by greenfield lands to the west.</p> <p>The proposed development consists of the following:</p> <ul style="list-style-type: none"> • Construction of 1 no. warehouse / logistics unit, including 16,840 sq.m of warehouse/ logistics floorspace and 1,441 sq.m of ancillary office floorspace (over two levels), resulting in a total GFA of 18,281 sq.m, and with a maximum building height of 17.09 metres. The proposal includes a signage zone for the proposed unit; • The provision of 181 no. car parking spaces, 60 no. cycle parking spaces, HGV loading bays and service yard area; • The access to the unit will be provided by extending the existing Kilshane Avenue access road serving Northwest Logistics Park (including alterations to the existing road layout) to a proposed new roundabout within the subject site, which will provide access to the current development proposal, and provide access arrangements for future potential development on adjoining lands; • The development also includes an ESB substation, a smoking shelter, a sprinkler tank with a pumphouse and valvehouse, landscaping, boundary treatments, entrance gates, site lighting, and all associated site development works, underground foul and storm water drainage services (including a connection to an existing pumphouse to the southwest of the proposed warehouse / logistics unit) and attenuation areas. <p>An Environmental Impact Assessment Report (EIAR) will be submitted to the Planning Authority with the planning application and the EIAR will be available for inspection or purchase at a fee not exXceeding the reasonable cost of making a copy at the offices of the Planning Authority.</p>	A site (known as site A), located to the north of Northwest Logistics Park, (NWLP), Ballycoolin, Dublin 15	GRANT PERMISS ION	15 Feb 2022

FW21A/00 96	The proposed development will consist of plant located outside of the existing warehousing and logistics building granted under FW19A/0143; sprinkler pump house (7 x 6 x 3.6m high), sprinkler tank (8.4m high and 10m diameter), chiller (3.5m x 2.5m x 2.5m high) and oxidiser storage unit (6 x 3 x 3.4m high) in the rear service yard, and a standby generator (4.2m x 1.5m x 2.2m high) to the north of the existing warehouse, all on concrete bases. An ancillary logistics office (69sq.m) and mezzanine plant area (247sq.m) are proposed within the existing warehouse. An additional window (1.35m high x 1.12m wide) and 2 No. relocated doors are proposed along the eastern elevation of the existing building. Additional metal louvres are proposed on the north, south and east elevations.	Crane House, Dublin Airport Logistics Park, St. Margaret's Road, St. Margaret's, Co. Dublinrane House, Dublin Airport Logistics Park, St. Margaret's Road, St. Margaret's, Co. Dublin	GRANT PERMISSION	17 Aug 2021
FW20A/02 11	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. Each building will measure 18.1m high (at parapet level) and have 2 storey ancillary offices. Elevational signage will be provided. The units will form Phase 2 of the Vantage Business Park, with Phase 1 to the south (units 1 and 2) under construction. The proposed development includes 39 HGV parking spaces, 224 car parking spaces, 134 cycle parking spaces, 29 dock levellers and 7 grade loading bays. All associated site works including diversion of existing foul rising main, boundary treatments, landscaping, service yards, internal road and footpaths, swales, lighting, 3 no. free standing signs, signage at entrance, refuse storage, substation, foul pumping station, extension of foul infrastructure from Phase 1, modified vehicular entrance off the R135 (including new entrance gate and pillars) and dedicated new footpath and cycleway along the east side of the R135.	Lands between the N2 and R135 (north of the N2-R135 link road), at Coldwinters, St. Margarets, Co. Dublin	GRANT PERMISSION	19 May 2021
FW19A/01 43	The construction of 2 no. Single-Storey Units for industrial and/or Warehouse use with ancillary Two-Storey offices with a gross floor area 11,157.90 square meters. The development will also include 2no. ESB substations, ancillary site development works for underground duct work, drainage and utility services, service yards, car parking, signage to the proposed units, the extension of Cedar Drive to the west, on a site area of 2.97 hectares	Dublin Airport Logistics Park, St Margaret's Road, St Margaret's, County Dublin	GRANT PERMISSION	19 Mar 2020

F18A/0146	<p>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 surface treatment of the vehicle storage areas comprises recycled plastic modular porous paving. Associated facilities include: a vehicle wash area, fuelling area and valet enclosure (approx. 120 sq.m.). The development also includes a vehicle inspection and fit out building (approx. 2656 sq.m. and 9.14m high) incorporating operation control room, offices, meeting room, canteen, toilets, plant area and building signage. Other site development works include: 1 no. security hut (11 sq.m); staff car parking (28 no. spaces) and staff bicycle parking spaces (14 no. spaces); boundary treatments including landscape berm and boundary fence over wall (approx. 3.33m high) new primary gated vehicular entrance onto the R135; emergency gated vehicular entrance onto Kilshane Road (L3125); lighting and CCTV poles (approx. 12m high); on-site substation (24.6 sq.m); external plant area (76 sq.m.); underground drainage and electricity infrastructure; the removal of existing vegetation and new landscaping works. The development also includes road improvement works to the Kilshane Road (L3125) comprising the reconfiguration of the existing roadway (including extending existing culvert); provision of a left turn lane at the junction with the R135; and dedicated cycle and pedestrian facilities. All development to take place on a site of approx. 13.1 hectares.</p>	Newtown, Kilshane Cross, Co Dublin	GRANT PERMISS ION	09 Apr 2019
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APPENDIX 6.1. TII CRITERIA

**NRA/TII Criteria for Rating the Magnitude and Significance of Hydrological and
Hydrogeological Impacts at EIA Stage National Roads Authority
NRA/TII, 2009**

Table 1 Criteria for Rating Site Attributes – Estimation of Importance of Hydrological Attributes (NRA)

Importance	Criteria	Typical Examples
Extremely High	Attribute has a high quality or value on an international scale	River, wetland or surface water body ecosystem protected by EU legislation e.g. 'European sites' designated under the Habitats Regulations or 'Salmonid waters' designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988.
Very High	Attribute has a high quality or value on a regional or national scale	<p>River, wetland or surface water body ecosystem protected by national legislation – NHA status.</p> <p>Regionally important potable water source supplying >2500 homes.</p> <p>Quality Class A (Biotic Index Q4, Q5).</p> <p>Flood plain protecting more than 50 residential or commercial properties from flooding.</p> <p>Nationally important amenity site for wide range of leisure activities.</p>
High	Attribute has a high quality or value on a local scale	<p>Salmon fishery.</p> <p>Locally important potable water source supplying >1000 homes.</p> <p>Quality Class B (Biotic Index Q3-4).</p> <p>Flood plain protecting between 5 and 50 residential or commercial properties from flooding.</p> <p>Locally important amenity site for wide range of leisure activities.</p>
Medium	Attribute has a medium quality or value on a local scale	<p>Coarse fishery.</p> <p>Local potable water source supplying >50 homes.</p> <p>Quality Class C (Biotic Index Q3, Q2- 3).</p> <p>Flood plain protecting between 1 and 5 residential or commercial properties from flooding.</p>

Importance	Criteria	Typical Examples
Low	Attribute has a low quality or value on a local scale	<p>Locally important amenity site for small range of leisure activities.</p> <p>Local potable water source supplying <50 homes Quality Class D (Biotic Index Q2, Q1).</p> <p>Flood plain protecting 1 residential or commercial property from flooding.</p> <p>Amenity site used by small numbers of local people.</p>

Table 2 Criteria for rating Site Attributes - Estimation of Importance of Hydrogeology Attributes (NRA)

Magnitude of Impact	Criteria	Typical Examples
Extremely High	Attribute has a high quality or value on an international scale	Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation e.g. SAC or SPA status
Very High	Attribute has a high quality or value on a regional or national scale	<p>Regionally Important Aquifer with multiple well fields</p> <p>Groundwater supports river, wetland or surface water body ecosystem protected by national legislation – NHA status</p> <p>Regionally important potable water source supplying >2500 homes</p> <p>Inner source protection area for</p>
High	Attribute has a high quality or value on a local scale	<p>Regionally Important Aquifer Groundwater provides large proportion of baseflow to local rivers</p> <p>Locally important potable water source supplying >1000 homes</p> <p>Outer source protection area for regionally important water source</p> <p>Inner source protection area for locally important water source</p>
Medium	Attribute has a medium quality or value on a local scale	<p>Locally Important Aquifer</p> <p>Potable water source supplying >50 homes</p>

Magnitude of Impact	Criteria	Typical Examples
		Outer source protection area for locally important water source
Low	Attribute has a low quality or value on a local scale	Poor Bedrock Aquifer Potable water source supplying <50 homes

Source: Box 4.3: 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the National Roads Authority (NRA, 2009)

Table 3 Criteria for Rating Site Attributes – Estimation of Magnitude of Impact on Hydrological Attribute (NRA)

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute	Loss or extensive change to a waterbody or water dependent habitat. Increase in predicted peak flood level >100mm. Extensive loss of fishery. Calculated risk of serious pollution incident >2% annually. Extensive reduction in amenity value.
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Increase in predicted peak flood level >50mm. Partial loss of fishery. Calculated risk of serious pollution incident >1% annually. Partial reduction in amenity value.
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	Increase in predicted peak flood level >10mm. Minor loss of fishery. Calculated risk of serious pollution incident

Magnitude of Impact	Criteria	Typical Examples
		>0.5% annually. Slight reduction in amenity value.
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	Negligible change in predicted peak flood level. Calculated risk of serious pollution incident <0.5% annually.
Minor Beneficial	Results in minor improvement of attribute quality	Reduction in predicted peak flood level >10mm. Calculated reduction in pollution risk of 50% or more where existing risk is <1% annually.
Moderate Beneficial	Results in moderate improvement of attribute quality	Reduction in predicted peak flood level >50mm. Calculated reduction in pollution risk of 50% or more where existing risk is >1% annually.
Major Beneficial	Results in major improvement of attribute quality	Reduction in predicted peak flood level >100mm

Table 4 Criteria for Rating Impact Significance at EIS Stage – Estimation of Magnitude of Impact on Hydrogeology Attribute (NRA)

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute and /or quality and integrity of attribute	Removal of large proportion of aquifer. Changes to aquifer or unsaturated zone resulting in extensive change to existing water supply springs and wells, river baseflow or ecosystems. Potential high risk of pollution to groundwater from routine run- off. ¹ Calculated risk of serious pollution incident >2% annually. ²

Magnitude of Impact	Criteria	Typical Examples
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	<p>Removal of moderate proportion of aquifer.</p> <p>Changes to aquifer or unsaturated zone resulting in moderate change to existing water supply springs and wells, river baseflow or ecosystems.</p> <p>Potential medium risk of pollution to groundwater from routine run-off. ¹</p> <p>Calculated risk of serious pollution incident >1% annually. ²</p>
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	<p>Removal of small proportion of aquifer.</p> <p>Changes to aquifer or unsaturated zone resulting in minor change to water supply springs and wells, river baseflow or ecosystems.</p> <p>Potential low risk of pollution to groundwater from routine run-off. ¹</p> <p>Calculated risk of serious pollution incident >0.5% annually. ²</p>
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	<p>Calculated risk of serious pollution incident <0.5% annually. ²</p>

1 refer to Annex 1, Method C, Annex 1 of HA216/06

2 refer to Appendix B3 / Annex 1, Method D, Annex 1 of HA216/06

Source: Box 5.3: 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the National Roads Authority (NRA, 2009)

Table 5 Rating of Significant Environmental Impacts at EIS Stage (NRA)

Importance of Attribute	Magnitude of Importance			
	Negligible	Small Adverse	Moderate Adverse	Large Adverse
Extremely High	Imperceptible	Significant	Profound	Profound
Very High	Imperceptible	Significant/moderate	Profound/Significant	Profound

Importance of Attribute	Magnitude of Importance			
	Negligible	Small Adverse	Moderate Adverse	Large Adverse
High	Imperceptible	Moderate/Slight	Significant/moderate	Profound/Significant
Medium	Imperceptible	Slight	Moderate	Significant
Low	Imperceptible	Imperceptible	Slight	Slight/Moderate

APPENDIX 6.2 - WFD SCREENING REPORT



Trinity
Consultants

awnconsulting

Water Framework Directive Assessment

Project Ref: Kilshane Phase 2 EIAR

CLIENT
Kilshane Energy LTD



DOCUMENT REFERENCE
257501.0374WR01

DATE
2 December 2025

DOCUMENT CONTROL SHEET

Document Control Sheet	
Our Reference	257501.0374WR01
Original Issue Date	02 December 2025
Client:	Kilshane Energy LTD
Client Address:	Kilshane Road, Kilshane, Finglas, Dublin 11

Revision	Revision Date	Description

Details	Written by	Approved by
Signature		
Name	Denis Power	Marcelo Allende
Title	Environmental Consultant	Principal Hydrological Consultant
Date	2 December 2025	

Disclaimer

This report considers the specific instructions and requirements of our client. It is not intended for third-party use or reliance, and no responsibility is accepted for any third party. The provisions in this report apply solely to this project and should not be assumed applicable to other developments without review and modification.



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1. INTRODUCTION

1.1 Background

AWN Consulting Limited (AWN) has prepared this Water Framework Directive (WFD) Assessment to support the competent authority, in determining if there is a likelihood of significant effects on the Water Framework status of the receiving waterbodies as a result of the proposed development. A full description of the proposed development is provided in Chapter 2 of the EIAR, Description of Proposed Development. Please. In summary, the subject development is for a Gas Turbine Power Generation Station comprising of 2 additional gas turbines and associated infrastructure at the permitted Kilshane gas turbine power generation station, GIS building and associated compound, increased diesel storage, extensions to the administration building and development of access roads and electrical substations.

This WFD Assessment has been prepared in response to the requirements of the Water Framework Directive 2000/60/EC This WFD compliance document should be read in conjunction with Chapter 6 of the Environmental Impact Assessment Report (EIAR).

The objective of the assessment is to address the following:

- ▶ Does the development cause deterioration of a water body from its current status or potential for reaching "Good" status?
- ▶ Does the development impact on any water dependent protected areas, priority species, habitats etc.?
- ▶ Does the development support the achievement of water body objectives and programme of measures?

1.2 Experience of Authors

This report was prepared by Marcelo Allende and Denis Power. Marcelo Allende (BSc, BEng) is a Principal Environmental Consultant (Hydrologist) with AWN Consulting with over 20 years of experience in water resources technical studies, conceptual and numerical hydrological/hydrogeological modelling and environmental consultancy. Marcelo holds a degree in Water Resource Civil Engineering (BEng, Hons) from the University of Chile and a Bachelor of Science in Engineering (BSc, Hons). He has worked on a wide of range of projects including multi-aspect environmental investigations, geo-environmental impact assessments, surface and groundwater resource management, hydrological and hydrogeological conceptual and numerical modelling, strategic and site specific flood risk assessments (Stage 1,2 and 3), Due Diligence reporting, baselines studies, soils, surface water 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. He is currently a member of the International Association of Hydrogeologists (IAH, Irish Group) and a member of Engineers Ireland (MIEI).

Denis Power is a junior environmental consultant at AWN with 3 years experience in water, noise and air monitoring and reporting. Denis holds a degree in environmental management and urban planning and has studied in Utrecht university's earth surface and water masters programme.

1.3 Source of Information

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

- ▶ Geological Survey of Ireland- online mapping (GSI, 2025).
- ▶ GSI - Geological Heritage Sites & Sites of Special Scientific Interest.
- ▶ Ordnance Survey of Ireland (OSI).
- ▶ Teagasc subsoil database.
- ▶ National Parks and Wildlife services (NPWS, 2025).

- ▶ Environmental Protection Agency (EPA) – website mapping and database information. Envision water quality monitoring data for watercourses in the area.
- ▶ WFD Cycle 2 – Nanny-Delvin Catchment Report – Sub-Catchment Broadmeadow_SC_010 (EPA, 2018).
- ▶ WFD Cycle 3 – HA 08 Nanny-Delvin Catchment Report (EPA, May 2024).
- ▶ Water Action Plan 2024 - A River Basin Management Plan for Ireland, (Department of Housing Local Government & Heritage, Sept 2024).
- ▶ Fingal Development Plan 2023-2029.
- ▶ 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)

Site specific data was derived from the following sources:

- ▶ Various design site plans and drawings, as submitted with this planning application.
- ▶ Waterman Moyaln Overland Flow Paths (2025).
- ▶ Various plans and drawings.

Relevant legislation and guidance is as follows:

- ▶ European Communities 920030, Common Implementation Strategy for the Water Framework Directives (2000/60/EC) Guidance Document No.2.
- ▶ EPA (May 2015), An approach to characterisation as part of the Water Framework Directive V2 revised.
- ▶ EPA (2010) Methodology for Establishing Groundwater Threshold Values, the Assessment of Chemical and Quantitative Status for Groundwater and Groundwater Trends.
- ▶ Common Implementation Strategy (CIS) (2017) Guidance Document No. 36 'Exemptions to the environmental objectives according to Article 4(7) provides comprehensive guidance on the application of Article 4(7).
- ▶ Joint Assistance to Support Projects in European Regions (JASPERS) (2018) Water Framework Directive Project assessment checklist tool.
- ▶ UKTAG (2012) Groundwater Chemical Classification for the Water Framework Directive. Paper 11b(i).
- ▶ UK Technical Advisory Group on the Water Framework Directive.
- ▶ UKTAG (2012) Groundwater Quantitative Classification for the Water Framework Directive. Paper 11b(ii), UK Technical Advisory Group on the Water Framework Directive.
- ▶ Inland Fisheries Ireland (IFI) – A Guideline on Planning for Watercourses in the Urban Environment.

This WFD assessment was based on desktop review of the Environmental Protection agency (EPA) and Local Authority Waters Programme water quality records which were obtained from the portal www.catchments.ie (accessed in November 2025). From the aforementioned source of information, the WFD Status classification and Risk score were obtained for the identified water bodies.

1.4 Site Setting and WFD General Screening

The Proposed Site Development is located in Kilshane, Co. Dublin, covering a total area of approximately 5.33 hectares (ha) in extent and will form part of a larger landholding pertaining to Kilshane Energy. The overall site area for the Kilshane site, including Proposed Development site area is equal to 27.04 ha. The Kilshane Energy site is located at Kilshane, Dublin 11, west of the N2 Primary Road and approximately 2 km north-west of the M50. The Proposed Development area exists at present is mostly greenfield and bareground with tree lines existent along the Kilshane site boundary. The Proposed Development site bounded to the west, north and south by Kilshane lands and to the east by agricultural lands. The Huntstown Quarry is located in close proximity to the south. The greater area is largely characterized by agricultural lands, commercial and industrial development, road network and a few scattered residential dwellings.

The site's topography generally slopes from west to east with a high point of 80.50m OD Malin on the western boundary, and a low point of 77.54m OD Malin on the eastern boundary.

The proposed development site is located within the Nanny-Delvin WFD Catchment (Hydrometric Area 08) and Broadmeadows sub-catchment (WFD name: Broadmeadow_SC_010, Id 08_3) (EPA, 2025).

This WFD Screening has identified six (6) no. WFD surface water bodies and one (1) no. WFD groundwater bodies of potential relevance due to the close proximity and connection of these waterbodies with the Proposed Development facilities.

The potential water bodies are listed in Table 1-1 below which also presents the most recent WFD Status and Risk Score for these waterbodies.

Table 1-1. Current WFD Status and Risk Score of the relevant waterbodies

Waterbody	Type	Location relative to development	EU Code	2019-2024 Status	3rd Cycle Risk Score
WARD_030	River	10 m	IE_EA_08W010300	Moderate	At Risk
WARD_040	River	5.8 km d/s	IE_EA_08W010300	Moderate	At Risk
BROADMEADOW_040	River	9.55 km d/s	IE_EA_08B020800	Poor	At Risk
Broadmeadow Water	Transitional	10 km	IE_EA_060_0100	Moderate	At Risk
Malahide Bay	Coastal	12.6 km	IE_EA_060_0000	Moderate	At Risk
Northwestern Irish Sea (HA 08)	Coastal	14.5 km	IE_EA_020_0000	Good	At risk
08 Nanny-Delvin	Groundwater	-	IE_EA_G_011	Good	Not at risk

1.5 Legislation and Guidance

The Water Framework Directive (WFD) 2000/60/EC aims to protect and enhance the quality of the water environment (both surface water and groundwater) across all European Union member states. The WFD was transposed into Irish law by the European Communities (Water Policy) regulations 2003 (S.I. No 722 of 2003). The WFD requires that EU Member States achieve at least "Good" status for all water bodies by the year of 2027 at the latest. Additionally, where Member States assign "High" status objectives to water bodies, the "High" status must be achieved or maintained by 2027.

The concept of 'deterioration of the status' of a body of surface water in Article 4(1)(a)(i) of Directive 2000/60 is interpreted as meaning that there is deterioration as soon as the status of at least one of the quality elements, within the meaning of Annex V to the directive, falls by one class, even if that fall does not result in a fall in classification of the body of the surface water as a whole. However, if the quality element concerned, within the meaning of that annex, is already in the lowest class, any deterioration of that element constitutes a 'deterioration of the status' of a body of surface water, within the meaning of Article 4(1)(a)(i).

As part of the WFD implementation process the EPA completes a risk assessment and the outcomes are implemented through River Basin Management Plans (RBMPs) in six-year cycles. Ireland is currently in WFD third cycle 2022-2027 i.e. Water Action Plan 2024 - A River Basin Management Plan for Ireland, (Department of Housing Local Government & Heritage, Sept 2024). Waterbodies are either "At Risk" or "Not at Risk" of meeting WFD environmental objectives. Where a waterbody is "At Risk", the EPA determines the significant pressures that are placing the water body at risk of meeting its status objective. This determination focuses the Programme of Measures for the relevant subcatchment(s).

The primary aim of the RBMP is that water bodies identified as being 'At Risk' of not achieving their WFD environmental objectives need to have targeted measures implemented to achieve objectives under this

Plan. The EPA determines the significant pressures that are placing the water body at risk of meeting its status objective. This determination focuses the programme of Measures for the relevant subcatchment(s).

As part of its role, the EPA and other stakeholders such as local authorities must consider whether proposals for new developments (other than where exemptions apply Article 4.4 - 4.7 of the WFD) have the potential to:

- ▶ Cause a deterioration of a water body from its current status or potential; and/ or
- ▶ Prevent future attainment of good status or potential where not already achieved.

As a result, new developments that have the potential to impact on current or predicted WFD status are required to assess their compliance against the WFD objectives of the potentially affected water bodies.

1.6 Methodology

This WFD assessment is based on desktop review of the Environmental Protection Agency (EPA) dataset which was obtained from the portal www.catchments.ie (accessed in November 2025).

The water bodies identified for this assessment are related to the vicinity of the proposed development and its direct or indirect hydrological or hydrogeological connection. From the aforementioned source of information, the WFD Status classification, and Risk score were obtained for the identified water bodies and are presented in Table 1-1 above.

Besides the status classification of water bodies, the WFD also requires that 'designated sites' meet their environmental requirements and conservation objectives. Designated sites are Natura 2000 sites (Special Areas of Conservation, SACs, with water-dependent habitats, and Special Protection Areas for species listed in the EU Habitats Directive); drinking water protected areas; bathing waters; shellfish waters; salmonid waters; and nutrient sensitive waters. Environmental requirements and conservation objectives for designated sites are stipulated in existing regulations or are being developed by the relevant public bodies (e.g., National Parks and Wildlife Service for SACs).

1.6.1 WFD Risk Status

The WFD Risk score is the risk for each waterbody of failing to meet their WFD objectives by 2027. The risk of not meeting WFD objectives has been determined by assessment of monitoring data, data on the pressures and data on the measures that have been implemented. Waterbodies that are At Risk are prioritised for implementation of measures. This assessment was completed in 2020 by the EPA Catchments Unit in conjunction with other public bodies and was primarily based on monitoring data up to the end of 2018.

The three risk categories are:

- ▶ Waterbodies that are 'At Risk' of not meeting their Water Framework Directive objectives. For these waterbodies an evidence-based process was undertaken to identify the significant pressures; once a pressure is designated as 'significant', measures and accompanying resources are needed to mitigate the impact(s) from this pressure. These 'At Risk' waterbodies require not only implementation of the existing measures described in the various regulations, e.g., the Good Agricultural Practices Regulations, but also in many instances more targeted supplementary measures.
- ▶ Waterbodies that are categorised as 'Review' either because additional information is needed to determine their status before resources and more targeted measures are initiated or the measures have been undertaken, e.g., a wastewater treatment plant upgrade, but the outcome hasn't yet been measured/monitored.
- ▶ Waterbodies that are 'Not at Risk' and therefore are meeting their Water Framework Directive objectives. These require maintenance of existing measures to protect the satisfactory status of the water bodies.

1.6.2 WFD Water Body Status

Surface water body status is classified by the EPA on the basis of chemical and ecological status or potential. This system is summarised in Appendix A Figure 1. Under the WFD, groundwater body status is classified on the basis of quantitative and chemical status. This system is summarised in Appendix A Figure 2.

1.6.3 Surface Water No Deterioration Assessment

Table 1-2 below presents the matrix used to assess the effect of the proposed development on surface water status or potential class. It ranges from a major beneficial effect (i.e., a positive change in overall WFD status) through no effect to deterioration in overall status class. The colour coding used in Table 1-2 is applied to the 'No Deterioration Assessment' spreadsheet provided in Appendix B of this report.

Table 1-2. Surface Water Assessment Matrix

Effect	Description/ Criteria	Outcome
Major Beneficial	Impacts that taken on their own or in combination with others have the potential to lead to the improvement in the ecological status or potential of a WFD quality element for the entire waterbody	Increase in status of one or more WFD element giving rise to a predicted rise in status class for that waterbody.
Minor/ localised beneficial	Impacts when taken on their own or in combination with others have the potential to lead to a minor localised or temporary improvement that does not affect the overall WFD status of the waterbody or any quality elements	Localised improvement, no change in status of WFD element
No Impact	No measurable change to any quality elements.	No change
Localised / temporary adverse effect	Impacts when taken on their own or in combination with others have the potential to lead to a minor localised or temporary deterioration that does not affect the overall WFD status of the waterbody or any quality elements. Consideration will be given to habitat creation measures.	Localised deterioration, no change in status of WFD element when balanced against mitigation measures embedded in the project.
Adverse effect on class of WFD element	Impacts when taken on their own or in combination with others have the potential to lead to the deterioration in the WFD status class of one or more biological quality elements, but not in the overall status of the waterbody. Consideration will be given to habitat creation measures.	Decrease in status of WFD element when balanced against positive measures embedded in the project.
Adverse effect on overall WFD class of waterbody	Impacts when taken on their own or in combination with others have the potential to lead to the deterioration in the ecological status or potential of a WFD quality element, which then lead to a deterioration of status/potential of waterbody.	Decrease in status of overall WFD waterbody status when balanced against positive measures embedded in the project.

1.6.4 Groundwater No Deterioration Assessment

Table 1-3 below presents the matrix used to assess the effect of the proposed development on groundwater status class. It ranges from a beneficial effect but no change in status to deterioration in overall status class. The colour coding used in Table 1-3 is applied to the final 'No Deterioration Assessment' spreadsheet in Appendix B of this report.

Table 1-3. Groundwater Assessment Matrix

Magnitude of Impact of the proposed development on WFD Element	Effect on WFD Element within the assessment boundary	Effect on Status of WFD element at the Groundwater Body Scale
Impacts lead to beneficial effect	Combined impacts have the potential to have a beneficial effect on the WFD element.	Improvement but no change to status of WFD element
No measurable change to groundwater levels or quality.	No measurable change to WFD elements.	No change and no deterioration in status of WFD element
Impacts when taken on their own have the potential to lead to a minor localised or temporary effect	Combined impacts have the potential to lead to a minor localised or temporary adverse effect on the WFD element.	Combined impacts have the potential to lead to a minor localised or temporary effect on the WFD element. No change to status of WFD element and no significant deterioration at groundwater body scale.
Impacts when taken on their own have the potential to lead to a widespread or prolonged effect.	Combined impacts have the potential to have an adverse effect on the WFD element.	Combined impacts have the potential to have an adverse effect on the WFD element, resulting in significant deterioration but no change in status class at groundwater body scale.
Impacts when taken on their own have the potential to lead to a significant effect.	Combined impacts in combination with others have the potential to have a significant adverse effect on the WFD element.	Combined impacts in combination with others have the potential to have an adverse effect on the WFD element AND change its status at the groundwater body scale

1.6.5 Assessment against Future Status Objectives

River Basin Management Plans are used to outline water body pressures and the actions that are required to address them. The future status objective assessment considers the ecological and chemical potential of a surface water body and the mitigation measures stated in the River Basin Management plans that defined the ecological and chemical potential. Assessments are based on the project (including mitigation measures) risks (construction and operation) with regard to the objectives for achieving good status as set out in the 3rd Cycle RBMP 2022-2027 i.e. Water Action Plan 2024. The assessment considers whether the proposed development has the potential to prevent the implementation or impact the effectiveness of the defined measures in these plans.

2. DESCRIPTION OF HYDROLOGICAL AND HYDROGEOLOGICAL ENVIRONMENT

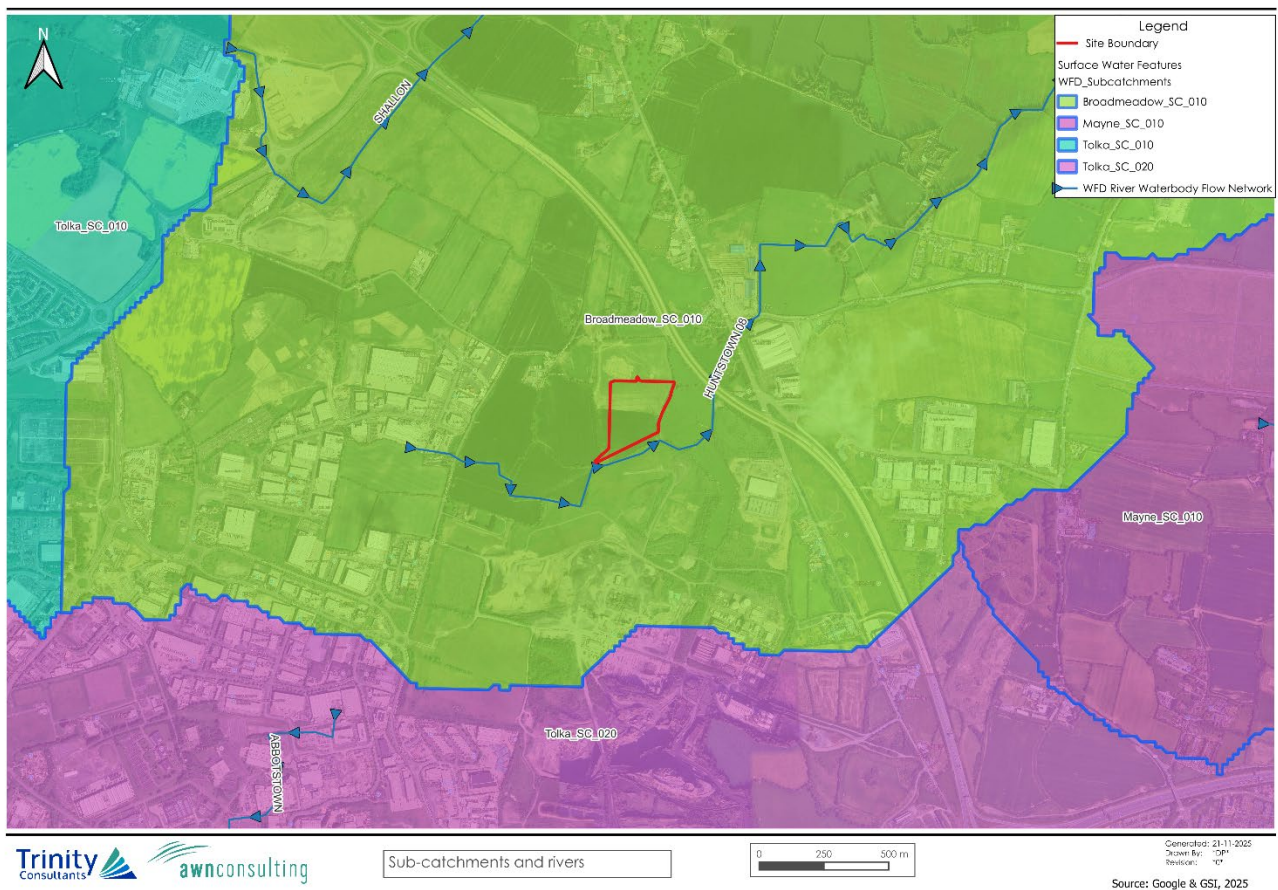
2.1 Hydrology

2.1.1 Regional Hydrological Environment

The subject site is located in the River Tolka WMU (Water Management Unit) within the former Eastern River Basin District (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). According to the EPA maps, the proposed development site lies within the Nanny-Delvin Catchment (Hydrometric Area 08) and the Broadmeadow sub-catchment (refer to Figure 6.1 below). The topographic survey has confirmed that the internal and boundary hedgerows contain ditches which convey flow to the Huntstown Stream to the east of the site, during heavier rainfall events. These ditches only serve the subject site and the agricultural fields immediately to the west, located between the subject site and the Kilshane Road, and does not convey any upstream watercourse.

The Huntstown Stream generally flows in a north-easterly direction to join the River Ward approximately 4.4km to the Northeast of the site at St. Margaret's Golf and Country Club. The River Ward is a tributary of the Broadmeadow River, which in turn outfalls to the Irish Sea at the Malahide Estuary, as shown in Figure 2-1 below. Figure 2-2 below presents the regional hydrological environment as per the latest EPA mapping.

Figure 2-1 Overland Flow Paths (Source: Waterman Moylan, 2025)



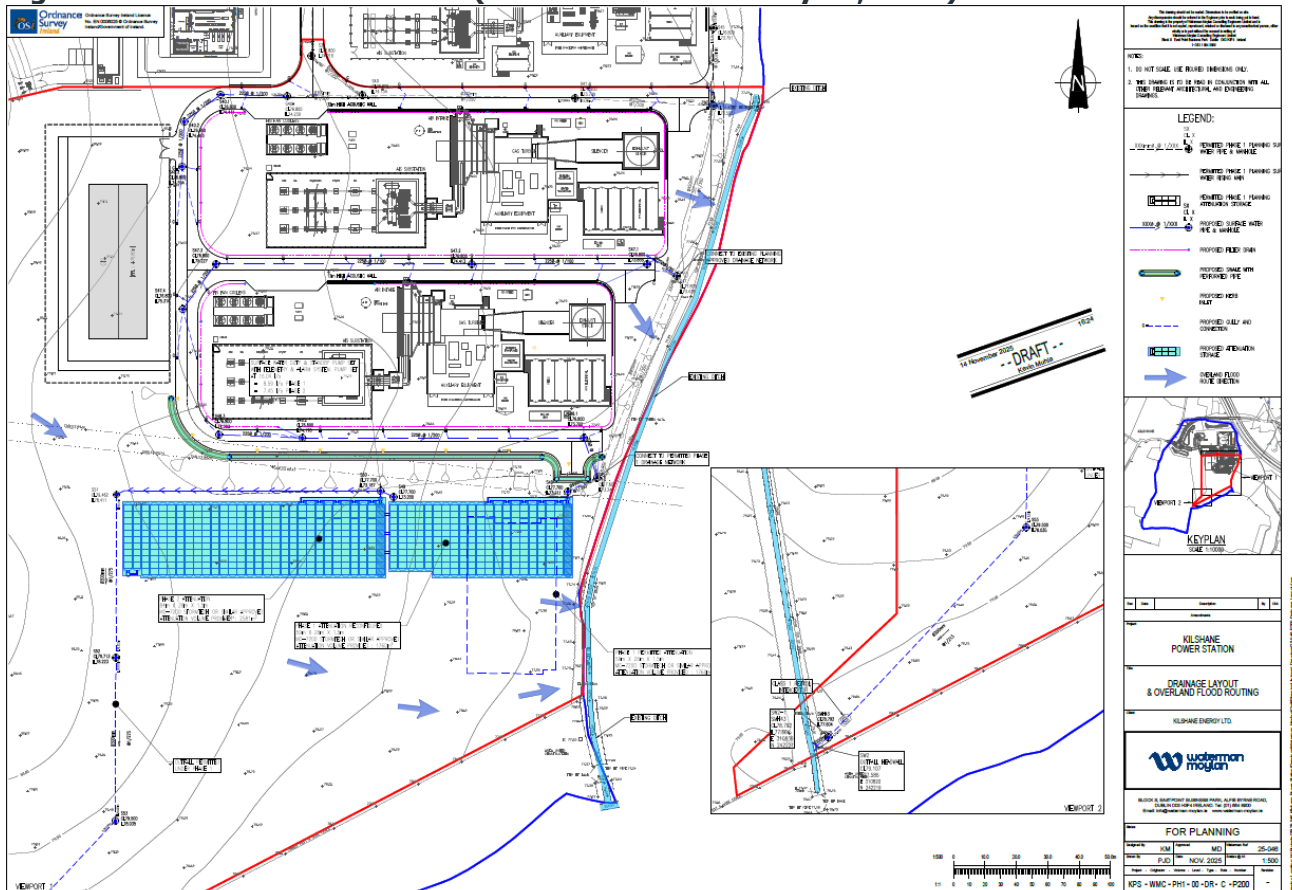
2.1.2 Local Hydrological Environment

As stated above the topographic survey indicates the presence of drainage ditches which convey flow from the proposed site to the Huntstown stream (WARD_030).

The topography of the phase 2 proposed development falls in an easterly directions towards the Huntstown stream.

Overland flow paths which run perpendicular to the contours are shown in Figure 2-2 below. All these paths are believed to flow towards Ward River to the East of the subject site.

