PROPOSED LARGE -SCALE RESIDENTIAL DEVELOPMENT, RATHMULLAN ROAD, OLDBRIDGE, DROGHEDA, CO. MEATH

EIAR Volume 3 Appendices

Earlsfort Developments Drogheda Limited

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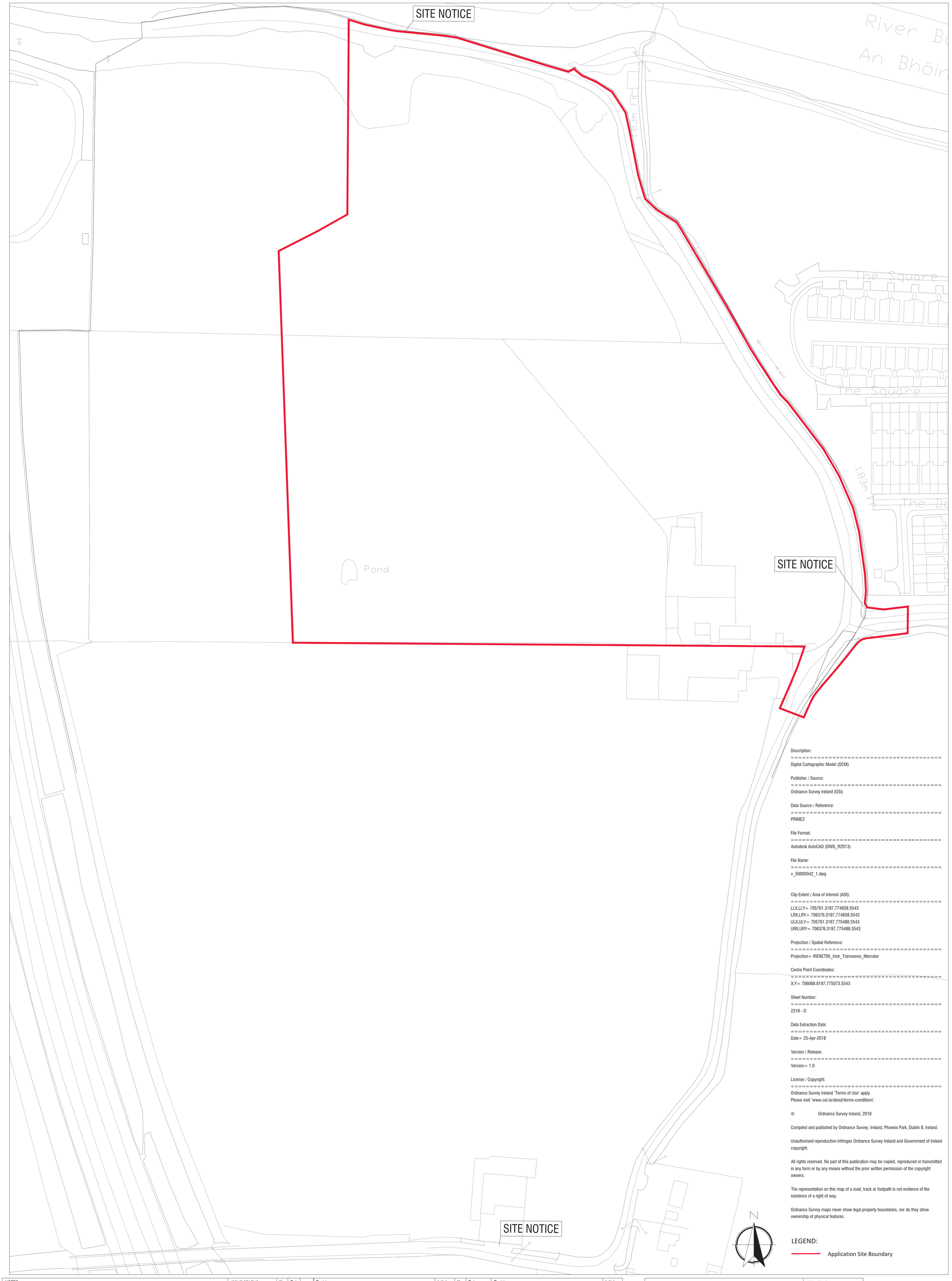

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Application Site Boundary

NOTES

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3. The contractor is responsible for checking all levels and dimension on site and shall refer all discrepancies to the Architect.
4. Where appropriate, for details of R.C. structure, or mechanical and electrical details, see Engineers drawings.
5. Proprietary items shall be fixed in strict accordance with manufacturers instructions.
6. Sizes of proprietary items shall be checked with manufacturer.
7. The contractor shall be responsible for the co-ordination of structure, finishes and services.

ISSUE STATUS	No.	Date	
PROGRESS			■
INFORMATION ONLY			■
PLANNING APPLICATION			■
TENDER			■
FIRE CERT			■
CONSTRUCTION			■
DAC			■
COMPLIANCE			■

Revision	Initials	No.	Date	Revision	Initials

Project : LARGE-SCALE RESIDENTIAL DEVELOPMENT - BOYNE RIDGE
Client: Earlsfort Developments Ltd

NDBA JOB NO. 23/004

DrawingTitle: Site Location Map

REVISION NO. 0

Drawing No.: PL-SP-01A

Date :	Scale :	Drawn by: ES	Format:
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Appendix 2-2

Site Plan Layout

1:500

HOUSE SCHEDULE				
Type		ROOM / PERSON	House Type	Quantity
2.1		2 BED/4P	2 Bed Mid Terrace	23
2.4		2 BED/4P	2 Bed Semi-Detached	8
2.5		2 BED/4P	2 Bed Semi-Detached	6
3.2		3 BED/5P	3 Bed Mid Terrace	16
3.4		3 BED/5P	3 Bed Mid Terrace	22
3.5		3 BED/4P	3 Bed Semi-Detached	4
3.6		3 BED/4P	3 Bed Semi-Detached	14
3.7		3 BED/5P	3 Bed Semi-Detached	46
3.8		3 BED/5P	3 Bed Semi-Detached	9
4.1		4 BED/6P	4 Bed Semi-Detached	22
				170

DUPLEX UNIT SCHEDULE				
Type		ROOM / PERSON		Quantity
D.1		1 BED/2P	1 Bed Unit (GFP)	16
D.2		2 BED/4P	2 Bed Unit (1st/2nd)	16
				32

APARTMENT BUILDING SCHEDULE						
Type		Quantity	ROOM / PERSON	UNIT PER BUILDING	Total Number	Quantity
AP1		4	1 BED/2P	2	8	16
			2 BED/4P	2	8	
AP2		4	1 BED/2P	2	8	16
			2 BED/4P	2	8	
AP3		3	1 BED/2P	2	6	15
			2 BED/4P	3	9	
						47

COMMERCIAL BUILDING SCHEDULE			
Type		Name	Quantity
COM		Creche	1

UNIT MIX			
Type	Quantity	[%]	
1 BED	38	15.3%	**249**
2 BED	78	31.3%	
3 BED	111	44.6%	
4 BED	22	8.8%	

PROPOSED DEVELOPMENT SUMMARY
- 170 Houses
- 32 Duplex Units
- 47Apartment Units

Total Number of Units: 249

	MAIN ROAD SURFACE
	NEIGHBORHOOD STREET SURFACE
	PEDESTRIAN SURFACE
	PUBLIC OPEN SPACE
	PRIVATE OPEN SPACE

APPLICATION SITE
AREA CALCULATED IN DENSITY
AREA CALCULATED IN PUBLIC OPEN SPACE
PROPOSED SITE ENTRANCE

APPLICATION SITE within Red line	**9.2 ha**
PROPOSED DEVELOPMENT SITE: (residentially zoned part of site)	**6.92 ha**
PROPOSED RESIDENTIAL UNITS:	**249**
DENSITY:	**(35.9 / ha)**
PROPOSED PUBLIC OPEN SPACE: (residentially zoned part of site)	**1.17ha (16.90%)**
PROPOSED PUBLIC OPEN SPACE: (parkland area within red line)	**1.68ha**
TOTAL PUBLIC OPEN SPACE: (within red line)	**2.85 ha (30.98%)**

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TENDER	
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CONSTRUCTION	
DAC	
COMPLIANCE	

REV.	DATE	DR	CKD.	COMMENT

REV.	DATE	DR	CKD.	COMMENT

REV.	DATE	DR	CKD.	COMMENT

REV.	DATE	DR	CKD.	COMMENT

Project : LARGE-SCALE RESIDENTIAL DEVELOPMENT - BOYNE RIDGE
Client: Earlsfort Developments Ltd
NDBA JOB NO. 23/004
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Drawing No.: PL-SP-04
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Appendix 6-1

Outline Construction Environmental Management Plan

Proposed Residential Development at Rathmullan, Drogheda, Co. Meath.

September 2025

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Client Name:	Earlsfort Developments Drogheda Limited
Document Reference:	18-014r.401
Project Number:	18-014

Quality Assurance – Approval Status

This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001: 2015 and BS EN ISO 14001: 2015)

Issue	Date	Prepared by	Checked by	Approved by
No. 1	Jan' 25	L. Song	B. Gallagher	B. Gallagher
No. 2	Sep' 25	L. Song	B. Gallagher	

Comments

Disclaimer

This report has been prepared by Waterman Moylan, with all reasonable skill, care and diligence within the terms of the Contract with the Client, incorporation of our General Terms and Condition of Business and taking account of the resources devoted to us by agreement with the Client.

We disclaim any responsibility to the Client and others in respect of any matters outside the scope of the above.

This report is confidential to the Client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at its own risk.

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1. Introduction

This report has been prepared by Waterman Moylan Consulting Engineers, on behalf of Earlsfort Developments Drogheda Limited, for a proposed large-scale residential development at Rathmullan, Drogheda, Co. Meath, situated to the west of Drogheda town centre. The proposal relates to a residential development of 249 No. residential units and a creche.

The plan sets out typical arrangements and measures which may be undertaken during the construction phase of the project in order to mitigate and minimise disruption / disturbance to the area around the site. The purpose of this report is to summarise the possible impacts and measures to be implemented and to guide the Contractor who will be required to develop and implement the Construction Management Plan on site.

This Construction Environmental Management Plan is indicative only and should not be construed as representing the exact method or sequence in which the construction works shall be carried out.

As is normal practice, the Main Contractor for the project is responsible for the method in which the demolition and construction works are carried out and to ensure that best practices and all legal obligations including Local Authority requirements and Health and Safety legislation are complied with. The main contractor is also responsible for the design and installation of all temporary works required to complete the permanent works. This plan can be used by the Main Contractor to develop their final Outline Construction Environmental Management Plan. The Applicant reserves the right to deviate from the contents of this report, while still complying with all relevant Local Authority requirements and legislation.

2. Site Location and Description

2.1 Site Location

The site is located on Rathmullan Road in Drogheda, Co. Meath. The site is situated approximately 2.5 km west of Drogheda town centre. The proposed development is bounded to the south by agricultural land. The site is bound to the east by existing residential development, consisting of two-storey terraced houses and three-storey duplexes. The site is bound to the north by Rathmullan Road, the Boyne Greenway and the Boyne River. To the west the site is bound by agricultural land, and the M1 Motorway is c. 500m away from the vicinity of the site in the same direction. The proposed development will be accessed from Rathmullan Road via a new signal-controlled 4-arm junction.

The proposed site area is approximately 9.20ha within the proposed red line boundary. The current agricultural lands exhibit a general slope from the south-west to the north-east towards the River Boyne, with existing ground levels ranging from 30 m to 6m OD Malin within the proposed red line boundary. Access to the site is currently facilitated through an existing entrance located off the Rathmullan Road.

Please refer to Waterman Moylan drawing No. 18-014-P401- Rev A for the exact site location and surrounding lands as outlined above.

Figure 1: Proposed Development Location

2.2 Description of the Proposed Development

The proposed development includes (i) demolition/removal of all existing farm buildings/structures and associated hard standing on site; (ii) construction of a large-scale residential development (LRD) of 249 no. units comprising 170 no. two-storey houses (including 37 no. two-bedroom houses, 111 no. three-bedroom houses and 22 no. four-bedroom houses), 16 no. three-storey duplex buildings (accommodating 16 no. one-bedroom and 16 no. two-bedroom units) and a mix of 8 no. three-storey and 3 no. four-storey apartments blocks accommodating a total of 22 no. one-bedroom and 25 no. two-bedroom apartments); (iii) construction of a new vehicular entrance and access road off Rathmullan Road with associated junction works and associated internal access road network with pedestrian and cyclist infrastructure; (iv) provision of a three-storey creche facility (411sq.m) with external play areas at ground and second floor levels and vehicular/bicycle parking area; and, (v) all ancillary site and infrastructural works, inclusive of removal of existing vehicular entrances, general landscaping and public open space provision, vehicular parking provision (396 no. spaces in total), bicycle parking, boundary treatments, foul/surface water drainage, attenuation areas, provision of a pumping station and provision of an ESB substation, as necessary to facilitate the proposed development. Each house will be served by vehicular parking to the front and private amenity space in the form of a rear garden. Each duplex building will be served by vehicular parking to the front and private amenity space in the form of balcony/terrace spaces to the rear. Each apartment block will have shared access to adjoining car parking bays with communal amenity space and bicycle/bin stores provided to the rear and each apartment will be provided with private amenity space in the form of a balcony or terrace. The development includes provision of a landscaped area of public open space to the north of the site, with 2 no. pedestrian/cyclist connections (via the northern/eastern site boundaries) to Rathmullan Road which will be subsequently ceded to Meath County Council. The application is accompanied by a Natura Impact Statement (NIS) and an Environmental Impact Assessment Report (EIAR).

The application for this development also includes all the necessary associated infrastructure to service the above. This includes the installation of a network of foul water and storm water pipes, watermains, and a network of roads and footpaths.

The proposed estate road levels around the site, range from 19m to 30.20m. Additionally, the proposed finished floor levels for the housing units also range between 19.6m and 30.2m above the OD Malin.

In terms of access to the site, the existing Rathmullan Road will be extended towards the site with the existing road, footpath and cycle path removed and area landscaped. Details can be seen in Waterman Moylan drawing No. RAT-WMX-PH2-00-DR-C-P416 – Rev A. Main point of junction entry will be provided via a newly proposed four-armed signalized junction. This junction will connect the Rathmullan Road (East), the Rathmullan Road (North), the proposed site access and the Oldbridge Road.

The design and layout of the proposal has been prepared to fully comply with the current relevant design standards and specifications applicable to this form of development. The relevant design standards and specifications that the layout has been designed in accordance with but not limited to are as follows:

- DMURS
- Uisce Eireann Code of Practice (CoP) and Standard Details (Water and Wastewater)
- Transport Infrastructure Ireland (TII)
- Cycle Design Manual
- SuDS Manual Ciria C753

- Technical Guidance Documents, Section H etc

2.3 Proposed Construction Programme

The proposed work will consist of the following:

- Site preparation including demolition of the existing farm buildings;
- Demolition of the agricultural buildings on site and the removal of demolition waste;
- Erection of security fencing/perimeter fencing;
- Setting up a secure site compound including wash down area;
- Site clearance including topsoil stripping;
- Construction of infrastructure including access road, footpaths, drainage and services, a pumping station;
- Construction of 4-arm signalised junction and roadways which connect to the existing Rathmullan Road;
- Construction of residential housing scheme comprising 170 no. houses 32 no. duplexes and 47 no. apartments units (providing a total of 249 no. residential units) and a creche.
- The development provides for a preliminary 24-month construction period commencing in 2026 with completion in 2027/28
- Refer to the Construction Waste Management Plan report for the details on site setup, pre commencement measures, site security, construction traffic routes, deliveries, parking, storage and opening hours.
- Relevant chapters of the EIAR are cited where specific environmental aspects are covered, including:
    - Air Quality: CWMP Chapter 9 – Control of Dirt and Dust
    - Noise and Vibration: CWMP Chapter 10 – Noise and Vibration
    - Waste Management: CWMP Chapter 5 – Construction and Demolition Waste Management

3. Summary of Mitigation Measures

The following mitigation measures are planned to address any potential impacts to water quality and to protect the Special Area of Conservation (River Boyne) adjacent to the site of the proposed development throughout.

A refurbishment & demolition survey for asbestos-containing-materials and a site investigation report have been conducted to help understand the soil natural onsite. Full report can be seen in Appendix B and Appendix C. A technical note prepared as an addendum to the site Investigation report is attached in Appendix D

All works will be undertaken with reference to the following guidelines:

- CIRIA C532: Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (Masters-Williams et al., 2001);
- CIRIA C692: Environmental Good Practice on Site, (Audus et al., 2010)
- BPGCS005: Oil Storage Guidelines;
- CIRIA C648: Control of Water Pollution from Linear Construction Projects: Technical Guidance (Murnane et al., 2006a)
- CIRIA C648: Control of Water Pollution from Linear Construction Projects: Site Guide (Murnane et al., 2006a)
- Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters (IFI 2016)
- Guidelines for Planning Authorities – Architectural Heritage Protection – Guidance on Part IV of the Planning and Development Act 2000. (Part 2, Chapter 7) and ICOMOS Principles.

The schedule of mitigation presented within Table 1 summarises measures that will be undertaken to reduce impacts on ecological receptors within the zone of influence of the proposed development.

Table 1: Schedule of Ecological Mitigation

No.	Impact Identified with Biodiversity Chapter of NIS and/or Natura Impact Statement	Mitigation	Result of Mitigation
1	All construction phase impacts	Employment of Environmental Specialist to monitor works	Undertakes pre-construction checks for protected species, reviews method statement of contractor to ensure that it incorporates all aspects of CEMP. Provides tool box talks and other training, and ensures understanding by all involved of all mitigation measures. Assesses effectiveness of mitigation, checks weather forecast and site conditions where trigger levels are required, checks for adequacy of infiltration where water is being pumped, undertakes weekly water-quality monitoring.
2	Water quality impacts Reduction in habitat quality Mortality of aquatic key ecological receptors/qualifying interests	Designated parking at least 50m from any watercourse.	Ensures no soil disturbance or hydrocarbons leak near aquatic zone
3	Water quality impacts Reduction in habitat quality Mortality of aquatic key ecological receptors/qualifying interests	The site compound will be located at least 50m from any watercourse. All potentially polluting materials will be contained within bunds with a capacity of 110% of their contents.	Prevents pollution of the aquatic zone from toxic pollutants
4	Water quality impacts Reduction in habitat quality Mortality of aquatic key ecological receptors/qualifying interests	Fuels, oils, greases and other potentially polluting chemicals will be stored in bunded compounds at the Contractor's compound or at a location at least 50m from any stream. Bunds are to be provided with 110% capacity of storage container. Spill kits will be kept on site at all times and all staff trained in their appropriate use. Method statements for dealing with accidental spillages will be provided the Contractor for review by the Employer's Representative.	Prevents contamination of aquatic zone by toxic pollutants
5	Water quality impacts Reduction in habitat quality	Silt barrier devices will be installed between the works area and any watercourses to prevent any construction related sediments from entering the existing ditches and watercourses.	Ensures no movement of soil or contaminated water from the construction site to the River Boyne

6	Water quality impacts Reduction in habitat quality Mortality of aquatic key ecological receptors/qualifying interests	Pouring of concrete will not be permitted within 50m of any watercourse during inclement weather	Prevents pollution of the aquatic zone by toxic pollutants
7	Water quality impacts Reduction in habitat quality Mortality of aquatic key ecological receptors/qualifying interests	A designated wash down area within the Contractor's compound will be used for cleaning of any equipment or plant, with the safe disposal of any contaminated water.	Prevents contamination of aquatic zone by suspended solids or pollutants, ensures invasive species material is not transported off site
8	Water quality impacts Reduction in habitat quality Mortality of aquatic key ecological receptors/qualifying interests	Spill kits will contain 10 hr terrestrial oil booms (80mm diameter x 1000mm) and a plastic sheet, upon which contaminated soil can be placed to prevent leaching to ground water	Prevents contamination of aquatic zone by petrochemicals
9	Water quality impacts Reduction in habitat quality Mortality of aquatic key ecological receptors/qualifying interests	Any refuelling and maintenance of equipment will be done at designated bunded areas with full attendance of plant operative(s) within contained areas at least 50m from any watercourse	Prevents contamination of aquatic zone by petrochemicals
10	Water quality impacts Reduction in habitat quality Mortality of aquatic key ecological receptors/qualifying interests	All silt fencing remains actively managed and regularly checked until the construction works are completed The responsibility for, reporting and management of silt fencing during the period after the construction has been completed will be clearly stated in the contract documents. Any and all waste materials arising during the works will either be immediately taken to a location from which discharge to the River Boyne cannot take place or temporarily stored/covered to prevent washout thereto	Prevents contamination of aquatic zone by suspended solids from bare soil. Refer to the details in Table 1 – item 4
11	Unforeseen discovery of bats	Tree inspection surveys will be undertaken by a licenced bat worker to assess whether the trees marked for felling have any suitability to support roosting bats. If the trees are confirmed to have potential roosting features, these trees must be inspected at height for roosting bats the day prior to felling works. Once surveyor is satisfied that bats are not present within potential roosting features, the tree will be felled. If bats are encountered during any works at the site including farm buildings for demolition the relevant works will be suspended until the	Compliance with legislation protecting bats Avoidance of impacts on roosting bats

		advice of a suitably qualified and licenced bat ecologist is sought. A derogation licence may need to be sought from NPWS in order to permit removal of bats and mitigate for the loss of any roosts on the site.	
12	Nesting birds	All tall woody and herbaceous vegetation in worked areas should be removed outside of the breeding bird season (1st March to 31st August, inclusive) to avoid the destruction of nests or disturbance of breeding birds If this is not possible, trees will be inspected by a qualified ecologist immediately prior to removal. If it is found that breeding birds are present, felling works must be suspended immediately and cannot recommence until chicks have fledged and the nest has been abandoned.	Compliance with legislation protecting birds
13	Woodland and hedgerows	All hedgerows and immature woodland marked for retention will be fenced off at the outset of works and for the duration of construction to avoid damage to the trunk, branches or root systems of the trees. Please refer to the arboricultural report for further details. Temporary fencing will be erected at a sufficient distance from the tree so as to enclose the Root Protection Area (RPA) of the tree (National Roads Authority, 2005-2011). In general, the RPA covers an area equivalent to a circle with a radius 12 times the stem diameter (measured at 1.5m above ground level for single stemmed trees); Where fencing is not feasible due to insufficient space, protection for the tree/hedgerow will be afforded by wrapping hessian sacking (or suitable equivalent) around the trunk of the tree and strapping stout buffer timbers around it. It will still be necessary to ensure that the area within the RPA is not used for vehicle parking or the storage of materials (including oils and chemicals) Soil will not be placed within the Root Protection Area of trees or within 5m of hedgerows; The woodland will not be lit during the construction or operational phases of the development; and, The construction compound will be located a minimum of 50m from watercourses.	Avoidance of impacts on KER habitats

4. Management of Environmental Impacts

Construction shall commence upon the final grant of planning permission subject to any works having to be delayed during the bird breeding season or otherwise as may be advised by the NPWS (see flora and fauna section below) It is anticipated that the development will be constructed over a two year period depending upon the housing demand.

The proposed potential pollution mitigation measures outlined below will be implemented in accordance with 'CIRIA C532 – Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors' – CIRIA-2001.

4.1 Roles and Responsibilities

4.1.1 Construction Waste Manager

A Construction Waste Manager shall be appointed from the Contractor's Staff and have overall responsibility for the implementation of the project Waste Management Plan (WMP) during the construction phase. The Construction Waste Manager will be appropriately trained and assigned the authority to instruct all site personnel to comply with the specific provisions of the WMP. At the operational level, a designated person from the main contractor and from each sub-contractor on the site shall be assigned the direct responsibility to ensure that the operations stated in the WMP are performed on an on-going basis.

Copies of the Waste Management Plan will be made available to all relevant personnel on site. All site personnel and sub-contractors will be instructed about the objectives of the Waste Management Plan and informed of the responsibilities which fall upon them as a consequence of its provisions. Where source segregation, selective demolition and material reuse techniques apply, each member of staff will be given instructions on how to comply with the Waste Management Plan. Posters will be designed to reinforce the key messages within the Waste Management Plan and will be displayed prominently for the benefit of site staff.

4.1.2 Environmental Officer

The Environmental Officer will be responsible for, but not limited to, the following activities:

- Ensuring that the requirements of the CEMP are developed and environmental system elements (including procedures, method statements and work instructions) are implemented and adhered to with respect to environmental requirements;
- Reviewing the environmental responsibilities of other managed contractors in scoping their work and during contract execution;
- To ensure that advice, guidance and instruction on all CEMP matters are provided to all their managers, employees, construction contractors and visitors on site;
- Report to the Construction manager on the environmental performance of the Line Management, Supervisory Staff, Employees and Contractors; and,
- Advise site management (including, but not limited to, the site Construction Manager) on environmental matters.

4.1.3 Project Environmental Consultant

The Project Environmental Consultant will be responsible for, but not limited to, the following activities:

- Preparation of the finalised CEMP, environmental control plans, supporting procedures;
- Advise site management (including, but not limited to, the site Construction Manager) on environmental matters;
- Ensure adherence to the specific measures listed in the Planning Conditions and in the Natura Impact Statement (NIS) Mitigation matters;
- Advise upon the production of written method statements and site environmental rules and on the arrangements to bring these to the attention of the workforce;
- Investigate incidents of significant, potential or actual environmental damage, ensure corrective actions are carried out and recommend means to prevent recurrence; and,
- Be responsible for maintaining all environmental related documentation.

4.1.4 Project Ecologist

The Project Ecologist is required to:

- Undertake pre-construction checks for protected species
- Review method statement of contractor to ensure that it incorporates all aspects of CEMP
- Provide tool-box talks and other training, and ensure understanding by all involved of all mitigation measures
- Assess effectiveness of mitigation, check weather forecast and site conditions where trigger levels are required
- Check for adequacy of infiltration where water is being pumped

4.1.5 Site Supervisors

Site Supervisors are required to:

- Read, understand and implement the CEMP;
- Know the broad requirements of the relevant law in environmental matters and take whatever action is necessary to achieve compliance. Where necessary, they will seek the advice of the Environmental Officer;
- Ensure that the environmental matters are taken into account when considering contractors' construction methods and materials at all stages;
- Be aware of any potential environmental risks relating to the site, plant or materials to be used the premises and bring these to the notice of the senior management.
- Ensure plant suggested is environmentally suited to the task in hand;
- Co-ordinate environmental planning of the construction activities to comply with environmental authorities' requirements and with minimal risk to the environment. Give contractors precise instructions as to their responsibility to ensure correct working methods where risk of environmental damage exists;
- Where appropriate, ensure contractors' method statements include correct waste disposal methods;
- Be aware of any potential environmental risks relating to the contractors and bring these to the notice of the appropriate management

4.1.6 Site Personnel

All contractors and other site personnel on the project will adhere to the following principal duties and responsibilities:

- To co-operate with the construction management team and the Environmental Officer in the implementation and development of the CEMP at the site;
- To conduct all their activities in a manner consistent with regulatory and best environmental practice;
- To participate in the environmental training programme and provide management with any necessary feedback to ensure effective environmental management at the site; and,
- Adhere to the requirements of the site environmental rules.

4.2 Hours of Working

Typical working hours for the site will be 08.00 to 19.00 Monday to Friday and 09.00 to 13.00 Saturday. No Sunday work will generally be permitted. Special construction operations may occasionally need to be carried out outside typical working hours in order to minimise disruption to the surrounding area.

Weather restrictions may apply, e.g. no cement pouring during heavy rainfall. These restrictions shall be determined by the project ecologist taking into account pertaining environmental factors on site.

4.3 Pre-Construction Plan

4.3.1 Designated Storage Area & Site Compound

At least one site compound, including offices and welfare facilities, will constructed by the main contractor in a location or locations to be decided within the subject site.

The main contractor will be required to schedule delivery of materials on a daily basis. The main contractor shall use the constructed site compound(s) on the site for the secure storage of materials.

Prevention and mitigation measures will be implemented throughout the construction stage to prevent contamination of the soil and adjacent watercourses from oil and petrol leakages and significant siltation. Suitable bunded areas will be installed for oil and petrol storage tanks. Designated fuel filling points will be put in place with appropriate oil and petrol interceptors to provide protection from accidental spills. Spill kits will be provided by the main contractor to cater for any other spills.

4.3.2 Cut-Off Trenches

To prevent silt runoff from the development site the contractor will excavate a number of temporary cut-off trenches along the northern development boundary in advance of stripping any topsoil. These cut-off trenches will be connected to a temporary settlement pond. Straw bales will be placed within the cut-off trenches at strategic locations and at the outfall from the settlement pond. Indicative details are attached in Appendix A.

4.3.3 Deliveries and Site Access

Deliveries and access to the construction site will typically be made via Rathmullan Road to the east of the site. Construction traffic will not be permitted to use the River Road to the north of the site or the local Sheephouse Road to the south of the site as these would be considered unsuitable for construction traffic.

Haul roads for construction traffic purposes will generally be 6.0m wide and will be constructed using 300 mm min. capping layer material (clean broken stone).

In the event that large concrete pours are required which may result in congestion at the entrance to the site the deliveries will be organised such that concrete trucks will queue at a pre-determined staging point (such that they do not cause an obstruction to general traffic in the area) and will then be called in by radio as appropriate to the site, via a pre-determined route and to the required access gate.

Set procedures and designated wash-out areas will be provided.

All delivery vehicles will be co-ordinated as required at the relevant access point.

4.4 Construction Plan

4.4.1 Dust and Dirt Control

Nuisance dust emissions from construction activities are a common and well recognised problem. Fine particles from these sources are recognised as a potential significant cause of pollution.

The main contractor will be required to demonstrate that both nuisance dust and fine particle emissions from the site are adequately controlled and are within acceptable limits through use of the prevention and mitigation measures set out herein.

Dust and fine particle generation from construction and demolition activities on the site can be substantially reduced through carefully selected mitigation techniques and effective management. Once particles are airborne it is very difficult to prevent them from dispersing into the surrounding area. The most effective technique is to control dust at source and prevent it from becoming air borne, since suppression is virtually impossible once it has become air borne.

The following are techniques and methods which are widely used currently throughout the construction industry and which shall be used in the construction of the proposed development, where appropriate:

- The roads around the site are all surfaced and no dust is anticipated arising from unsealed surfaces.
- Vehicles travelling on any unsurfaced site roads shall have their speed restricted to 20 kph.
- A regime of ‘wet’ road sweeping will be set up to ensure the roads around the immediate site areas are kept as clean and free from dirt / dust arising from the site, as is reasonably practicable. This cleaning will be carried out by approved mechanical sweepers.
- Footpaths immediately around the site will be cleaned by hand regularly, with damping as necessary.
- High level walkways and surfaces such as scaffolding shall be cleaned regularly using safe ‘wet’ methods, as opposed to dry methods.
- Vehicle waiting areas or hard standings will be regularly inspected and kept clean by brushing or vacuum sweeping and will be regularly sprayed to keep moist, if necessary.
- Vehicle and wheel washing facilities will be provided at site exit(s) where practicable. If necessary, vehicles shall be washed down before exiting the site.
- Netting will be provided to enclose scaffolding in order to mitigate escape of air borne dust from the existing and new buildings.
- Vehicles and equipment shall not emit black smoke from exhaust system, except during ignition at start up.
- Engines and exhaust systems shall be maintained so that exhaust emissions do not breach stationary emission limits set for the vehicle / equipment type and mode of operation.

- Servicing of vehicles and plant shall be carried out regularly, rather than just following breakdowns.
- Internal combustion plant shall not be left running unnecessarily.
- Exhaust direction and heights shall be such as not to disturb dust on the ground and to ensure adequate local dispersal of emissions.
- Where possible fixed plant such as generators shall be located away from residential areas.
- The number of handling operations for materials will be kept to a minimum in order to ensure that dusty material is not moved or handled unnecessarily.
- The transport of dusty materials and aggregates shall be carried out using covered / sheeted lorries.
- Material handling areas shall be clean, tidy and free from dust.
- Vehicle loading shall be dampened down and drop heights for material shall be kept to a minimum.
- Drop heights for chutes / skips shall be kept to a minimum.
- Dust dispersal over the site boundary shall be minimised using static sprinklers or other watering methods as necessary.
- Stockpiles of materials shall be kept to a minimum and if necessary, they shall be kept away from sensitive receptors such as residential areas etc.
- Stockpiles where necessary, shall be sheeted or watered down.
- Methods and equipment shall be in place for immediate clean-up of spillages of dusty material.
- No burning of materials will be permitted on site.
- Earthworks excavations shall be kept damp where necessary and where reasonably practicable.
- Cutting on site shall be avoided where possible by using pre-fabrication methods.
- Equipment and techniques for cutting / grinding / drilling / sawing / sanding etc, which minimise dust emissions and which have the best available dust suppression measures, shall be employed.
- Where scabbling is to be employed, tools shall be fitted with dust bags, residual dust shall be vacuumed up rather than swept away, and areas to be scabbled shall be screened off.
- Wet processes shall be used to clean building facades if possible. If dry grit blasting is unavoidable then ensure areas of work are sealed off and dust extraction systems used.
- Where possible pre-mixed plasters and masonry compounds shall be used to minimise dust arising from on-site mixing.
- Prior to commencement, the main contractor shall identify the construction operations which are likely to generate dust and draw up action plans to minimise emissions, utilising the methods highlighted above. Furthermore, the main contractor shall prepare environmental risk assessments for all dust generating processes which are envisaged.
- The main contractor shall allocate suitably qualified personnel to be responsible for ensuring the generation of dust is minimised and effectively controlled.
- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board shall also include head/regional office contact details.

The contractor will be obliged to implement the mitigation measures outlined above in respect of dust/dirt control.

4.4.2 Noise Control

The main contractor will deal with the immediate risks to hearing etc. associated with high noise levels and the impact of same on construction operatives, by means of risk assessment and mitigation/precautionary measures and equipment, all pursuant to the current health and safety legislation.

The Main Contractor shall carry out a noise assessment in relation to the proposed works at construction stage. A designated environmental liaison officer should be appointed to site during construction works. Any noise complaints should be logged and followed up in a prompt fashion by the liaison officer. In addition,

where a particularly noisy construction activity is planned or other works with the potential to generate high levels of noise, or where noisy works are expected to operate outside of normal working hours etc., the liaison officer will inform the nearest noise sensitive locations of the time and expected duration of the noisy works.

The noise assessment shall include the following steps:-

- Identify and list all construction work activities where there is likely to be a significant noise hazard.
- Determine the hazards / nuisance.
- Identify all third parties likely to be exposed to the nuisance.
- Measuring the risk: The level of noise in dBA.
- Considering and Implementing Control Measures.
- Control exposure to noise.
- Record the findings of the noise assessment.
- Review and revise.

The contractor will be obliged to implement the noise mitigation measures set out above.

4.4.3 Protection of Soils and Groundwater

In order to preserve the topsoil on the site, topsoil will be removed to stockpiles and protected during the construction period for reuse on completion of the works. Topsoil will be stored in mounds located as far away from the river Boyne as possible, ideally to the south of the subject site and suitably protected to prevent water logging during wet weather. The stripping of topsoil will be undertaken on a phased basis so that no area is stripped until such time as works are imminent in that area. It is important that topsoil is kept completely separate from all other construction waste as any cross-contamination of the topsoil can render it useless for reuse. It is important to ensure that topsoil is protected from all kinds of vehicle damage and kept away from site-track, delivery vehicle turning areas and site plant and vehicle storage areas. If topsoil is stored in piles of greater than two metres in height the soil matrix (internal structure) can be damaged beyond repair. It should also be kept as dry as possible and used as soon as possible to reduce any deterioration through lengthy storage and excess moving around the site.

All topsoil stripping associated with the proposed development will be monitored by a suitably qualified archaeologist. During topsoil stripping a written and photographic record describing the form of the townland boundaries to be impacted upon should be included in the monitoring report.

Levels of the proposed roads will be established to minimise the quantity of fill material to be imported to the site. Surplus subsoil will be used for landscaping where possible.

The provision of wheel wash facilities at the construction entrance to the development will minimise the amount of soils deposited on the surrounding road network. The adjoining road network will be cleaned on a regular basis, if required, to prevent the build-up of soils from the development site on the existing blacktop roads.

Measures will be implemented throughout the construction stage to prevent contamination of the soil and adjacent watercourses from oil and petrol leakages and significant siltation. Suitable bunded areas will be installed for oil and petrol storage tanks. Designated fuel filling points will be put in place with appropriate oil and petrol interceptors to provide protection from accidental spills. Spill kits will be provided by the main contractor to cater for any other spills.

Cut-off trenches along the northern boundary of the development boundary will be constructed prior to stripping topsoil. These cut-off trenches will have a settlement pond / silt trap at the end of each trench with an overflow. Straw bales will be placed within the cut-off trenches at strategic locations and at the outfall of the settlement ponds to the overflow. These measures will be implemented and maintained during the construction phase to prevent silt runoff into the existing ditches/watercourses during the drainage works.

Dampening down measures with water sprays will be implemented during periods of dry weather to reduce dust levels arising from the development works.

After implementation of the above measures the proposed development will not give rise to any significant long term adverse impact. Negative impacts during the construction phase will be short term only in duration.

4.4.4 Protection of Surface Waters

- The main contractor will appoint a suitably qualified person to oversee the implementation of measures for the prevention of pollution to the receiving surface water environment.
- Cut-off trenches along the northern boundary of the development boundary will be constructed prior to stripping topsoil. These cut-off trenches will have a settlement pond silt trap at the end of each trench with an overflow. Straw bales will be placed within the cut off trenches at strategic locations and at the outfall of the settlement ponds to the overflow. These measures will be implemented and maintained during the construction phase to prevent surface water runoff from discharging directly into the local water course. An indicative layout for the proposed cut off trenches is set out in Appendix A of this report.
- Settlement ponds/silt traps as outlined above will be provided to prevent silt runoff into the existing ditches/watercourses during the drainage works
- Regular testing of surface water discharges will be undertaken at the outfall from the subject lands. The location will be agreed between the project ecologist and the site foreman at the commencement of works. Trigger levels for halting works and re-examining protection measures will be: pH >9.0 or pH <6.0; and/or suspended solids >25 mg/l. These trigger levels are based on those outlined within 'Guidelines on Protection of Fisheries During Works in and Adjacent to Waters (IFI, 2016)'.
- Where silt control measures are noted to be failing or not working adequately, works will cease in the relevant area. The project ecologist will review and agree alternative pollution control measures, such as deepening or redirecting trenches as appropriate, before works may recommence.
- All fuels and chemicals will be bunded, and where applicable, stored within double skinned tanks / containers with the capacity to hold 110% of the volume of chemicals and fuels. Bunds will be located on flat ground a minimum distance of 50m from any watercourse or other water conducting features, including the cut off trenches.
- All existing services will be located using service records, GPR surveys and slit trenches to ensure that their position is accurately identified before excavation works commence.
- Temporary traffic management will be implemented as appropriate during the construction of the outfalls on Rathmullan/River Road.

4.4.5 Flora and Fauna

Field surveys were undertaken by Scott Cawley Ltd. to inform the NIS accompanying the application for the development. Mitigation measures within same cover all potential construction-phase impacts on flora and fauna.

The site is located directly south of the River Boyne and is therefore hydrologically connected to four European sites and one Nationally designated site: the River Boyne and Blackwater SAC (002299), River Boyne and Blackwater SPA (004080), Boyne Coast and Estuary SAC (001957), Boyne Estuary SPA (004080) and the Boyne River Islands pNHA (01862). The mitigation measures outlined in this CEMP are designed to prevent pollutants from entering the River Boyne.

Roosting bats were discovered inside the derelict farm buildings onsite and bats were recorded using the treelines and hedgerows for commuting and foraging. The mitigation measures outlined in this CEMP will prevent disturbance and mortality to bats during the construction phase of this development.

A number of bird species were recorded within the hedgerows and treelines on the proposed development site. Please refer to NIS for further details. The mitigation measures outlined in this CEMP will prevent disturbance and mortality to birds during the construction phase of the development.

The subject lands contains woodlands and hedgerows which are at risk of damage during construction. The mitigation measures outlined within this CEMP will prevent accidental damage to trees in hedgerows and woodland in the site.

Protection of Bats

- Roosting bats were found to be present within the existing farm buildings onsite. Please refer to the most recent bat survey. A draft derogation licence application has been submitted to the NPWS to allow for the demolition of the buildings. The mitigation measures as outlined below and in Table 1 of this report must be adhered to in order to avoid disturbance or mortality of bats;
    - Tree inspection surveys will be undertaken by a licenced bat worker to assess whether the trees marked for felling have any suitability to support roosting bats. If the trees are confirmed to have potential roosting features, these trees must be inspected at height for roosting bats the day prior to felling works. Once surveyor is satisfied that bats are not present within potential roosting features, the tree will be felled; and/or,
    - If bats are encountered during any works at the site the relevant works will be suspended until the advice of a suitably qualified and licenced bat ecologist is sought. A derogation licence may need to be obtained from NPWS in order to permit removal of bats and mitigate for the loss of any roosts on the site.

Protection of Birds

- All tall woody and herbaceous vegetation in worked areas should be removed outside of the breeding bird season (1st March to 31st August, inclusive) to avoid the destruction of nests or disturbance of breeding birds. It is particularly important that areas of dense vegetation be cleared in advance of the breeding bird season, as it is difficult to check or confirm presence/absence of nests in these areas during the breeding season.
- In instance where clearance of vegetation between 1st March and .31st August is unavoidable, vegetation will first be inspected by a qualified ecologist immediately prior to any scheduled clearance. Where birds or their nests are encountered, works may not proceed until chicks have

fledged and the nest has been abandoned. The ecologist may need to implement a buffer area around the nest where works or personnel are not allowed to enter.

Protection of Aquatic Fauna and Habitats

- Aquatic fauna and habitats will be protected through the implementation of mitigation measures detailed within Table 1 of this CEMP.
- All hedgerows and immature woodland marked for retention will be fenced off at the outset of works and for the duration of construction to avoid damage to the trunk, branches or root systems of the trees. Temporary fencing will be erected at a sufficient distance from the tree so as to enclose the Root Protection Area (RPA) of the tree (National Roads Authority, 2005-2011). In general, the RPA covers an area equivalent to a circle with a radius 12 times the stem diameter (measured at 1.5m above ground level for single stemmed trees).
- Where fencing is not feasible due to insufficient space, protection for the tree/hedgerow will be afforded by wrapping hessian sacking (or suitable equivalent) around the trunk of the tree and strapping stout buffer timbers around it. It will still be necessary to ensure that the area within the RPA is not used for vehicle parking or the storage of materials (including oils and chemicals).
- Soil will not be placed within the Root Protection Area of trees or within 5m of hedgerows.

4.4.6 Refuelling

- Construction plant and equipment will only be parked over-night within the site compound. Construction plant and equipment will be checked daily for any visual signs of oil or fuel leakage, as well as wear and tear.

- Fuel will not be stored on site for the duration of the construction phase. Fuel will only be brought to site via mobile fuel bowser. For any liquid other than water, this will include storage in suitable tanks and containers which will be housed in the designated area surrounded by a bund wall of sufficient height and construction so as to contain 110 per cent of the total contents of all containers and associated pipework. The floor and walls of the bunded areas will be impervious of all containers and associated pipework. The floor and walls of the bunded area will be impervious to both water and oil. The pipes will vent downwards into the bund.

- Where contractors are required to refuel vehicles, this will only be carried out at the designated refuelling location within the site storage compound, which must employ pollution control mechanisms to prevent escape of fluids to the river. No refuelling is permitted on site, i.e. within the river or adjacent due to risk of spillage.

- The local authority will be informed immediately of any spillage or pollution incident that may occur on-site during the construction phase.

- All small plant such as generators and pumps bunded and stood in drip trays capable of holding 110 per cent of their tank contents,

- All small plant will be positioned on the bridge itself (within the designated works area – refer to Preliminary Traffic Management Plan), on the secured scaffolding/work platforms, or within the dewatered, 'dry' sections of the dammed river during the works.

- Waste oils, empty oil containers and other hazardous wastes will be disposed of in accordance with the requirements of the Waste Management Act, 1996.

4.4.7 Site Tidiness and Housekeeping

- Construction works will be carried out according to a defined schedule agreed with the client and the relevant contractors, with regard to the hours of work outlined above. Any delays or extensions required will be notified at the earliest opportuning to the client and contractors.

- Contractors will ensure that road edges and footpaths are swept on a regular basis.

- Any and all waste materials arising during the works will either be immediately taken to a location from which discharge to the River Boyne cannot take place or temporarily stored/covered to prevent washout thereto.

- All contractors will be responsible for the clearance of their plant, equipment and any temporary buildings upon completion of construction. The site will be left in a safe condition.

4.4.8 Monitoring, Inspection and Record Keeping

- The Project Ecologist will supervise the sampling of suspended solids downstream prior to commencement of works, and weekly during remediation works. Samples will be analysed on site. Should results show a 10 per cent increase in suspended solids downstream of the site this will be brought to the attention of the contractor by the Project Ecologist and any suitable contingency measures will be instigated.

- Routine inspections of construction activities will be carried out on a daily basis by the contractor staff to ensure all controls to prevent environmental impact, relevant to the construction activities taking place at the time, are in place. Environmental inspections will ensure that the works are undertaken in compliance with the Project CEMP and that the requirements of the Conditions of Planning, the NIS and associated documentation are being adhered to during construction.

- The Contractor will develop their own site inspection programme, which will include an inspection procedure and relevant forms to record any issues.

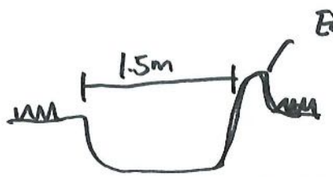
- Only suitably trained staff will undertake environmental site inspections.

- The Project Ecologist will keep records of works undertaken.

APPENDICES

A. Indicative Construction Stage Surface Water Runoff Management Strategy

RATHMULLAN - TEMPORARY CUTOFF TRENCH LAYOUT & DETAILS



TYPICAL CUT OFF TRENCH

NOTE. STRAW BALES TO BE PLACED AT APPROPRIATE INTERVALS ALONG THE CUT OFF TRENCHES AND AT THE OVERFLOW LOCATIONS

B. Refurbishment & Demolition Survey for Asbestos Containing Materials

ABOUT SAFETY LTD.

ASBESTOS | LEAD BASED PAINT | MOULD | SILICA DUST | HAZMAT
SURVEYING & TESTING
RISK MANAGEMENT | PROJECT MANAGEMENT

Refurbishment & Demolition Asbestos Survey

Site Address	**Boyne Ridge** **Rathmullan Road** **Drogheda** **Co. Louth**
Site Location	
Client	**Name:** **Earlsfort Developments Drogheda Ltd** **13-18 City Quay** **Dublin** **Contact:** **David Fitzpatrick** **087 243 8456**
Survey Dates	**26th August, 2025**
Issue Date	**August 2025**
Surveyor(s)	**Lauren O' Donoghue, About Safety Ltd.**

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Executive Summary

Ref:	Confirmed Asbestos [Requires removal and disposal as asbestos waste by a competent asbestos contractor prior to work likely to cause disturbance.]
1,2	Asbestos containing corrugated roof sheeting to Building 1 roof. Asbestos debris around the building from fire damage. 25 square meters approximately.
3,4,5,7-12,16,19,25-27	Asbestos cement pipes and associated debris around various areas of the site. Site remediation by a competent contractor is recommended.

NB: The extent of asbestos containing materials identified in this report are only approximate and should not be relied upon as a basis for tendering removal works. Contractors tendering works are expected to satisfy themselves by site visit and measurement the exact nature and extent of any works which is proposed.

Introduction

About Safety Ltd. was instructed to carry out a Refurbishment and Demolition Asbestos Survey of the above property. The survey and sampling was carried out taking cognizance of the requirements of the Health and Safety Executive (UK) document, *HSG 264*, *Asbestos: The Survey Guide.*

Objectives

The objectives of this survey were to:

To carry out a survey to ascertain the presence of asbestos based materials.
To carry out a survey to locate and describe, as far as reasonably practicable, all asbestos containing materials prior to refurbishment/demolition.
To gain access to all areas, as necessary, to determine the extent of any asbestos that may be present.
To sample and estimate the extent and volume of any asbestos materials that may be present.
To generate asbestos material assessments where the period between the survey and event is significant i.e. more that 3 months.
To produce a report identifying areas containing asbestos to be used as a basis for tendering their removal.
To instigate asbestos removal works prior to refurbishment/demolition.

Scope of Works & Site Description

General Information

Scope of Works:	**Proposed demolition of the buildings on site.**
Structural Details:	**Outhouses and sheds. Corrugated sheeting to shed 1. Galvanized sheeting to all other buildings.**

Survey Limitations

All areas accessed for proposed refurbishment works were subjected to a survey taking cognisance of the requirements of HSG 264, Asbestos: The Survey Guide. The investigation consisted of an inspection of each room and area to be impacted by the works.
No report has been made on any concealed spaces, which may exist within the fabric of the building where the extent and presence of these is not evident due to inaccessibility, lack of building drawings or insufficient knowledge of the structure of the building at the time of the survey. Original and permanent finishes or areas of the building subject to protection orders were not disturbed where requested by the client.

Inaccessible Areas: Electrical equipment such as, boiler units, water heaters, storage heaters, fuse or switch boards. Within floor or wall structures, behind wall or ceiling cladding or within blocked up chimneys. Within internal areas of fire doors unless asbestos observed from keyhole or other damaged areas. Care should always be exercised when working on any electrical equipment in particular the older styles as asbestos-containing materials may be present.

Special considerations for old boilers and plant containing asbestos gaskets:
Some old plant may have gaskets and seals which could contain asbestos. During normal maintenance operations these gaskets or seals may have to be opened, which would not normally be notifiable. If, however the gasket was in a friable condition or had to broken up for removal or examination, the work could become notifiable. An assessment would need to be made and the work notified with the H.S.A. if necessary. Dismantling of boilers and plant is a specialist task requiring specialist tools and is considered demolition.

