

AtkinsRéalis



# Natura Impact Statement – redacted version

Meath County Council

December 2024  
5197347DG0122

## BOYNE GREENWAY - GROUND INVESTIGATION WORKS

# Notice

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# 1. Introduction

## 1.1 Background

AtkinsRéalis have been commissioned by Meath County Council to prepare, on its behalf, an Appropriate Assessment Screening and Natura Impact Statement in respect of the proposed Boyne Greenway - Ground Investigation Works project (hereafter referred to as the 'proposed project' or 'proposed GI Works'). The proposed project comprises ground investigation works to be carried out along the route of the proposed Boyne Greenway at numerous locations and is not directly connected with or necessary to the management of any designated site for nature conservation.

## 1.2 Background

Ground investigations are proposed along the 26.4km Boyne Greenway scheme which includes 8 no. proposed structures and 5 no. existing structures comprising of bridges and boardwalks. The Boyne Greenway scheme will comprise of a 3.0m to 4.0m wide two-way shared path accommodating both pedestrians and cyclists.

The starting point of the proposed Boyne Greenway Scheme is at Councillor Andy Brennan Park in Navan town. The proposed greenway route extends eastward along the banks of the river Boyne, passing Slane Castle, Slane village, Brú na Bóinne, and terminates at the main gates of the Oldbridge Estate, where it ties in with an existing greenway and boardwalk facility

The Boyne Greenway is part of the National Cycle Route 13 (N13/M5) which proposes to link to the East Coast Cycle Route between Belfast and Wexford at Drogheda and to the Dublin to Galway route along the Royal Canal south of Longwood.

The proposed GI Works are necessitated to inform the design of the proposed Boyne Greenway Scheme.

Figure 1-1 below illustrates the alignment of the proposed Boyne Greenway Scheme. A detailed description of the proposed GI Works is provided in Section 4.