Figure 2-2. Overland Flow Paths (Source: Waterman Moylan, 2025)



2.1.3 Surface Water Quality

All the watercourses that drain the subject site are associated with the WARD_030 river waterbody (European Code: IE_EA_08W010300). As mentioned above, this waterbody has a most recent WFD surface water status (WFD Period: 2021-2024) of 'Moderate' and its current WFD risk score (2019-2024) of 'At risk' of not achieving good status. According to the EPA (2025), the WARD_030 river failed to achieve good status due to issues arising from urban waste water, agriculture, urban run off and additional pressures, including urban waste water from combined sewer overflows, anthropogenic pressures associated with golf courses and hydromorphological pressures, namely channelisation.

The Ward_040 (European code: IE_EA_08W010300) river located c. 5.8 km downstream of the proposed development has a 'Moderate' Status and is classified as being 'At Risk' of not achieving good status. According to the EPA (2025), the Ward_040 failed to achieve good status due to issues arising from hydromorphology and urban run off. Pressures associated with the Ward_040 include hydromorphological

pressures, namely channelisation, diffused urban run off, and urban waste water from combined sewer overflows.

The BROADMEADOW_040 (European code: IE_EA_08B020800) river located c. 9.55 km downstream of the proposed development has a 'Poor' Status and is classified as being 'At Risk' of not achieving good status. According to the EPA (2025), the BROADMEADOW_040 failed to achieve good status due to issues arising from hydromorphology and agriculture. Pressures on the BROADMEADOW_040 include hydromorphological pressures, namely channelisation, agricultural pressures from agriculture and farmyards.

The Broadmeadow water (European code: IE_EA_060_0100) transitional water body located c. 10 km downstream of the proposed development has a 'Moderate' Status and is classified as being 'At Risk' of not achieving good status. According to the EPA (2025), the Broadmeadow water failed to achieve good status due to issues arising from urban waste water and domestic waste water. Pressures on the Broadmeadow water include domestic waste water discharges and urban waste water agglomeration PE> 10000.

Malahide bay (European code: IE_EA_060_0000) coastal water body located c. 12.6 km downstream of the proposed development has a 'Moderate' Status and is classified as being 'At Risk' of not achieving good status. According to the EPA (2025), Malahide Bay failed to achieve good status due to issues arising from urban waste water.

The Northwestern Irish Sea (HA 08) (European code: IE_EA_020_0000) coastal water body located c. 14.5 km downstream of the proposed development has a 'good' Status and is classified as being 'At Risk' of not achieving good status. According to the EPA (2025), Malahide bay faces unknown pressures in maintaining its good status.

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 Proposed Development site, the nearest (active) surface river waterbody EPA monitoring stations are 'Coolatrath Br' (EPA Code: RS08W010070): located in the Ward River c. 3.3km from the proposed site, located on the WARD_020 which contributes to the WARD_030 river, with a most recent status recorded by the EPA (2025) as Q3-4/Moderate. 'Br N of Killeek' (EPA Code: RS08W010300): located in the WARD_030 River c. 1.2km downstream from it joins with the Huntstown Stream. The most recent status recorded by the EPA (2025) is classified as Q3-4/Moderate.

2.1.4 Areas of Conservation

The NPWS (2025) on-line database have been reviewed to determine the location of areas of conservation within proximity to the Proposed Development site, and there are no Special Protected Areas (SPA) established under the EU Birds Directive (79/409/EEC), or Special Areas of Conservation (SAC) established under the Habitats Directive on or within the boundary of the Proposed Development site. The closest European listed sites are the Royal Canal (002103) pNHA - circa. 5.1 km to the south of the site and the Santry Demesne (00178) pNHA – circa 4.8 km to the east of the site. The development site has no hydrological connection with either of these sites.

2.1.5 Water Supplies

A review of the Environmental Protection Agency's (EPA) online mapping, which includes the Register of Protected Areas (RPA) established under the Water Framework Directive (WFD), indicates that the nearest public supply protection area the Dunboyne PWS c.8.9km to the West of the site.

In terms of water abstraction, there are no registered water abstraction sites located within the site boundaries. The nearest water abstraction pumps are located on the site of the Huntstown quarry. Please see Figure 2-3 below.

Figure 2-3 Abstraction well locations



2.1.6 Water Infrastructure

Infrastructure to support the on site surface water, foul water and water supplies will be constructed. Surface water run off will be managed through the use of various SuDS techniques to treat and minimise surface water runoff from the site. Storm water from the site will discharge at a controlled rate, limited to the greenfield equivalent runoff, to the existing ditches forming the site boundary, which are connected to the Huntstown Stream. Rainfall in excess of this will be attenuated in the underground tanks for each catchment. The proposed development will be designed to incorporate best drainage practice. Foul water will be managed through an on site pumping station. A 150mm diameter rising main will be constructed from the on-site pumping station for a distance of c. 1,818m to the existing gravity foul network on Mitchelstown Road. While the Kilshane pumping station is closer, it is not considered feasible to undertake the construction of the rising main under the N2 and through the Kilshane Cross junction. The water supply to the proposed site will be connected to the existing 110mm Ø MOPVC watermain located to the southwest of the site on Kilshane Road.

2.2 Hydrogeology

2.2.1 Regional Groundwater Quality

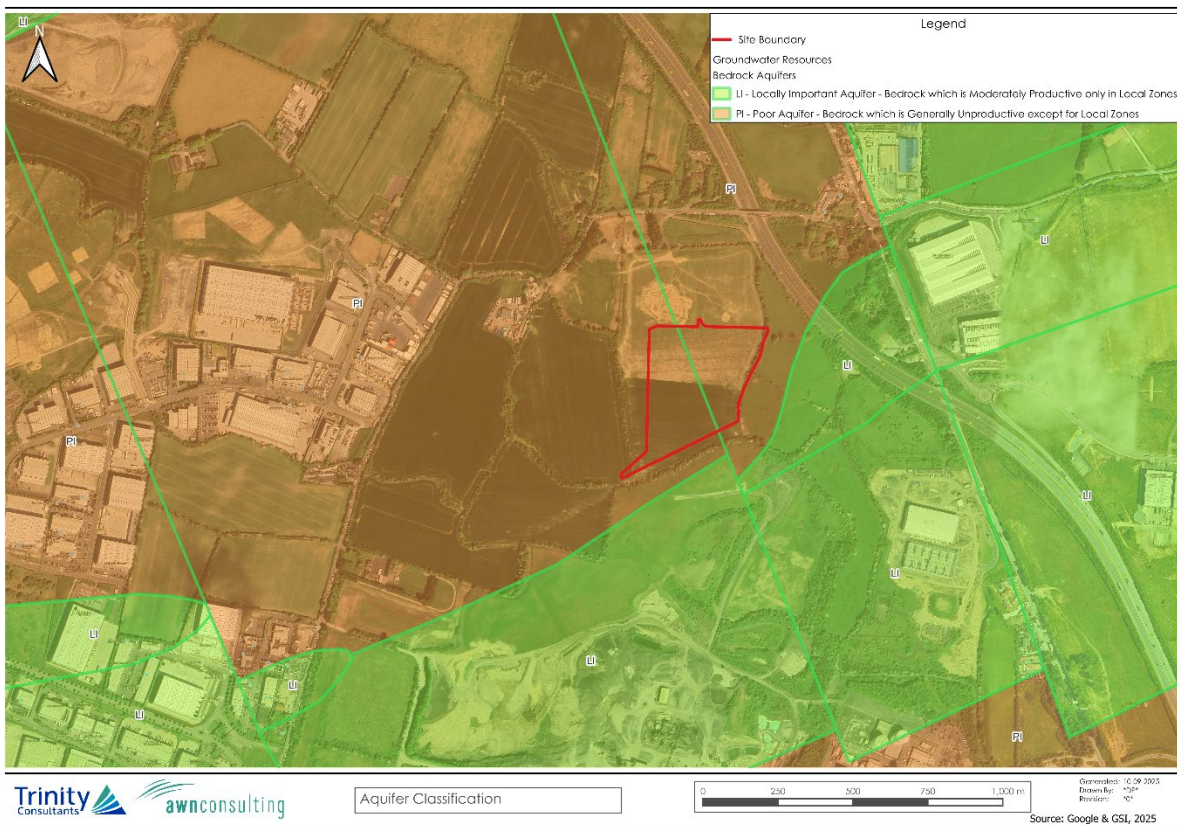
The groundwater body in the region of the site (Swords GWB - European Code: IE_EA_G_011) for which the site is located entirely within, has a WFD status of 'Good' (WFD Period: 2019-2024) and a WFD risk score (3rd Cycle) of "Not at Risk" of not achieving good status, meaning it has achieved its objectives.

2.2.2 Aquifer Classification and Vulnerability

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 (km²), well yield (m³/d), specific capacity (m³/d/m) and groundwater throughput (mm³/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 (LI). Similarly, poor aquifers are classed as either generally unproductive except for local zones (PI) or generally unproductive (Pu).

From analysis of GSI National data the bedrock aquifer underlying the study site is classified as Poor which is characterised as Generally Unproductive except for Local Zones. GSI mapping has shown a Locally Important Aquifer (LI) which is moderately productive only in Local Zones located in close proximity immediately south of the site.

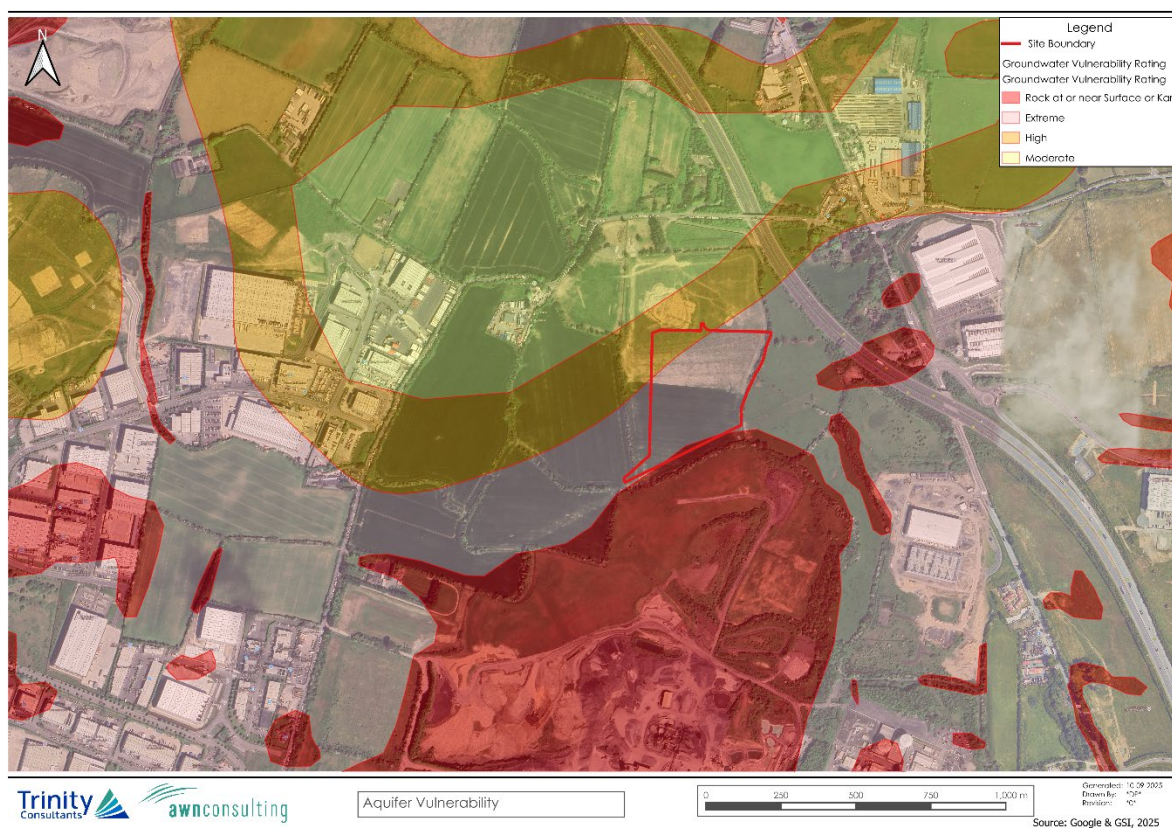
Figure 2-4. Aquifer Classification (Source: GSI, 2025)



Groundwater vulnerability is an indication of how easily the aquifer can become contaminated by human activity. It is dependent on the thickness and permeability of the overlying soils and depth to the water table. For example, a bedrock aquifer with minimal thickness of overburden or with a thin layer of permeable overburden will be more vulnerable to contamination than a bedrock aquifer which has a thick layer of low permeability overburden. Extreme groundwater vulnerability is also associated with karst landforms as these are a direct pathway for water and contaminants to enter the aquifer from the surface.

The GSI (2025) guidance currently displays/shows varied aquifer vulnerability across in the region. The approximate northwest half of the site overlies a 'Moderate' vulnerable aquifer, while moving south east the vulnerability progresses to 'High' and 'Extreme' in the southeast portion of the site. As can be seen from 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. (refer to Figure 2-5 below).

Figure 2-5. Aquifer Vulnerability (Source: GSI, 2025)



2.2.3 Groundwater Supply

There are no recorded Public Supply Source Protection Area or Group Scheme Preliminary Source Protection Areas in the vicinity of the proposed development site.

The nearest Group Scheme Preliminary Source Protection area is Kiltale, located c. 22.6 km North West of the proposed site. There is no hydrological connection between the proposed site and this Group Scheme Preliminary Source Protection.

3. WATERBODIES IDENTIFICATION AND STATUS

The Water Framework Directive (WFD) 2000/60/EC was adopted in 2000 as a single piece of legislation covering rivers, lakes, groundwater, 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 or at least by 2027, 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.

As presented in Section 1.4 above, this WFD Screening has identified six (6) no. WFD surface water bodies (river and transitional) and one (1) no. WFD groundwater bodies of relevance due to the close proximity and connection of these waterbodies with the Proposed Development.

In accordance with the WFD, each river catchment within the former RBD was assessed by the EPA and a water management plan detailing the programme of measures was put in place for each one. Currently, as presented in Table 1-1 above, the EPA classifies the WFD Ecological Status for the Ward river (Ward_030 and Ward_040) as "Moderate" with a current WFD River Waterbody risk score of 'At risk' of not achieving good status'. For the Ward_030 river, the specific "moderate" statuses achieved were related to invertebrate and orthophosphate, while the Ward_040 river receive "moderate" statuses for invertebrates, the general chemical conditions, Nitrates and Orthophosphates. The Broadmeadow_040 river which joins with the Ward river has a status of "Poor" and a classification of "At risk" of not achieving a good status. The Broadmeadow_040 river has a range of statuses, the invertebrate status achieved a status of "poor", while the general chemical conditions, Nitrates and Orthophosphates all achieved statuses of "moderate". The general chemical conditions also failed in the category of dissolved oxygen.

The Broadmeadow water Transitional Waterbody located c. 10 km downstream of the Proposed Development Site has a 'Moderate' status and a risk score of and 'At risk of not achieving good status'. As mentioned above, the Broadmeadow water failed to achieve good status due to issues arising from urban waste water and domestic waste water discharges.

The main pressure associated with the Nanny Delvin catchment (Broadmeadow_SC_010) is mainly Agriculture hydromorphological pressures and urban waste water discharges. Based on the WFD Cycle 3 Nanny-Delvin catchment report produced by the EPA in May 2024.

There is an existing hydrological connection/pathway between the Proposed Development Site and these surface waterbodies through the site drainage which ultimately discharges into the Ward River which discharges into the Broadmeadow river, the Broadmeadow water, Malahide bay and Northwestern Irish sea.

As mentioned in Section 1.4 above, the groundwater body (GWB) underlying the site is the Swords Groundwater Body (European Code: IE_EA_G_011). Based on the most recent data (www.epa.ie), the Swords GWB for which the site is located entirely within, has a WFD status of 'Good' (WFD Period: 2019-2024) and a WFD risk score (3rd Cycle) of 'Not At Risk' of not achieving good status.

The Proposed Development will temporarily increase the aquifer vulnerability during construction prior to paving and installation of stormwater drainage and services. However, there is no potential for change in groundwater levels as a result of local changes in the groundwater regime at the site due to the unlikely occurrence of dewatering activities and the natural recharge capacity of the underlying 'Poor Aquifer', which allows for the maintenance of groundwater levels. This ensures that the aquifer's integrity and functionality remain unaffected by any temporary dewatering measures.

Other waterbodies that may be hydrologically connected to the Proposed Development site, but are located further away (namely Malahide Bay coastal Waterbody [EU code: IE_EA_060_0000], and the Northwestern Irish sea [EU code: IE_EA_020_0000]) were excluded from the assessment due to their distance from the subject site, the potential loading of contaminant from the site and significant dilution through its pathway.

Figure 3-1 to Figure 3-4 below summarise the water quality of the aforementioned waterbodies.

Figure 3-1. Water Quality for the WARD_030 River Waterbody (Source: EPA, 2025)

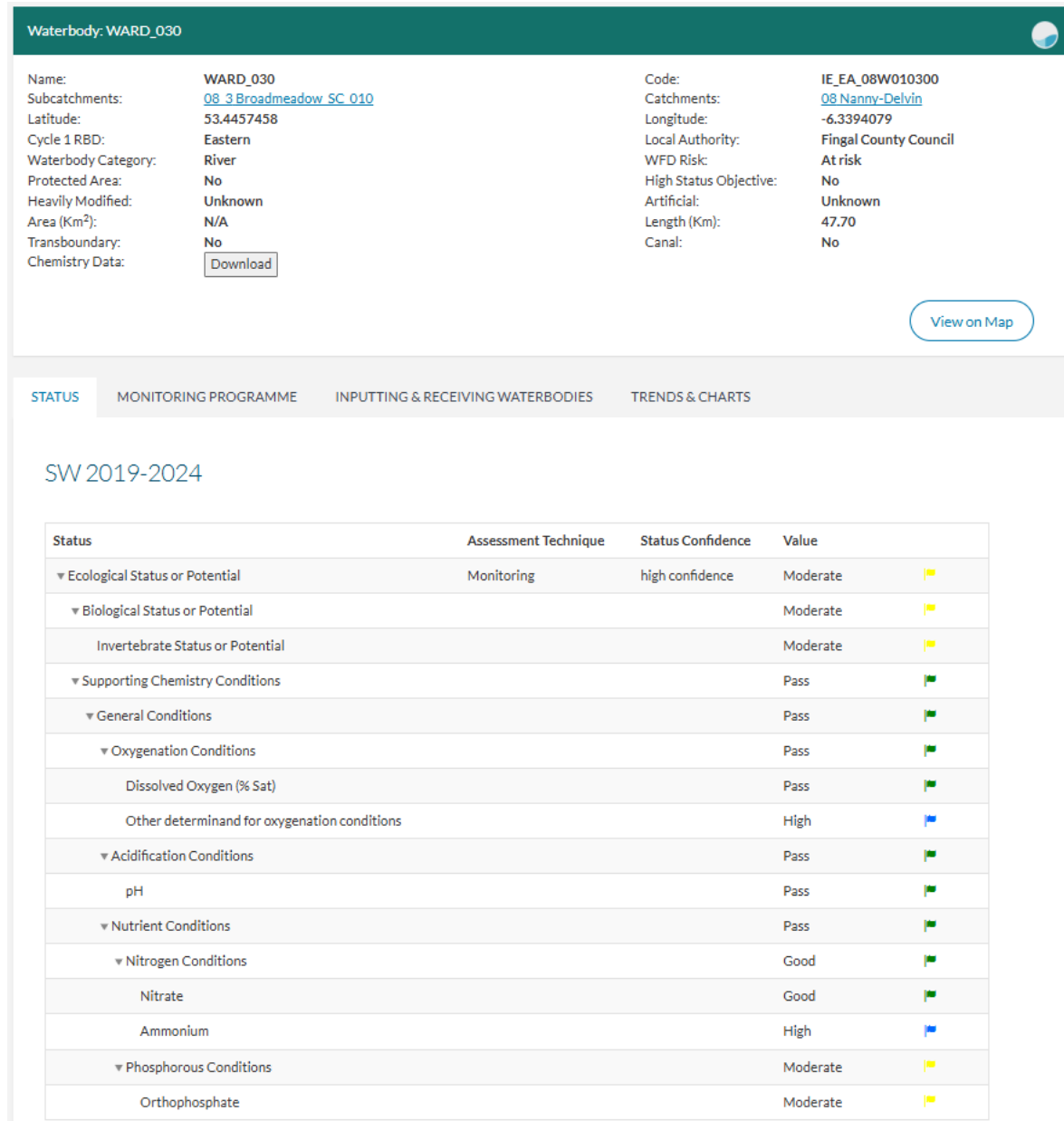


Figure 3-2. Water Quality for the WARD_040 River Waterbody (Source: EPA, 2025)

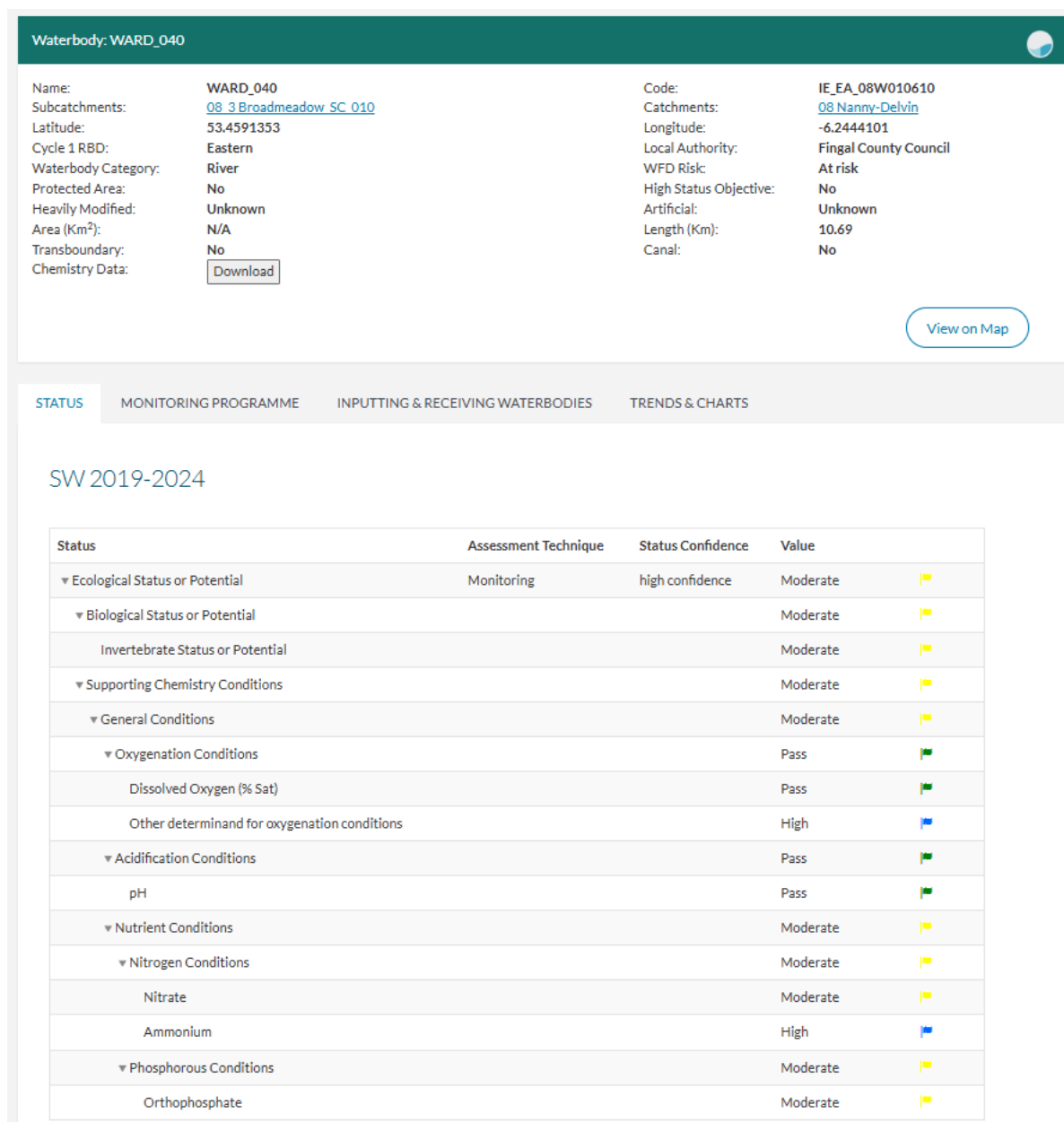


Figure 3-3. Water Quality for the BROADMEADOW_040 (Source: EPA, 2025)

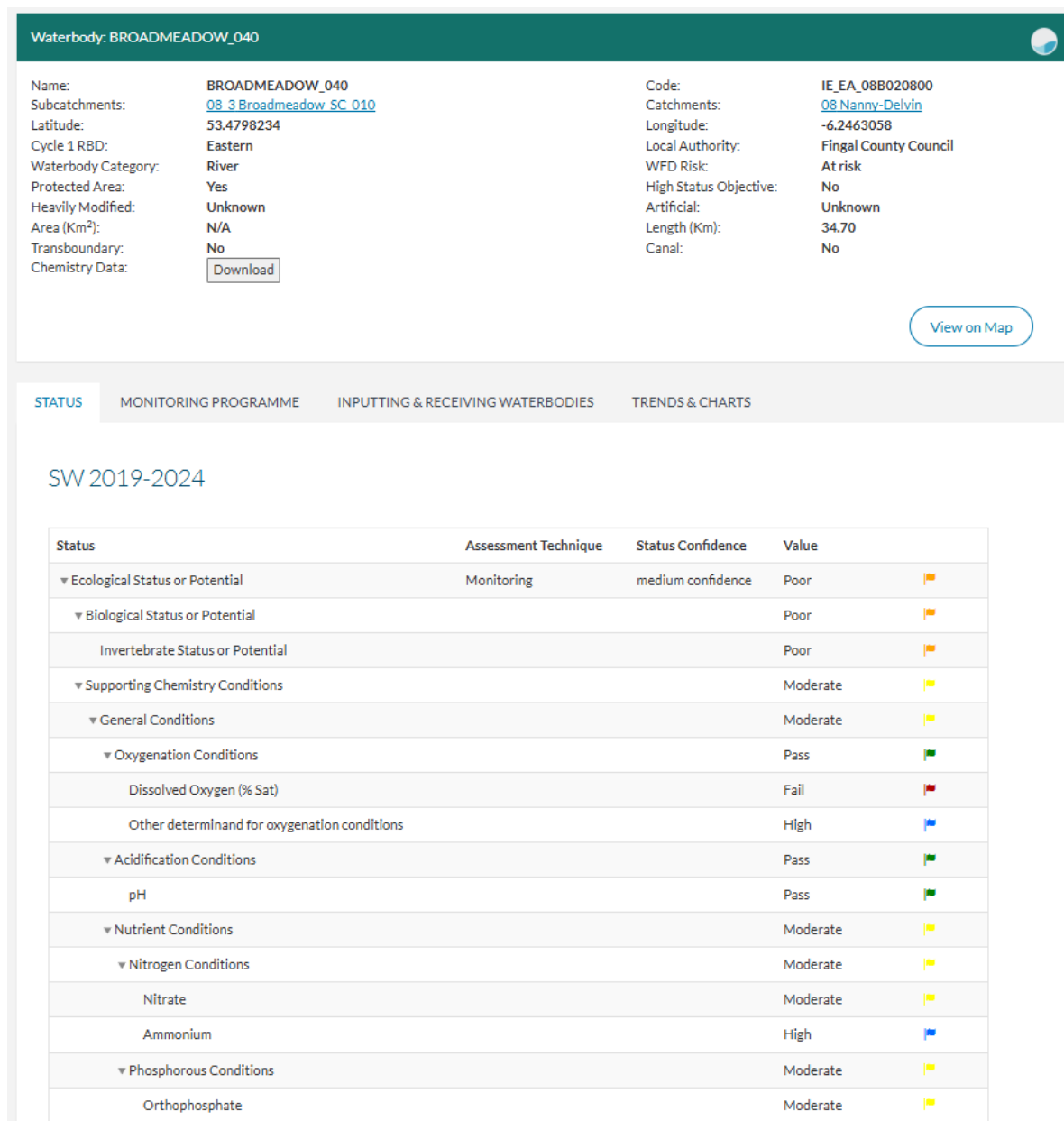


Figure 3-4. Water Quality for the Broadmeadow water transitional waterbody (Source: EPA, 2025)

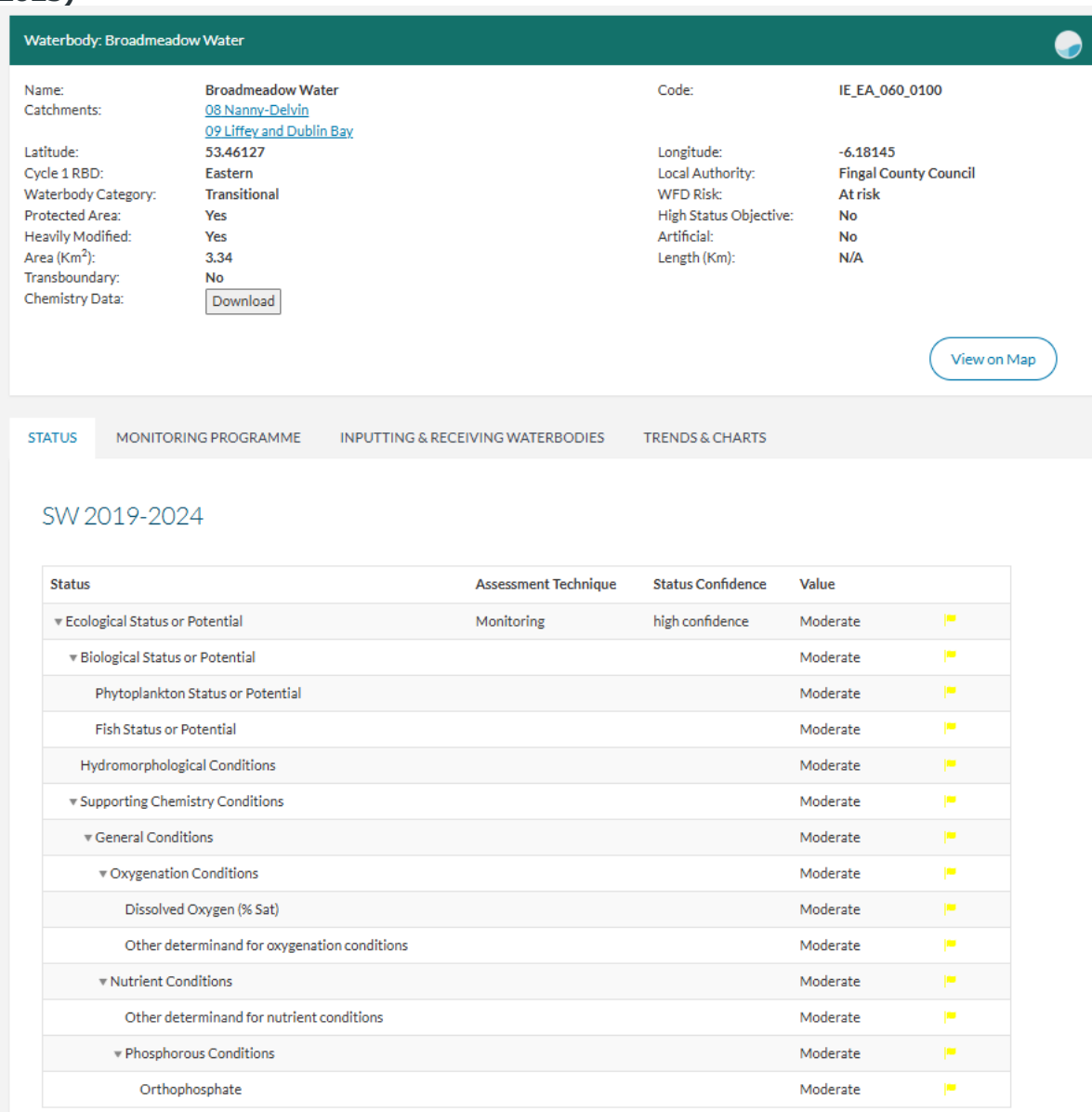


Figure 3-5. Water Quality for the Malahide Bay coastal waterbody (Source: EPA, 2025)

Name:	Malahide Bay	Code:	IE_EA_060_0000
Catchments:	08 Nanny-Delvin 09 Liffey and Dublin Bay		
Latitude:	53.46362	Longitude:	-6.14379
Cycle 1 RBD:	Eastern	Local Authority:	Fingal County Council
Waterbody Category:	Coastal	WFD Risk:	At risk
Protected Area:	N/A	High Status Objective:	No
Heavily Modified:	N/A	Artificial:	N/A
Area (Km ²):	N/A	Length (Km):	N/A
Transboundary:	No		
Chemistry Data:	Download		

[View on Map](#)

STATUS MONITORING PROGRAMME INPUTTING & RECEIVING WATERBODIES TRENDS & CHARTS

SW 2019-2024

Status	Assessment Technique	Status Confidence	Value
▼ Ecological Status or Potential	Monitoring	high confidence	Moderate
▼ Biological Status or Potential			Moderate
Phytoplankton Status or Potential			High
▼ Other Aquatic Flora Status or Potential			Moderate
Macroalgae Status or Potential			Moderate
Angiosperm Status or Potential			Good
Hydromorphological Conditions			Good
▼ Supporting Chemistry Conditions			High
▼ General Conditions			High
▼ Oxygenation Conditions			High
Dissolved Oxygen (% Sat)			High
Other determinand for oxygenation conditions			High
▼ Nutrient Conditions			High
Other determinand for nutrient conditions			High
▼ Phosphorous Conditions			High
Orthophosphate			High
Specific Pollutant Conditions			Pass

Figure 3-6. Water Quality for the Northwestern Irish Sea (HA 08) (Source: EPA, 2025)

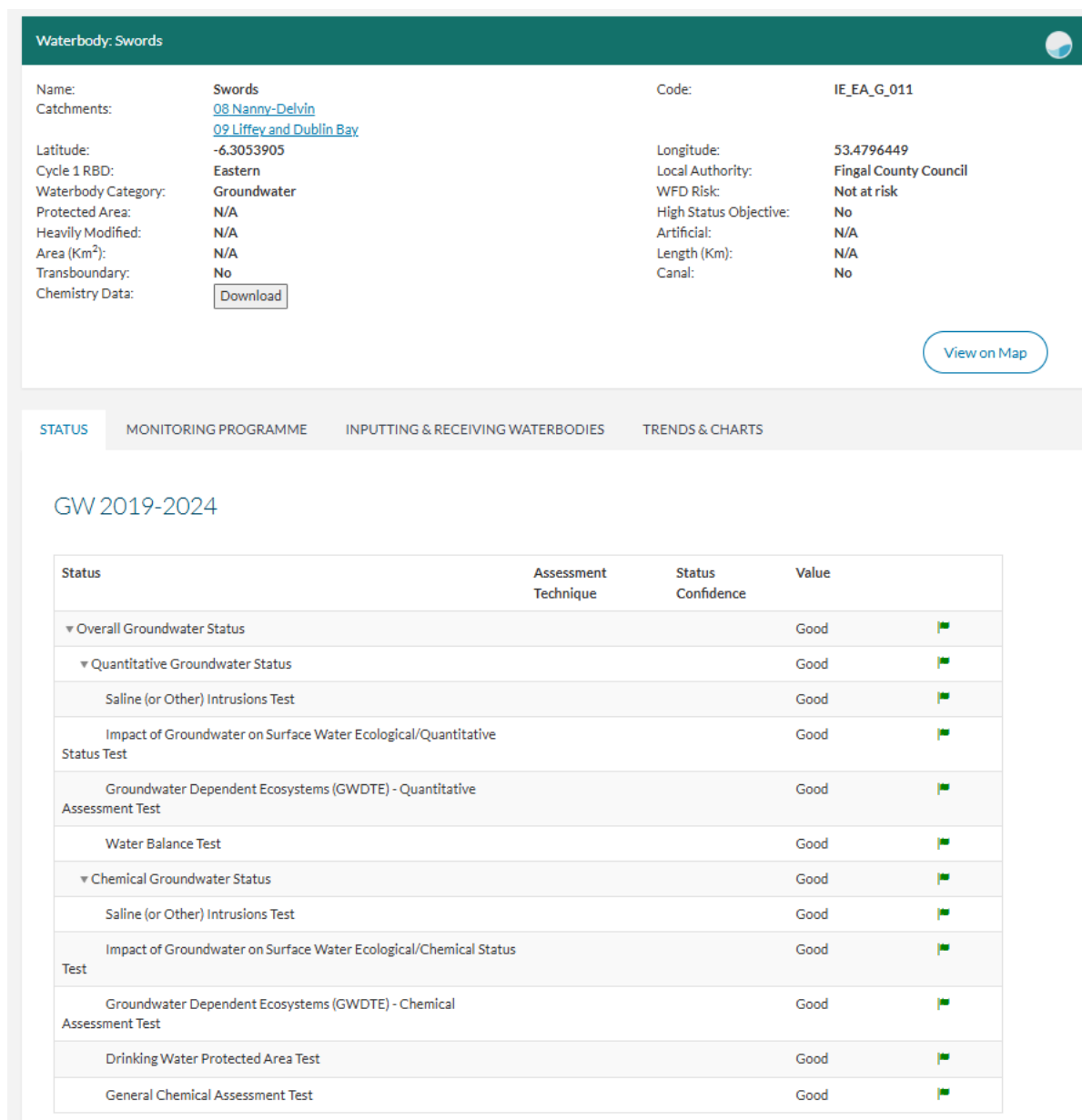
<p>Name: Northwestern Irish Sea (HA 08)</p> <p>Catchments: 07 Boyne 08 Nanny-Delvin 09 Liffey and Dublin Bay</p> <p>Latitude: 53.58428</p> <p>Cycle 1 RBD: Eastern</p> <p>Waterbody Category: Coastal</p> <p>Protected Area: N/A</p> <p>Heavily Modified: N/A</p> <p>Area (Km²): N/A</p> <p>Transboundary: No</p> <p>Chemistry Data: <input type="button" value="Download"/></p>	<p>Code: IE_EA_020_0000</p> <p>Longitude: -6.10649</p> <p>Local Authority: Fingal County Council</p> <p>WFD Risk: At risk</p> <p>High Status Objective: Yes</p> <p>Artificial: N/A</p> <p>Length (Km): N/A</p>
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STATUS
MONITORING PROGRAMME
INPUTTING & RECEIVING WATERBODIES
TRENDS & CHARTS

SW 2019-2024

Status	Assessment Technique	Status Confidence	Value
▼ Ecological Status or Potential	Monitoring	high confidence	Good
▼ Biological Status or Potential			Good
Phytoplankton Status or Potential			High
▼ Other Aquatic Flora Status or Potential			High
Macroalgae Status or Potential			High
Invertebrate Status or Potential			Good
Hydromorphological Conditions			Good
▼ Supporting Chemistry Conditions			High
▼ General Conditions			High
▼ Oxygenation Conditions			High
Dissolved Oxygen (% Sat)			High
Other determinand for oxygenation conditions			High
▼ Nutrient Conditions			High
Other determinand for nutrient conditions			High
▼ Phosphorous Conditions			High
Orthophosphate			High

Figure 3-7. Groundwater Quality for the Swords groundwater body (Source: EPA, 2025)



4. DESCRIPTION OF THE PROPOSED DEVELOPMENT

The purpose of this section is to provide an overview of the key relevant details of the construction phase and operational phase of the Proposed Development. The information presented in this section is informed by the project design, but it is not a complete description of the Proposed Development. Therefore, it should be read in conjunction with the full development package. For a more comprehensive understanding of the Proposed Development, please refer to Chapter 2 'Description of the Proposed Development' of the EIA Report. Chapter 2 provides a detailed overview of the lifecycle of the project, including reference to the architectural and civil engineering, drawings, plans, reports, and other relevant documents in order to define the Proposed Development.