Asbestos Refurbishment & Demolition Survey: Definition

A refurbishment and demolition survey is needed before any refurbishment or demolition works is carried out. This type of survey is used to locate and describe, as far as reasonably practicable, all ACM's in the area where the refurbishment works will take place or in the whole building if demolition is planned. The survey will be fully intrusive and involve destructive inspection, as necessary, to gain access to all areas, including those that may be difficult to reach. A refurbishment and demolition survey may also be required in other circumstances, e.g. when more intrusive and maintenance and repair work will be carried out or for plant removal and dismantling.
Where the refurbishment or demolition works may not take place for a significant period after the survey (e.g. three months), then the information required for a management survey should be obtained.

Asbestos Contaminated Soils (ACS)

The first point of contact with soil or ground contaminated with asbestos will be during site investigations and exploratory ground works. This may be defined as asbestos operative related work and applies where there is a potential for sporadic or low intensity exposure. People directly involved in these preliminary works, geotechnical engineers and ground workers, should receive formal training enabling them to work safely where asbestos could be present in the ground as a consequence of legacy use issues with the land. In principle, the general tiered approach to the assessment and management of potential risks posed by ACS is the same as that for any other contaminant. However, the unique nature of asbestos means that different methods of analysis, exposure estimation and risk estimation are required. Importantly, soil and air analysis methods need to be more detailed than those currently and commonly used to demonstrate compliance with the Asbestos Regulations.

Material Assessment

No condition assessment is normally necessary for refurbishment and demolition surveys but, where the period between survey and the event is significant, e.g. more than 3 months, then a material assessment should be conducted and interim management arrangements put in place.

Material Assessment Algorithm

In the material assessment process, the main factors influencing fiber release are given a score which can then be added together to obtain a material assessment rating. The four main parameters which determine the amount of fiber released from an ACM when subject to disturbance are:

- **Product Type**
- **Extent of damage or deterioration**
- **Surface Treatment; and**
- **Asbestos type**

Each parameter is scored between 1 and 3. A score of 1 equivalent to a low potential for fiber release, 2 = medium and 3 = high. Two parameters can also be given a nil score (equivalent to a very low potential for fiber release). The value assigned to each of the four parameters is added together to give a total score of between 2 and 12. Presumed or strongly presumed ACM's are scored as Crocidolite (i.e. score = 3) unless there is strong evidence to show otherwise.

Materials with assessment scores of 10 or more are rated as having a high potential to release fibers, if disturbed. Scores of between 7 and 9 are regarded as having a medium potential, and between 5 and 6 a low potential. Scores of 4 or less have a very low potential to release fibers.

Analytical Techniques

Asbestos Bulk Sample Analysis is conducted by using Polarised Light and Dispersion Staining Techniques. Dispersion Staining is used to describe the colour effects produced when a transparent colourless particle or fiber is immersed in a liquid having a refractive index near to that of the particle or fiber, and is viewed under a microscope using transmitted white light (based on HSE Publication, HSG 248).

Samples were returned to About Safety Ltd. Laboratory for Analysis. Photographs were taken at all of the sample locations (unless otherwise stated). The commitment to quality is independently assured through membership of the Asbestos in Materials scheme (AIMS), HSL(UK).
Materials of a similar type were only occasionally sampled and it was assumed that other materials visually inspected to where the sample was taken, were of a similar composition.
Each area was viewed for suspect materials thought or known to contain asbestos and samples taken where it was considered necessary.

General Caveat

This report is based on a Refurbishment & Demolition survey of an unoccupied building.

During the course of the survey all reasonable efforts were made to identify the physical presence of materials containing asbestos. It is known that asbestos materials are frequently concealed within the fabric of buildings or within sealed building voids so that it is not possible to regard the findings of any survey as being definite. It must remain a possibility that asbestos containing materials may be found during demolition activities. For reasons set out in this report, the results cannot give an assurance that all asbestos materials have been found and must not be thought to do so.

This report has been written with reference to the various Guidance Notes etc., issued, and current at the date of this report and describes circumstances at the site on the date the survey took place.

Specific Notes

Legislation and Codes of Practice

The Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006 to 2010, apply to work where there is or may be asbestos fibers present. These regulations apply in particular to any person or employer working with or removing asbestos.

In addition, Safety, Health and Welfare at Work (Construction) Regulations 2013 (SI 291 of 2013) also apply to any building, installation, repair, demolition and asbestos removal work.

Information about working with material containing asbestos cement is containing in Health and Safety Authority's document "Asbestos-containing materials (ACM's) in Workplaces – Practical Guidelines on ACM Management and Abatement".

Provision of information

It is recommended that this report is brought to the attention of any person likely to be involved in refurbishment/demolition works.
Once asbestos materials have been identified it is essential that appropriate remedial measures be introduced prior to any structural alterations, refurbishment or demolition works commencing. All the asbestos removal works should be carried out by a competent asbestos removal contractor in accordance with Asbestos at Work Regulations 2006 to 2010. Statutory notification requirements of 14 days are required under the provisions of the Asbestos Regulations for certain works involving asbestos. The contractor appointed for removal works is responsible for deciding if a 14-day notification is required and for drawing up a plan of work for any removal works.

Appendix A – Asbestos Bulk Identification Report

ASBESTOS BULK IDENTIFICATION REPORT

Report on:
Identification of asbestos content of suspected asbestos containing materials (ACM's) sampled from the following location/site:

Boyne Ridge
Rathmullan Road
Drogheda
Co. Louth

TEST RESULT

SAMPLE NO	LAB. REF.	SAMPLE LOCATION	MATERIAL DESCRIPTION	ASBESTOS TYPE IDENTIFIEID
Jkb19041501	1910501	**Building 1**	**Corrugated roof sheeting**	**Chrysotile**
Jkb19041502	1910502	**Building 1**	**Roof sheeting debris**	**Chrysotile**
Jkb19041503	1910503	**Building 1**	**Cement pipe debris**	**Chrysotile**
Jkb19041504	1910504	**Building 1**	**Cement pipe debris**	**Chrysotile**

Glossary

*NADIS = No Asbestos Detected in Sample Chrysotile (white asbestos) Amosite (brown asbestos) Crocidolite (blue asbestos)
VFT = Vinyl Floor Tile

Analyst: John Kelleher

Appendix B – Schedule of Survey Sheets

Ref No.	Building or Area of Site	Location or Functional Space	Sample No.	Material Description, surface treatment and condition	Extent	Asbestos identified (presumed, strongly presumed or identified)	Product type	Condition	Surface treatment	Asbestos type	Material assessment score	Recommendations	Photo
1.	Boyne ridge Rathmullan Rd	Building 1	1910501	Corrugated roof sheeting with debris strewn around the area	25sm approx.	Chrysotile	1	3	1	1	6	Removal and disposal by a competent contractor prior to demolition. Cleanup of debris around the building.	
2.	Boyne ridge Rathmullan Rd	Building 1	1910502	Corrugated sheeting debris		Chrysotile	1	3	1	1	6	Removal and disposal by a competent contractor prior to demolition. Cleanup of debris around the building.	
3.	Boyne ridge Rathmullan Rd	Building 1 yard	1910504	Cement pipe debris		Chrysotile	1	3	1	1	6	Removal and disposal by a competent contractor prior to demolition. Cleanup of debris around the building.	
4.	Boyne ridge Rathmullan Rd	Building 1/ building 2 yard	1910503	Cement pipe debris		Chrysotile	1	3	1	1	6	Removal and disposal by a competent contractor prior to demolition. Cleanup of debris around the building.	

Key
NAD = No asbestos detected
AIB = Asbestos insulation board
AC = Asbestos cement
VFT = vinyl floor tile
NQ = Not Quantified/Quantifiable
SM = Square Meters
LM = Linear Meters

Confirmed Asbestos
Presumed/Strongly presumed ACM Or Non Accessed Area

Material Assessment Score	Risk
≤ 4	Very Low
5 - 6	Low
7 - 9	Medium
≥ 10	High

No condition assessment is normally necessary for refurbishment and demolition surveys but, where the period between survey and the event is significant, e.g. more than 3 months, then a material assessment should be conducted and interim management arrangements put in place.

Ref No.	Building or Area of Site	Location or Functional Space	Sample No.	Material Description, surface treatment and condition	Extent	Asbestos identified (presumed, strongly presumed or identified)	Product type	Condition	Surface treatment	Asbestos type	Material assessment score	Recommendations	Photo
5.	Boyne ridge Rathmullan Rd	Building 3		Cement pipe debris		Chrysotile	1	3	1	1	6	Removal and disposal by a competent contractor prior to demolition. Cleanup of debris around the building.	
6.	Boyne ridge Rathmullan Rd	Building 2		Corrugated metal sheeting and concrete		NAD							
7.	Boyne ridge Rathmullan Rd	Building 2		Cement pipe debris		Chrysotile	1	3	1	1	6	Removal and disposal by a competent contractor prior to demolition. Cleanup of debris around the building.	
8.	Boyne ridge Rathmullan Rd	Building 2		Cement pipe debris		Chrysotile	1	3	1	1	6	Removal and disposal by a competent contractor prior to demolition. Cleanup of debris around the building.	

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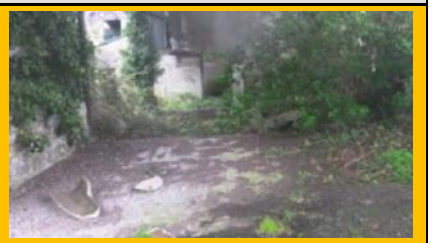
Ref No.	Building or Area of Site	Location or Functional Space	Sample No.	Material Description, surface treatment and condition	Extent	Asbestos identified (presumed, strongly presumed or identified)	Product type	Condition	Surface treatment	Asbestos type	Material assessment score	Recommendations	Photo
9.	Boyne ridge Rathmullan Rd	Building 2		Cement pipe debris		Chrysotile	1	3	1	1	6	Removal and disposal by a competent contractor prior to demolition. Cleanup of debris around the building.	
10.	Boyne ridge Rathmullan Rd	Building 2		Cement pipe debris		Chrysotile	1	3	1	1	6	Removal and disposal by a competent contractor prior to demolition. Cleanup of debris around the building.	
11.	Boyne ridge Rathmullan Rd	Building 2 water trough		Cement pipe/ corrugated sheeting debris		Chrysotile	1	3	1	1	6	Removal and disposal by a competent contractor prior to demolition. Cleanup of debris around the building.	
12.	Boyne ridge Rathmullan Rd	Ground between building 2 and containers		Cement pipe debris		Chrysotile	1	3	1	1	6	Removal and disposal by a competent contractor prior to demolition. Cleanup of debris around the building.	

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13.	Boyne ridge Rathmullan Rd	Building 3 front		Corrugated metal sheeting		NAD							
14.	Boyne ridge Rathmullan Rd	Building 2 mezzanine				NAD							
15.	Boyne ridge Rathmullan Rd	Building 2 mezzanine		Corrugated metal sheeting		NAD							
16.	Boyne ridge Rathmullan Rd	Building 2 ground floor debris		Cement pipe/ corrugated sheeting debris		Chrysotile	1	3	1	1	6	Removal and disposal by a competent contractor prior to demolition. Cleanup of debris around the building.	

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Ref No.	Building or Area of Site	Location or Functional Space	Sample No.	Material Description, surface treatment and condition	Extent	Asbestos identified (presumed, strongly presumed or identified)	Product type	Condition	Surface treatment	Asbestos type	Material assessment score	Recommendations	Photo
17.	Boyne ridge Rathmullan Rd	Building 2				NAD							
18.	Boyne ridge Rathmullan Rd	Building 2				NAD							
19.	Boyne ridge Rathmullan Rd	Ground at container		Cement pipe debris		Chrysotile	1	3	1	1	6	Removal and disposal by a competent contractor prior to demolition. Cleanup of debris around the building.	
20.	Boyne ridge Rathmullan Rd	Building 4		Concrete construct		NAD							

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Ref No.	Building or Area of Site	Location or Functional Space	Sample No.	Material Description, surface treatment and condition	Extent	Asbestos identified (presumed, strongly presumed or identified)	Product type	Condition	Surface treatment	Asbestos type	Material assessment score	Recommendations	Photo
21.	Boyne ridge Rathmullan Rd	Building 4		Corrugated metal sheeting		NAD							
22.	Boyne ridge Rathmullan Rd	Building 4		Concrete construct		NAD							
23.	Boyne ridge Rathmullan Rd	Building 5		Corrugated metal sheeting		NAD							
24.	Boyne ridge Rathmullan Rd	Building 5 rear				NAD							

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Presumed/Strongly presumed ACM Or Non Accessed Area

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5 - 6	Low
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No condition assessment is normally necessary for refurbishment and demolition surveys but, where the period between survey and the event is significant, e.g. more than 3 months, then a material assessment should be conducted and interim management arrangements put in place.

Ref No.	Building or Area of Site	Location or Functional Space	Sample No.	Material Description, surface treatment and condition	Extent	Asbestos identified (presumed, strongly presumed or identified)	Product type	Condition	Surface treatment	Asbestos type	Material assessment score	Recommendations	Photo
25.	Boyne ridge Rathmullan Rd	Building 5		Cement pipe debris to interior rear		Chrysotile	1	3	1	1	6	Removal and disposal by a competent contractor prior to demolition. Cleanup of debris around the building.	
26.	Boyne ridge Rathmullan Rd	Old containers		Cement pipe debris on ground		Chrysotile	1	3	1	1	6	Removal and disposal by a competent contractor prior to demolition. Cleanup of debris around the building.	
27.	Boyne ridge Rathmullan Rd	Old containers		Cement pipe debris internally		Chrysotile	1	3	1	1	6	Removal and disposal by a competent contractor prior to demolition. Cleanup of debris around the building.	

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C. Site Investigation Report

PRELIMINARY DRAFT REPORT

RATHMULLAN DROGHEDA
PROPOSED HOUSING
CLARD DEVELOPMENTS

WATERMAN MOYLAN
CONSULTING ENGINEERS

CONTENTS

I	**INTRODUCTION**
II	**FIELDWORK**
III	**TESTING**
IV	**DISCUSSION**

APPENDICES

I	**BOREHOLE LOGS**
II	**TRIAL PIT RECORDS**
III	**DYNAMIC PROBES**
IV	**BRE DIGEST 365 TESTS**
V	**LABORATORY DATA**
VI	**SITE PLAN AND SECTION**

FOREWORD

The following Conditions and Notes on Site Investigation Procedures should be read in conjunction with this report.

General.

Recommendations made, and opinions expressed in the report are based on the strata observed in the exploratory holes, together with the results of in-situ and laboratory tests. No responsibility can be held for conditions which have not been revealed by exploratory work, or which occur between exploratory hole locations. Whilst the report may suggest the likely configuration of strata, both between exploratory hole locations, or below the maximum depth of the investigation, this is only indicative, and liability cannot be accepted for its accuracy.

Unless specifically stated, no account has been taken of possible subsidence due to mineral extraction below or close to the site.

Boring Procedures.

Unless otherwise stated, the 'Shell and Auger' technique of soft ground boring has been employed. All boring operations sampling and/or logging of soils and in-situ testing complies with the recommendations of the British Standard Code of Practice BS 5930 (1981), 'Site Investigation' and BS 1377:1990, 'Methods of test for soils for civil engineering purposes'.

Whilst the technique allows the maximum data to be obtained in soft ground, some disturbance and variation of soft and layered soils is unavoidable. Attention is drawn to this condition, whenever it is suspected. Where cobbles and boulders are recorded, no conclusion should be drawn concerning the size, presence, lithological nature, or numbers per unit volume of ground.

Where peat has been encountered during siteworks, samples have been logged in accordance with the Von Post Classification (ref. Von Post, L. 1992. Sveriges Gologiska Undersoknings torvinventering och nogra av dess hittils vunna resultat (SGU peat inventory and some preliminary results) Svenska Mosskulturforeningens Tidskrift, Jonkoping, Swedden, 36, 1-37 & Hobbs N. B. Mire morphology and the properties of some British and foreign peats. QJEG, Vol. 19, 1986).

Routine Sampling.

Undisturbed samples of soils, predominantly cohesive in nature are obtained unless otherwise stated by a 104mm diameter open-drive tube sampler. In granular soils, and where undisturbed sampling is inappropriate, disturbed samples are collected. Smaller disturbed samples are also recovered at intervals to allow a visual examination of the full strata section.

In-Situ Testing.

Standard penetration tests, utilising either the standard split spoon sampler or solid cone and automatic trip-hammer are conducted unless otherwise where required by instruction. Subsequent to a seating drive of 150mm, a summation for the number of blows for 300mm penetration is recorded on the boring records together with the blow count for each 75mm penetration. In cases where incomplete penetration is obtained, the number of blows for the recorded value of penetration are noted. In coarse granular soils, a cone end is fitted to the sampler and a similar procedure adopted.

Groundwater.

The depth of entry of any influx of groundwater is recorded during the course of boring operations. However, the normal rate of boring does not usually permit the recording of an equilibrium level for any one water strike. Where possible drilling is suspended for a period of twenty minutes to monitor the subsequent rise in water level.

Groundwater conditions observed in the borings or pits are those appertaining to the period of investigation. It should be noted however, that groundwater levels are subject to diurnal, seasonal and climatic variations and can also be affected by drainage condition, tidal variation or other causes.

Retention of Samples.

After satisfactory completion of all the scheduled laboratory tests on any sample, the remaining material is discarded unless a period of retention of samples is agreed, it is our normal practice to discard all soil samples one month after submission of our final report.

REPORT ON A SITE INVESTIGATION
FOR A HOUSING DEVELOPMENT
AT WEST DROGHEDA
COUNTY MEATH

FOR
CLARD DEVELOPMENTS LTD

WATERMAN MOYLAN
CONSULTING ENGINEERS

Report No. 21345 **NOVEMBER 2018**

I Introduction

A new housing development is proposed for a greenfield site located at Rathmullan, Drogheda West.

An investigation of sub soil conditions in the area of development has been ordered by Waterman Moylan, Consulting Engineers on behalf of Clard Developments Ltd.

The programme of the investigation included the construction of Boreholes, Trial Pits and Dynamic Probes to establish criteria on which to base foundation and infra-structural design. Work was carried out in accordance with BS 5930, Code of Practice for Site Investigations (1999).

In addition percolation testing to BRE Digest 365 was scheduled and carried out at several locations to establish soil percolation characteristics.

A programme of laboratory testing to confirm geotechnical and environmental soil parameters followed site operations.

This report includes all factual data pertaining to the project and comments on the findings relative to the new development.

II Fieldwork

The proposed development is to be undertaken on existing farm land located at Rathmullan, Drogheda West. The development area is bounded by the M1 Motorway to the West, The River Boyne to the North and The Riverbank Housing Estate to the East. The location is shown on the site map in Appendix VI. This drawing also shows the location of the various exploratory positions.

The field investigation included the following elements.

- Cable Percussion Boreholes at five locations
- Machine Excavated Trial Pits at five locations
- HD Dynamic Probes at five locations
- BRE Digest 365 Percolation Tests at five locations

The various locations have been referenced to national grid and OD levels established. Photographs of all excavations are included with this report in the relevant appendices.

Boreholes

Five exploratory holes were scheduled and bored with conventional 200mm cable-tool methods using a Dando Exploratory Rig. Each location was electronically scanned and shallow trial pits were opened to ensure that existing services were not damaged. One additional hole (BH02A) was bored when shallow refusal was recorded in the original location.

Detailed geotechnical records are contained in Appendix I to this report - the records give details of stratification, sampling, in-situ testing and groundwater. Note is also taken of any obstructions to normal boring requiring the use of the heavy chisel for advancement. In general it was not possible to recover undisturbed samples because of the high stone/cobble content of the strata encountered.

The boreholes consistently identified surface topsoil (300mm) overlying initially firm brown sandy gravelly CLAY. The gravelly CLAY stratum increases in strength to stiff and very stiff below about 1.20 metres with holes continuing to completion at depths between 5.80 and 8.50 metres. Angular and sub-angular cobbles and boulders were noted at varying depths in each borehole. The soils represent GLACIAL TILL or BOULDER CLAY deposition, typical of the region.

The final refusal depths may be indicative of boulders in the glacial clay or possibly the local bedrock horizon. Proof core drilling would be required to confirm the presence of bedrock in the area.

No water was encountered during the course of boring. Long-term ground water observation was not required.

Trial Pits

A JCB excavator was used under geotechnical engineering supervision to open trial pits at five locations.

Detailed trial pit records are presented in Appendix II. These records note stratification and ground water regime and detail sampling, obstructions and excavation stability. Photographs of each location are also included with the records.

The records confirm the borehole findings with topsoil overlying firm to stiff brown very sandy gravelly CLAY, typically containing cobble and boulder fragments. Difficulty in advancing the trial pits was noted in each location. Three pits were terminated on boulder obstructions between 1.50 and 2.00 metres BGL however TP01 continued to 2.60 metres and TP03 to 3.00 metres.

Ground water was not encountered during excavation of the trial pits. The pits were backfilled and compacted with the excavated spoil.

Dynamic Probes

Heavy Duty Probes were taken at a total of five locations each adjacent to an excavated trial pit and referenced DP01 to DP05.

Probing was in accordance with the heavy-duty probe specification of BS 1377: Part 9: 1990. In these tests, the soil resistance is measured in terms of the number of drop-hammer blows required to drive the test probe through each 100 mm increment of penetration. Probing is terminated when the blow count exceeds 25/100mm to avoid damage to the apparatus. Where loose material is present a single blow count may drive the apparatus in excess of 100mm. In this instance blow counts of zero may be recorded. Individual probe records are contained in Appendix III.

The probe graphs generally reflect a pattern of gradually increasing soil strength with penetration depth with probe refusals generally occurring between 1.20 and 3.00 metres. Isolate thin soft zones (100mm to 200mm thick) were noted at 1.70 metres BGL in DP01 and DP02.

A probe resistance of N100 = 4 with no significant underlying deterioration is indicative of an allowable bearing pressure of 100 Kpa, suitable for traditional two storey house construction.

Probe No.	**Depth to $N_{100} = 5$**	**Refusal**
DP01	0.50	2.50
DP02	1.80	3.10
DP03	0.50	1.20
DP04	0.50	1.50
DP05	0.50	1.10

Percolation Test to BRE Digest 365

Infiltration testing was performed at five locations in accordance with BRE Digest 365 'Soakaway Design'. The test pit was excavated and logged. The test material was firm to stiff brown very sandy gravelly CLAY with cobbles and boulders

To obtain a measure of the infiltration rate of the sub-soils, water is poured into the test pit, and records taken of the fall in water level against time. The test is carried out over two cycles following initial soakage.

The infiltration rate is the volume of water dispersed per unit exposed area per unit of time, and is generally expressed as metres/minute or metres/second. In these calculations the exposed area is the sum of the base area and the average internal area of the permeable stratum over the test duration. Designs are based on the slowest infiltration rate, which has been calculated from the final cycle.

In the test locations the water level dropped slowly over the test period. The design calculations are presented in Appendix IV, with the infiltration rates as follows:

SA 01	**Infiltration Rate (f)**	**0.00057 m/min**
SA02	**Infiltration Rate (f)**	**0.00068 m/min**
SA03	**Infiltration Rate (f)**	**0.00029 m/min**
SA04	**Infiltration Rate (f)**	**0.00052 m/min**
SA05	**Infiltration Rate (f)**	**0.00051 m/min**

The results are typical of low-permeability glacial till deposition.

III Testing

a. In-Situ

Standard penetration tests were carried out in each borehole at 1.00 metre intervals to establish relative soil strength. Results are presented in the right hand column of the boring records and are summarised as follows:

Stratum	**N Value Range**	**Comment**
Brown sandy gravelly CLAY		
1.00 metres BGL	10 to 18	Firm to Stiff
2.00 metres BGL	16 to 30	Stiff
3.00 metres BGL	25 to 33	Stiff to Very Stiff
4.00 metres BGL	31 to 51	Very Stiff to Hard
5.00 metres BGL	23 to 53	Stiff to Hard

b. Laboratory

All geotechnical samples from the boreholes and trial pits have been returned to the IGSL laboratory for initial visual inspection, a schedule of testing was prepared and tests carried out.

The programme of testing included the following elements and all results are presented in Appendix V. Standard geotechnical testing is carried out by IGSL in it's INAB-accredited laboratory. Chemical and environmental testing was carried out by CHEMTEST in the UK.

a. Classification (Liquid and Plastic Limits)
b. Particle size distribution (Sieve Analysis and Hydrometer)
c. Sulphate and pH determination
d. RILTA Environmental Suite

Classification and Moisture Content

Liquid and plastic limits were determined for samples of the cohesive soils from the trial pits and boreholes. Results are detailed and plotted on the standard Casagrande Classification Chart.

Particle Size Distribution

Grading curves for selected samples of the gravelly clay stratum from the boreholes were determined by wet sieve and hydrometer analysis.

Chemical (pH and Sulphate)

Four samples were submitted for chemical analysis.

RILTA Environmental Suite

Five sample were submitted for RILTA Suite (WAC) analysis.

IV Discussion

The proposed new housing development is to be undertaken on agricultural land at Rathmullan in Drogheda North.

A comprehensive investigation of sub soil conditions has been carried out for Waterman Moylan on behalf of Clard Developments Ltd.

This preliminary report is based on field findings, detailed geotechnical and environmental testing is being carried out to confirm design parameters.

The detailed findings are presented earlier in this report and these can be summarised as follows:

Boreholes indicate topsoil overlying firm brown sandy gravelly CLAY which extends to about 1.20 metres BGL. This overlies stiff to very stiff to hard brown gravelly CLAY (Brown Boulder CLAY). Boreholes were completed on refusal at depths between 5.80 and 8.50 metres. The final borehole depths are not indicative of rock horizon. No ground water was encountered.

Trial Pits confirmed this general pattern, with numerous cobble and boulder particles noted and recovered and excavation difficulty noted in several locations.

NEW HOUSE FOUNDATIONS

Standard Penetration Tests and Dynamic Probes indicate that an allowable bearing pressure of at least 125 kN/sq.m. can be taken at a depth of 1.00 metre BGL. Conventional reinforced strip or pad foundations will therefore be appropriate for this development with foundations placed 0.70 to 0.80 metres BGL.

At one probe location (DP02) a reduction in soil strength was noted between 1.60 and 1.80 metres. The overlying soils are stiff and consideration could be given to founding at 0.70 metres with a reduced bearing pressure of 75 kN/sq.m. to avoid overstressing the weaker underlying zone.

Alternatively foundations in this area could be deepened to 1.80 metres to achieve the higher allowable bearing pressure.

The sub soils increase in strength with depth and results indicate an allowable bearing pressure of 250 kN/sq.m. on the soils below 2.00 metres.

Careful visual inspection of foundation excavations is advised to ensure uniformity and suitability of the founding medium. This is particularly relevant given the variation noted at DP02.

PERCOLATION

Testing to BRE Digest 365 was carried out at five location with relatively low infiltration available in the gravelly boulder clay formation. An average infiltration rate (f) of 0.00050 metres/minute has been obtained.

ENVIRONMENTAL

CONCRETE

IGSL/JC
November 2018

Appendix I Boring Records

GEOTECHNICAL BORING RECORD

REPORT NUMBER 21345

CONTRACT	Rathmullen,Drogheda,Co.Louth	BOREHOLE NO.	BH01
		SHEET	Sheet 1 of 1
CO-ORDINATES	RIG TYPE Dando 2000	DATE COMMENCED	02/11/2018
GROUND LEVEL (m AOD)	BOREHOLE DIAMETER (mm) 200 BOREHOLE DEPTH (m) 4.20	DATE COMPLETED	05/11/2018
CLIENT	SPT HAMMER REF. NO.	BORED BY	W.Cahill
ENGINEER Waterman Moylan	ENERGY RATIO (%)	PROCESSED BY	F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples: Ref. Number	Sample Type	Depth (m)	Recovery	Field Test Results	Standpipe Details
0	TOPSOIL/subsoil			0.30						
	Firm light brown sandy SILT/CLAY with some gravel and occasional cobbles				AA11709	B	1.00		N = 10 (2, 2, 3, 3, 2, 2)	
1				1.80						
	Stiff to very stiff dark brown sandy SILT/CLAY with grvael and occasional cobbles and boulders				AA11710	B	2.00		N = 21 (4, 4, 5, 5, 5, 6)	
2										
					AA11711	B	3.00		N = 33 (5, 5, 7, 9, 7, 10)	
3										
				4.20	AA11712	B	4.00		N = 48/75 mm (15, 10, 48)	
4	Obstruction End of Borehole at 4.20 m									
5										
6										
7										
8										
9										

HARD STRATA BORING/CHISELLING

From (m)	To (m)	Time (h)	Comments
4	4.2	2	

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike

GROUNDWATER PROGRESS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

REMARKS Cat scanned location and hand dug inspection pit carried out.

Sample Legend
D - Small Disturbed (tub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

IGSL BH LOG 21345.GPJ IGSL.GDT 14/11/18

GEOTECHNICAL BORING RECORD

REPORT NUMBER 21345

CONTRACT	Rathmullen,Drogheda,Co.Louth	**BOREHOLE NO.**	**BH01A**
		SHEET	Sheet 1 of 1
CO-ORDINATES	**RIG TYPE** Dando 2000	**DATE COMMENCED**	02/11/2018
GROUND LEVEL (m AOD)	**BOREHOLE DIAMETER (mm)** 200	**DATE COMPLETED**	05/11/2018
	BOREHOLE DEPTH (m) 6.20		
CLIENT	**SPT HAMMER REF. NO.**	**BORED BY**	W.Cahill
ENGINEER Waterman Moylan	**ENERGY RATIO (%)**	**PROCESSED BY**	F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples: Ref. Number	Sample Type	Depth (m)	Recovery	Field Test Results	Standpipe Details
0	TOPSOIL/subsoil			0.30						
	firm light brown sandy SILT/CLAY with some gravel and occasional cobbles			1.80	AA10561	B	1.00		N = 11 (2, 3, 2, 3, 3, 3)	
2	Stiff to very stiff dark brown sandy SILT/CLAY with grvael and occasional cobbles and boulders			3.60	AA10562	B	2.00		N = 21 (4, 6, 4, 6, 5, 6)	
					AA10563	B	3.00		N = 31 (5, 4, 5, 6, 9, 11)	
4	Dense grey/brown fine to coarse clayey GRAVEL with cobbles and some boulders			4.20	AA10564	B	4.00		N = 42 (6, 6, 9, 9, 10, 14)	
	Very stiff dark brown SILT			4.50						
5	Very stiff dark brown very gravelly SILT/CLAY with cobbbles and occasional boulders				AA10565	B	5.00		N = 41 (5, 7, 9, 9, 11, 12)	
6				6.20	AA10566	B	6.00		N = 50/75 mm (7, 18, 50)	
	Obstruction End of Borehole at 6.20 m									
7										
8										
9										

HARD STRATA BORING/CHISELLING

From (m)	To (m)	Time (h)	Comments
3.5	3.7	0.75	
6	6.2	2	

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike

GROUNDWATER PROGRESS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

REMARKS Cat scanned location and hand dug inspection pit carried out.

Sample Legend
D - Small Disturbed (tub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

IGSL BH LOG 21345.GPJ IGSL.GDT 14/11/18

GEOTECHNICAL BORING RECORD

REPORT NUMBER 21345

CONTRACT	Rathmullen,Drogheda,Co.Louth	BOREHOLE NO.	BH02
		SHEET	Sheet 1 of 1
CO-ORDINATES	RIG TYPE Dando 2000	DATE COMMENCED	06/11/2018
GROUND LEVEL (m AOD)	BOREHOLE DIAMETER (mm) 200	DATE COMPLETED	06/11/2018
	BOREHOLE DEPTH (m) 6.50		
CLIENT	SPT HAMMER REF. NO.	BORED BY	W.Cahill
ENGINEER Waterman Moylan	ENERGY RATIO (%)	PROCESSED BY	F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples: Ref. Number	Sample Type	Depth (m)	Recovery	Field Test Results	Standpipe Details
0	TOPSOIL			0.15						
	Subsoil			0.35						
	Firm to stiff light brown sandy SILT/CLAY with gravel and occasional cobbles				AA105601	B	1.00		N = 18 (2, 3, 3, 4, 6, 5)	
1										
					AA105602	B	2.00		N = 16 (3, 3, 4, 4, 4, 4)	
2				2.90						
	Very stiff to hard light brown sandy SILT/CLAY with gravel,cobbles and some boulders				AA105603	B	3.00		N = 35 (5, 6, 6, 8, 10, 11)	
3										
					AA105604	B	4.00		N = 51 (6, 9, 11, 13, 14, 13)	
4										
					AA105605	B	5.00		N = 53 (11, 13, 10, 9, 19, 15)	
5										
					AA105606	B	6.00		N = 50/75 mm (25, 50)	
6				6.50						
	Obstruction End of Borehole at 6.50 m									
7										
8										
9										

HARD STRATA BORING/CHISELLING

From (m)	To (m)	Time (h)	Comments
4.2	4.5	0.75	
5.4	5.6	1	
6.3	6.5	2	

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike

GROUNDWATER PROGRESS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

REMARKS Cat scanned location and hand dug inspection pit carried out.

Sample Legend
D - Small Disturbed (tub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

IGSL BH LOG 21345.GPJ IGSL.GDT 14/11/18

GEOTECHNICAL BORING RECORD

REPORT NUMBER 21345

CONTRACT	Rathmullen,Drogheda,Co.Louth	**BOREHOLE NO.**	**BH03**
		SHEET	Sheet 1 of 1
CO-ORDINATES	**RIG TYPE** Dando 2000	**DATE COMMENCED**	12/11/2018
GROUND LEVEL (m AOD)	**BOREHOLE DIAMETER (mm)** 200	**DATE COMPLETED**	12/11/2018
	BOREHOLE DEPTH (m) 7.50		
CLIENT	**SPT HAMMER REF. NO.**	**BORED BY**	W.Cahill
ENGINEER Waterman Moylan	**ENERGY RATIO (%)**	**PROCESSED BY**	F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples: Ref. Number	Sample Type	Depth (m)	Recovery	Field Test Results	Standpipe Details
0	TOPSOIL/subsoil			0.20						
1	Firm dark brown sandy SILT/CLAY with some gravel and occasional cobbles			1.60	AA105620	B	1.00		N = 15 (2, 2, 2, 3, 3, 7)	
2	Stiff light brown sandy SILT/CLAY with gravel and some cobbles and boulders				AA105621	B	2.00		N = 22 (2, 3, 4, 5, 6, 7)	
3				3.20	AA105622	B	3.00		N = 36 (4, 6, 8, 8, 9, 11)	
4	Very stiff light brown sandy SILT/CLAY with gravel and some cobbles and boulders				AA105623	B	4.00		N = 50 (7, 9, 12, 11, 12, 15)	
5					AA105624	B	5.00		N = 23 (4, 4, 4, 6, 6, 7)	
6					AA105625	B	6.00		N = 30 (5, 6, 7, 7, 8, 8)	
7				7.50	AA105626	B	7.00		N = 50/150 mm (8, 14, 16, 34)	
8	Obstruction End of Borehole at 7.50 m									
9										

HARD STRATA BORING/CHISELLING

From (m)	To (m)	Time (h)	Comments
4.3	4.5	0.75	
7.2	7.5	2	

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike

GROUNDWATER PROGRESS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

REMARKS Cat scanned location and hand dug inspection pit carried out.

Sample Legend
D - Small Disturbed (tub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

IGSL BH LOG 21345.GPJ IGSL.GDT 14/11/18

GEOTECHNICAL BORING RECORD

REPORT NUMBER 21345

CONTRACT	Rathmullen,Drogheda,Co.Louth	BOREHOLE NO.	BH04
		SHEET	Sheet 1 of 1
CO-ORDINATES		RIG TYPE	Dando 2000
		BOREHOLE DIAMETER (mm)	200
GROUND LEVEL (m AOD)		BOREHOLE DEPTH (m)	8.50
		DATE COMMENCED	09/11/2018
		DATE COMPLETED	09/11/2018
CLIENT		SPT HAMMER REF. NO.	
ENGINEER	Waterman Moylan	ENERGY RATIO (%)	
		BORED BY	W.Cahill
		PROCESSED BY	F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples: Ref. Number	Sample Type	Depth (m)	Recovery	Field Test Results	Standpipe Details
0	Soft dark brown sandy SILT/CLAY with some gravel (subsoil)			0.20						
	Firm to stiff light brown sandy SILT/CLAY with gravel and some cobbles and boulders				AA105612	B	1.00		N = 17 (2, 4, 3, 5, 5, 4)	
1										
					AA105613	B	2.00		N = 21 (3, 2, 4, 4, 4, 9)	
2										
					AA105614	B	3.00		N = 25 (3, 5, 4, 5, 7, 9)	
3				3.30						
	Very stiff brown gravelly CLAY with cobbles				AA105615	B	4.00		N = 31 (6, 5, 7, 7, 9, 8)	
4										
					AA105616	B	5.00		N = 33 (5, 5, 5, 5, 8, 15)	
5				5.80						
	Stiff light brown sandy SILT/CLAY with gravel				AA105617	B	6.00		N = 24 (3, 6, 4, 5, 5, 10)	
6				6.80						
	Very stiff mottled light and dark brown sandy SILT/CLAY with gravel and angular cobbles				AA105618	B	7.00		N = 35 (8, 7, 9, 10, 8, 8)	
7										
					AA105619	B	8.00		N = 50/150 mm (8, 7, 15, 35)	
8				8.50						
	Obstruction End of Borehole at 8.50 m									
9										

HARD STRATA BORING/CHISELLING

From (m)	To (m)	Time (h)	Comments
5.4	5.6	0.5	
8.3	8.5	2	

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike

GROUNDWATER PROGRESS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

REMARKS Cat scanned location and hand dug inspection pit carried out.

Sample Legend
D - Small Disturbed (tub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

IGSL BH LOG 21345.GPJ IGSL.GDT 14/11/18

GEOTECHNICAL BORING RECORD

REPORT NUMBER 21345

CONTRACT	Rathmullen,Drogheda,Co.Louth	**BOREHOLE NO.**	**BH05**
		SHEET	Sheet 1 of 1
CO-ORDINATES	**RIG TYPE** Dando 2000	**DATE COMMENCED**	07/11/2018
GROUND LEVEL (m AOD)	**BOREHOLE DIAMETER (mm)** 200	**DATE COMPLETED**	07/11/2018
	BOREHOLE DEPTH (m) 5.80		
CLIENT	**SPT HAMMER REF. NO.**	**BORED BY**	W.Cahill
ENGINEER Waterman Moylan	**ENERGY RATIO (%)**	**PROCESSED BY**	F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples: Ref. Number	Sample Type	Depth (m)	Recovery	Field Test Results	Standpipe Details
0	TOPSOIL/subsoil			0.25						
1	Firm to stiff light brown sandy SILT/CLAY with gravel,cobbles and occasional boulders			1.90	AA105607	B	1.00		N = 18 (2, 3, 3, 4, 5, 6)	
2	Very stiff dark brown sandy SILT/CLAY with gravel,cobbles and occasional boulders				AA105608	B	2.00		N = 30 (3, 4, 5, 7, 9, 9)	
3					AA105609	B	3.00		N = 50/225 mm (8, 12, 14, 15, 21)	
4					AA105610	B	4.00		N = 36 (6, 9, 9, 10, 9, 8)	
5					AA105611	B	5.00		N = 31 (2, 4, 5, 7, 7, 12)	
6	Obstruction End of Borehole at 5.80 m			5.80					N = 50/225 mm (12, 13, 16, 15, 19)	
7										
8										
9										

HARD STRATA BORING/CHISELLING

From (m)	To (m)	Time (h)	Comments
3.1	3.3	0.75	
5.6	5.8	2	

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike

GROUNDWATER PROGRESS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

REMARKS Cat scanned location and hand dug inspection pit carried out.

Sample Legend
D - Small Disturbed (tub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

IGSL BH LOG 21345.GPJ IGSL.GDT 14/11/18

Appendix II Trial Pit Records

TRIAL PIT RECORD

REPORT NUMBER 21345

CONTRACT 21345	TRIAL PIT NO. TP01
	SHEET Sheet 1 of 1
LOGGED BY TOS	CO-ORDINATES
	DATE STARTED 05/11/2018
	DATE COMPLETED 05/11/2018
CLIENT	GROUND LEVEL (m)
ENGINEER Waterman Moylan	EXCAVATION METHOD JCB 3CX

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.30							
Firm / stiff brown sandy gravelly CLAY with medium cobble content / low boulder content. Sand is fine to coarse gravel is angular / subangular of grey limestone					AA104513	B	0.50		
1.0									
Compact very gravelly SAND with medium cobble content and medium boulder content. Sand is fine to coarse gravel is subangular / subrounded fine to coarse of grey limestone		1.30			AA104514	B	1.50		
2.0									
End of Trial Pit at 2.60m		2.60			AA104515	B	2.50		
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Good

General Remarks
Trial pit terminated at 2.6 due to refusal in Boulders

IGSL TP LOG 21345.GPJ IGSL.GDT 19/11/18

TRIAL PIT RECORD

REPORT NUMBER 21345

CONTRACT 21345	TRIAL PIT NO. TP02
	SHEET Sheet 1 of 1
LOGGED BY TOS	CO-ORDINATES
	DATE STARTED 05/11/2018
	DATE COMPLETED 05/11/2018
CLIENT	GROUND LEVEL (m)
ENGINEER Waterman Moylan	EXCAVATION METHOD JCB 3CX

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL					AA104510	B	0.20		
		0.35							
Firm / stiff orange brown slightly gravelly sandy CLAY. Sand is fine to coarse gravel is angular / subangular fine to coarse of dark grey limestone					AA104511	B	0.50		
1.0									
		1.30							
Compact BOULDERS and COBBLES with gravelly very sandy clay. Sand is fine to coarse gravel is angular / subangular fine to coarse of grey limestone					AA104512	B	1.50		
2.0									
		2.30							
End of Trial Pit at 2.30m									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Good

General Remarks
Trial pit terminated at 2.3 due to refusal in Boulders

IGSL TP LOG 21345.GPJ IGSL.GDT 19/11/18

TRIAL PIT RECORD

REPORT NUMBER 21345

CONTRACT 21345	TRIAL PIT NO. TP03
	SHEET Sheet 1 of 1
LOGGED BY TOS	CO-ORDINATES
	DATE STARTED 05/11/2018
	DATE COMPLETED 05/11/2018
CLIENT	GROUND LEVEL (m)
ENGINEER Waterman Moylan	EXCAVATION METHOD JCB 3CX

	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	TOPSOIL									
	Firm / stiff brown slightly gravelly sandy CLAY with low cobble content. Sand is fine to coarse gravel is subangular / subrounded fine to coarse of grey limestone		0.30			AA104506	B	0.50		
1.0	Compact very gravelly SAND with medium cobble content and medium boulder content. Sand is fine to coarse gravel is subangular / subrounded fine to coarse of grey limestone		1.00			AA104507	B	1.20		
2.0						AA104508	B	2.00		
3.0	End of Trial Pit at 3.00m		3.00			AA104509	B	3.00		
4.0										

Groundwater Conditions
Dry

Stability
Good

General Remarks
Trial pit terminated at scheduled depth

IGSL TP LOG 21345.GPJ IGSL.GDT 19/11/18

TRIAL PIT RECORD

REPORT NUMBER 21345

CONTRACT 21345		TRIAL PIT NO.	TP04
		SHEET	Sheet 1 of 1
LOGGED BY TOS	CO-ORDINATES	DATE STARTED	05/11/2018
		DATE COMPLETED	05/11/2018
CLIENT	GROUND LEVEL (m)	EXCAVATION METHOD	JCB 3CX
ENGINEER Waterman Moylan			

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL									
Firm / stiff orange brown slightly gravelly sandy CLAY. Sand is fine to coarse gravel is angular / subangular fine to coarse of dark grey limestone		0.30			AA104503	B	0.20		
					AA104504	B	0.50		
1.0									
Compact BOULDERS and COBBLES with gravelly very sandy clay. Sand is fine to coarse gravel is angular / subangular fine to coarse of grey limestone		1.50			AA104505	B	1.60		
2.0									
End of Trial Pit at 2.30m		2.30							
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Good

General Remarks
Trial pit terminated at 2.3 due to slow progress in compact boulders and cobbles

TRIAL PIT RECORD

REPORT NUMBER 21345

CONTRACT 21345	TRIAL PIT NO. TP05
	SHEET Sheet 1 of 1
LOGGED BY TOS	CO-ORDINATES
	DATE STARTED 05/11/2018
	DATE COMPLETED 05/11/2018
CLIENT	GROUND LEVEL (m)
ENGINEER Waterman Moylan	EXCAVATION METHOD JCB 3CX

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL									
Firm / stiff orange brown slightly gravelly sandy CLAY. Sand is fine to coarse gravel is angular / subangular fine to coarse of dark grey limestone		0.40			AA104501	B	0.50		
1.0 Compact BOULDERS and COBBLES with gravelly very sandy clay. Sand is fine to coarse gravel is angular / subangular fine to coarse of grey limestone		1.00			AA104502	B	1.20		
End of Trial Pit at 1.60m		1.60							
2.0									
3.0									
4.0									

Groundwater Conditions
Dry

Stability
Good

General Remarks
Trial pit terminated at 1.6 due to slow progress in compact boulders and cobbles

IGSL TP LOG 21345.GPJ IGSL.GDT 19/11/18

Appendix III Probe Records

DYNAMIC PROBE RECORD

REPORT NUMBER 21345

CONTRACT	Rathmullen , Drogheda , Co.Louth	PROBE NO.	DP01
		SHEET	Sheet 1 of 1
CO-ORDINATES		DATE DRILLED	05/11/2018
GROUND LEVEL (mOD)	HAMMER MASS (kg) 50	DATE LOGGED	05/11/2018
CLIENT	INCREMENT SIZE (mm) 100		
ENGINEER Waterman Moylan	FALL HEIGHT (mm) 500	PROBE TYPE	DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0						0.00	0
						0.10	3
						0.20	4
						0.30	4
						0.40	5
						0.50	8
						0.60	8
						0.70	5
						0.80	5
						0.90	5
1.0						1.00	6
						1.10	6
						1.20	7
						1.30	5
						1.40	4
						1.50	5
						1.60	4
						1.70	4
						1.80	2
						1.90	11
2.0						2.00	11
						2.10	11
						2.20	14
						2.30	20
						2.40	25
	End of Probe at 2.50 m						
3.0							
4.0							

Graphic Probe Record: 0 5 10 15 20 25

GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 21345.GPJ IGSL.GDT 6/11/18

DYNAMIC PROBE RECORD

REPORT NUMBER 21345

CONTRACT	Rathmullen , Drogheda , Co.Louth	PROBE NO.	DP02
		SHEET	Sheet 1 of 1
CO-ORDINATES		DATE DRILLED	05/11/2018
GROUND LEVEL (mOD)	HAMMER MASS (kg) 50	DATE LOGGED	05/11/2018
CLIENT	INCREMENT SIZE (mm) 100		
ENGINEER Waterman Moylan	FALL HEIGHT (mm) 500	PROBE TYPE	DPH

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0						0.00	0
						0.10	0
						0.20	1
						0.30	5
						0.40	4
						0.50	3
						0.60	5
						0.70	6
						0.80	7
						0.90	6
1.0						1.00	6
						1.10	4
						1.20	4
						1.30	3
						1.40	3
						1.50	2
						1.60	2
						1.70	1
						1.80	2
						1.90	6
2.0						2.00	10
						2.10	11
						2.20	9
						2.30	9
						2.40	11
						2.50	14
						2.60	16
						2.70	16
						2.80	18
						2.90	19
3.0	End of Probe at 3.10 m					3.00	25
4.0							

Graphic Probe Record: 0 5 10 15 20 25

GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 21345.GPJ IGSL.GDT 6/11/18

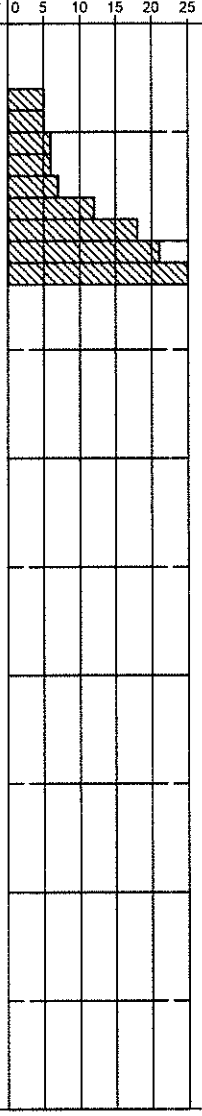
DYNAMIC PROBE RECORD

REPORT NUMBER 21345

CONTRACT	Rathmullen , Drogheda , Co.Louth	PROBE NO.	DP03
		SHEET	Sheet 1 of 1
CO-ORDINATES		DATE DRILLED	05/11/2018
GROUND LEVEL (mOD)	HAMMER MASS (kg) 50	DATE LOGGED	05/11/2018
CLIENT	INCREMENT SIZE (mm) 100	PROBE TYPE	DPH
ENGINEER Waterman Moylan	FALL HEIGHT (mm) 500		

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0	.					0.00	0
						0.10	0
						0.20	0
						0.30	5
						0.40	5
						0.50	6
						0.60	6
						0.70	7
						0.80	12
						0.90	18
1.0						1.00	21
						1.10	25
	End of Probe at 1.20 m						
2.0							
3.0							
4.0							

Graphic Probe Record



GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 21345.GPJ IGSL.GDT 6/11/18

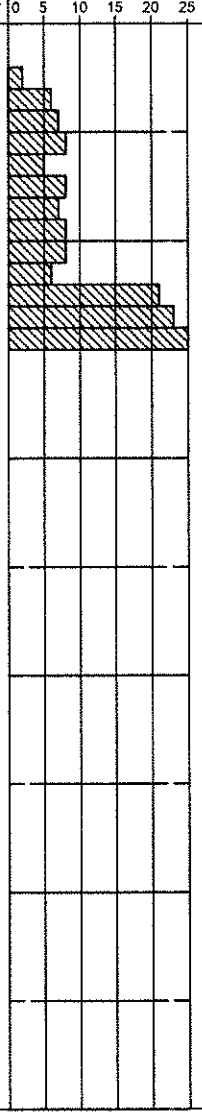
DYNAMIC PROBE RECORD

REPORT NUMBER 21345

CONTRACT	Rathmullen , Drogheda , Co.Louth	PROBE NO.	DP04
		SHEET	Sheet 1 of 1
CO-ORDINATES		DATE DRILLED	05/11/2018
GROUND LEVEL (mOD)	HAMMER MASS (kg) 50	DATE LOGGED	05/11/2018
CLIENT	INCREMENT SIZE (mm) 100	PROBE TYPE	DPH
ENGINEER Waterman Moylan	FALL HEIGHT (mm) 500		