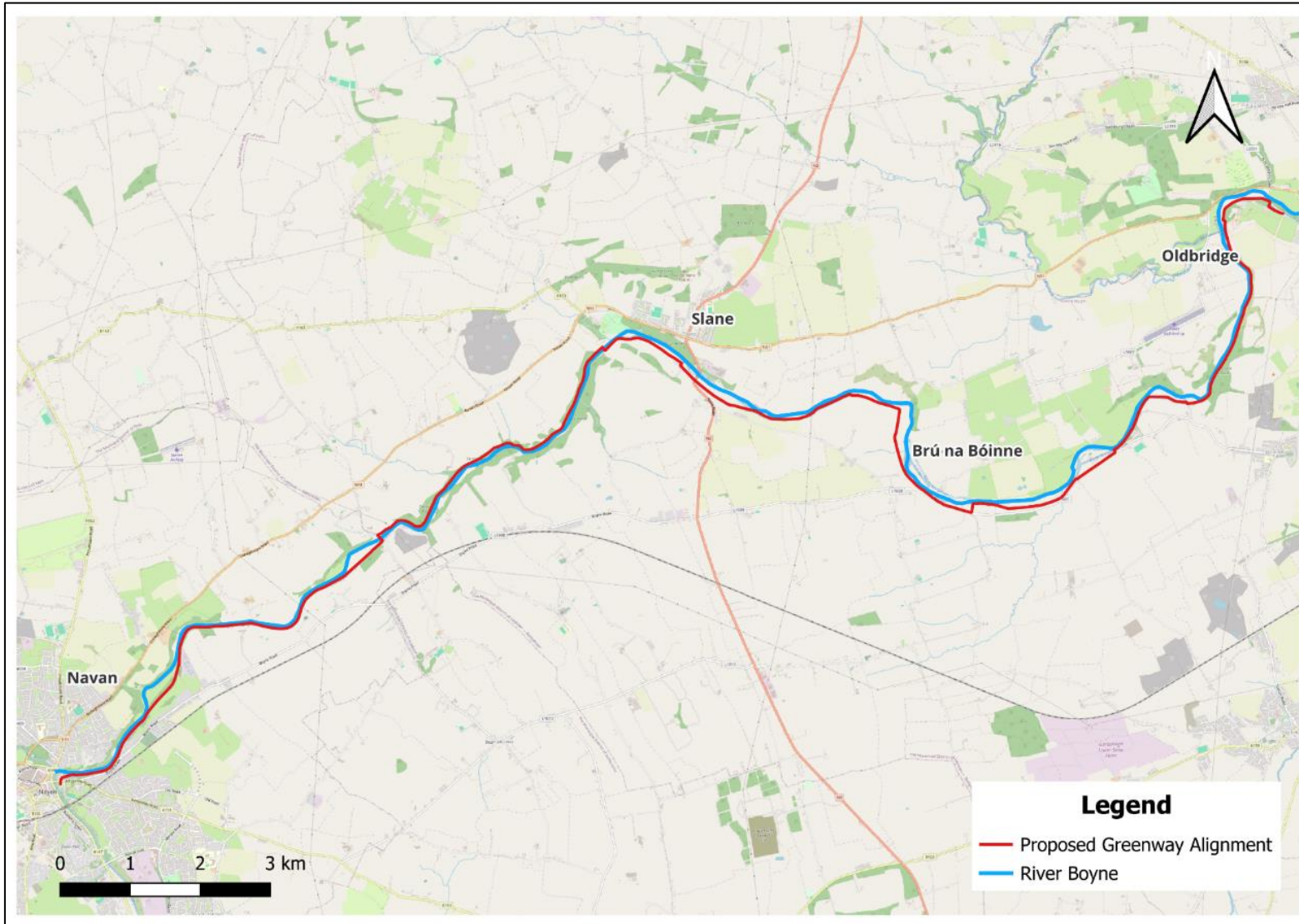


Figure 1-1 - Proposed alignment of the Boyne Greenway





## 2. Legislative Context

### 2.1 Natura 2000

Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (“the Habitats Directive”) is a legislative instrument of the European Union (EU) which provides legal protection for habitats and species of Community interest. Article 2 of the Directive requires the maintenance or restoration of such habitats and species at a favourable conservation status, while Articles 3 to 9, inclusive, provide for the establishment and conservation of an EU-wide network of special areas of conservation (SACs), known as Natura 2000, which also includes special protection areas (SPAs) designated under Article 4 of Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (“the Birds Directive”). Both SACs and SPAs are commonly referred to as “European sites” or “Natura 2000 sites”.

SACs are selected for natural habitat types listed on Annex I to the Habitats Directive and the habitats of species listed on Annex II to the Habitats Directive. SPAs are selected for species listed on Annex I to the Birds Directive and other regularly occurring migratory species. The habitats and species for which a Natura 2000 site is selected are referred to as the “qualifying interests” of that site and each is assigned a “conservation objective” aimed at maintaining or restoring its “favourable conservation condition” at the site, which contributes to the maintenance or restoration of its “favourable conservation status” at national and European levels.

### 2.2 Appropriate Assessment

Article 6 of the Habitats Directive deals with the management and protection of Natura 2000 sites. Articles 6(3) and (4) set out the decision-making process, known as “Appropriate Assessment” (AA), for plans or projects in relation to Natura 2000 sites. Article 6(3) states: -

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

The first sentence of Article 6(3) provides a basis for determining which plans and projects require AA, i.e. those “*not directly connected with or necessary to the management of [one or more Natura 2000 sites] but likely to have a significant effect thereon, either individually or in combination with other plans or projects*”. In *Waddenzee* (C-127/02), the Court of Justice of the European Union (CJEU) ruled that significant effects must be considered “likely” if “*it cannot be excluded, on the basis of objective information*”, that they would occur. This clearly sets a low threshold, such that AA is required wherever there is a reasonable possibility of significant effects on a Natura 2000 site. In the same judgment, the CJEU established that the test of significance relates specifically to the conservation objectives of the site concerned, i.e. “significant effects” are those which, “*in the light, inter alia, of the characteristics and specific environmental conditions of the site*”, could undermine the site’s conservation objectives. In addition to the effects of the plan or project on its own, the combined effects arising from the plan or project under consideration and other plans and projects must also be assessed.

The last part of the first sentence of Article 6(3) defines AA as an assessment of the “*implications [of the plan or project] for the site in view of the site’s conservation objectives*”. In the second sentence, Article 6(3) requires that, prior to agreeing to a plan or project, the competent authority must “ascertain” that “*it will not adversely affect the*



*integrity of the site concerned*. In *Sweetman v. An Bord Pleanála* (C-258/11), the CJEU ruled that a plan or project “will adversely affect the integrity of that site if it is liable to prevent the lasting preservation of the constitutive characteristics of the site that are connected to the presence of a priority natural habitat whose conservation was the objective justifying the designation of the site in the list of sites”. On that basis, EC (2019) described the “integrity of the site” as “the coherent sum of the site’s ecological structure, function and ecological processes, across its whole area, which enables it to sustain the habitats, complex of habitats and/or populations of species for which the site is designated”. As such, the “integrity” of a specific site is defined by its conservation objectives and is “adversely affected” when those objectives are undermined. In *Waddenzee*, the CJEU ruled that the absence of adverse effects can only be ascertained “where no reasonable scientific doubt remains”.