The Proposed Development will consist of the construction of two additional Gas Turbines and associated infrastructure at the permitted Kilshane Gas Turbine Power Generation Station (development ref. FW22A/0204, ABP-317480-23). As per site notice, the Proposed Development will consist of:

2 no. Gas Turbine and 2 no. 28 m high Exhaust Stack partially enclosed by 12 m high acoustic walls. 2 no. single storey Packaged Electronic/Electrical Control Compartment (PEECC) (c. 72 m²), 2 no. single storey Continuous Emission Monitoring System (CEMS) Shelter (c. 14.8 m²), and miscellaneous plant equipment, a Gas Insulated Switchgear (GSI) Substation and a 400kV GIS building and associated compound.

4.1 Construction Phase

The activities required for the construction phase of the proposed development represent the greatest risk of potential impact on the hydrological and hydrogeological environment. These activities primarily pertain to the site preparation, excavation and infilling activities required to facilitate construction of the Proposed Development.

There will be a need for soil excavation on-site. The earthworks will include the excavation of level platforms and foundations for building and the importation of stone material for access roads, etc. The design of road levels and finished floor levels has been carried out in such a way as to minimise cut / fill type earthworks operations.

The proposed works are expected to generate an estimated cut volume of ca. 54,857 m³, 8,100 m³ of topsoil and about 46,757 m³ of subsoil.

The required fill volume will be met entirely using material generated from on-site excavation. Based on the planned reuse and site operations, no significant surplus or shortfall of material is anticipated. However, any excavated material that does not get reused will be removed from the site. This will be taken for appropriate offsite reuse, recovery, recycling and / or disposal.

Due to the expected excavation levels, pumping out of standing water may be necessary. Localised perched groundwater within the cohesive deposits/ weathered bedrock, or pooling surface water during and after heavy rainfall events is expected. Dewatering (removing of perched groundwater) is necessary to create a dry working environment and prevent water from seeping into the excavation and flooding the construction site. If dewatering is necessary, it will occur via suitably installed dewatering wells/sumps containing pumps to abstract groundwater and surface water (rainfall landing on the site).

During construction should water need to be discharged it shall be discharged to the existing foul sewer network. Where required, a wastewater discharge licence will be applied for to manage surface water on site during the construction phase. This shall permit the discharge of trade effluent arising from groundwater/surface water ingress on the construction site. In case of any exceedances of discharge permit conditions, water will be disposed of to a licenced facility. The treatment and monitoring of this water prior to disposal will occur outside the construction site in a regional facility north of the site.

At a minimum, the works will be carried out according to standard 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*, and
- ▶ CIRIA 697 (2007), *The SUDS Manual*; and *UK Pollution Prevention Guidelines*, (PPG) UK Environment Agency, 2004.

4.2 Operational Phase

The surface water network will be catered to through the use of ditches, swales for excess flows and underground attenuation. Ditches along the Kilshane site boundary will cater for most of the stormwater on site which will be ultimately discharged to the Huntstown Stream to the south of the site. In case of excess rainfall, storm water will be attenuated in the underground tanks for each catchment area within the site.

The Proposed Development will be located within Catchment 3 within the Kilshane site, with current permitted underground storage capacity of 1,735 m³. The upsizing of the permitted underground attenuation system is proposed in order to cater for the additional 20310.5 m² of hardstanding generated as result of the Proposed Development. A new underground tank with an additional attenuation volume of 2,510m³ will be constructed beside the permitted underground tank to the south of the proposed turbines.

The flow control manholes will be in place between the attenuation tank and the outfall headwall and will limit discharges to the greenfield equivalent runoff. The Phase 1 flow control pump will be also upsized to accommodate additional runoff. The already permitted Class 1 bypass interceptors and full retention petrol interceptors will mitigate against contamination arising from potential spills or leaks. These interceptors will be located before ditch outfall.

The development will result in an increase in hardstand which will reduce the local recharge to ground and a loss of land.

There will be no requirement for excavation of topsoil, subsoil and near-surface rock head during the operational phase. The majority of the site will be capped by hardstand/building during construction and installation of drainage will minimize the potential for contamination of the aquifer beneath the site during the operational phase.

Surface water discharge from the subject site will be managed and controlled in order to have minimal impact on the current drainage environment. The discharge from the development lands will be limited to greenfield run-off rates via flow control devices, with the resulting excess volumes attenuated via means on on-site attenuation. The surface water run-off will be directed through SuDs features to new attenuation facilities and ultimately discharge to existing stormwater sewer and ultimately into the Ward river.

The foul water drainage strategy for the proposed development will be reliant on the permitted Phase 1 foul water network and pumping station (Confirmation of Feasibility: CDS22004080) which consists of a gravity network which is then pumped south in an 80mm rising main for 1,823m along Kilshane Road to connect to the foul gravity network on Mitchelstown Road. The permitted foul scheme has been designed with capacity to cater for an additional 11no., future industrial units with an additional 743 staff. This represents an additional dry weather flow capacity of 0.946 l/s and peak flow of 2.838l/s. The total dry

weather flow generated as result of the Proposed Development from the development will be 0.013 l/s, with a peak flow of 0.059 l/s. As such, an upgrade of the Phase 1 development welfare facilities is not required to accommodate this staff increase.

5. ASSESSMENT OF SOURCE-PATHWAY-RECEPTOR (SPR) MODEL

A conceptual site model is developed based on a good understanding of the hydrological and hydrogeological environment, plausible sources of impact and knowledge of receptor requirements. This in turn allows possible Source Pathway Receptor (S-P-R) linkages to be identified. If no S-P-R linkages are identified, then there is no risk to identified receptors.

The proposed development site is located in the Nanny-Delvin WFD Catchment (Hydrometric Area 08) and Broadmeadows sub-catchment (WFD name: Broadmeadow_SC_010, Id 08_3) (EPA, 2025).

As stated in Section 2.2 above, the site is underlain by the Nanny-Delvin WFD Catchment (Hydrometric Area 08), which has been investigated by the GSI and is described as a which has been investigated by the GSI and is classified as 'Poor' which is characterised as Generally Unproductive except for Local Zones. The majority of groundwater flow in this aquifer will occur in the top few metres, through the weathered zone in a lateral direction towards rivers and springs, as well as through, joints and fractures, rather than through the rock mass.

No significant dewatering is expected. However, depending on the time of year development works are carried out, local minor dewatering may be required during excavation works and groundworks at the proposed development site. This will slightly and temporarily increase the aquifer vulnerability, prior to paving and installation of stormwater drainage and services. However, there is no potential for change in groundwater levels as a result of local changes in the groundwater regime at the site due to the limited extent of the unlikely dewatering activities and the natural recharge capacity of the underlying "poor aquifer", which allows for the maintenance of groundwater levels. In addition, the mitigation measures that will be implemented during construction (as set out in the CEMP) and operational design measures (SuDS) will ensure there are no potential impacts on the hydrogeological and hydrological environment.

The site is connected to the Ward and Broadmeadow Rivers, which join with the Malahide Estuary (NHA, SAC, SPA) this hydrological connection links the proposed development to this NHA/SPA/SAC. The nearest Recreational Waters area is Portmarnock, Velvet Strand Beach to the vicinity of the site.

Other waterbodies that may be hydrologically connected to the Proposed Development site, but are located further away (namely North-West Irish Sea SPA [EU PA code: IE0004236]), was excluded from the assessment due to its distance from the subject site, the potential loading of contaminant from the site and significant dilution through its pathway.

If not mitigated, contaminated water can pose a temporary risk to the local drainage network connected to the Ward River (WARD_030 and WARD_040 river waterbodies), Broadmeadow river (BROADMEADOW_040) , Broadmeadow Water transitional waterbody (10 km downstream) and Malahide bay coastal water (12.6 km downstream), Northwestern Irish sea (14.5 km downstream) and the underlying 'Poor Aquifer' i.e. Swords GWB . However, no impacts on these waterbodies are foreseen based on the low expected loading of any potential contaminant, the significant distance to these waterbodies, natural attenuation in the subsoils, and the high level of dilution in the downstream waterbodies.

The increased foul water generated by the expansion of the site to phase 2 will join with the existing phase 1 drainage network. It is proposed to connect to the permitted phase 1 watermain network under Reg. Ref. ABP-317480-23 via a 250mm \varnothing watermain which will loop around the subject site. Uisce Eireann has confirmed the feasibility of this as of the 28th of August 2025.

Table 5-1 below describes the S-P-R model for the proposed development site and includes the robust mitigation and design measures which will be incorporated into the proposed development throughout the construction phases.

Table 5-1. Pollutant Linkage (S-P-R) Assessment

Source	Pathway	Receptor	Risk of Impact	Mitigation/Design Measures
Construction Impacts (summary)				
<p>Unmitigated leak from an oil tank to ground/ unmitigated leak from construction vehicle (1,000 litres worst case scenario).</p> <p>Discharge to ground of runoff water with:</p> <ul style="list-style-type: none"> • High pH from cement process. • Hydrocarbons from construction vehicles. • Run-off containing a high concentration of contaminated suspended solids from the former landfill. 	<p>Vertical migration through contaminated overburden to underlying "Poor Aquifer" (PI), classified by the GSI as having a 'High' to 'Extreme' vulnerability.</p> <p>Excavations will temporarily increase the aquifer vulnerability.</p> <p>Lateral migration via groundwater within the underlying bedrock aquifers to the hydrological and hydrogeological environment i.e. Ward and Broadmeadow rivers, Broadmeadow water transitional water body, Malahide bay and North Western Irish sea coastal waters as well as the Swords GWB.</p>	<p>Underlying "Poor Aquifer" (Swords GWB).</p> <p>WARD_030 River Waterbody (c 10m downstream)</p> <p>WARD_040 River Waterbody (c 5.8km downstream)</p> <p>BROADMEADOW_040 River Waterbody (c 9.55km downstream)</p> <p>Broadmeadow water Transitional Waterbody (c. 10.0 km downstream)</p> <p>Malahide Bay Coastal waterbody (c.12.6km downstream)</p> <p>Northwestern Irish Sea (HA08) (c.14.5 km downstream)</p>	<p>No likely impact on the status of the Swords GWB (Poor Aquifer) due to low potential loading, shallow depth of excavations and mitigation measures during construction (refer to CEMP).</p> <p>No likely impacts on the status of the Surface Waterbodies (river and transitional) due to low potential loading, significant distance to these waterbodies, natural attenuation in the subsoils, and the high level of dilution in the downstream waterbodies, in addition to mitigation measures in place (refer to CEMP).</p>	<p>Only potential for temporary impacts due to accidental releases. Mitigation measures outlined in a CEMP which will be a live document. 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 CEMP and any subsequent conditions relevant to the proposed development. These include management of soils, re-fuelling of machinery and chemical handling, control of water during the construction phase and treatment of discharge water where required.</p>

Source	Pathway	Receptor	Risk of Impact	Mitigation/Design Measures
Operational Impacts (summary)				
<p>Discharge to ground of hydrocarbons from roads, car parking, and hardstanding areas.</p> <p>Discharge of foul water to the Liffey River post treatment at Ringsend WWTP .</p>	<p>Indirect pathway through stormwater drainage to the Ward River (WARD_030 and WARD_040 river waterbodies), Broadmeadow river (BROADMEADOW_040) , Broadmeadow Water transitional waterbody (10 km downstream) and Malahide bay coastal water (12.6 km downstream), Northwestern Irish sea (14.5 km downstream).</p> <p>Lateral migration via groundwater within the underlying 'Poor Aquifer to the hydrological environment i.e. Ward River (WARD_030 and WARD_040 river waterbodies), Broadmeadow river (BROADMEADOW_040) , Broadmeadow Water transitional waterbody, Malahide Bay and the NorthWestern irish sea.</p> <p>Indirect pathway to the Liffey River, Liffey Estuary Lower and the North and South Dublin Bay SAC, North Bull island SPA, Soth Dublin bay and river tolka SPA, North West Irish sea SPA, North and South Dublin bay NHA through the foul sewer connection (post treatment) at Ringsend WWTP).</p>	<p>Underlying "Poor Aquifer" (Swords GWB).</p> <p>WARD_030 River Waterbody (c 10m downstream)</p> <p>WARD_040 River Waterbody (c 5.8km downstream)</p> <p>BROADMEADOW_040 River Waterbody (c 9.55km downstream)</p> <p>Broadmeadow water Transitional Waterbody (c. 10.0 km downstream)</p> <p>Malahide Bay Coastal waterbody (c.12.6km downstream)</p> <p>Northwestern Irish Sea (HA08) (c.14.5 km downstream)</p>	<p>No perceptible risk due to the implementation of the design measures which includes SuDS and the use of interceptors along the drainage system. Furthermore, the extent of loading of potential contaminant, distance between the source and the receptors along with significant dilution in the drainage network will ensure any released hydrocarbons and other contaminants are at background levels (i.e., with no likely impact above water quality objectives as outlined in S.I. No. 272 of 2009, S.I. No. 386 of 2015 and S.I. No. 77 of 2019).</p> <p>No perceptible risk to the hydrological or hydrogeological environment following treatment in the EPA licenced Ringsend WWTP</p>	<p>The proposed development is designed to ensure the protection of the hydrological and hydrogeological environment by incorporating SuDs measures in design including permeable paving, attenuation system, petrol interceptor, among others. These features will effectively manage surface water flows, directing them to the attenuation system to maximize their storage potential. Surface water runoff will be stored efficiently before entering the downstream network, i.e. WARD_030 and WARD_040 river waterbodies), Broadmeadow river (BROADMEADOW_040) .</p>

6. NO-DETERIORATION ASSESSMENT

6.1 Hydrological Environment

As stated in Section 5 above, the Proposed Development has an 'indirect' hydrological connection with the WARD_030, WARD_040 River, Broadmeadow_040 rivers, the Broadmeadow water transitional waterbody, the Malahide bay and Northeastern Irish sea coastal Waterbody (located c. 10m, 5.8 km, 9.55 km, 10 km, 12.6km and 14.5 km downstream of the subject site, respectively) through the stormwater drainage.

This is a lengthy hydrological pathway allowing significant time for settlement and dilution, should an accidental release (even without mitigation) to surface water occur. Therefore, no potential impacts are anticipated during construction and operation in the receiving waterbodies.

There is also an 'indirect' hydrological connection/pathway with the Liffey River, Liffey Estuary Lower and the North and South Dublin Bay SAC, North Bull island SPA, South Dublin Bay and River Tolka SPA, North West Irish sea SPA, North and South Dublin bay NHA through the proposed foul sewer connection to Ringsend WWTP, located along the Liffey River. This plant has capacity to treat the foul water from the development, and no potential impacts are anticipated on the receiving waterbodies.

During construction, there are mitigation and design measures which will be implemented to protect the hydrological (and hydrogeological) environment. There is a potential of accidental discharges should mitigation fail during the construction phase, however these are temporary short-lived events that will not impact on the water status of waterbodies long-term and as such will not impact on trends in water quality and over all status assessment. This is based on the low expected loading of any potential contaminant, the significant distance to these waterbodies, natural attenuation in the subsoils, and the high level of dilution in the downstream waterbodies. As such, there is no potential for any accidental release into the Ward River and the Proposed Development will not cause any significant deterioration or change in water quality status or prevent attainment, or potential to achieve the WFD objectives or to meet the requirements and/or objectives in the third cycle river basin management plan (2022-2027) i.e. Water Action Plan 2025 - A River Basin Management Plan for Ireland

Nevertheless, the project-specific Construction and Environmental Management Plan (CEMP) which the works contractor will develop will implement strict mitigation measures to ensure the protection of the hydrological (and hydrogeological) environment during construction which will ensure that there will be no negative impact on the quantitative or qualitative or morphology of the nearby watercourses.

During operation, in the scenario of an unmitigated leak of fuel from car park areas and roads, these are temporary short-lived events that will not impact on the status of the waterbodies mentioned above in the long-term. This is based on the low expected loading of any potential contaminant, the significant distance to these waterbodies, natural attenuation in the subsoils, and the high level of dilution in the downstream waterbodies.

However, to mitigate potential contamination from surface water runoff, which may originate from roads, car parks and hardstanding areas, a sustainable urban drainage system (SuDS) will be implemented. This system is designed to minimize the risk of contaminants, such as hydrocarbons, entering the stormwater drainage network and subsequently impacting surface waterbodies downstream (WARD_030, WARD_040 River, Broadmeadow_040 rivers, the broadmeadow water transitional waterbody, the Malahide bay and Northeastern Irish sea coastal Waterbody); as well as groundwater bodies i.e. the Swords GWB underlying the site.

The surface water drainage strategy integrates various SuDs measures, including permeable paving, attenuation system, and petrol interceptors. These features will effectively manage surface water flows, directing them to the attenuation system to maximize their storage potential.

The SuDS and proposed measures have been designed in detail with the ultimate aim of protecting the hydrological (& hydrogeological) environment.

There are no proposed diversions of any drainage ditches or waterbodies as part of the proposed development.

Overall, the potential effects on the current status of the surface waterbodies are considered *no impact i.e. no change to the WFD status or elements in terms of the hydrological environment.*

6.2 Hydrogeological Environment

No significant dewatering is expected. However, depending on the time of year development works are carried out, local minor dewatering may be required during excavation during excavation of topsoil materials associated and groundworks at the proposed development site. This will slightly and temporarily increase the aquifer vulnerability, which is classified by the GSI as having 'High' to 'Extreme' vulnerability, prior to paving and installation of stormwater drainage and services.

This minor dewatering would be perched water within the overburden layer composed of low permeable glacial tills. Therefore, groundwater is not anticipated to be encountered during the minor excavation works projected at this location.

There is no potential for change in groundwater levels as a result of local changes in the groundwater regime at the site due to the limited extent of the unlikely dewatering activities and the natural recharge capacity of the underlying 'Poor Aquifer', which allows for the maintenance of groundwater levels. In addition, the mitigation measures that will be implemented during construction (as set out in the CEMP) and operational design measures (SuDS) will ensure there are no potential impacts on the hydrogeological and hydrological environment.

Therefore, there is no potential for change in water quality or levels as a result of local changes in the groundwater regime at the site. There are no planned discharges to groundwater during the operational phase and no long-term groundwater dewatering for the project. The proposed development design includes hardstand cover across the site.

During construction, there is limited potential of accidental discharges. However, should these occur they are temporary short-lived events that will not impact on the water status of the underlying bedrock aquifer long-term and as such will not impact on trends in water quality and over all status assessment. The project-specific Construction and Environmental Management Plan (CEMP), which the works contractor will develop will implement strict mitigation measures to ensure the protection of the hydrogeological environment during construction which will ensure that there will be no negative impact on the quantitative or qualitative of the underlying gravel and bedrock aquifers.

In terms of the operational phase, the risk to the aquifer is considered to be low due to the presence of handstand and a drainage system incorporating use of oil / hydrocarbon / petrol interceptors (or equivalent) on the stormwater drainage system prior to discharge from the site.

Overall, the potential effects on the WFD status to the groundwater bodies are considered no impact i.e., no change to the current status *or* elements in terms of the underlying hydrogeological environment.

6.3 Assessment in Terms of Future Good Status

The WARD_030 ,WARD_040 and BROADMEADOW_040 WFD surface waterbodies have a most recent WFD surface water status (WFD Period: 2021-2024) of 'moderate', 'moderate' and 'poor' respectively, with their current WFD risk score (3rd risk cycle) as 'At risk' of not achieving good status by 2027, meaning they have not achieved their objectives, and their overall status is considered "poor".

The Broadmeadow water Transitional Waterbody located c. 10.0 km downstream of the Proposed Development Site has a 'moderate' status and a risk score of and '*At risk of not achieving good status*'. As mentioned above, the Broadmeadow water Transitional Waterbody failed to achieve good status due to issues arising from urban waste water and domestic waste water.

The Malahide Bay (c.12.6km downstream) and Northwestern Irish Sea (c.14.5 km downstream) have statuses of "moderate" and "good" respectively. As mentioned above Malahide Bay failed to achieve good status due to urban waste water discharges.

The main pressure associated with the Nanny Delvin catchment (HA_08) is mainly Agriculture, Hydromorphology Urban Waste Water, domestic wastewater and urban runoff, based on the WFD Cycle 3 report produced by the EPA in May 2024.

As for these pressures and with respect to Urban Wastewater, no perceptible risk to the hydrological or hydrogeological environment is foreseen following treatment in the EPA licenced Ringsend WWTP. With respect to agricultural and pasture activities, the Proposed Development is not associated with activities related to these pressures.

Presently, the groundwater body in the region of the site (Swords GWB) for which the site is located entirely within, has a WFD status of 'Good' (WFD Period: 2019-2024) and a WFD risk score (3rd Cycle) of 'Not at Risk' of not achieving good status, meaning it has achieved its objectives, and its overall status is considered good.

At present WARD_030, WARD_040 and BROADMEADOW_040 are considered an area requiring action, with LAWPRO restoration measures occurring within the catchment to maintain or achieve improvements to the status of the water bodies. However, the following are some pressures associated with waterbody catchments:

- ▶ Hydromorphology.
- ▶ Management of pollution from agricultural activities.
- ▶ Management of pollution from domestic wastewater.
- ▶ Management of pollution from urban runoff.
- ▶ Other unspecified pressures

The proposed development will incorporate SuDs measures within the landscape and drainage design in order to manage run-off quality and foul sewers management will be in compliance with UÉ specifications. No dewatering is required during operation. All discharges will be adequately treated through the proposed SuDs measures as outlined in Section 4.2 above. As such there will be no change to the existing status as a result of the proposed development.

Based on the above information it is *not* considered that any aspects of the proposed development will prevent the WFD objectives from being achieved or to meet the requirements and/or objectives in the Water Action Plan 2024 - A River Basin Management Plan for Ireland, (Department of Housing Local Government & Heritage, Sept 2024).

7. CONCLUSIONS

Appendix A contains the background information and the WFD classification elements for surface water and groundwater body status. The colour coded system referred to in Appendix A, is used in Appendix B – Table 1 and Table 2 to give a visual impression of the surface water and groundwater assessment, respectively

The WFD assessment indicates that, based on the current understanding of the proposed development, there is no potential for adverse or minor temporary/ long-term or localised effects on the receiving waterbodies (WARD_030 and WARD_040; (EU Code IE_EA_08W010300 and IE_EA_08W010300, respectively) BROADMEADOW_040 (EU code IE_EA_08B020800), Broadmeadow water (EU code IE_EA_060_0100), Malahide Bay (EU code IE_EA_060_0000) or the Northwestern Irish sea (EU code IE_EA_020_0000).

Therefore, it has been assessed that the proposed development will not cause any significant deterioration or change in water body status or prevent attainment, or potential to achieve, future good status or to meet the requirements and/or objectives in the Water Action Plan 2024 - A River Basin Management Plan for Ireland, (Department of Housing Local Government & Heritage, Sept 2024).

The WFD assessment indicates that there is no potential for adverse or minor temporary or localised effects on the Swords GWB - European Code: IE_EA_G_011. Therefore, it has been assessed that it is unlikely that the proposed development will cause any significant deterioration or change on its water body status or prevent attainment, or potential to achieve the WFD objectives or to meet the requirements and/or objectives in the Water Action Plan 2024 - A River Basin Management Plan for Ireland, (Department of Housing Local Government & Heritage, Sept 2024).

No further assessment of WFD is recommended given that no significant deterioration or change in water body status is expected based on the current understanding of the proposed development during construction and operation.

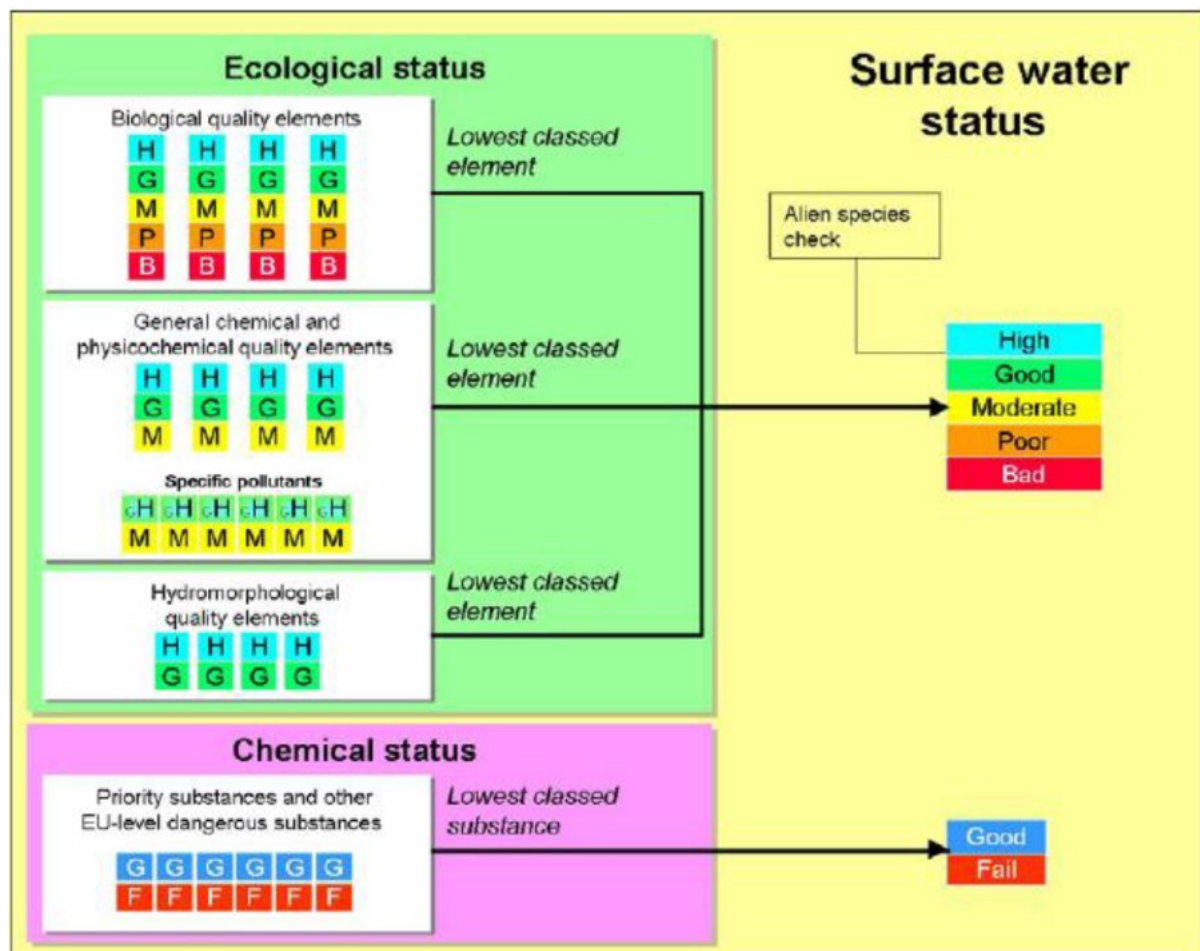
APPENDIX A. WFD ASSESSMENT MATRIX

WATER FRAMEWORK DIRECTIVE ASSESSMENT MATRIX

1.1 Background to Surface Water Body Status & Groundwater Body Status

Under the WFD, surface water body status is classified on the basis of chemical and ecological status or potential. Ecological status is assigned to surface water bodies that are natural and considered by the EPA not to have been significantly modified for anthropogenic purposes (i.e., culverting). Ecological potential is assigned to artificial and man-made water bodies (such as canals), or natural water bodies that have undergone significant modification. The term 'ecological potential' is used as it may be impossible to achieve good ecological status because of modification for a specific use, such as navigation or flood protection. The ecological potential represents the degree to which the quality of the water body approaches the maximum it could achieve. The worst-case classification is assigned as the overall surface water body status, in a 'one-out all-out' system (i.e., by taking the worst case of all the combined risk outcomes). This system is summarised below in Figure 1.

Figure 1. WFD classification elements for surface water body status (Environmental Agency, 2015)



1.1.2 Chemical Status

Chemical status is defined by compliance with environmental standards for chemicals that are priority substances and/or priority hazardous substances, in accordance with the Environmental Quality Standards Directive (2008/105/EC). This is assigned on a scale of good or fail. Surface water bodies are

only monitored for priority substances where there are known discharges of these pollutants; otherwise, surface water bodies are reported as being at good chemical status.

1.1.3 Ecological Status

Ecological status or potential is defined by the overall health or condition of the watercourse. This is assigned on a scale of High, Good, Moderate, Poor or Bad, and on the basis of four classification elements or 'tests', as follows:

- **Biological:** This test is designed to assess the status indicated by a biological quality element such as the abundance of fish, invertebrates or algae and by the presence of invasive species. The biological quality elements can influence an overall water body status from Bad through to High.
- **Physico-chemical:** This test is designed to assess compliance with environmental standards for supporting physicochemical conditions, such as dissolved oxygen, phosphorus and ammonia. The physicochemical elements can only influence an overall water body status from Moderate through to High.
- **Specific pollutants:** This test is designed to assess compliance with environmental standards for concentrations of specific pollutants, such as zinc, cypermethrin or arsenic. As with the physico-chemical test, the specific pollutant assessment can only influence an overall water body status from Moderate through to High.
- **Hydromorphology:** For natural waterbodies, this test is undertaken when the biological and physicochemical tests indicate that a water body may be of High status. It specifically assesses elements such as water flow, sediment composition and movement, continuity, and structure of the habitat against reference or 'largely undisturbed' conditions. If the hydromorphological elements do not support High status, then the status of the water body is limited to Good overall status. For artificial or highly modified waterbodies, hydromorphological elements are assessed initially to determine which of the biological and physico-chemical elements should be used in the classification of ecological potential. In all cases, assessment of baseline hydromorphological conditions are an important factor in determining possible reasons for classifying biological and physicochemical elements of a water body as less than Good, and hence in determining what mitigation measures may be required to address these failing water bodies.

1.2 Background to Groundwater Body Status

Under the WFD, groundwater body status is classified on the basis of quantitative and chemical status. Status is assessed primarily using data collected from the EPA monitoring network; therefore, the scale of assessment means that groundwater status is mainly influenced by larger scale effects such as significant abstraction or widespread/ diffuse pollution. The worst-case classification is assigned as the overall groundwater body status, in a 'one-out all-out' system. This system is summarised in Figure 2 below.

1.2.1 Quantitative Status

Quantitative status is defined by the quantity of groundwater available as baseflow to watercourses and water-dependent ecosystems, and as 'resource' available for use as drinking water and other consumptive purposes. This is assigned on a scale of Good or Poor, and on the basis of four classification elements or 'tests' as follows:

- **Saline or other intrusions:** This test is designed to identify groundwater bodies where the intrusion of poor-quality water, such as saline water or water of different chemical composition, as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions.
- **Surface water:** This test is designed to identify groundwater bodies where groundwater abstraction is leading to a significant diminution of the ecological status of associated surface water bodies.

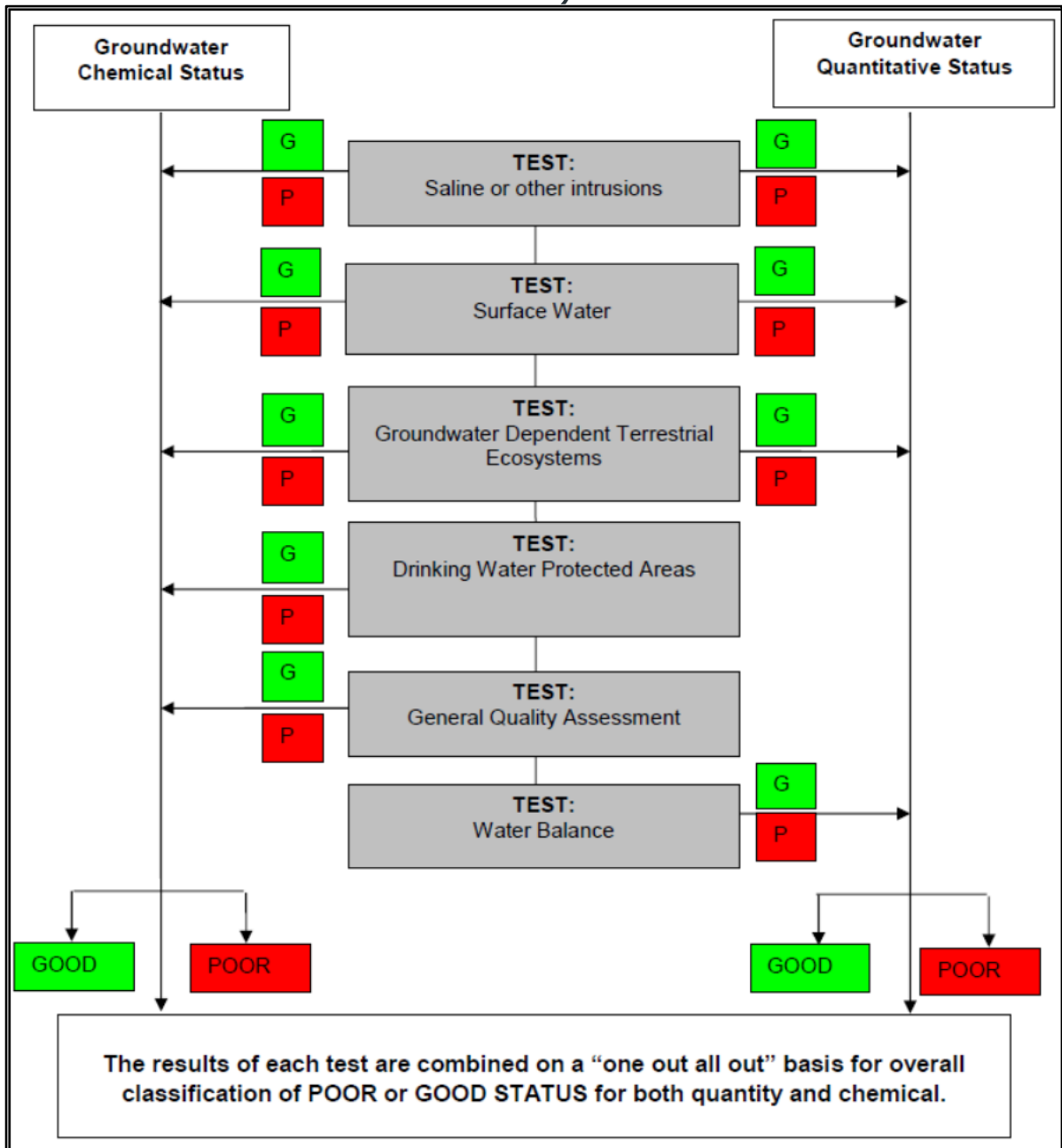
- **Groundwater Dependent Terrestrial Ecosystems (GWDTEs):** This test is designed to identify groundwater bodies where groundwater abstraction is leading to “significant damage” to associated GWDTEs (with respect to water quantity).
- **Water balance:** This test is designed to identify groundwater bodies where groundwater abstraction exceeds the “available groundwater resource”, defined as the rate of overall recharge to the groundwater body itself, as well as the rate of flow required to meet the ecological needs of associated surface water bodies and GWDTEs.

1.2.2 Chemical Status

Chemical status is defined by the concentrations of a range of key pollutants, by the quality of groundwater feeding into watercourses and water-dependent ecosystems and by the quality of groundwater available for drinking water purposes. This is assigned on a scale of Good or Poor, and on the basis of five classification elements or ‘tests’ as follows:

- **Saline or other intrusions:** This test is designed to identify groundwater bodies where the intrusion of poor-quality water, such as saline water or water of different chemical composition, as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions.
- **Surface water:** This test is designed to identify groundwater bodies where groundwater abstraction is leading to a significant diminution of the chemical status of associated surface water bodies.
- **GWDTEs:** This test is designed to identify groundwater bodies where groundwater abstraction is leading to “significant damage” to associated GWDTE’s (with respect to water quality).
- **Drinking Water Protected Areas (DrWPAs):** This test is designed to identify groundwater bodies failing to meet the DrWPA objectives defined in Article 7 of the WFD or at risk of failing in the future.
- **General quality assessment:** This test is designed to identify groundwater bodies where widespread deterioration in quality has or will compromise the strategic use of groundwater.