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0	.					0.00	0
						0.10	0
						0.20	2
						0.30	6
						0.40	7
						0.50	8
						0.60	5
						0.70	8
						0.80	7
						0.90	8
1.0						1.00	8
						1.10	6
						1.20	21
						1.30	23
						1.40	25
	End of Probe at 1.50 m						
2.0							
3.0							
4.0							

Graphic Probe Record



GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 21345.GPJ IGSL.GDT 6/11/18

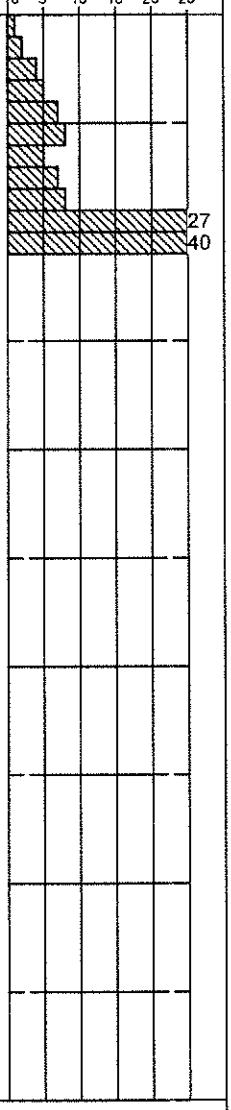
DYNAMIC PROBE RECORD

REPORT NUMBER 21345

CONTRACT	Rathmullen , Drogheda , Co.Louth	PROBE NO.	DP05
		SHEET	Sheet 1 of 1
CO-ORDINATES		DATE DRILLED	05/11/2018
GROUND LEVEL (mOD)	HAMMER MASS (kg) 50	DATE LOGGED	05/11/2018
CLIENT	INCREMENT SIZE (mm) 100	PROBE TYPE	DPH
ENGINEER Waterman Moylan	FALL HEIGHT (mm) 500		

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation (mOD)	Water	Depth (m)	Probe Readings (Blows/Increment)
0.0						0.00	1
						0.10	2
						0.20	4
						0.30	5
						0.40	7
						0.50	8
						0.60	5
						0.70	7
						0.80	8
						0.90	27
1.0						1.00	40
	End of Probe at 1.10 m						
2.0							
3.0							
4.0							

Graphic Probe Record



GROUNDWATER OBSERVATIONS

REMARKS

IGSL DP LOG 100MM INCREMENTS 21345.GPJ IGSL.GDT 6/11/18

Appendix IV BRE Digest 365

Soakaway Design f -value from field tests (F2C) IGSL

Contract: Rathmullan, Drogheda Contract No. 21345
Test No. SA01
Client Waterman Moylan
Date: 06/11/2018

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL	
0.30	1.50	Firm / stiff brown slightly gravelly sandy CLAY with medium cobble	
		content	

Notes:

Field Data

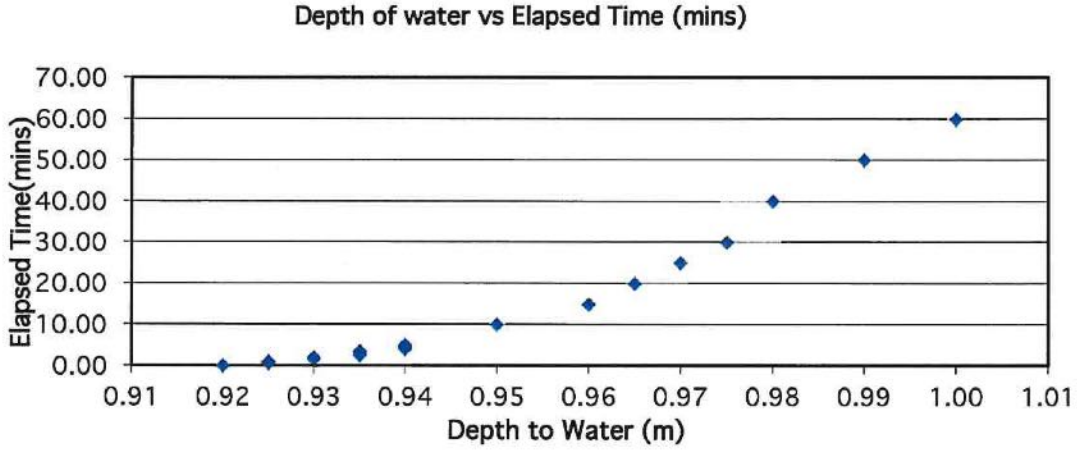
Depth to Water (m)	Elapsed Time (min)
0.92	0.00
0.93	0.50
0.93	1.00
0.93	1.50
0.93	2.00
0.94	2.50
0.94	3.00
0.94	3.50
0.94	4.00
0.94	4.50
0.94	5.00
0.95	10.00
0.96	15.00
0.97	20.00
0.97	25.00
0.98	30.00
0.98	40.00
0.99	50.00
1.00	60.00

Field Test

Depth of Pit (D)	1.50	m
Width of Pit (B)	1.50	m
Length of Pit (L)	1.80	m
Initial depth to Water =	0.92	m
Final depth to water =	1.00	m
Elapsed time (mins)=	60.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	2.7	m2
*Av. side area of permeable stratum over test period=	3.564	m2
Total Exposed area =	6.264	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00057 m/min or 9.5785E-06 m/sec



Soakaway Design f -value from field tests (F2C) IGSL

Contract: Rathmullan, Drogheda Contract No. 21345
Test No. SA02
Client Waterman Moylan
Date: 06/11/2018

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL	
0.30	1.50	Firm / stiff brown slightly gravelly sandy CLAY with medium cobble	
		content	

Notes:

Field Data

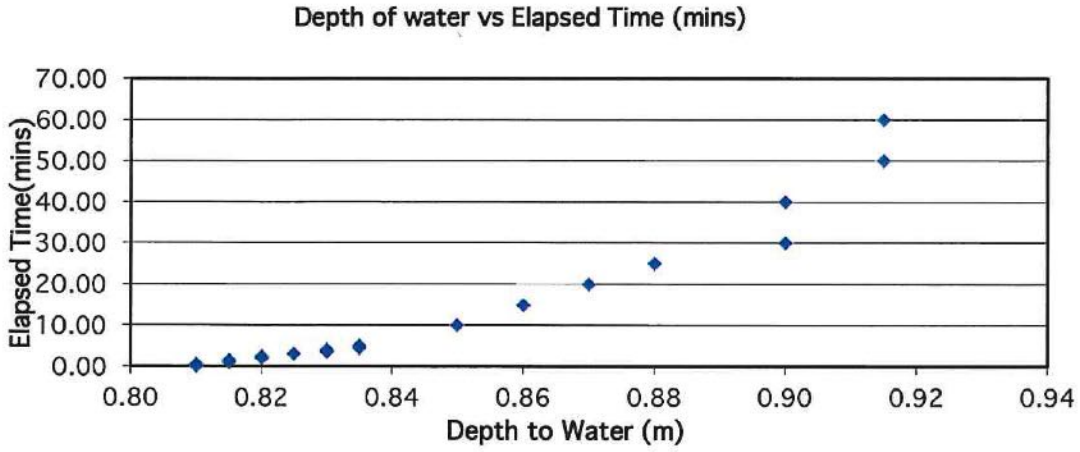
Depth to Water (m)	Elapsed Time (min)
0.81	0.00
0.81	0.50
0.82	1.00
0.82	1.50
0.82	2.00
0.82	2.50
0.83	3.00
0.83	3.50
0.83	4.00
0.84	4.50
0.84	5.00
0.85	10.00
0.86	15.00
0.87	20.00
0.88	25.00
0.90	30.00
0.90	40.00
0.92	50.00
0.92	60.00

Field Test

Depth of Pit (D)	1.50	m
Width of Pit (B)	1.50	m
Length of Pit (L)	1.80	m
Initial depth to Water =	0.81	m
Final depth to water =	0.92	m
Elapsed time (mins)=	60.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	2.7	m2
*Av. side area of permeable stratum over test period=	4.2075	m2
Total Exposed area =	6.9075	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00068 m/min or 1.1401E-05 m/sec



Soakaway Design f -value from field tests (F2C) IGSL

Contract: Rathmullan, Drogheda Contract No. 21345
Test No. SA03
Client Waterman Moylan
Date: 06/11/2018

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL	
0.30	1.50	Firm / stiff brown slightly gravelly sandy CLAY	

Notes:

Field Data

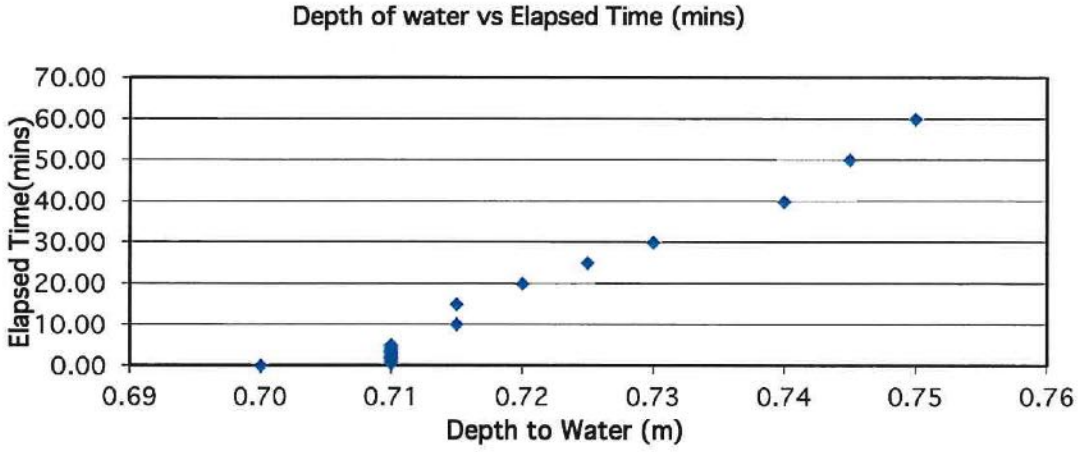
Depth to Water (m)	Elapsed Time (min)
0.70	0.00
0.71	0.50
0.71	1.00
0.71	1.50
0.71	2.00
0.71	2.50
0.71	3.00
0.71	3.50
0.71	4.00
0.71	4.50
0.71	5.00
0.72	10.00
0.72	15.00
0.72	20.00
0.73	25.00
0.73	30.00
0.74	40.00
0.75	50.00
0.75	60.00

Field Test

Depth of Pit (D)	1.50	m
Width of Pit (B)	1.50	m
Length of Pit (L)	1.80	m
Initial depth to Water =	0.70	m
Final depth to water =	0.75	m
Elapsed time (mins)=	60.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	2.7	m2
*Av. side area of permeable stratum over test period=	5.115	m2
Total Exposed area =	7.815	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00029 m/min or 4.7985E-06 m/sec



Soakaway Design f -value from field tests (F2C) IGSL

Contract: Rathmullan, Drogheda Contract No. 21345
Test No. SA04
Client Waterman Moylan
Date: 06/11/2018

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL	
0.30	1.50	Firm / stiff brown slightly gravelly sandy CLAY	

Notes:

Field Data

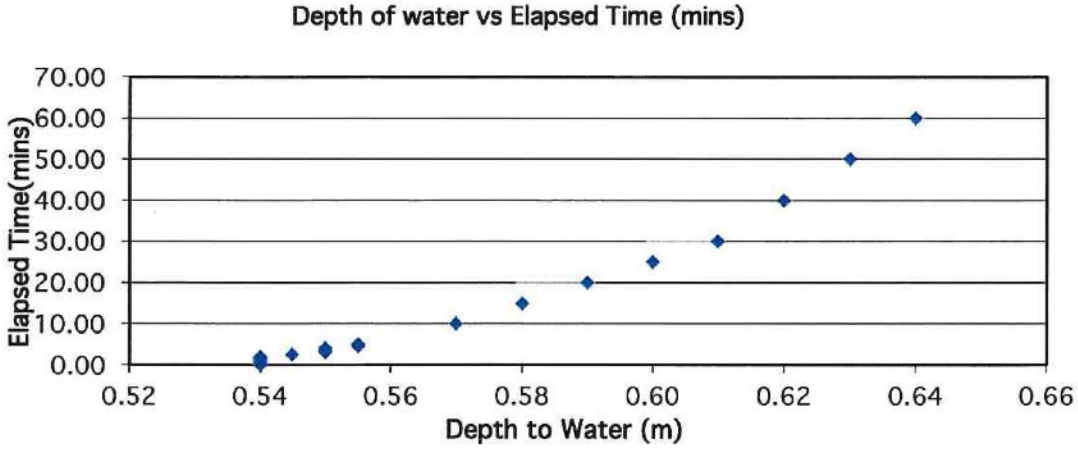
Depth to Water (m)	Elapsed Time (min)
0.54	0.00
0.54	0.50
0.54	1.00
0.54	1.50
0.54	2.00
0.55	2.50
0.55	3.00
0.55	3.50
0.55	4.00
0.56	4.50
0.56	5.00
0.57	10.00
0.58	15.00
0.59	20.00
0.60	25.00
0.61	30.00
0.62	40.00
0.63	50.00
0.64	60.00

Field Test

Depth of Pit (D)	1.50	m
Width of Pit (B)	1.50	m
Length of Pit (L)	1.80	m
Initial depth to Water =	0.54	m
Final depth to water =	0.64	m
Elapsed time (mins)=	60.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	2.7	m2
*Av. side area of permeable stratum over test period=	6.006	m2
Total Exposed area =	8.706	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00052 m/min or 8.6147E-06 m/sec



Soakaway Design f -value from field tests (F2C) IGSI

Contract: Rathmullan, Drogheda Contract No. 21345
Test No. SA05
Client Waterman Moylan
Date: 06/11/2018

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL	
0.30	1.30	Firm / stiff orange brown slightly gravelly sandy CLAY	

Notes: Refusal at 1.3 due to cobble

Field Data

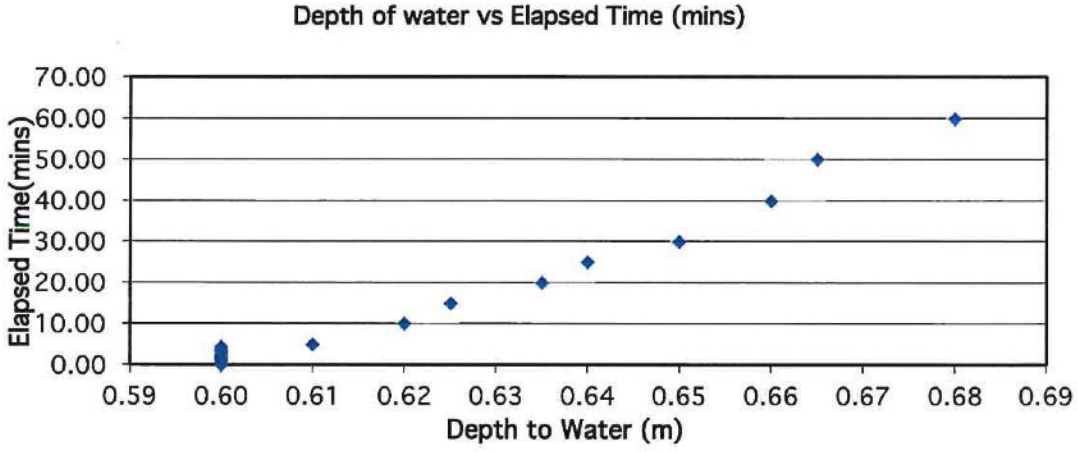
Depth to Water (m)	Elapsed Time (min)
0.60	0.00
0.60	0.50
0.60	1.00
0.60	1.50
0.60	2.00
0.60	2.50
0.60	3.00
0.60	3.50
0.60	4.00
0.60	4.50
0.61	5.00
0.62	10.00
0.63	15.00
0.64	20.00
0.64	25.00
0.65	30.00
0.66	40.00
0.67	50.00
0.68	60.00

Field Test

Depth of Pit (D)	1.30	m
Width of Pit (B)	1.50	m
Length of Pit (L)	1.80	m
Initial depth to Water =	0.60	m
Final depth to water =	0.68	m
Elapsed time (mins)=	60.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	2.7	m2
*Av. side area of permeable stratum over test period=	4.356	m2
Total Exposed area =	7.056	m2

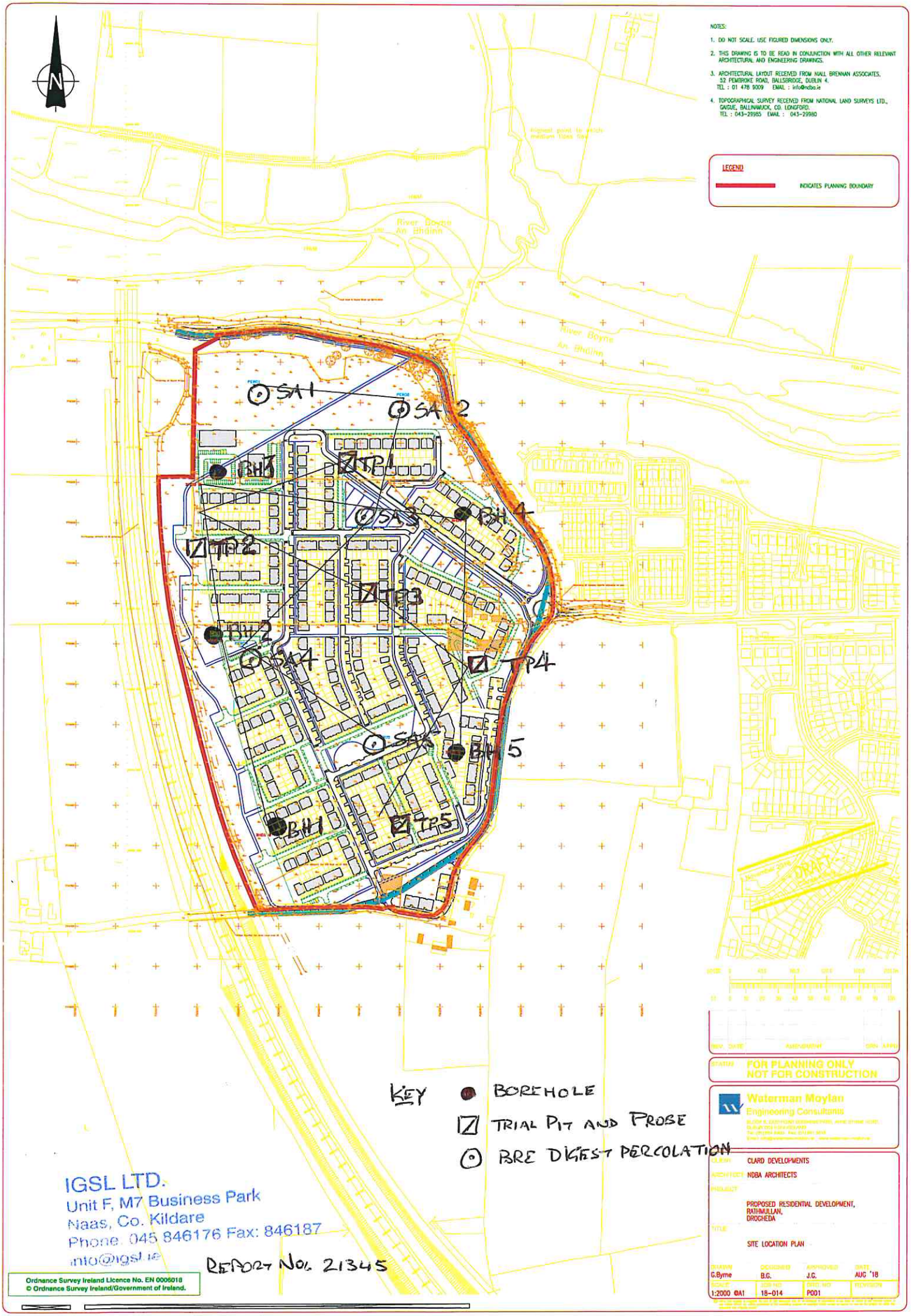
Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00051 m/min or 8.5034E-06 m/sec



Appendix V Laboratory Data

Appendix VI Site Plan


NOTES:
1. DO NOT SCALE. USE FIGURED DIMENSIONS ONLY.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT ARCHITECTURAL AND ENGINEERING DRAWINGS.
3. ARCHITECTURAL LAYOUT RECEIVED FROM HALL BRENNAN ASSOCIATES, 52 PEMBROKE ROAD, BALLSBRIDGE, DUBLIN 4. TEL : 01 478 9009 EMAIL : info@nbbc.ie
4. TOPOGRAPHICAL SURVEY RECEIVED FROM NATIONAL LAND SURVEYS LTD., SAGUE, BALLINAMUCK, CO. LONGFORD. TEL : 043-29955 EMAIL : 043-29980
LEGEND
INDICATES PLANNING BOUNDARY
River Boyne
An Bhóinn
SA1
SA2
SA3
SA4
SA5
BH1
BH2
BH3
BH4
BH5
TP1
TP2
TP3
TP4
TP5
KEY
BOREHOLE
TRIAL PIT AND PROBE
BRE DIGEST PERCOLATION
FOR PLANNING ONLY
NOT FOR CONSTRUCTION
Waterman Moylan
Engineering Consultants
CLIENT CLARD DEVELOPMENTS
ARCHITECT NOBA ARCHITECTS
PROJECT
PROPOSED RESIDENTIAL DEVELOPMENT, RATHMULLAN, DROGHEDA
TITLE
SITE LOCATION PLAN
DRAWN G.Byrne
DESIGNED B.G.
APPROVED J.G.
DATE AUG '18
SCALE 1:2000 @A1
JOB NO 18-014
DWG NO P001
REVISION
IGSL LTD.
Unit F, M7 Business Park
Naas, Co. Kildare
Phone: 045 846176 Fax: 846187
info@igsl.ie
REPORT NO. 21345
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D. Technical Note

TECHNICAL NOTE

Project:	**Rathmullan**	**Job No:**	18-014
Subject:	**Site Investigation**	**Revision:**	
Prepared by:	**J. Gibbons**	**Date:**	27/08/2025
Checked by:	**J. Gibbons**	**Date:**	28/08/2025
Approved by:	**P. O'Connell**	**Date:**	28/08/2025

This note has been prepared as an addendum to the Site Investigation report (Ref number 21345) prepared by IGSL Ltd and dated November 2018.

It is noted that the Site Investigation was carried out some 7 years ago and that the planning application for a Large Scale Residential development is relying upon the findings of the report.

The site investigation report is a factual report providing details of the underlying ground condition on the site at the time of the investigation.

The purpose of this technical note is to confirm that the site has not been changed since the preparation of the report that would give rise to any change in the ground conditions. In this regard Joe Gibbons, Chartered Engineer and Director of Waterman Moylan Consulting Engineers undertook a site inspection to review the site and to determine if there had been any works undertaken on the site which could have changed the underlying ground conditions. The inspection was carried out on Tuesday 27th August 2025. During the inspection a number of photographs were taken which are set out below. Google Earth images were also reviewed for the period between 2018 and 2025 and these are also presented below.

The site is in agricultural use as can be seen in the photographs and google earth images. There have been no works carried out on the site which would have in any way changed the underlying ground conditions. The site investigation report of 2018 would be considered to represent the underlying ground conditions and can still be relied upon.

Google Earth Image - May 2025

Block S, EastPoint Business Park, Alfie Byrne Road, Dublin D03 H3F4
t. 00 353 1 664 8900 **f.** 00 353 1 661 3618 **e.** info@waterman-moylan.ie **w.** www.waterman-moylan.ie

Google Earth Image – June 2024

Google Earth Image – September 2023

Google Earth Image – August 2022

Google Eart Image – July 2021

Block S, EastPoint Business Park, Alfie Byrne Road, Dublin D03 H3F4
t. 00 353 1 664 8900 **f.** 00 353 1 661 3618 **e.** info@waterman-moylan.ie **w.** www.waterman-moylan.ie

Google Earth Image – April 2020

Google Earth Image – June 2019

Block S, EastPoint Business Park, Alfie Byrne Road, Dublin D03 H3F4
t. 00 353 1 664 8900 **f.** 00 353 1 661 3618 **e.** info@waterman-moylan.ie **w.** www.waterman-moylan.ie

Google Earth Image June 2018

Photographs taken during site visit of 27 August 2025

Block S, EastPoint Business Park, Alfie Byrne Road, Dublin D03 H3F4
t. 00 353 1 664 8900 **f.** 00 353 1 661 3618 **e.** info@waterman-moylan.ie **w.** www.waterman-moylan.ie

Block S, EastPoint Business Park, Alfie Byrne Road, Dublin D03 H3F4
t. 00 353 1 664 8900 **f.** 00 353 1 661 3618 **e.** info@waterman-moylan.ie **w.** www.waterman-moylan.ie

In conclusion the site has remained unchanged and has been in agricultural use since 2018. The underlying ground condition would not have changed in the period and the site investigation report can therefore be relied upon despite the fact that it was carried out in 2018.

Block S, EastPoint Business Park, Alfie Byrne Road, Dublin D03 H3F4
t. 00 353 1 664 8900 **f.** 00 353 1 661 3618 **e.** info@waterman-moylan.ie **w.** www.waterman-moylan.ie

UK and Ireland Office Locations

Appendix 7-1

RATHMULLAN ROAD, OLDBRIDGE, DROGHEDA, CO. MEATH

Hydrological and Hydrogeological Risk Assessment Report

Earlsfort Developments Drogheda Limited

Report no.: 1.0, Rev. **1.0**
Document no.: 1.0
Date: 02/09/2025

DOCUMENT CONTROL SHEET

Client	Earlsfort Developments Drogheda Limited
Project Title	Large-Scale Residential Development on Lands at Rathmullan Road, Drogheda, Co. Meath
Document Title	Hydrological and Hydrogeological Risk Assessment Report

Rev.	Status	Author(s)	Reviewed by	Approved by	Issue Date
01	ISSUE	*Nuria Manzanas* *Principal Consultant*	*Warren Vokes* *Senior Consultant*	*Gareth Carroll* *Principal Consultant*	10/07/2025
01	ISSUE	*Nuria Manzanas* *Principal Consultant*	*Warren Vokes* *Senior Consultant*	*Gareth Carroll* *Principal Consultant*	02/09/2025

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The information contained in this Report is based upon information provided by others and upon the assumption that all relevant information has been provided by those parties from whom it has been requested and that such information is accurate. Information obtained by DNV has not been independently verified by DNV, unless otherwise stated in the Report.
The methodology adopted and the sources of information used by DNV in providing its services are outlined in this Report.

The work described in this Report is based on the conditions encountered and the information available during the said period of time. The scope of this Report and the services are accordingly factually limited by these circumstances.

All work carried out in preparing this report has used, and is based upon, DNV's professional knowledge and understanding of the current relevant national legislation. Future changes in applicable legislation may cause the opinion, advice, recommendations or conclusions set out in this report to become inappropriate or incorrect. However, in giving its opinions, advice, recommendations and conclusions, DNV has considered pending changes to environmental legislation and regulations of which it is currently aware. Following delivery of this report, DNV will have no obligation to advise the client of any such changes, or of their repercussions.
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The content of this report represents the professional opinion of experienced environmental consultants. DNV does not provide legal advice or an accounting interpretation of liabilities, contingent liabilities or provisions.

If the scope of work includes subsurface investigation such as boreholes, trial pits and laboratory testing of samples collected from the subsurface or other areas of the site, and environmental or engineering interpretation of such information, attention is drawn to the fact that special risks occur whenever engineering, environmental and related disciplines are applied to identify subsurface conditions. Even a comprehensive sampling and testing programme implemented in accordance with best practice and a professional standard of care may fail to detect certain conditions. Laboratory testing results are not independently verified by DNV and have been assumed to be accurate. The environmental, ecological, geological, geotechnical, geochemical and hydrogeological conditions that DNV interprets to exist between sampling points may differ from those that actually exist. Passage of time, natural

occurrences and activities on and/or near the site may substantially alter encountered conditions.

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1 INTRODUCTION

DNV was appointed by Earlsfort Developments Drogheda Ltd (hereafter referred to as 'the Applicant') to prepare a hydrological and hydrogeological risk assessment (HRA) for the proposed large-scale residential development (LRD) on lands at Rathmullan Road, Oldbridge, Drogheda Co. Meath (referred to hereafter as the 'Proposed Development' and 'site').

1.1 Project Objective

The project objective was to establish the baseline hydrological and hydrogeological conditions at the site and to identify the potential for any effects on receptors associated with the site and the Proposed Development:

- Establish the hydrological and hydrogeological regime and Conceptual Site Model (CSM) at the Proposed Development site.
- Determine if there are any potential effects on the receiving water environmental receptors including those at the site and adjoining downgradient of the site.
- Determine if the Proposed Development could have an effect on any designated and protected Natura 2000 sites hydraulically connected with the site.
- Determine if the Proposed Development could have an effect on the water quality status assigned by the EPA of the receiving water bodies hydraulically connected with the site for the purposes of the Water Framework Directive.

1.2 Project Scope

The scope of the hydrological and hydrogeological assessment included the following tasks:

- A desk-based review of published information and information pertaining to the site and Proposed Development provided by the Applicant.
- Develop a hydrogeological Conceptual-Site-Model and identify any potential source-pathway-receptor linkages.
- Identify and assess any potential effects associated with the Proposed Development on sensitive receptors associated with the receiving water environment.

This assessment is reliant on the design information for the Proposed Development provided by the Applicant.

1.3 Professional Competency

The report was prepared by Nuria Manzanas a Principal Consultant of DNV with over 11 years' experience in preparing hydrogeological assessments. The report was reviewed by Warren Vokes Ba MSc MCIWEM CWEM, a Senior Consultant of EGC. Warren is a Chartered Water and Environmental Manager with over 9 years' experience of preparing environmental and hydrological assessments. The report was approved by Gareth Carroll BA BEng MIEnvSc CEnv, a Principal Consultant of EGC. Gareth is a Chartered Environmentalist (CEnv) with the Institute of Environmental Sciences (IES) with over 12 years' experience of preparing environmental and hydrogeological assessments for a range of project types and geological and hydrogeological site settings and accredited to undertake water framework directive assessments.

2 METHODOLOGY

2.1 Standards and Regulations

The methodology adopted for this assessment takes cognisance of all relevant standards and regulations pertinent to undertaking a hydrological and hydrogeological assessment in particular the following:

- Council Directive 2006/118/EEC, 2006. On the protection of groundwater against pollution and deterioration. European Parliament and the Council of European Communities.
- Commission Directive 2014/80/EU of 20 June 2014 amending Annex II to Directive 2006/118/EC of the European Parliament and of the Council on the protection of groundwater against pollution and deterioration.
- Meath County Council (MCC) Development Plan 2021-2027 (MCC, 2021).
- EU Water Framework Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy with amendments.
- European Communities (Water Policy) Regulations 2003 (S.I. No. 722/2003).
- Environmental Protection Agency, December 2011. Guidance on the Authorisation of Discharges to Groundwater.
- Department of the Environment, Heritage and Local Government, Environmental Protection Agency and Geological Survey of Ireland, 1999. Groundwater Protection Schemes (Groundwater Protection Schemes, 1999).
- Local Government, July 1990. No. 21 of 1990. Local Government (Water Pollution) (Amendment) Act, 1990.
- S.I. No. 9/2010 - European Communities Environmental Objectives (Groundwater) Regulations 2010 and as amended.
- S.I. No. 272/2009 - European Communities Environmental Objectives (Surface Waters) Regulations 2009 and as amended.

2.2 Desk-based Study

A desk-based study was undertaken including a review of relevant information from the following publicly available sources and information provided by the Applicant:

- Ordnance Survey Ireland Online mapping (OSI, 2025).
- Geological Survey of Ireland Online mapping (GSI, 2025).
- Environmental Protection Agency Online mapping (EPA, 2025).
- National Parks & Wildlife Services, Protected Sites Webmapping (NPWS, 2025).
- Relevant drawings and design reports for the Proposed Development provided by the Applicant;
    - Asbestos & Lead Surveying and Testing Consultancy. About Safety Ltd., 2025 (About Safety, 2025). Refurbishment and Demolition. Derelict Farm Buildings, Rathmullan Road, Drogheda, Co. Louth.
    - JBA Consulting, 2025. Rathmullan, Co. Meath. Flood Risk Assessment Draft Report.

- Waterman Moylan Consulting Engineers, 2018. Report on a Site Investigation for a Housing Development at West Drogheda, County Meath. Report No. 21345.
- Waterman Moylan Consulting Engineers, 2025 (WM Engineers, 2025a). Engineering Assessment Report. Proposed Residential Development at Rathmullan, Drogheda, County Meath.
- Waterman Moylan Consulting Engineers, 2025 (WM Engineers, 2025b). Construction Environmental Management Plan Proposed Residential Development at Rathmullan, Drogheda, Co. Meath.
- Waterman Moylan Consulting Engineers, 2025 (WM Engineers, 2025c). Construction Waste Management Plan Proposed Residential Development at Rathmullan, Drogheda, Co. Meath.

2.3 Risk Based Effect Assessment

A risk-based and receptor-focussed approach was adopted to include an assessment of any effect to the receiving hydrological and hydrogeological (water) environment associated with the Proposed Development.

The basis for a risk assessment is the Conceptual Site Model (CSM) or Source-Pathway-Receptor (SPR) model which underpins the Directive 2000/60/EC (Water Framework Directive) amended by Directives 2008/105/EC, 2013/39/EU and 2014/101/EU that has been transposed to Irish legislation as European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003) as amended, as well as EPA guidelines on the protection of groundwater and surface water resources including associated aquatic ecosystems and human health receptors (e.g., groundwater supply users), the EPA Guidance on the Authorisation of Discharges to Groundwater (EPA, 2011) and the EPA Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites (EPA, 2013) on the protection of groundwater and surface water resources including associated aquatic ecosystems and human health receptors (e.g., groundwater supply users).

A risk assessment is undertaken to provide an understanding of the risk associated with the presence of any potentially contaminating materials and/or activities on a Site. This is informed by the assessment of potential for viable pollutant linkage(s) to be present. A pollutant linkage is established when there is a viable or potentially viable **S**ource, a **P**athway and a **R**eceptor (refer to Section 2.4 below).If one or more of the three elements are missing, the exposure pathway is considered incomplete and there is no risk associated with the activity or contaminant source (i.e., a viable means of exposure is not considered to be present or is unlikely to be present).

The objective of the Water Framework Directive (WFD) is no deterioration of the water quality status, and the “prevent or limit” objective is a key element of achieving that WFD status for all water bodies regardless of the water quality status of the water body. The ‘prevent or limit’ objective is a key element to achieving the WFD status and water quality objectives and in principle, prevent or limit measures (i.e., avoidance and mitigation) are the first line of defence in restricting inputs of pollutants from a development (i.e., ‘source’ removal) and any potential effect or deterioration of water quality status or WFD status of the receiving water body.

In this assessment all three elements of the Source-Pathway-Receptor model will be identified to develop a Conceptual Site Model (CSM), and any potential linkages evaluated and

assessed to determine if the development could potentially have an effect upon any identified receptors including Natura 2000 sites as well as the WFD Status of the water bodies associated with the Site.

2.4 Conceptual Site Model

An initial assessment was carried out to define the project in terms of its location, type, and scale, establish the baseline environmental conditions, identify the hydrological setting, and outline the activities associated with the Proposed Development. This assessment also included an initial evaluation of potential environmental impacts.

The information gathered from various sources was compiled into a preliminary Conceptual Site Model (CSM). A CSM is a structured representation of the environmental setting of a site, developed to identify and assess potential risks arising from contamination. It is based on the widely accepted Source–Pathway–Receptor framework used in environmental risk assessment.

The three essential elements of the CSM are described as:

- **Source** – a substance that is in, on, or under the land and has the potential to cause harm or pollution;
- **Pathway** – a transport route or mechanism by which a receptor can be exposed to or affected by a contaminant source; and
- **Receptor** – something that could be adversely affected by a contaminant, such as people, ecological systems, property, or water bodies.

A pollutant linkage is formed when a source, pathway, and receptor are connected in such a way that a particular contaminant can affect a specific receptor via a defined pathway. While each element can exist independently, a risk is only present when all three are linked.

The CSM for the site of the Proposed Development was initially defined during the preliminary assessment and has undergone iterative reviews and updates. These updates incorporated site-specific data obtained through investigations and studies, ensuring that the model accurately reflects the evolving understanding of potential environmental risks.

3 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The Applicant intends to apply for permission for a Large-Scale Residential Development (LRD) on a site of approximately 9.20 hectares (Ha).

The Proposed Development comprises the following:

(i) demolition/removal of all existing farm buildings/structures, and associated hard standing on site;

(ii) construction of a large-scale residential development (LRD) of 249 no. units comprising 170 no. two-storey houses (including 37 no. two-bedroom houses, 111 no. three-bedroom houses and 22 no. four-bedroom houses), 16 no. three-storey duplex buildings (accommodating 16 no. one-bedroom and 16 no. two-bedroom units) and a mix of 8 no. three-storey and 3 no. four-storey apartments blocks accommodating a total of 22 no. one-bedroom and 25 no. two-bedroom apartments);

(iii) construction of a new vehicular entrance and access road off Rathmullan Road with associated junction works and associated internal access road network with pedestrian and cyclist infrastructure;

(iv) provision of a three-storey creche facility (411sq.m) with external play areas at ground and second floors and vehicular/bicycle parking area; and,

(v) all ancillary site and infrastructural works, inclusive of removal of existing vehicular entrances, general landscaping and public open space provision, vehicular parking provision (396 no. spaces in total), bicycle parking, boundary treatments, foul/surface water drainage, attenuation areas, provision of pumping station and provision of an ESB substation, as necessary to facilitate the Proposed Development. Each house will be served by vehicular parking to the front and private amenity space in the form of a rear garden. Each duplex building will be served by vehicular parking to the front and private amenity space in the form of balcony/terrace spaces to the rear. Each apartment block will have shared access to adjoining car parking bays with communal amenity space and bicycle/bin stores provided to the rear and each apartment will be provided with private amenity space in the form of a balcony or terrace. The development includes provision of a landscaped area of public open space to the north of the site, with 2 no. pedestrian/cyclist connections (via the northern/eastern site boundaries) to Rathmullan Road which will be subsequently ceded to Meath County Council.

The layout of the Proposed Development site is presented in Figure 3-1.

Figure 3-1: Proposed Development Site Layout Plan (NDBA, 2025)

3.1 Construction Phase

The construction phase of the Proposed Development will include:

- Removal of topsoil and stockpiled onsite for reuse on completion of the works.
  - The stripping of topsoil will be undertaken on a phased basis so that no area is stripped until such time as works are imminent in that area.
  - Topsoil disturbed during the construction phase will be reused as much as practicable.
  - The surplus excavated topsoil will be removed to a licenced facility.
- Excavation of subsoil will be required to allow the construction of roads, building foundations, drainage, and ancillary services. The maximum excavation depths will be

4.645m, located at the site entrance. This is for drainage in a road area to be cut in at site access.
    - Based on the cut and fill analysis, the volume of cut (i.e., excavated material) is approximately 37,524.04m^3 and the volume of fill is approximately 12,437.84m^3 (refer to Drawing No. RAT-WMX-PH2-00-DR-C-P500 - Cut & Fill Analysis-Sub Base Level submitted with the planning application under separate cover). It is estimated that approximately 25,086.20m^3 of this soil material will be stockpiled temporarily before being removed from site.
    - It is estimated that approximately 6,534.31m^3 of additional soil and subsoil material will be excavated and removed offsite for the construction of the underground attenuation tanks and foul pumping station.
    - It is anticipated that there will be no requirement for the excavation of bedrock during the construction stage of the Proposed Development.
    - Excavated soil and subsoil materials will be reused for engineering fill and landscaping where possible.
- Demolition of the existing farm buildings located within the southeastern boundary of the site. It is noted that asbestos was reported in a number of locations across the buildings.
- Building foundations will consist of a traditional reinforced concrete foundation founded in 100 kPa allowable bearing pressure stratum. The stratum is to be stiff natural ground. Where this stratum is deep, a lean mixed trench will be constructed below the foundations to effectively found in the required stratum. There will be no requirement for piled foundations.
- There will be large quantities of materials brought to the site to facilitate construction such as concrete, concrete blocks, timber, reinforcement, pipework, insulation, fixings, plasterboard, etc.
- Aggregate materials imported to the site (i.e., natural stones and gravel, aggregates, and related fill products) will be sourced from locally available quarries in accordance with the appropriate statutory guidelines.
- Groundwater was not encountered during site investigations which extended to a maximum depth of 8.5mbGL (WM, 2018). Therefore, it is anticipated that excavations for the construction of the Proposed Development will be above groundwater with no requirement for dewatering. However, there may be a requirement for management of surface water (rainwater) within excavations during groundworks.
- Construction of new surface water drainage designed in accordance with the principles and objectives of Sustainable Drainage Systems (SuDS) and the Greater Dublin Sustainable Drainage System (GDSDS) and the requirements of MCC.
- Construction of new foul and mains water connections in accordance with UE Code of Practice for Wastewater Infrastructure 2020 & Standard Details for Wastewater Infrastructure (IW-CDS-5030-03) and UE's Code of Practice for Water Infrastructure (IW-CDS-5020-03).

3.2 Operational Phase

3.2.1 Surface Water Drainage

Surface water runoff from the Proposed Development will be managed in a surface water drainage system designed in accordance with the principles and objectives of:

- Sustainable Drainage Systems (SuDS).
- Meath County Development Plan 2021-2027.
- Greater Dublin Sustainable Drainage Scheme (GDSDS).

As documented in the Engineering Assessment Report (WM, 2025a), it is proposed that the surface water from the Proposed Development will drain via gravity and discharge at a restricted rate into the existing 1200mm culvert adjacent to Rathmullan Road at the northeast of the site. This culvert merges into a ditch on the opposite side of the existing road approximately 120m to the north of the proposed outfall location. The ditch travels northwards for approximately 60m before outfalling into the Boyne Estuary, which is tidal at this location.

The surface water network for the Proposed Development has been divided into two separate catchments, the Northern Catchment and Southern Catchment. These catchments operate in series with runoff from the Southern Catchment flowing into the downstream Northern Catchment area at a restricted rate, equivalent to the existing 1200mm culvert adjacent to Rathmullan Road at the northeast of the site. Excess stormwater will be attenuated and will be restricted via hydrobrakes or similar approved.

- Southern Catchment: It covers a catchment area of approximately 3.019 ha.
  - The total impermeable area is approximately 1.589 ha.
  - The attenuation storage will accommodate the Qbar runoff rate of 10.70 l/s and will be restricted via the hydrobrake manhole with excess runoff stored in an attenuation system located on the central open space.
  - This catchment will outfall into an attenuation system, with an underground attenuation storage capable of accommodating up to 1 in 30 return years (i.e., volume of approximately 896m^3). The excess surface water for the 1 in 100 year storm will be attenuated in the overground detention basin that has a volume of 214.40m^3. The storage required is calculated to be approximately 1057.54m^3. However, the total surface water storage provided within the proposed attenuation system is c. 1,110.4m^3.
  - This catchment outfalls to the downstream Northern Catchment.
- Northern Catchment: It covers a catchment area of approximately 3.167 ha.
  - The total impermeable area is approximately 1.971 ha.
  - The attenuation storage will accommodate the Qbar runoff rate of 11.23 l/s and will be restricted via the hydrobrake manhole with excess runoff stored in the aboveground grass detention basin system.
  - This catchment outfalls to the existing 1200 mm culvert on Rathmullan Road at a restricted rate of 21.93 l/s (total from the Southern and Northern Catchments).
  - The flow from the Southern Catchment and the Northern Catchment will outfall into an attenuation system with an underground attenuation storage whose capacity will hold up to a return year of 1 in 30 years (i.e., volume of 1000m^3). The excess surface water for the 1 in 100 year storm will be attenuated in the overground detention basin (i.e., volume of 311.35m^3) that will be split into two parts that will be interconnected.
  - The total surface water storage within the proposed attenuation system is approximately 1311.35m^3. However, the storage required is calculated to be approximately 1300m^3 (1 in 100 years storm events).
  - This catchment outfalls to the downstream Northern Catchment to the North direction.

The total capacity of the attenuation storage for both catchments is 2,368.89m^3, based on the 100-year storm event with 20% climate change. Both underground attenuation storages are designed to cater the 1 in 30 year storm events to ensure the above ground grass detention basin is dry throughout the year. Once the 1 in 30 year is exceeded, the above ground detention basin will be filled up slowly and dissipate over time.

A SuDS treatment approach has been implemented in accordance with the CIRIA SuDS Manual C753, as required by the GDSDS, to alleviate the detrimental effects of traditional urban storm water drainage practice (i.e., piping runoff of rainfall from developments to the nearest receiving watercourse).

The SuDS elements, which take account of quantity, quality and amenity issues to manage surface water runoff, are summarised as follows:

- Water Butts - utilised within each residential unit for external gardening and wash down use only, which will ensure interception of roof runoff at source.
- Permeable Pavement - allows stormwater runoff to filter through voids in the pavement surface into an underlying stone reservoir, where it is temporarily stored or infiltrated.
- Swales - an infiltration trench is incorporated at the invert of the swales which will encourage surface water to drain directly to ground. Excess water will drain to the surface water network.
- Grass Detention Basin – above ground features located at the green open space areas utilised to restrict the outflow to the greenfield runoff rate.
- Flow control device (e.g. hydrobrake or similar device) – installed at the outfall manhole of each catchment to reduce the flow rate to that of a greenfield site.
- Petrol Interceptor – installed downstream of each flow control device manhole prior to each outfall into the attenuation to ensure primary treatment of any pollutants present.

As documented in the Engineering Assessment Report (WM, 2025a),*'the management train commences with source control through the provision of filter drains. The second stage of the management train, site control, is provided by the introduction of swales, all of which provide a degree of treatment before discharging to the detention basin. The rate of runoff is controlled through the provision of a hydro-brake. The detention basin offers a third stage of treatment, regional control, by slowing the storm water discharge down and removes any additional silt which may remain in the storm water* '.

Surface water drains will be 150mm to 225mm and generally will consist of PVC (to IS 123) or concrete socket and spigot pipes (to IS 6). These drains will be laid to comply with the Requirements of the Building Regulations 2010, and in accordance with the recommendations contained in Section H of the Technical Guidance Documents. In addition, surface water public sewers will be 225 mm to 525 mm and will consist of PVC or concrete socket and spigot pipes (to IS 6) and will be laid strictly in accordance with the requirements of MCC (WM, 2025a).

The layout of the proposed surface water drainage network is presented in WM Drawing No. 18-014-P451 and P452 - Proposed Drainage Layout submitted with the planning application under separate cover. The surface water area catchments are presented in Figure 3-2 and WM Drawing No. P459 also submitted with the planning application under separate cover.

Figure 3-2. Surface Water Catchment Areas (WM, 2025a)

3.2.2 Water Supply

As documented in the Engineering Services Report (WM, 2025a), a new proposed connection will be made to the existing 150mm diameter HPPE watermain located on Rathmullan Road to the east of the site. It is noted that the 150mm diameter HPPE watermain will be upgraded to 200mm diameter as part of the Proposed Development.

A Confirmation of Feasibility (COF) was issued by Uisce Eireann (UE) on 1st of April 2025 (UE COF Reference: CDS24009836). The UE COF confirms the connection is feasible, subject to upgrades including replacing approximately 140m of existing 150mm diameter HPPE watermain with a 200mm diameter watermain and the provision of approximately 50m of new 450mm ID watermain and a Flow Control Valve. All upgrade works will be carried out by UE and funded by the Applicant as part of the connection agreement.

All water supply details will be in accordance with UE's Code of Practice for Water Infrastructure (IW-CDS-5020-03).

The layout of the proposed water supply is presented in WM Drawing No. 18-014-P481 and P482 - Water Supply Layout submitted with the planning application under separate cover.

3.2.3 Foul Drainage

As documented in the Engineering Assessment Report (WM, 2025a), the foul drainage from the site will drain via a network of gravity sewers to a proposed pumping station located at the low point in the northeastern corner of the site. Foul water will be pumped from the proposed pumping station and will outfall to the existing foul water drainage network at the junction of Rathmullan Road and Marley's Lane.

A Confirmation of Feasibility (COF) was issued by UE on 1st of April 2025 (UE COF Reference: CDS24009836). The UE COF confirms the connection is feasible, subject to upgrades. To address the requirements of the UE COF, a proposed new pumping station will replace the adjacent existing old pumping station and will facilitate flows from the adjacent Riverbank and Oldbridge Manor Developments. The Applicant will fund all upgrade works and will ensure that all works are completed in agreement with and to the satisfaction of UE prior to connection.

Foul water sewers within the Proposed Development will be laid to comply with the requirements of the Building Regulations, and in accordance with the recommendations contained in Section H of the Technical Guidance Documents.

In accordance with the Irish Water "Code of Practice for Wastewater Supply", the proposed foul outfall from the site is a 225 mm-diameter pipe laid at a gradient of 1:200, giving a capacity of 32 l/s and therefore has adequate capacity to cater for the flows from the development (WM, 2025a).

The proposed pumping station will be designed in compliance with the Irish Water Code of Practice and Irish Water Standard Details and has provision to cater for foul water storage from the Proposed Development with a total capacity of 261m^3. The pumping station is located with a 20m separation distance from the proposed nearest dwelling. This complies with Section 5.5 of the UE "Code of Practice for Wastewater Supply", which states that a Type 3 pumping stations require a minimum buffer zone of 15m. A control kiosk will be provided adjacent to the pumping station.

The layout of the proposed foul water drainage network is presented in WM Drawing No. 18-014-P451 and P452 - Proposed Drainage Layout submitted with the planning application under separate cover.