The “precautionary principle” applies to all of the legal tests in AA, i.e. in the absence of objective information to demonstrate otherwise, the worst-case scenario is assumed. Where the tests established by Article 6(3) cannot be satisfied, Article 6(4) applies (see explanation in Section 2.2 below).

## 2.3 Competent authority

The requirements of Articles 6(3) and (4) are transposed into Irish law by, inter alia, Part 5 of the European Communities (Birds and Natura Habitats) Regulations, 2011 (as amended) (“the Habitats Regulations”) and Part XAB of the Planning and Development Act, 2000 (as amended) (“the Planning and Development Acts”). As per the second sentence of Article 6(3), it is the “competent national authorities” who are responsible for carrying out AA and, by extension, for determining which plans and projects require AA. The competent authority in each case is the entity responsible for authorising a plan or project, e.g. local authorities, An Bord Pleanála, Transport Infrastructure Ireland (TII) or a Government Minister. In all cases, it is the competent authority who is ultimately responsible for determining whether or not a plan or project requires AA and for carrying out the AA, where required.

## 2.4 Appropriate Assessment Process

The AA process can be described as being made up of three distinct stages, as described below, the need to progress to each stage being determined by the outcome of the preceding stage.

Stage 1: Screening – This stage involves a determination by the competent authority as to whether or not a given plan or project required AA. As explained in Section 2.1, AA is required in respect of any plan or project not directly connected with or necessary to the management of a Natura 2000 site, but for which the possibility of likely significant effects on one or more Natura 2000 sites cannot be excluded. The CJEU’s Judgment on *Eco Advocacy v. An Bord Pleanála* (C-721/21) and the Opinion of Advocate General Kokott in the same case set out the principles for identifying any aspects of a plan or project which may constitute what the CJEU termed in *People Over Wind* (C-323/17) “measures intended to avoid or minimise harmful effects on a Natura 2000 site” and, as such, cannot be taken into account in making an AA Screening determination. Consideration of the potential for in-combination effects is also required at this stage.

Stage 2: Appropriate Assessment – This stage involves a detailed assessment of the implications of the plan or project, individually and in combination with other plans and projects, for the integrity of the Natura 2000 site(s) concerned. This stage also involves the development of appropriate mitigation to address any adverse effects and an assessment of the significance of any residual impacts following the inclusion of mitigation. In *Kelly v. An Bord Pleanála* (IEHC 400), the High Court ruled that a lawful AA must contain complete, precise and definitive findings based on examination and analysis, and conclusions and a final determination based on an evaluation of the findings. In the same judgment, the High Court stressed that, in order for the findings to be complete, precise and definitive, the AA must be carried out in light of best scientific knowledge in the field and cannot have gaps or lacunae. In *Holohan v. An Bord Pleanála* (C-461/17), the CJEU clarified that AA must “catalogue the entirety of habitat types and species for which a site is protected” (i.e. the qualifying interests of the site) and assess the implications of the plan



or project for the qualifying interests, both within and outside the site boundaries, and other, non-qualifying interest habitats and species, whether inside or outside the site boundaries, “provided that those implications are liable to affect the conservation objectives of the site”. The proposer of a plan or project requiring AA is furnishes the competent authority with the scientific evidence upon which to base its AA by way of a Natura Impact Statement (NIS) or Natura Impact Report (NIR). If it is not possible to ascertain that the plan or project will not adversely affect one or more Natura 2000 sites, authorisation can only be granted subject to Article 6(4).

Stage 3: Article 6(4) – If a plan or project does not pass the legal test at Stage 2, alternative solutions to achieve its aims must be considered and themselves subject to Article 6(3). If no feasible alternatives exist, authorisation can only be granted where it can be demonstrated that there are imperative reasons of overriding public interest (IROPI) justifying its implementation. Where this is the case, all compensatory measures must be taken to protect the overall coherence of Natura 2000.

The three stages described above are illustrated in Figure 2-1 below.