Figure 2. WFD classification elements for groundwater body status (Environmental Agency, 2015)



APPENDIX B. NON-DETERIORATION ASSESSMENT

Table 1 - Risk screening of potential to cause deterioration of current WFD status

	Surface Water	Scheme Elements	Proposed Development						Mitigation Measures	Overall Impact with mitigation measures
	Ward_030 River Waterbody (IE_EA_08W010300) Ward_040 River Waterbody (IE_EA_08W010300) Broadmeadow_040 River Waterbody (IE_EA_08B020800) Broadmeadow Water Transitional Waterbody (IE_EA_060_0100) Malahide Bay coastal waterbody (IE_EA_060_0000) Northeastern Irish sea (IE_EA_020_0000)		Phase (Construction/ Operation)	Construction	Construction	Construction	Construction	Operation		
		Identified Quantitative Impacts	Increased run-off and sediment loading	Temporary land-take during the construction phase	Pollution due to accidental discharges or spillages during the construction phase	Release of sediments, pollutants and construction material during Bridge construction.	Increase in Hardstanding	Pollution due to accidental discharges or spillages from car parks and hardstanding areas during the operation phase		
WFD Status	Macrophytes and phytobenthos - combined	Predicted change to status elements (green = none, amber = possibly, red = likely)	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	Construction: The project-specific CEMP will include robust mitigation measures to protect the hydrological environment. 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 conditions relevant to the proposed development. These include management of soils, re-fuelling machinery and chemical handling and control of water during the construction phase.	No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Macroinvertebrates		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Fish		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
Physio-Chemical Status	Total Ammonia	Predicted change to status elements (green = none, amber = possibly, red = likely)	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	Operation: The proposed development is designed to ensure the protection of the hydrological environment such as delivery and distribution and use of oil interceptors on the stormwater system and the use of SuDS techniques. In order to limit the surface water discharge from the site to pre-development, greenfield rates, and to ensure improvement in the overall surface water quality before ultimate discharge the principles of Sustainable Drainage Systems, (SuDS) are to be implemented. Details are to be agreed with local county council authorities. The proposed foul drainage system will eventually discharge to the licenced Ringsend WWTP.	No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Total Nitrogen		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Ortho-Phosphate		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
Hydromorphological Elements	Quantity and dynamics of river flow	Predicted change to status elements (green = none, amber = possibly, red = likely)	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	Operation: The proposed development is designed to ensure the protection of the hydrological environment such as delivery and distribution and use of oil interceptors on the stormwater system and the use of SuDS techniques. In order to limit the surface water discharge from the site to pre-development, greenfield rates, and to ensure improvement in the overall surface water quality before ultimate discharge the principles of Sustainable Drainage Systems, (SuDS) are to be implemented. Details are to be agreed with local county council authorities. The proposed foul drainage system will eventually discharge to the licenced Ringsend WWTP.	No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Connection to Groundwater		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	River continuity		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	River depth and width variation bed		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Structure and substrate of river bed		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Structure of riparian zone		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status

Table 2 - Risk screening of potential to cause deterioration of current WFD status

	Groundwater	Scheme Elements	Proposed Development					Mitigation Measures	Overall Impact
	Nanny-Delvin Groundwater Body (GWB) IE_EA_G_011	Phase (Construction/ Operation)	Construction	Construction	Construction	Operation	Operation		
		Identified Quantitative Impacts	Increased run-off and sediment loading	Release of sediments, pollutants and construction material during Bridge construction.	Pollution due to accidental discharges or spillages during the construction phase	Increase in Hardstanding	Pollution due to accidental discharges or spillages from car parks and hardstanding areas during the operation phase		
Quantitative Elements	Saline or other intrusions. To identify groundwater bodies where the intrusion of poor quality water as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions.	Predicted change to status elements (green = none, amber = possibly, red = likely)	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	<p>Construction: The project-specific CEMP will include robust mitigation measures to protect the underlying hydrogeological environment. 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 conditions relevant to the proposed development. These include management of soils, re-fuelling machinery and chemical handling and control of water during the construction phase. No significant dewatering is required which could impact on quantitative status.</p> <p>Operation: The proposed development is designed to ensure the protection of the underlying hydrogeological environment such as use of oil interceptors on the stormwater system and prior to discharge from the site and the use of SuDS techniques. In order to limit the surface water discharge from the site to pre-development, greenfield rates, and to ensure improvement in the overall surface water quality before ultimate discharge the principles of Sustainable Drainage Systems, (SuDS) are to be implemented. No significant abstraction is required which could impact on quantitative status. The proposed foul drainage drainage system will eventually discharge to the licenced Ringsend WWTP.</p>	No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Surface water. To assess the impact of groundwater abstractions on the ecological status of surface water bodies.		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Groundwater Dependent Terrestrial Ecosystems (GWDTE's) To assess the impact of groundwater abstractions on the condition of GWDTE's.		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Water balance To identify groundwater bodies where abstractions exceed the available resource.		Not Applicable (no dewatering anticipated)	Not Applicable (no dewatering anticipated)	Not Applicable (no dewatering anticipated)	Not Applicable (no water supply from borehole anticipated)	Not Applicable (no water supply from borehole anticipated)		Not Applicable
Chemical Elements	Saline or other intrusions. To identify groundwater bodies where the intrusion of poor quality water as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions.	Predicted change to status elements (green = none, amber = possibly, red = likely)	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No anticipated impacts to the hydrological environment with no deterioration to the WFD Status	
	Surface water. To assess the impact of groundwater abstractions on the ecological status of surface water bodies.		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No anticipated impacts to the hydrological environment with no deterioration to the WFD Status	
	Groundwater Dependent Terrestrial Ecosystems (GWDTE's) To assess the impact of nutrient concentrations in groundwater (primarily phosphates) on GWDTE's.		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No anticipated impacts to the hydrological environment with no deterioration to the WFD Status	
	Drinking Water Protected Areas (DrWPAs) To identify groundwater bodies failing to meet the DrWPA objectives defined in Article 7 of the WFD or at risk of failing in the future.		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No anticipated impacts to the hydrological environment with no deterioration to the WFD Status	
	General quality assessment To identify groundwater bodies where widespread deterioration in quality has or will compromise the strategic use of groundwater.		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No anticipated impacts to the hydrological environment with no deterioration to the WFD Status	

APPENDIX 8.1 AIR QUALITY – TECHNICAL APPENDIX

8.1.1 Description of the AERMOD Model

The AERMOD dispersion model has been developed in part by the U.S. Environmental Protection Agency (USEPA) (EPA, 2020; USEPA, 1995; USEPA, 2005; USEPA, 2022). The model is a steady-state Gaussian model used to assess pollutant concentrations associated with industrial sources. The model is an enhancement on the Industrial Source Complex-Short Term 3 (ISCST3) model which has been widely used for emissions from industrial sources.

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

In contrast to ISCST3, AERMOD is widely applicable in all types of terrain. Differentiation of the simple versus complex terrain is unnecessary with AERMOD. In complex terrain, AERMOD employs the dividing-streamline concept in a simplified simulation of the effects of plume-terrain interactions. In the dividing-streamline concept, flow below this height remains horizontal, and flow above this height tends to rise up and over terrain. Extensive validation studies have found that AERMOD (precursor to AERMOD with PRIME) performs better than ISCST3 for many applications and as well or better than CTDMPPLUS for several complex terrain data sets (USEPA, 1999).

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

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

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

The immediate zone in the lee of the building is termed the cavity or near wake and is characterised by high intensity turbulence and an area of uniform low pressure. Plume mass captured by the cavity region

is re-emitted to the far wake as a ground-level volume source. The volume source is located at the base of the lee wall of the building but is only evaluated near the end of the near wake and beyond. In this region, the disruption caused by the building downwash gradually fades with distance to ambient values downwind of the building.

AERMOD has made substantial improvements in the area of plume growth rates in comparison to ISCST3 (USEPA, 1995; 1999). ISCST3 approximates turbulence using six Pasquill-Gifford-Turner Stability Classes and bases the resulting dispersion curves upon surface release experiments. This treatment, however, cannot explicitly account for turbulence in the formulation. AERMOD is based on the more realistic modern planetary boundary layer (PBL) theory which allows turbulence to vary with height. This use of turbulence-based plume growth with height leads to a substantial advancement over the ISCST3 treatment.

Improvements have also been made in relation to mixing height (USEPA, 1995; 1999). The treatment of mixing height by ISCST3 is based on a single morning upper air sounding each day. AERMOD, however, calculates mixing height on an hourly basis based on the morning upper air sounding and the surface energy balance, accounting for the solar radiation, cloud cover, reflectivity of the ground and the latent heat due to evaporation from the ground cover. This more advanced formulation provides a more realistic sequence of the diurnal mixing height changes.

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

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

8.1.2 Meteorological Data - AERMET

AERMOD incorporates a meteorological pre-processor AERMET (USEPA, 2018). AERMET allows AERMOD to account for changes in the plume behaviour with height. AERMET calculates hourly boundary layer parameters for use by AERMOD, including friction velocity, Monin-Obukhov length, convective velocity scale, convective (CBL) and stable boundary layer (SBL) height and surface heat flux. AERMOD uses this information to calculate concentrations in a manner that accounts for changes in dispersion rate with height, allows for a non-Gaussian plume in convective conditions, and accounts for a dispersion rate that is a continuous function of meteorology.

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

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

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

The values of albedo, Bowen Ratio and surface roughness depend on land-use type (e.g., urban, cultivated land etc) and vary with seasons and wind direction. The assessment of appropriate land-use types was carried out in line with USEPA recommendations (USEPA, 2005) and using the detailed methodology outlined by the Alaska Department of Environmental Conservation (ADEC, 2008). AERMET has also been updated to allow for an adjustment of the surface friction velocity (u^*) for low wind speed stable conditions based on the work of Qian and Venkatram. Previously, the model had a tendency to over-predict concentrations produced by near-ground sources in stable conditions.

Surface roughness

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

Appendix Table B-1. Surface Roughness based on an inverse distance area-weighted average of the land use within a 1 km radius of Dublin Airport

Sector	Area Weighted Land Use Classification	Spring	Summer	Autumn	Winter ^a
340-100	0% Water, 100% Urban, 0% Grassland	1	1	1	1
100-340	0% Water, 0% Urban, 100% Grassland	0.05	0.1	0.01	0.01

Sector	Area Weighted Land Use Classification	Spring	Summer	Autumn	Winter ^a
a. Winter defined as periods when surfaces covered permanently by snow whereas autumn is defined as periods when freezing conditions are common, deciduous trees are leafless and no snow is present. Thus, for the current location autumn more accurately defines "winter" conditions at the proposed facility.					

Albedo

Noon-time Albedo is the fraction of the incoming solar radiation that is reflected from the ground when the sun is directly overhead. Albedo is used in calculating the hourly net heat balance at the surface for calculating hourly values of Monin-Obuklov length. The area-weighted arithmetic mean albedo derived from the land use classification over a 10 km x 10 km area centred on Dublin Airport is shown in Table B-2.

Appendix Table B-2. Albedo based on an area-weighted arithmetic mean of the land use over a 10 km x 10 km area centred on Dublin Airport

Area Weighted Land Use Classification	Spring	Summer	Autumn	Winter ^a
2% Water, 49% Urban, 31% Grassland, 19% Cultivated Land	0.152	0.173	0.185	0.185
a. For the current location autumn more accurately defines "winter" conditions at the proposed facility.				

Bowen Ratio

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

Appendix Table B-3. Bowen Ratio based on an area-weighted geometric mean of the land use over a 10 km x 10 km area centred on Dublin Airport

Area Weighted Land Use Classification	Spring	Summer	Autumn	Winter ^a
2% Water, 49% Urban, 31% Grassland, 19% Cultivated Land	0.63	1.23	1.36	1.36
a. For the current location autumn more accurately defines "winter" conditions at the proposed facility.				

APPENDIX 10.1 - GLOSSARY OF ACOUSTIC TERMINOLOGY

ambient noise	The totally encompassing sound in a given situation at a given time, usually composed of sound from many sources, near and far.
background noise	The steady existing noise level present without contribution from any intermittent sources. The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90 per cent of a given time interval, T ($L_{AF90,T}$).
broadband	Sounds that contain energy distributed across a wide range of frequencies.
dB	Decibel - The scale in which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the RMS pressure of the sound field and the reference pressure of 20 micro-pascals (20 μ Pa).
dB L_{pA}	An 'A-weighted decibel' - a measure of the overall noise level of sound across the audible frequency range (20 Hz – 20 kHz) with A-frequency weighting (i.e. 'A'-weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
Hertz (Hz)	The unit of sound frequency in cycles per second.
impulsive noise	A noise that is of short duration (typically less than one second), the sound pressure level of which is significantly higher than the background.
$L_{Aeq,T}$	This is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period (T). The closer the L_{Aeq} value is to either the L_{AF10} or $L_{=}$ value indicates the relative impact of the intermittent sources and their contribution. The relative spread between the values determines the impact of intermittent sources such as traffic on the background.
L_{AFN}	The A-weighted noise level exceeded for N% of the sampling interval. Measured using the "Fast" time weighting.
L_{AFmax}	is the instantaneous slow time weighted maximum sound level measured during the sample period (usually referred to in relation to construction noise levels).
$L_{Ar,T}$	The Rated Noise Level, equal to the L_{Aeq} during a specified time interval (T), plus specified adjustments for tonal character and impulsiveness of the sound.
L_{AF90}	Refers to those A-weighted noise levels in the lower 90 percentile of the sampling interval; it is the level which is exceeded for 90% of the measurement period. It will therefore exclude the intermittent features of traffic and is used to estimate a background level. Measured using the "Fast" time weighting.
$L_{AT(DW)}$	equivalent continuous downwind sound pressure level.
$L_{FT(DW)}$	equivalent continuous downwind octave-band sound pressure level.
L_{day}	L_{day} is the average noise level during the daytime period of 07:00hrs to 19:00hrs

L _{night}	L _{night} is the average noise level during the night-time period of 23:00hrs to 07:00hrs.
low frequency noise	LFN - noise which is dominated by frequency components towards the lower end of the frequency spectrum.
noise	Any sound, that has the potential to cause disturbance, discomfort or psychological stress to a person exposed to it, or any sound that could cause actual physiological harm to a person exposed to it, or physical damage to any structure exposed to it, is known as noise.
noise sensitive location	NSL – Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or other area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.
octave band	A frequency interval, the upper limit of which is twice that of the lower limit. For example, the 1,000Hz octave band contains acoustical energy between 707Hz and 1,414Hz. The centre frequencies used for the designation of octave bands are defined in ISO and ANSI standards.
rating level	See L _{A,r,T} .
sound power level	The logarithmic measure of sound power in comparison to a referenced sound intensity level of one picowatt (1pW) per m ² where: $L_w = 10 \log \frac{P}{P_0} \text{ dB}$
	Where: p is the rms value of sound power in pascals; and P ₀ is 1 pW.
sound pressure level	The sound pressure level at a point is defined as: $L_p = 20 \log \frac{P}{P_0} \text{ dB}$
specific noise level	A component of the ambient noise which can be specifically identified by acoustical means and may be associated with a specific source. In BS 4142, there is a more precise definition as follows: 'the equivalent continuous A-weighted sound pressure level at the assessment position produced by the specific noise source over a given reference time interval (LA _{eq} , T)'.
tonal	Sounds which cover a range of only a few Hz which contains a clearly audible tone i.e. distinguishable, discrete or continuous noise (whine, hiss, screech, or hum etc.) are referred to as being 'tonal'.
1/3 octave analysis	Frequency analysis of sound such that the frequency spectrum is subdivided into bands of one-third of an octave each.

APPENDIX 10.2 - NOISE MODELLING DETAILS & ASSUMPTIONS

Noise Model

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

DGMR iNoise

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

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

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

Brief Description of ISO9613-2: 1996

ISO9613-2:1996 calculates the noise level based on each of the factors discussed previously. Note that there is a new version of the standard became available in 2024 after the model was built. However, the effect of meteorological conditions is significantly simplified by calculating the average downwind sound pressure level, $L_{AT}(DW)$, for the following conditions:

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

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

$$L_{fT}(DW) = L_W + D_c - A \quad \text{Eqn. A}$$

Where:

$L_{fT}(DW)$ is an octave band centre frequency component of $L_{AT}(DW)$ in dB relative to $2 \times 10^{-5}\text{Pa}$;

L_W is the octave band sound power of the point source;

D_c is the directivity correction for the point source;

A is the octave band attenuation that occurs during propagation, namely attenuation due to geometric divergence, atmospheric absorption, ground effect, barriers and miscellaneous other effects.

The estimated accuracy associated with this methodology is shown in Table 10.A2.1 below:

Table 10.A2.1 Atmospheric Attenuation Assumed for Noise Calculations (dB per km)

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

* h is the mean height of the source and receiver. † d is the mean distance between the source and receiver.

N.B. These estimates have been made from situations where there are no effects due to reflections or attenuation due to screening.

Input Data and Assumptions

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

<i>Site Layout</i>	The general site layout has been obtained from the drawings forwarded by Kavanagh Tuite.
<i>Local Area</i>	The location of noise sensitive locations has been obtained from a combination of site drawings provided by Kavanagh Tuite Architects and others obtained from Ordnance Survey Ireland (OSI).
<i>Heights</i>	The heights of buildings on site have been obtained from site drawings forwarded by Kavanagh Tuite Architects. Off-site buildings have been assumed to be 8m high with the exception of industrial buildings where a default height of 15m has been assumed.
<i>Contours</i>	Site ground contours/heights have been obtained from site drawings forwarded by Kavanagh Tuite Architects where available.

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

Source Sound Power Data

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

Table 10.A2.2 Sound Power Levels Utilised in Noise Model

Item	Sound Power Level, L_{WA} (dB) at Octave-band Centre Frequency, (Hz)									dB(A)
	31.5	63	125	250	500	1k	2k	4k	8k	
Inlet Filter Face	115	110	99	91	85	88	89	93	90	98
Inlet Duct	113	104	89	79	76	79	89	85	67	92
Inlet Transition Duct	120	111	96	85	85	86	81	75	47	91
Inlet Plenum	90	92	89	91	90	91	100	91	79	102
Gas Turbine Enclosure	112	114	108	97	91	90	92	90	84	99
GT Enclosure Vent Fans	57	70	88	86	89	89	89	93	88	97
Exhaust Diffuser with Barrier Wall	106	113	97	93	87	85	86	89	76	95
Generator Enclosure	113	117	114	101	96	92	90	82	79	102
Fin Fan Coolers	56	69	93	92	97	100	91	86	86	102
Liquid Fuel Module (Liquid Fuel Only)	115	119	116	103	98	94	92	84	81	104
Fuel Oil Pump (Liquid Fuel only)	80	81	82	84	84	87	84	80	74	91
Demin Water Pump – (Liquid Fuel Only)	80	81	82	84	84	87	84	80	74	91
Fuel Gas Separator Skid (Gas Fuel Only)	47	51	60	65	69	79	91	92	86	96
Fuel Gas Performance Heater Skid (Gas Fuel Only)	43	48	57	61	65	75	87	88	82	92
Silencer Duct Stage 1	127	118	103	92	92	93	88	82	54	98
Silencer Duct Stage 2	88	92	87	83	89	93	89	83	53	96
Stack with Shroud	119	100	67	48	47	53	60	70	42	81
Stack outlet	88	89	81	83	87	86	81	88	78	92
Air Compressor	83	87	88	89	90	88	86	82	76	93
Admin Building HVAC	41	57	67	71	74	73	71	68	58	78
Warehouse Louvre (each of 2)	41	57	67	71	74	73	71	68	58	78
Warehouse Exhaust (each of 2)	41	57	67	71	74	73	71	68	58	78
Aux Transformer	48	59	74	83	85	91	83	73	59	92
Step-up Transformer	48	59	74	83	85	91	83	73	59	92

Noise Barrier

The design incorporates a noise barrier of 12 m height at the north east part of the main gas turbine area, as in the figure below:

Figure 10.A2.1 Noise Barrier



The noise barrier has the following acoustic properties:

Table 10.A2.3 Sound Reduction Index

SRI dB at Octave Band Centre Frequencies (Hz)								
31.5	63	125	250	500	1k	2k	4k	8k
8	15	20	25	39	48	50	50	50

Table 10.A2.4 Acoustic Absorption on side facing gas turbine

Acoustic Absorption at Octave Band Centre Frequencies (Hz)								
31.5	63	125	250	500	1k	2k	4k	8k
0.5	0.5	0.84	1.0	1.0	1.0	1.0	0.97	0.97

APPENDIX 10.3 – NOISE MODEL PARAMETERS

Prediction calculations for noise emissions have been conducted in accordance with ISO 9613: *Acoustics – Attenuation of sound during propagation outdoors, Part 2: General method of calculation, 1996*. The following are the main aspects that have been considered in terms of the noise predictions presented in this instance.

Directivity Factor:

The directivity factor (D) allows for an adjustment to be made where the sound radiated in the direction of interest is higher than that for which the sound power level is specified. In this case the sound power level is measured in a down wind direction, corresponding to the worst case propagation conditions and needs no further adjustment.

Ground Effect:

Ground effect is the result of sound reflected by the ground interfering with the sound propagating directly from source to receiver. The prediction of ground effects is inherently complex and depend on source height receiver height propagation height between the source and receiver and the ground conditions. The ground conditions are described according to a variable defined as G, which varies between 0.0 for hard ground (including paving, ice concrete) and 1.0 for soft ground (includes ground covered by grass trees or other vegetation) Our predictions have been carried out using various source height specific to each plant item, a receiver heights of 1.6m for single storey properties and 4m for double. An assumed ground factor of $G = 1.0$ has been applied off site. Noise contours presented in the assessment have been predicted to a height of 4m in all instances. For construction noise predictions have been made at a level of 1.6m as these activities will not occur at night.

Geometrical Divergence

This term relates to the spherical spreading in the free-field from a point sound source resulting in attenuation depending on distance according to the following equation:

$$A_{geo} = 20 \times \log(\text{distance from source in meters}) + 11$$

Atmospheric Absorption

Sound propagation through the atmosphere is attenuated by the conversion of the sound energy into heat. This attenuation is dependent on the temperature and relative humidity of the air through which the sound is travelling and is frequency dependent with increasing attenuation towards higher frequencies. In these predictions a temperature of 10°C and a relative humidity of 70% have been used, which give relatively low levels of atmosphere attenuation and corresponding worst case noise predictions.

Table 10.A3.1 Atmospheric Attenuation Assumed for Noise Calculations (dB per km)

Temp (°C)	% Humidity	Octave Band Centre Frequencies (Hz)								
		31.5	63	125	250	500	1k	2k	4k	8k
10	70	0.12	0.41	1.04	1.92	3.66	9.70	33.06	118.4	10

Barrier Attenuation

The effect of any barrier between the noise source and the receiver position is that noise will be reduced according to the relative heights of the source, receiver and barrier and the frequency spectrum of the noise.

APPENDIX 12.1 RECORDED ARCHAEOLOGICAL MONUMENTS

Prepared by CRDS, 2025

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 Service¹. 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 recorded on the Record of Monuments and Places all receive statutory protection under the National Monuments Act 1994. 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 Record of Monuments and Places was consulted in the Archives of the Department of Arts, Heritage and the Gaeltacht. The recorded archaeological monuments in the study area are listed below.

SMR No	DU014-001----
County	DUBLIN
Townland	Kilshane
ITM	E. 710410m, N. 743822m
Classification	Castle - motte
Description	Shown on the 1837-1937 OS maps as a substantial circular mound with an enclosing fosse titled 'Kilshane Moat'. The site was subject to geophysical survey (License no. 07R093) which confirmed the presence of archaeological responses at the site of the motte. The responses are sub-circular in form surrounded by an enclosing ditch (67m NS x 62m EW). Internal responses may indicate plough damaged occupational activity (Harrison 2007, 11). The responses correspond to a prominent mound in the northwest corner of a large open tillage field. The owner has been farming it since 1955 and noticed lots of stone in the area as the plough would have to be raised. A crop-mark illustrating an extent of the earthwork is visible on digital globe measuring 67.5 N-S and 72.8 E-W. This aerial view was created on the 9 June 2016. Additional information provided from an aerial photograph taken in the dry spell in July 2018 shows a tapering avenue defined by a pair of ditches extending out from the SE side of the monument and visible for approximately 140m.
Compiled by	Geraldine Stout
Updated by	Christine Baker and Margaret Keane
Date of upload	21 January 2015

SMR No	DU014-005001-
County	DUBLIN
Townland	Dunsoghly
ITM	E. 711764m, N. 743185m
Classification	Castle - tower house
Description	<p>Located with a farmyard, this late 15th-century tower house is a National Monument. Associated with the Plunkett family it rises to four storeys with four large corner towers. Built of coursed limestone blocks with dressed stone quoins and a base batter.</p> <p>Entrance on the ground floor is through a three-centred arched doorway in the N wall. The main chamber is barrel vaulted on a N-S alignment, with wicker-work centring evident (int. dims. L 10.5m; Wth 8.1m). There are chambers in all the corner turrets except the NE turret which contains the stairs. The ground floor is lit by slit opes in the S, W and N. NW chamber is entered through a pointed arched doorway. It is vaulted (dims. L 3.4m; Wth 2.8m). A curving passage, which is only partially roofed, leads into the SW tower.</p> <p>The SE tower is also vaulted (dims. L 3.2m; Wth 2.8m). The first floor chamber is lit by tall rectangular windows. Off this, the NW angle tower contains a brick fireplace, which incorporates some chamfered jambs. It is lit by a tall rectangular window in the W and a</p>

¹ <https://archaeology.ie>

pointed arched window in the NW. There is a garderobe and wall press in SW tower with musket hole in the N wall. The SE tower on first floor contains a hollowed basin with a drain hole and a musket hole in a wall recess.

Corbels for the main second floor chamber are still in place. A substantial percentage of the original roof timbers are present over third floor. A fireplace in the W wall has a flat arch with chamfered jambs. There are stepped window embrasures on the E, W and S walls. The corner chambers have corbelled roofs. Tudor style chimneys are still present. The battlements are entered through a pointed arched doorway in the NE tower (Healy 1975, 26; Crawford 1922, 85-87; Anon 1897, 448-50). Remains of a dwelling (DU014-005006-) attached by wall to NW end of tower house. Possible house-sites are visible on aerial photograph (CUCAP, AID 57) E of the tower house (Harbison 1998, 164-5; Sweetman 1999, 138-9).

The surrounding lands were subject to a geophysical survey (License no. 10R033) as part of a Conservation Plan that explored the development potential of the castle and its surroundings, in the context of its archaeological, historical, landscape and wildlife significance. The survey did not provide any clear evidence for features although agricultural activity was prevalent with numerous ploughing trends and linear responses suggestive of former field divisions. It is possible that some of these responses reflect former field systems and ridge and furrow cultivation and may be contemporary with Dunsoghly Castle (Leigh 2010, 11).

Compiled by Geraldine Stout
Updated by Christine Baker
Date of upload 22 January 2015

SMR No DU014-005002-

County DUBLIN
Townland Dunsoghly
ITM E. 711765m, N. 743172m

Classification Chapel
Description Connected to the southwest corner of Dunsoghly castle (DU014-005001-) by a wall with entrance. The chapel is an oblong, single storey building. It is built of randomly coursed masonry with roughly dressed limestone quoins. Entrance is in the west end of north wall through round arched doorway which contains punch dressed jambs with double roll moulding and a hood moulding that terminates in a rosette and fleur-de-lis (int. dims. L 6.60m, W 4.40m). Sizeable crack from door to roof resulting in some water damage around door and arch and between wall and chapel. Above the door is an inscribed limestone tablet (DU014-005005-). Interior is lit by a double light window with semi-elliptical arches in the W gable, and blocked up rectangular window in the S wall alongside a pointed arch single light window with cusps and punch-dressed jambs. The southeast corner is slightly battered with remains of (blocked) round arched opening. Within the interior are wall presses in E and W end of N the wall (Tutty 1979, 32, 156).

Compiled by Geraldine Stout
Updated by Christine Baker
Date of upload 22 January 2015

SMR No DU014-005003-

County DUBLIN
Townland Dunsoghly
ITM E. 711656m, N. 743051m

Classification Castle - motte and bailey
Description Situated on a natural rise southwest of Dunsoghly Castle (DU014-005001-). Marked on the 1837 OS map as Connaberry Moat. The site comprises a raised area, roughly oval in plan (80m NE-SW; 65m SE-NW; H 3m). Its flat top is occupied by a farm and tree cover. Traces

of an outer bank are visible on an aerial photograph taken by Leo Swan. Not visible at ground level.

Compiled by Geraldine Stout
Updated by Christine Baker
Date of upload 22 January 2015

SMR No DU014-005004-

County DUBLIN
Townland Dunsoghly
ITM E. 711806m, N. 743202m
Classification House - indeterminate date
Description East of Dunsoghly castle (DU014-005001-) two square trenched areas are visible on an aerial photograph (CUCAP AID57). The site has been partially built on since the photographs were taken. The general area is disturbed. Not visible at ground level.

Compiled by Geraldine Stout
Date of upload 26 August 2011

SMR No DU014-005005-

County DUBLIN
Townland Dunsoghly
ITM E. 711762m, N. 743175m
Classification Crucifixion plaque
Description Above the door of the chapel (DU014-005002-) is an inscribed limestone tablet with symbols of the passion, a date of 1573 A. D. and initials J. P. M. D. D. S. i. e. John Plunkett, Miles de Dunsoghley, and wife's surname 'Sarsefield'. Verigated.

Compiled by Geraldine Stout
Updated by Christine Baker
Date of upload 22 January 2015

SMR No DU014-005006-

County DUBLIN
Townland Dunsoghly
ITM E. 711748m, N. 743211m
Classification House - 16th/17th century
Description Attached to bawn wall that extends from the northwest of Dunsoghly Castle (DU014-005001-). The west wall and north gable with Tudor style chimney is all that survives and these have been incorporated into farm outbuildings. This is probably the building mentioned in the Civil survey (1654-6) as a 'dwelling house' with the castle at Dunsoghly (Simington 1945, 210).

Compiled by Geraldine Stout
Updated by Christine Baker
Date of upload 22 January 2015

SMR No DU014-006001-

County DUBLIN
Townland Newtown (Coolock By., Finglas Ed)
ITM E. 711962m, N. 742457m
Classification Ringfort - unclassified
Description Was formerly located on a slight rise in undulating tillage. Now within Dublin Airport Logistics Park. Marked on OS historical maps, the site was levelled in 1953 (NMI Correspondence). Prior to its destruction it comprised a roughly circular area (diam. c. 90m) enclosed by a bank (H c. 2m) with external fosse and a low external counterscarp bank. There was an entrance causeway in the south (NMI Correspondence 3 September 1952). A series of aerial

photographs taken after site destruction (BDR 27, BDQ 65, BGM, 70, AVS 38, 37) shows detailed cropmark evidence for two distinct building phases on the site. A roughly circular enclosure (diam. c. 45m) with field system attached to the W (DU014-006002-) appears to pre-date the ringfort levelled in 1953 (Stout and Stout 1992, 5-14).

Test excavation (License no. 05E0236) was undertaken in advance of the industrial park development. A strategy of open area testing was adopted to find the extent of remains. A total of 33 features were identified including human remain, pits, postholes, stakeholes, hearths and large ditch features. The testing confirmed the presence of large ditches illustrated on the OS maps in the form of two enclosing ditches and a bank between. The burials, aligned east-west, are located to the north east quadrant of the ditches cut into its fill indicating a later deposition. The burials and eastern quadrant of the site was preserved in situ under the carpark of DHL. The western quadrant of the ringfort was covered in terram and stone. Now within wasteland. Drop of c.1m down to stone. No indication of significance of the site.

Compiled by Geraldine Stout
Updated by Christine Baker
Date of upload 22 January 2015

SMR No **DU014-006002-**
County DUBLIN
Townland Newtown (Coolock By., Finglas Ed)
ITM E. 711827m, N. 742447m
Classification Ringfort - unclassified
Description Located on wasteland within the Dublin Airport Logistics Park. Previously a golf course. A series of aerial photographs taken after site destruction (BDR 27, BDQ 65, BGM, 70, AVS 38, 37) shows detailed cropmark evidence for two distinct building phases on the site. A roughly circular enclosure (diam. c. 45m) with field system attached to the west appears to pre-date the ringfort (DU014-006001-) levelled in 1953 (Stout and Stout 1992, 5-14).

Compiled by Geraldine Stout
Updated by Christine Baker
Date of upload 22 January 2015

SMR No **DU014-007----**
County DUBLIN
Townland Enclosure
ITM E. 712226m, N. 742620m
Classification Enclosure
Description Situated on a slight rise in a large open field of tillage. An oval-shaped, single-ditched enclosure (max. dims. L 33m; Wth. 30m) appears as a cropmark on a Cambridge aerial photograph (CUCAP, BGM 68). Visible on Bing (Viewed 22 January 2015). Entrance to the east. Not visible at ground level.

Compiled by Geraldine Stout
Updated by Christine Baker
Date of upload 22 January 2015

SMR No **DU014-012001-**
County DUBLIN
Townland Kilshane
ITM E. 710876m, N. 742260m
Classification Church
Description On the 1st edition OS 6-inch (1842) there is a field named 'Church Field' and an area identified as the 'Old Burying Ground' outlined in the N end of the same field. Other than this placename there is no supporting documentary evidence for a church at this location. The area has been extensively quarried. Not visible at ground level.
Compiled by Geraldine Stout
Updated by Christine Baker
Date of upload 22 January 2015

SMR No **DU014-012002-**
County DUBLIN
Townland Kilshane
ITM E. 710975m, N. 742277m
Classification Burial ground
Description On the 1st edition OS 6-inch map (1842) there is an area identified as the 'Old Burying Ground' outlined in the N end of this field. The area has been extensively quarried. Not visible at ground level.
Compiled by Geraldine Stout
Updated by Christine Baker
Date of upload 22 January 2015

SMR No **DU014-012003-**
County DUBLIN
Townland Kilshane
ITM E. 710869m, N. 742258m
Classification Ritual site - holy well
Description Annotated 'Church Well' on the 1838 ed. OSi 6-inch map where it is shown standing in NW corner of an 'Old Burying Ground' (DU014-012002-) in the NE corner of a large field annotated 'Church Field' (DU014-012001-). In 1958 the well was being used for domestic purposes and not considered to be a holy well (Ó Danachair 1958, 76). It has been removed by quarrying.
Compiled by Geraldine Stout
Revised by Caimin O'Brien
Date of revision 14 April 2023

SMR No **DU014-013----**
County DUBLIN
Townland Newtown (Coolock By., Finglas Ed)
ITM E. 711319m, N. 742325m
Classification Castle - motte and bailey
Description Situated in a field next to the N2. Prior to its destruction in 1952 this site comprised a circular platform (diam. 28m; H 3m) which was enclosed around the base by a wide fosse. This flat-topped platform was further enclosed by an oval earthwork or bailey (dims. 100m E-W; 70m N-S; NMI IA 245/1952). The site is visible as a soilmark on an aerial photograph taken in 1971 (FSI 2.4154/4) and on colour vertical photograph (OS 8/Flight 31, 7616 see Healy 1975, 26). A cropmark showing oval enclosure with the faint traces of a smaller oval enclosure within is visible on digital globe aerial view created on the 9 June 2016
The site was subject to geophysical survey and test excavation (License no. 04E0807). The geophysical survey concluded there were extensive archaeological remains present including

the enclosing fosse and internal features of a motte and bailey. Text excavation confirmed the presence of archaeological remains (the fosse measures 5m in width). A burnt mound was also identified.

Compiled by Geraldine Stout
Updated by Christine Baker
Date of upload 22 January 2015

SMR No DU014-015----

County DUBLIN
Townland Coldwinters (Castleknock By.)
ITM E. 711859m, N. 741605m
Classification Ring-ditch
Description Located in pasture (formerly the green of a golf course) between the Dublin-Ashbourne Road and the N2. A circular cropmark (diam. c. 15m) visible on an aerial photograph (CUCAP, BDQ 66). Not visible at ground level.

Compiled by Geraldine Stout
Updated by Christine Baker
Date of upload 22 January 2015

SMR No DU014-016----

County DUBLIN
Townland Coldwinters (Castleknock By.)
ITM E. 711988m, N. 741810m
Classification Enclosure
Description An aerial photograph (CUCAP, BDQ 66) shows cropmark evidence for a circular, single-ditched enclosure (diam. c. 45m). It had been truncated by field boundaries in the east and was formerly incorporated into a golf course. The site was subject to test excavation (License no. 05E0236) but not identified (Tierney, 2005). Not visible at ground level.

Compiled by Geraldine Stout
Updated by Christine Baker
Date of upload 22 January 2015

SMR No DU014-048----

County DUBLIN
Townland Kilshane
ITM E. 710300m, N. 742841m
Classification Burial ground
Description Topsoil removal prior to construction of a gas pipeline in 1988 exposed the remains of several skeletons. The follow-up excavations revealed 123 skeletons, many of whom were children and adolescents (Gowen 1989, 17). These were aligned roughly east-west in the Christian manner, many haphazardly placed. Some of the individuals had stones around and under the heads. The presence of 'pillowstones' may indicate an 9th-13th-century date for the site.

Compiled by Geraldine Stout
Date of upload 26 August 2011

SMR No DU014-093----

County DUBLIN
Townland Kilshane
ITM E. 710927m, N. 742924m
Classification Enclosure
Description Excavations in advance of the N2 Finglas-Ashbourne Road Scheme in 2004 revealed a prehistoric enclosure on a gently undulating gravel ridge along a tributary of the Ward river.

This comprised an irregular ditch (Wth 1.9m-3.8m) enclosing an-egg shaped area (NW-SE 38.5m, NE-SW 27.5m). The ditch had been connected in a series of interconnecting, regular and irregular segments. Antler tines possibly used in ditch construction were found in the primary fill. One of the largest Neolithic bone assemblages from an excavated context (pers. comm. Mc Cormick) was deposited around the full circumference of the ditch. This was followed by the deposition of mid Neolithic broad-rimmed, round bottomed vessel, followed by a sealing layer of orange clay. Subsequent activity in the Early Bronze age consisted primarily of a series of deposits and features cutting into ditch fill. This produced some bone that had been worked into pins and awls, lithic material and a large pottery assemblage. In the northern area of the site there were cremation pits directly associated with burials of single bones. The only intact burial was that of a single crouched inhumation, located south of centre of the enclosure. A single hearth represents activity later in the Bronze Age (NRA).