Foul water from the Proposed Development will be treated in the Drogheda WWTP (Discharge Licence No. D0041) before ultimately discharging to the Boyne Estuary transitional waterbody (EU Code: IE_EA_010_0100).

4 SITE SETTING

4.1 Site Location and Description

The site covers an area of 9.20ha and is located adjacent to the Meath-Louth county boundary approximately 2.5 Km west of Drogheda Town Centre. The site is accessed by the Rathmullan road along the eastern boundary and is 40m south of the Boyne Estuary and 0.2km east of the M1 motorway.

The site location is presented in Figure 4-1 and the current layout of the site is presented in Figure 4-2.

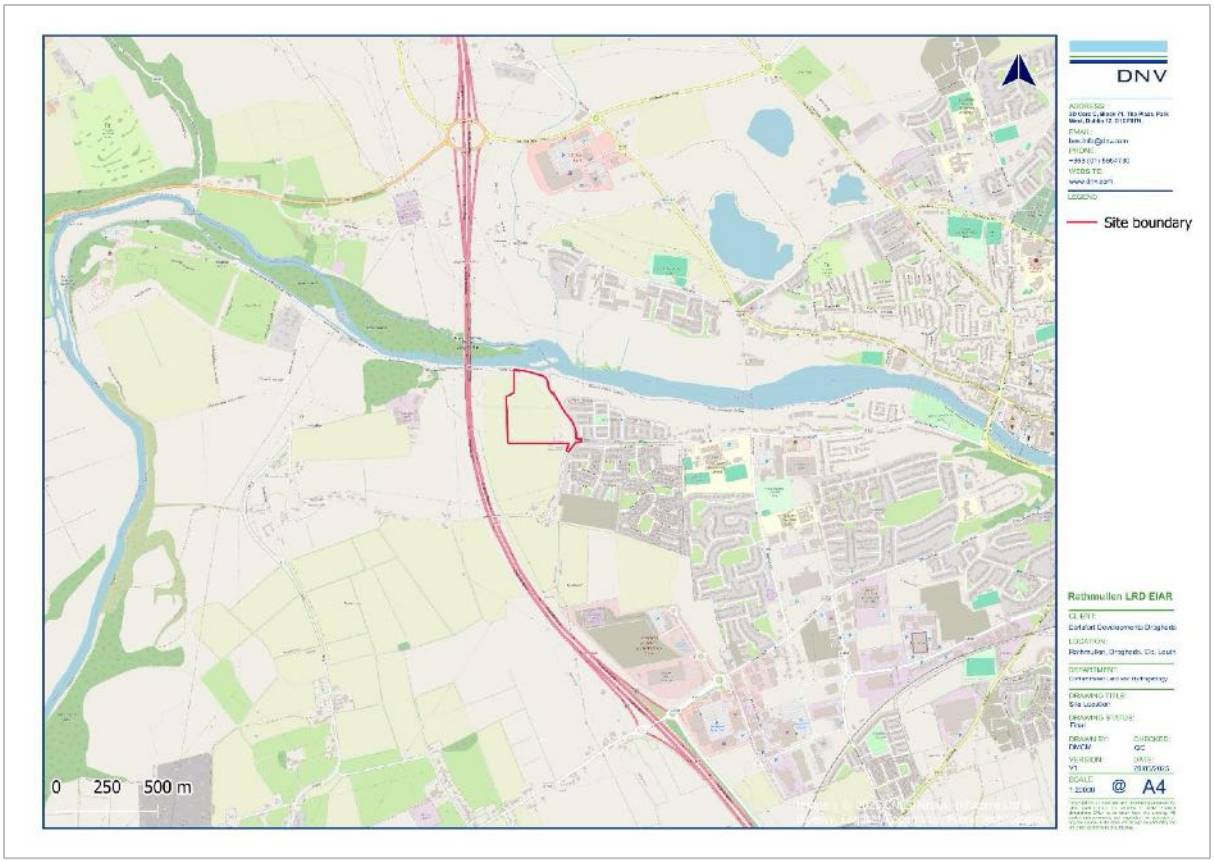

Figure 4-1. Site Location

Figure 4-2. Current Site Layout

4.2 Topography

As documented in the Engineering Assessment Report (WM, 2025a) submitted with the planning application under separate cover, the site generally slopes from the southwest to the northeast towards the Boyne Estuary, with existing ground levels ranging from 30m above Ordnance Datum (mOD) to 6mOD within the site boundary.

4.3 Soil and Geology

The soils beneath the majority of the site are mapped by Teagasc (Teagasc, 2025) as deep well drained mineral (mainly acidic), Acid Brown Earths, Brown Podzolics (IFS Soil Code: AminDW) derived from mainly non-calcareous parent materials described as till derived chiefly from Lower Palaeozoic rocks (sandstone and shale till – TLPSsS). A small area of the eastern portion of the site is mapped as shallow well drained mineral (mainly basic), Renzinas, Lithosols (IFS Soil Code: BminSW) derived from mainly calcareous parent materials described as bedrock at surface - calcareous – RckCa).

The subsoil or quaternary sediments beneath the majority of the site are mapped by the GSI (GSI, 2025) as till derived from Lower Palaeozoic sandstones and shales (TLPSsS). A small area within the southeastern corner of the site is classified as a Kartsified bedrock outcrop or subcrop (KaRck).

The bedrock beneath the site is mapped by the GSI (GSI, 2025) as the Platin Formation (Code: CDPLTN) described as coarse greywacke & shale.

There are five karst features mapped by the GSI (GSI, 2025) within a 2km radius of the site.

- Enclosed Depression (IE_GSI_Karst_40K_1635) – located approximately 1.82km northeast of the site.
- Spring (IE_GSI_Karst_40K_3873) - located approximately 1.51km north of the site.
- Swallow Hole (IE_GSI_Karst_40K_2950) - located approximately 1.6km north of the site.
- Superficial Solution Feature (IE_GSI_Karst_40K_3874) - located approximately 1.63km north of the site.
- Swallow Hole (IE_GSI_Karst_40K_8042) - located approximately 1.63km north of the site

4.3.1 Previous Site Investigation

The geology encountered during site investigations (WM, 2018) is summarised as follows:

- A 300mm layer of topsoil was identified overlying the natural ground.
- The topsoil was underlain by initially firm, brown, sandy, gravelly CLAY (i.e., glacial till or boulder clay) turned into stiff and very stiff brown, sandy, gravelly CLAY at approximately 1.20 metres below ground level (mbgl). Angular and sub-angular cobbles and boulders were noted at varying depths. This unit was encountered to the final extent of investigation ranging from 5.8mbgl at BH05 to 8.5mbgl at BH04.
- Bedrock was not encountered during the site investigations. However, refusal encountered during the drilling of the site investigation locations could potentially indicate that a boulder was encountered or possibly indicate the presence of bedrock.
- Groundwater was not encountered during borehole drilling or the excavation of the trial pits.

The site investigation locations are presented in Figure 4-3 below.

Figure 4-3: Site Investigation and Monitoring Well Locations (Extract from WM, 2018)

4.3.1.1 Soil Analysis

Soil samples were collected during the installation of the groundwater monitoring wells (BH01 to BH05) (WM, 2018).

Eight environmental soil samples were taken at specific depths during the installation of the five groundwater monitoring wells at the site. The soil samples depth was as follows;

- BH01 at 1.00mbgl.
- BH20 at 1.00mbgl and 2.00mbgl.
- BH03 at 1.00mbgl and 2.00mbgl.

- BH04 at 1.00mbgl.
- BH05 at 1.00mbgl and 3.00mbgl.

The soil results reported no exceedances of mineral oil, total petroleum hydrocarbons (TPHs), benzene, toluene, ethylbenzene, m&p-xylene, o-xylene and methyl tert-butyl ether, polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs). Asbestos was not detected in any of the soil samples analysed.

The results of the site investigation remains relevant to the hydrogeological evaluation of the site, because it provided direct subsurface data, such as trial pits, boreholes, dynamic probes, and percolation tests, that were used to identify and assess the hydrogeological subsurface features at the site and refine the CSM. In addition, the findings of the site walkover, undertaken by DNV on the 17th June 2025, indicate that the condition of the site remains unchanged since the 2018 site investigation and therefore, the findings of the investigation (2018) remain valid. Furthermore, a Technical Note was prepared by Waterman Moylan (WM) on 28th August 2025, confirming that the site conditions observed during the 2018 Site Investigation remain unchanged. The note verifies that there have been no alterations to the site since the original investigation that would give rise to any change in ground conditions. It is acknowledged that the Site Investigation was conducted approximately seven years ago, and that the current planning application for a Large-Scale Residential Development is relying on its findings. However, given that the site has remained in agricultural use since 2018 and no changes have occurred that would affect the underlying ground conditions, the original report remains valid and can be relied upon.

4.3.1.2 Groundwater

As documented in the site investigation report (WM, 2018), groundwater was not encountered during borehole drilling or the excavation of the trial pits which extended to depths ranging from 1.6 meters below ground level (mbGL) to 8.5mbGL.

The location of the trial pits is presented in Figure 4-3 below.

4.4 Hydrogeology

4.4.1 Site Hydrogeology and Groundwater Levels

As documented in the site investigation report (WM, 2018), groundwater was not encountered during borehole drilling or the excavation of the trial pits which extended to depths ranging from 1.6 meters below ground level (mbGL) to 8.5mbGL.

4.4.2 Groundwater Body and Flow Regimes

The bedrock aquifer beneath the site is within the Drogheda Groundwater Body (GWB) (EU Code: IE_EA_G_025).

The Drogheda GWB Report (GSI, 2025) identifies the main recharge mechanism for the aquifer as by point and diffuse recharge. Groundwater and surface water are more directly linked at certain karst features such as springs and swallow holes. Rainwater can enter the aquifer directly at enclosed depressions or at swallow holes. Diffuse recharge will be limited depending on the thickness and permeability of the subsoils overlying the aquifer which may reduce the amount of water reaching the water table. Groundwater will discharge from the aquifer directly to the coast and to rivers in the area as baseflow or as springs in the vicinity of rivers.

Groundwater flow in the aquifer is expected to be from the main recharge areas (i.e. the areas of thin subsoil) predominantly in the west and north towards the discharge areas (i.e. River Boyne and the coast) along fractures, joints and major faults. The majority of the groundwater flow is likely to occur in the upper 30m, within the weathered zone of a few metres and a connected fractured zone below this. However, deep water strikes in more isolated faults/ fractures can be encountered down to at least 50m. Flow path lengths can be between 500m and 2000m. The nature of groundwater flow will depend on the degree of karstification of the bedrock (i.e., limestone). Groundwater flow paths of up to a couple of kilometres can be expected.

As mentioned above, groundwater was not encountered during the site investigations undertaken at the site (WM, 2018). Based on the topography of the site and the presence of local rivers (i.e., Sheephouse_07 observed to be present as a dry ditch during the site walkover undertaken by DNV), it is considered that groundwater flow is likely to the northeast toward the Boyne Estuary.

4.4.3 Aquifer Classification

The GSI provides a methodology for aquifer classification based on resource value (regionally important, locally important and poor) and vulnerability (extreme, high, moderate or low). Resource value refers to the scale and production potential of the aquifer whilst vulnerability refers to the ease with which groundwater may be contaminated by human activities (vulnerability classification primarily based on the permeability and thickness of subsoils).

The bedrock aquifer within the Platin Formation (Code: CDPLTN) beneath the site is classified by the GSI (GSI, 2025) as a Regionally Important Aquifer - Karstified (diffuse) (Rkd).

Regionally important aquifers are capable of supplying regionally important abstractions (e.g. large public water supplies), or ‘excellent’ yields (>400 m3/d). ‘Karstification’ is the process whereby limestone is slowly dissolved away by percolating waters. Karstification frequently results in the uneven distribution of permeability through the rock, and the development of distinctive karst landforms at the surface (e.g. swallow holes, caves, dry valleys), some of which provide direct access for recharge/surface water to enter the aquifer.

It is noted that there are no gravel aquifers mapped by the GSI (GSI, 2025 at the site or within a 2km radius of the site (GSI, 2025). The closest sand and gravel aquifer recorded on the GSI mapping is the Littlegrange aquifer which is a Locally important gravel aquifer (Lg) located approximately 2.05km west of the site (GSI, 2025).

The bedrock aquifer map is presented in Figure 4-4.

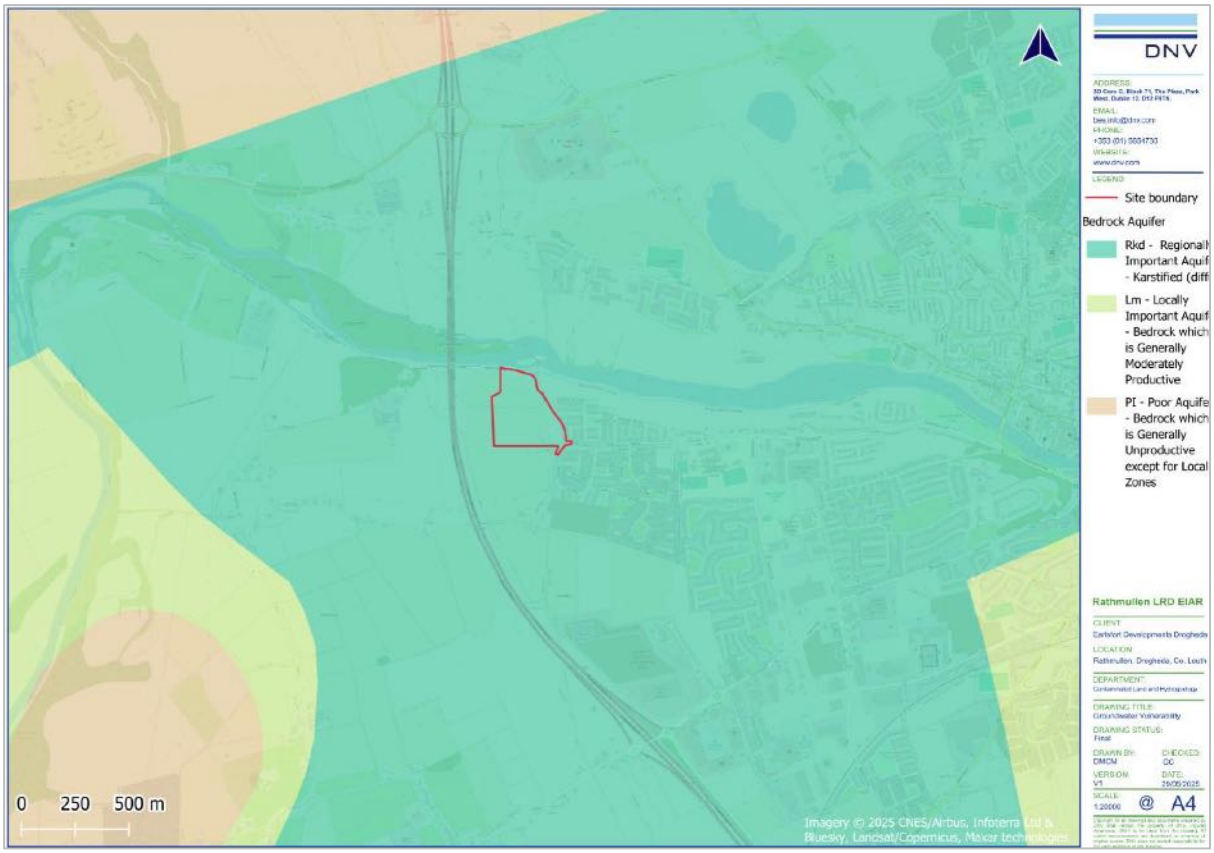

Figure 4-4. Aquifer Classification

4.4.3.1 Groundwater Vulnerability

The vulnerability categories, and methods for determination, are presented in the Groundwater Protection Schemes publication (DEHLG/EPA/GSI, 1999) and summarised in Table 4-1. The publications state that 'as all groundwater is hydrologically connected to the land surface, it is the effectiveness of this connection that determines the relative vulnerability to contamination. Groundwater that readily and quickly receives water (and contaminants) from the land surface is considered to be more vulnerable than groundwater that receives water (and contaminants) more slowly and in lower quantities. The travel time, attenuation capacity and quantity of contaminants are a function of the following natural geological and hydrogeological attributes of any area.

Table 4-1. Vulnerability Mapping Criteria (DEHLG/EPA/GSO, 1999)

Subsoil Thickness	Hydrogeological Requirements				
	Diffuse Recharge			Point Recharge	Unsaturated Zone
	Subsoil Permeability and Type			(Swallow Holes, Losing Streams)	(Sand and Gravel Aquifers Only)
	High Permeability (Sand and Gravel)	Moderate Permeability (Sandy Subsoil)	Low Permeability (Clayey Subsoil, Clay, Peat)		
0-3m	Extreme	Extreme	Extreme	Extreme (30m radius)	Extreme
3-5m	High	High	High	N/A	High

Subsoil Thickness	Hydrogeological Requirements				
	Diffuse Recharge			Point Recharge	Unsaturated Zone
	Subsoil Permeability and Type			(Swallow Holes, Losing Streams)	(Sand and Gravel Aquifers Only)
	High Permeability (Sand and Gravel)	Moderate Permeability (Sandy Subsoil)	Low Permeability (Clayey Subsoil, Clay, Peat)		
5-10m	High	High	Moderate	N/A	High
>10m	High	Moderate	Low	N/A	High
Notes: (i) N/A = not applicable (ii) Permeability classifications relate to the material characteristics as described by the subsoil description and classification method.					

The GSI has assigned a groundwater vulnerability rating ranging from 'Moderate' (M) to 'High' (H) for the bedrock aquifer beneath the southwestern part of the site and 'Extreme' (E) and 'Rock at or near Surface or Karst' (X) for the bedrock aquifer beneath the east / southeast portion of the site. Therefore, the anticipated depth to bedrock based on the groundwater vulnerability rating and low permeability subsoils beneath the site is between 0.0mbGL and 10.0mbGL. It is noted that bedrock was not encountered during the site investigations (WM, 2018) in which the total depth of the wells extended to a maximum depth of 8.5mbGL.

The groundwater vulnerability map is presented in Figure 4-5.

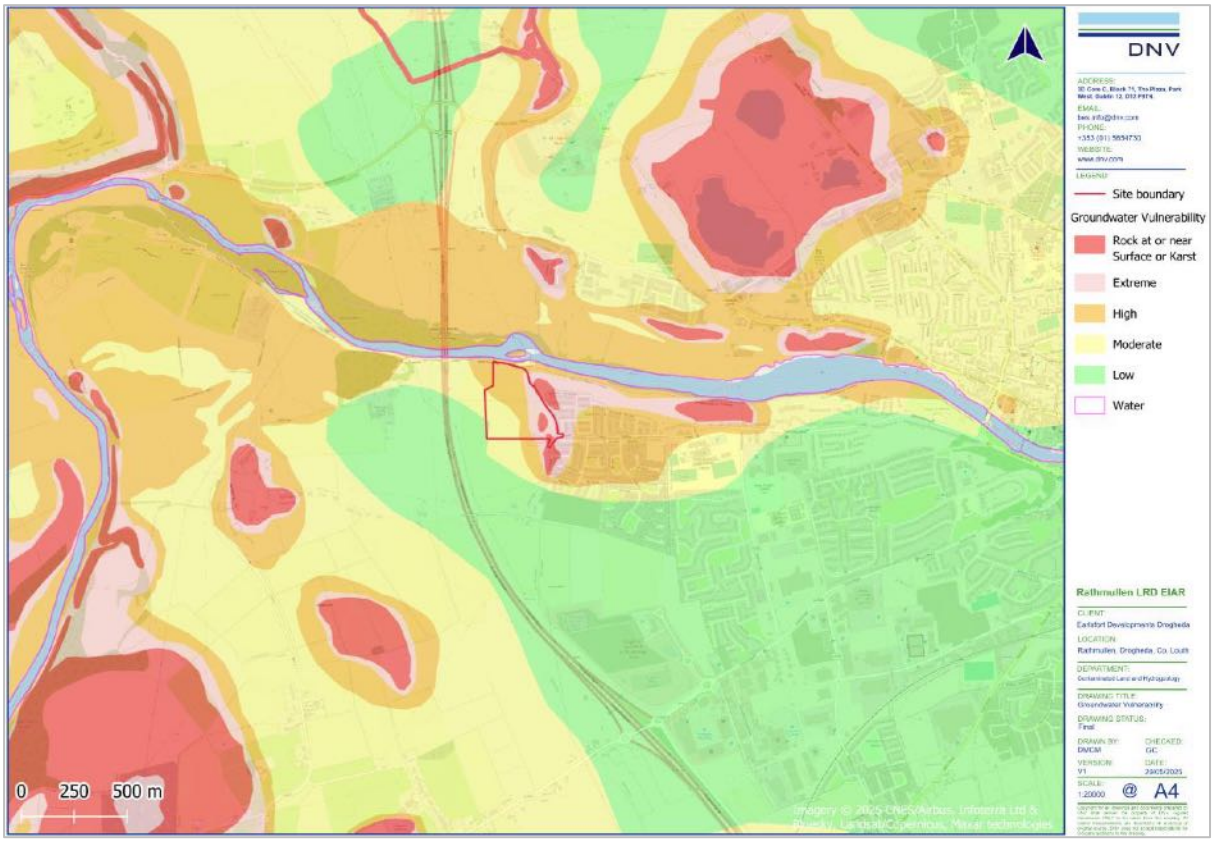

Figure 4-5. Groundwater Vulnerability

4.5 Hydrology

4.5.1 Catchment and Surface Water Features

The Proposed Development site lies within the Boyne Catchment (Hydrometric Area 07) and Boyne_SC_130 sub-catchment (ID 07_17) (EPA, 2025). The site has been mapped by the EPA (EPA, 2025) to be within the Stagrennan_010 WFD River Sub-basin (River Waterbody Code: IE_EA_07S320550).

The closest surface water features recorded on the EPA database (EPA, 2025) to the site is the Sheephouse 07 River (WFD Name: Stagrennan_010; River Waterbody Code: IE_EA_07S320550) which crosses a small area of the southeastern boundary of the site along Rathmullan Road. The Sheephouse 07 River flows north before discharging into the Boyne Estuary approximately 33m north of the site at its closest point. As documented in the SSFRA (JBA, 2025), prior to the construction of the M1 motorway, this ditch formed the lower reach of a watercourse originating to the southwest of the site. However, significant cutting required to accommodate the M1 has disconnected the lower section from its catchment upstream of the M1 motorway. Flows from the upper catchment of the former watercourse are now incorporated into the surface water drainage network of the M1 and do not continue to flow into the disused ditch, which is no longer considered to be a functional fluvial watercourse (JBA, 2025). The ditch is culverted along the eastern perimeter of the site and conveys local drainage flows in the surrounding area including lands upstream of the site to the east of the M1 motorway. This culvert outfalls to a ditch on the opposite side of the Rathmullan Road approximately 120m to the north of the proposed outfall location. The ditch travels northwards for approximately 60m before outfalling to the Boyne Estuary, which is tidal at this location.

Other surface water features within the vicinity of the site and Proposed Development are summarised as follows:

- The Mell River (WFD Name: Tullyeskar_010; River Waterbody Code: IE_EA_07T270880) is located approximately 128m north of the site, which runs in a southerly direction before discharging into the Boyne Estuary.
- The Rathmullen River (WFD Name: Tullyeskar_010; River Waterbody Code: IE_EA_07T270880) is located approximately 124m north of the site, which runs in a southerly direction before discharging into the Boyne Estuary.
- The Boyne Estuary Transitional Waterbody (WFD Name: Boyne Estuary; Transitional Waterbody Code: IE_EA_010_0100) is adjacent to the northern boundary of the site and it is fed by multiple rivers downstream of the site (i.e., >2km downstream of the site). This waterbody runs in an easterly direction before discharging into the Boyne Estuary Plume Zone Coastal Waterbody (Coastal Waterbody Code: IE_EA_010_0000) approximately 9.1km east of the site.

The following Coastal Waterbodies are indirectly connected to the site due to the connection to the Boyne Estuary Plume Zone Coastal Waterbody:

- Louth Coast (HA 06) (Coastal Waterbody Code: IE_NB_025_0000) – upstream of the Boyne Estuary Plume Zone Coastal Waterbody.
- Northwestern Irish Sea (HA 08) (Coastal Waterbody Code:IE_EA_020_0000) - downstream of the Boyne Estuary Plume Zone Coastal Waterbody.

The surface water features mapped by the EPA (EPA, 2025) within a 2km radius of the site are presented in Figure 4-6.

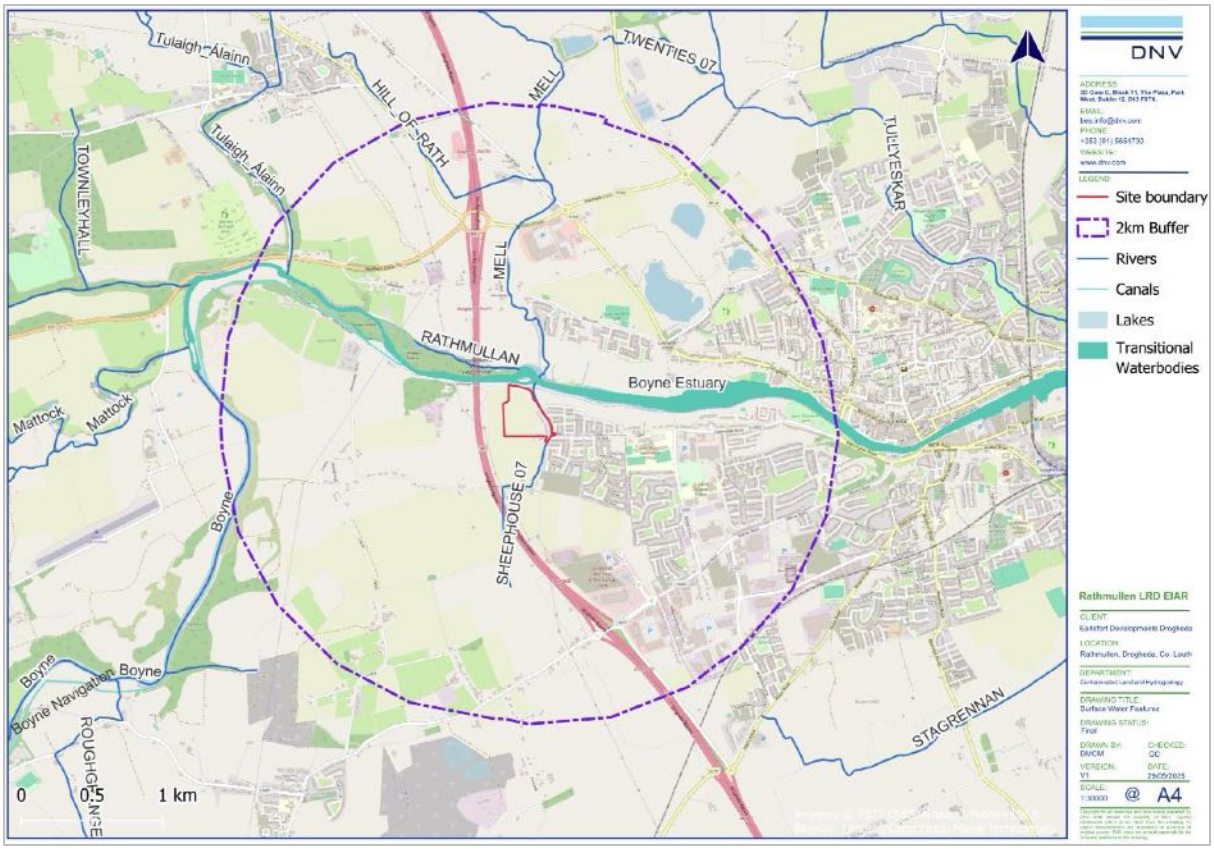

Figure 4-6: Surface Water Features within a 2km Radius of the Site

4.5.1.1 Existing Drainage Infrastructure

As documented in the Engineering Assessment Report (WM, 2025a), there is no existing surface water or foul water drainage network within the site of the Proposed Development. However, there is an existing foul water drainage network at the junction of Rathmullan Road and Marley's Lane. Foul drainage from the Proposed Development will be pumped via the proposed pumping station to this existing foul water drainage network.

4.6 Flood Risk

A site-specific flood risk assessment (SSFRA) was prepared for the site and Proposed Development by JBA Consulting (JBA, 2025). It assessed the potential flood risk associated with fluvial, groundwater, coastal and pluvial flooding.

The primary source of flood risk to the site was fluvial flooding as represented in the Eastern CFRAM Study. However, following the construction of the M1 motorway and the site visit undertaken by JBA Consulting on 5th August 2025, it was confirmed that the former watercourse (Sheephouse_07 Stream), running in a south-north direction, had been disconnected by the M1 Motorway, observed by the presence of piped culverts diverting surface water flows into the M1 surface water drainage network. The culverted system then flows parallel to the road surface and discharges directly into the River Boyne. The former watercourse adjacent to the site now exists as a dry ditch unable to convey flow and no longer serves as a functional watercourse. In addition, it does not appear to have any active hydraulic

connectivity with lands to the south of the site. Therefore, the Eastern CFRAMs mapping does not accurately represent the current conditions of the site and associated fluvial flood risk. '*Upon detailed review of all available fluvial flood information and surface water drainage construction drawings of the M1 Motorway, it is determined within this report that fluvial flood risk from the former Sheephouse watercourse is no longer present, as there is no watercourse remaining which could be the source of flooding to the site'* (JBA, 2025).

The SSFRA (JBA, 2025) concludes the following:

'A portion of the site is currently incorrectly classified as Flood Zone A/B, due to the outdated catchment conditions represented within the Eastern CFRAMs flood modelling and mapping.'

'Due to the outdated catchment conditions represented within the Eastern CFRAMs flood modelling and mapping incorrectly identifying fluvial flood risk to the site, it is the finding of this site-specific flood risk assessment that the Flood Zones for the site are not appropriate, and the entire site should be redefined as Flood Zone C. The Planning System and Flood Risk Management Guidelines for Planning Authorities, classes residential development as a highly vulnerable land use and is therefore appropriate for development only within Flood Zone C without the need to provide a Justification Test. This FRA confirms the proposed development footprint within the subject site as being located wholly within Flood Zone C and is therefore appropriate for residential development.'

Although the Proposed Development footprint is located within Flood Zone C, mitigation measures have been considered and included, where necessary, to mitigate the risk of pluvial flooding to and from the site (JBA Consulting, 2025).

4.7 Water Use and Source Protection

The GSI groundwater wells and springs database (GSI, 2025) was utilised to identify registered wells and groundwater sources in the surrounding area. There are thirty-three (33 No.) groundwater sources recorded within a 2km radius of the site (refer to Figure 4-7).

- 23 wells were part of the N51 and M1 road developments – source: MCC.
- Two recorded wells of industrial use.
- Seven recorded wells of unknown use.
- One recorded wells of domestic use.

The site is located within an area served by mains water supply. As documented in the Engineering Assessment Report (WM, 2025a), there are no existing watermains present within the site boundary. However, there is an existing 150mm HPPE watermain on Rathmullan Road to the east of the site. Water supply for Proposed Development will be connected to the existing 150mm watermain which is to be upgraded.

There are three Groundwater Source Protection Areas (SPAs) mapped by the GSI (GSI, 2025) within a 2km radius of the site and one (1 No.) Group Water Scheme Preliminary Source Protection Area Zone of Contribution.

- Ballymakenny GWS (Ground Water Supply) – the Inner Protection Area (SI) is located approximately 1.82km northeast of the site.
- Kiltrough PWS (Public Water Supply) - the Outer Protection Area (SO) is located approximately 1.62km southeast of the site.

- Drybridge PWS (Public Water Supply) - the Inner Protection Area (SI) is located approximately 0.6km north of the site.
- Drybridge Water Scheme - located approximately 1.84km north of the site.

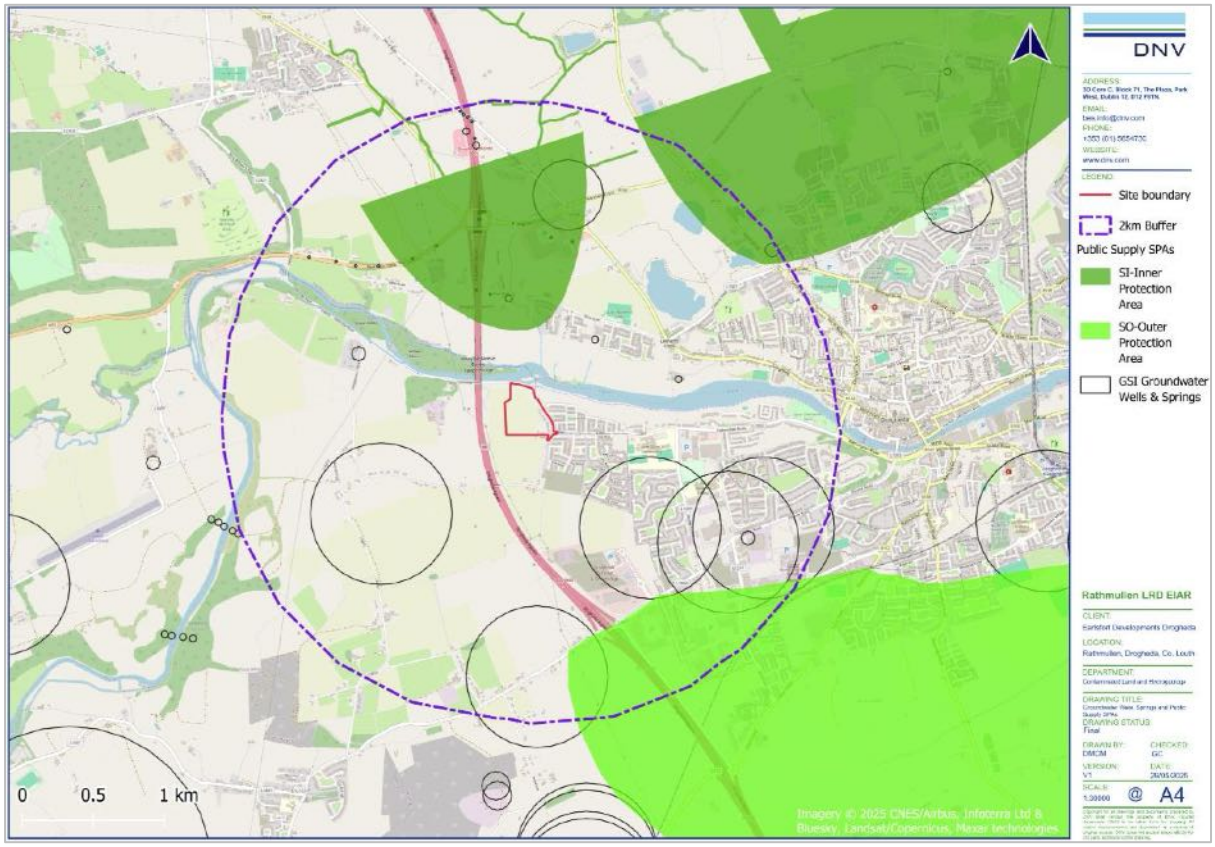

Figure 4-7. Groundwater Wells, Springs and Public Supply SPA's

4.8 Water Quality

4.8.1 EPA Water Quality

4.8.1.1 Published Regional Surface Water Quality

The EPA surface water quality monitoring database (EPA, 2025) was consulted. A summary of the most recent published EPA water quality monitoring data (EPA, 2025) for waterbodies which have a potential hydraulic connection to the site is presented in Table 4-2.

Table 4-2. Surface Water Quality

Waterbody I.D. (Location)	EPA WFD Parameter Quality & Trend Analysis				
	Parameter	Period	Indicative Quality	Trend	Baseline Conc. (2020) (mg/l)
Stagrennan_010	No data available				
Tullyeskar_010	No data available				
	Chlorophyll	Summer	High	None	3.500mg/m^3

Waterbody I.D. (Location)	EPA WFD Parameter Quality & Trend Analysis				
	Parameter	Period	Indicative Quality	Trend	Baseline Conc. (2020) (mg/l)
Boyne Estuary (Transitional Waterbody)		Winter	High	Upwards	3.400mg/m^3
	Dissolved Inorganic Nitrogen (as N)	Summer	Good	Upwards	0.675
		Winter	Bad	Upwards	3.214
	Ortho-Phosphate (as P) - unspecified	Summer	High	Downwards	18.500
		Winter	Good	Upwards	37.000
Boyne Estuary Plume Zone (Coastal Waterbody)	Dissolved Inorganic Nitrogen (as N)	Summer	High	Downwards	0.031
	Ortho-Phosphate (as P) - unspecified	Summer	High	Downwards	5.350
Louth Coast (HA 06)	Dissolved Inorganic Nitrogen (as N)	Summer	High	Downwards	0.026
	Ortho-Phosphate (as P) - unspecified	Summer	High	Upwards	6.750
Northwestern Irish Sea (HA 08)	Chlorophyll	Winter	High	Downwards	1.800mg/m^3
		Summer	High	Downwards	1.900mg/m^3
	Dissolved Inorganic Nitrogen (as N)	Winter	High	Upwards	0.199
		Summer	High	Upwards	0.033
	Dissolved Inorganic Nitrogen (as N)	Winter	High	Downwards	17.500
		Summer	High	Downwards	5.000

4.8.1.2 Published Regional Groundwater Quality

The EPA groundwater monitoring data (EPA, 2025) was reviewed to locate the closest groundwater quality monitoring stations within the close vicinity of the site. The closest groundwater stations are the Drybridge station (Station ID: GWIE_EA_G_02521000005) located approximately 0.5km north of the site and the Ballymakenny station (Station ID: GWIE_EA_G_02521000002) located approximately 3.3km northeast of the site. The recorded groundwater quality data for the groundwater body beneath the site (Drogheda GWB) is presented in Table 4-3.

Table 4-3. Groundwater Quality

Groundwater Body	EPA WFD Parameter Quality & Trend Analysis				
	Parameter	Period	Indicative Quality	Trend	Baseline Conc. (2018) (mg/l)
Drogheda GWB	Ammonia-Total (As N) - Drybridge	Annual	Good	Downwards	0.021
	Ammonia-Total (As N) - Ballymakenny	Annual	Good	None	0.020
	Chloride - Drybridge	Annual	Failing to achieve good status	Downwards	42.481
	Chloride - Ballymakenny	Annual	Good	Upwards	23.308
	Conductivity@25°C - Drybridge	Annual	Good	Upwards	598.889
	Conductivity@25°C - Ballymakenny	Annual	Good	Downwards	559.750
	Nitrate (as NO3) - Drybridge	Annual	Good	Upwards	16.091
	Nitrate (as NO3) - Ballymakenny	Annual	Good	Upwards	5.455
	ortho-Phosphate (as P) – unspecified - Drybridge	Annual	Good	Downwards	0.029
	ortho-Phosphate (as P) – unspecified - Ballymakenny	Annual	Good	Upwards	0.031

4.8.2 Receiving Water Quality – Drogheda WWTP (Wastewater Treatment Plant)

Foul water from the Proposed Development will be discharged via the Drogheda WWTP to the Boyne Estuary transitional waterbody (IE_EA_010_0100). The WWTP is operated under relevant statuary approvals. The most recent available Annual Environmental Report (AER) for the Drogheda WWTP is 2023 (Uisce Éireann (UE), 2023). The AER identified that the final

effluent was non-compliant with the Emission Limit Values (ELV) specified in the discharge license (D0041-01). The parameters falling to meet the ELV's included Ammonia-Total (as N) mg/l ortho-Phosphate (as P) - unspecified mg/l and Total Phosphorus (as P) mg/l. It was reported that the non-compliances were a result of 'inadequate operational procedures/training', 'WWTP upgrade required to meet ELVs' and 'WWTP not designed for phosphorus removal'.

While exceedances in the ELV's are recorded, the following is also noted under the significance of results section of the AER:

- *The coastal/transitional ambient monitoring results meet the required EQS. The EQS relates to the Oxygenation and Nutrient Conditions set out in the Surface Water Regulations 2009.*
- *Based on ambient monitoring results a deterioration in BOD, TON, Dissolved Oxygen, TSS and Ortho-P concentrations downstream of the effluent discharge is noted.*
- *A deterioration in water quality has been identified, however it is not known if it or is not caused by the WWTP.*
- *Agriculture & the Drogheda WWTP are cited as significant pressures effecting the Boyne Estuary transitional waterbody in the 3rd Cycle Draft Boyne Catchment Report (HA 07).*
- *Based on the effluent compliance results, the discharge from the wastewater treatment plant may be having an observable negative effect on the Water Framework Directive status downstream of the WWTP. It should be noted however that the current WFD status is Moderate both upstream and downstream of the WWTP.*
- *It is not considered that the discharge from the wastewater treatment plant is having an observable negative effect on any downstream bathing water areas.*

4.9 Water Framework Directive

The WFD status for river, lake, groundwater, transitional and/or coastal water bodies that have a potential hydraulic connection to the subject site as recorded by the EPA (EPA, 2025) in accordance with European Communities (Water Policy) Regulations 2003 (S.I. No. 722/2003) are provided in Table 4-4 and the locations presented in Figure 4-8.

Table 4-4. Water Framework Directive Status

Waterbody Name	Waterbody EU Code	Location from Site	Distance from Site (km)	WFD Status (2016-2021)	WFD Risk	Hydraulic Connection to the Site
Surface Water Bodies						
Stagrennan_010	IE_EA_07S320550	South and east	0.0	Moderate	Review	None, culverted along eastern boundary of the site. Furthermore, no longer considered a functional watercourse (JBA, 2025)

Waterbody Name	Waterbody EU Code	Location from Site	Distance from Site (km)	WFD Status (2016-2021)	WFD Risk	Hydraulic Connection to the Site
Tullyeskar_010	IE_EA_07T270880	North and northeast	124m and 128m	Moderate	Review	No identified hydraulic connection
Transitional Water Bodies						
Boyne Estuary	IE_EA_010_0100	Adjacent to the northern boundary of the site	0.25	Moderate	At Risk	Hydraulic connection via the site and the Drogheda WWTP discharge
Coastal Water Bodies						
Boyne Estuary Plume Zone	IE_EA_010_0000	East	9.1	Moderate	At Risk	Hydraulic connection via the Boyne Estuary and the Drogheda WWTP discharge
Louth Coast (HA 06)	IE_NB_025_0000	Northeast	9.2	High (medium confidence)	Not at Risk	
Northwestern Irish Sea (HA 08)	IE_EA_020_0000	Southeast	9.5	Good	At Risk	
Groundwater Bodies						
Drogheda GWB	IE_EA_G_025	Underlying	0.0	Good	At Risk	Yes, underlying the site

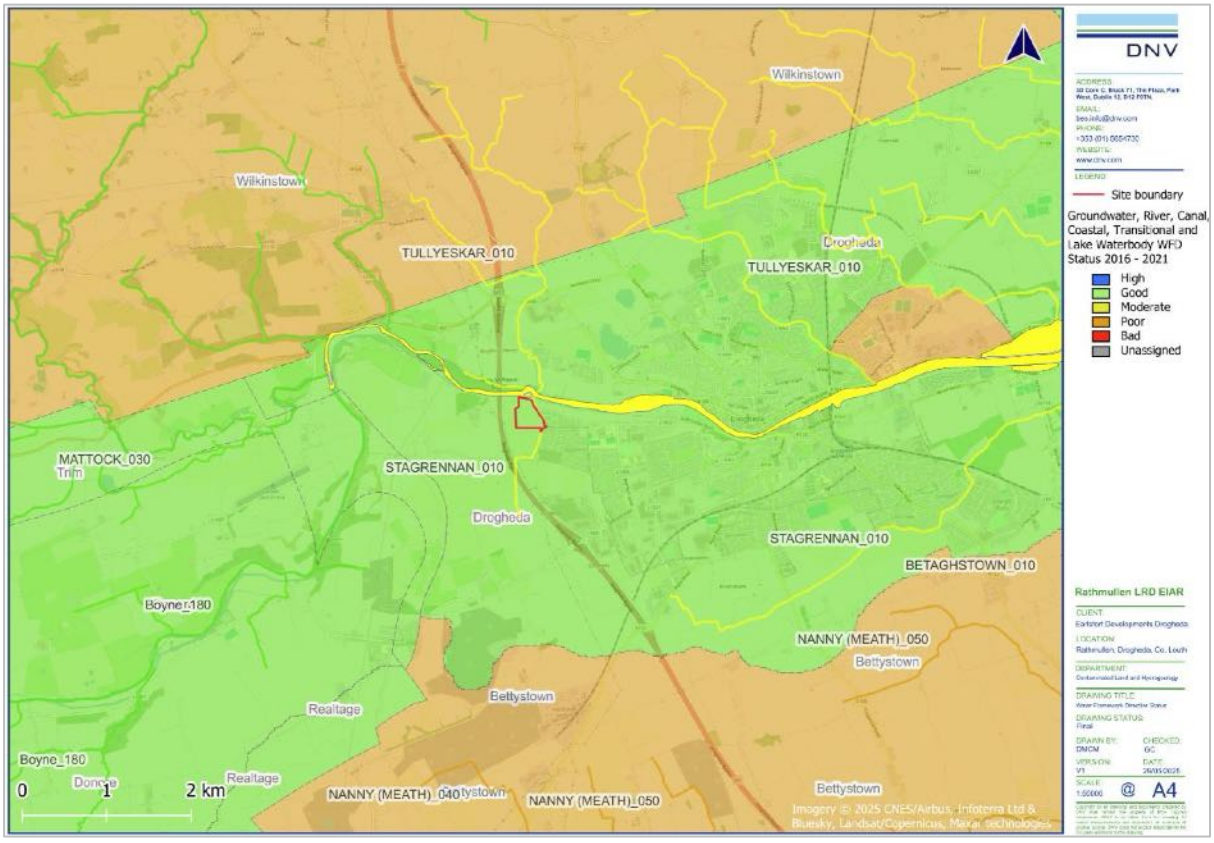

Figure 4-8. Water Framework Directive Status (2016-2021)

4.9.1 Designated and Protected Areas

The Habitats Directive (92/43/EEC) seeks to conserve natural habitats and wild fauna and flora by the designation of Special Areas of Conservation (SACs) and the Birds Directive (2009/147/EC) seeks to protect birds of special importance by the designation of Special Protection Areas (SPAs). SACs and SPAs are collectively known as Natura 2000 or European sites (referred to hereafter as Natura 2000 site).

National Heritage Areas (NHAs) are designations under the Wildlife Acts to protect habitats, species, or geology of national importance. The boundaries of many of the NHAs in Ireland overlap with SAC and/or SPA Sites. Although many NHA designations are not yet fully in force under this legislation (referred to as 'proposed NHAs' or pNHAs), they are offered protection in the meantime under planning policy which normally requires that planning authorities give recognition to their ecological value.

There are four (4 No.) Natura 2000 sites that are identified with a potential hydraulic connection to the site and Proposed Development. There are also two pNHAs identified with a potential hydraulic connection to the site and the Proposed Development. The Natura 2000 sites and other protected and designated sites or areas with a potential hydraulic connection to the site are summarised in Table 4-5.

Further details and assessment of the of the potential effects of the Proposed Development on habitats, flora and fauna are included in Chapter 5 of this EIAR.

Table 4-5. Designated and Protected Sites

Designated Site	Site Code	Distance from Site (km)	Direction	Potential Risk
Special Area of Conservation (SAC)				
River Boyne and River Blackwater SAC	002299	0.0	Adjacent to the northern boundary of the site	Yes, downstream of the site and the Drogheda WWTP discharge.
Boyne Coast and Estuary SAC	001957	5.57	East / Northeast	
Special Protection Area (SPA)				
Boyne Estuary SPA	004080	4.4	East / Northeast	Yes, downstream of the site and the Drogheda WWTP discharge.
North-West Irish Sea SPA	004236	10.3	East	Indirect, hydraulic connection via

Designated Site	Site Code	Distance from Site (km)	Direction	Potential Risk
				the Boyne Estuary SPA.
River Boyne and River Blackwater SPA	004232	0.19	West	Not connected to the site – upgradient of the site.
Proposed Natural Heritage Area (pNHA)				
Boyne River Islands pNHA	001862	0.0	Adjacent to the northern boundary of the site	Yes, downstream of the site.
Boyne Coast and Estuary pNHA	001957	5.57	East / Northeast	Indirect, hydraulic connection via the Boyne Estuary.
Dowth Wetland pNHA	001861	1.8	West	Not connected to the site – upgradient of the site.
King William's Glenp NHA	001804	1.7	Northwest	
Note: '*' = Distance is measured as closest point to the site				

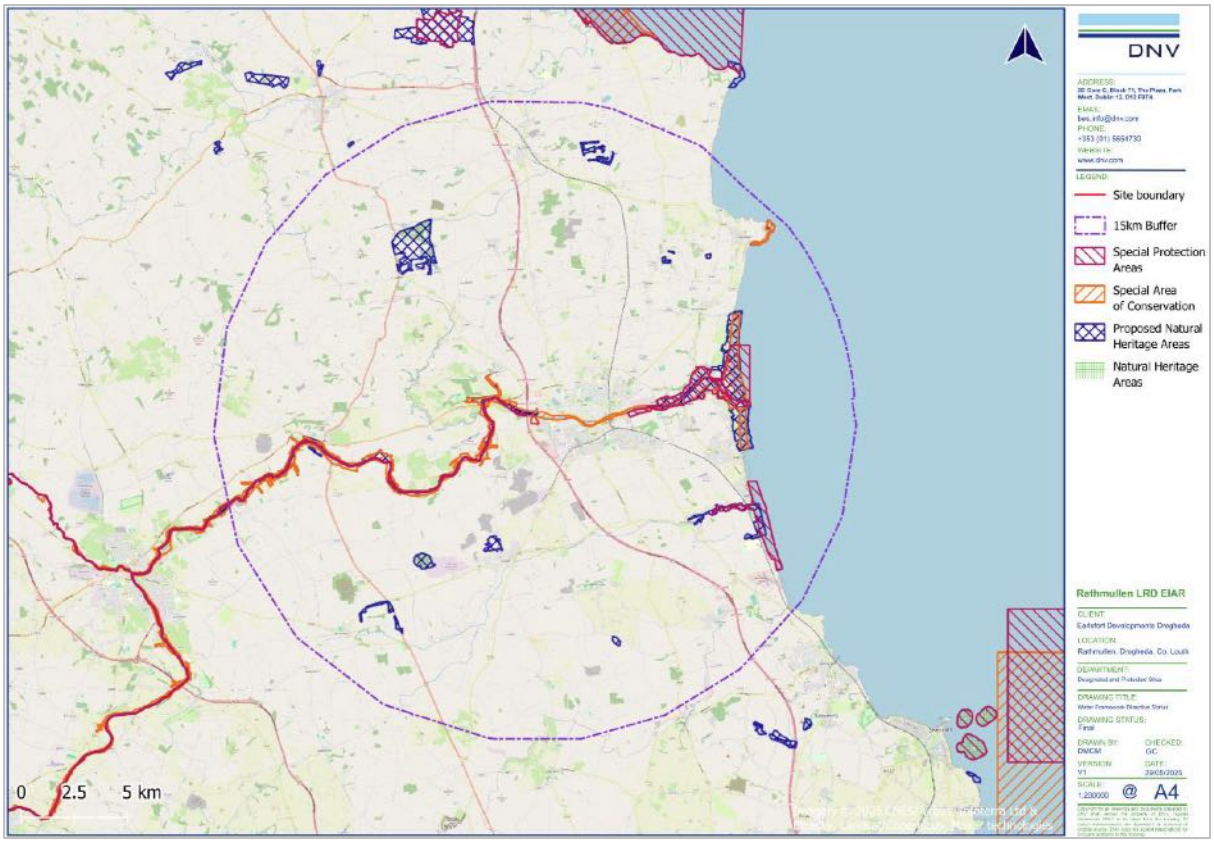

Figure 4-9. Designated and Protected Sites

4.9.2 Drinking Water

The river drinking water protected areas (DWPA) are represented by the full extent of the Water Framework Directive (WFD) river waterbodies from which there is a known qualifying abstraction of water for human consumption as defined under Article 7 of the WFD.