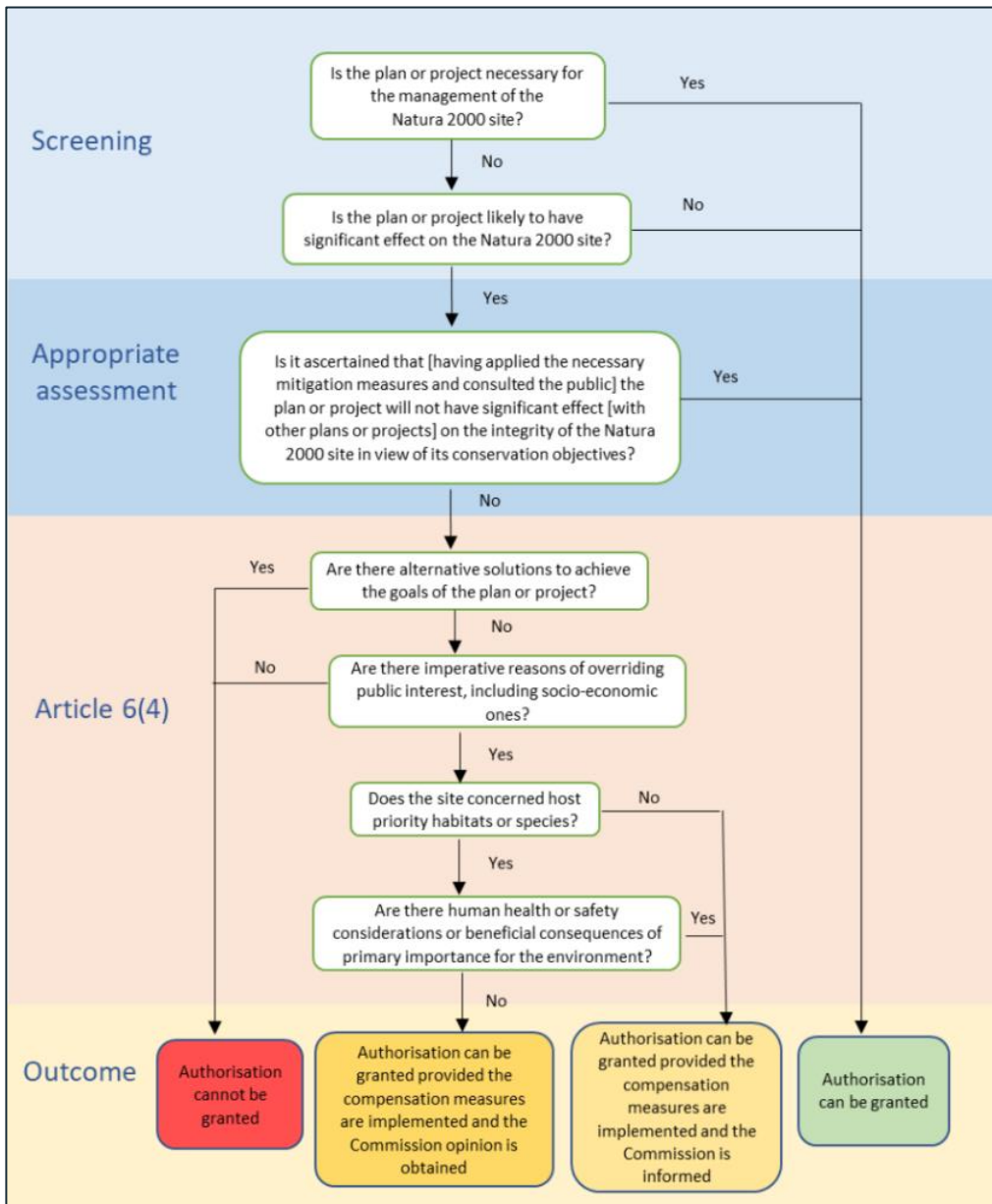


Figure 2-1 - Stages of the Appropriate Assessment process (EC, 2021a)



# 3. Methodology

## 3.1 Sources of Guidance

This report was prepared with due regard to the relevant European and Irish legislation, case law and guidance, including but not limited to: -