Compiled by Geraldine Stout
Date of upload 26 August 2011

SMR No DU014-094----

County DUBLIN
Townland Broghan
ITM E. 711394m, N. 743960m
Classification Habitation site
Description Investigations in 1988 for the Phase 2, NE Gas Pipeline revealed an area of occupation debris, containing artifacts of multi-period date including three iron objects. Located on slight N-facing incline (Gowen 1989, 8).

Compiled by Geraldine Stout
Date of upload 26 August 2011

SMR No DU014-097----

County DUBLIN
Townland Ringfort - unclassified
ITM E. 712231m, N. 742517m
Classification Ringfort - unclassified
Description Aerial photograph (GB89. L.04) shows cropmark of a circular enclosure defined by a fosse. This is probaly a ploughed-out ringfort. Just one of four monuments within this large open field behind Newtown Caroline. No visible remains.

Compiled by Geraldine Stout
Updated by Christine Baker
Date of upload 23 January 2015

SMR No DU014-100----

County DUBLIN
Townland Newtown (Coolock By., Finglas Ed)
ITM E. 711913m, N. 742603m
Classification Ring-ditch
Description Aerial photograph (GB90. BY.03) shows cropmark of a ring-ditch. Circular ring-ditch visible on Bing Maps (accessed 30/10/13). Just one of four monuments within this large open field behind Newtown Caroline.

Compiled by Geraldine Stout
Updated by Christine Baker
Date of upload 23 January 2015

SMR No DU014-134----

County DUBLIN
Townland Newtown (Coolock By., Finglas Ed)

ITM E. 711929m, N. 742619m
Classification Ring-ditch
Description Located in a large arable field, c.6.4m NW of DU014-100-, cropmarks indicate the presence of the sub-surface remains of a ring-ditch. The ring-ditch, visible on Google imagery (April 2020), comprises a circular feature (ext. diam. c.17m) defined by a ditch (wth. c.1.5m). There are no indications of any gap across the ditch. Other ring-ditches in the field may indicate the presence of an extensive prehistoric landscape.
Compiled by Christine Baker
Date of upload 8 November 2021

SMR No DU014-135----
County DUBLIN
Townland Newtown (Coolock By., Finglas Ed)
ITM E. 711916m, N. 742790m
Classification Ring-ditch
Description Located in a large arable field, c.155m N of Ring-ditch (DU014-134----), cropmarks indicate the presence of the sub-surface remains of a ring-ditch. The ring-ditch, visible on Google imagery (accessed 2019), comprises a circular feature (ext. diam. c.12.5m) defined by a ditch (wth. c.1.5m). There are no indications of any gap across the ditch. Other ring-ditches upslope in the same field may indicate the presence of an extensive prehistoric landscape.
Compiled by Christine Baker
Date of upload 8 November 2021

SMR No DU014-138----
County DUBLIN
Townland Johnstown (Castleknock By., Blanchardstown Ed)
ITM E. 711578m, N. 741507m
Classification Earthwork
Description In tillage field. Circular-shaped cropmark (diam. c. 45m) with possible outer enclosing ditches visible on Apple Maps orthoimage and Google Earth orthoimages.
Compiled by Caimin O'Brien based on details provided by Jean-Charles Caillère
Date of upload 21 December 2022

SMR No DU014-141----
County DUBLIN
Townland Newtown (Coolock By., Finglas Ed)
ITM E. 711784m, N. 742742m
Classification Ring-ditch
Description In tillage field. Small circular-shaped area (int. diam. c. 11m) defined by the cropmark of a ditch visible on on Google Earth orthoimage taken 24/06/2018.
Compiled by Caimin O'Brien based on details provided by Jean-Charles Caillère
Date of upload 29 May 2023

APPENDIX 12.2 RECORDED ARCHAEOLOGICAL EXCAVATIONS

Prepared by CRDS, 2025

The excavation bulletin website² 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 2024. The study area has been subject to twelve development led licensed excavations, of which seven uncovered archaeological remains. Summaries of excavations within the study area are detailed below.

License no.: E440

Excavation no.: see 1988:18

County: Dublin

Site name: Kilshane

Description: The following is taken from the Dublin County Archaeological Reports archive, through Heritage Maps online. The report described several excavated sites, the one relative to this project being at Kilshane townland:

The Site

This site lies on flat, low-lying land about a half a mile to the west of N2 near St. Margaret's in a townland which already has two recorded cemetery sites,

The Remains

The site was discovered when topsail removal uncovered the remains of several skeletons and areas of disturbed bane, Excavation revealed the remains of 123 individuals, many of which were the remains of children and adolescents (this is in marked contrast to the range of ages on the other cemetery sites). There was no enclosing element though a linear ditch was revealed at the north of the excavated area (this appeared to be an old field boundary).

No historic references have yet been found for this site, but a more detailed study of the documentary sources may yield some information on it.

The Burials

Burial occurred on a £.1m stretch of the pipeline corridor and a occurred only on the western side of the area excavated (an 8m-wide strip) running beneath the spoilheap of topsoil and probably beyond the western limit of the pipeline corridor (the area to the east was intensively trenched and no further burials were located). There was thus a dramatic density of burial in the small area excavated (up to 3-4 individuals one on top of the other in places),

While the burials were aligned east-west, in the Christian mode, the burial alignment was far more haphazard than had been noted on the other sites investigated. Some of the bodies appeared to have been buried either in rigor mortis or in a very hurried manner, as some were crouched, folded or lying to one or other side and there appeared to be little regard in many cases for the position of the hands. The remains of at least ten infants/young children occurred among those excavated.

In general the bone was remarkable well-preserved, even in the case of the infants. This may indicate that the cemetery is of relatively recent date, perhaps dating to the Famine Period. However, the presence of stones around and under the heads of some individuals, and the presence of 'pillow stones' may indicate a rather earlier date for the site

License no.: —

Excavation no.: 1988:18

County: Dublin

Site name: KILSHANE

SMR No.: N/A

Author: Margaret Gowen, 5 St. Catherine's Road, Glenageary, Co. Dublin

Site type: Burial ground

² <https://excavations.ie>

Period/Dating: Undetermined
ITM: E 710408m, N 742789m
Lat, Long.: 53.423648, -6.338816
Description: Several excavations were carried out between May and October 1988, ahead of the construction of the North-eastern Pipeline, Phase 2, running from Abbotstown to Dundalk. This site lies on flat, low lying land about half a mile to the west of the N2 near St Margaret's in a townland which already has two recorded cemetery sites.

The Remains
The site was discovered when topsoil removal uncovered the remains of several skeletons and areas of disturbed bone. Excavation revealed the remains of 123 individuals, many of whom were children and adolescents. There was no enclosing element, though a linear ditch which appeared to be an old field boundary was revealed at the north of the excavated area.
No historic references have yet been found for this site but a more detailed study of the documentary sources may yield some information on it.

The Burials
Burial occurred on a c.21m stretch of the pipeline corridor and only on the western side of the area excavated which was a 8m wide strip running beneath the spoilheap of topsoil and probably beyond the western limit of the pipeline corridor. The area to the east was intensively trenched and no further burials were located. There was thus a dramatic density of burial in the small area excavated (as many as 3-4 individuals, one on top of the other in places).
While the burials were aligned east-west, in the Christian mode, the burial alignment was far more haphazard than had been noted on the other sites investigated during the same pipeline campaign. Some of the bodies appeared to have been buried either in rigor mortis or in a very hurried manner, as some were crouched, folded or lying to one or other side and there appeared to be little regard in many cases for the position of the hands. The remains of at least ten infants/young children occurred among those excavated.
In general the bone was remarkably well preserved, even in the case of the infants. This may indicate that the cemetery is of relatively recent date, perhaps dating back to the Famine Period. However, the presence of stones around and under the heads of some individuals, and the presence of 'pillowstones' may indicate a rather earlier date for the site.

Other Features
Two, apparently agricultural, ditches/drains were revealed, one to the south and one to the north of the excavated area. The fill of the northernmost feature, a linear ditch 5m wide where excavated (crossed diagonally) and 1m deep, which crossed the pipeline corridor in a north west/south east direction, contained animal bone and shell. This feature appeared to be an old field boundary or open drain and could be traced as a depression crossing the field through which the pipeline corridor passed in this area.
The second feature, a land drain 1m wide with a fill of stones at the base, ran north/south at the eastern limit of the site, lying outside the burial area.

Finds
The only finds retrieved were a plain blue glass bead and a fragment of a large tanged iron knife of relatively modern appearance.

License no.: 99E0028

Excavation no.: 1999:269

County: Dublin

Site name: NEWTOWN LINK ROAD, St Margaret's

SMR No.: N/A

Author: Claire Walsh, Archaeological Projects Ltd, 25A Eaton Square, Terenure, Dublin 6W

Site type: Cultivation ridges

Period/Dating: Medieval (AD 400-AD 1600)

ITM: E 711926m, N 741824m

Lat, Long: 53.414662, -6.316320

Description: A second phase of monitoring of topsoil-stripping was undertaken from 10 to 12 March 1999. The area to be stripped lay outside and to the north of the area that had previously been studied archaeologically for the construction of the new road. The area had to be stripped to allow the laying of a drainage pipe leading from the road north to the stream that flows north-eastwards just east of Connaberry Motte and for the construction of a paddock.

As this area lay outside the study area and was close to Connaberry Motte and Dunsoghly Castle, the topsoil was removed using a toothless grading bucket. A series of cultivation furrows was uncovered. They were aligned roughly north-south and were regularly spaced, 3m apart. They varied from less than 55m wide and from 20mm or less to 60mm wide. They were only visible where they cut into subsoil and did not survive in the north-west side of the stripped area, owing to the stony nature of the underlying subsoil there. The furrows were filled with grey, loamy silt, and no finds were retrieved from any of them. However, several sherds of medieval pottery (North Leinster cooking wares and wheel-thrown Dublin wares) were uncovered from the topsoil that overlay them.

The furrows are the remains of ridge-and-furrow cultivation, which is probably of medieval date. The proximity of the site to both the Connaberry Motte and to Dunsoghly Castle means that the cultivation system could have been used by the occupants of either site.

License no.: 99E0220

Excavation no.: 1999:253

County: Dublin

Site name: KILSHANE

SMR No.: SMR 14:48

Author: Malachy Conway for Margaret Gowen & Co. Ltd, 2 Killiney View, Albert Road Lower, Glenageary, Co. Dublin

Site type: Structure

Period/Dating: Modern (AD 1750-AD 2000)

ITM: E 710408m, N 742789m

Lat, Long: 53.423648, -6.338816

Description: An assessment and subsequent monitoring (see No. 161 Excavations 1999) of topsoil removal were undertaken at Kilshane, Co. Dublin, as part of the reinforcement of the Brownsbarn to Ballough Gas Pipeline (formerly known as the Northeastern Pipelines, Phases I and II). The name Kilshane contains the element 'Kil', or Cill, signifying a church, while the second element is less certain, but in at least one other instance (in County Limerick) a church site called Cill Senaig has been anglicised as Kilshane. That being the case, the County Dublin site may well represent the church of Senach.

The site, first discovered on removal of topsoil during the Phase II pipeline operation in 1988, is in a flat, low-lying area c. 0.5 miles to the west of the N2, near St Margaret's. During Phase II pipeline operations an unenclosed cemetery comprising 123 individuals was revealed over a 21m stretch of the pipeline corridor (see report by Margaret Gowen in

Excavations 1988, 17). Consequent to this discovery, the site was included in the SMR by the National Monuments and Historic Properties Service.

The new reinforcement pipeline corridor runs parallel to the existing and archaeologically resolved area of 1988 and thereby encroached the SMR constraint area for the cemetery site. Geophysical survey of the proposed corridor was undertaken before the assessment.

In summary, the assessment revealed one feature of archaeological potential, and no further features or finds were revealed during subsequent monitoring of topsoil-stripping before pipe-laying.

Magnetic gradiometry and electrical soil-resistivity surveys were undertaken at the site. The former technique indicated strong ferrous (iron) interference within the western area of the survey grid, along with two anomalies representing possible ditch features. One of these anomalies is just beyond the disturbance zone caused by the existing gas pipe and is almost certainly ditch F140 revealed in the NEP II 1988 operation. Various clusters of small anomalies were also discerned, along with regular linear-trending anomalies, suggesting changes in the underlying geology. The resistivity survey revealed a number of low-resistance linear trends, which coincide with the magnetic anomalies, indicating possible ditches. However, the majority of the resistivity responses appeared to reflect natural variations in resistance values across the site, especially along the western edge of the survey grid, which would suggest disturbance from the pipe and 1988 construction. The same may also be said of a number of linear trends in the north-eastern corner of the survey grid, which equate with plough action or other modern disturbances.

Four test-trenches were excavated across the proposed 30m wayleave realignment corridor. The trenches were directly east of the area excavated and resolved in 1988. The position of the trenches was largely determined by the anomalous responses from the geophysical survey carried out before the assessment.

Trenches 1 and 2 were conjoined in T-shaped plan, with Trench 1 orientated north-west/south-east and Trench 2 set perpendicular to its centre and extending away in a south-west direction. The position of Trench 1 was determined by the double-ditch-like response from the geophysical survey, which correlates with a ditch excavated at the eastern limit of the 1988 NEP II pipeline corridor and which appeared to mark the eastern boundary of the cemetery. The position of Trench 2 was also determined by geophysical responses, in this case a number of roughly west-east-lying linear anomalies. Trenches 3 and 4 were conjoined in T-shaped plan, as with Trenches 1 and 2, and were positioned south of these. Only a few limited anomalous responses were detected in the southern portion of the survey grid, and the position of Trenches 3 and 4 was largely designed to test a number of these responses as well as to examine areas that failed to give a response.

Trench 1 was positioned 112m from the eastern field boundary and measured 22m by 2m. Removal of topsoil 0.25–0.3m deep revealed two modern drainage features between 0.4 and 0.5m wide and cut directly into subsoil, which in this area was brown, sandy clay containing frequent stones. The eastern half of the test-trench was completely devoid of features and was characterised by grey clay subsoil with less stone than on the western side.

Trench 2, 29m by 2.1m, was conjoined with Trench 1. Several roughly north-west/south-east-aligned features, mostly natural, were revealed on removal of topsoil. Only one item of archaeological significance was revealed, a west-east linear feature, which extended beyond the western limit of the test-trench. The feature, initially defined by several longitudinally set stones, was characterised by a roughly linear spread of dark soil containing charcoal and numerous (apparently heat-shattered) angular stones. The feature, which survived in the trench in a truncated form, was up to 1.9m long by at most 0.75m wide and at its deepest point, the west section, was found to be up to 0.15m deep. A single fragment of iron slag was recovered from the fill of the feature at the western section. The east end of the feature was rounded in plan and delimited by iron staining in

the subsoil. It was significantly shallower than the western end and contained a thin lens of grey clay flecked with charcoal, overlying and partially cutting into the brown clay subsoil at this point. The western section of the feature comprised charcoal-flecked, grey clay overlying a deposit of orange, friable ash and a basal deposit of soil charcoal. None of the stones either within or forming the limits of the feature were found to be burnt. It was estimated that the feature could extend, at most, only a further 0.3m beyond the western section face, which was confirmed during later monitoring. In attempting to date this feature, and also taking into account that some possible fragments of bone were associated with the uppermost fill deposit, it would seem that the feature is fairly late, possibly after AD 1700.

The excavation of Trenches 3 and 4 failed to reveal deposits, features or finds of archaeological significance. A simple sequence of topsoil, between 0.25m and 0.3m deep, was found to overlie either yellow/brown clay or grey boulder clay.

No further features were revealed during topsoil removal of the pipeline corridor in late July 1999. The solitary archaeological feature, revealed in Trench 2, appears to be an isolated linear feature, which in the absence of clearly datable finds would appear to be post-17th-century in date.

License no.: 00E0043

Excavation no.: 2000:0213

County: Dublin

Site name: BROWNSBARN-KILSHANE

SMR No.: N/A

Author: Ian W. Doyle, Margaret Gowen & Co. Ltd, 2 Killiney View, Albert Road Lower, Glenageary, Co. Dublin

Site type: Excavation - miscellaneous

Period/Dating: Multi-period

ITM: E 706241m, N 736578m

Lat, Long: 53.368704, -6.403578

Description: Monitoring of topsoil construction for the southern section of the new North-Eastern Pipeline 3 was carried out in mid-2000. The Bord Gáis Éireann pipeline will extend south from Ballough to Brownsbarn, Co. Dublin, reusing sections of the previously excavated NEP 1 and NEP 2 (1983 and 1988, see Excavations 1988, 43, note by Margaret Gowen). The first stage of the Ballough to Brownsbarn pipeline involved topsoil-stripping from Ballough to Kilshane. This was monitored by Malachy Conway in 1999 (Excavations 1999, 50-1, 99E0395). The construction of the southern section entailed the monitoring of topsoil-stripping from Kilshane to Brownsbarn.

From the southernmost portion of the pipeline at Brownsbarn to the Naas Road (N7) the pipeline ran through relatively low-lying land that has been intensively farmed. A series of plough-truncated cut features was detected in this area. A small, undated pit in Cheeverstown townland contained occasional fragments of animal bone. To the north of this, the possible remains of a fulacht fiadh were revealed in Kingswood townland. This consisted of a pit filled with a mix of charcoal-blackened clay and silt with heat-shattered stone. A large field boundary ditch running on a south-west/north-east axis was found closeby. A possible flint thumbnail scraper was found in ploughsoil at this point.

To the north of the Naas Road in Baldonnell Lower townland a cluster of small, shallow, burnt spreads were observed. These remained undated. Further north in Ballyowen townland an elaborate French drain was revealed. This was composed of mortared side-walls and large lintel stones. To the north of the N4 Galway road in Fonthill townland, a burnt spread was detected on the southern bank of the Liffey. This was resolved by John Ó Néill under license 00E0447 (see Excavations 2000, No. 298).

On the north bank of the Liffey, in Astagob townland, a small modern layer of burnt material was revealed. In December 2000, owing to difficulties in tunnelling under the

Liffey at this point, the contractors sought to construct an interconnector pipe between the completed northern section of the pipeline and the previously constructed NEP 2 pipeline some 400m to the east. This entailed excavation along the Strawberry Beds road parallel to the Liffey. A stretch of some 100m was excavated through a ploughed field. A single masonry wall on a north-south axis was revealed. This is likely to be associated with an industrial complex referred to as the 'New Holland Fruit and Starch Works', depicted on the 1843 1:10,560 Ordnance Survey map (Sheet 17). In the northern part of Astagob townland a small subcircular pit was excavated. This had a charcoal-rich fill.

Further north, in Ballycoolen townland, a small pit containing charcoal and vitreous slag-like material was found. In the townland of Mitchelstown two modern metallised surfaces were revealed. A shallow charcoal-rich pit was found to the north of this.

License no.: 01E1214

Excavation no.: 2001:456

County: Dublin

Site name: NEWTOWN

SMR No.: SMR 14:13

Author: Fiona Rooney, Archaeological Consultancy Ltd., Ballydavid South, Athenry, Co. Galway

Site type: No archaeology found

Period/Dating: N/A

ITM: E 711740m, N 742459m

Lat, Long: 53.420399, -6.318904

Description: An assessment of a proposed development in the townland of Newtown, Kilshane, Co. Dublin, found that one monument, the site of a possible motte and bailey, was located within its boundary. The site was visited in 1952 by a representative from the National Museum of Ireland, prior to its demolition. It was recorded as a circular platform 28m in diameter and 3m in height. The base of the flat-topped platform was enclosed by a wide ditch, which was in turn enclosed by an oval earthwork (100m by 70m). At present the site is only visible as a soil-mark on aerial photographs. Consequently, monitoring of ground disturbance at the site was recommended by the assessment.

Seven test-pits were excavated. No features or artefacts of archaeological significance were revealed. The trenches excavated were small in comparison to the area of the proposed development. Consequently, while no archaeological features were encountered, it is possible that such features do exist, particularly in the vicinity of the motte and bailey site in the north.

License no.: 01E1214 ext.

Excavation no.: 2002:0636

County: Dublin

Site name: NEWTOWN

SMR No.: SMR 14:13

Author: Martin Fitzpatrick, Arch. Consultancy Ltd., Ballydavid South, Athenry, Co. Galway

Site type: Excavation - miscellaneous

Period/Dating: Undetermined

ITM: E 713092m, N 725187m

Lat, Long: 53.264960, -6.304733

Description: Testing was recommended to assess the potential impact on archaeological remains in the area of the proposed development at Newtown, Kilshane, and to establish a buffer zone around the motte and bailey situated in a field proposed for development. During 2001 seven test-pits were excavated by Fiona Rooney; no features or artefacts of archaeological significance were revealed (Excavations 2001, No. 456).

Nineteen test-trenches were mechanically excavated. The soil profiles in the trenches were fairly uniform, and any changes recorded appear to have been the result of varying

topography as opposed to anthropogenic factors. The ground was generally drier, and the bedrock closer to the surface, in areas where the ground was higher than the surrounding area. The softer dark material and sand recognised in the trenches to the west of the field were a result of the ground being low lying and close to the stream that forms the western boundary of the field. A notable feature of all trenches was the lack of finds from the topsoil, apart from some fragments of black earthenware, blue-patterned delft and glass.

A number of features were recognised. A ditch, 2.45m wide, running north-west/south-east was noted at the base of Trench 13, with a small fragment of brown glass in its fill. An old field drain that was cut into the subsoil and disturbed by two relatively modern field drains was revealed in Trench 16. A small fragment of brown earthenware was noted in the upper part of the fill mixed between the large stones. Two flint nodules were found in the fill at the base of the cut. A linear cropmark could be seen running approximately east-west across the field, and a large ditch was recognised in Trench 17 where this cropmark crossed the trench. This feature may be associated with an old field boundary marked on the OS maps or may represent the ditch for a large drainage pipe. At the base of Trench 10 a small modern post-hole and a circular pit containing wood fragments were revealed.

Nothing of archaeological significance was noted. The area south of Trenches 1 and 13 and west of Trench 12 can be said to have been resolved; however, the area north of Trenches 1 and 13 and east of Trench 12 has not been resolved. This line should represent the limit of the buffer zone surrounding the monument.

License no.: 02E1353
Excavation no.: 2002:0590
County: Dublin
Site name: FINGLAS-ASHBOURNE
SMR No.: N/A
Author: Hilary Opie, for Valerie J. Keeley Ltd, Brehon House, Kilkenny Road, Castlecomer, Co. Kilkenny
Site type: Excavation - miscellaneous
Period/Dating: Undetermined
ITM: E 713182m, N 739145m
Lat, Long: 53.390325, -6.298401
Description: Monitoring of test-pits was carried out along the route of the proposed N2 Finglas-Ashbourne Road Scheme, in counties Dublin and Meath. The test-pits were on, or in the vicinity of, known or potential archaeological sites, identified by a combination of field assessment, paper survey and geophysical survey. Fourteen test-pits were monitored over four days, 21 and 23 August, 11 September and 3 October 2002. All were excavated by machine using a narrow, toothed bucket and were c. 2.7m long and 0.9m wide.
No finds or features of an archaeological nature were found in thirteen of the test-pits. However, one, TP 421, had very deep topsoil and lower topsoil layers, with undisturbed subsoil being reached at 1-1.2m below the ground surface. This may suggest that this pit was of archaeological significance. It was situated near a large complex of enclosures and ditches, as suggested by the geophysics survey, which may also suggest that it is of archaeological significance. It is possible that this test-pit encountered part of the filled-in remains of a ditch. Although it was not possible to identify it positively as of archaeological importance, this area remains of potential significance, and further investigation is required to establish the exact nature of the activity here.

License no.: 02E1353
Excavation no.: 2002:1522
County: Meath
Site name: RAYSTOWN

SMR No.: N/A
Author: Hilary Opie, for Valerie J. Keeley Ltd, Brehon House, Kilkenny Road, Castlecomer, Co. Kilkenny
Site type: Excavation - miscellaneous
Period/Dating: Undetermined
ITM: E 704109m, N 751361m
Lat, Long: 53.501936, -6.430706
Description: Monitoring of a series of test-pits was carried out along the route of the proposed N2 Finglas– Ashbourne Road Scheme, in counties Dublin and Meath (No. 590, Excavations 2002, 02E1353).

One test-pit, TP421, Chainage 14140, had very deep topsoil and lower topsoil layers, with undisturbed subsoil being reached at 1–1.2m below the ground surface, suggesting that it may be of archaeological significance. It was situated near a large complex of enclosures and ditches, as indicated by the geophysics survey, which also suggests that it may be archaeologically significant. It is possible that this test-pit encountered the infilled remains of a ditch. Although the site could not be positively identified as of archaeological importance, this area remains of potential significance, and further investigation would be required to establish the exact nature of the activity here.

License no.: 02E1353 ext.

Excavation no.: 2003:475

County: Dublin
Site name: COLDWINTERS (Test Area 1)
SMR No.: N/A
Author: Neil O'Flanagan, 3 Manor Street, Stoneybatter, Dublin 7
Site type: No archaeology found
Period/Dating: N/A
ITM: E 711900m, N 741579m
Lat, Long: 53.412467, -6.316798
Description: The excavation of engineering test-pits on the N2 Improvement Scheme was monitored in September and October 2003. No archaeological features were exposed.

License no.: 02E1353 ext.

Excavation no.: 2003:1373

County: Meath
Site name: COLDWINTERS
SMR No.: N/A
Author: Neil O'Flanagan, 3 Manor Street, Stoneybatter, Dublin 7
Site type: No archaeology found
Period/Dating: N/A
ITM: E 712038m, N 741642m
Lat, Long: 53.412997, -6.314714
Description: Monitoring was carried out by Laurence McGowan on behalf of Neil O'Flanagan in September and October 2003 on the excavation of five engineering test-pits in Coldwinters golf course. This was part of additional geotechnical site investigations along the proposed route of the N2 Finglas-Ashbourne realignment. The proposed road scheme is approximately 17km long, commencing at the M50 interchange in Dublin and extending to the townland of Rath, north of Ashbourne, Co. Meath.

Two sites are located within the golf course, the site of a ring-ditch (SMR 14:15) and a possible ringfort (SMR 14:16) outside but adjacent to the route. Previous monitoring of geotechnical site investigation in this area was carried out by Hilary Opie between August and October 2002 (Excavations 2002, No. 1522, 02E1353). No features of archaeological significance were uncovered during this testing. A geophysical survey of this route, carried

out in 2002 by GSB Prospection Ltd, did not produce any anomalies of archaeological significance in this area.

No finds or features of an archaeological nature were found in any of the test-pits during the additional geotechnical site investigations.

License no.: 03E1359 ext.

Excavation no.: 2004:0612

County: Dublin

Site name: KILSHANE

SMR No.: N/A

Author: Dermot G. Moore, for Cultural Resource Development Services Ltd, Unit 4, Dundrum Business Park, Dundrum, Dublin 14

Site type: Causewayed enclosure, Habitation site and Cremation pit

Period/Dating: Prehistoric (12700 BC-AD 400)

ITM: E 710927m, N 742924m

Lat, Long: 53.424752, -6.330966

Description: This excavation was undertaken as part of the archaeological mitigation in advance of the N2 Finglas–Ashbourne road scheme (Appendix II). A geophysical survey was carried out by GSB Prospection in 2002, which recorded a number of possible archaeological features in Testing Area 5 (GS 2 Area 25). Pre-development testing subsequently carried out by David Bonner in October 2003 (03E1359) exposed a small number of archaeological deposits, interpreted as a ditch and ditch-like feature containing burnt stone, both undated. The license was transferred to Dermot G. Moore in March 2004 and, from 15 March to 22 July 2004, excavation of Site 5 was carried out by a team of 43 archaeologists.

Site 5, which comprised three distinct areas, Sites 5a, 5b and 5c, was situated on a gently undulating gravel ridge associated with tributaries of the Ward River and was located in a large irregular-shaped field bordered by the Kilshane road to the south and the N2 to the east. Open drains and hedgerows formed of mature hedge plants and trees bounded the area of the site to the north and west. A commercial glasshouse was located on the north-western side of the enclosure. Site 5a was situated atop this ridge at 80.53–81.3m OD, while Site 5b was situated north of Site 5a at 80.3m OD. Site 5c, situated north-west of Site 5a, lies at 81.04m OD.

Initially, two areas were topsoil-stripped in February 2004 (consisting of a total of 199m²) around the area of a possible ditch/gully feature (later designated Site 5a) and a linear feature (designated Site 5b) identified during the testing phase in October 2003. The topsoil-stripping was carried out using a tracked mechanical digger equipped with a 2m-wide toothless ditching bucket. Upon commencing investigation of these features, it became obvious that the area of Site 5a was considerably greater in extent. A further programme of topsoil-stripping was therefore initiated, which expanded the Site 5a stripped area to 1335m². This included the excavation of two geological test-trenches to determine the nature of the natural boulder clay and gravel deposits into which most of the archaeological deposits were cut. While the excavation was ongoing, the commercial glasshouse was demolished and the underlying topsoil stripped, adding a further 3500m² to the opened area. A number of extensions to Site 5a were also added, as well as expansion of the area opened at Site 5b and a series of test-trenches to the west of Site 5a.

The main enclosure ditch on Site 5a was excavated in a series of fourteen box sections, ranging in length from 2.4m to 11.25m, to determine the structure and sequence of the ditch deposits and method of construction. Longitudinal sections were also cut through a number of the baulks to determine the sequence of deposition of individual deposits within identified ditch segments and to define an entranceway. The smaller causewayed ditch uncovered in Site 5c was also excavated by box section.

A detailed excavation strategy was put in place to retrieve as much information as possible from the enclosure ditch and its fills, especially the animal bone layer, due to the quality of preservation and the uniqueness of such a deposit from an Irish prehistoric site. All archaeological features interior and exterior to the enclosure were excavated, in addition to a number of geological features that were investigated to determine their archaeological potential.

The natural deposits defined on the site consisted of three types. The first was glacial gravel clay of unknown depth consisting of firm mixed grey/brown gritty gravel with frequent small stone and pebble inclusions. Ice wedges were identified within this deposit where exposed in the excavated ditch sections. Overlying this was a deposit of frequent angular and sub-angular stones and cobbles (of limestone/greywacke) within compacted mixed brown/grey silty clay with a depth of 0.2–0.35m, which occurred predominantly in the interior of Site 5a and to the west-north-west of the excavated area. This deposit appears to have become exposed due to a combination of natural erosion of the slight ridge on which the enclosure is set and plough action over the years.

Overlying this substantial deposit of stone was a mixed deposit of firm pale-grey/orange coarse sand gravel. This deposit occurred predominantly at the northern and southern limits of the excavated area and was cut by the enclosure ditch and a number of features, especially in the northern portion of the site. This deposit appears to represent the 'B' horizon material of the overlying topsoil. In addition to the main geological deposits, a smaller series of deposits was identified during the period of excavation consisting of the remains of decomposed siltstones and calcareous rocks, while others were simply irregular depressions in the natural filled with yellow/yellow-brown sands and fine gravels.

Site 5a

The earliest activity is defined by the construction and infilling of a large ditched enclosure dating to mid-Neolithic times. The enclosure was almost egg-shaped, coming to a notable point (the 'apex') in the north. Once the limits were defined prior to excavation, it was noted that the shape of the ditch was very irregular and the reason for this became apparent during the excavation. The ditch had been excavated in a series of interconnecting regular and irregular segments.

The overall plan of the ditch shows that its long axis was aligned north-west/south-east and that it had maximum external dimensions of 45m north-west/south-east by 34m. The width of the ditch varied around its circumference (1.9–3.8m) and enclosed an area 38.5m north-west/south-east by 27.5m, totalling c. 850m². The western side of the ditch bowed inwards, off line with the rest of the ditch, which followed a gentle curve north to south. However, there were sharp turns noted, particularly at three locations: the apex, the south-east and the south-west. This is quite probably due to the method of construction of the ditch.

The average length of a segment was 8.9m, the shortest being 6m and the longest c. 13m. The segments were interconnecting and were probably dug by different work groups. The alteration in direction of the line of the ditch at the apex and in other segments may be due to inaccurate ditch digging between the different work groups. This would also add to the suggestion that the segments were dug at different times.

During the excavation, the segments were primarily defined by changes in direction of the ditch and slight changes in height where the segments connected. The profile of the ditch, especially the individual ditch segments, varied from gentle U-shaped to V-shaped (generally, wide U-shaped profile in the centre of the segments and V-shaped at the ends).

In plan, some of the segments appeared to have considerable breaks between them but in most this can be seen as the remains/evidence of the segment terminals, which were sloping rather than vertical-sided terminals. Tentative evidence for the method of ditch excavation is shown by the presence of portions of antler tines in some of the ditch fills, although as yet only one was recognised from primary fill deposits.

Soon after the ditch was cut, it began to silt up (sometimes irregularly) around its circumference. Probably at this stage a segmented ditch with at least four defined causeways was constructed in the area designated as Site 5c to the north-west.

Once the initial natural slumping and silting in the base of the ditch began, a large volume of animal bone was deposited around the full circumference of the ditch. The bone assemblage, consisting of 60–70 individual cattle, is the largest Neolithic bone assemblage from an excavated context (Finbar McCormick, pers comm.). The cattle bone was placed in both a disarticulated and articulated state with apparent selection of certain bones, such as vertebra or long bones, to be deposited together.

In some areas of the ditch the bone appeared to have been deposited from the exterior, while in others it was deposited from the interior. None of the animal bone recovered appeared to have any distinct butchery marks (this has yet to be confirmed) and the deposition of the bone varied from each area of the ditch, indicating a number of possible phases of deposition, with some distinctions noted within individual segments. Fully articulated cattle skeletons were noted, primarily in the eastern portion of the ditch, where at least three were found in close proximity. Amongst the bone were large stones and boulders, which may have eroded from the sides, possibly due to water action.

As the bone was being deposited, the silting continued and at the same time there was a series of slumps into the ditch, probably from the upcast material interior and exterior to the ditch. A further series of infillings took place, culminating in the placement of pottery within the ditch. This consisted of a large mid-Neolithic broad-rimmed, round bottomed vessel, which appears to have been deliberately placed on top of this sealing deposit in the south-eastern portion of the ditch. Other fragmentary pieces of ceramic material were recovered from just above the bone layer in the northwestern section of the enclosure ditch and these also may prove, using thin section analysis, to be Neolithic. The enclosure then appears to have been abandoned for a considerable period of time.

The next major activity occurs in the Early to Middle Bronze Age, with the deposition within the ditch of a relatively uniform deposit of orange sandy clay. This appears to have been deliberately placed into the ditch around its full circumference, possibly to seal the earlier (Neolithic) activity. The deposition of the orange clay appears to have been immediately preceded by deposition of charcoal/wood lenses, especially in the western portion of the enclosure.

The deposition of the orange sandy clay within the ditch is another intriguing aspect of the site, with a number of questions relating to the origin of this material and why such a considerable deposit was placed in the ditch. Artefactual material and animal-bone fragments were also recovered from this orange clay deposit. Two suggestions are that the orange clay material was derived from the basal topsoil material or that it was derived from either the interior or exterior of the site, possibly from the creation of a bank. However, there was no evidence of an external or internal bank encountered during the excavation, but this may have been ploughed out.

The next defined phase of activity on Site 5a occurs during the Early Bronze Age. This activity consists primarily of a series of deposits and features associated with the later stages of the main enclosure ditch and a series of cut features, some of which, based on ceramic associations, may date to the Earlier Bronze Age.

Set on to and in many cases cut into the orange clay deposit sealing the fills of the enclosure ditch was a series of deposits, shallow scoops and pits. Most of these were located along the eastern portion of the ditch. Many of the scoops and pits intercut each other and almost all were filled with the same generally homogeneous fill, which seems to represent a midden deposit. The size and depth of these pits and scoops varied considerably, but none appear to have exceeded 0.2m in depth. Within these scoops were ash/cinder deposits and burnt and unburnt bone (some of which appears to be human). The animal-bone remains appear, on preliminary identification, to be pig and possibly ovicaprid. Some of the bone had been worked into pins or awls. Also within this deposit

was a large range of lithic material in the form of flint manufacturing debris and finished tools. The predominant components of the flint manufacturing debris consisted of small pebble cores and fine micro-debitage. The secondary worked material consisted predominantly of small, high-quality thumbnail scrapers, a fine hollow-based flint arrowhead and a reworked small barb and tanged arrowhead. A well-made flint piercer and a large hollow scraper (of non-pebble flint) were also recovered. The hollow scraper represents a non-Early Bronze Age tool type and may be directly associated with the initial construction of the enclosure. Chert, quartz and other coarse stone material were also well represented.

However, it is the ceramic remains which dominate the artefactual assemblage. These consist of a substantial quantity of high-quality Early Bronze Age ceramic styles in the form of funerary and high status/ceremonial wares such as food vessels, cordoned urns, cinerary urns, Irish bowl food vessels and a small range of as yet unidentified ceramics. In many cases several ceramic styles were deposited together, with at least six different types (based on decoration and form) being recovered from one single square metre. On some occasions, burnt or partially burnt stone was also found within the deposit.

Generally overlying the artefact-rich deposit was a relatively compact metalled surface, which had its greatest extent in the extreme eastern area of the ditch. The function of this metalled deposit may have been to formally seal the midden deposit. Overlying the metalled deposit was a less artefact-rich horizon, which appears to have been partially disturbed. The extent of this deposit is greater than the underlying deposit and variants were found in the northern, southern and western portions of the enclosure ditch. A small number of inter-connecting pits containing material similar to the artefact-rich horizon were also uncovered in the northern area of the enclosure ditch (near the apex).