There are two surface water drinking water sources, under Article 7 of the Water Framework Directive, identified by the EPA (EPA, 2025) within a 2km radius of the site. The Tulaigh_Álainn River (WFD Name: Boyne_180, EPA Code: IE_EA_07B042200) and the Boyne River (WFD Name: Boyne_180, EPA Code: IE_EA_07B042200). These waterbodies are upgradient of the site and therefore, not hydraulically connected to the site. Additionally, the groundwater body beneath the site, the Drogheda GWB (IE_EA_G_025), is classified under Article 7 Abstraction for Drinking Water.

4.9.3 Shellfish Areas

Although the Shellfish Waters Directive (SWD) has been repealed, areas used for the production of shellfish that were designated under the SWD, are protected under the WFD as ‘areas designated for the protection of economically significant aquatic species’.

The requirement from a WFD perspective is to ensure that water quality does not have an effect on the quality of shellfish produced for human consumption. In Ireland, 64 areas have been designated as shellfish waters (S.I. No. 268 of 2006, S.I. No. 55 of 2009, S.I. 464 of 2009).

The closest designated Shellfish Area location is Balbriggan\Skerries (IE_EA_020_0000) located approximately 10.35km southeast of the site (EPA, 2025).

4.9.4 Nutrient Sensitive Areas

EU member states are required under the Urban Wastewater Treatment Directive (91/271/EEC) to identify nutrient-sensitive areas. These have been defined as “natural freshwater lakes, other freshwater bodies, estuaries and coastal waters which are found to be eutrophic or which in the near future may become eutrophic if protective action is not taken”.

The closest designated nutrient-sensitive area (estuaries and lakes) is the Boyne Estuary (IE_EA_010_0100 - Urban Wastewater Treatment Directive Sensitive Area), located approximately 40m north of the site at its closest point (EPA, 2025).

4.9.5 Bathing Waters

Bathing waters are designated under Regulation 5 of Directive 2006/7/EC. Designated Bathing Waters exist under S.I. No. 79/2008 and S.I. No. 351/2011 Bathing Water Quality (Amendment) Regulations 2011. EC Bathing Water Profiles - Best Practice and Guidance 2009.

The closest designated Bathing Water location is Laytown/Bettystown (IEEABWC020_0000_0700) located approximately 9.7km southeast of the site (EPA, 2025).

5 ASSESSMENT OF POTENTIAL EFFECTS

5.1 Conceptual Site Model

As outlined in Section 2.4, the conceptual site model (CSM) represents the characteristics of the site and identified the possible relationship and potential risk between the contaminant sources, pathways and receptors.

The preliminary CSM and identified sources, pathways and receptors associated with the site and Proposed Development are outlined in Section 5.1.1, Section 5.1.2 and Section 5.1.3.

5.1.1 Potential Sources

The potential sources associated with the Proposed Development during construction and operational phases are discussed below.

5.1.1.1 Construction Phase

During the construction phase, there will be no direct discharges to surface water or groundwater at the Proposed Development with the exception of rainfall which will continue to infiltrate to ground or which may require some degree of dewatering during extreme rainfall events. Based on the findings of the site investigations (WM, 2018), groundwater was not encountered during borehole drilling or the excavation of the trial pits which extended to depths ranging from 1.6m below ground level (mbGL) to 8.5mbGL. Additionally, the maximum excavation depths would be 4.645m, located at the site entrance. This is for drainage in a road area to be cut in at site access. Therefore, it is unlikely there will be a requirement for temporary dewatering of groundwater during the construction of building foundations and utility infrastructure during the construction phase. Furthermore, there will be no unauthorised discharge of water (groundwater or surface water runoff) to drains or water courses during the construction phase of the Proposed Development. Foul water discharge from the temporary welfare units at the site will be either tankered offsite in accordance with waste management legislation or discharged under temporary consent to the UE mains foul network for treatment at Drogheda WWTP subject to agreement with UE. As noted in Section 3.2.3, the UE COF confirms the connection is feasible, subject to upgrades. The Applicant will fund all upgrade works and will ensure that all works are completed in agreement with and to the satisfaction of UE prior to connection.

Potential sources of contamination that could affect water quality based on the design of the site include:

- Storage and use of fuel, oils and chemicals used during construction which in the event of an accidental release through the failure of secondary containment or a materials handling accident could infiltrate to the underlying aquifer.
- Leakage from machinery or refuelling of plant and machinery operating onsite that has the potential to be accidentally discharged from the site during the construction phase.
- Use of concrete and cementitious materials during construction, in particular for the installation of below-ground infrastructure and foundations where shallow groundwater may be encountered. Runoff water from recently cemented areas has the potential to result in highly alkaline water (i.e., high pH water) which could potentially infiltrate through the soils and migrate down into the groundwater.

- Suspended sediment and other contaminants entrained in runoff arising from groundworks, stockpiling of materials and other construction works at the site that have the potential to be transported into the nearby open waterbodies.
- Sediment or other material on construction vehicles could potentially be tracked offsite to external public roads.
- Accidental release of wash-down water from construction vehicles or foul water from facilities at the subject site (e.g., wheel wash and temporary welfare facilities).
- Release of foul water from existing foul water drainage during connection to live sewers.

5.1.1.2 Operational Phase

Surface water runoff from the Proposed Development will be managed in accordance with the principles and objectives of SuDS and GDSDS. Surface water will be treated and attenuated prior to discharge from the site via gravity at a restricted rate into the existing 1200mm culvert adjacent to Rathmullan Road at the northeast of the site. This culvert merges into a ditch on the opposite side of the existing road approximately 120m to the north of the proposed outfall location. The ditch travels northwards for approximately 60m before outfalling into the Boyne Estuary, which is tidal at this location.

Foul water from the Proposed Development will eventually discharge to the Drogheda WWTP via the UE foul drainage network. A Confirmation of Feasibility (COF) was issued by UE on 1st of April 2025 (UE COF Reference: CDS24009836) confirming the feasibility of the connection, subject to upgrades. To address the requirements of the UE COF, the proposed new pumping station will replace the adjacent existing old pumping station and will facilitate flows from the adjacent Riverbank and Oldbridge Manor Developments

There will be no requirement for bulk storage of petroleum hydrocarbon-based fuels during the operational phase of the Proposed Development.

The most plausible, albeit worst case, source scenario is outlined as follows:

- Fuels or other potentially hazardous materials released in the event of an accidental spill or leak from a parked vehicle (assumed 70 litres) are considered a worst-case source at the site. This potential source is considered to be a short-term event in a worst-case scenario and while unlikely to occur, this scenario is considered in this assessment.
- Suspended sediment entrained in runoff is considered a low-risk source of contamination at the site for the operational phase of the Proposed Development.

5.1.2 Pathways

The following potential pathways are identified and evaluated below:

Vertical Migration to the Underlying Bedrock and Lateral Migration within the Aquifer to Downgradient Receiving Surface Waterbodies

The site is underlain by a Regionally Important Aquifer - Karstified (diffuse) (Rkd). Generally, the main recharge mechanism for the aquifer is considered to be by point and diffuse recharge. Groundwater and surface water are more directly linked at certain karst features such as springs and swallow holes. Diffuse recharge will be limited depending on the thickness and

permeability of the subsoils overlying the aquifer which may reduce the amount of water reaching the water table.

The GSI recorded the vulnerability of the site from moderate to extreme (Rock at or near Surface or Karst). The maximum total depth of the wells recorded during previous site investigations undertaken at the site (WM, 2018) was 8.5mbgl, where bedrock was not encountered and the wells terminated due to refusal (i.e., they terminated either in boulder or bedrock). Therefore, it is considered that the thickness of the underlying subsoils above the bedrock would likely offer a degree of protection to the aquifer in the event of a localised diesel/ fuel oil spill during the construction or operational phases.

Surface Water Runoff and Migration Offsite via Watercourses to Downstream Surface Waterbodies

There is no identified hydraulic connection between the site and the Sheephouse_07 Stream (WFD Name: Stagrennan_010) which is culverted along the eastern boundary of the site. However, during rainfall events surface water runoff at the site will potentially drain via overland flow to the Boyne Estuary located along the northern boundary of the site. In the absence of mitigation during the construction phase of the Proposed Development, there is a potential for release of suspended sediments entrained in surface runoff from groundworks or indirectly tracked on vehicles / machinery entering the receiving waterbodies.

Groundwater Discharge to Mains Sewer and Downstream Receiving Surface Waterbodies

Based on the findings of the site investigations (WM, 2018), groundwater was not encountered during borehole drilling or the excavation of the trial pits. The final depth of the wells ranged from 5.8mbgl at BH05 to 8.5mbgl at BH04. Therefore, it is envisaged that shallow groundwater will not be encountered during the construction phase of the Proposed Development. As such, there will not be a need to temporarily dewater the site during the construction phase due to the design of the Proposed Development (i.e., building foundations and utility infrastructure).

Surface Water Discharge to Mains Sewer and Downstream Receiving Surface Waterbodies

There will be a requirement for management of surface water (rainwater) during the construction phase and operational phase of the Proposed Development. Therefore, there will be a pathway for surface water runoff (rainwater) discharged via onsite drainage network during the construction phase and operational phase of the Proposed Development.

- Where required, surface water runoff (rainwater) during the construction phase will be discharged offsite in accordance with the necessary discharge licences issued by Irish Water under Section 16 of the Local Government (Water Pollution) Acts and Regulations for any water discharges to sewer (and ultimately the Boyne Estuary transitional waterbody via the Drogheda WWTP) or from DLRCC under Section 4 of the Local Government (Water Pollution) Act 1977, as amended in 1990 for discharges to surface water.
- Surface water runoff during the operational phase of the Proposed Development, will be managed in accordance with the principles and objectives of SuDS and GDSDS, and will be treated and attenuated prior to discharge from the site.

- During the operational phase, attenuated and treated surface water runoff from the different catchments (i.e., Southern Catchment and Northern Catchment) proposed for the Proposed Development will ultimately outfall to the Boyne Estuary north and east of the site.

Foul Water Discharge to Main Sewer and Receiving Surface Waterbodies

Foul water during the construction phase of the Proposed Development will be either removed by tanker in accordance with waste management legislation and managed accordingly or discharged under consent to the mains UE foul drainage network and ultimately discharged to the Boyne Estuary transitional waterbody via the Drogheda WWTP. Similarly, during the operational phase of the Proposed Development, foul water will be discharged to the mains foul network for treatment at Drogheda WWTP. Therefore, this indirect pathway to the Boyne Estuary is considered in this assessment.

5.1.3 Receptors

The receptors considered in this assessment include the following:

- Groundwater Bodies
  - Underlying Regionally Important Aquifer - Karstified (diffuse) (Rkd.) which is part of the Drogheda (GWB)
- Surface Waterbodies:
  - Boyne Estuary.
- Coastal Water Bodies:
  - Boyne Estuary Plume Zone.
  - Louth Coast (HA 06).
  - Northwestern Irish Sea (HA 08).
- Natura 2000 sites:
  - River Boyne and River Blackwater SAC.
  - Boyne Coast and Estuary SAC.
  - Boyne Estuary SPA.
  - North-West Irish Sea SPA
- Other Protected Sites:
  - Boyne River Islands pNHA.
  - Boyne Coast and Estuary pNHA

It is noted that there are other Natura 2000 sites with a potential indirect hydrological connection to the site (refer to Table 4-5) however, only those hydrologically and hydrogeologically closest to the site have been considered as the most sensitive Natura 2000 sites and have been brought forward for assessment.

5.2 Risk Evaluation of Source-Pathway-Receptor Linkages

A risk-based assessment of the Source-Pathway-Receptor (SPR) Model and the potential risk linkages associated with the construction phase and operational phase of the Proposed Development was undertaken. The results were evaluated to determine if the Proposed Development could potentially affect any potential receptors associated with the site.

Table 5-1. Conceptual Site Model (Source- Pathway Receptor) and Risk Evaluation

Source	Pathway	Receptor	Risk Evaluation and Avoidance
Construction Phase			
Discharge of Contaminants to Ground / Groundwater	Vertical and Lateral Groundwater Migration in Bedrock Aquifer	Underlying Bedrock Aquifer Receiving surface waterbodies (i.e., the Boyne Estuary and downstream waterbodies) Natura 2000 Sites	Low to Moderate Risk (worst-case unmitigated scenario) During groundworks and excavations, the groundwater vulnerability will be increased and there will be a more direct pathway for surface contaminants to enter the underlying bedrock aquifer and migrate towards downgradient receiving surface water bodies. Generally, the aquifers within the Drogheda GWB are unconfined, but may become locally confined where the subsoil is thicker and of lower permeability. According to the site investigations the total depth of the wells ranged between 5.8mbgl at BH05 and 8.5mbgl at BH04 where bedrock was not encountered. In a worst-case scenario during the construction phase (e.g., accidental release of fuels, chemicals or oils through the failure of secondary containment or a materials handling accident) in the absence of any mitigation measures there is potential for discharge of contaminants to groundwater. The groundwater within the Drogheda GWB may be effected locally in the immediate vicinity of the site. According to the GSI GWB descriptions (GSI, 2025), the thickness of the subsoil increases to over 10m in places in the east, although isolated areas of outcrop are still present'. Given the thickness of subsoils present within the site as encountered during the site investigations, it is considered that there is a negligible risk to watercourses within the catchments of the Boyne Estuary and associated downstream waterbodies and Natura 2000 sites via groundwater flow from the site. Appropriate design avoidance and mitigation measures in accordance with the CEMP will prevent any potential effect to the receiving water quality.
Discharge of Surface Water Runoff (i.e., Rainwater)	Discharge to Mains Sewer	Receiving surface waterbodies (i.e., the Boyne Estuary and downstream waterbodies) Natura 2000 Sites	Low Risk During the construction phase, surface water runoff (i.e., rainwater) will be discharged following appropriate treatment (e.g., settlement or hydrocarbon interceptor) in accordance with the necessary discharge licences issued by UE under Section 16 of the Local Government (Water Pollution) Acts and Regulations or by MCC under

Source	Pathway	Receptor	Risk Evaluation and Avoidance
			Section 4 of the Local Government (Water Pollution) Act 1977, as amended in 1990 and ultimately discharged to the receiving surface waterbodies (i.e., the Boyne Estuary Plume Zone via Drogheda WWTP). There is no identified hydraulic connection between the site and the Sheephouse_07 Stream which is culverted along the eastern boundary of the site. However, during rainfall events there is a potential for release of suspended sediments entrained in surface runoff from groundworks or indirectly tracked on vehicles / machinery entering the receiving waterbodies which will potentially drain via overland flow to the Boyne Estuary. During the construction phase, all works will be undertaken in strict accordance with the CEMP which will detail appropriate design avoidance and mitigation measures to prevent any potential effect to the receiving water quality.
Foul Water Discharge	Discharge to Mains Sewer	Receiving surface waterbodies (i.e., the Boyne Estuary and downstream waterbodies) Natura 2000 Sites	Low Risk Foul water during the construction phase of the Proposed Development will be either removed by tanker in accordance with waste management legislation and managed accordingly or discharged under consent to the mains UE drainage network and ultimately discharged to the receiving surface waterbodies (i.e., the Boyne Estuary Plume Zone via Drogheda WWTP). Foul water from the site will only be discharged to the UE network under the appropriate consents from UE and therefore, the Proposed Development will not cause a potential effect at any receiving waterbody or Natura 2000 sites associated with discharges from the site.
Operational Phase			
Discharge of Surface Water Runoff (i.e., rainwater)	Discharge to Surface Water Drainage Network	Receiving surface waterbodies (i.e., Boyne Estuary and downstream waterbodies) Natura 2000 Sites	Low to Moderate Risk (worst-case unmitigated scenario) During the operational phase of the Proposed Development, there is limited potential for discharge of any contaminated runoff to the receiving

Source	Pathway	Receptor	Risk Evaluation and Avoidance
			water courses associated with surface water runoff from the site. Surface runoff from roofs and paved areas will be managed and treated in accordance with SUDS and pass through petrol interceptor and attenuation tanks prior to discharging to the public surface water network, which is located adjacent to Rathmullan Road at the northeast of the site.However, in a worst-case scenario during the operational phase (i.e., failure of SuDS) in the absence of any mitigation measures there is potential for discharge of contaminants to receiving surface water receptors (i.e., the Boyne Estuary and downstream receptors).
Discharge of Contaminants to Ground / Groundwater	Vertical and Lateral Groundwater Migration in Bedrock Aquifer	Underlying Bedrock Aquifer Receiving surface waterbodies (i.e., Boyne Estuary and downstream waterbodies) Natura 2000 Sites	No Identified Risk Based on the design of the Proposed Development there are limited potential sources of contamination during the operational phase and there will be limited potential for discharge of contaminants associated with surface water runoff to ground via unpaved, permeable areas due to the low infiltration potential at the site. Surface water will be managed in accordance with the principles and objectives of SuDS and the GDSDS to treat and attenuate water prior to discharging offsite. Ongoing regular operational monitoring and maintenance of drainage and the SuDS measures will be incorporated into the overall management strategy for the Proposed Development. This will ensure that there are no effects on water quality during the operational phase of the Proposed Development.
Foul Water Discharge	Discharge to Mains Sewer	Receiving surface waterbodies (i.e., Boyne Estuary and downstream waterbodies) Natura 2000 Sites	Low Risk Foul water during the operational phase of the Proposed Development will be discharged to the UE drainage network and ultimately discharged to Boyne Estuary Plume Zone via the Drogheda WWTP. Foul water from the site will only be discharged to the UE network under the appropriate consents from UE, and therefore, the Proposed Development will not cause a potential effect at any receiving waterbody or Natura 2000 sites associated with discharges from the site.

Source	Pathway	Receptor	Risk Evaluation and Avoidance
			As noted in Section 3.2.3, the UE COF confirms the connection is feasible, subject to upgrades. The Applicant will fund all upgrade works and will ensure that all works are completed in agreement with and to the satisfaction of UE prior to connection.
Flooding of Site During Operation	Out of Bank from the Boyne Estuary	Underlying Bedrock Aquifer Receiving surface waterbodies (i.e., the River Dodder, the Liffey Estuary, and Dublin Bay) Natura 2000 Sites Persons or property	Low Risk The proposed development is not identified to be at risk of flooding in events up to and exceeding the 1 in 1000-year event.

5.2.1 Design Avoidance and Mitigation

The assessment of the potential effects on the receiving environment takes account of the embedded design avoidance measures and standard good practice construction methods to reduce the potential for effects to the water environment. These are outlined below together with additional specific measures based on the findings of this assessment.

5.2.1.1 Construction Phase

During the Construction Phase, all works will be undertaken in accordance with the Construction Environmental Management Plan (CEMP) (MW, 2025b) and the Resource and Waste Management Plan (RWMP) (DNV, 2025). Following appointment, the contractor will be required to further develop the CEMP and RWMP to provide detailed construction phasing and methods to manage and prevent any potential emissions to ground and surface water with regard to the relevant industry standards (e.g., Guidance for Consultants and Contractors, CIRIA-C532', CIRIA, 2001). The CEMP and RWMP will be implemented for the duration of the Construction Phase, covering construction and waste management activities that will take place during the Construction Phase of the Proposed Development. Refer to the EIAR (Water Chapter - Volume 3) submitted with the planning application for the mitigation measures proposed for the Proposed Development.

These measures will address the main activities of potential impact which include:

- Control and Management of surface water runoff.
- Control and management of shallow groundwater during excavation and dewatering.
- Management and control of soil and materials.
- Appropriate fuel and chemical handling, transport and storage.
- Management of accidental release of contaminants at the site.
- Control and handling of cementitious materials.

There will be no authorised discharge of water to ground during the construction phase. Where surface water runoff must be pumped from the excavations, water will be managed in

accordance with best practice standards (i.e., CIRIA C750), the CEMP (WM, 2025b) and regulatory consents to minimise the potential effect on the local groundwater flow regime within the underlying aquifer and surface water bodies. Surface water runoff will be discharged by the contractor, following appropriate treatment (e.g., settlement or hydrocarbon interceptor) to sewer in accordance with the necessary discharge licences issued by UE under Section 16 of the Local Government (Water Pollution) Acts and Regulations for any water discharges to sewer or from MCC under Section 4 of the Local Government (Water Pollution) Act 1977, as amended in 1990 for discharges to surface water. Under no circumstances will any untreated wastewater generated onsite (from equipment washing, road sweeping etc.) be released offsite. Where required, all public sewers will be protected to ensure that any untreated wastewater generated onsite does not enter the public sewers.

Cut-off trenches will be constructed prior to stripping topsoil along the northern boundary of the Proposed Development. These cut-off trenches will have a settlement pond / silt trap at the end of each trench with an overflow. Straw bales will be placed within the cut-off trenches at strategic locations and at the outfall of the settlement ponds to the overflow. Silt fencing will also be installed on the downgradient side of the cut-off trenches to prevent surface water runoff to the water course and will be retained in place for the duration of the construction phase until the development is complete. The project specific CEMP (which will be prepared by the main contractor in advance of construction works commencing) will identify how the silt fencing is to be installed and maintained throughout the construction phase.

All water leaving the site during construction will be desilted using standard techniques. Settlement ponds/silt traps will be provided by the contractor where necessary and regularly maintained to prevent silts and soils from being washed away into the existing ditches/watercourses during periods of heavy rain and during the drainage works.

The main contractor will appoint a suitably qualified person to oversee the implementation of measures for the prevention of pollution to the receiving surface water environment.

Regular testing of surface water discharges will be undertaken at the outfall from the subject lands. The location will be agreed between the project ecologist and the site foreman at the commencement of works. Trigger levels for halting works and re-examining protection measures will be: pH >9.0 or pH 25 mg/l. These trigger levels are based on those outlined within ‘Guidelines on Protection of Fisheries During Works in and Adjacent to Waters (IFI, 2016)’.

Where silt control measures are noted to be failing or not working adequately, works will cease in the relevant area. The project ecologist will review and agree alternative pollution control measures, such as deepening or redirecting trenches as appropriate, before works may recommence.

The use of wheel wash and water treatment facilities will be used as required onsite. The correct use and management of these will be undertaken by the appointed contractor to ensure that there is no harm to the receiving water environment.

Where required, stockpiles of loose materials pending re-use onsite will be protected for the duration of the works and not located in areas where sediment laden runoff may enter existing surface water drains.

- To help shed rainwater and prevent ponding and infiltration, the sides and top of the stockpiles will be regraded to form a smooth gradient with compacted sides reducing infiltration and silt runoff.
- Where required, silt fences will be erected at the toe of stockpiles to prevent runoff.
- The silt fences will be monitored daily by the appointed contractor and silt will be removed as required.

During the construction phase, fuelling and lubrication of equipment will be carried out in accordance with the procedures outlined in the CEMP in a designated area of the site away from any watercourses and drains (where not possible to carry out such activities onsite). Any diesel, fuel or hydraulic oils stored onsite will be stored in designated areas. These areas will be bunded and located away from surface water drainage and features. Bunds will have regard to Environmental Protection Agency guidelines 'Amendment to IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities' (EPA, 2013). The main contractor will maintain an emergency response action plan and emergency procedures will be developed by the appointed contractor in advance of any works commencing.

Strict supervision of contractors will be adhered to in order to ensure that all plant and equipment utilised onsite is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Proposed Development site. Only emergency breakdown maintenance will be carried out onsite. Drip trays and spill kits will be available onsite to ensure that any spills from vehicles are contained and removed offsite.

Emergency procedures will be developed by the appointed Contractor in advance of works commencing and spillage kits will be available onsite, including in vehicles operating onsite. Construction staff will be familiar with emergency procedures in the event of accidental fuel spillages. Remedial action will be immediately implemented to address any potential impacts in accordance with industry standards and legislative requirements.

- Any required emergency vehicle or equipment maintenance work will take place in a designated impermeable area within the site.
- Emergency response procedures and contingency plans will be put in place, in the unlikely event of emergency accidents (i.e., spillages of fuels or lubricants).
- Spill kits, including oil absorbent material, will be provided and available onsite, so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained.
- In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the Proposed Development site and compliantly disposed of offsite. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures, standards and EPA guidelines.
- All construction works staff will be familiar with the emergency procedures in the event of accidental fuel spillages.
- All construction works staff onsite will be fully trained on the use of equipment.

All below ground drainage infrastructure will be constructed in accordance with current UE requirements to ensure that there are no potential impacts to groundwater quality.

Welfare facilities have the potential, if not managed appropriately, to release organic and other contaminants to ground or surface water courses. Foul drainage from temporary welfare

facilities during the construction phase of the Proposed Development will either be discharged to temporary holding tank(s), the contents of which will periodically be tankered off site to a licensed facility or discharged to public sewer in accordance with the necessary temporary discharge licences issued by UE. The Drogheda WWTP is operated in accordance with relevant statutory approvals issued by UE. The increase discharge to the Drogheda WWTP as a result of the Proposed Development is considered to be insignificant in terms of the overall scale of the facility. The increased load does not have the capacity to alter the effluent released from the WWTP to such an extent as to result in likely significant effects on its receiving waters. Therefore, there will be no potential impact at any Natura 2000 sites associated with discharges from the site.

5.2.1.2 Operational Phase

Based on the design of the Proposed Development there are limited potential sources of contamination during the operational phase and there will be limited potential for discharge of contaminants associated with surface water runoff to ground via unpaved, permeable areas due to the low infiltration potential at the site. Surface water will be managed in accordance with the principles and objectives of SuDS and the GDSDS to treat and attenuate water within the different catchments prior to discharging to the Boyne Estuary. Ongoing regular operational monitoring and maintenance of drainage and the SuDS measures will be incorporated into the overall management strategy for the Proposed Development. This will ensure that there are no effects on water quality and quantity (flow regime) during the operational phase of the Proposed Development.

Foul water during the operational phase of the Proposed Development will ultimately discharge via the Drogheda WWTP to the Boyne Estuary transitional waterbody and subsequently to the Boyne Estuary Plume Zone coastal waterbody under the appropriate consents from UE. As mentioned above, the Drogheda WWTP, does not have an observable effect on the water quality, nor does it have an observable negative effect on the WFD status. Foul water from the site will only be discharged to the UE network under the appropriate consents from UE, and therefore, the Proposed Development will not cause a potential effect at any Natura 2000 sites associated with discharges from the site.

5.2.2 Potential Effect on Natura 2000 Sites

Based on the findings of this assessment, it is considered that in applying the precautionary principle and assessing a worst case scenario there is no identified potential negative effect associated with the Proposed Development, considering the distance downstream and the significant dilution which will occur, on the closest hydraulically connected Natura 2000 sites and other protected and designated sites in particular the River Boyne and River Blackwater SAC, Boyne Coast and Estuary SAC, Boyne Estuary SPA, North-West Irish Sea SPA, the Boyne River Islands pNHA and Boyne Coast and Estuary pNHA individually or in-combination. The mitigation measures as outlined above, including the design of the existing drainage network in accordance with SuDS and the GDSDS and construction mitigation measures, will prevent any effect on the receiving groundwater and surface water environment and in turn will prevent any effect on the closest Natura 2000 sites.

Furthermore, based on the design of the Proposed Development there are limited potential sources of contamination anticipated during the operational phase of the Proposed Development. Foul water from the site will only be discharged to the UE network under the

appropriate consents from UE. Surface water will be managed by SuDS to treat and attenuate water prior to discharging offsite. Therefore, the proposed development will not cause any potential effect on Natura sites associated with the discharges from the site.

5.2.3 Water Framework Directive Status

The findings of the risk-based assessment (refer to the WFD Assessment (DNV, 2025) submitted with the planning application under separate cover for further detail) identified that in the absence of any mitigation and avoidance measures there could be a potential effect on the water quality within receiving water bodies associated with the Proposed Development, specifically within a local zone of the Drogheda GWB and within the Boyne Estuary. There is no identified potential effect to the coastal waterbodies (Boyne Estuary Plume Zone, Louth Coast (HA 06) and Northwestern Irish Sea (HA 08)) attributed to the separation distances and anticipated assimilation capacity of the receiving water bodies taking account of the existing baseline conditions and WFD Status.

The mitigation measures as outlined above (section 5.2.1), including the implementation of the CEMP during the construction phase of the Proposed Development and the incorporation of SUDS in accordance with the GDSDS in the design of the operation phase of the Proposed Development, will prevent any effect on the receiving groundwater and surface water environment. Hence, the Proposed Development will not have any effect on compliance with the EU Water Framework Directive, European Communities (Environmental Objectives) Surface Water Regulations, 2009 (SI 272 of 2009, as amended 2012 (SI No 327 of 2012), and the European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010), as amended 2012 (SI 149 of 2012) and 2016 (S.I. No. 366 of 2016).

The Proposed Development will not cause a deterioration in the status of waterbodies hydraulically connected with the Proposed Development, taking account of design avoidance and mitigation measures that will be implemented. The Proposed Development will not jeopardise the objective to achieve ‘good’ surface water status or good ecological potential.

There will be no effect to the existing WFD status of water bodies associated with the Proposed Development including the Boyne Estuary transitional waterbody and associated coastal waters (Boyne Estuary Plume Zone, Louth Coast (HA 06) and Northwestern Irish Sea (HA 08)) and the Drogheda GWB as a result of the Proposed Development taking account of embedded design avoidance and mitigation measures.

6 CONCLUSIONS

DNV carried out a risk-based hydrological and hydrogeological effect assessment for the Proposed Development to determine if there is any potential for significant effects on the receiving water environment and designated Natura 2000 sites in the absence of avoidance and mitigation measures.

The CSM was developed identifying plausible S-P-R linkages for the Proposed Development and receiving water environment. The CSM formed the basis of the evaluation of any potential effects to receptors including water bodies and Natura 2000 sites associated with the Proposed Development. The assessment was undertaken to determine the potential for harmful effects in the absence of mitigation measures intended to avoid or reduce potential harmful effects, assuming a worst-case scenario—both individually and in combination.

Based on the findings of this assessment the following can be concluded:

- Assuming a worst-case scenario (e.g., accidental release of fuels, chemicals or oils through the failure of secondary containment or a materials handling accident during the construction phase or SuDS failure during the operational phase) at the site and taking account of the local hydrogeological regime, there is a potential risk of effect to local groundwater quality, however there is no identified potential effect on the receiving surface water bodies via groundwater flow from the site.
- There are no identified direct pollutant linkages between the site via surface water courses to receiving water bodies.
- The appropriate standard design measures for the construction phase and operational phase of the Proposed Development including implementation of the CEMP and SuDS measures within the drainage design will prevent, limit and mitigate the potential for the worst-case scenario to occur. These embedded measures will ensure there is no risk to water quality of the receiving watercourses.
- The aquifer underlying the site has been identified as karstified, which means it is characterized by features such as fissures, conduits, and rapid groundwater flow. These properties can significantly increase the vulnerability of the aquifer to contamination, as pollutants may travel quickly and unpredictably through the subsurface with limited natural attenuation. However, due to the substantial thickness of the subsoils present at the site, the potential for contaminants within the Drogheda Groundwater Body (GWB) to migrate vertically or laterally to other water bodies is considered limited. Even under worst-case conditions, any effects are likely to remain confined to the immediate vicinity of the site.
- There is no identified risk to water quality via discharge of foul water drainage or discharges from the Proposed Development that will ultimately be discharged to the Boyne Estuary transitional waterbody via Drogheda WWTP under appropriate consent from UE.
- In the unmitigated worst-case scenario, there is no identified negative effect on the closest hydraulically connected Natura 2000 sites in particular the River Boyne and River Blackwater SAC, the Boyne Coast and Estuary SAC, the Boyne Estuary SPA, the Boyne River Island pNHA and Boyne Coast and Estuary pNHA associated with the Proposed Development either individually or in-combination.

- There is no identified effect to the existing WFD status of water bodies associated with the Proposed Development including the Drogheda GWB, Boyne Estuary Transitional Waterbody and the Boyne Estuary Plume Zone, Louth Coast (HA 06) and Northwestern Irish Sea (HA 08) Coastal Waters as a result of the Proposed Development taking account of design avoidance and mitigation measures that will be implemented as described.

Overall, taking into account the hydrogeological risk assessment undertaken for the site associated with both the construction and operational phases of the Proposed Development, it is considered any potential impact on the receiving environment (hydrogeology) will be imperceptible and non-significant. Furthermore, no hydrological and hydrogeological-related constraints have been identified that would be expected to hinder or prevent the Proposed Development from proceeding as planned.

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Appendix 7-2

RATHMULLAN ROAD, OLDBRIDGE, DROGHEDA, CO. MEATH

Water Framework Directive Assessment

Earlsfort Developments Drogheda Limited

Report no.: 1.0, Rev. **1.0**
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LIST OF ABBREVIATIONS

Abbreviation	Definition
AEP	Annual Exceedance Probability
AFA	Area for Further Assessment
DEHLG	Department of Environment, Heritage and Local Government
DWPA	Drinking Water Protected Areas
GSI	Geological Survey Ireland
OPW	Office of Public Works
RBMP	River Basin Management Plan
TII	Transport Infrastructure Ireland
UE	Uisce Éireann
WAP	Water Action Plan
WFD	Water Framework Directive
WWTP	Wastewater Treatment Plant

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1 INTRODUCTION

DNV has been appointed by Earlsfort Developments Drogheda Limited (hereafter referred to as the Applicant) to complete a Water Framework Directive (WFD) Assessment for the proposed residential development at Rathmullan, Drogheda, Co. Meath (hereafter referred to as the 'Proposed Development' and 'site').

This report presents the findings of the WFD Assessment for the site and Proposed Development.

1.1 Project Objective

The overall objective of this WFD assessment is to determine if any specific components or activities associated with the Proposed Development will compromise WFD Article 4 objectives, cause a deterioration in the status of any surface water or groundwater body and/or jeopardise the attainment of good surface water or groundwater status. This assessment also aims to identify any waterbodies with the potential to be impacted, describe the proposed mitigation measures if required and define any residual potential impacts.

1.2 Project Scope of Work

The scope of this WFD assessment included the following tasks in line with WFD Common Implementation Strategy (CIS) Guidance:

- Screening for Potential Effects - Determine whether the Proposed Development could have any direct or indirect effect on the different quality elements relevant to the WFD.
- Scoping of Further Investigations - Outline the information required to determine the significance of any effect on the relevant quality elements.
- Data Collection and Assessment - Assess whether any effect could cause deterioration or compromise the status/potential status of a water body.

This assessment is reliant on the design information for the Proposed Development provided by the Applicant.

1.3 Professional Competency

The report was prepared by Nuria Manzanas a Principal Consultant of DNV. Nuria is a Chartered Geologist (PGeo) with the Institute of Geologists Ireland (IGI) with over 11 years' experience of preparing environmental and hydrogeological assessments for a range of project types and geological and hydrogeological site settings. The report was reviewed by Warren Vokes Ba MSc MCIWEM CWEM a Senior Consultant of DNV. Warren is a Chartered Water and Environmental Manager with over 9 years' experience of preparing environmental and hydrological assessments. The report was approved by Gareth Carroll BA BEng MIEnvSc CEnv, a Principal Consultant of DNV. Gareth is a Chartered Environmentalist (CEnv) with the Institute of Environmental Sciences (IES) with over 12 years' experience of preparing environmental and hydrogeological assessments for a range of project types and geological and hydrogeological site settings and accredited to undertake water framework directive assessments.

2 METHODOLOGY

2.1 Legislative Context

The EU Water Framework Directive (2000/60/EC), as amended by Directives 2008/105/EC, 2013/39/EU, and 2014/101/EU ("WFD"), was enacted to ensure the protection of the water environment. The Directive was transposed into Irish law by the European Communities (EU) (Water Policy) Regulations 2003 (S.I. No. 722 of 2003) with regard to the Common Implementation Strategy for the Water Framework Directive and the Floods Directive (EU Water Directors, 2016).

The WFD requires that all member states protect and improve water quality in all waters, with the aim of achieving good status by 2027 at the latest. It applies to all surface waters (defined as inland waters, both standing and flowing and includes rivers, lakes, reservoirs, streams and canals), groundwater, transitional (estuarine) and coastal waters. This includes both natural and "artificial and heavily modified bodies of water" ('artificial' is defined in Article 2(8) as 'a body of surface water created by human activity' and 'heavily modified' is defined in Article 2(9) as 'a body of surface water which as a result of physical alternations by human activity is substantially changed in character').

The WFD Article 4 objectives, which have been considered as part of the design process of the Proposed Development, include the following:

- Protect, enhance, and restore all bodies of surface water and groundwater with the aim of achieving good surface water status by 2027.
- Prevent deterioration and maintain a 'high' status where it already exists.
- Implement the necessary measures with the aim of progressively reducing pollution in surface waters and groundwater.
- Ensure waters in protected areas meet requirements.

2.1.1 National Policy

The WFD is implemented through the River Basin Management Plans (RBMP), which operates on a renewing six-year cycle of planning, action, and review. RBMPs set targets to address water quality issues, including the identification of river basin districts, water bodies, protected areas, and any pressures or risks, setting out monitoring requirements, and proposing environmental objectives. In Ireland, the first RBMP covered the period from 2009 to 2015, with the second cycle plan covering the period from 2018 to 2021.

The Water Action Plan 2024 (RBMP 3rd Cycle – 2022-2027) Programme of Measures outlines comprehensive measures to protect and improve water quality across various sectors. The Programme of Measures (PoM) for the RBMP is a set of actions designed to achieve the environmental objectives set out in the WFD. The PoM includes both broad measures applicable at a national scale and supplementary measures applicable to only specific catchments:

Key elements of the PoM include:

- Integrated Catchment Management: The PoM uses an integrated catchment management approach, focusing on identifying the right measures for specific locations to maximise effectiveness.

- Collaboration: Implementation involves collaboration between various government departments, local authorities, the EPA, and other stakeholders, with the Programme Delivery Office overseeing and coordinating efforts.
- Monitoring and Reporting: An enhanced monitoring and reporting programme tracks the implementation progress and assesses the effectiveness of the measures.
- Targeted Actions: The PoM identifies specific actions under each pressure/issue affecting water quality, assigning lead organisations, timelines, and key performance indicators.
- Multiple Benefits: The PoM aims to deliver multiple benefits for water, biodiversity, and climate change mitigation and adaptation.
- Environmental Assessment: All measures and projects arising during the third-cycle RBMP are subject to further environmental assessments, including Strategic Environmental Assessment (SEA) and Appropriate Assessment (AA), as required.

The Water Action Plan 2024 provides numerous specific examples of measures within the PoM, categorised by the sector driving the impact:

- Agriculture: Implementation of a stronger and more targeted Nitrates Action Programme, including tighter controls on nutrient applications, a livestock excretion banding system, a national fertiliser sales database, and enhanced inspection and enforcement programmes.
- Hydromorphology: Developing a new Controlled Activities for the Protection of Waters regime to address pressures on the physical condition of waters.
- Forestry: Increasing the area of forests with appropriate water setbacks, seeking improvements to the licence applications process for key forestry activities, and rolling out schemes that promote water protection.
- Urban Wastewater: Continued investment in urban wastewater infrastructure and a review of water bodies where urban wastewater is a significant pressure.
- Peatlands: Updating the National Peatlands Strategy and continuing the national programme of peatland restoration.

These measures are designed to ensure that all new developments comply with the WFD's fundamental requirements and contribute to the overall goal of achieving good water status by 2027.

This assessment takes into account and meets all the requirements and objectives outlined above, ensuring compliance with the WFD.

2.1.2 Other Relevant Policy and Guidance

The methodology adopted for this assessment takes cognisance of other relevant standards and regulations pertinent to undertaking a WFD assessment in particular the following:

- Council Directive 2006/118/EC, 2006. On the protection of groundwater against pollution and deterioration. European Parliament and the Council of European Communities.
- Commission Directive 2014/80/EU of 20 June 2014 amending Annex II to Directive 2006/118/EC of the European Parliament and of the Council on the protection of groundwater against pollution and deterioration.

- EU Water Framework Directive 2000/60/EC of the European Parliament and of the Council of 23rd October 2000 establishing a framework for Community action in the field of water policy with amendments.
- European Communities (Water Policy) Regulations 2003 (S.I. No. 722/2003);
- Environmental Protection Agency, December 2011. Guidance on the Authorisation of Discharges to Groundwater.
- Department of the Environment, Heritage and Local Government, Environmental Protection Agency and Geological Survey of Ireland, 1999. Groundwater Protection Schemes (Groundwater Protection Schemes, 1999);
- Local Government, July 1990. No. 21 of 1990. Local Government (Water Pollution) (Amendment) Act, 1990.
- S.I. No. 9/2010 - European Communities Environmental Objectives (Groundwater) Regulations 2010 and as amended; and,
- S.I. No. 272/2009 - European Communities Environmental Objectives (Surface Waters) Regulations 2009 and as amended.
- Environmental Protection Agency (EPA) (2022), Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EIAR).
- Inland Fisheries Ireland (IFI) (2016), Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Water.
- Transport Infrastructure Ireland (TII 2009) Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.
- DoEHLG (Nov 2009) The Planning System and Flood Risk Management – Guidelines for Planning Authorities.

2.2 Waterbody Characterisation

The following definition of a waterbody is presented in Article 2 of the WFD:

“Body of surface water' means a discrete and significant element of surface water such as a lake, a reservoir, a stream, river or canal, part of a stream, river or canal, a transitional water or a stretch of coastal water. This definition is transcribed in Part 1 of S.1. No. 272/2009 - European Communities Environmental Objectives (Surface Waters') Regulations 2009. Guidance on what constitutes a "discrete and significant element" is presented in the "Common Implementation Strategy for the Water Framework Directive (2000/60/EC), Guidance document No.2 identification of Water Bodies" (CIS No.2),

As noted in the CIS guidance document, "The Directive does not include a threshold for very small waterbodies". The WFD under Annex II sets out two systems for differentiating water bodies into typologies: System A and B System. The limited number of descriptors in System A was to aid cross comparison of waterbody typologies across the EU. However, in many regions of Europe the limited descriptors and parameters do not provide appropriate differentiation for Waterbodies. This was the case on the island of Ireland (ecoregion 17) where System B was adopted instead. System B has no predefined descriptor ranges but must allow for at least the same level of differentiation as System A and can consider additional descriptors to those required for System A.

As part of the implementation of the WFD in Ireland the EPA set out parameters for characterisation under System B. The EPA characterisation of waterbodies is described in the *Submission in accordance with Article 5 of Directive 2000/60/EC of the European Parliament*

and of the Council of 23rd October 2000 establishing a framework for Community action in the field of water policy, and in accordance with EC-DG Environment D.2 document 'Reporting Sheets for 2005 Reporting" dated 19th November 2004. (EPA, 2005).

It should be noted that WFD covers all waterbodies, but not every watercourse is monitored or classified by the EPA individually. Local 'non-characterised' water features are considered tributaries of the 'characterised' water bodies they connect to and are assessed as such here.

2.3 Water Framework Directive Classification

The information used in the classification of the status of our water bodies is collected in the national WFD monitoring programme.

2.3.1 Surface Water Assessment

Under the WFD, surface water bodies are defined as stated in section 2.1 above and below:

- Rivers;
- Lakes;
- Transitional waters;
- Coastal waters;
- Artificial surface water bodies; and,
- Heavily modified surface water bodies.

The overall status of surface waters is classified using information on the ecological status and chemical status which are outlined below.

2.3.1.1 Ecological Status

The ecological status of a surface water body is assessed based on the following categories, with each category receiving a rating of, “High,” “Good,” “Moderate,” “Poor” and “Bad” (EPA, 2025). Refer to Figure 2-1 below for a representation of the WFD classification of the waterbodies (Catchments.ie, 2025).

High status, which is considered to be the best status achievable or benchmark for a given water body, is the *‘reference condition’* defined as the biological, chemical, and morphological conditions associated with no or very low human pressure.

The ecological status of a surface water body is assessed according to:

- Biological quality (i.e., the condition of biological elements (aquatic flora and fauna));
- Physico-chemical quality (temperature, oxygenation, nutrient conditions) and,
- Hydromorphological quality (waterflow (i.e., flow and tidal conditions), sediment composition and movement, riverbank structure, etc).

The overall ecological status of a surface water body is based on the lowest of the three individual categories, which means that the condition of a single quality element (i.e., biological, physico-chemical and hydromorphological) can cause a water body to fail to reach its WFD classification objectives.

In the case of artificial and heavily modified waters, ecological potential status is assessed similarly to ecological status above but is rated as “Maximum,” “Good,” “Moderate,” “Poor” or “Bad” ecological potential instead. In general terms, ‘maximum ecological potential’ means that the water body is as close as possible to a comparable surface water body, with the only differences being those directly attributed to the artificial or modified nature of the water body.

2.3.1.2 Chemical Status

Chemical status (level of harmful chemicals in the water) is recorded by one of two ratings, 'Good' or 'Fail.' It is assessed by compliance with Environmental Quality Standards (EQS) for chemicals that are listed in the European Communities Environmental Objectives (Surface Waters) Regulations 2009 S.I. No. 272/2009 (as amended). This involves making sure that no changes take place that would worsen the current condition of any waterbody and that a proposed development does not prevent the achievement of the future status objectives of any waterbody.

The chemical status classification for the waterbody is determined by the lowest scoring chemical reported in the waterbody.

For an Artificial or Heavily Modified Water Body hydromorphologically which has been altered for anthropogenic purposes (i.e., water supply, flood protection or navigation), the objective is to achieve a Good Ecological Potential (GEP) for those waterbodies. This means that the ecology must be as close as possible to that of a similar natural water body, without compromising the specified human use for which the waterbody is designated.

2.3.2 Groundwater Assessment

Groundwater is awarded either "Good" or "Poor" status. Groundwater is assessed based on its chemical and quantitative status.

2.3.2.1 Chemical Status

Good chemical status of a groundwater body requires the entry of hazardous substances and saline intrusion into the groundwater to be prevented, and the presence of other pollutants to be below the limits within S.I. No. 9/2010 - European Communities Environmental Objectives (Groundwater) Regulations 2010 (as amended). Concentrations of pollutants must also not be of such a concentration as to affect the ecological or chemical status of associated surface waters or to damage linked terrestrial ecosystems.

2.3.2.2 Quantitative status

Quantitative status (i.e., the amount of water present) is assessed based on whether or not the available groundwater resource is being reduced by the long-term rate of annual abstraction.

Refer to Figure 2-1 below for a representation of the WFD classification of the waterbodies.

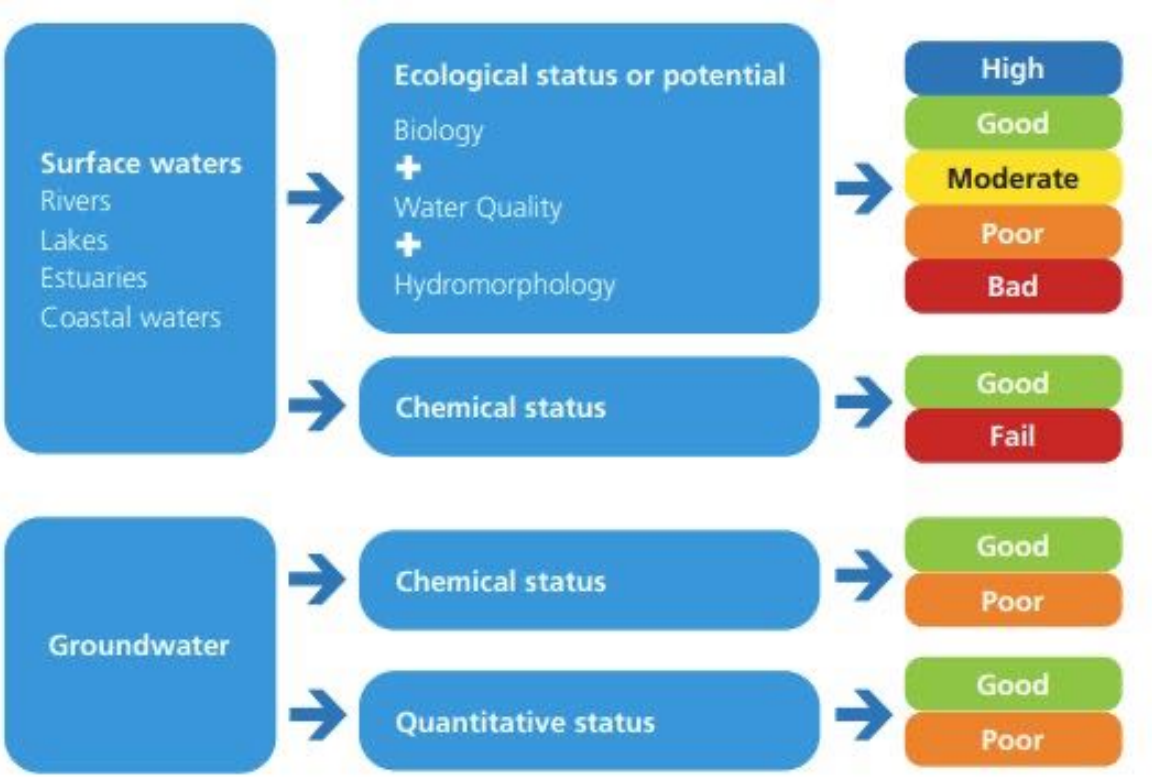

Figure 2-1: WFD Classification (source: EPA, 2025 – www.catchments.ie)

2.4 Approach to WFD Assessment

In order to assist in the implementation of the WFD, EU member states, alongside Norway and the European Commission, developed a Common Implementation Strategy (CIS) in May 2001. This CIS was designed to provide coherent and comprehensible guidelines aimed at achieving the aims of WFD.