Associated with this Early Bronze Age activity in the ditch were a number of features located within and without the enclosure. In the northern area of the site, three rather mysterious features were also uncovered. These appear to be cremation pits, which contained unusual sloping red-orange burnt soil deposits upon which were set thin deposits of finely 'pounded' or crushed burnt bone. As two of these pits are directly associated with burials of single bones, their true function still awaits clarification. They do, however, seem to be connected with the artefact-rich horizon in the upper portion of the enclosure ditch.

During the course of the excavation of the interior of the main enclosure, a number of features were uncovered which gave the impression of having been cleaned out (sterilised) in antiquity. Several appear to have been pits for probable unprotected cremations, with much of the cremation deposits (and the putative pots into which they were placed) having been 'cleaned out' of the pits as the material was deposited into the ditch.

The only intact burial was that of a single crouched inhumation, located south of the centre point of the enclosure. The burial was orientated east-west in a shallow oval pit with no evident grave goods. It was in an extremely degraded condition due to the nature of preservation. The grave might have been tampered with, which may account for the lack of grave goods.

A further series of rather irregular features was also encountered within the interior of the enclosure and these consisted of irregularly shaped pits, which contained small amounts of charcoal and occasionally burnt bone and pottery. The pottery recovered appeared to date to the Early Bronze Age. Only one feature, a hearth, represents activity later in the Bronze Age.

Some medieval activity also occurred on Site 5a, which took the form of a large pit group with deposits of stone and medieval pottery, and another single large pit associated with a north-south-running field boundary. A second parallel field boundary was noted on the south-eastern part of the site. The last phase of activity consisted of a large east-west post-medieval culvert drain and a number of north-south running culvert drains, which

were all part of agricultural improvements to the land, which had since been used for pasture and crops.

Site 5b

The archaeological activity located within the confines of this area consisted of a south-north oriented linear feature c. 9.5m in length. It varied in width from 0.44m to 0.96m and up to 1.05m where it became very shallow at its northern end. It had a variable depth of 0.1–0.2m and contained only two distinct fills. The basal fill consisted of partially burnt sandy clay with some charcoal flecking, while the upper fill consisted of grey/black sandy clay with much charcoal flecking and occasional burnt stone. Small quantities of burnt bone (and snail shell) were also recovered from the upper fill. Each of the deposits was sampled and when these are analysed a fuller determination can be made as to the function of this feature. For the moment, the linear feature in Site 5b is interpreted as a burnt-out field boundary, with the burnt bone possibly representing small rodents or birds trapped within the hedgerow. However, the fills of the feature also may suggest burnt-mound activity.

Site 5c

The area designated as Site 5c (located in the area of the now demolished commercial greenhouse) produced better and more definitive evidence of a causewayed ditch. This feature ran approximately north-south and had an excavated extent of c. 70m. The ditch itself had a variable depth of 0.13–0.48m, with the smaller depths occurring at the terminals of segments and the greater depths at the centre of segments. Width also varied between 0.99m and 1.77m and this corresponds to the centre and terminals of segments. At the northern and southern ends of this ditched feature, the width narrowed considerably, to 0.5m.

At present, at least four narrow causeways have been identified. The ditch itself was filled by a series of deposits, some of which contained charcoal, animal bone (predominantly cattle) and mollusc (snail) remains. Although, a number of lithic finds were recovered from the various deposits, the only artefact of note was a complete leaf-shaped arrowhead from the uppermost fill of one ditch segment. The recovery of this projectile point from such a location would tend to indicate that the causewayed ditch is Neolithic in construction.

The form of the ditch also varied, especially in the southern area of Site 5c, where the ditch not only narrowed but also divided into two. Although severely truncated by the insertion of the concrete reservoir associated with the commercial glasshouse, the ditch then appeared to deepen and widen before it was lost under modern activity. In this location, two distinct fills were evident, one of which produced a small irregular pebble core and a quantity of mollusc shell.

Also on Site 5c, the only other probable prehistoric feature was a small hearth pit containing burnt and unburnt animal bone. It is also significant to note that the upper homogeneous fill of the large west-east-running double culvert produced two retouched pieces of flint and one small thumbnail scraper. It would appear likely that the deposit within which these three secondary worked pieces were found was derived from somewhere close by, possibly from the two large pit features on the northern edge of Site 5a.

In summary, the main enclosure ditch seems to fall into the causewayed enclosure tradition or at the very least a variation of it, if not by the presence of causeways across the line of the ditch (which may have been removed) then by the segmented nature of the ditch construction; also the apparent deposition in individual segments of grouped cattle-bone deposits, of which there is an exceptionally large quantity, and the presence on top of the sealing deposits of a mid-late decorated Neolithic vessel of broad-rimmed type. In addition, the presence of the outer segmented ditch to the north-west (Site 5c) would lend further weight to the causewayed enclosure hypothesis.

License no.: 03E1450
Excavation no.: 2003:476
County: Dublin
Site name: COLDWINTERS
SMR No.: N/A
Author: Laurence McGowan, for Judith Carroll Network Archaeology Ltd, 27 Lindenwood Park, Foyle Springs, Derry
Site type: No archaeology found
Period/Dating: N/A
ITM: E 711900m, N 741579m
Lat, Long: 53.412467, -6.316798
Description: This work was undertaken as part of a programme of testing, ahead of the proposed realignment of the N2 Finglas to Ashbourne carriageway. The area investigated lies between Chainage points 500 and 900 on the proposed road, and encompasses roughly 30% of the area designated as Testing Area 1. The remainder of the area is in land currently occupied by St Margaret's Golf Course and will be tested later. The area was tested by means of a machine-excavated central trench with perpendicular offsets located on either side at 20m intervals.
A single oval pit, measuring 0.9m by 0.4m by 0.13m deep (maximum), was uncovered. It contained a single dark-brown, silty clay fill with frequent charcoal inclusions. An additional area, approximately 5m by 7m, was opened surrounding this feature but failed to produce any further evidence of activity from any period.

License no.: 03E1450 ext.
Excavation no.: 2004:0631
County: Dublin
Site name: NEWTOWN
SMR No.: N/A
Author: Holger Schweitzer, for CRDS Ltd, Unit 4, Dundrum Business Park, Dublin 14
Site type: Burnt spread
Period/Dating: Undetermined
ITM: E 711740m, N 742459m
Lat, Long: 53.420399, -6.318904
Description: The site (Site 1) was excavated as part of the archaeological mitigation in advance of the N2 Finglas–Ashbourne road scheme (Appendix II) between 6 and 20 April 2004. It was located within the townland of Newtown, Co. Dublin. The site was formerly within an open golf course and is located c. 0.5km north of the M50 Finglas–Ashbourne interchange adjacent to the east of the existing N2. Due to the location of the site within a former golf course, the terrain has been heavily landscaped. The entire site was contained within the footprint of the road-take, with all exposed features of archaeological significance fully excavated.
The removed topsoil consisted of dark loamy soil and varied in depth between 0.2m and 1.4m, with an average depth of c. 0.4m. The natural subsoil consisted of a layer of yellowish-brown silty clay.
Excavation was carried out in two separate areas separated by a distance of c. 15m. Area 1 measured c. 20m by 13m and contained the remains of a spread of burnt-mound material, measuring 3.5m by c. 10m with an average depth of 0.15m, which was located adjacent to the south of a natural waterlogged peat basin. This basin measured c. 15m east-west and extended beyond the limit of excavation to the north. Two pits and a subcircular trough containing heat-shattered stones and charcoal-rich deposits were excavated in the vicinity of the burnt spread. No archaeological finds were encountered during the excavation. Within the peat basin a large number of preserved timbers were encountered. While most of the wood consisted of natural brushwood and branch

material, two large split roundwood logs were positioned roughly parallel to each other. Although no evidence of woodworking was apparent, it cannot be ruled out that they may have been deliberately deposited within the basin to serve as an artificial subdivision, possibly contemporary with the burnt spread.

Area 2, c. 15m to the north of Area 1, covered an area measuring in total 24m². The only archaeological feature encountered here was a small and shallow isolated deposit of burnt-mound material. No finds were recovered. The proximity and nature of this deposit could indicate that it was contemporary with the burnt-mound material in Area 1.

License no.: 04E0807

Excavation no.: no excavations summary submitted

County: Dublin

Site name: Newtown Motte, Kilshane

ITM: -

Lat, Long: -

Description: The following is taken from the Dublin County Archaeological Reports archive, through Heritage Maps online:

Archaeological deposits were recorded on the development site both in the vicinity of the recorded monument and outside the area of the recorded monument. These include a previously unknown burnt mound (C15), agricultural features of unknown antiquity and a large ditch feature (C10), also presently not dated.

The testing corroborated the results of the geophysical survey and verified the presence of the large enclosure ditch C3. This appears define the original motte structure as described by P.J. Hartnett of the National Museum of Ireland. A curvilinear internal feature C4 was also identified within the space defined by C3. A large ditch CS was recorded running in a northeast southwest orientation to the east of C3 and may represent an external defensive ditch. This extended to the south beyond the area of excavation. C10 a large ditch was identified running across the western end of trench 6. This was similar in dimension to CS and may represent the returning section of the ditch to the west of the C3 enclosure. The 1 edition Ordnance Survey Map depicts the motte surrounded by an enclosing earthwork of similar dimensions. This earthwork would have curved just south of the area of geophysical survey (just north of the ploughed out east-west field boundary). A number of potential archaeological features were recorded along trench 6 in the area between the southern edge of the circular motte enclosure C3 and the conjectured southern curve of C5.

It is suggested that all the above archaeological and potential archaeological features are associated with the motte. It is recommended that all these features are avoided and that the site as whole is contained within a buffer zone. This buffer zone should extend 10m east of the eastern edge of C5, 10m south of the conjectured southern edge of C5/C10, at least 20m west of the western edge of C3 and at least 20m north of the

A burnt mound (possibly a fulacht fiadh) and an area of burning (C1) were recorded in Trench 1 this was comprised of a deposit of heat affected and shattered stone (C15). The burnt mound was located at the lower reaches of a hill and in close proximity to a natural water source (typical location for a fulacht fiadh). The feature was identified as G1 in the geophysical survey. If the burnt mound and area of burning cannot be avoided by the proposed development then a full record of the site should be created through archaeological resolution under license to The Department of Environment, Heritage and Local Government.

In addition it is possible that there are archaeological features on the development site not located in the test trenches. It is recommended that full monitoring of any groundworks outside of the proposed buffer zone area be carried out by a suitably qualified archaeologist under license to The Department of Environment, Heritage and Local Government.

License no.: 04E1191
Excavation no.: 2004:0613
County: Dublin
Site name: KILSHANE
SMR No.: N/A
Author: Gina Johnson, c/o Archaeological Services Unit, University College Cork
Site type: No archaeology found
Period/Dating: N/A
ITM: E 710408m, N 742789m
Lat, Long: 53.423648, -6.338816
Description: The diversion of two gas pipelines by Bord Gáis was monitored over two and a half weeks in August and September 2004. The pipeline extended across three large fields which were under wheat and had been subject to reclamation in recent years, as evidenced by two ditches and a number of modern plastic and ceramic land drains noted during monitoring.
The removal of topsoil and excavation of the pipeline trenches were supervised and no archaeological features or artefacts were uncovered. The topsoil removal in the stopple locations to the north-east and south-west of the pipeline corridor was also monitored, but these were in areas already disturbed down on to the existing pipes.

License no.: 05E0236
Excavation no.: 2008:384
County: Dublin
Site name: COLDWINTERS
SMR No.: N/A
Author: James Lyttleton, The Archaeology Company, Hamilton House, Emmet Square, Birr, Co. Offaly
Site type: Excavation - miscellaneous
Period/Dating: Modern (AD 1750-AD 2000)
ITM: E 712000m, N 741806m
Lat, Long: 53.414484, -6.315214
Description: Testing was undertaken in the area of a proposed development at Dublin Airport Logistics Park, Coldwinters, Co. Dublin. The area was formerly used as a golf-course (St Margaret's). The overall area of development comprises a total of some 62.6ha on lands divided between the townlands of Coldwinters and Newtown. It is bounded to the north and south by field boundaries, to the east by the R122 and to the west by the N2 dual carriageway. A private road linking the N2 and the R122 runs through the centre of the development site. The development consists of warehouse facilities and ancillary groundworks. Some areas of the development site have already undergone different phases of archaeological investigations, including two episodes of large-scale intensive testing which took place in an area to the north of the present site in 2005 by Ellen O'Carroll (Excavations 2005, No. 409) and in 2007 by Michael Tierney and M. Rooney.
Testing was undertaken between 9 and 19 June 2008. A total of 32 trenches with a total length of 3,423m were opened, 10m apart, across the site. The work was completed using a mechanical excavator fitted with a 2.4m grading bucket to excavate topsoil to the level of potential archaeological horizons. The area was under high thick grass and all the features associated with the golf-course were levelled out prior to the development. The topsoil largely consisted of a brownish-yellow sandy clay, 0.2–0.4m in depth, overlying a layer of dark-greyish-brown sandy clay, 0.2–0.4m in depth, with moderate to frequent stones. The subsoil was a mid-greyish-brown sandy clay with moderate inclusions of stones. Besides a number of land drains associated with the golf-course and a few modern

field boundaries, there was no evidence of any deposits or features of archaeological significance uncovered during the testing of the site.

License no.: 05E0236

Excavation no.: 2005:409

County: Dublin

Site name: COLDWINTERS/NEWTOWN

SMR No.: N/A

Author: Ellen O'Carroll, The Archaeology Company, 17 Castle Street, Dalkey, Co. Dublin

Site type: No archaeology found

Period/Dating: N/A

ITM: E 712638m, N 742975m

Lat, Long: 53.424844, -6.305201

Description: A levelled site (SMR 14:6) and two further sites (14:16 and 14:53) which were recorded from aerial photography were tested in Coldwinters as part of a planning application for Logistic warehousing units. The site had been used as a golf course in the recent past. Site 14:6 was located and found to exhibit significant subsurface archaeological features. Whilst the monument displays characteristics of an early medieval multivallate ringfort, a feature within the monument complex has yielded a sherd of pottery of probable prehistoric date. Site 14:16 was not located, and testing did not reveal anything of archaeological significance. It is likely, therefore, that landscaping undertaken during construction of the golf course has removed any traces of the monument. Site 14:53 was not located during the testing. The many features such as bunkers and tees in the vicinity of the monument site, and the landscaping required to create the golf course, may have served to remove all traces of the monument.

License no.: 17E0220

Excavation no.: no excavations summary submitted

County: Dublin

Site name: St. Margaret's Road

ITM: -

Lat, Long: -

Description: The following is taken from the Dublin County Archaeological Reports archive, through Heritage Maps online:

This report details the results of licensed archaeological monitoring on a development site at Dublin Airport Logistics Park, St. Margaret's, County Dublin. The only evidence for previous settlement related to a small golf course developed in the 1980s and there was nothing further of archaeological interest recorded over the site.

License no.: 17E0285

Excavation no.: 2017:424

County: Dublin

Site name: COLDWINTERS

SMR No.: DU014-016

Author: Martin Byrne, Byrne Mullins & Associates, 7 Cnoc na Greine Square, Kilcullen, Co. Kildare

Site type: Enclosure and Cremated remains

Period/Dating: Undetermined

ITM: E 711987m, N 741808m

Lat, Long: 53.414499, -6.315421

Description: The SMR files of the Archaeological Survey of Ireland indicate the location of an enclosure site—DU014-016—within lands at Coldwinters, Co. Dublin. The existence of this possible monument was originally noted as a cropmark on an aerial photograph (CUCAP, BDQ 66) dating to 1971. The cropmark is approx. 40m in diameter and bounded to the immediate

north and east by field boundaries. The lands were subsequently developed as a golf course and the field boundaries removed, making the exact location of the feature difficult to determine. The centre point of the monument is indicated on SMR mapping—www.archaeology.ie—and this location was used as the basis of a programme of archaeological testing.

No evidence of the monument was uncovered during the testing. A further review of the Aerial Photograph (CUCAP, BDQ 66) on which the monument was originally identified indicated that the cropmark enclosure feature was bounded to the north and east by field boundaries, both of which were removed when the land were used as a golf course. Based on the results of the archaeological testing and reappraisal of A/P CUCAP, BDQ 66, the monument centre is located approx. 90m to the north-east of that indicated in the SMR and possibly within a copse of tree planting (Revised Centre ITM: 712014 741886).

The remains of a previously unrecorded deposit of burnt/cremated human bone were uncovered and subsequently excavated (ITM: 711972 741892). The sampled material was submitted for processing and bone identification to Dr. Clare Mullins. In summary, the sample of cremated bone contained the remains of at least one adult or individual in late adolescence and may also have contained the remains of a child. Ageing criteria for the adult was based solely on bone size and sex could not be assigned. Virtually all of the bone was fully calcined and the bone was highly fragmented. The sample weighed 96.9g, of which 59.8g could be identified to skeletal region. Fragments of skull, axial skeleton and limb bones were identified indicating that it is unlikely that specific regions of the body were selected for either cremation or collection for burial. The presence of a child was indicated only by a number of deciduous teeth but it is possible that other parts of the juvenile skeleton were fragmented beyond recognition. That so little bone was present in the sample may indicate that it was a token cremation. However, the find circumstances may indicate that the small sample size is due to post-depositional disturbance of the remains. A sample of the bone was submitted to the Chrono-Lab, Queens University Belfast (QUB) for Carbon-14 dating but a date could not be achieved.

License no.: 17E0436

Excavation no.: 2017:842

County: Dublin

Site name: COLDWINTERS

SMR No.: DU014-015

Author: Jon Stirland, Archaeological Consultancy Services Unit, Unit 21 Boyne Business Park, Greenhills, Drogheda, Co Louth

Site type: Structure and Kiln

Period/Dating: Undetermined

ITM: E 711891m, N 741564m

Lat, Long: 53.412328, -6.316951

Description: Test trenching was carried out at the site of a proposed development within the townland of Coldwinters, North County Dublin. The site contains a recorded monument, DU014-015, classified as a ring-ditch, and is described within the RMP as located in pasture (formerly the green of a golf course) between the Dublin-Ashbourne Road and the N2. The monument takes the form of a circular cropmark (diam. c. 15m), that currently has no surface expression. It appears very clearly however on an aerial photograph within the Cambridge University Collection of Aerial Photography (CUCAP, BDQ 66), which was taken in 1967 before the construction of the golf course. During the site inspection no visible surface evidence for the monument was noted.

Ten archaeological test trenches were excavated within the boundary of the proposed development. The presence of DU014-015 was identified within Trenches 2 and 8, in the form of a circular slot-trench (C009) measuring 10m in diameter with an average depth of

between 0.27m to 0.3m. This circular feature appears to represent a circular slot-trench associated with a possible dwelling/round house. No dating evidence was recorded.

20m to the east of the circular slot-trench, also within Trench 2, a keyhole-shaped corn-drying kiln (C003), was recorded, alongside which was a small possible pit-type feature (C004). No further features or deposits of an archaeological nature were recorded within the other test trenches.

License no.: 17E0436

Excavation no.: 2021:238

County: Dublin

Site name: COLDWINTERS

SMR No.: DU014-015

Author: Derek Gallagher, Archaeological Consultancy Services Unit, 21 Boyne Business Park, Greenhills, Drogheda, Co Louth

Site type: Structure and Kiln - corn-drying

Period/Dating: Multi-period

ITM: E 711891m, N 741564m

Lat, Long: 53.412328, -6.316951

Description: Archaeological test trenching and excavation was undertaken at a site at Coldwinters, Co. Dublin.

The first phase of licensed test trenching was carried out by Jon Stirland of Archaeological Consultancy Services Unit (ACSU), on 5–9 October 2017. As part of this assessment 10 archaeological test trenches were excavated within the site boundary of the proposed development. During the test trenching, within Trenches 2 and 8 the presence of recorded monument DU014-015 was identified in the form of a circular slot-trench measuring 10m in diameter with an average depth of between 0.27–0.3m. This feature likely represented a circular slot-trench associated with a possible dwelling/round house. 37.32m to the east of the circular slot-trench, also within Trench 2, was a cereal-drying kiln, measuring 3.2m in length, 1.3m maximum width, with a depth of 0.45m in the north bowl and 0.3m in the south bowl. Both features were highly truncated by agricultural activity in the past. No further archaeological features or deposits of an archaeological nature were recorded within the other test trenches.

Both features were fully excavated by hand in November of 2018. A small fragment of blue glass was recovered from the circular slot trench, and a small flint thumbnail scraper was found within the cereal-drying kiln. Samples were retrieved and processed, with a charcoal sample from the cereal-drying kiln returning a date of Cal 1050–1270AD.

The circular feature and the cereal-drying kiln appeared disturbed by agricultural activity in the past. Both were cut into the natural boulder clay with no surface expression. All archaeological features identified were excavated, paleoenvironmental samples were retrieved and the features recorded. During this time, the south part of the site was not available for monitoring.

As a result, the license was transferred to Derek Gallagher in May 2021, with the remainder of the site monitored in October 2021.

License no.: 17E0436 ext.

Excavation no.: 2021:372



County: Dublin

Site name: COLDWINTERS

SMR No.: DU014-015

Author: Derek Gallagher, Archaeological Consultancy Services Unit, Unit 21, Boyne Business Park, Greenhills, Drogheda, Co Louth

Site type: Structure and Kiln - corn-drying

Period/Dating: Medieval (AD 400-AD 1600)

ITM: E 711891m, N 741564m

Lat, Long: 53.412328, -6.316951

Description: Archaeological test trenching carried out at this site in October 2017 at a pre-planning stage, under license 17E0436, successfully identified archaeological features on site, including a feature accounting for monument DU014-015, a kiln, and a post-hole.

As the development of the site would directly impact all archaeological features identified, preservation by record was recommended and carried out in November 2018. In addition, monitoring of the southern portion of the site took also place. This was carried out in October 2021 by Derek Gallagher of Archaeological Consultancy Services Unit (ACSU) under an extension to license 17E0436. No additional features were exposed and all archaeological works were completed.

In the course of investigations, all the features identified were fully excavated. The features were identified in the northern part of the site. Two areas were stripped of topsoil, one measuring roughly 17m by 21m centred around the circular feature/slot trench C03; the other measuring 11m by 12m and opened up around the kiln C14. The circular slot trench C03 accounted for the monument DU014-015 and measured between 0.42m to 0.88m in width; it had an external diameter of 10.1m, enclosing an area of 8.4m. Its upper extent was heavily truncated and the feature measured between 0.11m to 0.32m in depth. It was filled by four deposits that contained animal bone, shell fragments and charcoal inclusions. The animal bone samples retrieved were analysed and consisted of horse, cow and sheep/goat remains. A small fragment of blue glass (17E0436:04:01) was also recovered. The apparent entrance at the west side of C03 is likely the result of the initial test trench removing this part of the feature. It should be mentioned that the Cambridge aerial photograph of the feature shows it as a complete circle with no gap that could indicate the entrance. The feature was interpreted as representing a possible dwelling/roundhouse; however, this interpretation remains tentative. The kiln C14 and associated post-hole C21 were excavated in the north-eastern portion of the site. The kiln measured 3.2m in length by 1.3m in width, and the firing bowl had a depth of 0.45m, while the drying chamber had a depth of 0.3m. Within the kiln, 11 deposits were recorded. A burnt flint thumbnail scraper (17E0436:17:1) was recovered from the kiln. A sample of

alder charcoal (0.05g) recovered from a charcoal-rich deposit (C18; Sample 8) in the firing bowl of the kiln C14, returned a date of 840 +/- 30 BP, giving a 2sigma calibrated date range of 1050–1270 AD (ICA ID20C/0406) and placing the feature in the medieval period. Due to its nature, this deposit represents the final burning in the kiln and marks the time when the kiln went out of use. The post-hole C21 was located on the southern edge of kiln C14. It measured 0.26m in diameter and was c. 0.22m deep, and was likely contemporary with the kiln. The kiln was interpreted as an irregular figure-of-eight shaped kiln of medieval date with associated post-hole.

All archaeological features exposed on site were excavated and preserved by record (fully excavated). No further archaeological mitigation is required.

License no.: 07E1147

Excavation no.: 2008:369

County: Dublin

Site name: TYRRELLSTOWN TO CHERRYHOUND INTERCHANGE,

SMR No.: N/A

Author: Robert O'Hara, Archaeological Consultancy Services Limited, Unit 21, Boyne Business Park, Greenhills, Drogheda, Co. Louth

Site type: Kiln, Ring-ditch, Cremation pit and Field system

Period/Dating: Multi-period

ITM: E 707716m, N 742619m

Lat, Long: 53.422678, -6.379351

Description: The proposed Tyrrelstown to N2 (Cherryhound Interchange) link road will connect Mulhuddart Village with the N2 Finglas–Ashbourne motorway at Cherryhound Interchange. It will consist of c. 4.5km of new dual carriageway with associated works. The scheme will also require the widening and realigning of sections of the existing road network. The assessment of the proposed development involved the mechanical excavation of 198 test-trenches with a combined total length of 9879.36m, resulting in a total excavated area of 21240.62m².

Fourteen fields were tested, and four archaeological sites were identified: Bay 1 (cremation pits), Bay 2 (kiln, ring-ditch, cremation pit), Bay 3 (kiln and possible field system associated with DU014–089) (see Nos 370–2, Excavations 2008) and Hollywoodrath 1 (early medieval activity) (see No. 464, Excavations 2008).

License no.: 17E0569

Excavation no.: 2018:257

County: Dublin

Site name: FINGAL

SMR No.: DU014-006001

Author: John Tierney, Eachtra Archaeological Projects Ltd, Lickybeg, Clashmore, Co Waterford. P36 WA44

Site type: Ringfort - unclassified

Period/Dating: Multi-period

ITM: E 711959m, N 742455m

Lat, Long: 53.420317, -6.315613

Description: Work took place in a green field site in Dublin Airport Logistics Park in Fingal, Co. Dublin for Rohan Holdings Ltd. The purpose was to determine the nature and extent of the archaeological remains within the western portion of the ringfort DU014-006001 in order to assess the significance of the site and the potential impacts of the proposed development on the site. The eastern half of the ringfort is preserved in situ in the adjoining site (to the east), which is occupied by a DHL warehouse. Testing was undertaken in January/February 2018.

A measured drone survey of the stripped site was conducted in January 2018 and this was used as the foundation survey to record the site. A magnetometry geophysical survey (18R0029, J. M. Leigh) was also conducted across the site once all soil stripping was complete. The drone survey and the geophysical survey results were both combined in a GIS package and this was used in the interpretation of the nature and extent of the archaeological remains.

Dr. Linda Lynch, osteoarchaeologist, visited the site to examine the human remains which were recorded in the interior of the site when the terram was removed.

An area measuring 0.5ha (5000 m²) was stripped to reveal the full extent of the ringfort and the remains of the ringfort fully occupies that area. The site comprises three concentric ditches, with the innermost 2 (Ditches 1 and 2) overlapping slightly in their southernmost arc. Ditches 2 and 3 maintain a concentric arrangement throughout their visible arcs. An entrance is formed by Ditch 1 terminating at the south end of the site however Ditches 2 and 3 do not have any termini visible.

Within the area of the 3 ditches a core occupation area measuring 2500 m² has been identified in the east and south parts of the site. The three ditches (1–3) enclose the highest point in the micro topography of the site and the occupation area is on the most level ground within their enclosing arc, albeit the ground slopes slightly to the north and west. It is apparent that the ringfort dwellers chose to live on the best level ground at the highest point available to them.

Three other ditches (Nos 4-6) are present which appear to radiate out from, and are connected to, the arc of the inner ditch (Ditch No. 1).

Our main hypothesis for the development of the site is as follows:

a. Ditch 1 represents the earliest, univallate enclosure (c. 1300 m²) and it had an associated field system (Ditches Nos 4–6) attached to the west.

b. The early univallate ringfort was expanded outwards and replaced by a bivallate ringfort represented by Ditches 2 and 3.

The entrance to the univallate fort measures 12m in width and is located to the south. A slot trench and series of pits/post-holes are located on the west side of the entrance. The ringfort was expanded and the original ditch was backfilled and a new larger bivallate (double bank and ditch) ringfort was constructed (c. 5000 m²). The bivallate enclosing element is continuous within the area of the site so it is likely that the entrance is located to the east outside the area of development. A probable entrance is visible in the Leo Swan aerial photographs in an area east of the site.

There is extensive evidence for early medieval occupation in the interior of the site which includes two round houses and a series of pits and hearths. A group of burials, representing at least six individuals, has been recorded in the area to the north of the round houses.

License no.: 17E0569 extension
Excavation no.: 2018:259
County: Dublin
Site name: FINGAL
SMR No.: DU014-006001
Author: John Tierney, Eachtra Archaeological Projects Ltd, Lickybeg, Clashmore, Co Waterford. P36 WA44
Site type: Ringfort -unclassified and Burial
Period/Dating: Early Medieval (AD 400-AD 1099)
ITM: E 711959m, N 742455m
Lat, Long: 53.420317, -6.315613
Description: A group of human burials were recorded in the center of Newtown ringfort DU014-006001 during testing works. Dr. Linda Lynch confirmed the human skeletal remains to be

archaeological. A decision was made to apply to the National Monuments Service to extend the license due to concerns about further deterioration to the human remains.

The skeletons were excavated in March 2018. A total of eight skeletons were excavated from the interior of Newtown ringfort. All were incomplete as they had suffered significantly from truncation and fragmentation.

Initially six burials were recorded to the north of House Site 1 while a seventh was located to the south of House Site 2 and close to the eastern baulk of the site. The area containing the six burials (SK 1-6) measured approximately 12m north-south by 15m. No formal barrier was identified separating the burial ground from the rest of the interior of the ringfort. The burials were interred in simple earth-dug graves but no real trace of any grave cuts had survived. They were supine and extended with the head orientated to the east. Remains of two additional burials (SK 8 & SK 9) were identified post-excavation by Dr. Lynch.

Skeleton 8 (aged 3.5–4 years) was very incomplete. Fragments of the right femur and right hip (ilium) were bagged with the left hand of SK 4 and are interpreted by Dr. Lynch as the remains of a burial lying parallel to, and to the south of, SK 4. No other remains of SK 8 were recovered on site. It appears that SK 4 (possible female 17–25 years) and SK 8 (3.5–4 years) may have been buried immediately adjacent to each other. In addition one fragment of a bone from a young infant (SK 9 <6 months) was found in association with SK 4.

Few dental remains were recovered, just 23 permanent teeth from three adults, one permanent tooth from the adolescent/young adult, and two permanent teeth from a juvenile.

Two samples of bone, one from skeleton 3 and the second from skeleton 7, were chosen by Dr. Linda Lynch for AMS dating.

Lab ID UB-37844, Sample ID 17E0569:SK3, Context Female 45+ yrs Material/Type, Fragment of diaphysis of right femur, Radiocarbon BP 1499+/-33, Calibrated cal AD 432-640, Date Period, Early medieval

Lab ID UB-37845, Sample ID 17E0569:SK7, Context Male 35-39 yrs, Fragment of diaphysis of left femur, Radiocarbon BP 1066+/-33, Calibrated cal AD 895-928, Early medieval

It is possible that the eight burials (SK 1-6 and SK 8-9) date to the earlier phase of the ringfort, while SK 7, with the later date and the relatively isolated location, may represent a somewhat later burial on the site, though possibly still when the site was in use.

The skeletal assemblage, comprised a total of nine individuals, three adult females, two adult males, one young adult, two juveniles and an infant. Two of these burials, SK 3 and SK 7, were dated to the early medieval period. Eight of the individuals were recorded in a group to the north of house site 1 while the ninth was located close to the eastern boundary of the site. It should be noted that the eastern boundary of the site does not represent the perimeter of the ringfort but the boundary between the green field site and a DHL warehouse to the east. In addition four other individuals, recorded in 2005 but not excavated, are preserved in situ in the eastern portion of the ditch under the DHL carpark.

According to Dr. Lynch the Newtown individuals are quite interesting in terms of actual burial practice. They appear to be interred in relatively simple earth-dug graves, the most common form of burial in early medieval Ireland. All appear to be supine and extended. The exception was SK1 (15–20 years), whose skeletal remains were simply too disturbed to ascertain the original burial position, although it was probably at least extended.

The unusual aspect of the burials was that, in the vast majority of cases (the exception again being SK1), the bodies were interred with the head to the east, directly opposite to the classic traditional Christian burial which was with the head to the west.

There is a possibility that ringfort could be classified as a cemetery settlement site though the number of known recorded burials is low. Only full excavation of the western half of the ringfort would elucidate this possibility. O'Brien (1992; 2003) believes that it

was not until the 8th/9th century that burial in recognisable Christian ecclesiastical settlements became the norm in Ireland. Until then burial in unconsecrated family graveyards or ferta was also practised. Burial grounds have now been found in non-ecclesiastical enclosures on numerous excavated sites—often occupying the south-east quadrant and sometimes within a dedicated sub-enclosure. It is difficult to provide a definitive description of a cemetery settlement as they vary widely, however, a number of defining characteristics have emerged (O’Sullivan & Harney 2008; Ó Carragáin 2009; Stout & Stout 2008). The size of the enclosing element ranges from 40–100m and the cemetery element occupies just a small fraction of the available space. The cemetery is usually sited to the east or south-east within the enclosure which mirrors the layout of ecclesiastical cemeteries. With a few exceptions where good dating evidence is available, the sites seem to have fallen out of use by AD 1000. The cemetery settlements have a broadly similar chronology ranging from the 5th/6th century to the 9th/10th century which does tie in with the radiocarbon dates obtained from the burials at Newtown which range from AD 432 to 928.

References

O’Brien, E. 1992 ‘Pagan and Christian burial in Ireland during the first millennium AD: continuity and change’. In N. Edwards and A. Lane (eds.) *The early church in Wales and the west*, 130–7. Oxbow Monograph 16. Oxford.

Ó Carragáin, T. 2009 ‘From family cemeteries to community cemeteries in Viking Age Ireland’ In C. Corlett and M. Potterton (eds.) *Death and burial in early medieval Ireland*, Dublin.

O’Sullivan, A. and Harney, L. 2008 *Early Medieval Archaeological Project: Investigating the character of early medieval archaeological excavations, 1970 – 2002*. UCD School of Archaeology.

Stout, G. and Stout, M. 2008 *Excavation of a secular cemetery at Knowth, Site M, Co. Meath*. Bray.

License no.: 17E0570

Excavation no.: 2018:258

County: Dublin

Site name: FINGAL: Newtown, Dublin Airport Logistics Park

SMR No.: DU014-006002

Author: John Tierney, Eachtra Archaeological Projects Ltd, Lickybeg, Clashmore, Co Waterford. P36 WA44

Site type: Ringfort - unclassified

Period/Dating: Early Medieval (AD 400-AD 1099)

ITM: E 711826m, N 742446m

Lat, Long: 53.420264, -6.317616

Description: Testing was undertaken to locate a possible ringfort in a green field site in Dublin Airport Logistics Park in Fingal, in the townland of Newtown, Co. Dublin. The clients, Rohan Holdings Ltd., are developing the site. Testing was undertaken in January/February 2018.

The Park is situated on the former St Margaret’s Open Golf Course, to the east of the M2 motorway and north of Junction 5 on the M50 motorway. Dublin Airport is located to the east.

Two archaeological sites, ringfort DU014-006001- (71958 742457) and possible ringfort DU014-006002- (711825 742448) are located within the development site. The possible ringfort DU014-006002 is located approximately 50m to the west of ringfort DU014-006001. Testing (17E0569) was undertaken on the second site DU014-006001- and is the subject of a separate summary.

Ringfort DU014-006002- is described as follows on www.archaeology.ie:

A series of aerial photographs taken after site destruction (BDR 27, BDQ 65, BGM, 70, AVS 38, 37) shows detailed cropmark evidence for two distinct building phases on the site.

A roughly circular enclosure (diam. c. 45m) with field system attached to the west appears to pre-date the ringfort (DU014-006001-) levelled in 1953 (Stout and Stout 1992, 5-14).

The wording of the entry for ringfort DU014-006002 on www.archaeology.ie is the same as part of the wording for the entry for ringfort DU014-006001. An examination of the aerial photographs (BDR 27, BDQ 65, BGM, 70, AVS 38, 37) held in the archives in the National Monuments Service failed to show any trace of a crop mark in the area of the possible site of DU014-006002. Further examination of late 20th-century aerial photographs also failed to display any trace of the site (Leo Swan Photograph Collection). By contrast detailed cropmark evidence for DU014-006001, as described in the www.archaeology.ie text, was clearly visible on both sets of aerial photographs.

In addition the ringfort DU014-006002 is not marked on the historical editions of the Ordnance Survey maps and was not recorded during testing of the site in 2005 in conjunction with a planning application to Fingal County Council. No trace of possible ringfort DU014-006002, previously identified as a crop mark, was recorded within the development site during the previous phases of archaeological work at the site.

A programme of testing was devised to locate and establish the nature and extent of possible ringfort DU014-006002 in order to assess the significance of the site and the potential impacts of the proposed development on the site. A measured drone survey of the stripped site was conducted in January 2018 and this was used as the foundation survey to record the site.

The site was identified using www.archaeology.ie and the digital copy of the SMR map. A test trench measuring 55m north-south x 1.5m wide was first excavated across the area of the possible site. This trench was then widened to 7m wide (Trench A). Two perpendicular offshoot trenches were then excavated measuring 20m east-west x 3m wide (Trench B) and another measuring 23m east-west by 3m wide (Trench C). Nothing of archaeological significance was found in any of the test trenches. The sputh end of the north-south trench had a different subsoil which appears to represent differential groundwater levels.

A separate test trench was excavated 25m east of the site of the possible ringfort to investigate a raised ridge of ground (Trench D). This ridge appears to have been a golf course feature and contained modern buried rubbish.

The excavation of test trenches failed to produce any evidence of the existence of the site. It is suggested, based on the following considerations, that the possible ringfort does not exist, within the area of the development site;

1. the lack of physical stratigraphic archaeological evidence derived from testing the area in 2018 and 2005
2. the lack of annotation on the relevant cartographic sources
3. the duplication of a site description on www.archaeology.ie
4. the absence of a cropmark, notwithstanding the existence of a very clear cropmark for DU014-006001, on two sets of aerial photographs.

License no.: 18E0073

Excavation no.: 2018:260

County: Dublin

Site name: FINGAL: Newtown, Dublin Airport Logistics Park

SMR No.: DU014-006001

Author: Jacinta Kiely, Eachtra Archaeological Projects Ltd, Clashmore, Co Waterford. P36 WA44

Site type: Ringfort - unclassified

Period/Dating: Early Medieval (AD 400-AD 1099)

ITM: E 711914m, N 742239m

Lat, Long: 53.418386, -6.316366

Description: Monitoring took place of ground disturbance works for the development of two industrial units in a green field site in Dublin Airport Logistics Park in Fingal, Co Dublin. Planning for

the development has been granted by Fingal County Council, planning reference number F16A/0128.

The development site, which is to house the westernmost of the industrial units, measures c. 130m by 75m. The ground slopes very gently to the west, where the overburden is significantly thinner. The site was stripped by machine in the following sequence:

1. Single pass with a grasscutter/mulcher.
2. Removal of the sod by a 20-ton tracked machine.
3. Removal of the topsoil by a 50-ton tracked machine.
4. Archaeologists monitored the stripping by the 50-ton tracked machine and one archaeological feature was recorded and excavated.

The topsoil was a mid-greyish brown clayey and the underlying subsoil was a light-brownish grey silty clay with moderate small stone. The natural was a light-orange grey clay with frequent stone inclusions and limestone outcrops on darker sediment.

The base of an isolated hearth (measuring 1m x 1m) with a stake-hole on the southern edge was recorded in the south-east section of the site (711941 742199).

The hearth is likely to be associated with the occupation of ringfort DU014-006001. Similar hearths with associated stake-holes, which supported fireside furniture such as spits, have been recorded in proximity to other early medieval sites. For example a date of cal AD 1270–1381 (UB–30584) was returned from the basal charcoal of an isolated hearth of similar dimensions in Kilbritten, Co Cork (15E0080) and an isolated hearth with associated stake-hole returned a date of cal AD 400-570 (Beta 210808) on the route of the N22 outside Tralee, Co. Kerry.

No other archaeological stratigraphy, features or artefacts, with the exception of the base of an isolated hearth, were recorded while monitoring.

License no.: 18E0357

Excavation no.: 2018:339

County: Dublin

Site name: BALLYCOOLIN

SMR No.: N/A

Author: Kim Rice and Red Tobin, Courtney Deery Heritage Consultancy, Lynwood House, Balinteer Rd., Dublin 16, D16 H9V6

Site type: No archaeology found

Period/Dating: N/A

ITM: E 709649m, N 742178m

Lat, Long: 53.418314, -6.350446

Description: Testing was undertaken at Units 628, 629, 631 and 632, in Northwest Business Park, Ballycoolin, Dublin 15. Twenty-three trenches were excavated across the northern and south-western parts of the site; however, the only uncovered remains consisted of nineteenth- and twentieth-century extraction pits and field drains.

License no.: 22E0348

Excavation no.: no excavations summary submitted

County: Dublin

Site name: Kilshane

ITM: E 710777, N. 742666m

Lat, Long: -

Description: The following is taken from the Dublin County Archaeological Reports archive, through Heritage Maps online.

A geophysical survey of the application area identified a number of anomalies which may represent archaeological features (License Nos 22R0092). Of particular note was a potential large, oval shaped enclosure with possible internal structures/divisions. Additional

features include a section of a possible double ditch located in the northeast area of the site and part of a potential rectangular enclosure located in the southeast section of the site.

A total of 33 test trenches were excavated across the site. The majority of trenches did not contain archaeological deposits. Where these trenches overlay anomalies identified in the geophysical survey, they were revealed to be modern drains, plough furrows, farming tramlines or were simply not present. The remaining Trenches 15-21 produced features which corresponded with the enclosure complex recorded in the geophysical Survey.

Full archaeological resolution of the identified archaeological remains by means of a full-scale archaeological resolution was carried out by Chris Lynn of Gahan and Long Ltd under license 22E0348.

License no.: 22E0536

Excavation no.: 2022:519

Site name: Kilshane

SMR No.: DU014-048

Author: Colum Hardy, Archaeological Management Solutions, Fahy's Road, Kilrush, Co. Clare, V15 C780

Site type: Three possible early medieval enclosures

Period/Dating: Early Medieval (AD 400-AD 1099)

ITM: E 710276m, N 742913m

Lat, Long: 53.424786, -6.340761

Description: Archaeological test excavations and monitoring of Geotechnical Site Investigation works took place as part of a due diligence exercise in the townland of Kilshane, Co. Dublin between 5 August and 12 September 2022. The site included two fields (Field 1 and Field 2) measuring a total of c.7.1ha. A total of 474.5 linear metres was tested within Field 1 and 769 linear metres of Field 2. Both fields were investigated through a combination of targeted and random test trenching. All anomalies identified during the geophysical surveys previously undertaken by Target Archaeological Geophysics (Field 1) (License Number 22R0059) & Dr Ger Dowling in Field 2 (22R0201)) were investigated.

Three major enclosing ditches originally identified through geophysics were confirmed by testing. The ditches are substantial in scale with the main outer boundary enclosing ditch having a diameter of approximately 110m north-east/south-west and measured 3.1–4.2m wide and a maximum of 1.53m deep. The middle enclosure ditch measured approximately 90m north-east/south-west, approximately 3m wide and 1–1.2m deep. The inner enclosure ditch measured approximately 78m in diameter north-east/south-west, approximately 1.65–3m wide and 0.73m deep. There was no direct evidence for any of the enclosure ditches continuing into Field 1 and it is possible that the enclosures represent a more D-shaped pattern with their eastern perimeter delineated by the current north–south field boundary.

In association with these enclosing boundary ditches, a number of radial, possible annex ditches were identified within Field 2. These are likely to represent small fields or paddocks. They measured 25–35m in length intersecting the three main enclosure boundary ditches. Many of these ditches included evidence for animal bones, shells and occasional charcoal inclusions. They varied in shape and size ranging between 0.4–3.42m wide and 0.13–1.16m deep. A concentration of metal slag recorded from the south-east corner of Field 2 may indicate an industrial aspect to the site in the form of making or repairing tools and artefacts. A single adult human tooth was also recorded from one of the ditches.

The discovery of skeletal remains in Trench 10 and the additional cutting subsequently opened to the west of this indicates a continuation of the known burial ground (DU014-048) where 123 skeletons were excavated by Margaret Gowen & Co. Ltd in advance of the gas pipeline in 1988. Testing identified up to eight individuals approximately 0.2–0.3m below ground level. The methodology focused on identifying but not fully exposing any

burials, to minimise disturbance. As such no grave cuts were visible as excavation was halted on the initial discovery of remains. The majority of the remains identified consisted of cranial fragments. Also, as per the Method Statement, three sondages were strategically inserted into Trench 10 to investigate the vertical stratigraphy within the burial ground. Human remains were identified in all three sondages between 0.14–0.18m deep. As the western extent of the burial ground had not been identified an area measuring 6.8m north–south by 5m was opened to the west of Trench 10. Nine areas of scattered skeletal remains were identified across the cutting, approximately 0.28–0.38m below ground level. The scattering of skeletal remains became less evident closer to the field hedge, possibly indicating the western extent of the burial ground

Burials were not identified during testing in Field 2 and it appears likely, based on testing undertaken, that burials are confined to the western portion of Field 1, adjacent to the known burial ground. Based on the original results from the excavation of the burial ground, the skeletal remains identified are also likely to date between the ninth and thirteenth centuries.

A number of additional ditches, stone drains, a charcoal spread and a charcoal-rich pit were also identified.

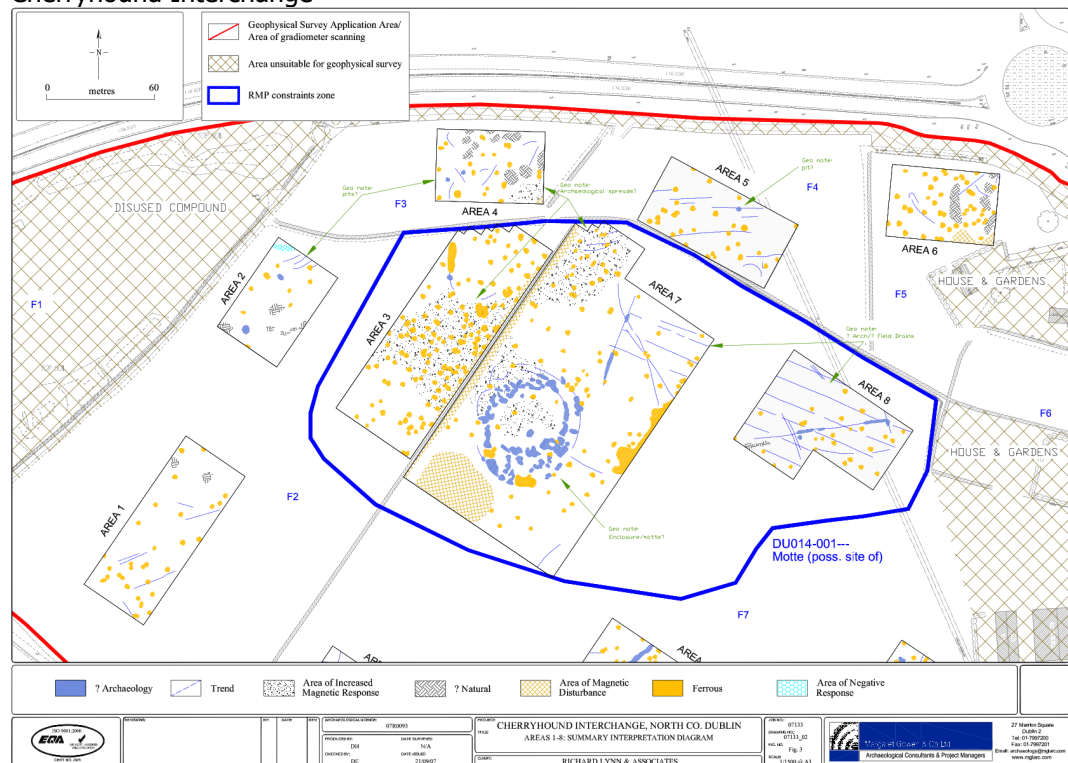
Preliminary results would indicate a possible multi-phased early medieval enclosure settlement site with evidence for agricultural activity, field systems, metalworking and burial.

APPENDIX 12.3 RECORDED ARCHAEO-GEOPHYSICAL SURVEYS

Prepared by CRDS, 2025

The Heritage Maps website³ was consulted to identify previous archaeo-geophysical surveys that have been carried out within the study area. This database contains links to scans of geophysical survey reports undertaken in the county of Dublin.

License no. 07R0093
Author David Harrison for Margaret Gowen & Co. Ltd
County Dublin
Location Cherryhound Interchange



Description Geophysical survey has identified an area of significant archaeological potential contained within the constraints of the recorded monument DU014:001 (motte, possible site of) and corresponding with a prominent earthen mound (Area 7). The responses are roughly sub circular in form and measure 62m from east to west and 67m from north to south. Several clusters of positive responses amid an area of increased background response are enclosed by fragmented curvilinear responses and fainter curvilinear trends, perhaps representing an enclosing ditch(es). North of the possible enclosure (Areas 3 & 7), two broad areas of increased background response have been identified. No clear archaeological patterns are discernable here, and these areas may represent localised pedological variations. However, given the local archaeological context an archaeological interpretation must be considered and these areas may represent broad spreads of archaeological material.

108m south east of the recorded monument, a second area of archaeological potential has been identified (Area 11). No clear archaeological patterns are visible but a number of clusters of positive responses and curvilinear trends may represent plough-damaged or ephemeral archaeological remains.

Elsewhere, several isolated responses have been identified throughout the survey area (Areas 25, 7-11 & 14-17) which may be of interest, perhaps indicating isolated pits or ephemeral archaeological remains.

³ <https://www.heritagemaps.ie>

License no. **08R17**
Author Target Geophysics Ltd
County Dublin
Location Tyrrelstown To N2 (Cherryhound Interchange) Link Road
Description Gradiometer scanning and detailed gradiometer survey along the route of the proposed Tyrrelstown to N2 (Cherryhound Interchange) Link Road have identified two areas of settlement activity extending through Fields 7 and 10. These comprise possible early prehistoric remains in Areas C & D, and a further settlement complex and probable building in Area I. The latter concentration of response appears to coincide with the location of RMP site DU014:089. The location of one possible fulacht fiadh or burnt mound site has also been recorded at the eastern edge of Area A, In Field 1.
Further responses of potential interest have been highlighted from detailed survey in Areas E, F, G, H, & J (Fields 7, 8 & 11) However, more conclusive interpretation of these anomalies has been complicated by limited feature enhancement, interference from more recent cultivation, and extensive modern ferrous interference. Traces of natural variation, more recent land drain installation, and former boundaries are also apparent in the results from survey.

License no. **10R0033**
Author J. M. Leigh Surveys
County Dublin
Location Dunsoghly Castle
Description Detailed gradiometer survey has identified multiple linear trends and ploughing trends suggestive of former field divisions and agricultural activity. Ridge and furrow cultivation may be represented here. Faint linear trends and series of isolated responses suggest possible bank/ditch features in the east of the application area. They possibly represent an enclosing boundary associated with the castle site. In the north of the application area a series of isolated responses and linear trends is of archaeological potential and may represent archaeological settlement features.
However this is speculative as the responses are of a fragmented nature and an archaeological pattern is barely discernable. In the east of the application area, three responses of some magnetic strength ($\pm 60\text{nT}$) are of potential interest. The strength and form of the responses is suggestive of a burnt feature. It is possible that the remains of a hearth or kiln feature are located here.
Several responses in the south of the application area are of potential archaeological interest. An archaeological pattern is difficult to discern, but it is speculated that the responses represent settlement activity.

License no. **22R0059**
Author Archaeological Management Solutions Ltd
County Dublin
Location Kilshane
Description The investigations comprised high-resolution magnetometer and EMI surveys and identified the remains of a small enclosure situated c.20m north-northeast of the survey centre. It measures roughly 20m x 12m in diameter with adjoining weakly magnetic linear responses. This enclosure likely forms part of burial ground DU014-048 excavated by Margaret Gowen & Co Ltd in 1988 (License no. E440).

License no. **22R0092**
Author Gahan and Long
County Dublin
Location Kilshane

Description Geophysical survey identified a number of anomalies which may represent archaeological features. Of particular note is a potential large, oval shaped enclosure with possible internal structures/divisions. This potential enclosure measures approximately 90m northwest-southeast by 65m northeast-southwest. It appears to contain a number of internal divisions/structures most notable of which is a possible sub- circular structure approximately 18m in diameter. Additional features include a section of a possible double ditch located in the northeast area of the site and part of a potential rectangular enclosure located in the southeast section of the site. It is possible that this may relate to the church site DU014-012.

License no. **22R0201**

Author Dr Ger Dowling, Archaeological Management Solutions Ltd

County Dublin

Location Kilshane

Description The survey conducted by Dr Ger Dowling in Field 2 (west of Field 1) (22R0201) comprised high-resolution magnetometer and identified several curvilinear enclosures, linear ditches, a curving double ditch-type feature, areas of burning, pits and additional anomalies (Figure 9 and Figure 10) (Dowling 2022). It is highly likely that these features are related to the burial ground (DU014-048).

APENDIX 12.4 ARCHAEOLOGICAL REPORT: PLANNING & STRATEGIC INFRASTRUCTURE DEPARTMENT, FINGAL COUNTY COUNCIL

Prepared by CRDS, 2025

Archaeological Report

Planning & Strategic Infrastructure Department

Fingal County Council

Register Reference: FW22A/0204

Proposed Development: The proposed development will consist of the following: The construction of a new Gas Turbine Power Generation Station with an output of up to 293 Megawatts. The proposed station will consist of 1 no. Gas Turbine and 1 no. 28 m high Exhaust Stack partially enclosed by a 12 m high acoustic wall. 1 no. single storey Admin Building and Warehouse (c. 926 m²), 1 no. single storey Packaged Electronic/Electrical Control Compartment (PEECC) (c. 72 m²), 1 no. single storey Continuous Emission Monitoring System (CEMS) Shelter (c. 14.8 m²), 1 no. 16.2m high x 024.4m Fuel Oil Tank, 1 no. 15.3m high x 09.2m Raw/Fire Water Tank, 1 no. 16.2m high x 018.3m Demin Water Tank, and miscellaneous plant equipment. The demolition of a detached residential dwelling (c. 142 m² GFA) and associated farm buildings (c. 427 m² GFA) located in the north west corner of the subject site to facilitate the proposed development. Road improvement works to 493.34 m Kilshane Road (L3120), including the realignment of a portion of the road (293.86 m) within the subject site boundary and the provision of new footpaths, off-road cycle ways, together with the construction of a new roundabout linking the proposed realignment of Kilshane Road back to the existing road network to the northeast of the subject site and to the proposed internal road network to serve the proposed development. The construction of entrance gates, low wall and railings fronting the realigned Kilshane Road and a private internal road network providing for vehicular, cyclist and pedestrian access to serve the development. Construction of 3 m high security fencing within development. Total provision of 26 no. car parking spaces including 1 no. disabled persons parking space and 2 no. EV electrical charging points. Provision of security lighting columns to serve the development and the installation of Closed-Circuit Television System (CCTV) for surveillance and security purposes. Provision of 20 no. sheltered bicycle parking spaces. Provision of hard and soft landscaping works, tree planting and boundary treatments including 3 m high security fence along Kilshane Road and the perimeter of the subject site boundary. Provision of new on-site foul sewer pumping station to serve the development. Provision of underground surface water attenuation areas to serve the development. All associated site development and excavation works, above and below ground, necessary to facilitate the development. An Environmental Impact Assessment Report has been prepared in respect of the proposed development. This application relates to a development that will require an Industrial Emissions Directive licence from the Environmental Protection Agency. A subsequent application will be submitted for an Above Ground Installation (AGI) compound, underground gas supply installation and a subsequent Strategic Infrastructure Development (SID) Application will also be submitted for a Gas-Insulated Switchgear Substation (GIS), Air Insulated Switchgear Substation (AIS) and grid connection to serve the development..

Location: Kilshane Road, Kilshane, Finglas, Dublin 11.

Report Type: Permission

Planning Officer: Kathy Tuck

Lodged: 13/09/2022

A report-*Archaeological Test Excavation Report* (NMS Licence Ref.: 22E0348) by Chris Lynn and Chris Long of Gahan Long Ltd. (dated 09 September 2022)- was submitted with this application. Information pertaining to the archaeological remains was also included Chapter 15 Archaeology & Cultural Heritage and Appendix 9 of the EIAR by AWN Consulting (dated September 2022).

Archaeological Report

Planning & Strategic Infrastructure Department
Fingal County Council

Geophysical survey (NMS Licence Ref. 22R0092) of the proposed development identified an enclosure that measured c.88m x 66m with internal features and structures and archaeological test excavation (NMS Licence Ref. 22E0348) confirmed these results;

The proposed development will have a direct negative impact on the newly identified sub-surface site. However, preservation by record i.e. excavation has been recommended as mitigation. This approach has been agreed with the National Monuments Services, Department of Housing, Local Government and Housing and the topsoil stripped from this area under archaeological supervision.

Archaeological excavation under licence to the National Monuments Service, Department of Housing, Local Government and Heritage is required;

- The features should then be hand excavated, recorded, photographed and planned in accordance with best practice.
- The results of the excavation including post-excavation dating of environmental samples and specialist analysis should be reported on and placed in an archaeological and historical context with an analysis of their significance, as per the requirements of the National Monuments Service.
- Copies of the final report should be submitted to the Planning Authority and to the Department of Housing, Local Government and Heritage for consideration.

Given the scale of the site and the relatively high potential for further identification of archaeological material in the areas beyond those subject to test excavation, a programme of archaeological monitoring is also recommended.

- All ground reduction should be subject to a programme of archaeological monitoring, under licence, by a suitably qualified archaeologist.
- Where archaeological material is shown to be present, avoidance, preservation in situ, or preservation by record (excavation) may be required. Works may be halted pending receipt of advice from the National Monuments Service, Department of Housing, Local Government and Heritage who will advise the Applicant/Developer with regard to these matters.
- On completion of monitoring of groundworks, and any excavations arising, the archaeologist shall submit a written report to the Planning Authority and to the Department of Housing, Local Government and Heritage for consideration.

Signed:

Christine Baker

Position:

Heritage Officer

Date:

17/10/2022

APPENDIX 15.1. RESOURCE & WASTE MANAGEMENT PLAN



Trinity
Consultants

awnconsulting

Resource & Waste Management Plan

Project Title: Kilshane Energy Phase 2

Appendix 15.1



CLIENT
Kilshane
Energy Ltd.

DOCUMENT REFERENCE
257501. 0374WMR01

DATE
24/03/2026

DOCUMENT CONTROL SHEET

Document Control Sheet		
Our Reference	257501. 0374WMR01	
Original Issue Date	24/03/2026	
Client:	Kilshane Energy Ltd.	
Revision	Revision Date	Description

Details	Written by	Approved by
Signature		
Name	Laura Griffin	Chonail Bradley
Title	Senior Environmental Consultant	Associate
Date	24/03/2026	24/03/2026

Disclaimer

This report considers the specific instructions and requirements of our client. It is not intended for third-party use or reliance, and no responsibility is accepted for any third party. The provisions in this report apply solely to this project and should not be assumed applicable to other developments without review and modification.



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1. INTRODUCTION

AWN Consulting, a Trinity Consultants Company, has prepared this Construction and Demolition (C&D) Resource & Waste Management Plan (RWMP) on behalf of Kilshane Energy Ltd. The Proposed Development is located at Kilshane, Dublin 11, west of the N2 Primary Road and approximately 2 km north-west of the M50 motorway. The Proposed Development comprises the construction of two additional gas turbines with an output of 340 Megawatts (MW) per turbine, with a total additional output of 680 Megawatts to the already permitted Gas Turbine Power Generation Station at Kilshane Road, Kilshane, Finglas, Dublin 11.

This plan provides information necessary to ensure that the management of C&D waste at the site is undertaken in accordance with the current legal and industry standards including the *Waste Management Act 1996* as amended and associated Regulations ¹, *Environmental Protection Agency Act 1992* as amended ², *Litter Pollution Act 1997* as amended ³, the National Waste Management Plan for a Circular Economy 2024 - 2030 (NWMPCE) (2024) ⁴. In particular, this plan aims to ensure maximum recycling, reuse and recovery of waste with diversion from landfill, wherever possible. It also provides appropriate measures in relation to the collection and transport of waste from the site to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil and/or water).

This RWMP includes information on the legal and policy framework for C&D waste management in Ireland, estimates of the type and quantity of waste to be generated by the Proposed Development and prescribes measures for the management of different waste streams. The RWMP should be viewed as a live document and will be regularly revisited throughout the project's lifecycle so that opportunities to maximise waste reduction / efficiencies are exploited throughout, and that data is collected on an ongoing basis so that it is as accurate as possible.

2. OVERVIEW OF WASTE MANAGEMENT IN IRELAND

2.1 National level

The Irish Government issued a policy statement in September 1998, *Changing Our Ways*⁵, which identified objectives for the prevention, minimisation, reuse, recycling, recovery and disposal of waste in Ireland. The target for C&D waste in this report was to recycle at least 50% of C&D waste within a five year period (by 2003), with a progressive increase to at least 85% over fifteen years (i.e. 2018).

In response to the *Changing Our Ways* report, a task force (Task Force B4) representing the waste sector of the already established Forum for the Construction Industry, released a report entitled '*Recycling of Construction and Demolition Waste*'⁶ concerning the development and implementation of a voluntary construction industry programme to meet the Government's objectives for the recovery of C&D waste.

In September 2020, the Irish Government published a policy document outlining a new action plan for Ireland to cover the period of 2020-2025. This plan, '*A Waste Action Plan for a Circular Economy*'⁷ (WAPCE), replaces the previous national waste management plan, '*A Resource Opportunity*' (2012), and was prepared in response to the 'European Green Deal' which sets a roadmap for a transition to an altered economical model, where climate and environmental challenges are turned into opportunities.

The WAPCE sets the direction for waste planning and management in Ireland up to 2025. This reorientates policy from a focus on managing waste to a much greater focus on creating circular patterns of production and consumption. Other policy statements of a number of public bodies already acknowledge the circular economy as a national policy priority.

The policy document contains over 200 measures across various waste areas including circular economy, municipal waste, consumer protection and citizen engagement, plastics and packaging, construction and demolition, textiles, green public procurement and waste enforcement.

One of the first actions to be taken was the development of the *Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less'* (2021)⁸ to set a course for Ireland to transition across all sectors and at all levels of Government toward circularity and was issued in December 2021. It is anticipated that the Strategy will be updated in full every 18 months to 2 years. There has not yet been an update released regarding a new iteration.

The *Circular Economy and Miscellaneous Provisions Act 2022*⁹ was signed into law in July 2022. The Act underpins Ireland's shift from a "take-make-waste" linear model to a more sustainable pattern of production and consumption, that retains the value of resources in our economy for as long as possible and that will work to significantly reduce our greenhouse gas emissions. The Act defines Circular Economy for the first time in Irish law, incentivises the use of recycled and reusable alternatives to wasteful, single-use disposable packaging, introduces a mandatory segregation and incentivised charging regime for commercial waste, streamlines the national processes for End-of-Waste and By-Products decisions, tackling the delays which can be encountered by industry, and supporting the availability of recycled secondary raw materials in the Irish market, and tackles illegal fly-tipping and littering.

The Environmental Protection Agency (EPA) of Ireland issued '*Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects*' in November 2021¹⁰. These guidelines replace the previous 2006 guidelines issued by *The National Construction and Demolition Waste Council (NCDWC)* and the Department of the Environment, Heritage and Local Government (DoEHLG) in 2006¹¹. The guidelines provide a practical approach which is informed by best practice in the prevention and management of C&D wastes and resources from design to construction of a project, including consideration of the deconstruction of a project. These guidelines have been followed in the preparation of this document and include the following elements:

- ▶ *Predicted C&D wastes and procedures to prevent, minimise, recycle and reuse wastes;*
- ▶ *Design teams roles and approach;*
- ▶ *Relevant EU, national and local waste policy, legislation and guidelines;*
- ▶ *Waste disposal/recycling of C&D wastes at the site;*
- ▶ *Provision of training for Resource Waste Manager (RM) and site crew;*
- ▶ *Details of proposed record keeping system;*
- ▶ *Details of waste audit procedures and plan; and*
- ▶ *Details of consultation with relevant bodies i.e. waste recycling companies, Local Authority, etc.*

Section 3 of the Guidelines identifies thresholds above which there is a requirement for the preparation of a bespoke RWMP for developments. The new guidance classifies developments on a two-tiered system. Developments which do not exceed any of the following thresholds may be classed as Tier 1 development, which require a simplified RWMP:

- ▶ *New residential development of less than 10 dwellings;*
- ▶ *Retrofit of 20 dwellings or less;*
- ▶ *New commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 1,250m²;*
- ▶ *Retrofit of commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 2,000m²; and*
- ▶ *Demolition projects generating in total less than 100m³ in volume of C&D waste.*

A development which exceeds one or more of these thresholds is classed as Tier-2 development.

This development requires a RWMP as a Tier 2 development as it exceeds the following threshold:

- ▶ *New commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 1,250m².*

The Proposed Development includes two gas turbines, exhaust stacks, acoustic walls, a 400 kV GIS building, and associated compounds. The combined floor area of these elements exceeds 1,250 m², and the nature of the project constitutes strategic energy infrastructure.

Other guidelines followed in the preparation of this report include '*Construction and Demolition Waste Management – a handbook for Contractors and Site Managers*'¹², published by FÁS and the Construction Industry Federation in 2002 and the previous guidelines, '*Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects*' (2006).

These guidance documents are considered to define best practice for C&D projects in Ireland and describe how C&D projects are to be undertaken such that environmental impacts and risks are minimised and maximum levels of waste recycling are achieved.

2.2 Regional Level

The Proposed Development is located in the Local Authority area of Fingal County Council (FCC).

The *Eastern Midlands Region (EMR) Waste Management Plan 2015 – 2021*, which previously governed waste management policy in the FCC area, has been superseded as of March 2024 by the NWMPC 2024 – 2030, the national waste management plan for Ireland.

The NWMPCE does not dissolve the three regional waste areas. The NWCPCE sets the ambition of the plan to have a 0% total waste growth per person over the life of the Plan with an emphasis on non-household wastes including waste from commercial activities and the construction and demolition sector. This Plan seeks to influence sustainable consumption and prevent the generation of waste, improve the capture of materials to optimise circularity and enable compliance with policy and legislation.

The national plan sets out the following strategic targets for waste management in the country that are relevant to the development:

National Targets

- ▶ 1B. (Construction Materials) 12% Reduction in Construction & Demolition Waste Generated by 2030.
- ▶ 3B. (Reuse Facilities) Provide for reuse at 10 Civic Amenity Sites, minimum.

Municipal landfill charges in Ireland are based on the weight of waste disposed. In the Leinster Region, charges are approximately €140 - €160 per tonne of waste which includes an €85 per tonne landfill levy introduced under the *Waste Management (Landfill Levy) (Amendment) Regulations 2015 (as amended)*¹³. The *Circular Economy (Waste Recovery Levy) Regulations 2024*¹⁴ will also incur a levy of €10 per tonne for waste accepted for recovery. This will include backfilling at authorised recovery sites and at municipal waste landfills.

The *Fingal Development Plan 2023 – 2029*¹⁵ (2023) sets out a number of objectives for the Fingal region in line with the objectives of the national waste management plan, including the following:

- ▶ *Objective DMSO241 - Construction and Demolition Waste Management Plan - Require that Construction Waste Management Plans be submitted as part of any planning application for projects in excess of any of the following thresholds:*
 - *New residential development of 10 units or more.*
 - *New developments other than above, including institutional, educational, health and other public facilities, with an aggregate floor area in excess of 1,250 sqm.*
 - *Renovation / refurbishment projects generating in excess of 100m³ in volume of construction waste.*
 - *Civil engineering projects in excess of 500m³ of waste materials used for development of works on the site.*

2.3 Legislative Requirements

The primary legislative instruments that govern waste management in Ireland and applicable to the development are:

- ▶ *Waste Management Act 1996 as amended;*
- ▶ *Environmental Protection Agency Act 1992 as amended;*
- ▶ *Litter Pollution Act 1997 as amended;*
- ▶ *Planning and Development Act 2000 as amended*¹⁶; and
- ▶ *Circular Economy and Miscellaneous Provisions Act 2022.*

One of the guiding principles of European waste legislation, which has in turn been incorporated into the *Waste Management Act 1996* as amended and subsequent Irish legislation, is the principle of "Duty of Care". This implies that the waste producer is responsible for waste from the time it is generated through until its legal recycling, recovery or disposal (including its method of disposal). As it is not practical in most cases for the waste producer to physically transfer all waste from where it is produced to the final destination, waste contractors will be employed to physically transport waste to the final destination. Following on from this is the concept of "Polluter Pays" whereby the waste producer is liable to be prosecuted for pollution incidents, which may arise from the incorrect management of waste produced,

including the actions of any contractors engaged (e.g. for transportation and disposal/recovery/recycling of waste).

It is therefore imperative that the Developer ensures that the waste contractors engaged by demolition and construction contractors are legally compliant with respect to waste transportation, recycling, recovery and disposal. This includes the requirement that a contractor handle, transport and recycle/recover/dispose of waste in a manner that ensures that no adverse environmental impacts occur as a result of any of these activities.

A collection permit to transport waste must be held by each waste contractor which is issued by the National Waste Collection Permit Office (NWCPO). Waste receiving facilities must also be appropriately permitted or licensed. Operators of such facilities cannot receive any waste, unless in possession of a Certificate of Registration (COR) or waste permit granted by the relevant Local Authority under the *Waste Management (Facility Permit & Registration) Regulations 2007 as amended* or a Waste Licence granted by the EPA. The COR / permit / licence held will specify the type and quantity of waste able to be received, stored, sorted, recycled, recovered and/or disposed of at the specified site.

3. DESIGN APPROACH

The client and the design team have integrated the '*Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects*' guidelines into the design workshops, to help review processes, identify and evaluate resource reduction measures and investigate the impact on cost, time, quality, buildability, second life and management post demolition and construction. Further details on these design principles can be found within the aforementioned guidance document.

The design team have undertaken the design process in line with the international best practice principles to firstly prevent waste, reuse where possible and thereafter sustainably reduce and recover materials. The below sections have been the focal point of the design process and material selections and will continue to be analysed and investigated throughout the design process and when selecting material.

As noted in the EPA guidelines, the approaches presented are based on international principles of optimizing resources and reducing waste on demolition and construction projects through:

- ▶ *Prevention;*
- ▶ *Reuse;*
- ▶ *Recycling;*
- ▶ *Green Procurement Principles;*
- ▶ *Off-Site Construction;*
- ▶ *Materials Optimisation; and*
- ▶ *Flexibility and Deconstruction.*

3.1 Designing For Prevention, Reuse and Recycling

Undertaken at the outset and during project feasibility and evaluation the Client and Design Team considered:

- ▶ Establishing the potential for any reusable site assets (buildings, structures, equipment, materials, soils, etc.);
- ▶ The potential for refurbishment and refit of existing structures or buildings rather than demolition and new build;
- ▶ Assessing any existing buildings on the site that can be refurbished either in part or wholly to meet the Client requirements; and
- ▶ Enabling the optimum recovery of assets on site.

3.2 Designing for Green Procurement

Waste prevention and minimisation pre-procurement have been discussed and will be further detailed in this section. The Design Team will:

- ▶ Discuss proposed design solutions to reduce waste generation at source;
- ▶ Encourage innovation in tenders and incentivise competitions to recognise sustainable approaches;
- ▶ Engage with the main Contractor and subcontractors/suppliers to explore options for packaging reduction, including:
 - Adoption of 'Just-in-Time' delivery strategies; and
 - Implementation of ordering procedures that avoid excessive material waste.

Green procurement principles will extend from the planning stage into detailed design and tender stage and will remain an ongoing part of the long-term design and selection process.

3.3 Designing for Off-Site Construction

Use of off-site manufacturing has been shown to reduce residual wastes by up to 90% (volumetric building versus traditional). The decision to use offsite construction is typically cost-led, but there are significant benefits for resource management. Some further considerations for procurement which are being investigated as part of the planning stage design process are listed as follows:

- ▶ Modular buildings as these can displace the use of concrete and the resource losses associated with concrete blocks such as broken blocks, mortars, etc.;
 - Modular buildings are typically pre-fitted with fixed plasterboard and installed insulation, eliminating these residual streams from site.
- ▶ Use of pre-cast structural concrete panels which can reduce the residual volumes of concrete blocks, mortars, plasters, etc.;
- ▶ The use of prefabricated composite panels for walls and roofing to reduce residual volumes of insulation and plasterboards;
- ▶ Using pre-cast hollow-core flooring instead of in-situ ready mix flooring or timber flooring to reduce the residual volumes of concrete/formwork and wood/packaging, respectively; and
- ▶ Designing for the preferential use of offsite modular units.

3.4 Designing for Materials Optimisation During Construction

To ensure manufacturers and construction companies adopt lean production models, including maximising the reuse of materials onsite as outlined in section 3.1, structures should be designed to eliminate waste. This approach reduces environmental impacts associated with transportation of materials and from waste management activities. Key measures include:

- ▶ Investigating the use of standardised material sizes to minimise offcuts; and
- ▶ Promoting and developing off-site manufacturing methods.

3.5 Designing for Flexibility and Deconstruction

Design flexibility has and will continue to be investigated throughout the design process to ensure that, where possible, products (including buildings) are constructed using materials that can be recycled and are designed for easy disassembly.

Material efficiency is being considered for the duration and end of life of a building project to produce:

- ▶ Flexible, adaptable spaces that enable a resource-efficient, low-waste future change of use;
- ▶ Durability of materials to ensure long-term performance;
- ▶ Strategies for how materials can be recovered effectively during:
 - Maintenance and refurbishment activities; and
 - Disassembly and deconstruction at end of life.

4. DESCRIPTION OF THE DEVELOPMENT

4.1 Location, Size and Scale of the Development

The Proposed Development comprises the construction of two additional gas turbines with an output of 340 Megawatts (MW) per turbine, with a total additional output of 680 Megawatts to the already permitted Gas Turbine Power Generation Station at Kilshane Road, Kilshane, Finglas, Dublin 11. The Proposed Development includes the following:

- ▶ Construction of 2 no. Gas Turbines, with an output of up to 340 Megawatts (MW) each, along with ancillary structures and equipment associated with each of the two turbines. Each of the turbines will have an exhaust stack with a height of c. 28m.
- ▶ Adjacent to each of the turbines, the development will also comprise 1 no. single storey Packaged Electrical and Electronic Control Centre (PEECC); fan cooler systems; 1 no. single storey Continuous Emission Monitoring System (CEMS) Shelter, and associated plant and equipment.
- ▶ Adjacent to each of the gas turbines, the development includes 2 no. Air Insulated Substations (AIS) to house transformers and electrical equipment within fenced compounds.
- ▶ The proposed development will be bound to its northern and part of its eastern boundary by acoustic fencing.
- ▶ Construction of a 400kV GIS building and associated electrical equipment located to the northwest of the site, within a fenced compound.
- ▶ Provision of hard and soft landscaping works, tree planting and boundary treatments.
- ▶ Attenuation storage will be located to the southeast of the site, alongside the existing permitted attenuation storage.