CIS Guidance Document 36 provides an outline of an approach to WFD Assessments which breaks the assessment down into the following sequential steps:

- Screening for Potential Effects - Determine whether the Proposed Development could have any direct or indirect effect on the different quality elements relevant to the WFD.
- Scoping of Further Investigations - Outline the information required to determine the significance of any effect on the relevant quality elements.
- Data Collection and Assessment - Assess whether any effect could cause deterioration or compromise the status/potential status of a water body.

If a proposed development is determined to compromise or deteriorate the status/potential status of a waterbody then an “Article 4(7) Test” is required. The Proposed Development can only be authorised if the conditions as outlined under Article 4(7) a) to d) are fulfilled. The applicant must provide detailed evidence to meet these four stringent tests:

- (a): All practical steps are taken to mitigate the adverse impacts on the water body.
- (b): The reasons for modifications or alterations are documented in the RBMP.
- (c)(1): There is an overriding public interest in the Development or
- (c)(2): The benefits outweigh those of the WFD objectives, particularly regarding human health, safety, or sustainable development.

- (d): The project's benefits cannot be achieved by a significantly better environmental option that is technically feasible and not disproportionately costly.

The Proposed Development must not permanently exclude or compromise the WFD objectives in other water bodies within the same RBD and must comply with other environmental legislation (Article 4(8)). Additionally, new provisions must guarantee at least the same level of protection as existing legislation (Article 4(9)). Additional guidance relating to Article 4(7) derogations is provided in the Common Implementation Strategy Document No.36 (EU Water Directors, 2017).

If the conditions are not fulfilled the Proposed Development cannot be authorised according to the WFD. If no impacts are identified, then no Article 4(7) assessment is required and authorisation may be permitted according to the WFD.

3 DESCRIPTION OF THE PROPOSED DEVELOPMENT

The Applicant intends to apply for permission for a Large-Scale Residential Development (LRD) on a site of approximately 9.20 hectares (Ha).

The Proposed Development comprises the following:

(i) demolition/removal of all existing farm buildings/structures, and associated hard standing on site;

(ii) construction of a large-scale residential development (LRD) of 249 no. units comprising 170 no. two-storey houses (including 37 no. two-bedroom houses, 111 no. three-bedroom houses and 22 no. four-bedroom houses), 16 no. three-storey duplex buildings (accommodating 16 no. one-bedroom and 16 no. two-bedroom units) and a mix of 8 no. three-storey and 3 no. four-storey apartments blocks accommodating a total of 22 no. one-bedroom and 25 no. two-bedroom apartments);

(iii) construction of a new vehicular entrance and access road off Rathmullan Road with associated junction works and associated internal access road network with pedestrian and cyclist infrastructure;

(iv) provision of a three-storey creche facility (411sq.m) with external play areas at ground and second floors and vehicular/bicycle parking area; and,

(v) all ancillary site and infrastructural works, inclusive of removal of existing vehicular entrances, general landscaping and public open space provision, vehicular parking provision (396 no. spaces in total), bicycle parking, boundary treatments, foul/surface water drainage, attenuation areas, provision of pumping station and provision of an ESB substation, as necessary to facilitate the Proposed Development. Each house will be served by vehicular parking to the front and private amenity space in the form of a rear garden. Each duplex building will be served by vehicular parking to the front and private amenity space in the form of balcony/terrace spaces to the rear. Each apartment block will have shared access to adjoining car parking bays with communal amenity space and bicycle/bin stores provided to the rear and each apartment will be provided with private amenity space in the form of a balcony or terrace. The development includes provision of a landscaped area of public open space to the north of the site, with 2 no. pedestrian/cyclist connections (via the northern/eastern site boundaries) to Rathmullan Road which will be subsequently ceded to Meath County Council.

3.1 Construction Phase

The construction phase of the Proposed Development will include:

- Removal of topsoil and stockpiled onsite for reuse on completion of the works.
    - The stripping of topsoil will be undertaken on a phased basis so that no area is stripped until such time as works are imminent in that area.
    - Topsoil disturbed during the construction phase will be reused as much as practicable.
    - The surplus excavated topsoil will be removed to a licenced facility.
- Excavation of subsoil will be required to allow the construction of roads, building foundations, drainage, and ancillary services. The maximum excavation depths will be 4.645m, located at the site entrance. This is for drainage in a road area to be cut in at site access.

  - Based on the cut and fill analysis, the volume of cut (i.e., excavated material) is approximately 37,524.04m^3 and the volume of fill is approximately 12,437.84m^3 (refer to Drawing No. RAT-WMX-PH2-00-DR-C-P500 - Cut & Fill Analysis-Sub Base Level submitted with the planning application under separate cover). It is estimated that approximately 25,086.20m^3 of this soil material will be stockpiled temporarily before being removed from site.
  - It is estimated that approximately 6,534.31m^3 of additional soil and subsoil material will be excavated and removed offsite for the construction of the underground attenuation tanks and foul pumping station.
  - It is anticipated that there will be no requirement for the excavation of bedrock during the construction stage of the Proposed Development.
  - Excavated soil and subsoil materials will be reused for engineering fill and landscaping where possible.
- Demolition of the existing farm buildings located within the southeastern boundary of the site. Asbestos was reported in a number of locations across the buildings.
- Building foundations will consist of a traditional reinforced concrete foundation founded in 100 kPa allowable bearing pressure stratum. The stratum is to be stiff natural ground. Where this stratum is deep, a lean mixed trench will be constructed below the foundations to effectively found in the required stratum. There will be no requirement for piled foundations.
- There will be large quantities of materials brought to the site to facilitate construction such as concrete, concrete blocks, timber, reinforcement, pipework, insulation, fixings, plasterboard, etc.
- Aggregate materials imported to the site (i.e., natural stones and gravel, aggregates, and related fill products) will be sourced from locally available quarries in accordance with the appropriate statutory guidelines.
- Groundwater was not encountered during site investigations which extended to a maximum depth of 8.5mbGL (WM, 2025b). Therefore, it is anticipated that excavations for the construction of the Proposed Development will be above groundwater with no requirement for dewatering. However, there may be a requirement for management of surface water (rainwater) within excavations during groundworks.
- Construction of new surface water drainage designed in accordance with the principles and objectives of Sustainable Drainage Systems (SuDS) and the Greater Dublin Sustainable Drainage System (GDSDS) and the requirements of MCC.
- Construction of new foul and mains water connections in accordance with UE Code of Practice for Wastewater Infrastructure 2020 & Standard Details for Wastewater Infrastructure (IW-CDS-5030-03) and UE's Code of Practice for Water Infrastructure (IW-CDS-5020-03).

3.2 Operational Phase

3.2.1.1 Surface Water Drainage

Surface water runoff from the Proposed Development will be managed in a surface water drainage system designed in accordance with the principles and objectives of:

- Sustainable Drainage Systems (SuDS).
- Meath County Development Plan 2021-2027.

- Greater Dublin Sustainable Drainage Scheme (GDSDS).

As documented in the Engineering Assessment Report (WM, 2025a), it is proposed that the surface water from the Proposed Development will drain via gravity and discharge at a restricted rate into the existing 1200mm culvert adjacent to Rathmullan Road at the northeast of the site. This culvert merges into a ditch on the opposite side of the existing road approximately 120m to the north of the proposed outfall location. The ditch travels northwards for approximately 60m before outfalling into the Boyne Estuary, which is tidal at this location.

The surface water network for the Proposed Development has been divided into two (2 No.) separate catchments, the Northern Catchment and Southern Catchment. These catchments operate in series with runoff from the Southern Catchment flowing into the downstream Northern Catchment area at a restricted rate, equivalent to the existing 1200mm culvert adjacent to Rathmullan Road at the northeast of the site. Excess stormwater will be attenuated and will be restricted via hydrobrakes or similar approved.

- Southern Catchment: It covers a catchment area of approximately 3.019 hectares.
    - The total impermeable area is approximately 1.589 hectares.
    - The attenuation storage will accommodate the Qbar runoff rate of 10.70 l/s and will be restricted via the hydrobrake manhole with excess runoff stored in an attenuation system located on the central open space.
    - This catchment will outfall into an attenuation system, with an underground attenuation storage capable of accommodating up to 1 in 30 return years (i.e., volume of approximately 896m^3). The excess surface water for the 1 in 100 year storm will be attenuated in the overground detention basin that has a volume of 214.40m^3. The storage required is calculated to be approximately 1057.54m^3. However, the total surface water storage provided within the proposed attenuation system is approximately 1,110.4m^3.
    - This catchment outfalls to the downstream Northern Catchment.
- Northern Catchment: It covers a catchment area of approximately 3.167 hectares
    - The total impermeable area is approximately 1.971 hectares.
    - The attenuation storage will accommodate the Qbar runoff rate of 11.23 l/s and will be restricted via the hydrobrake manhole with excess runoff stored in the aboveground grass detention basin system.
    - This catchment outfalls to the existing 1200 mm culvert on Rathmullan Road at a restricted rate of 21.93 l/s (total from the Southern and Northern Catchments).
    - The flow from the Southern Catchment and the Northern Catchment will outfall into an attenuation system with an underground attenuation storage whose capacity will hold up to a return year of 1 in 30 years (i.e., volume of 1,000m^3). The excess surface water for the 1 in 100 year storm will be attenuated in the overground detention basin (i.e., volume of 311.35m^3) that will be split into 2 parts that will be interconnected.
    - The total surface water storage within the proposed attenuation system is approximately 1,311.35m^3. However, the storage required is calculated to be approximately 1,300m^3 (1 in 100 years storm events).
    - This catchment outfalls to the downstream Northern Catchment to the North direction.

The total capacity of the attenuation storage for both catchments is 2,368.89m^3, based on the 100-year storm event with 20% climate change. Both underground attenuation storages are designed to cater the 1 in 30 year storm events to ensure the above ground grass detention basin is dry throughout the year. Once the 1 in 30 year is exceeded, the above ground detention basin will be filled up slowly and dissipate over time.

A SUDS treatment approach has been implemented in accordance with the CIRIA SuDS Manual C753, as required by the GDSDS, to alleviate the detrimental effects of traditional urban storm water drainage practice (i.e., piping runoff of rainfall from developments to the nearest receiving watercourse).

The SuDS elements, which take account of quantity, quality and amenity issues to manage surface water runoff, are summarised as follows:

- Water Butts - utilised within each residential unit for external gardening and wash down use only, which will ensure interception of roof runoff at source.
- Permeable Pavement - allows stormwater runoff to filter through voids in the pavement surface into an underlying stone reservoir, where it is temporarily stored or infiltrated.
- Swales - an infiltration trench is incorporated at the invert of the swales which will encourage surface water to drain directly to ground. Excess water will drain to the surface water network.
- Grass Detention Basin – above ground features located at the green open space areas utilised to restrict the outflow to the greenfield runoff rate.
- Flow control device (e.g. hydrobrake or similar device) – installed at the outfall manhole of each catchment to reduce the flow rate to that of a greenfield site.
- Petrol Interceptor – installed downstream of each flow control device manhole prior to each outfall into the attenuation to ensure primary treatment of any pollutants present.

As documented in the Engineering Assessment Report (WM, 2025a),*'the management train commences with source control through the provision of filter drains. The second stage of the management train, site control, is provided by the introduction of swales, all of which provide a degree of treatment before discharging to the detention basin. The rate of runoff is controlled through the provision of a hydro-brake. The detention basin offers a third stage of treatment, regional control, by slowing the storm water discharge down and removes any additional silt which may remain in the storm water* '.

Surface water drains will be 150mm to 225mm and generally will consist of PVC (to IS 123) or concrete socket and spigot pipes (to IS 6). These drains will be laid to comply with the Requirements of the Building Regulations 2010, and in accordance with the recommendations contained in Section H of the Technical Guidance Documents. In addition, surface water public sewers will be 225 mm to 525 mm and will consist of PVC or concrete socket and spigot pipes (to IS 6) and will be laid strictly in accordance with the requirements of MCC (WM, 2025a).

The layout of the proposed surface water drainage network is presented in WM Drawing No. 18-014-P451 and P452 - Proposed Drainage Layout submitted with the planning application under separate cover. The surface water area catchments are presented in Figure 3-1 and WM Drawing No. P459 also submitted with the planning application under separate cover.

Figure 3-1. Surface Water Catchment Areas (WM, 2025a)

3.2.1.2 Foul Drainage

As documented in the Engineering Assessment Report (WM, 2025a), submitted with the planning application under separate cover, the foul drainage from the site will drain via a network of gravity sewers to a proposed pumping station located at the low point in the northeastern corner of the site. Foul water will be pumped from the proposed pumping station and will outfall to the existing foul water drainage network at the junction of Rathmullan Road and Marley's Lane.

A Confirmation of Feasibility (COF) was issued by UE on the 1st of April 2025 (UE COF Reference: CDS24009836). The UE COF confirms the connection is feasible, subject to upgrades. To address the requirements of the UE COF, a proposed new pumping station will replace the adjacent existing old pumping station and will facilitate flows from the adjacent Riverbank and Oldbridge Manor Developments. The Applicant will fund all upgrade works and will ensure that all works are completed in agreement with and to the satisfaction of UE prior to connection.

Foul water sewers within the Proposed Development will be laid to comply with the requirements of the Building Regulations, and in accordance with the recommendations contained in Section H of the Technical Guidance Documents.

In accordance with the Irish Water "Code of Practice for Wastewater Supply", the proposed foul outfall from the site is a 225 mm-diameter pipe laid at a gradient of 1:200, giving a capacity of 32 l/s and therefore has adequate capacity to cater for the flows from the development (WM, 2025a).

The proposed pumping station will be designed in compliance with the Irish Water Code of Practice and Irish Water Standard Details and has provision to cater for foul water storage from the Proposed Development with a total capacity of 261m^3. The pumping station is located with a 20m separation distance from the proposed nearest dwelling. This complies with Section 5.5 of the UE "Code of Practice for Wastewater Supply", which states that a Type 3 pumping stations require a minimum buffer zone of 15m. A control kiosk will be provided adjacent to the pumping station.

The layout of the proposed foul water drainage network is presented in WM Drawing No. 18-014-P451 and P452 - Proposed Drainage Layout submitted with the planning application under separate cover.

Foul water from the Proposed Development will be treated in the Drogheda WWTP (Discharge Licence No. D0041) before ultimately discharging to the Boyne Estuary transitional waterbody (EU Code: IE_EA_010_0100).

3.2.1.3 Water Supply

As documented in the Engineering Services Report (WM, 2025a), submitted with the planning application under separate cover, a new proposed connection will be made to the existing 150mm diameter HPPE watermain located on Rathmullan Road to the east of the site. It is noted that the 150mm diameter HPPE watermain will be upgraded to 200mm diameter as part of the Proposed Development.

A Confirmation of Feasibility (COF) was issued by UE on the 1st of April 2025 (UE COF Reference: CDS24009836). The UE COF confirms the connection is feasible, subject to upgrades including replacing approximately 140m of existing 150mm diameter HPPE watermain with a 200mm diameter watermain and the provision of approximately 50m of new 450mm ID watermain and a Flow Control Valve. All upgrade works will be carried out by UE and funded by the Applicant as part of the connection agreement.

All water supply details will be in accordance with UE's Code of Practice for Water Infrastructure (IW-CDS-5020-03).

The layout of the proposed water supply is presented in WM Drawing No. 18-014-P481 and P482 - Water Supply Layout submitted with the planning application under separate cover.

4 STUDY AREA SCREENING

The WFD screening assessment was based on the information presented on the EPA mapping website and the specific quality status of the nearby waterbodies (i.e., groundwater, surface water, transitional waterbodies, etc.) was gathered from the information presented on the catchments.ie website.

4.1 Surface Water

The Proposed Development site lies within the Boyne Catchment (Hydrometric Area 07) and Boyne_SC_130 sub-catchment (ID 07_17) (EPA, 2025). The site has been mapped by the EPA (EPA, 2025) to be within the Stagrennan_010 WFD River Sub-basin (IE_EA_07S320550).

The closest surface water feature recorded on the EPA database (EPA, 2025) to the site is the Sheephouse 07 River (WFD Name: Stagrennan_010; River Waterbody Code: IE_EA_07S320550) which crosses a small area of the southeastern boundary of the site along Rathmullan Road. The Sheephouse 07 River flows north before discharging into the Boyne Estuary approximately 33m north of the site at its closest point. As documented in the SSFRA (JBA, 2025), prior to the construction of the M1 motorway, this ditch formed the lower reach of a watercourse originating to the southwest of the site. However, significant cutting required to accommodate the M1 has disconnected the lower section from its catchment upstream of the M1 motorway. Flows from the upper catchment of the former watercourse are now incorporated into the surface water drainage network of the M1 and do not continue to flow into the disused ditch, which is no longer considered to be a functional fluvial watercourse (JBA, 2025). The ditch is culverted along the eastern perimeter of the site and conveys local drainage flows in the surrounding area including lands upstream of the site to the east of the M1 motorway. This culvert outfalls to a ditch on the opposite side of the Rathmullan Road approximately 120m to the north of the proposed outfall location. The ditch travels northwards for approximately 60m before outfalling into the Boyne Estuary, which is tidal at this location.

Other surface water features within the vicinity of the site and Proposed Development are summarised as follows:

- The Mell River (WFD Name: Tullyeskar_010; River Waterbody Code: IE_EA_07T270880) is located approximately 128m north of the site, which runs in a southerly direction before discharging into the Boyne Estuary.
- The Rathmullan River (WFD Name: Tullyeskar_010; River Waterbody Code: IE_EA_07T270880) is located approximately 124m north of the site, which runs in a southerly direction before discharging into the Boyne Estuary.
- The Boyne Estuary Transitional Waterbody (WFD Name: Boyne Estuary; Transitional Waterbody Code: IE_EA_010_0100) is adjacent to the northern boundary of the site and it is fed by multiple rivers downstream of the site (i.e., >2km downstream of the site). This waterbody runs in an easterly direction before discharging into the Boyne Estuary Plume Zone Coastal Waterbody (Coastal Waterbody Code: IE_EA_010_0000) approximately 9.1km east of the site.

The following Coastal Waterbodies are indirectly connected to the site due to the connection to the Boyne Estuary Plume Zone Coastal Waterbody:

- Louth Coast (HA 06) (Coastal Waterbody Code: IE_NB_025_0000) – upstream of the Boyne Estuary Plume Zone Coastal Waterbody.
- Northwestern Irish Sea (HA 08) (Coastal Waterbody Code: IE_EA_020_0000) - downstream of the Boyne Estuary Plume Zone Coastal Waterbody.

The surface water features mapped by the EPA (EPA, 2025) within a 2km radius of the site are presented in Figure 4-1.

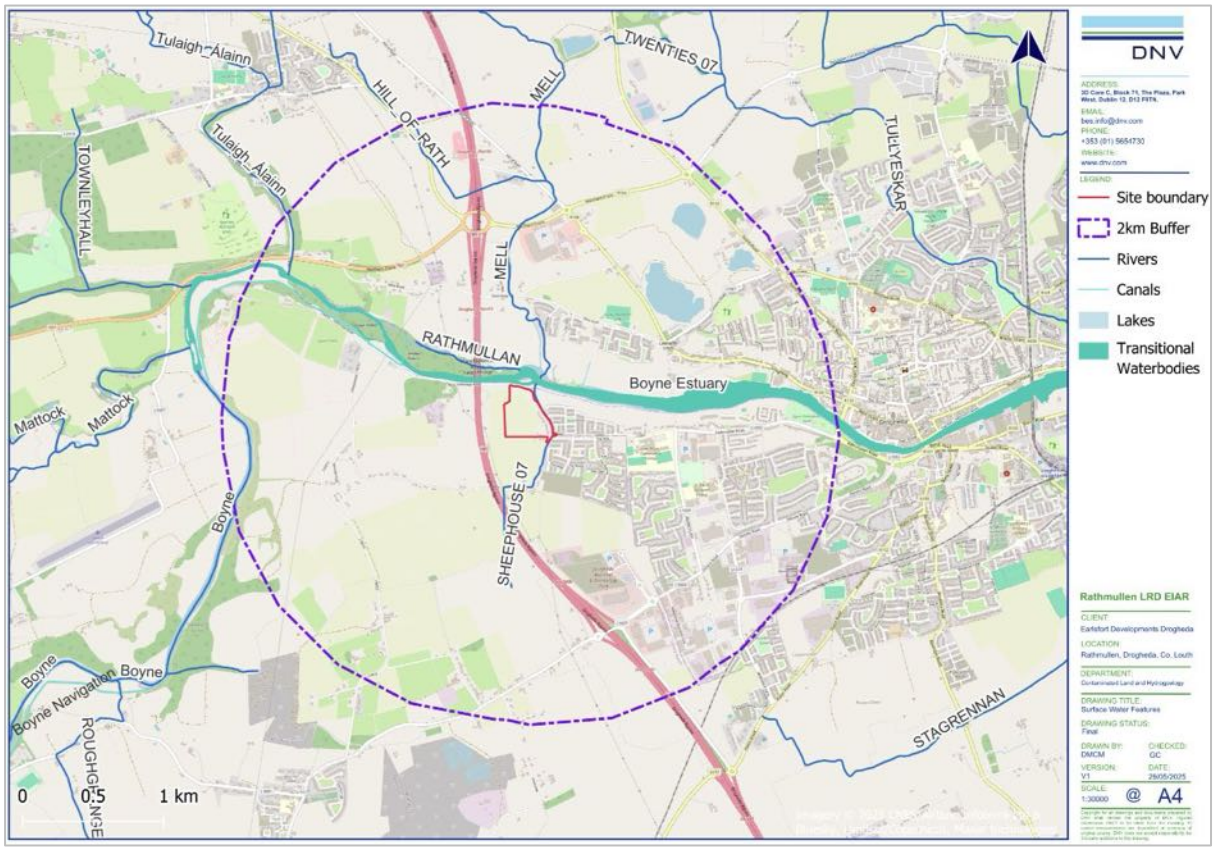

Figure 4-1: Surface Waterbodies within 2km of the Proposed Development

Table 4-1: WFD Status of Surface Waterbodies Potentially Hydraulically Connected to the Site

Name (WFD)	EPA Code	Waterbody Type	WFD Status (2016 – 2021)			WFD Risk Status
			Ecological	Chemical	Hydro-morphological	
Stagrennan_010	IE_EA_07S320550	River	Moderate (Note - Low Confidence)	-	-	Review
Tullyeskar_010	IE_EA_07T270880	River	Moderate (Note - Low Confidence)	-	-	Review
Boyne Estuary Transitional Waterbody	IE_EA_010_0100	Transitional Waterbody	Moderate (Note - High Confidence)	Failing to Achieve Good	-	At Risk
Boyne Estuary Plume Zone Coastal Waterbody	IE_EA_010_0000	Coastal Waterbody	Moderate (Note - High Confidence)	-	-	At Risk
Louth Coast (HA 06)	IE_NB_025_0000	Coastal Waterbody	High (Note – Medium Confidence)*	-	-	Not at Risk
Northwestern Irish Sea (HA 08)	IE_EA_020_0000	Coastal Waterbody	Good (Note – High Confidence)	-	-	At Risk

Note - * The protection and restoration of these high-status water bodies is a priority under Ireland's River Basin Management Plan (RBMP).

4.2 Groundwater

The bedrock aquifer beneath the site is within the Drogheda Groundwater Body (GWB) (EU Code: IE_EA_G_025), refer to Hydrogeological Risk Assessment (HRA) included in Appendix 7.1.

Figure 4-2 below shows the groundwater bodies within 2km of the site and the quality status (i.e., chemical and quantitative) and risks within the groundwater bodies identified within the study area are presented in Table 4-2 below.

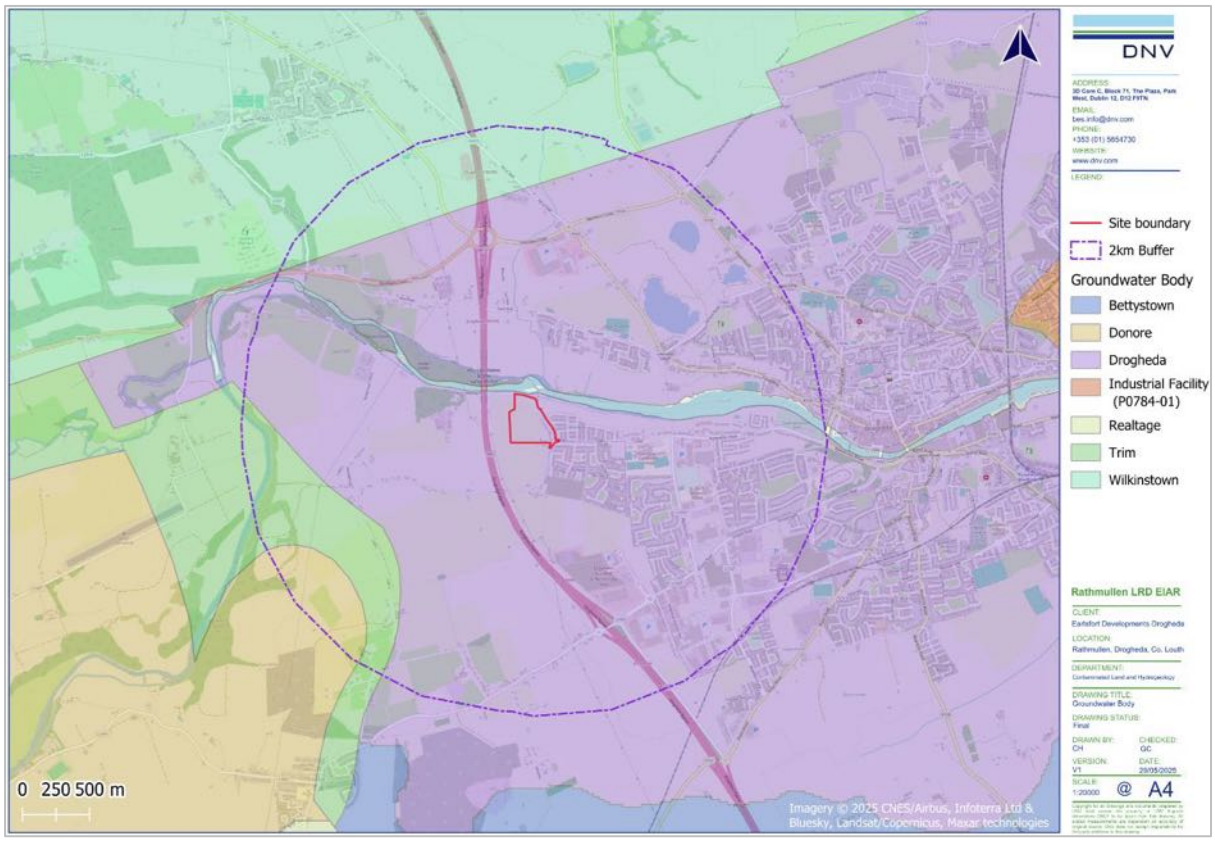

Figure 4-2: Groundwater Bodies within 2km of the Proposed Development

Table 4-2: WFD Status of Groundwater Waterbodies within 2km of the Site

Name	EPA Code	Type	WFD Status (2016-2021)		WFD Risk Status
			Chemical	Quantitative	
Drogheda GWB	IE_EA_G_025	Regionally Important Aquifer - Karstified (diffuse) - Rkd	Good	Good	At Risk
Wilkinstown GWB	IE_EA_G_010	Poorly productive bedrock	Poor	Good	At Risk
Trim GWB	IE_EA_G_002	Productive fissured bedrock	Good	Good	At Risk
Donore GWB	IE_EA_G_021	Poorly productive bedrock	Good	Good	Not at Risk

Although the Proposed Development does not include groundwater abstraction (refer to the HRA Appendix 7.1), the vulnerability of the groundwater will increase due to the excavation of soils and subsoils during the construction phase. As such, mitigation measures will be required

during site activities to limit potential releases to groundwater during the construction phase of the Proposed Development. Refer to Section 5.2 for the GWBs screened in/out as part of the Proposed Development.

4.3 Flood Risk Assessment

A site-specific flood risk assessment (SSFRA) was prepared for the site and Proposed Development by JBA Consulting (JBA, 2025). It assessed the potential flood risk associated with fluvial, groundwater, coastal and pluvial flooding.

The primary source of flood risk to the site was fluvial flooding as represented in the Eastern CFRAM Study. However, following the site visit undertaken by JBA Consulting on 5th August 2025, it was confirmed that the upper catchment of the Sheephouse_07 Stream has been disconnected from its lower catchment by the construction of the M1 Motorway, observed by the presence of piped culverts diverting surface water flows into the M1 surface water drainage network . The culverted system then flows parallel to the road surface and discharges directly into the River Boyne. The lower reach of the Sheephouse_07 Stream now exists as a dry ditch and no longer serves as a functional watercourse. In addition, it does not appear to have any active hydraulic connectivity with lands to the south of the site. Therefore, the Eastern CFRAMs mapping does not accurately represent the current conditions of the site and associated fluvial flood risk. '*Upon detailed review of all available fluvial flood information and surface water drainage construction drawings of the M1 Motorway, it is determined within this report that fluvial flood risk from the former Sheephouse watercourse is no longer present, as there is no watercourse remaining which could be the source of flooding to the site'* (JBA Consulting, 2025).

The report (JBA Consulting, 2025) concludes the following:

'A portion of the site is currently incorrectly classified as Flood Zone A/B, due to the outdated catchment conditions represented within the Eastern CFRAMs flood modelling and mapping.'

'Due to the outdated catchment conditions represented within the Eastern CFRAMs flood modelling and mapping incorrectly identifying fluvial flood risk to the site, it is the finding of this site-specific flood risk assessment that the Flood Zones for the site are not appropriate and the entire site should be redefined as Flood Zone C. The Planning System and Flood Risk Management Guidelines for Planning Authorities, classes residential development as a highly vulnerable land use and is therefore appropriate for development only within Flood Zone C without the need to provide a Justification Test. This FRA confirms the proposed development footprint within the subject site as being located wholly within Flood Zone C and is therefore appropriate for residential development.'

Although the Proposed Development footprint is located within Flood Zone C, mitigation measures have been considered and included, where necessary, to mitigate the risk of pluvial flooding to and from the site (JBA Consulting, 2025).

4.4 Register of Protected Areas

The WFD Register of Protected Areas is a comprehensive list of areas designated under the Water Framework Directive (WFD) that require special protection due to their environmental significance. These areas include:

I. Drinking Water Protected Areas: Areas designated for the abstraction of water intended for human consumption.

II. Areas for the Protection of Economically Significant Aquatic Species: Such as shellfish waters.

III. Recreational Waters: Including bathing waters.

IV. Nutrient-Sensitive Areas: Such as nitrate vulnerable zones.

V. Areas for the Protection of Habitats and Species: Including those designated under the Habitats Directive and Birds Directive.

The register helps ensure that these areas are managed and their integrity protected to meet the Article No.4 objectives set out in the WFD.

4.4.1 Nature Conservation

The Habitats Directive (92/43/EEC) seeks to conserve natural habitats and wild fauna and flora by the designation of Special Areas of Conservation (SACs) and the Birds Directive (2009/147/EC) seeks to protect birds of special importance by the designation of Special Protection Areas (SPAs). SACs and SPAs are collectively known as Natura 2000 or European sites (referred to hereafter as Natura 2000 sites).

National Heritage Areas (NHAs) are designations under the Wildlife Acts to protect habitats, species, or geology of national importance. The boundaries of many of the NHAs in Ireland overlap with SAC and/or SPA sites. Although many NHA designations are not yet fully in force under this legislation (referred to as ‘proposed NHAs’ or pNHAs), they are offered protection in the meantime under planning policy which normally requires that planning authorities give recognition to their ecological value.

As documented in the HRA (DNV, 2025a) included in the EIAR Volume 3: Appendix 7.1, there are four Natura 2000 sites that are identified with a potential hydraulic connection to the site and Proposed Development. There are also two pNHAs identified with a potential hydraulic connection to the site and the Proposed Development.

- River Boyne and River Blackwater SAC
- Boyne Coast and Estuary SAC
- Boyne Estuary SPA
- North-West Irish Sea SPA
- Boyne River Islands pNHA
- Boyne Coast and Estuary pNHA

The Natura 2000 sites and other protected and designated sites or areas with a potential hydraulic connection to the site are presented in Figure 4-3.

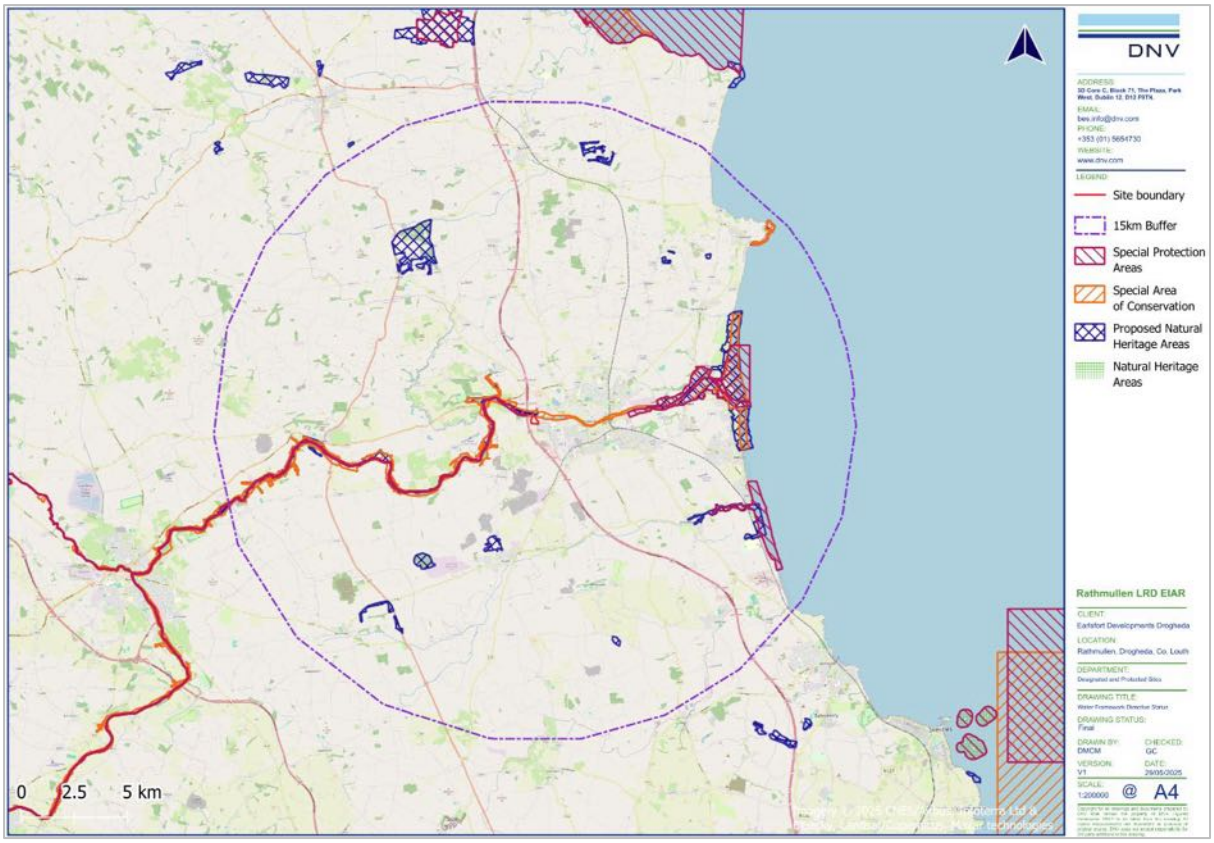

Figure 4-3. Designated and Protected Sites

4.4.2 Additional Protected Areas

The WFD brings together the processes and aims of a range of other European Directives, such as the Revised Bathing Water Directive (2006/7/EC), the Shellfish Directive (2006/113/EC) and the Conservation of Natural Habitats and of Wild Fauna and Flora Directive (92/43/EEC). These Directives establish protected areas to manage water, nutrients, chemicals, economically significant species, and wildlife, and have been brought in line with the planning timescales of the WFD.

4.4.2.1 Drinking Water

The river drinking water protected areas (DWPA) are represented by the full extent of the Water Framework Directive (WFD) river waterbodies from which there is a known qualifying abstraction of water for human consumption as defined under Article 7 of the WFD.

There are no surface water drinking water sources, under Article 7 of the Water Framework Directive, identified by the EPA (EPA, 2025) hydraulically downstream of the site. However, there are two (2 No.) rivers upstream of the site within the 2km radius of the site, the Tulaigh_Álainn River (WFD Name: Boyne_180; EPA code: IE_EA_07B042200) is located approximately 1.7km northwest of the site and discharges into the Boyne Estuary. The Boyne River (WFD Name: Boyne_180; EPA code: IE_EA_07B042200) is located approximately 1.9km west of the site and also discharges into the Boyne Estuary. The groundwater body beneath the site, the Drogheda GWB (IE_EA_G_025) is classified under Article 7 Abstraction for Drinking Water.

4.4.2.2 Shellfish Areas

Although the Shellfish Waters Directive (SWD) has been repealed, areas used for the production of shellfish that were designated under the SWD, are protected under the WFD as “areas designated for the protection of economically significant aquatic species”.

The requirement from a WFD perspective is to ensure that water quality does not impact on the quality of shellfish produced for human consumption. In Ireland, 64 areas have been designated as shellfish waters (S.I. No. 268 of 2006, S.I. No. 55 of 2009, S.I. 464 of 2009).

The closest designated Shellfish Area location is the Balbriggan\Skerries (IE_EA_020_0000) located approximately 10.2km southeast of the site.

4.4.2.3 Nutrient Sensitive Areas

EU member states are required under the Urban Wastewater Treatment Directive (91/271/EEC) to identify nutrient-sensitive areas. These have been defined as “natural freshwater lakes, other freshwater bodies, estuaries and coastal waters which are found to be eutrophic or which in the near future may become eutrophic if protective action is not taken”.

The closest designated nutrient-sensitive area (estuaries and lakes) is the Boyne Estuary (IE_EA_010_0100-Urban Wastewater Treatment Directive Sensitive Area) located approximately 42m north of the site at its closest point. In addition, the closest nutrient-sensitive area (rivers) is the Boyne River (Urban Wastewater Treatment Directive Sensitive Area) located approximately 1.9km east of the site at its closest point.

4.4.2.4 Bathing Waters

Bathing waters are designated under Regulation 5 of Directive 2006/7/EC. Designated Bathing Waters exist under S.I. No. 79/2008 and S.I. No. 351/2011 Bathing Water Quality (Amendment) Regulations 2011. EC Bathing Water Profiles - Best Practice and Guidance 2009.

The closest designated Bathing Water location is Laytown/Bettystown (IEEABWC020_0000_0700) located approximately 9.7km southeast of the site (EPA, 2025).

5 STAGE 1 - SCREENING FOR POTENTIAL EFFECTS

This stage aims to determine if the Proposed Development impacts WFD waterbodies. It involves gathering relevant design information of the Proposed Development and the baseline environment of potentially impacted waterbodies. Where no potential impact pathways are identified, Stage 2 and 3 of the assessment are not undertaken.

The screening stage includes the following:

- Initial screening to identify relevant water bodies using criteria such as direct impact, connectivity, and underlying groundwater bodies.
- Reviewing the RBMP to decide which water bodies to include.
- Collecting baseline data and relevant design information of the Proposed Development.

The screening assesses the potential risk to WFD objectives based on design, implementation, and baseline data. Activities associated with the Proposed Development are divided into construction and operational phases, as detailed in Section 3. The assessment uses expert knowledge for a qualitative evaluation of potential risks to WFD objectives.

5.1 Surface Waterbodies

The methodology for screening surface waterbodies is based on proximity to the proposed works and scale and nature of the works likely to affect the waterbody in question. The initial study area extends beyond the site boundaries and includes a 2.0km radius of the site (i.e., Proposed Development) and potential receptors outside of this radius that are potentially hydrologically connected with the site which is based on the Institute of Geologists of Ireland (IGI) Guidelines (IGI, 2013). The extent of the wider study area was based on the IGI Guidelines (IGI, 2013) that recommend a minimum distance of 2km radius from the site. This broader study area is necessary to identify and evaluate all potential receptors that could be affected by the Proposed Development, either directly or indirectly. The distinction between the site and the study area is crucial. The site of the Proposed Development is the focal point of the Proposed Development, while the study area includes any potential hydrogeological / hydrological connections to sensitive receptors including habitats that might experience secondary effects.

The WFD status for river, lake, transitional and/or coastal water bodies that have a potential hydrological connection to the site as recorded by the EPA (EPA, 2025) in accordance with European Communities (Water Policy) Regulations 2003 (SI no. 722/2003) are provided in Table 5-1 which also presents the screening exercise undertaken for identified surface waterbodies within the study area.

Table 5-1. Surface Waterbodies Screening Assessment

Waterbody Name	Waterbody EU Code	Screening Assessment	Justification
Stagrennan_010	IE_EA_07S320550	Screened Out	There is no identified hydraulic connection between the site and the Sheephouse_07 Stream (WFD Name: Stagrennan_010) which is culverted along the eastern boundary of the site. Prior to the construction of the M1 motorway, this ditch formed the lower reach of a watercourse originating to the southwest of the site. The M1 has disconnected the lower section from its catchment upstream of the M1 motorway which is now a disused ditch and no longer considered to be a functional fluvial watercourse (JBA, 2025). No portion of the proposed surface water drainage network will discharge to the remnant channel. Therefore, it has been screened out of further assessment.
Tullyeskar_010	IE_EA_07T270880	Screened Out	Surface waterbody located approximately 128m north of the site, which runs in a southerly direction before discharging into the Boyne Estuary. However, it is located on the other site of the Boyne Estuary and so is unlikely to be affected by the construction and operation phases of the Proposed Development. No works are to be undertaken within the catchment of this waterbody and there are no proposed construction or operational activities that could propagate upstream and adversely affect the waterbody. Therefore, it has been screened out of further assessment.
Boyne Estuary Transitional Waterbody	IE_EA_010_0100	Screened In	Waterbody directly downstream of the Proposed Development and within the same subcatchment (Boyne_SC_130) which has been screened in due to its proximity to the site and the fact that there is a hydraulic connection via the site and the Drogheda WWTP discharge. Furthermore, foul water from the Proposed Development will be discharged via the Drogheda WWTP to this waterbody and therefore, it has been screened in of further assessment.
Boyne Estuary Plume Zone Coastal Waterbody	IE_EA_010_0000	Screened In	Waterbody directly downstream of the Proposed Development which has been screened in based on its hydraulic connection with the Boyne Estuary and the WWTP.
Louth Coast (HA 06)	IE_NB_025_0000	Screened Out	There is an indirect connection to the site via the Boyne Estuary Plume Zone Coastal Waterbody. However, based on the significant separation distance from the site and substantial water volumes (i.e., dilution) associated with transitional and coastal waterbodies (i.e., Boyne Estuary and Boyne Estuary Plume Zone Coastal Waterbody), it is unlikely that the construction and operational phases of the Proposed Development will have a potential to adversely affect water quality status. Furthermore, The Proposed Development is anticipated to have no potential to cause a deterioration in the status of these waterbodies or hinder the future attainment of good surface water quality objectives.
Northwestern Irish Sea (HA 08)	IE_EA_020_0000	Screened Out	

5.2 Groundwater

Similar to surface waterbodies (refer to Section 5.1), the methodology for screening groundwater bodies is based on proximity to the site of the Proposed Development and the scale and nature of the works likely to effect the waterbody in question.

The WFD status and risk for groundwater bodies that have a potential hydrological connection to the site as recorded by the EPA (EPA, 2025) in accordance with European Communities (Water Policy) Regulations 2003 (SI no. 722/2003), are provided in Table 5-2 and Figure 4-2.

Groundwater bodies (GWB) within the 2km radius of the site and Proposed Development were screened in for assessment. Therefore, the Drogheda GWB (Regionally Important Aquifer - Karstified (diffuse)) underlying the site has been screened in. No other groundwater bodies (i.e. Wilkinstown GWB, Trim GWB and Donore GWB) in the vicinity of the site are sufficiently close or hydraulicly connected (i.e., upgradient of the site) to the site to have their status impacted as a result of the Proposed Development.

Table 5-2 Groundwater Bodies Screening Assessment

Waterbody Name	Waterbody EU Code	Screening Assessment	Justification
Drogheda GWB	IE_EA_G_025	Screened In	There is a pathway for (i.e., direct hydrogeological link) contamination to enter the already "At Risk" Drogheda GWB, during the construction phase of the Proposed Development, via groundwater flow, which could potentially degrade the water quality of the already pressured GWB (Drogheda GWB) if unmitigated. Construction will temporarily increase groundwater vulnerability and exposure during the excavation of soils and subsoils. Groundwater was not encountered during the site investigations (WM, 2025b) undertaken at the site in 2018, where the wells were drilled to a maximum depth of 8.5mbgl. However, there may be a need to temporarily dewater if groundwater is encountered during the construction phase of the Proposed Development.
Wilkinstown GWB	IE_EA_G_010	Screened Out	GWB located north of the site, however, unlikely to be affected during the construction phase of the Proposed Development, as the site is discharging into the Boyne Estuary, which is within the Drogheda GWB. Therefore, it is unlikely for potential pollutants to migrate to the Wilkinstown GWB to cause adverse effects on the status.
Trim GWB	IE_EA_G_002	Screened Out	GWBs located upgradient of the main GWB (Drogheda GWB) beneath the site. Proposed works during the construction phase of the Proposed Development will not have the potential to adversely affect the status of the underlying GWB if unmitigated.
Donore GWB	IE_EA_G_021	Screened Out	

5.3 Register of Protected Areas

The WFD Register of Protected Areas is a comprehensive list of areas designated under the Water Framework Directive (WFD) that require special protection due to their environmental significance. These areas include:

- Drinking Water Protected Areas: Areas designated for the abstraction of water intended for human consumption.
- Areas for the Protection of Economically Significant Aquatic Species: Such as shellfish waters.
- Recreational Waters: Including bathing waters.
- Nutrient-Sensitive Areas: Such as nitrate vulnerable zones.
- Areas for the Protection of Habitats and Species: Including those designated under the Habitats Directive and Birds Directive.

The register helps ensure that these areas are managed and their integrity protected to meet the Article No.4 objectives set out in the WFD.

The WFD and its associated directives provide a robust framework for the protection of water bodies, including protected areas. Guidance documents, such as the CIS guidance (European Commission, 2021. Common Implementation Strategy) on the delineation of water bodies and groundwater monitoring, clarify the requirements for protected areas and their integration into the overall water management strategy.

Given this integrated approach, a separate screening / risk evaluation for protected areas is not required. The existing assessment process already encompasses the necessary considerations and measures to protect these areas. The assessment ensures compliance with the WFD objectives including protected areas.

Potential impacts of the Proposed Development on protected areas are discussed further in Chapter 5 Biodiversity, Chapter 6 Soil and Chapter 7 Hydrology and Hydrogeology of the Environmental Impact Assessment (EIAR) and HRA (submitted as Appendix 7-1 in Chapter 7 Hydrology and Hydrogeology) submitted with the planning application for the Proposed Development.

5.4 Water Action Plan (WAP) 2024 Programme of Measures

The Water Action Plan (WAP) provides information on the status and planned actions for surface waterbodies in Ireland. These entries offer insights into the specific measures being considered or implemented to improve the ecological status of the surface waterbodies.

The WAP identifies several key pressures impacting water quality in surface waterbodies across the country:

- Nutrient Pollution: Excessive levels of phosphorus and nitrogen from agricultural runoff are a significant concern. These nutrients can lead to eutrophication, which depletes oxygen in the water and harms aquatic life
- Urban Pollution: Inadequately treated wastewater and stormwater runoff from urban areas contribute to the degradation of water quality. This includes pollutants such as heavy metals, oils, and other contaminants
- Physical Modifications: Changes to the river's natural flow and structure, such as barriers and drainage works, disrupt the ecosystem and affect water quality

- Climate Change: Altered weather patterns and increased frequency of extreme weather events exacerbate existing pressures on water quality.

The WAP identifies several suggested actions to protect and restore water quality in surface waterbodies ensuring a sustainable and healthy aquatic environment. The actions include:

- Nutrient Management: Implementing stricter controls on agricultural practices to reduce nutrient runoff. This includes promoting the use of buffer strips, cover crops, and precision farming techniques
- Improving Wastewater Treatment: Upgrading wastewater treatment facilities to ensure that effluents meet higher standards before being discharged into waterbodies
- Restoring Natural Ecosystems: Removing or modifying barriers to restore natural river flow and habitat connectivity. This also involves re-naturalizing riverbanks and floodplains
- Integrated Catchment Management: Developing and implementing catchment-specific management plans that address local pressures and involve stakeholders in decision-making processes
- Climate Adaptation Measures: Enhancing resilience to climate change by incorporating adaptive management strategies and investing in green infrastructure.

5.5 Climate Change

It is generally understood that the likely effects of climate change have the potential to exacerbate pressures on waterbodies in the future. However, regarding the proposed developments inclusion of appropriate climate change allowances in the design of SuDS as well as consideration as part of the schemes Site Specific Flood Risk Assessment ensure that the proposed development is sufficiently adaptable to accommodate any adverse effects and there is no potential for adverse effects to waterbodies as a result of climate change.

6 STAGE 2 - SCOPING OF FURTHER INVESTIGATIONS

The publicly available data reviewed in this assessment has been deemed adequate for appraising the potential risks associated with the proposed development in relation to WFD Article 4 objectives. The use of desk-based information is appropriate for this assessment due to the comprehensive nature of existing baseline data recorded as part of the EPAs ongoing WFD monitoring programme with supplemental data provided by organisations such as the GSI, NPWS and OPW. This provides sufficient insight into hydrological and hydrogeological conditions without necessitating further investigations.

7 STAGE 3- WFD IMPACT ASSESSMENT

Potential effects of the Proposed Development on the WFD surface waterbody status (i.e., river waterbodies, transitional waterbodies, etc.) both during construction and operation have been considered. Refer to section 1.1, section 7.1, section 7.2 and section 7.3 below for further assessment.

7.1 Transitional Waterbodies

7.1.1 Boyne Estuary

Table 7-1: Boyne Estuary Transitional Waterbody

Receptor	Potential Impact (Construction)	Potential Impact (Operation)	Potential Impact of Proposed Development	Mitigation Required?
Hydromorphology quality	Yes	No	No works are proposed in or adjacent to the waterbody or its bank either during the construction or operational phases of the Proposed Development and diversions of water courses are not required for the construction phase. However, during construction, excavations of soils and subsoils and stockpiling required as part of the construction phase of the Proposed Development have the potential to mobilise suspended solids directly into the Boyne Estuary and adversely affect the hydromorphological quality of this receiving waterbody.	Mitigation measures required.
Biological quality	Yes	No	Excavations of soils and subsoils and stockpiling required as part of the construction phase of the Proposed Development have the potential to mobilise suspended solids directly into the Boyne Estuary and adversely affect the biological quality of this receiving waterbody. Furthermore, the use of deleterious materials such as fuels, oils and cementitious materials will be required to be used onsite through the construction phase and so, any fugitive emission has the potential to adversely affect this waterbody. No riverbed works or works along banks are proposed during either the construction or operational phase of the Proposed Development, so there will be no direct risk to habitats or species.	Mitigation measures required.
Physico-Chemical quality	Yes	No	Excavations of soils and subsoils and stockpiling required as part of the construction phase of the Proposed Development have the potential to mobilise suspended solids directly into the Boyne Estuary and adversely affect the physico-chemical quality of this receiving waterbody. Furthermore, the use of deleterious materials such as fuels, oils and cementitious materials will be required to be used onsite through the construction phase and so, any fugitive emission has the potential to adversely affect this waterbody and would result in significant long-term effects. This risk will significantly reduce following the completion of construction, which would remove the need for heavy machinery and vehicles onsite.	Mitigation measures required.

Receptor	Potential Impact (Construction)	Potential Impact (Operation)	Potential Impact of Proposed Development	Mitigation Required?
			No riverbed works or works along banks are proposed during either the construction or operational phase of the Proposed Development, so there will be no direct risk to habitats or species.	
Protected Sites	No	No	Targeted field surveys were completed at and surrounding the Proposed Development site to identify whether mobile species of conservation interest (SCIs) of surrounding SACs and SPAs relied on the development site and whether the development site represented an ex-situ habitat for these species. Following the surveys, it is concluded that the Proposed Development site does not function as an ex-situ habitat for these species and there is no mobile species pathway connecting the Proposed Development to SACs or SPAs in the wider surrounding area. The following European Sites were screened in for further examination (as part of this Natura Impact Statement report) due to the potential for a mobile species pathway to connect the Proposed Development to them: Natura 2000 sites: • River Boyne and River Blackwater SAC. • Boyne Coast and Estuary SAC. • Boyne Estuary SPA. • North-West Irish Sea SPA Other Protected Sites: • Boyne River Islands pNHA. • Boyne Coast and Estuary pNHA Given the absence of a mobile species pathway between the Proposed Development and these SPAs / SACs there will be no potential for construction phase works to result in adverse effects to these four European Sites. For further details, refer to Chapter 5 (Biodiversity) of the EIAR and NIS submitted with the planning application under separate cover.	None required.

7.2 Coastal Waterbodies

7.2.1 Boyne Estuary Plume Zone Coastal Waterbody

Table 7-2. Boyne Estuary Plume Zone Coastal Waterbody Impact Assessment

Receptor	Potential Impact (Construction)	Potential Impact (Operation)	Potential Impact of Proposed Development	Mitigation Required?
Hydromorphology quality	No	No	No works proposed in or adjacent to the Boyne Estuary Plume Zone Coastal Waterbody. As such it is considered unlikely that the Proposed Development will adversely affect hydromorphological status of receiving watercourses.	None required.
Biological quality	No	No	No works are proposed in or near the Boyne Estuary Plume Zone, therefore, there will be no direct risk to habitats or species.	None required.
Physico-Chemical quality	No	No	Excavations of soils and subsoils and stockpiling required as part of the construction phase of the Proposed Development have the potential to mobilise suspended solids directly into the Boyne Estuary Plume Zone and adversely affect the physico-chemical quality of this receiving waterbody, as well as the use of deleterious materials such as fuels, oils and cementitious materials during the construction phase. However, it is unlikely that it will have any significant effect on the overall status of the waterbody given the separation distances from the Proposed Development and the tidal nature of this waterbody. Furthermore, there are no direct discharges from the Proposed Development to this waterbody, although an indirect connection exists through the Boyne Estuary waterbody and the Drogheda WWTP. However, it is considered that any effects associated with normal operational discharges of foul water to the Drogheda WWTP from the Proposed Development will be insignificant in regard to the coastal waterbody due to the distances involved and dilution within the waterbody. Based on the separation distances from the Proposed Development, there will be no direct risk to habitats or species during either the construction or operational phase of the Proposed Development.	None required.

Receptor	Potential Impact (Construction)	Potential Impact (Operation)	Potential Impact of Proposed Development	Mitigation Required?
Ecological Sites	No	No	Targeted field surveys were completed at and surrounding the Proposed Development site to identify whether mobile species of conservation interest (SCIs) of surrounding SACs and SPAs relied on the development site and whether the development site represented an ex-situ habitat for these species. Following the surveys, it is concluded that the Proposed Development site does not function as an ex-situ habitat for these species and there is no mobile species pathway connecting the Proposed Development to SACs or SPAs in the wider surrounding area. The following European Sites were screened in for further examination (as part of this Natura Impact Statement report) due to the potential for a mobile species pathway to connect the Proposed Development to them: Natura 2000 sites: • River Boyne and River Blackwater SAC. • Boyne Coast and Estuary SAC. • Boyne Estuary SPA. • North-West Irish Sea SPA Other Protected Sites: • Boyne River Islands pNHA. • Boyne Coast and Estuary pNHA Given the absence of a mobile species pathway between the Proposed Development and these SPAs there will be no potential for construction phase works to result in adverse effects to these four European Sites. For further details, refer to Chapter 5 (Biodiversity) of the EIAR and NIS submitted with the planning application under separate cover.	None required.

7.3 Groundwater Bodies

7.3.1 Drogheda GWB

Table 7-3: Drogheda GWB Impact Assessment

Status	Potential Impact (Construction)	Potential Impact (Operation)	Potential Impact of Proposed Development	Mitigation Required?
Chemical quality	Yes	No	During the excavation works, the groundwater vulnerability will temporarily be increased and there will be an increased risk to the underlying bedrock aquifer due to the potential for accidental releases of deleterious materials (e.g., fuels or other hazardous materials being used onsite), through the failure of secondary containment, a material handling accident at the site or from machinery utilised during the construction phase of the Proposed Development creating a direct pathway to the underlying bedrock aquifer. This risk will significantly reduce, following the completion of the construction phase, which would remove the need for heavy machinery and vehicles onsite and for hazardous material to be stored onsite. Proper mitigation measures during the construction phase will reduce the risk posed to the groundwater body chemical status to an acceptable level. Use of Cementitious Materials - There is a potential risk associated with the cementitious materials used during the construction works including construction of foundations and other structures impacting on the underlying groundwater at the site. During the operational phase of the Proposed Development, there will be no storage of hazardous material onsite and surface water runoff from the Proposed Development will be managed in accordance with SuDS and GDSDS. Therefore, no adverse chemical effects are predicted to occur.	Mitigation measures required.
Quantitative quality	No	No	During the excavation works and stockpiling, there is a potential for soil compaction from heavy machinery used in the construction phase, which has the potential to reduce infiltration of rainwater into the aquifer beneath the site, and therefore, decreasing the recharge potential of groundwater. Furthermore, groundwater was not encountered during the site investigations which extended to a maximum depth of 8.5mbgl (WM, 2018) and it is unlikely to be encountered during the excavation works for foundations and utility drainage. Due to the karstified nature of the Drogheda GWB and the recharge patterns of those aquifers (i.e., karst), which are characterised by uneven distribution of permeability through the rock, it is envisaged that the recharge capacity of the aquifer will not be impeded during the construction phase of the Proposed Development. During the operational phase there will be no discharges to groundwater or abstraction of groundwater as part of the Proposed Development. Therefore, no adverse quantitative effects are predicted to occur.	No

8 DESIGN AVOIDANCE AND MITIGATION

The measures outlined in this section of the report will ensure that there will be no significant impact on the receiving waterbodies. The effective implementation of these measures will ensure that the Proposed Development will not have any impact on compliance with the EU Water Framework Directive, European Communities (Environmental Objectives) Surface Water Regulations (S.I. 272 of 2009 and as amended) and the European Communities Environmental Objectives (Groundwater) Regulations (S.I. No. 9 of 2010 and as amended) individually or in combination.

8.1 Construction Phase

During the Construction Phase, all works will be undertaken in accordance with the Construction Environmental Management Plan (CEMP) (MW, 2025b) and the Resource and Waste Management Plan (RWMP) (DNV, 2025). Following appointment, the contractor will be required to further develop the CEMP and RWMP to provide detailed construction phasing and methods to manage and prevent any potential emissions to ground and surface water with regard to the relevant industry standards (e.g., Guidance for Consultants and Contractors, CIRIA-C532', CIRIA, 2001). The CEMP and RWMP will be implemented for the duration of the Construction Phase, covering construction and waste management activities that will take place during the Construction Phase of the Proposed Development. Refer to the EIAR (Water Chapter - Volume 3) submitted with the planning application for the mitigation measures proposed for the Proposed Development.

These measures will address the main activities of potential impact which include:

- Control and Management of surface water runoff.
- Control and management of shallow groundwater during excavation and dewatering.
- Management and control of soil and materials.
- Appropriate fuel and chemical handling, transport and storage.
- Management of accidental release of contaminants at the site.
- Control and handling of cementitious materials.

There will be no authorised discharge of water to ground during the construction phase. Where surface water runoff must be pumped from the excavations, water will be managed in accordance with best practice standards (i.e., CIRIA C750), the CEMP (WM, 2025b) and regulatory consents to minimise the potential effect on the local groundwater flow regime within the underlying aquifer and surface water bodies. Surface water runoff will be discharged by the contractor, following appropriate treatment (e.g., settlement or hydrocarbon interceptor) to sewer in accordance with the necessary discharge licences issued by UE under Section 16 of the Local Government (Water Pollution) Acts and Regulations for any water discharges to sewer or from MCC under Section 4 of the Local Government (Water Pollution) Act 1977, as amended in 1990 for discharges to surface water. Under no circumstances will any untreated wastewater generated onsite (from equipment washing, road sweeping etc.) be released offsite. Where required, all public sewers will be protected to ensure that any untreated wastewater generated onsite does not enter the public sewers.

Cut-off trenches will be constructed prior to stripping topsoil along the northern boundary of the Proposed Development. These cut-off trenches will have a settlement pond / silt trap at

the end of each trench with an overflow. Straw bales will be placed within the cut-off trenches at strategic locations and at the outfall of the settlement ponds to the overflow. Silt fencing will also be installed on the downgradient side of the cut-off trenches to prevent surface water runoff to the water course and will be retained in place for the duration of the construction phase until the development is complete. The project specific CEMP (which will be prepared by the main contractor in advance of construction works commencing) will identify how the silt fencing is to be installed and maintained throughout the construction phase.

All water leaving the site during construction will be desilted using standard techniques. Settlement ponds/silt traps will be provided by the contractor where necessary and regularly maintained to prevent silts and soils from being washed away into the existing ditches/watercourses during periods of heavy rain and during the drainage works.

The main contractor will appoint a suitably qualified person to oversee the implementation of measures for the prevention of pollution to the receiving surface water environment.

Regular testing of surface water discharges will be undertaken at the outfall from the subject lands. The location will be agreed between the project ecologist and the site foreman at the commencement of works. Trigger levels for halting works and re-examining protection measures will be: pH >9.0 or pH 25 mg/l. These trigger levels are based on those outlined within ‘Guidelines on Protection of Fisheries During Works in and Adjacent to Waters (IFI, 2016)’.

Where silt control measures are noted to be failing or not working adequately, works will cease in the relevant area. The project ecologist will review and agree alternative pollution control measures, such as deepening or redirecting trenches as appropriate, before works may recommence.

The use of wheel wash and water treatment facilities will be used as required onsite. The correct use and management of these will be undertaken by the appointed contractor to ensure that there is no harm to the receiving water environment.

Where required, stockpiles of loose materials pending re-use onsite will be protected for the duration of the works and not located in areas where sediment laden runoff may enter existing surface water drains.

- To help shed rainwater and prevent ponding and infiltration, the sides and top of the stockpiles will be regraded to form a smooth gradient with compacted sides reducing infiltration and silt runoff.
- Where required, silt fences will be erected at the toe of stockpiles to prevent runoff.
- The silt fences will be monitored daily by the appointed contractor and silt will be removed as required.

During the construction phase, fuelling and lubrication of equipment will be carried out in accordance with the procedures outlined in the CEMP in a designated area of the site away from any watercourses and drains (where not possible to carry out such activities onsite). Any diesel, fuel or hydraulic oils stored onsite will be stored in designated areas. These areas will be bunded and located away from surface water drainage and features. Bunds will have regard to Environmental Protection Agency guidelines ‘Amendment to IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities’ (EPA, 2013). The main contractor

will maintain an emergency response action plan and emergency procedures will be developed by the appointed contractor in advance of any works commencing.

Strict supervision of contractors will be adhered to in order to ensure that all plant and equipment utilised onsite is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Proposed Development site. Only emergency breakdown maintenance will be carried out onsite. Drip trays and spill kits will be available onsite to ensure that any spills from vehicles are contained and removed offsite.

Emergency procedures will be developed by the appointed Contractor in advance of works commencing and spillage kits will be available onsite, including in vehicles operating onsite. Construction staff will be familiar with emergency procedures in the event of accidental fuel spillages. Remedial action will be immediately implemented to address any potential impacts in accordance with industry standards and legislative requirements.

- Any required emergency vehicle or equipment maintenance work will take place in a designated impermeable area within the site.
- Emergency response procedures and contingency plans will be put in place, in the unlikely event of emergency accidents (i.e., spillages of fuels or lubricants).
- Spill kits, including oil absorbent material, will be provided and available onsite, so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained.
- In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the Proposed Development site and compliantly disposed of offsite. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures, standards and EPA guidelines.
- All construction works staff will be familiar with the emergency procedures in the event of accidental fuel spillages.
- All construction works staff onsite will be fully trained on the use of equipment.

All below ground drainage infrastructure will be constructed in accordance with current UE requirements to ensure that there are no potential impacts to groundwater quality.

Welfare facilities have the potential, if not managed appropriately, to release organic and other contaminants to ground or surface water courses. Foul drainage from temporary welfare facilities during the construction phase of the Proposed Development will either be discharged to temporary holding tank(s), the contents of which will periodically be tankered off site to a licensed facility or discharged to public sewer in accordance with the necessary temporary discharge licences issued by UE. The Drogheda WWTP is operated in accordance with relevant statutory approvals issued by UE. The increase discharge to the Drogheda WWTP as a result of the Proposed Development is considered to be insignificant in terms of the overall scale of the facility. The increased load does not have the capacity to alter the effluent released from the WWTP to such an extent as to result in likely significant effects on its receiving waters. Therefore, there will be no potential impact at any Natura 2000 sites associated with discharges from the site.

8.2 Operational Phase

Based on the design of the Proposed Development there are limited potential sources of contamination during the operational phase and there will be limited potential for discharge of

contaminants associated with surface water runoff to ground via unpaved, permeable areas due to the low infiltration potential at the site. Surface water will be managed in accordance with the principles and objectives of SuDS and the GDSDS to treat and attenuate water within the different catchments prior to discharging to the Boyne Estuary. Ongoing regular operational monitoring and maintenance of drainage and the SuDS measures will be incorporated into the overall management strategy for the Proposed Development. This will ensure that there are no effects on water quality and quantity (flow regime) during the operational phase of the Proposed Development.

Foul water during the operational phase of the Proposed Development will ultimately discharge via the Drogheda WWTP to the Boyne Estuary transitional waterbody and subsequently to the Boyne Estuary Plume Zone coastal waterbody under the appropriate consents from UE. As mentioned above, the Drogheda WWTP, does not have an observable effect on the water quality, nor does it have an observable negative effect on the WFD status. Foul water from the site will only be discharged to the UE network under the appropriate consents from UE, and therefore, the Proposed Development will not cause a potential impact on the WFD status of any receiving waterbody.

8.3 Residual Risk to Waterbody Status

The effect of the design avoidance and mitigation measures have been assessed and summarised in Table 8-1 below, which provides a summary of the predicted/potential status changes associated with the Proposed Development, with and without mitigation. In all cases, the proposed measures are sufficient to meet WFD objectives. Similarly, the objectives of the WFD Register of Protected Areas will not be compromised and their long-term integrity will be preserved.

Table 8-1. Summary of WFD Status for Unmitigated and Mitigated Scenarios

Name	EPA Code	Current WFD Status (2016-2021)	Current WFD Risk	Potential Unmitigated WFD Status Change	Potential Mitigated WFD Status Change
Construction Phase					
Transitional waterbody					
Boyne Estuary	IE_EA_010_0100	Moderate	At Risk	Poor	Moderate
Coastal waterbody					
Boyne Estuary Plume Zone Coastal Waterbody	IE_EA_010_0000	Moderate	At Risk	Moderate	Moderate
Groundwater Waterbody					
Drogheda	IE_EA_G_025	Good	At Risk	Moderate	Good
Operational Phase					
Transitional waterbody					
Boyne Estuary	IE_EA_010_0100	Moderate	At Risk	Poor	Moderate
Coastal waterbody					

Name	EPA Code	Current WFD Status (2016-2021)	Current WFD Risk	Potential Unmitigated WFD Status Change	Potential Mitigated WFD Status Change
Boyne Estuary Plume Zone Coastal Waterbody	IE_EA_010_0000	Moderate	At Risk	Moderate	Moderate
Groundwater Waterbody					
Drogheda	IE_EA_G_025	Good	At Risk	Good	Good

8.4 Potential Impact on Protected Areas Objectives

Based on the findings of this assessment, it is considered that in applying the precautionary principle and assessing a worst-case scenario there is no identified potential negative impact associated with the Proposed Development on the Protected Areas individually or in-combination.

8.5 Residual Cumulative Impacts

Cumulative effects are defined in the European Commission Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions, defines cumulative effects as:

"*Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project*".

Effects caused by the interaction of multiple impacts, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect in nature, arising from the accumulation of individually minor impacts that, when combined, may result in more significant environmental consequences. These effects may occur over time or across space and are particularly relevant where multiple developments interact with shared environmental receptors. Refer to Table 8-2

Table 8-2 List of Cumulative Schemes

No.	Application Reg. Ref.	Address	Development Proposal	Decision Date
1	**MCC planning ref: 211757** **ABP-313187-22 Planning**	South Of Oldbridge Manor, Rathmullan Road, Drogheda, Co. Meath	The construction of 26 no. dwellings consisting of 16 no. 3 bed two storey semi-detached dwellings (Type B2/B3/E2), 4 no. 4 bed two storey semi-detached dwellings (Type D2), 6 no. 3 bed two storey terraced dwellings (Type G2/G3/G4/G5/F) including all roads, footpaths, landscaping and site development works. A new pedestrian and cycle link is proposed to Sheephouse Road from the site. The vehicular access to the development will be from the public road at 'The Boulevard', Oldbridge Manor. A Natura Impact Statement will be submitted to the Planning Authority with the	08/03/2022 MCC: Granted with 24 no. conditions. 04/04/2022 ABP Appeal Decision Status: Live case stayed by

	Appeal		application. Significant further information/revised plans submitted on this application.	Order of the High Court in [2023] IEHC 218 No decision as of 03/09/2025
2	**MCC Planning ref: 211669** **ABP-313190-22** **Planning Appeal**	South Of Oldbridge Manor, Rathmullan Road, Drogheda, Co. Meath	The construction of 96 no. dwellings consisting of 4 no. one-bed apartments accommodated in 1 pair of two-storey semi-detached maisonettes (type A & A1), 6 No.2 bedroom two storey terraced dwellings (type G, G1) and 83 no. 3 bedroom terraced and semi-detached dwellings (Type B2, B3, D2, D3, E2, G2, G3) and 3 no. 4 bed detached dwellings (Type H) including landscaping, new roads, footpaths, cycle paths and open space including play area and all associated works. Anew pedestrian and cycle link is proposed to Sheephouse Road from the site. The vehicular access to the development will be from the public road at 'The Boulevard', Oldbridge Manor. A Natura Impact Statement will be submitted to the Planning Authority with the application	08/03/2022 MCC: Granted with 24 no. conditions 04/04/2022 ABP Appeal Decision Status: Live case stayed by Order of the High Court in [2023] IEHC 218 No decision as of 03/09/2025
3	**LCC Planning Ref: 22954**	Mell, Drogheda, Co. Louth	Permission for development on lands south of existing M1 Retail Park, bound by Trinity St and Barrack Lane, for: (i) provision of 10 no. single storey retail units including a part-licensed anchor retail supermarket store (Unit1), a DIY/Home store, including a garden centre (Unit 10), 8 no. smaller retail/commercial units, including a cafe and pharmacy (Units 2-8) and 1 no. single storey Drive-Thru Restaurant/Cafe unit, including external seating area. A deliveries area, service yard and ground mounted plant units will be provided to the side (south) and rear (west) of Retail Unit 1, a dedicated set down point is also proposed adjacent to the front entrance to Unit 1. Deliveries will also be accommodated to the rear (south) of proposed Units 2 - 10, with a truck turning area provided to the rear (south) of Unit 10. Dock levellers will be provided to the rear of Units 2 - 10 to facilitate loading and unloading of goods. A total of 311 no. car parking spaces are proposed to serve the development, including 23 no. accessible parking spaces, 2 no. click and collect spaces and 17 no. parent and child spaces. A bus parking area (4 spaces) is provided, 104 no. bicycle parking spaces are proposed. A partially covered pedestrian circulation space will be provided to the front of each of the units. (ii) Provision of 2 no. vehicular and pedestrian connection points to the existing MI Retail Park to the north will provide access to the development; (iii) internal roads, footpaths and pedestrian crossings; (iv) trolly bays, signage, hard and soft landscaping, boundary treatments, Electric Vehicle Charging spaces and lighting; (v) associated site and infrastructural works are also proposed which include foul and surface water drainage, plant areas, 3 no. ESB substations and (vi) all associated	08/09/2023 Granted with 20 no. conditions

			site development works. An EIAR and a NIS has been submitted with this application. *SFI received on 24/07/2023 which consists of: (a) a revised site layout comprising a substantially reduced quantum of retail/commercial development. The proposed development now comprises 3 no. units in total; see revised newspaper & site notices for full amended description*	
4	**LCC Planning Ref: 22975**	Leonards Cross, Slane Road, Mell, Drogheda, Co. Louth	Permission for construction of an 8,005sqm assisted living facility with a total of 98 accommodation units in a range of accommodation types as follows: A) 28 no. reablement studios designed to help people to retain or regain their skills and confidence so they can learn to manage again after a period of illness. B) 52 no. 1 bedroom assisted living suites, C) 16 no. 2 bedroom assisted living suites. D) 2 no. 1 bed units to be provided through the subdivision of an existing house on site for use as assisted living suites, or as staff/visitor accommodation. The proposed facility will include cafe/restaurant facilities, staff and administration spaces, nurses station, recreation rooms, meeting spaces, treatment rooms and landscaped gardens together with all associated site development works including boundary walls and fences, car parking, waste water pumping station, surface water attenuation and connections to public utilities, as well as plant rooms, a bin store, roof mounted solar panels and an ESB substation. The facility will deliver a range of tailored care packages to elderly residents on a rental basis only, none of the units will be made available for sale	10/02/2023 Granted with 19 no. conditions
5	**LCC Planning Ref: 211283** **(Amended by 260368 & 246026 6)**	Old Slane Road & Mell, Tullyallen, Drogheda, Co. Louth	An application has been made to An Bord Pleanála for permission for a 237 no. dwellings in detached, semi-detached, terraced/townhouse, terraced/duplex and apartment form. Building range in height from 1 to 5 storeys in the following mix - 19 no. 1 bed, 98 no. 2 bed, 99 no. 3 bed and 21 no. 4 bed. Apartment block 5 will have an undercroft car park. All buildings proposed have the option for the installation of photovoltaic/solar panels. The development will provide for a creche with potential capacity for 65 children. Open public space provided extends to c.9240sq.m. Construction of a footpath with public lighting from northern boundary along southern side of R168 providing pedestrian only connection to the M1 Retail Park. A single vehicular connection to the site is proposed from the Old Slane Road at the southern boundary. Full footpath connectivity will be provided along the Old Slane Rd eastwards to the junction with R168 at Leonards Cross. Works to Old Slane Rd provide for sections of footpath, revised road markings and public lighting. Full footpath connection will be available through site connecting Old Slane Rd to the south with R168 to the north and then on to the M1 Retail Park. All associated site development works incl. a pumping station and rising main, infrastructure and service provision, landscaping, boundary treatments, roads, footpaths and cycle paths, public lighting, ESB substation, electrical vehicle charging points, regrading/infilling of land levels, retaining walls/structures. A Natura Impact Statement is included	08/12/2021 Granted with 33 no. conditions

6	**LCC Planning Ref: 2460514**	Mell, Drogheda, Co. Louth	Permission for development comprising a single warehouse unit, 2 no. site entrances, internal access through road and ancillary works including surface water drainage at Mell, over a proposal application site area of 3.38 ha. The proposed development will include 1 no. warehouse unit of 3,347 m2 in area. The unit has been placed to the east of the site and the yard area at the west, parallel to the main entrance road. The proposed warehouse unit will include ancillary office area of 476 m2 located at the south-eastern corner of the proposed warehouse unit. The yard area is approximately 2,616 m2 and comprises 3no. loading docks and 1no. ground level door, services area and provision for trailer parking. Staff and Visitors' car parking comprises 33 spaces (31 standard sizes and 2 accessible spaces), also provision of a bicycle parking area for 19 bicycles. A proposed internal access road of 516m will be developed, connecting the R166 regional road with the R168. This will include the development of 2 no. accesses, one access onto each of the regional roads. The access road will also include a segregated footpath and cycleway along its length. The development will include all ancillary servicing, surface water management infrastructure, soft landscaping and lighting. Surface water management infrastructure will include permeable paving, rainwater harvesting, underground attenuation tank and detention pond in addition to surface water drainage and a proposed connection point to an existing storm sewer on the R168. A Natura Impact Statement has been prepared for this application	23/05/2025 Granted with 18 no. conditions

It is reasonable to assume that any approved, pending, or further information stage cumulative development has demonstrated (or will demonstrate prior to approval) no adverse environmental effects and the incorporation of good practice measures (e.g., construction phase and permanent SuDS, pollution prevention measures) into their designs. Such measures are expected to manage surface water runoff rate, quantity, and quality, resulting in no adverse effect on waterbody status or WFD objectives.

In accordance with the requirements of the WFD, the cumulative assessment has considered the potential for combined effects arising from the Proposed Development and other relevant projects listed in Table 8-2. This includes consideration of whether such cumulative effects could impact the status of water bodies, protected areas, or the achievement of WFD environmental objectives. Based on the findings of this assessment, no likely significant cumulative effects are predicted.

8.6 Potential Impact on Water Action Plan Programme of Measures

Based on the findings of this assessment, it is considered that in applying the precautionary principle and assessing a worst-case scenario the Proposed Development will have no adverse impacts on the implementation of the WAP Programme of Measures. Adverse impacts associated with historic urbanisation will be negated through the implementation of SuDS and appropriate treatment of foul effluent from the site.

9 CONCLUSIONS

The findings of the risk-based assessment identified that in the absence of any mitigation and avoidance measures there could be a potential impact on the waterbody status within receiving water bodies associated with the Proposed Development, specifically within a local zone of the Drogheda GWB, and receiving waterbodies including the Boyne Estuary Transitional Waterbody, and the Boyne Estuary Plume Zone Coastal Waterbody.

The mitigation measures as outlined above will prevent any impact on the receiving groundwater and surface water environment. Hence, the Proposed Development will not have any impact on compliance with the EU Water Framework Directive, European Communities (Environmental Objectives) Surface Water Regulations, 2009 (SI 272 of 2009, as amended 2012 (SI No 327 of 2012), and the European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010), as amended 2012 (SI 149 of 2012) and 2016 (S.I. No. 366 of 2016).

The Proposed Development will not cause a deterioration in the status of waterbodies hydraulically connected with the Proposed Development, taking account of design avoidance and mitigation measures that will be implemented. The Proposed Development will not jeopardise the objective to achieve 'good' surface water status or good ecological potential required by the WFD.

There will be no impact to the existing WFD status of waterbodies associated with the Proposed Development including the Drogheda GWB, Boyne Estuary Transitional Waterbody, and downstream surface waterbodies as a result of the Proposed Development taking account of embedded design avoidance and mitigation measures. Similarly, the objectives of the WFD Register of Protected Areas will not be compromised and their long-term integrity will be preserved.

9.1 WFD Article 4 Objectives Compliance Statement

The assessment contained within this report has comprehensively demonstrated that the proposed development adheres to the Article 4 objectives of the Water Framework Directive (WFD). Applying the precautionary principle and evaluating a worst-case scenario, it is evident that there are no adverse impacts to the status of waterbodies, thus aligning with the objective to protect, enhance, and restore all bodies of surface water and groundwater, with the aim of achieving good surface water status by 2027.

Furthermore, the proposed development incorporates measures, such as Sustainable Drainage Systems (SuDS) and the appropriate management of construction stage runoff, which will prevent any deterioration in waterbody status and maintain high status where it already exists. Moreover, the necessary measures are being implemented with the aim of progressively reducing pollution in surface waters and groundwater, thereby fulfilling the objective of reducing pollution incrementally.

Regarding a derogation requirement, since none of the Article 4(7) criteria have been triggered, no Article 4(7) assessment is required. Therefore, authorisation for the Proposed Development may be permitted according to the Water Framework Directive (WFD).

Finally, the development ensures that waterbodies associated with Protected Areas will not be subject to significant adverse effects, thereby safeguarding the environmental objectives

set forth for such areas. Consequently, the Proposed Development is in full compliance with the overarching goal of achieving good surface water status by 2027 and maintaining the integrity of the water environment.

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Appendix 8-1

Junction Number	Name	Base Flows	DO NOTHING SCENARIOS			DO SOMETHING SCENARIOS			%HGV	Speed (kph)	Link Length (m)
		2025	2028	2033	2043	2028	2033	2043			
1	Site Access Road (W)	-	-	-	2,175	1,804	1,804	3,979	0.00%	30	30
	Oldbridge Road (N)	-	145	145	649	358	358	862	0.00%	-	50
	Rathmullan Road (E)	1,750	1,843	1,948	5,606	3,603	3,708	7,366	0.00%	50	100
	Local Road (S)	1,750	1,843	1,948	3,467	1,931	2,036	3,555	0.60%	50	100
2	Rathmullan Road (W)	8,351	9,500	10,001	13,595	11,054	11,555	15,148	0.45%	50	100
	Rathmullan Road (E)	12,026	13,069	13,790	16,490	14,008	14,730	17,430	1.40%	50	100
	Marley's Lane (S)	11,655	12,680	13,382	15,856	13,516	14,218	16,692	1.35%	50	100
3	Rathmullan Road (W)	10,645	11,570	12,208	14,581	12,397	13,036	15,409	1.19%	50	100
	R132 (N)	28,411	30,115	31,819	34,970	30,644	32,349	35,500	2.04%	50	100
	R132 (E)	22,577	23,991	25,347	27,857	24,406	25,762	28,272	2.09%	50	100
4	Donore Road (W)	12,434	13,269	14,015	15,537	13,732	14,478	16,001	2.94%	50	100
	Marley's Lane (N)	12,668	13,739	14,499	17,154	14,585	15,345	18,000	1.49%	50	100
	Donore Road (E)	12,376	13,228	13,972	15,510	13,545	14,289	15,826	2.64%	50	100

Appendix 11-1

Photomontages
RESIDENTIAL DEVELOPMENT ON RATHMULLAN ROAD, DROGHEDA

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www.shackleton.ie info@shackleton.ie

Chris Shackleton Consulting Ltd.
19 Waterside Crescent
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Co Dublin, K36 DF74
email: info@shackleton.ie
Tel: +353-86-8206374

Photomontage Views

PM01 Sheephouse Road WHS buffer boundary looking N
- Existing
- Proposed

PM02 Over gate near house cluster Sheephouse Road looking NE
- Existing
- Proposed

PM03 Donore Cemetery looking NNE
- Existing
- Proposed

PM04 Battle of the Boyne viewpoint, Oldbridge looking E
- Existing
- Proposed

PM05 Driveways Bloomsbury Cottage & 'Bouvinda'looking ESE
- Existing
- Proposed

PM06 Oldbridge House Visitor Centre looking ESE
- Existing
- Proposed

CSC Chris Shackleton Consulting
www.shackleton.ie info@shackleton.ie

PM07 Drybridge House looking SSE
- Existing
- Proposed

PM08 Boyne River walkway at slipway looking SSE
- Existing
- Proposed

PM09 Road Bridge on Hill of Rath Road looking S
- Existing
- Proposed

PM10 The Square (South) looking W
- Existing
- Proposed

PM11 Rathmullan Road looking W
- Existing
- Proposed

PM12 Tullybrook Housing looking SSW
- Existing
- Proposed

PM13 N51 at Mell looking S
- Existing
- Proposed

CSC Chris Shackleton Consulting
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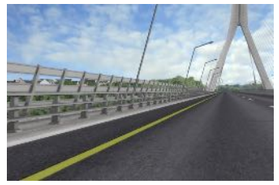
CGI Views

CGI01 From Mary McAleese Boyne Valley Bridge Southbound Carriageway looking South
- Proposed



Name Camera Locations Status Photomontage View Locations Scale Not to Scale		**Earlsfort Developments Drogheda Limited**		CSC Chris Shackleton Consulting www.shackleton.ie info@shackleton.ie
Residential Development on Rathmullan Road, Drogheda	Rev: **0**			

Name PM01 Status Existing Reference: Sheephouse Road WHS buffer boundary looking N		**Earlsfort Developments Drogheda Limited**	**Camera location** 705907, 774709, 42.0 **Target Direction** 705926, 774941, 41.3	Camera Canon 6D Mk 2 Lens Canon EF 50mm HView Angle Nominal 40 degrees Date/Time: 19/05/2025 16:05	CSC Chris Shackleton Consulting www.shackleton.ie info@shackleton.ie
Residential Development on Rathmullan Road, Drogheda	Rev: **0**			Recommended viewing distance with both eyes is 500mm.	

Name PM01 Status Proposed Reference: Sheephouse Road WHS buffer boundary looking N		**Earlsfort Developments Drogheda Limited**	**Camera location** 705907, 774709, 42.0 **Target Direction** 705926, 774941, 41.3	Camera Canon 6D Mk 2 Lens Canon EF 50mm HView Angle Nominal 40 degrees Date/Time: 19/05/2025 16:05	CSC Chris Shackleton Consulting www.shackleton.ie info@shackleton.ie
Residential Development on Rathmullan Road, Drogheda	Rev: **0**			Recommended viewing distance with both eyes is 500mm.	

Name PM02 Status Existing Reference: Over gate near house cluster Sheephouse Road looking NE		**Earlsfort Developments Drogheda Limited**	**Camera location** 705562, 774717, 32.6 **Target Direction** 705982, 775321, 28.4	Camera Canon 6D Mk 2 Lens Canon EF 50mm HView Angle Nominal 40 degrees Date/Time: 19/05/2025 16:20
Residential Development on Rathmullan Road, Drogheda	Rev: **0**			Recommended viewing distance with both eyes is 500mm.

CSC Chris Shackleton Consulting
www.shackleton.ie info@shackleton.ie

Name PM02 Status Proposed Reference: Over gate near house cluster Sheephouse Road looking NE		**Earlsfort Developments Drogheda Limited**	**Camera location** 705562, 774717, 32.6 **Target Direction** 705982, 775321, 28.4	Camera Canon 6D Mk 2 Lens Canon EF 50mm HView Angle Nominal 40 degrees Date/Time: 19/05/2025 16:20
Residential Development on Rathmullan Road, Drogheda	Rev: **0**			Recommended viewing distance with both eyes is 500mm.

CSC Chris Shackleton Consulting
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Name PM03 Status Existing Reference: Donore Cemetery looking NNE	**Earlsfort Developments Drogheda Limited**	**Camera location** 705523, 774068, 82.0 **Target Direction** 706220, 775207, 72.5	Camera Canon 6D Mk 2 Lens Canon EF 50mm HView Angle Nominal 40 degrees Date/Time: 19/05/2025 16:39	CSC Chris Shackleton Consulting www.shackleton.ie info@shackleton.ie
Residential Development on Rathmullan Road, Drogheda	Rev: **0**			Recommended viewing distance with both eyes is 500mm.

Name PM03 Status Proposed Reference: Donore Cemetery looking NNE	**Earlsfort Developments Drogheda Limited**	**Camera location** 705523, 774068, 82.0 **Target Direction** 706220, 775207, 72.5	Camera Canon 6D Mk 2 Lens Canon EF 50mm HView Angle Nominal 40 degrees Date/Time: 19/05/2025 16:39	CSC Chris Shackleton Consulting www.shackleton.ie info@shackleton.ie
Residential Development on Rathmullan Road, Drogheda	Rev: **0**			Recommended viewing distance with both eyes is 500mm.

Name PM04 Status Existing Reference: Battle of the Boyne viewpoint, Oldbridge looking E		**Earlsfort Developments Drogheda Limited**	**Camera location** 704994, 775212, 31.3 **Target Direction** 705714, 775217, 28.0	Camera Canon 6D Mk 2 Lens Canon EF 50mm HView Angle Nominal 40 degrees Date/Time: 19/05/2025 17:21
Residential Development on Rathmullan Road, Drogheda	Rev: **0**			Recommended viewing distance with both eyes is 500mm.

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Name PM04 Status Proposed Reference: Battle of the Boyne viewpoint, Oldbridge looking E		**Earlsfort Developments Drogheda Limited**	**Camera location** 704994, 775212, 31.3 **Target Direction** 705714, 775217, 28.0	Camera Canon 6D Mk 2 Lens Canon EF 50mm HView Angle Nominal 40 degrees Date/Time: 19/05/2025 17:21	CSC Chris Shackleton Consulting www.shackleton.ie info@shackleton.ie
Residential Development on Rathmullan Road, Drogheda	Rev: **0**			Recommended viewing distance with both eyes is 500mm.	

Name PM05 Status Existing Reference: Driveways Bloomsbury Cottage & 'Bouvinda' looking ESE	**Earlsfort Developments Drogheda Limited**	**Camera location** 704966, 775571, 8.1 **Target Direction** 705679, 775209, 3.9	Camera Canon 6D Mk 2 Lens Canon EF 50mm HView Angle Nominal 40 degrees Date/Time: 19/05/2025 16:59	CSC Chris Shackleton Consulting www.shackleton.ie info@shackleton.ie
Residential Development on Rathmullan Road, Drogheda Rev: **0**			Recommended viewing distance with both eyes is 500mm.	

Name PM05 Status Proposed Reference: Driveways Bloomsbury Cottage & 'Bouvinda' looking ESE		**Earlsfort Developments Drogheda Limited**	**Camera location** 704966, 775571, 8.1 **Target Direction** 705679, 775209, 3.9	Camera Canon 6D Mk 2 Lens Canon EF 50mm HView Angle Nominal 40 degrees Date/Time: 19/05/2025 16:59	CSC Chris Shackleton Consulting www.shackleton.ie info@shackleton.ie
Residential Development on Rathmullan Road, Drogheda	Rev: **0**			Recommended viewing distance with both eyes is 500mm.	

Name PM06 Status Existing Reference: Oldbridge House Visitor Centre looking ESE		**Earlsfort Developments Drogheda Limited**	**Camera location** 704054, 776013, 16.6 **Target Direction** 705668, 775494, 16.6	Camera Canon 6D Mk 2 Lens Canon EF 50mm HView Angle Nominal 40 degrees Date/Time: 19/05/2025 13:19
Residential Development on Rathmullan Road, Drogheda	Rev: **0**			Recommended viewing distance with both eyes is 500mm.

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Name PM06 Status Proposed Reference: Oldbridge House Visitor Centre looking ESE	**Earlsfort Developments Drogheda Limited**	**Camera location** 704054, 776013, 16.6 **Target Direction** 705668, 775494, 16.6	Camera Canon 6D Mk 2 Lens Canon EF 50mm HView Angle Nominal 40 degrees Date/Time: 19/05/2025 13:19	CSC Chris Shackleton Consulting www.shackleton.ie info@shackleton.ie
Residential Development on Rathmullan Road, Drogheda — Rev: **0**			Recommended viewing distance with both eyes is 500mm.	

Name PM07 Status Existing Reference: Drybridge House looking SSE	**Earlsfort Developments Drogheda Limited**	**Camera location** 705704,7 76122, 18 **Target Direction** 706007, 775241, 6.3	Camera Canon 6D Mk 2 Lens Canon EF 50mm HView Angle Nominal 40 degrees Date/Time: 19/05/2025 14:35	CSC Chris Shackleton Consulting www.shackleton.ie info@shackleton.ie
Residential Development on Rathmullan Road, Drogheda Rev: **0**			Recommended viewing distance with both eyes is 500mm.	

Name PM07 Status Proposed Reference: Drybridge House looking SsE	**Earlsfort Developments Drogheda Limited**	**Camera location** 705704,7 76122, 18 **Target Direction** 706007, 775241, 6.3	Camera Canon 6D Mk 2 Lens Canon EF 50mm HView Angle Nominal 40 degrees Date/Time: 19/05/2025 14:35	CSC Chris Shackleton Consulting www.shackleton.ie info@shackleton.ie
Residential Development on Rathmullan Road, Drogheda Rev: **0**			Recommended viewing distance with both eyes is 500mm.	

Name PM08 Status Existing Reference: Boyne River walkway at slipway looking SSE		**Earlsfort Developments Drogheda Limited**	**Camera location** 706189, 775413, 5.2 **Target Direction** 706343, 775152, 7.5	Camera Canon 6D Mk 2 Lens Canon EF 50mm HView Angle Nominal 40 degrees Date/Time: 19/05/2025 15:18
Residential Development on Rathmullan Road, Drogheda	Rev: **0**			Recommended viewing distance with both eyes is 500mm.

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Name PM08 Status Proposed Reference: Boyne River walkway at slipway looking SSE		**Earlsfort Developments Drogheda Limited**	**Camera location** 706189, 775413, 5.2 **Target Direction** 706343, 775152, 7.5	Camera Canon 6D Mk 2 Lens Canon EF 50mm HView Angle Nominal 40 degrees Date/Time: 19/05/2025 15:18
Residential Development on Rathmullan Road, Drogheda	Rev: **0**			Recommended viewing distance with both eyes is 500mm.

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Name PM09 Status Existing Reference: Road Bridge on Hill of Rath Road looking S		**Earlsfort Developments Drogheda Limited**	**Camera location** 705754, 777303, 54.2 **Target Direction** 706084, 775486, 41.8	Camera Canon 6D Mk 2 Lens Canon EF 50mm HView Angle Nominal 40 degrees Date/Time: 19/05/2025 13:49	CSC Chris Shackleton Consulting www.shackleton.ie info@shackleton.ie
Residential Development on Rathmullan Road, Drogheda	Rev: 0				

Recommended viewing distance with both eyes is 500mm.

Name PM09 Status Proposed Reference: Road Bridge on Hill of Rath Road looking S		**Earlsfort Developments Drogheda Limited**	**Camera location** 705754, 777303, 54.2 **Target Direction** 706084, 775486, 41.8	Camera Canon 6D Mk 2 Lens Canon EF 50mm HView Angle Nominal 40 degrees Date/Time: 19/05/2025 13:49	CSC Chris Shackleton Consulting www.shackleton.ie info@shackleton.ie
Residential Development on Rathmullan Road, Drogheda	Rev: **0**				

Recommended viewing distance with both eyes is 500mm.

Name PM10 Status Existing Reference: The Square (South) looking W		**Earlsfort Developments Drogheda Limited**	**Camera location** 706441, 775228, 29.8 **Target Direction** 706315, 775211, 30.3	Camera Canon 6D Mk 2 Lens Canon EF 50mm HView Angle Nominal 40 degrees Date/Time: 19/05/2025 15:48
Residential Development on Rathmullan Road, Drogheda	Rev: **0**			Recommended viewing distance with both eyes is 500mm.

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Name PM10 Status Proposed Reference: The Square (South) looking W		**Earlsfort Developments Drogheda Limited**	**Camera location** 706441, 775228, 29.8 **Target Direction** 706315, 775211, 30.3	Camera Canon 6D Mk 2 Lens Canon EF 50mm HView Angle Nominal 40 degrees Date/Time: 19/05/2025 15:48
Residential Development on Rathmullan Road, Drogheda	Rev: **0**			Recommended viewing distance with both eyes is 500mm.

CSC Chris Shackleton Consulting
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Name PM11 Status Existing Reference: Rathmullan Road looking W		**Earlsfort Developments Drogheda Limited**	**Camera location** 706476, 775076, 31.6 **Target Direction** 706177, 775115, 30.8	Camera Canon 6D Mk 2 Lens Canon EF 50mm HView Angle Nominal 40 degrees Date/Time: 19/05/2025 15:33
Residential Development on Rathmullan Road, Drogheda	Rev: 0			Recommended viewing distance with both eyes is 500mm.

CSC Chris Shackleton Consulting
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Name PM11 Status Proposed Reference: Rathmullan Road looking W		**Earlsfort Developments Drogheda Limited**	**Camera location** 706476, 775076, 31.6 **Target Direction** 706177, 775115, 30.8	Camera Canon 6D Mk 2 Lens Canon EF 50mm HView Angle Nominal 40 degrees Date/Time: 19/05/2025 15:33
Residential Development on Rathmullan Road, Drogheda	Rev: **0**			Recommended viewing distance with both eyes is 500mm.

CSC Chris Shackleton Consulting
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Name PM12 Status Existing Reference: Tullybrook Housing looking SSW	**Earlsfort Developments Drogheda Limited**	**Camera location** 706340, 775954, 21.8 **Target Direction** 705848, 775063, 27.9	Camera Canon 6D Mk 2 Lens Canon EF 50mm HView Angle Nominal 40 degrees Date/Time: 19/05/2025 14:51	CSC Chris Shackleton Consulting www.shackleton.ie info@shackleton.ie
Residential Development on Rathmullan Road, Drogheda — Rev: 0			Recommended viewing distance with both eyes is 500mm.	

Name PM12 Status Proposed Reference: Tullybrook Housing looking SSW	**Earlsfort Developments Drogheda Limited**	**Camera location** 706340, 775954, 21.8 **Target Direction** 705848, 775063, 27.9	Camera Canon 6D Mk 2 Lens Canon EF 50mm HView Angle Nominal 40 degrees Date/Time: 19/05/2025 14:51	CSC Chris Shackleton Consulting www.shackleton.ie info@shackleton.ie
Residential Development on Rathmullan Road, Drogheda — Rev: 0			Recommended viewing distance with both eyes is 500mm.	

Name PM13 Status Existing Reference: N51 at Mell looking S		**Earlsfort Developments Drogheda Limited**	**Camera location** 706083, 776552, 34.2 **Target Direction** 706054, 776346, 31.6	Camera Canon 6D Mk 2 Lens Canon EF 50mm HView Angle Nominal 40 degrees Date/Time: 19/05/2025 14:15
Residential Development on Rathmullan Road, Drogheda	Rev: **0**			Recommended viewing distance with both eyes is 500mm.

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Name PM13 Status Proposed Reference: N51 at Mell looking S		**Earlsfort Developments Drogheda Limited**	**Camera location** 706083, 776552, 34.2 **Target Direction** 706054, 776346, 31.6	Camera Canon 6D Mk 2 Lens Canon EF 50mm HView Angle Nominal 40 degrees Date/Time: 19/05/2025 14:15
Residential Development on Rathmullan Road, Drogheda	Rev: **0**			Recommended viewing distance with both eyes is 500mm.

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Name CGI01 Status Proposed CGI Reference: From Mary McAleese Boyne Valley Bridge Southbound Carriageway looking South		**Earlsfort Developments Drogheda Limited**	**Camera location** 705820, 775713, 21.0 **Target Direction** 706089, 774512, 15.4	Camera Virtual CGI Lens Virtual 50mm HView Angle Nominal 40 degrees Viewer Height Car
Residential Development on Rathmullan Road, Drogheda	Rev: **0**			Recommended viewing distance with both eyes is 500mm.

CSC Chris Shackleton Consulting
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Photomontage Methodology / Method Statement

Work has been completed in accordance with best practice guidelines a summary of which are provided below.

Preparation

Prior to site visit camera locations were identified and located on digital map to enable GPS routing to the correct locations. The site was “scouted” for access using Google Streetview (c) Google.