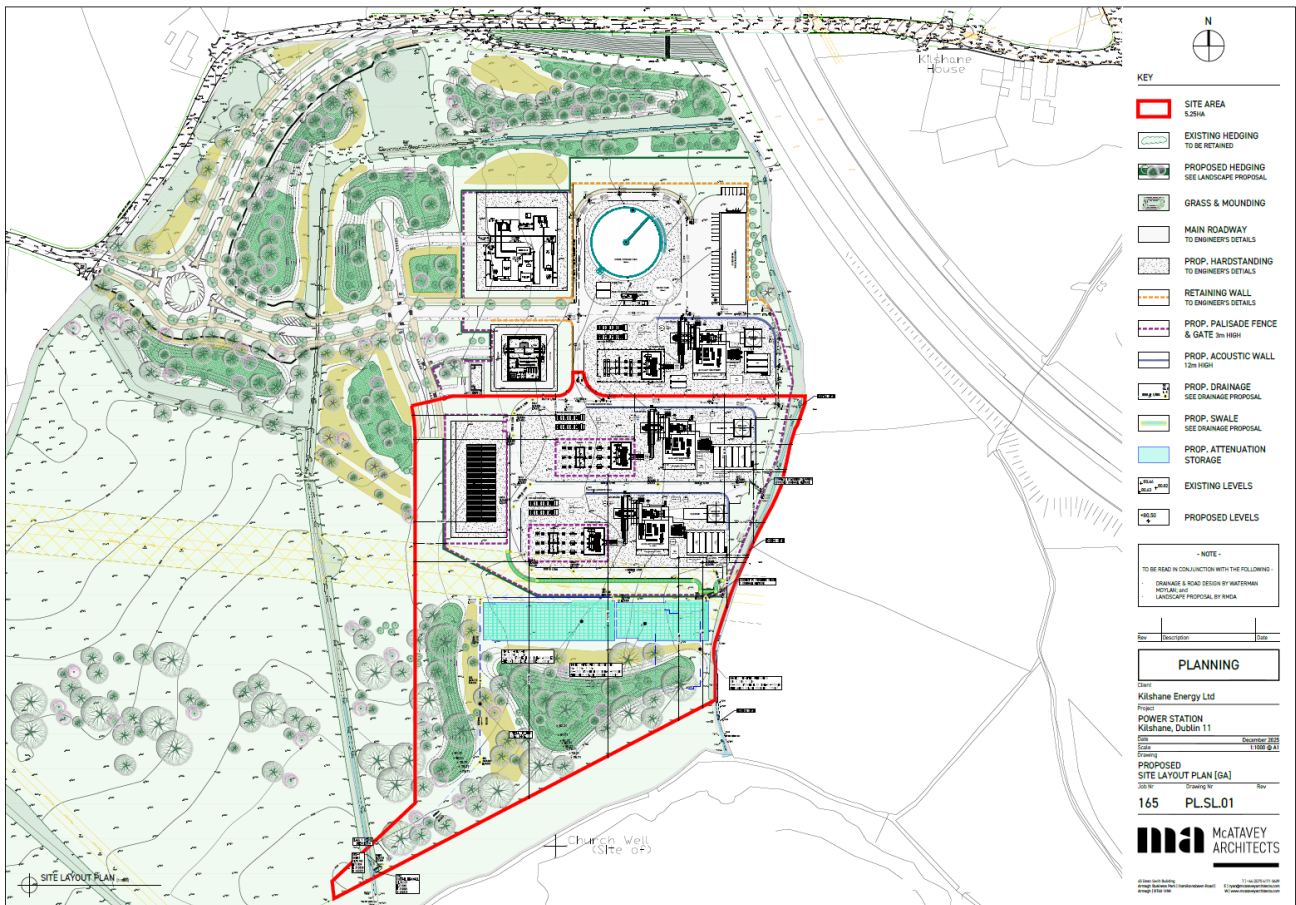


Figure 4.2 Proposed Development Site Layout

4.2 Details of the Non-Hazardous Wastes to be Produced

There are no demolition works required or proposed.

There will be soil, stones and clay excavated to facilitate site clearance, construction of new building foundations and installation of services. The development engineers (Waterman Moylan Consulting Engineers Limited) have estimated that c. 63,856 m³ of material (comprising 10,200m³ of topsoil and 53,656m³ of other material) will need to be excavated to do so. It is currently envisaged that none of this excavated material will be reused on site due to the limited opportunities for reuse on site, meaning the full volume will need to be removed offsite for appropriate offsite reuse, recovery, recycling and / or disposal.

During the construction phase there may be a surplus of building materials, such as timber off-cuts, broken concrete blocks, cladding, plastics, metals and tiles generated. There may also be excess concrete during construction which will need to be disposed of. Plastic and cardboard waste from packaging and supply of materials will also be generated. The Contractor will be required to minimise material oversupply and maximise the opportunities for the reuse of suitable materials on site.

Waste will also be generated from construction workers e.g. organic / food waste, dry mixed recyclables (wastepaper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and potentially sewage sludge from temporary welfare facilities provided on site 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.

4.3 Potential Hazardous Wastes Arising

4.3.1 Contaminated Soil

Site investigations (SI) were undertaken by Site Investigations Ltd. in 2021. In total, 11 no. soil samples were collected throughout the trial pitting exercise at the data centre site and analysed for a range of parameters to examine the soil quality and to investigate any present and/or past contamination occurred across the site.

Of the 11 no. samples taken, 8 no. 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 sample is 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.

In the unlikely event that any potentially contaminated material is encountered during construction, it will need to be segregated from clean/inert material, tested and classified as either non-hazardous or hazardous in accordance with the EPA publication entitled '*Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous*'¹⁷ using the *HazWasteOnline* application (or similar approved classification method). The material will then need to be classified as clean, inert, non-hazardous or hazardous in accordance with the waste acceptance criteria in accordance with *EC Council Decision 2003/33/EC*¹⁸, which establishes the criteria for the acceptance of waste at landfills

No asbestos was found during the SI. In the unlikely event that Asbestos Containing Materials (ACMs) are found within the excavated material, the removal will only be carried out by a suitably permitted waste contractor, in accordance with *S.I. No. 386 of 2006 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010*¹⁹ and the *Best Practice Guidance for Handling Asbestos (2023)*²⁰ All asbestos will be taken to a suitably licensed or permitted facility.

In the event that hazardous soil, or historically deposited waste is encountered during the construction phase, the Contractor will notify FCC and provide a Hazardous / Contaminated Soil Management Plan, to include estimated tonnages, description of location, any relevant mitigation, destination for disposal / treatment, in addition to information on the authorised waste collector(s).

4.3.2 Fuel/Oils

Fuels and oils are classed as hazardous materials; any on-site storage of fuel / oil, and all storage tanks and all draw-off points will be bunded and located in a dedicated, secure area of the site. Provided that these requirements are adhered to and the site crew are trained in the appropriate refueling techniques, it is not expected that there will be any fuel / oil waste generated at the site.

4.3.3 Invasive Plant Species

An invasive species survey was carried out by Altemar on 19th June 2025. No invasive species subject to restrictions under the European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024) were

recorded on site. Butterfly Bush (*Buddleja davidii*), a medium impact non-native invasive species according to the National Biodiversity Data Centre, was noted within perimeter treeline habitats that will be retained. Control of Butterfly Bush is considered preferable and may be implemented as part of site landscaping or ongoing maintenance; however, removal is not required as the species does not restrict soil movement and occurs in retained perimeter habitats.

In the event that any other Third Schedule Invasive species are found on site, the Invasive Species Management Plan will be updated to include an eradication and treatment program which is to be submitted to FCC. This management plan will be continued as required during the Operational Phase until eradication is complete.

4.3.4 Asbestos

While it is not anticipated that there will be any asbestos containing materials (ACMs) generated during the construction phase of the Proposed Development, if located onsite, removal of asbestos or ACMs will be carried out by a suitably qualified contractor. ACMs will only be removed from site by a suitably permitted / licensed waste contractor, in accordance with the *Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010 and the Best Practice Guidance for Handling Asbestos (2023)*. All material will be taken to a suitably licensed or permitted facility.

4.3.5 Other Known Hazardous Substances

Paints, glues, adhesives and other known hazardous substances will be stored in designated areas. They will generally be present in small volumes only and associated waste volumes generated will be kept to a minimum. Wastes will be stored in appropriate receptacles pending collection by an authorised waste contractor.

In addition, WEEE (containing hazardous components), printer toner / cartridges, batteries (Lead, Ni-Cd or Mercury) and / or fluorescent tubes and other mercury containing waste may be generated from during C&D activities or temporary site offices. These wastes, if generated, will be stored in appropriate receptacles in designated areas of the site pending collection by an authorised waste contractor.

5. ROLES AND RESPONSIBILITIES

The *Best Practice Guidelines on the Preparation of Resource Waste Management Plans for Construction and Demolition Projects* promotes that a suitably qualified Resource Manager (RM) with expertise in waste and resource management to implement the RWMP should be appointed. The RM may be performed by number of different individuals over the life-cycle of the Project, however it is intended to be a reliable person chosen from within the Planning/Design/Contracting Team, who is technically competent and appropriately trained, who takes responsibility to ensure that the objectives and measures within the Project RWMP are complied with. The RM is assigned the requisite authority to meet the objective and obligations of the RWMP. The role will include the important activities of conducting waste checks/audits and adopting construction methodology that is designed to facilitate maximum reuse and/or recycling of waste.

5.1 Role of the Client

The Client is responsible for establishing the aims and the performance targets for the project.

- ▶ The Client has commissioned the preparation and submission of this RWMP as part of the design and planning submission;
- ▶ The Client is to commission the preparation and submission of an updated RWMP as part of the construction tendering process;
- ▶ The Client will ensure that the RWMP is agreed on and submitted to the local authority and their agreement obtained prior to commencement of works on site; and
- ▶ The Client will request the end-of-project RWMP from the Contractor.

5.2 Role of the Client Advisory Team

The Client Advisory Team or Design Team is formed of architects, consultants, quantity surveyors and engineers and is responsible for:

- ▶ Drafting and maintaining the RWMP through the design, planning and procurement phases of the project;
- ▶ Appointing a RM to track and document the design process, inform the Design Team and prepare the RWMP.
- ▶ Including details and estimated quantities of all projected waste streams with the support of environmental consultants/scientists. This will also include data on waste types (e.g. waste characterisation data, contaminated land assessments, site investigation information) and prevention mechanisms (such as by-products) to illustrate the positive circular economy principles applied by the Design Team;
- ▶ Handing over of the RWMP to the selected Contractor upon commencement of construction of the development, in a similar fashion to how the safety file is handed over to the Contractor; and
- ▶ Working with the Contractor as required to meet the performance targets for the project.

5.3 Future Role of the Contractor

The future construction contractors have not yet been decided upon for this RWMP. However, once selected, they will assume critical responsibilities in delivering the project objectives. Specifically, they will be responsible for:

- ▶ Preparing, implementing and reviewing the RWMP throughout the construction phases (including the management of all suppliers and sub-contractors) as per the requirements of the EPA guidelines;
- ▶ Identifying a designated and suitably qualified RM who will be responsible for implementing the RWMP;

- ▶ Identifying all hauliers to be engaged to transport each of the resources / wastes off-site;
- ▶ Implementing waste management policies whereby waste materials generated on site are to be segregated as far as practicable;
- ▶ Renting and operating a mobile-crusher to crush concrete for temporary reuse onsite during construction and reduce the amount of HGV loads required to remove material from site;
- ▶ Applying for the appropriate waste permit to crush concrete onsite;
- ▶ Identifying all destinations for resources taken off-site. As above, any resource that is legally classified as a 'waste' must only be transported to an authorised waste facility;
- ▶ End-of-waste and by-product notifications addressed with the EPA where required;
- ▶ Clarification of any other statutory waste management obligations, which could include on-site processing;
- ▶ Full records of all resources (both wastes and other resources) will be maintained for the duration of the project; and
- ▶ Preparing a RWMP Implementation Review Report at project handover.

6. KEY MATERIALS & QUANTITIES

6.1 Project Resource Targets

Project specific resource and waste management targets for the site have not yet been set, and this information will be updated for these targets once these targets have been confirmed by the client. However, it is expected for projects of this nature that a minimum of 70% of waste is fully re-used, recycled or recovered. Target setting will inform the setting of project-specific benchmarks to track target progress. Typical Key Performance Indicators (KPIs) that will be used to set targets include (as per guidelines):

- ▶ *Weight (tonnes) or Volume (m³) of waste generated per construction value;*
- ▶ *Weight (tonnes) or Volume (m³) of waste generated per construction floor area (m²);*
- ▶ *Fraction of resource reused on site;*
- ▶ *Fraction of resource notified as by-product;*
- ▶ *Fraction of waste segregated at source before being sent off-site for recycling/recovery; and*
- ▶ *Fraction of waste recovered, fraction of waste recycled, or fraction of waste disposed.*

6.2 Main Construction and Demolition Waste Categories

The main non-hazardous and hazardous waste streams that could be generated by the demolition and construction activities at a typical site are shown in Table 6.1. The List of Waste (LoW) code (2018) for each waste stream is also shown.

Table 6.1 Typical Waste Types Generated and LoW Codes (Individual Waste Types may Contain Hazardous Substances)

Waste Material	LoW Code
Concrete, bricks, tiles, ceramics	17 01 01-03 & 07
Wood, glass and plastic	17 02 01-03
Treated wood, glass, plastic, containing hazardous substances	17-02-04*
Bituminous mixtures, coal tar and tarred products	17 03 01*, 02 & 03*
Metals (including their alloys) and cable	17 04 01-11
Soil and stones	17 05 03* & 04
Gypsum-based construction material	17 08 01* & 02
Paper and cardboard	20 01 01
Mixed C&D waste	17 09 04
Green waste	20 02 01
Electrical and electronic components	20 01 35 & 36
Batteries and accumulators	20 01 33 & 34
Liquid fuels	13 07 01-10
Chemicals (solvents, pesticides, paints, adhesives, detergents etc.)	20 01 13, 19, 27-30
Insulation materials	17 06 04
Organic (food) waste	20 01 08
Mixed Municipal Waste	20 03 01

* Individual waste type may contain hazardous substances

6.3 Demolition Waste Generation

There are no demolition works required or proposed and therefore there will be no demolition waste generated.

6.4 Construction Waste Generation

Table 6.2 shows the breakdown of C&D waste types produced on a typical site based on data from the EPA *National Waste Reports*²¹ and the joint EPA & GMT study²².

Table 6.2 Waste Materials Generated on a Typical Irish Construction Site

Waste Types	%
Mixed C&D	33
Timber	28
Plasterboard	10
Metals	8
Concrete	6
Other	15
Total	100

Table 6.3, below, shows the estimated construction waste generation for the Proposed Development based on the gross floor area of construction and other information available to date, along with indicative targets for management of the waste streams. The estimated amounts for the main waste types (with the exception of soils, stones and clay) are based on an average large-scale development waste generation rate per m², using the waste breakdown rates shown in Table 6.2. These have been calculated from the schedule of development areas provided by the architect.

Table 6.3 Predicted On and Off-Site Reuse, Recycle and Disposal Rates for Construction Waste

Waste Type	Tonnes	Reuse		Recycle / Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	129.9	10	13.0	80	103.9	10	13.0
Timber	110.2	40	44.1	55	60.6	5	5.5
Plasterboard	39.4	30	11.8	60	23.6	10	3.9
Metals	31.5	5	1.6	90	28.3	5	1.6
Concrete	23.6	30	7.1	65	15.4	5	1.2
Other	59.1	20	11.8	60	35.4	20	11.8
Total	393.7		89.4		267.3		37.0

In addition to the waste streams in Table 6.3, there will be soil, stones and clay excavated to facilitate site clearance, construction of new building foundations and installation of services, new foundations and underground services. The development engineers (Waterman Moylan Consulting Engineers Limited) have estimated that c. 63,856m³ of material (comprising 10,200m³ of topsoil and 53,656m³ of other material) will need to be excavated to do so. It is currently envisaged that none of this excavated material will be reused on site due to the limited opportunities for reuse, meaning the full volume will need to be removed offsite for appropriate offsite reuse, recovery, recycling and / or disposal.

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

proposed works as the exact materials and quantities may be subject to some degree of change and variation during the construction process.

6.5 Proposed Resource and Waste Management Options

Waste materials generated will be segregated on-site, where it is practical. Where the on-site segregation of certain waste types is not practical, off-site segregation will be carried out. There will be skips and receptacles provided to facilitate segregation at source, where feasible. All waste receptacles leaving the site will be covered or enclosed. The appointed waste contractor will collect and transfer the waste as receptacles are filled. There are numerous waste contractors in the Dublin region that provide this service.

All waste arisings will be handled by an approved waste contractor holding a current waste collection permit. All waste arising requiring disposal off-site will be reused, recycled, recovered or disposed of at a facility holding the appropriate registration, permit or licence, as required.

National End-of-Waste Decision EoW-N001/2023 (Regulation 28) published by the EPA in September 2023, establishes criteria determining when recycled aggregate resulting from a recovery operation ceases to be waste. Material from this Proposed Development will be investigated to see if it can cease to be a waste under the requirements of the National End of Waste Criteria for Aggregates.

During construction, some of the sub-contractors on site will generate waste in relatively low quantities. The transportation of non-hazardous waste by persons who are not directly involved with the waste business, at weights less than or equal to 2 tonnes, and in vehicles not designed for the carriage of waste, are exempt from the requirement to have a waste collection permit (per Article 30 (1) (b) of the Waste Collection Permit Regulations 2007, as amended). Any sub-contractors engaged that do not generate more than 2 tonnes of waste at any one time can transport this waste off-site in their work vehicles (which are not designed for the carriage of waste). However, they are required to ensure that the receiving facility has the appropriate COR / permit / licence.

Written records will be maintained by the contractor(s), detailing the waste arising throughout the C&D phases, the classification of each waste type, waste collection permits for all waste contractors who collect waste from the site and COR / permit / licence for the receiving waste facility for all waste removed off-site for appropriate reuse, recycling, recovery and / or disposal.

Dedicated bunded storage containers will be provided for hazardous waste which may arise, such as batteries, paints, oils, chemicals, if required.

The anticipated management of the main waste streams is outlined as follows:

Soil, Stone and Clay

The waste hierarchy states that the preferred option for waste management is prevention and minimisation of waste, followed by preparing for reuse and recycling / recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal. The excavations are required to facilitate construction works so the preferred option (prevention and minimisation) cannot be accommodated for the excavation phase.

When material is removed off-site it could be reused as a by-product (and not as a waste). If this is done, it will be done in accordance with Regulation 27 of the European Communities (Waste Directive) Regulations 2011, as amended, which requires that certain conditions are met and that by-product notifications are made to the EPA via their online notification form. Excavated material should not be removed from site until approval from the EPA has been received. The potential to reuse material as a by-product will be confirmed during the course of the excavation works, with the objective of eliminating any unnecessary disposal of material.

The next option (beneficial reuse) may be appropriate for the excavated material, pending environmental testing to classify the material as hazardous or non-hazardous in accordance with the EPA *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* publication. Clean inert material may be used as fill material in other construction projects or engineering fill for waste licensed sites. Beneficial reuse of surplus excavation material as engineering fill may be subject to further testing to determine if materials meet the specific engineering standards for their proposed end use.

Any nearby sites requiring clean fill/capping material will be contacted to investigate reuse opportunities for clean and inert material. If any of the material is to be reused on another site as a by-product (and not as a waste), this will be done in accordance with Regulation 27. 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 Regulation 27. Regulation 27 will be investigated to see if the material can be imported onto this site for beneficial reuse instead of using virgin materials.

If the material is deemed to be a waste, then removal and reuse / recovery / disposal of the material will be carried out in accordance with the Waste Framework Directive (Directive 2008/98/EC), 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. Once all available beneficial reuse options have been exhausted, the options of recycling and recovery at waste permitted and licensed sites will be considered.

In the event that contaminated material is encountered and subsequently classified as hazardous, this material will be stored separately to any non-hazardous material. It will require off-site treatment at a suitable facility or disposal abroad via Transfrontier Shipment of Wastes (TFS).

Bedrock

While it is not envisaged that bedrock will be encountered, if bedrock is encountered, it is anticipated that it will not be crushed on site. Any excavated rock is expected to be removed off-site for appropriate reuse, recovery and / or disposal. If bedrock is to be crushed on-site, the appropriate mobile waste facility permit will be obtained from FCC.

Silt & Sludge

During the construction phase, silt and petrochemical interception will be carried out on run-off and pumped water from site works, where required. Sludge and silt will then be collected by a suitably licensed contractor and removed off-site.

Concrete Blocks, Bricks, Tiles & Ceramics

The majority of concrete blocks, bricks, tiles and ceramics generated as part of the construction works are expected to be clean, inert material and will be recycled, where possible. If concrete is to be crushed on-site, the appropriate mobile waste facility permit will be obtained from FCC.

Hard Plastic

As hard plastic is a highly recyclable material, much of the plastic generated will be primarily from material off-cuts. All recyclable plastic will be segregated and recycled, where possible.

Timber

Timber that is uncontaminated, i.e. free from paints, preservatives, glues, etc., will be disposed of in a separate skip and recycled off-site.

Metal

Metals will be segregated, where practical, and stored in skips. Metal is highly recyclable and there are numerous companies that will accept these materials.

Plasterboard

There are currently a number of recycling services for plasterboard in Ireland. Plasterboard from the construction phases will be stored in a separate skip, pending collection for recycling. The site Manager will ensure that oversupply of new plasterboard is carefully monitored to minimise waste.

Glass

Glass materials will be segregated for recycling, where possible.

Waste Electrical & Electronic Equipment (WEEE)

Any WEEE will be stored in dedicated covered cages / receptacles / pallets pending collection for recycling.

Other Recyclables

Where any other recyclable waste, such as cardboard and soft plastic, are generated, these will be segregated at source into dedicated skips and removed off-site.

Non-Recyclable Waste

C&D waste which is not suitable for reuse or recovery, such as polystyrene, some plastics and some cardboards, will be placed in separate skips or other receptacles. Prior to removal from site, the non-recyclable waste skip / receptacle will be examined by a member of the waste team (see Section 9.0) to determine if recyclable materials have been placed in there by mistake. If this is the case, efforts will be made to determine the cause of the waste not being segregated correctly and recyclable waste will be removed and placed into the appropriate receptacle.

Asbestos Containing Materials

In the event that any asbestos or ACM is found on-site it will be removed by a suitably competent contractor and disposed of as asbestos waste before the construction works begin. All asbestos removal work or encapsulation work must be carried out in accordance with the *Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010*.

Other Hazardous Wastes

On-site storage of any hazardous waste produced (i.e. contaminated soil if encountered and / or waste fuels) will be kept to a minimum, with removal off-site organised on a regular basis. Storage of all hazardous wastes on-site will be undertaken so as to minimise exposure to on-site personnel and the public and to also minimise potential for environmental impacts. Hazardous waste will be recovered, wherever possible, and failing this, disposed of appropriately.

On-Site Crushing

It is currently not envisaged that the crushing of waste materials will occur on-site. However, if the crushing of material is to be undertaken, a mobile waste facility permit will first be obtained from FCC and the destination of the accepting waste facility or if an application under regulation 28 will be made using National End-of-Waste Decision EoW-N001/2023, will be supplied to the FCC waste unit.

It should be noted that until construction contractors are appointed it is not possible to provide information on the specific destinations of each construction waste stream. Prior to commencement of

construction and removal of any waste offsite, details of the proposed destination of each waste stream will be provided to FCC by the project team.

6.6 Tracking and Documentation Procedures for Off-Site Waste

All waste will be documented prior to leaving the site. Waste will be weighed by the Contractor, either by a weighing mechanism on the truck or at the receiving facility. These waste records will be maintained on site by the nominated project RM (see Section 8.0).

All movement of waste and the use of waste contractors will be undertaken in accordance with the Waste Framework Directive (Directive 2008/98/EC), the *Waste Management Act 1996* as amended, *Waste Management (Collection Permit) Regulations 2007* as amended and *Waste Management (Facility Permit & Registration) Regulations 2007* and amended. This includes the requirement for all waste contractors to have a waste collection permit issued by the NWCPO. The nominated project RM (see Section 8.0) will maintain a copy of all waste collection permits on-site.

If the waste is being transported to another site, a copy of the Local Authority waste COR / permit or EPA Waste Licence for that site will be provided to the nominated project Waste Manager (see Section 8.0). If the waste is being shipped abroad, a copy of the Transfrontier Shipping (TFS) notification document will be obtained from DCC (as the relevant authority on behalf of all Local Authorities in Ireland) and kept on-site along with details of the final destination (COR, permits, licences, etc.). A receipt from the final destination of the material will be kept as part of the on-site waste management records.

All information will be entered into a waste management recording system to be maintained on-site.

7. ESTIMATED COST OF WASTE MANAGEMENT

An outline of the costs associated with different aspects of waste management is outlined below. The total cost of C&D waste management will be measured and will take into account handling costs, storage costs, transportation costs, revenue from rebates and disposal costs.

7.1 Reuse

By reusing materials on site, there will be a reduction in the transport and recycle / recovery / disposal costs associated with the requirement for a waste contractor to take the material off-site. Clean and inert soils, gravel, stones, etc., which cannot be reused on-site may be used as access roads or capping material for landfill sites, etc. This material is often taken free of charge or at a reduced fee for such purposes, reducing final waste disposal costs.

7.2 Recycling

Salvageable metals will earn a rebate, which can be offset against the costs of collection and transportation of the skips.

Clean, uncontaminated cardboard and certain hard plastics can also be recycled. Waste contractors will charge considerably less to take segregated waste, such as recyclable waste, from a site than mixed waste.

Timber can be recycled as chipboard. Again, waste contractors will charge considerably less to take segregated waste, such as timber, from a site than mixed waste.

7.3 Disposal

Municipal landfill charges in Ireland are based on the weight of waste disposed. In the Leinster Region, charges are approximately €140 - €160 per tonne of waste which includes an €85 per tonne landfill levy introduced under the *Waste Management (Landfill Levy) (Amendment) Regulations*. The *Circular Economy (Waste Recovery Levy)* will also incur a levy of €10 per tonne for waste accepted for recovery. This will include backfilling at authorised recovery sites and at municipal waste landfills. In addition to disposal costs, waste contractors will also charge a collection fee for skips.

Collection of segregated C&D waste usually costs less than municipal waste. Specific C&D waste contractors take the waste off-site to a licensed or permitted facility and, where possible, remove salvageable items from the waste stream before disposing of the remainder to landfill. Clean soil, rubble, etc., is also used as fill / capping material, wherever possible.

8. TRAINING PROVISIONS

A member of the construction team will be appointed as the RM to ensure commitment, operational efficiency and accountability in relation to waste management during the C&D phases of development.

8.1 Resource Manager Training and Responsibilities

The nominated RM will be given responsibility and authority to select a waste team if required, i.e. members of the site crew that will aid them in the organisation, operation and recording of the waste management system implemented on site.

The RM will have overall responsibility to oversee, record and provide feedback to the client on everyday waste management at the site. Authority will be given to the Waste Manager to delegate responsibility to sub-contractors, where necessary, and to coordinate with suppliers, service providers and sub-contractors to prioritise waste prevention and material salvage.

The RM will be trained in how to set up and maintain a record keeping system, how to perform an audit and how to establish targets for waste management on site. The RM will also be trained in the best methods for segregation and storage of recyclable materials, have information on the materials that can be reused on site and be knowledgeable in how to implement this RWMP.

8.2 Site Crew Training

Training of site crew in relation to waste is the responsibility of the RM and, as such, a waste training program will be organised. A basic awareness course will be held for all site crew to outline the RWMP and to detail the segregation of waste materials at source. This may be incorporated with other site training needs such as general site induction, health and safety awareness and manual handling.

This basic course will describe the materials to be segregated, the storage methods and the location of the Waste Storage Areas (WSAs). A sub-section on hazardous wastes will be incorporated into the training program, and the particular dangers of each hazardous waste will be explained.

9. TRACKING AND TRACING / RECORD

Records will be kept for all waste material which leaves the site, either for reuse on another site, recycling or disposal. A recording system will be put in place to record the waste arisings on site.

A waste tracking log will be used to track each waste movement from the site. On exit from the site, the waste collection vehicle driver will stop at the site office and sign out as a visitor and provide the security personnel or RM with a waste docket (or Waste Transfer Form (WTF) for hazardous waste) for the waste load collected. At this time, the security personnel will complete and sign the Waste Tracking Register with the following information:

- ▶ Date
- ▶ Time
- ▶ Waste Contractor
- ▶ Company waste contractor appointed by, e.g. Contractor or subcontractor name
- ▶ Collection Permit No.
- ▶ Vehicle Reg.
- ▶ Driver Name
- ▶ Docket No.
- ▶ Waste Type
- ▶ LoW
- ▶ Weight/Quantity
- ▶ Receiving waste facility details

The waste vehicle will be checked by security personnel or the RM to ensure it has the waste collection permit no. displayed and a copy of the waste collection permit in the vehicle before they are allowed to remove the waste from the site.

The waste transfer dockets will be transferred to the RM on a weekly basis and can be placed in the Waste Tracking Log file. This information will be forwarded onto the FCC Waste Regulation Unit when requested.

Each subcontractor that has engaged their own waste contractor will be required to maintain a similar waste tracking log with the waste dockets / WTF maintained on file and available for inspection on site by the main Contractor as required. These subcontractor logs will be merged with the main waste log.

Waste receipts from the receiving waste facility will also be obtained by the site Contractor(s) and retained. A copy of the Waste Collection Permits, CORs, Waste Facility Permits and Waste Licences will be maintained on site at all times and will be periodically reviewed by the RM. Subcontractors who have engaged their own waste contractors, will provide the main Contractor with a copy of the waste collection permits and COR / permit / licence for the receiving waste facilities and maintain a copy on file, available for inspection on site as required.

10. OUTLINE WASTE AUDIT PROCEDURE

10.1 Responsibility for Waste Audit

The appointed RM will be responsible for conducting a waste audit at the site during the C&D phase of the Proposed Development. Contact details for the nominated RM will be provided to the FCC Waste Regulation Unit after the main Contractor is appointed and prior to any material being removed from site.

10.2 Review of Records and Identification of Corrective Actions

A review of all waste management costs and the records for the waste generated and transported off-site will be undertaken mid-way through the construction phase of the Proposed Development.

If waste movements are not accounted for, the reasons for this will be established in order to see if and why the record keeping system has not been maintained. The waste records will be compared with the established recovery / reuse / recycling targets for the site. Each material type will be examined, in order to see where the largest percentage waste generation is occurring. The waste management methods for each material type will be reviewed in order to highlight how the targets can be achieved.

Upon completion of the C&D phase, a final report will be prepared, summarising the outcomes of waste management processes adopted and the total recycling / reuse / recovery figures for the development.

10.3 Pest Management

A pest control operator will be appointed as required to manage pest onsite during the construction phases of the project. Organic and food waste generated by staff will not be stored in open skips, but in closed waste receptacles. Any waste receptacles will be carefully managed to prevent leaks, odours and pest problems.

11. CONSULTATION WITH RELEVANT BODIES

11.1 Local Authority

Once construction contractors have been appointed and have appointed waste contractors, and prior to removal of any C&D waste materials off-site, details of the proposed destination of each waste stream will be provided to the FCC Waste Regulation Unit.

FCC will also be consulted, as required, throughout the construction phases in order to ensure that all available waste reduction, reuse and recycling opportunities are identified and utilised and that compliant waste management practices are carried out.

11.2 Recycling / Salvage Companies

The appointed waste contractor for the main waste streams managed by the construction contractors will be audited in order to ensure that relevant and up-to-date waste collection permits and facility registrations / permits / licenses are held. In addition, information will be obtained regarding the feasibility of recycling each material, the costs of recycling / reclamation, the means by which the wastes will be collected and transported off-site, and the recycling / reclamation process each material will undergo off-site.

12. SUMMARY AND CONCLUSION

Adherence to this plan will also ensure that waste management during the construction phase at the Proposed Development is carried out in accordance with the requirements in the EPA's *Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects* and the *FCC Waste Bye-Laws* and the NWMPCE.

13. REFERENCES

1. Waste Management Act 1996 as amended,
2. Environmental Protection Agency Act 1992 as amended.
3. Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended
4. Regional Waste Management Planning Offices, *The National Waste Management Plan for a Circular Economy 2024 – 2030 (2024)*.
5. Department of Environment and Local Government (DoELG) *Waste Management – Changing Our Ways, A Policy Statement (1998)*.
6. Forum for the Construction Industry – *Recycling of Construction and Demolition Waste*.
7. Department of Communications, Climate Action and Environment (DCCAE), *Waste Action Plan for the Circular Economy - Ireland's National Waste Policy 2020-2025 (Sept 2020)*.
8. DCCAE, *Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less' (2021)*
9. Circular Economy and Miscellaneous Provisions Act 2022.
10. Environmental Protection Agency (EPA) '*Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021)*
11. Department of Environment, Heritage and Local Government, *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (2006)*.
12. FÁS and the Construction Industry Federation (CIF), *Construction and Demolition Waste Management – a handbook for Contractors and site Managers (2002)*.
13. Waste Management (Landfill Levy) Regulations 2015 (as amended)
14. Circular Economy (Waste Recovery Levy) Regulations 2024
15. Fingal County Council (FCC), *Fingal County Development Plan 2023 – 2029 (2023)*.
16. Planning and Development Act 2000 (S.I. No. 30 of 2000) as amended
17. EPA, *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous (2018)*
18. 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.
19. *S.I. No. 386 of 2006 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010*
20. Local Government Ireland, *Best practice guidance for handling asbestos (2023)*
21. Environmental Protection Agency (EPA), National Waste Database Reports 1998 – 2020 and the Circular Economy and National Waste Database Report 2021 – 2022 (2024)
22. EPA and Galway-Mayo Institute of Technology (GMIT), *EPA Research Report 146 – A Review of Design and Construction Waste Management Practices in Selected Case Studies – Lessons Learned (2015)*.

APPENDIX A. WASTE FACILITIES IN THE DUBLIN AREA

A full list of currently licensed waste facilities that can potentially be used for this development can be found on the National Waste Collection Permit Office Website - <https://facilityregister.nwcpo.ie/>.

Authorisation Reference	Name	Trading As	Address
WFP-DC-20-0054-01	Shanowen Plant Hire Ltd - Mobile Plant		Various Sites Various Sites Various Sites
WFP-DC-20-0053-01	Loftus Demolition & Recycling Ltd - Mobile PLant		Various Sites Various Sites Various Sites Various Sites
WFP-DC-20-0055-01	Padraig Thornton Waste Disposal Ltd	Thornton's Recycling	Unit S3A Henry Road Park West Business Park Dublin 12
WFP-DC-09-0015-03	Chevron Environmental Ltd	Electronic Recycling	Unit 20 Jamestown Business Park Jamestown Road Finglas D11 X2HN
WFP-DC-11-0023-03	Padraig Thornton Waste Disposal Ltd (PTWDL)	Thornton's Recycling	Unit 6 S3B Henry Road Park West Business Park D12 KT91
COR-DC-21-0010-01	Fridge Spares Wholesale Ltd		Unit 15, Blackwater Road Dublin Industrial Estate Glasnevin Dublin 11 D11 YK26
WFP-DC-11-0022-03	Dawnlane Limited	Mullen Scrap	31 & 32 Upper Clanbrassil Street Dublin 8 D08 XY92
WFP-DC-11-0025-03	Rehab Enterprises Limited	Rehab Recycle	The Rehab Building Kylemore Road Ballyfermot Dublin 10 D10 Y443
WFP-DC-11-0027-03	Tom Murphy Recovery & Towing Services Ltd		Block 4, Unit 24 Port Tunnel Business Park Clonshaugh Industrial Estate Dublin 17
WFP-DC-22-0059-01	Derek Beahan Limited	Derek Beahan Recovery	Unit 7 Concorde Industrial Estate Naas Road Dublin 12 D12 YD30
COR-DC-22-0011-01	Soaktech Limited		Unit 16, Butterly Business Park Kilmore Road Artane Dublin 5, D05 X079
WFP-DC-22-0060-01	Edward O'Reilly	E.O'Reilly Recycling	92E Fairview Strand Ballybough Dublin 3
WFP-DC-10-0021-04	Padraig Thornton Waste Disposal Ltd	Thornton's Recycling	Unit 51 Henry Road Park West Business Park Dublin 12 D12 FH68
WFP-DC-11-0028-03	Mitchell Taylor (Exports) Limited	MT oils	The Old Brewery Newmarket Dublin 8 D08 FPF6
WFP-DC-18-0045-02	J. Ryan Haulage Limited - Mobile Plant		Former Bailey Gibson Site 326-328 South Circular Road Dublin 8 D08 N8X6

Authorisation Reference	Name	Trading As	Address
WFP-DC-10-0018-03	Summerhill Spares Limited		Unit 3 Newtown Industrial Estate Malahide Road Coolock Dublin 17 D17 VY80
WFP-DC-10-0020-03	Everyday Waste & Skiphire	All Away Recycling	84E Pigeon House Road Ringsend Dublin 4 D04 R7N0
WFP-DC-23-0061-01	Wills Bros Limited		Terminal 4 North Lands, Dublin Port (bounded by Bond Road, Tolka Quay Road & Promenade Road) Dublin 1
WFP-DC-24-0062-01	Tinnelly Group	John Tinnelly & Sons Ireland Limited	Unit 5B, Unit 5H Fingal Bay Business Park Co. Dublin K32 NY57
WFP-DC-24-0063-01	Micks Recycling Limited	Micks Skips	Unit 3a Ballyboggan Business Centre Glasnevin Dublin 11
WFP-DC-19-0048-02	Sunflower Recycling Company (Limited by Guarantee)		Shamrock Terrace Five Lamps, North Strand Dublin 1 D01 DX67
WFP-DC-08-0002-04	G & T McGoverns Ltd		2-4, 9 & 12 Prices Lane Rear 31 Ranelagh Road Ranelagh Dublin 6
WFP-DC-22-0056-01 (T)	Dembachel Ltd.		Kylemore Business Park 2 Kylemore Way Inchicore Dublin 8
WFP-DC-25-0064-01	Martin Services (Industrial) Ltd		Unit 10/11 Bluebell Business Park Bluebell, Old Naas Road Dublin 12 D12 W995