Photography

- Photographs were taken on site at locations specified using a high-resolution professional digital camera. The Camera a Canon 6D is a full frame format (which corresponds to a traditional 35mm film format) as recommended by best practice guidelines.
- Images will be taken in RAW format which provides the maximum flexibility in adjustment along with the best quality available, and with bracketed exposure. The images were stored with embedded camera/photo exif data.
- The camera was tripod mounted, spirit leveled and set at a nominal 1.6m above ground level
- The lens used as a Canon prime (fixed) 50mm or normal lens. The 50mm lens provides a similar magnification to the human eye and will provide an image which is accepted.

Control

A series of survey points were captured on site for each photograph using Trimble R8 survey grade RTK-GPS. The following were measured:

- The camera position, plan and height
- Measured points of detail visible when the photograph was taken. On streetscape scenes points of detail (corners of buildings, poles, sign, white lines, structures, etc) are surveyed to provide an accurate orientation base where insufficient existing detail is available we supplement with either with red/white ranging rods or smaller orange cones placed in the camera’s field of view while taking the photograph.
- Regardless of the type of control the configuration shall be non-collinear with a good photogrammetric geometry. This ensures that computational analysis is convergent.

Setting up AVR Images

- Survey and OS mapping is imported into 3D software
- A calibrated virtual 50mm camera is created to match the physical one used to capture the image. These are snapped to the surveyed locations. The individual photograph frames are loaded into the viewport.
- Using in-built software algorithms the virtual camera is adjusted so the points of detail on the photograph and the surveyed points in real-life coalesce in the camera viewport. Once complete the virtual camera will be orientated so that it is identical to the physical camera that took the base photograph.
- Checks are made using the surveyed information and project mapping and cross referenced with the photographs to ensure they align.
- A Daylight system is then accurately introduced into the scene at it correct geo-referenced coordinates. Once the time/date and time zone is set the digital sky will match the position of the sun and shadows created by the same in the base photograph.

Verifiable Photomontage & Proposed development modelling

- The proposed development, structure, road works and earthworks is modeled up in 3D from the drawings provided by the Client / Design Team.
- The building is located in accordance with surveyed location and at the correct FFL.
- True life digital materials are designed and assigned to the 3D model elements using reference imagery provided by the client. Sophisticated real world rendering shaders are used in conjunction with the daylight system to produce final renders which will react in a verifiable manner to match the reference photographic base images.
- Finally, the new development image and the existing original photograph are merged with due care for any demolitions/removals, foreground / background existing objects, landscaping, lighting, shadows, etc. to produce a single believable and verifiable composite image.

Viewing instructions

These images are designed to be printed at A3 and taken to site to evaluate the impact of the development.

Images should be viewed with both eyes open from the locations indicated and held 500mm from the viewers eyes. (Arms length). When held at arms length the viewer should be able to effectively focus not only on the photomontage in hand but also on the surrounding landscape which will give them a much wider field of view.

When used in this fashion the existing landscape will line-up and the photomontage will provide similar perspective and thus enable the viewer to visually evaluate the proposal.

Appendix 12-1

Appendix 12.1 Notes on key data sources

Record of Monuments and Places (RMP)
Section 12(1) of the National Monuments (Amendment) Act 1994 provides that the Minister for Arts, Heritage, Gaeltacht and the Islands (now the Minister for Culture, Heritage and the Gaeltacht) shall establish and maintain a record of monuments and places where they believe there are monuments. The record comprises of a list of monuments and relevant places and mapping showing each monument and relevant place in respect of each county in the State. Sites recorded on the RMP all receive statutory protection under the National Monuments Act.

Sites and Monuments Record (SMR)
The SMR holds documentary evidence and records of field inspections of all known archaeological sites and monuments. Some information is also held about archaeological sites and monuments whose precise location is not known e.g. only a site type and townland are recorded. These are known to the National Monuments Section as 'un-located sites' and cannot be afforded legal protection. As a result these are omitted from the RMP. SMR sites are also listed on a website maintained by the DCHG.

National Monuments in the State Care Database
This is a list of all the National Monuments in the State guardianship or ownership. Each is assigned a National Monument number whether in guardianship or ownership and has a brief description of each monument. A National Monument receives statutory protection and is described as 'a monument or the remains of a monument the preservation of which is a matter of national importance by reason of the historical, architectural, traditional, artistic or archaeological interest attaching thereto' (National Monuments Act, 1930, Section 2).
The Minister for the Department of Environment, Heritage and Local Government (now the Minister for Culture, Heritage and the Gaeltacht) may acquire National Monuments by agreement or by compulsory order. The State or Local Authority may assume guardianship of any National Monument (other than dwellings). The owners of National Monuments (other than dwellings) may also appoint the Minister or the Local Authority as guardian of that monument if the State or Local Authority agrees. Once the site is in ownership or guardianship of the State, it may not be interfered with without the written consent of the Minister.

Preservation Orders List
Preservation Orders and/or Temporary Preservation Orders, can be assigned to a site or sites that are deemed to be in danger of injury or destruction. Orders are allocated under the National Monuments Act, 1930. Preservation Orders make any interference with the site illegal. Temporary Preservation Orders can be attached under the National Monuments Act, 1954. These perform the same function as a Preservation Order but have a time limit of six months, after which the situation must be reviewed. Work may only be undertaken on or in the vicinity of sites under Preservation Orders with the written consent, and at the discretion, of the Minister (DCHG).

Register of Historic Monuments
This register was established under Section 5 of the National Monuments (Amendment) Act 1987 and requires the Minister to establish and maintain such a record. Historic monuments and archaeological areas included in the register are afforded statutory protection pursuant to the regime under the National Monuments Acts 1930 to 2014. The register also includes sites under Preservation Orders and Temporary Preservation Orders. All registered monuments are included in the RMP.

Topographical files of the National Museum of Ireland
This is the national archive of all known finds recorded by the National Museum of Ireland. This archive relates primarily to artefacts but also includes references to monuments and

unique records of previous excavations. The find spots of artefacts are important sources of information on the discovery of sites of archaeological significance.

Cartographic sources

These are important in tracing land use development within the receiving environment of the Proposed Development as well as providing important topographical information on areas of archaeological potential and the construction of buildings. Cartographic analysis of all relevant maps has been made to identify any topographical anomalies or structures that no longer remain within the landscape.

The cartographic sources consulted include:

- Down Survey Map, Barony Map of 'Duleek' c. 1655;
- William Larkin's, Map of the County of Meath, 1812; and
- Ordnance Survey 6-inch and 25-inch maps of Meath (1836 and 1909).

Documentary Sources

Documentary sources (as identified above) were consulted to compile background information on the archaeological, architectural and Cultural Heritage receiving environment of the Proposed Development.

Development Plan

Development Plans contain a catalogue of all the Protected Structures, archaeological sites and Architectural Conservation Areas within every county. The development plan of relevance that was examined as part of this assessment is the Meath County Development Plan 2021–2027.

The National Inventory of Architectural Heritage (NIAH)

The NIAH is a government based organisation tasked with making a nationwide record of locally, regionally, nationally and internationally significant structures, which in turn provides county councils with a guide as to what structures to list within the Record of Protected Structures. The NIAH have also carried out a nationwide desk based survey of historic gardens, including demesnes that surround large houses.

Aerial Photographic Coverage

This is an important source of information regarding the precise location of sites and their extent. It also provides information on the terrain and its likely potential for archaeology. Ordnance Survey aerial photographs (1995, 2000, and 2005), Google Earth coverage (2003–2018) and Bing Maps were examined for this assessment.

Excavations Bulletin

This is a summary publication that has been produced every year since 1970. This summarises every archaeological excavation that has taken place in Ireland during that year up until 2010 and since 1987 has been edited by Isabel Bennett. This information is also available online from 1970–2018. Information from this resource is vital when examining the archaeological content of any area, which may not have been recorded under the SMR and RMP files.

Appendix 12-2

Appendix 12.2 Plates

Plate 12.1 View to the north across the study area toward Louth Hill, Tullyallen and Red Mountain

Plate 12.2 View southwards showing the developments on the east side of Pass, the Proposed Development Site is to the right

Plate 12.3 Western perimeter of Proposed Development Site, showing mature planting along the line of M1 motorway with Mary McAleese bridge marking the location of the Boyne

Plate 12.4 Looking south across the Proposed Development Site towards the hill at Donore

Plate 12.5 Panorama of Proposed Development Site from the south east

Plate 12.6 Cluster of modern farm buildings to the south of the Proposed Development Site.

Plate 12.7 Remains of older farm buildings under modern developments

Plate 12.8 Additional remains of older farm buildings surrounded by 20th century modifications.

Plate 12.9 View of Proposed Development site from hill at Donore ME020:011

Plate 12.10 View from Drybridge House, south east towards the Proposed Development site.

Plate 12.11 View south from Red Mountain, which Story notes as '*A hill from whence his Majesty first saw the Irish camp*'.

Plate 12.12 The location of Mill Ford, the point where William crossed the Boyne. Note the steeply rising ground to the left, on top of which is the Proposed Development site.

Plate 12.13 Detail of the steeply rising ground to the left which forms the southern bank of the Boyne at Mill Ford

Plate 12.14 The entrance to the ravine, Pass-if-you-can from Mill Ford, the undoubted route William's forces took towards the Jacobite forces positioned at Donore.

Appendix 12-3

Appendix 12.3 Sites and Monuments Record

SMR No. ME020-004--- Townland: Oldbridge Class: Souterrain
Description Two circular chambers connected by a Y –shaped passageway. Field Survey, 13/06/83, Sweetman: "The original entrance is now completely blocked with collapse. There is a well preserved chamber at the east side. It is constructed with dry-stone walling with largish boulders (up to 2.50m x .40m) near the base and getting smaller higher up.
"The passages are built with dry-stone walling and lintels over. In some cases, there are substantial gaps between these lintels, which are filled with boulders. The eastern chamber has a jamb at the south side of the exit; otherwise the dry-stone rises directly from the floor level. Some animal bone was to be seen to the east of the chamber, and maybe some occupation debris."

SMR No. ME020-008--- Townland: Sheephouse Class: Enclosure site
Description: A circular cropmark is evident from an aerial photograph (No. 912). This existence of this feature was confirmed survey conducted in 1984. (Diameter c.50m).

SMR No. ME020-011--- Townland Sheephouse Class Church
Description Located on the top of Donore hill. The remains of the medieval church (ME020-011----) are located in a walled graveyard (dims c. 60m ENE-WSW; c. 35m NNW-SSE) which contains a 17th century tombstone (ME020-011002-) and a cross-head (ME020-011003-). There are also 18th century and 19th century memorials, which are recorded (Sadleir 1913-14). Near the gate of the graveyard is a watch-house, which would have formerly used to guard against the possible exhumation of the recently buried by body-snatchers. The head and part of the shaft of a disc-headed cross (H c. 0.5m) were in Donore graveyard (ME020-011001-) in 1968. One side is plain and the other has a raised cross in a solid ring, a cap and blank panelling. It was not present in 1984, but it might be inside the locked watch house.

SMR No. ME020-025--- Townland Oldbridge Class Battlefield
Description Battle of the Boyne, 1690: The table below shows all sites associated with the battle field site.

SMR No.	Class
ME020-025001-	Battlefield
ME020-025002-	Ring-ditch
ME020-025003-	Ring-ditch
ME020-025004-	Burial
ME020-025005-	Road - road/trackway
ME020-025006-	Ford
ME020-025007-	Ford
ME020-025008-	Ford
ME020-025009-	Ford
ME020-025010-	Cultivation ridges
ME020-025011-	Field system
ME020-025012-	Field system
ME020-025013-	Settlement cluster
ME020-025014-	Ring-ditch
ME020-025015-	Ring-ditch
ME020-025016-	Ring-ditch
ME020-025017-	Ring-ditch
ME020-025018-	Field system
ME020-025019-	Prehistoric site - lithic scatter
ME020-025020-	Prehistoric site - lithic scatter
ME020-025021-	Prehistoric site - lithic scatter
ME020-025022-	Prehistoric site - lithic scatter
ME020-025023-	Prehistoric site - lithic scatter

SMR No. ME020-030--- Townland Oldbridge Class Standing Stone
Description: This monument was identified by Tom Condit, Department archaeologist.

SMR No: ME020-034--- Townland Oldbridge Class: Excavation (Misc)
Neolithic Pit: A single pit was uncovered on the access road route of the M1 ,50m north of its junction with the Sheephouse Road by Kieran Campbell, VJK Ltd. The pit, 1 m in diameter, produced sherds of a Western Neolithic shouldered bowl.

SMR No: ME020-035--- Townland Oldbridge Class: Excavation (Misc)
Prehistoric Pit. A small quantity of struck flint was recovered from a pit uncovered on the motorway approach to the Boyne Bridge route of the M1 by Kieran Campbell, VJK Ltd.

SMR No: ME020-036--- Townland Sheephouse Class: Excavation (Misc)
Prehistoric enclosure. An oval enclosure, situated on a gentle north-facing slope and measuring c. 30m x 30m, was discovered during test-trenching carried out by Valerie J. Keely Ltd. Topsoil stripping began in November 2000, revealing the extent of the enclosure, long with internal post holes and pits and additional peripheral material including cremation pits. Excavated by Dermot Neilis, lAC Ltd.
Multi-phase habitation site. This site was located 1 km west of Drogheda on the Rathmullan road and overlooked the Boyne to the north. It was excavated by Declan Moore, AES Ltd. It consisted of a line of post holes containing Neolithic Pottery, enclosure ditches, an oval enclosure, a circular ditch feature, a large enclosure. Throughout the site there was evidence of hearths, pits and post holes as well as a number of kilns.
Prehistoric activity. This site was discovered during monitoring of topsoil stripping during the construction of the M 1 motorway it was located between the two sites described above 2000:0778 and 2000: 1055. It contained a scattering of typical subsoil cut features such as refuse pits, hearths, stakes and post holes. The site produced very few artefacts and was excavated by Dermot Neilis, lAC Ltd.

SMR No. ME020-039--- Townland Oldbridge Class Ford
Description: This monument was identified by Tom Condit, Department archaeologist.

SMR No: ME020-040--- Townland: Donore Class: Excavation (Misc)
The site is one of a series of potential prehistoric sites identified during pre-development testing along the route of the Northern Motorway, Contract 7. This site (Site 10) is located approximately 500m to the south of the Donore Road, south-west of the town of Drogheda. The site is on a low ridge, with a good view of the surrounding countryside, including the Bronze Age complex (Sites 15 and 16) currently under excavation to the south. The site comprises a series of small pits and post-holes, with no obvious delimiting feature or structure. Identification of any structures is hampered by the site being transected by a modern field boundary ditch that cuts through what appears to be its central focus. Activity at the site appears to span a broad period of the earlier Bronze Age. To date, over 700 sherds of Bronze Age pottery have been recovered. Provisional identification suggests the presence of Beaker, Food Vessel, and Collared or Cordoned Urn pottery. Of particular interest are what appear to be the remains of several polypod bowls or similar, footed vessels. Five feet have been identified to date, in two distinct sizes, suggesting the presence of at least two vessels of this type. The function of the site is still unclear. It is least likely to be a funerary site. While cremated bone is present in many contexts, only small amounts are found, and there is no deliberation to their deposition. The absence of any hearths or clear structures at the site would appear to mitigate against a domestic function. However, the richest area of the site comprises a series of occupation-type layers delimited on the east side by a row of deep post-holes. Unfortunately, both these layers and the row of post-holes have been truncated by the field boundary ditch. Given the wealth of artefacts, and the span of time that they indicate, a ritual function for the site cannot be ruled out.

SMR No: ME020-041--- Townland: Oldbridge Class: Standing stone
Description Found to the east of the souterrain (ME020-004----).

SMR No: ME020-042--- Townland: Donore Class: Habitation site
The site was discovered during monitoring along the line of the Northern Motorway, Contract 7 (Drogheda Bypass). It was in an area of firm ground on a north-facing slope rising up from the River Boyne. When first uncovered by mechanical excavator the site appeared as a scattering of small subsoil-cut features, including one possible structural slot-trench, grouped within an area measuring 40m east–west by 50m. The distribution of archaeological features across the site formed no discernible pattern. Two groups of features, which in the absence of artefactual evidence cannot be identified as contemporary, were excavated. These two groups were situated in the north-eastern and south-western corners of the site. A minimum distance of over 10m separated the two groups of features and the rest of the site appeared to be archaeologically sterile. The south-western group consisted of ten subsoil-cut features grouped within an area approximately 15m east–west by 10m. Most of these features were irregular in plan, with gently sloping sides and uneven or rounded bases. The morphology of two features was relatively post-hole-like. These features, which were 0.15m and 0.25m deep respectively, were both roughly circular or oval with sheer sides and flat bases. The stratigraphy of their fills did not, however, support a structural interpretation, nor was there any other surviving structural evidence in the immediate vicinity. Although more than half of the features in this group contained varying amounts of charcoal, none of them could be directly interpreted as hearths or showed any sign of burning in situ. One feature, which was suboval in plan, 0.27m deep and with a maximum diameter of 0.9m, was filled with a burnt stone and charcoal-rich deposit which may have represented the dumped residue of an open fire. The fills of two other rounded features, C4 and C26, also contained quantities of burnt stone and charcoal. No diagnostic artefacts were retrieved from these features. One finely struck flint flake from a prepared core, with a modern fracture, was retrieved from the topsoil in this area. The north-eastern group consisted of sixteen subsoil-cut features grouped within an area measuring approximately 30m north–south by 20m. In common with the features in the south-western group, the fills of over half of these features contained varying amounts of charcoal. None of them, however, contained traces of burnt or heat-shattered stone such as that removed from features in the south-western group. This group of features was artefactually richer than those to the south-west. Traces of burnt bone were recovered from the fill of a shallow possible rubbish-pit situated at the south-east of the group. A flake of struck flint was recovered from the upper fill of an irregular, steep-sided feature. More pieces of flint and some poorly preserved sherds of apparently prehistoric pottery were recovered from the largely sterile, grey silty clay fill of a slot-trench excavated at the centre of this group. The profile and dimensions of the slot varied widely from a shallow, almost bowl-shaped ‘U’ with a minimum depth of 0.12m to a more sheer-sided near-‘V’ profile with a maximum depth of 0.29m. It was 0.31–0.6m wide. The function of the slot remains unclear. It appeared to be a structural slot-trench encompassing a roughly oval area with a subrectangular annexe to the west. These areas, which appeared to form an annexed or figure-of-eight structure, had combined dimensions of 7.75m east–west by 5.8m. However, little further structural evidence supported this appearance. No evidence of stake- or post-holes was uncovered at the base of, or within the areas encompassed by, the slot. No interruption suggestive of an entrance occurred at any point in the sweep of either arc. At the extreme western side of the smaller arc a deposit of medium-sized stones contained within the fill was removed from the trench. These stones could be tentatively interpreted as a drainage feature at the threshold of a slot-built structure. Immediately to the north of these stones a small concentration of charcoal, which could represent an accumulation of charcoal blown through the possible entrance from an internal hearth, directly overlay the upper fill of the slot. Only one internal feature (C52) was uncovered within the possible structure. The survival of only one internal feature may be the result of post-depositional truncation or an original absence of internal supports. The internal feature was a shallow, subcircular, bowl-like pit 0.15m in depth with a maximum diameter of 0.5m. It was filled with a compact sterile sandy clay which revealed no indication of the feature’s

function. The presence of an apparently structural slot combined with randomly scattered subsoil cuts, some containing burnt bone, charcoal, burnt and heat-shattered stone with some flakes of struck flint and sherds of prehistoric pottery, suggests that Donore 2 may have been an occupation site at one or several stages in prehistory. Immediately downhill of the site, 200m to the north, a large, possibly Bronze Age enclosure has recently been excavated by Dermot Nelis, and 300m further to the north an enclosure site dating from the Neolithic to the Iron Age or Early Christian period has also been recently excavated by Declan Moore.

SMR No. ME020-049--- Townland Oldbridge Class: Excavation (Misc)
A two-day excavation was carried out on a 4m x 4m area of loose stone and associated deposits containing animal bone on the route of the M1 by Kieran Campbell, VJK Ltd. No dating evidence recovered.

SMR No: ME020-054--- Townland Oldbridge Class: Excavation (Misc)
This site was identified during monitoring along the route of the Northern Motorway, Gormanston– Monasterboice, Contract 7, approximately 500m south of the River Boyne. It was on gently sloping, northerly-facing ground. The two-month excavation revealed a series of narrow linear ditches, a curvilinear ditch, a U-shaped ditch and several possible post-holes. The earliest activity appeared to have been a shallow pit, aligned east–west. It was 0.17m deep, 0.77m long and 0.7m wide. It was oval in plan with a gradual break of slope at the top and was truncated on the east side by a later ditch. No finds were recovered from the single fill. The next phase of activity was the cutting into the natural of a ditch which also truncated the above-mentioned pit. It was a broad V-shaped ditch, c. 11.2m in maximum excavated length and c. 0.8m in width. It contained three fills. It had a sharp break of slope at the top and steeply sloping sides and was aligned on a north–south axis. An oval pit, orientated north–south and measuring 0.37m in depth, 1.85m in length and 1.1m in width, truncated the above-mentioned ditch. No dating evidence was recovered from this feature. A curvilinear ditch represents the next phase of activity on the site. It measured 1.42m in length, 0.36m in width and was 0.63m deep. No dating evidence was recovered from any of the eight fills. A small post-hole was found to be stratigraphically later than this ditch. A series of shallow pits was also uncovered on the site, sealed by topsoil and truncated natural. No more precise stratigraphic relationships could be established for these features. As before, no dating evidence was recovered to help aid interpretation.

SMR No: ME020-063--- Townland Oldbridge Class: Kiln
Prehistoric. This site was identified during monitoring of the M1 motorway. It was located in the southern end of a field close to the road between Oldbridge and Sheephouse town lands and the area of excavation measured approximately 130m x 10m. A bowl shaped feature that may represent the remains of a kiln was excavated by Dermot Neilis, IAC Ltd, along with a series of irregularly shaped pits.

SMR No: ME020-072--- Townland Oldbridge Class: Enclosure
A possible enclosure was identified on Lidar imagery.

SMR No: ME020-088--- Townland Oldbridge Class: Enclosure
Located at the bottom of a N-facing slope down to a W-E section of the River Boyne, with the river c. 100m to the N, and just E of the M1 motorway. Archaeological testing (08E0506) identified a large enclosure (int. diam. c. 70m) defined by a ditch which produced a wealth of Middle Bronze Age pottery.

Appendix 12-4

Appendix 12.4 Excavations in the vicinity of the Proposed Development Site

Oldbridge, Co. Meath N/A
1999:706; 99D013 & 99R034 (dive survey and detection licences)
Meath County Council commissioned an underwater inspection and metal detector survey to be carried out along the southern shore of the River Boyne at the site of the new bridge pylon for the M1 motorway in Oldbridge, Co. Meath. This work was carried out by Niall Brady, VJK Ltd but nothing of archaeological significance was recorded.

Oldbridge, Co. Meath ME020-034---
2000:0769; 00E0929
Neolithic Pit. A single pit was uncovered on the access road route of the M1, 50m north of its junction with the Sheephouse Road by Kieran Campbell, VJK Ltd. The pit, 1 m in diameter, produced sherds of a Western Neolithic shouldered bowl.

Oldbridge, Co. Meath ME020-035---
2000:0770; 00E0938
Prehistoric Pit. A small quantity of struck flint was recovered from a pit uncovered on the motorway approach to the Boyne Bridge route of the M1 by Kieran Campbell, VJK Ltd.

Oldbridge, Co. Meath ME020-049---
2000:0771; 00E0939
A two-day excavation was carried out on a 4m x 4m area of loose stone and associated deposits containing animal bone on the route of the M1 by Kieran Campbell, VJK Ltd. No dating evidence recovered.

Donore, Co. Meath ME020-040---
2000:0775; 00E0813
The site is one of a series of potential prehistoric sites identified during pre-development testing along the route of the Northern Motorway, Contract 7. This site is located approximately 500m to the south of the Donore Road, south-west of the town of Drogheda. The site is on a low ridge, with a good view of the surrounding countryside. The site comprises a series of small pits and post-holes, with no obvious delimiting feature or structure. Identification of any structures is hampered by the site being transected by a modern field boundary ditch that cuts through what appears to be its central focus. Activity at the site appears to span a broad period of the earlier Bronze Age. To date, over 700 sherds of Bronze Age pottery have been recovered. Provisional identification suggests the presence of Beaker, Food Vessel, and Collared or Cordoned Urn pottery. Of particular interest are what appear to be the remains of several polypod bowls or similar, footed vessels. Five feet have been identified to date, in two distinct sizes, suggesting the presence of at least two vessels of this type. The function of the site is still unclear. It is least likely to be a funerary site. While cremated bone is present in many contexts, only small amounts are found, and there is no deliberation to their deposition. The absence of any hearths or clear structures at the site would appear to mitigate against a domestic function. However, the richest area of the site comprises a series of occupation-type layers delimited on the east

side by a row of deep post-holes. Unfortunately, both these layers and the row of post-holes have been truncated by the field boundary ditch. Given the wealth of artefacts, and the span of time that they indicate, a ritual function for the site cannot be ruled out.

Sheephouse, Co. Meath ME020-036---
2000:0778; 00E0811
Prehistoric enclosure. An oval enclosure, situated on a gentle north-facing slope and measuring c. 30m x 30m, was discovered during test-trenching carried out by Valerie J. Keely Ltd. Topsoil stripping began in November 2000, revealing the extent of the enclosure, long with internal post holes and pits and additional peripheral material including cremation pits. Excavated by Dermot Neilis, IAC Ltd.

Donore, Co. Meath ME020-042---
2001:0960; 01E0399
The site was discovered during monitoring along the line of the Northern Motorway, Contract 7 (Drogheda Bypass). The distribution of archaeological features across the site formed no discernible pattern. Two groups of features, which in the absence of artefactual evidence cannot be identified as contemporary, were excavated. These two groups were situated in the north-eastern and south-western corners of the site. A minimum distance of over 10m separated the two groups of features.
The south-western group consisted of ten subsoil-cut features grouped within an area approximately 15m east–west by 10m. The stratigraphy of their fills did not support a structural interpretation, nor was there any other surviving structural evidence in the immediate vicinity.
The north-eastern group consisted of sixteen subsoil-cut features grouped within an area measuring approximately 30m north–south by 20m. In common with the features in the south-western group, the fills of over half of these features contained varying amounts of charcoal. None of them, however, contained traces of burnt or heat-shattered stone such as that removed from features in the south-western group. This group of features was artefactually richer than those to the south-west. Traces of burnt bone were recovered from the fill of a shallow possible rubbish-pit situated at the south-east of the group. A flake of struck flint was recovered from the upper fill of an irregular, steep-sided slot feature.
The presence of an apparently structural slot combined with randomly scattered subsoil cuts, some containing burnt bone, charcoal, burnt and heat-shattered stone with some flakes of struck flint and sherds of prehistoric pottery, suggests that the site may have been an occupation site at one or several stages in prehistory.

Oldbridge Co Meath ME020-054---
2001:1017 01E0267
This site was identified during monitoring along the route of the Northern Motorway, Gormanston– Monasterboice, Contract 7, approximately 500m south of the River Boyne. It was on gently sloping, northerly-facing ground. The excavation revealed a series of inter-cutting narrow linear ditches, a curvilinear ditch, a U-shaped ditch and several possible post-holes. No dating evidence was recovered to help aid interpretation.

Sheephouse, Co. Meath ME020-036-
2001 :1055, 00E0810
Multi-phase habitation site, located 1 km west of Drogheda on the Rathmullan road and overlooked the Boyne to the north. It consisted of a line of post holes containing Neolithic Pottery, enclosure ditches, an oval enclosure, a circular ditch feature, a large enclosure. Throughout the site there was evidence of hearths, pits and post holes as well as a number of kilns.

Donore, Co Meath
2001:962: 01E0373
The site consisting of pre-historic activity, was discovered during testing along the line of the Northern Motorway, Contract 7 (Drogheda Bypass). It was in an area of firm ground toward the ridge of a north-facing slope rising up from the River Boyne. When first uncovered by mechanical excavator the site appeared as a scattering of small subsoil-cut features grouped within an area measuring 11m north–south by 10m.
The site consisted of a series of four small to medium-sized pits, grouped in an apparently random manner. The largest of these features was an irregularly cut, steep-sided pit with an average width of over 1m and a maximum depth of 0.59m. The pit was filled by one deposit, which contained a large quantity of prehistoric pottery, charcoal, flint and burnt bone. These would appear to suggest that the feature functioned as a domestic refuse-pit.
Approximately 0.55m to the south a second, smaller pit was excavated. The morphology of this feature suggested that it may have been the result of the removal of a natural stone by modern ploughing activity, and although its fill contained inclusions of charcoal these may have originated in the larger feature to the north.
The other features excavated on the site were uncovered at some distance from these pits. A subcircular bowl-shaped pit, 0.15m in depth with a maximum diameter of 0.8m, was situated approximately 6.2m to the south. Its fills contained no direct evidence of its function.
A subcircular flat-based pit, 0.13m in depth with a maximum diameter of 0.44m, was situated approximately 4.1m to the south-east of the first feature discussed. This pit also contained flint, some apparently burnt stones and a large proportion of charcoal, which appeared to suggest its use as a refuse-pit.
No other deposits or features were identified during the excavation of Site 6. It is likely that the features excavated on the site represent an area of prehistoric domestic activity. These pits may have been the last remaining features of a more extensive occupation site almost completely destroyed by modern agricultural practices. However, given the situation of the site at the extreme western edge of the area of archaeological investigation along the road-line, it is possible that these features represent the eastern limit of a settlement site still preserved immediately outside the line of the road.

Donore, Co Meath
2001:959: 01E0398
The site, consisting of possible burnt mound activity, was discovered during monitoring along the line of the Northern Motorway, Contract 7 (Drogheda Bypass). It was in an area of firm ground on a north-facing slope rising up from the River Boyne. When first uncovered by

mechanical excavator the site appeared as a scattering of small subsoil-cut features and a pair of large pits grouped within an area measuring 20m north–south by 10m.
The pair of large pits appeared to form the focus of the site. Both were filled with a loose, darkish grey soil with a high composition of burnt stone in a charcoal-rich matrix. This burnt mound-like material also filled a depression which formed a link between the two features. The morphology of the pits was similar; both were roughly suboval in plan with gently sloping, rounded sides leading to undulating rounded bases. The larger of the two pits measured 2.4m by 1.55m by 0.36m deep. The smaller was 1.62m by 0.6m by 0.1m deep. The site overall was heavily truncated by machine activity and any possible archaeology which may have been present to the east of these pits would have been removed by bulldozer in the topsoil-stripping process.
Three other subsoil-cut features were excavated. The morphology and sterile fills of these features did not support any particular interpretation of the site's date or function.

Donore, Co Meath
2001:961: 01E0400
The site consisting of an isolated pit was discovered during monitoring along the line of the Northern Motorway, Contract 7 (Drogheda Bypass). It was in an area of firm ground on a north-facing slope rising up from the River Boyne. When first uncovered by mechanical excavator the site appeared as a scattering of small subsoil-cut features grouped within an area measuring 6m east–west by 9m.
During the initial site clearance and investigation it became apparent that the majority of features initially identified as possibly archaeological were actually of modern origin, most being the result of recent machine activity. Only one feature was of an archaeological nature.
This was a circular pit with a maximum depth of 0.28m and a diameter of 0.73m. It had steep sides and a flat base, giving it a broad 'U' shape in profile. The feature was filled with three deposits, all of which contained inclusions of burnt bone and charcoal, suggesting that it may have served as a domestic refuse-pit or even as a token cremation pit.
No other archaeological features or deposits were discovered during the investigation of this site. The pit may represent the remains of a phase of prehistoric activity, the majority of which has not survived in the archaeological record. It is possibly more likely, however, that the pit is related to the large prehistoric enclosure, Site 3 Sheephouse (see para 11.7.7 above 00E0811), excavated by Dermot Nelis approximately 40m to the north.

Sheephouse, Co. Meath ME020-036---
2001: 1056; 01E0449
The area of prehistoric activity was discovered during monitoring of topsoil stripping during the construction of the M 1 motorway.It contained a scattering of typical subsoil cut features such as refuse pits, hearths, stakes and post holes. The site produced very few artefacts.

Sheephouse, Co. Meath ME020-063---
2001:1058; 01E0907
A prehistoric identified during monitoring of the M1 motorway. It was located in the southern end of a field close to the road between Oldbridge and Sheephouse town lands and the area of

excavation measured approximately 130m x 10m. A bowl shaped feature that may represent the remains of a kiln along with a series of irregularly shaped pits.

Rathmullan, Co Meath
2002:1509; 02E1265
Excavations were carried out at the IDA Business Park, Rathmullan, after testing of the site (25.5ha in extent) and monitoring of the topsoil-stripping for the site compound and Phase 1 of the roads (see No. 1508, Excavations 2002, 02E0183). Three of the areas excavated (A, B, D) were within the road-take, and the fourth, Area C, was to the east of the road.
Rathmullan is at the eastern end of the Boyne Valley and overlooks Drogheda to the east, the high ground of Tullyesker, Red Mountain and Coolfore to the north, and Drybridge, the location of the new bridge over the Boyne, to the north-west. It is bounded on the south by the Drogheda–Donore Road and on the west by the M1 motorway. Significant archaeological sites were uncovered on both sides of the Boyne during the construction of the M1 motorway; six of these were in the immediate vicinity of the business park. They ranged in date from the Neolithic (c. 4000 BC) to the early historic period (AD 900).
Area A
Area A was on a natural rise in the landscape that sloped gradually to both north and south. It measured 24m north–south by 20m. Fourteen features were noted during the topsoil-stripping for the road, one of which later proved to be non-archaeological. These comprised pits, post-holes, stake-holes and burnt spreads. Two of the pits had heavily burnt material in their fill. One pit had four stake-holes at its base and was dug into a second burnt pit, which was alongside a backfilled watercourse. No diagnostic material was recovered, but samples have been taken for radiocarbon dating. Burnt material, including animal bone, teeth, burnt stone and wood, was evident at the base of the adjacent gully. This material was well preserved owing to the waterlogged conditions. The watercourse itself was a natural feature; it was very deep (over 1.8m) and filled very rapidly with water. It did not require full excavation and has been preserved in situ. Another pit with burnt fill was situated c. 3m north-west of this feature and contained a similar fill of burnt stone and charcoal.
Two post-holes near to one another were excavated. They contained similar grey clay deposits with flecks of charcoal. Unfortunately no diagnostic finds were found in either of these features, so analysis of their fills will need to be carried out. A pit with a grey clay fill produced animal teeth, charcoal, one flint scraper and one flint flake. Only one hearth feature and one burnt spread were recorded in this area. Overall, the finds and features suggest a Bronze Age date for the site.
Area B
Area B, 10m north of Area A, measured 115m north–south by 20m; it sloped gently from south to north and then more steeply at its northern end. It was noted during excavation that the northern end was particularly water saturated and that it had possibly undergone some form of land reclamation.
Initially twenty features were identified in this area. Twelve were considered to be archaeological, comprising pits, a post-hole and a hearth. The other eight consisted of glacial features, drainage systems and field boundaries.

Two of the pits contained Bronze Age pottery, one with most of a pot, as well as a quartz pebble, burnt bone and flint artefacts. Although the burnt bone noted in these features was not of a high concentration, its association with Middle and Early Bronze Age pottery sherds suggests token burial deposits. However, this bone has yet to be positively identified as human. Also contained within these features were flint artefacts, including a thumbnail scraper, a flint blade, waste flakes and a possible stone axe, which was severely damaged at the blade end. The pottery, flint implements, burnt bone and charcoal samples await specialist analysis. The location of these pits at the western edge of the area suggests that more features may remain outside the road-take.

The remaining seven pits noted in this area were similar to each other, with relatively inorganic fills. In some cases these contained flint tools, e.g. a thumbnail scraper, a flint core and a possible worked chert. Small quantities of burnt bone and charcoal were included in these deposits. One post-hole and one possible hearth were also uncovered.

At the northern end of the area, in the lower-lying ground, a deep pit was excavated. This appeared to have functioned as a well or sump into which a shallow gully channelled water. When emptied of the fills, which had blocked it completely, it filled with water quite rapidly. Initial inspection showed that some of the fills contained snail shells, indicating that the feature had silted up and was not entirely backfilled as one operation. Wood taken from it had been worked and will be dated in due course. One piece has been identified tentatively as a medieval barrel spigot.

The other features investigated in Area B included modern drainage systems, field boundaries, furrows and natural glacial formations. The furrows indicate that the area was intensively farmed, resulting in the truncation of all of the features.

The diagnostic material in Area B appeared to suggest Bronze Age activity incorporating ritual and burial practices. Some of the undiagnostic features may relate to domestic activity that is not necessarily of Bronze Age date. As all of the features had been truncated by later ploughing, it was not possible to relate them stratigraphically.

Rathmullan, Co Meath

2002:1510; 02E1267

Excavations were carried out at the IDA Business Park, Rathmullan, after testing of the site (25.5ha in extent) and monitoring of the topsoil-stripping for the site compound and Phase 1 of the roads (No. 1508, Excavations 2002, 02E0183). Excavations were carried out in four separate areas; Areas A and B were dealt with under licence 02E1265 (No. 1509, Excavations 2002). Area C, in the east of the site, was excavated to allow ESB and security ducting to be inserted.

Area C area measured 35m east–west by 25m. The terrain was generally level, with a slight fall to the east. In contrast to Areas A and B, in which the features were generally dispersed, Area C consisted of a complex of post-holes, stake-holes, pits, burnt spreads and a possible trough, all in reasonably close proximity, and modern furrows. Unfortunately, owing to intensive later farming on this site, it was very difficult to determine the relationship between the features, as they had been badly truncated. A total of 69 features were recorded; two were non-archaeological, and 39 were post-holes. A large proportion of the post-holes formed a possible double-walled semicircular structure at the north-east of the site. The remaining post-holes were

widely dispersed throughout the site, and further analysis of their fills will determine the relationships, if any, between them.
The possible trough, with a series of post-holes on its perimeter, was situated roughly in the centre of the site. It was thought initially that the post-holes may have marked a windbreak for a hearth within the trough. However, the fill was a uniform, charcoal-rich deposit, suggesting a single dump of material. Seven stake-holes were recorded near the post-holes and therefore formed part of the structure.
Ten burnt spreads were noted. They were very irregular in shape and spanned the southern half of the site. This burnt material was also recorded as the latest fill of many of the post-holes. The presence of furrows truncating these spreads also explains why the burnt spread was widely and irregularly distributed throughout the site.
Three pits containing burnt stone and charcoal were uncovered. However, during excavation it was evident that none of these deposits was burnt in situ. This suggests that these pits in this area had been dug specifically for the purpose of dumping material that had been burnt elsewhere. One fragment of worked flint was found in the burnt deposits.
Another pit type consisted of irregularly shaped features containing grey silty clay deposits.
As a result of truncation by later farming activities, the archaeology uncovered was cut directly into subsoil, with all intermediate layers of activity having been destroyed. Without the survival of these layers, recreating a sequence of events for the area may prove difficult. Dating evidence, find analysis and background research are necessary to understand this site fully.

Rathmullan, Co Meath
2003:1450; 03E0916
The site is situated in Rathmullan Business Park, Co. Meath, in an area of high archaeological potential, as the existence of a ringfort (SMR 20:21) and the discovery of several sites in its vicinity during testing of the M1 motorway shows. The excavation was undertaken as a result of the proposed relocation of an ESB pylon. This site had already been identified during intensive testing of the area (Excavations 2002, No. 1510, 02E0183), undertaken prior to the proposed construction of an IDA business park. During the testing phase, 63 acres of farmland were examined and many archaeological sites dating from the prehistoric to the modern era were uncovered. The site under discussion was uncovered in Field 1.
The initial testing in the area of the proposed pylon site had been carried out in Test-trench 1.8. Two features were uncovered and the trench was subsequently backfilled for later evaluation. Prior to the start of the excavation, the footprint of the pylon was surveyed and a 2m buffer on the perimeter of this grid was added to allow for possible disturbance during the construction of the pylon. The final dimensions of the cutting were 11m in width by 11m in length by 0.45m in depth. This was stripped of topsoil by a 2m-wide ditching bucket. Archaeological features uncovered during the testing phase were reopened and excavated fully.
Two gullies were uncovered in this area. They ran parallel to each other, orientated roughly north-south, and merged at the northern extent of the site. Upon merging, both features appeared as a single ditch containing a mixed deposit. The point at which they merged was not apparent on excavation, therefore no stratigraphic relationship between both features could be obtained. No diagnostic finds were uncovered from their deposits, though charred grain was recovered from one, so dating of this feature is dependent on radiocarbon results, not yet

obtained. The results of the soil sample analysis may shed more light on both the function and dates of these features.

Rathmullan Road, Co Louth
2004:1089; 04E0507
Initial pre-development testing was undertaken at Rathmullan, Drogheda, Co. Louth, on 27 April 2004, using an eighteen-tonne tracked machine equipped with a toothless grading bucket. Twenty-seven trenches were excavated across the development area, many of which were specifically placed to target potential archaeological features that were identified during a geophysical testing programme that was undertaken prior to testing.
The geophysical testing results indicated a possible enclosure in the north-west of the proposed development area, but this area was not tested during the initial testing programme. When nothing of archaeological significance was identified in the first phase of testing, it was decided to hand-excavate two test-trenches across the possible enclosure. This was carried out between 27 May and 1 June 2004. One trench was excavated across the western part of the possible enclosure, while the other was excavated across the eastern part. It was later decided to join the two hand-excavated trenches using a five-tonne mini-digger equipped with a flat, toothless bucket. The mini-digger was also used to open two small areas around two potential internal features that were identified during the geophysical survey.
A ditch feature was recorded in the western trench. It measured 2.92m in width and was 0.84m deep. It was oriented north-south and its location tied in with the possible enclosure identified during the geophysical survey. No datable material was recovered from the fill, but a quantity of disarticulated animal bone was recovered.
On excavation of the trench over the eastern part of the potential enclosure, no archaeological features were immediately apparent. The trench was left open for a period of four days and was repeatedly trowelled during this period, but nothing of an archaeological nature was identified. No archaeological features were identified in the mechanically excavated trench across the interior of the enclosure.

Rathmullan, Co Meath
2005:1235; 05E0352
Excavation was required of features identified during an intensive testing programme carried out by Finola O'Carroll (Excavations 2002, No. 1508, 02E0183). Three areas of potential were identified on the basis of suspected pits and possible archaeological features. A fourth area was identified on the basis of an anomaly identified during a geophysical scan of the area.
Four additional test-trenches were excavated to the south of Field 6. Nothing of archaeological significance was recorded at this location. An additional trench was opened parallel with the southern edge of the northern hedge line in Field 9. Nothing of archaeological significance was recorded from here.
Area A, an area 20m by 22m north–south, was opened over anomalies in Field 6, revealing a number of shallow pits, some containing charcoal and evidence for burning. A possible hut site measuring 2m by 2.5m was identified. This consisted of a shallow pit and appeared to be flagged with irregular but flat stones. The stones were funnelled to the east and may have formed an entrance passage. A hearth was identified c. 0.3cm to the west.

No diagnostic finds were recovered from any of the features, but a number of struck flint items were retrieved from the topsoil. It is suspected that the possible hut site and hearth may be contemporary with the ephemeral remains of the pits and hearths and may represent the remains of a temporary encampment.
Area B, an area 16m by 13m (south-east/north-west), was opened over the anomaly identified in the geophysical scan. A modern stone-filled drain was recorded to the east of the area. Nothing of archaeological significance was recorded from the area.
Area C, an area 16.5m by 17.5m, was opened over a possible pit feature identified during testing. This was the only feature identified in the area. The pit was irregular and, although it contained charcoal, was not deemed to be of archaeological significance.
Area D, an area 28m by 18m, was opened over an anomaly identified during the testing programme. It was identified as a pit that contained a charcoal-rich fill with heat-shattered stone. This is probably the remains of a cooking pit. Three linear cuts were identified crossing the area and upon investigation were identified as modern drainage features.

Rathmullan, Co Meath
2006:1628; 06E0783
Excavations took place at the IDA Drogheda Business Park, Rathmullan, Co. Meath, in August–September 2006. This followed a programme of assessment and a phase of excavation of Areas A–D by Finola O'Carroll (Excavations 2002, Nos 1508–1511, 02E0183, 02E1265, 02E1267 and 02E1269). Area A revealed a series of pits and post-holes and a backfilled watercourse. Area B had a pit containing Neolithic pottery, a series of pits, hearths and a pit/sump containing a wooden handle. Area C revealed a semicircular triple-walled structure, a trough with associated stake-holes and a series of burnt stone and charcoal spreads. Area D contained a post-medieval structure, a cottage which was present on the first-edition OS map of the area. The 2006 excavations revealed a series of pits and burnt-stone deposits, along with a disused watercourse.
Area E measured 36m east–west by 28m. The area was marked by a north-west/south-east watercourse which was indicated pre-excavation by a wide band of silt cutting through the boulder clay. This feature was 7.5m in width and up to 0.4m in depth and had been truncated by the east–west field boundary that is present on the 1840 OS map. It had been truncated by two east–west field drains and was filled by a series of silt deposits ranging from orange/brown to grey in colour. The antiquity of this feature is unclear. It clearly pre-dates the post-medieval field boundaries and was detected during test-trenching both to the east and west of the excavated area. A number of post-medieval artefacts were found in the upper deposits. To the west of the excavated area this silt build-up became far deeper and it was clear that considerable amounts of colluvial material had accumulated from the flooding of this watercourse prior to the insertion of drains. It was notable during wet weather that the ground visibly moved with the movement of machinery, demonstrating the waterlogged nature of the ground.
A series of archaeological features were excavated in the south-west of the area, 3m from the watercourse.
A spread of fire-cracked limestone and charcoal-rich soil was located, measuring 3m east–west by 2.6m by 0.13m in depth. This overlay natural boulder clay. A small oval pit, 1.24m by 0.8m by 0.2m in depth, was located immediately 2m south-west of a burnt-stone spread. It was filled with

burnt-stone deposits in a charcoal-rich matrix. A large pit (F18), 1.9m by 1.65m by 1m in depth, was located 6m south of the burnt stone. This waterhole cut below the water table and contained heavily waterlogged deposits that included frequent charcoal flecks and lumps, decayed wood and reeds. It had a shelf on its northern and eastern sides and a deeper hollow at its base on the southern side.
A further substantial oval pit (F16), 1.74m by 1.18m by 0.84m, was located immediately west of F18. This was filled by alternating deposits of burnt stone in charcoal-rich sandy clay and grey/orange compact sandy clays.
A further small pit, 0.52m by 0.64m by 0.16m, was excavated 3m north-west of the large waterhole F18. This was filled by dark-brown sandy silt with frequent burnt stone and charcoal.
Finally, a further small pit was excavated 2.5m to the west of F18. It was filled by dark-grey silty clay with frequent burnt stone and charcoal.
Area F measured 17.5m east–west by 14m. A total of seven features were uncovered. These comprised an arc of seven shallow ephemeral hollows. A second pit was uncovered to the north-east. The area comprised dry, relatively level ground, with ploughsoil overlying boulder clay.
No artefacts of antiquity were recovered during excavations. A programme of radiocarbon dating is under way and it is expected that the majority of the pits will be shown to be of Bronze Age date.

Oldbridge, Meath
2013:215; 13E0400
Monitoring was carried out in association with the development of the Boyne Greenway, which will provide the public with a premium cycle and pedestrian facility measuring c. 1.7km in length. The route of the greenway runs from the Rathmullan Road to the entrance of the Oldbridge Estate. No features or artefacts of archaeological significance were identified.

Rathmullan, Sheephouse Donore, Co Meath
2023:0452; 23E0798 & 23R0279
Archaeological test trenching was carried out on the site at Rathmullan, Sheephouse and Donore, Co. Meath, following a geophysical survey (22R0279, Donald Murphy, 2022) as features of potential archaeological significance were recorded (including a plectrum-shaped enclosure, a ring ditch and possible ring ditches as well as features of potential archaeological significance).
A total of 54 test trenches were excavated, including additional trenches excavated to further investigate the archaeology exposed. Each trench measured 1.8m in width, and in total, 5450m of linear trenches were excavated. Anomalies identified during the geophysical survey were targeted. The test trenches were excavated to the natural subsoil, which varied significantly and was exposed at a depth of between 0.3-1.5m, but mainly at 0.3-0.8m.
Test trenching confirmed the results of the geophysical survey and two ring-ditches, C3 (Anomaly 1) and C21 (Anomaly 3a), with associated features, were recorded in Field 4. In the southern portion of the field, a possible house (C23) with a group of features, including a stake-hole (C27), post-holes (C24-26, C28, C29), a pit (C32), linear features (C30, C31, C33, C35-39) and a possible kiln (C34) were recorded. To the east, a curvilinear feature C14 (Anomaly 4c)

and associated features, including pits and linear features (C8, C10-13) were identified. In Fields 2 and 3, a plectrum-shaped enclosure, C43 (Anomaly 2), with associated linear features that could represent field systems (C40-C42, C44, C45, C47-C49, C51-60), curvilinear features (C43 and C50) and a possible kiln (C46) were exposed.
Field 1, adjacent to and east of the motorway remains untested.

Reference:

Murphy, Donald. (2022) Geophysical Survey at Rathmullan, Sheephouse and Donore, Co. Meath (22R0279) Unpublished report by ACSU.

Appendix 12-5

Appendix 12.5 ICOMOS Guide for assessing magnitude of impact

Grading	Historic landscape
Major	Change to most or all key historic landscape elements, parcels or components; extreme visual effects; gross change of noise or change to sound quality; fundamental changes to use or access; resulting in total change to historic landscape character unit and loss of Outstanding Universal Value (OUV).
Moderate	Change to many key historic landscape elements, parcels or components; visual change to many key aspects of the historic landscape; noticeable differences in noise or sound quality; considerable changes to use or access; resulting in moderate changes to historic landscape character.
Minor	Change to few key historic landscape elements, parcels or components; slight visual changes to few key aspects of historic landscape; limited changes to noise levels or sound quality; slight changes to use or access; resulting in limited change to historic landscape character.
Negligible	Very minor changes to key historic landscape elements, parcels or components; virtually unchanged visual effects; very slight changes in noise levels or sound quality; very slight changes to use or access; resulting in a very small change to historic landscape character.
No change	No change to elements, parcels or components; no visual or audible changes; no changes in amenity or community factors.

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