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild flora and fauna. *Official Journal of the European Communities* L 206/7-50.
- Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds. *Official Journal of the European Union* L 20/7-25.
- European Communities (Birds and Natural Habitats) Regulations, 2011. *S.I. No. 77/2011* (as amended) (“the Habitats Regulations”).
- Planning and Development Act, 2000. *No. 30 of 2000* (as amended) (“the Planning and Development Acts”).
- Planning and Development Regulations, 2001. *S.I. No. 600/2001* (as amended) (“the Planning Regulations”).
- EC (2019). *Managing Natura 2000 sites – The provisions of Article 6 of the Habitats Directive 92/43/EEC*. European Commission, Brussels. *Official Journal of the European Union* C 33/1-62.
- EC (2021a). *Assessment of plans and projects in relation to Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC*. European Commission, Brussels. *Official Journal of the European Union* C 437/1-107.
- EC (2021b) *Guidance document on the strict protection of animal species of Community interest under the Habitats Directive*. *C(2021) 7301*. European Commission, Brussels.
- DG Env (2022) *Guidance document on assessment of plans and projects in relation to Natura 2000 sites – A summary*. Directorate-General for Environment, European Commission, Brussels. Publications Office of the European Union, Luxembourg.
- DEHLG (2010a) *Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. Revised 11/02/2010*. Department of the Environment, Heritage and Local Government, Dublin.
- DEHLG (2010b) *Circular NPW 1/10 & PSSP 2/10. Dated 11/03/2010*. Department of the Environment, Heritage and Local Government, Dublin.
- NPWS (2012) *Marine Natura Impact Statements in Irish Special Areas of Conservation. A Working Document. April 2012*. National Parks & Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin.
- NPWS (2021) *Guidance on the Strict Protection of Certain Animal and Plant Species under the Habitats Directive in Ireland. National Parks & Wildlife Service Guidance Series 1*, Department of Housing, Local Government and Heritage, Dublin.
- Mullen, E., Marnell, F. and Nelson, B. (2021) *Strict Protection of Animal Species – Guidance for Public authorities on the Application of Articles 12 and 16 of the EU Habitats Directive to development/works undertaken by or on behalf of a Public authority. National Parks & Wildlife Service Guidance Series 2*, Department of Housing, Local Government and Heritage, Dublin.



- OPR (2021) *Appropriate Assessment Screening for Development Management*. OPR Practice Note PN01. Office of the Planning Regulator, Dublin.
- Case law, including *Waddenzee* (C-127/02), *Sweetman v. An Bord Pleanála* (C-258/11), *Kelly v. An Bord Pleanála* (IEHC 400), *Commission v. Germany* (C-142/16), *People Over Wind* (C-323/17), *Holohan v. An Bord Pleanála* (C-461/17), *Eoin Kelly v. An Bord Pleanála* (IEHC 84), *Heather Hill* (IEHC 450) and *Eco Advocacy v. An Bord Pleanála* (C-721/21).
- Sundseth, K. and Roth, P. (2014) *Article 6 of the Habitats Directive – Rulings of the European Court of Justice*. Ecosystems LTD (N2K Group), Brussels.

## 3.2 Desk Study

Baseline data regarding the receiving environment, including Natura 2000 sites, was gathered through a thorough desk study.

The boundaries of Natura 2000 sites were downloaded from *NPWS: Maps and Data* <<https://www.npws.ie/maps-and-data>>. Information on sites, including their overall structures and functions, qualifying interests, conservation objectives and threats/pressures and activities therein, was found in the Site Synopsis, Natura 2000 Standard Data Form, Conservation Objectives and supporting documents for each site. Spatial data for site-specific conservation objectives of Natura 2000 sites, and boundary data for other designated sites, such as Natural Heritage Areas, was also retrieved from *NPWS: Maps and Data*. Reporting under Article 17 of the Habitats Directive (NPWS, 2019a-c; *Article 17 web tool*) and Article 12 of the Birds Directive (NPWS, 2024c; *Article 12 web tool*) provided further information on the habitats and species concerned at the national level.

Information relating to recent and historical records of species was obtained from the National Biodiversity Data Centre (NBDC) *Biodiversity Maps* <<https://maps.biodiversityireland.ie/Map>>.

The Environmental Protection Agency (EPA) map viewer *EPA Maps (Water)* <<https://gis.epa.ie/EPAMaps/Water>> and spatial data for river, lake, canal, transitional and coastal waterbodies downloaded from the *EPA Geoportal* <<https://gis.epa.ie/GetData/Download>> was used to identify any hydrological connection between the proposed works and Natura 2000 sites or connected features. Satellite and aerial imagery from Google Earth, Bing Maps and Ordnance Survey Ireland (OSi) was reviewed to identify hedgerows, treelines and other potential ecological features.

In order to inform the assessment of potential in-combination effects, planning applications from the surrounding area were reviewed using the National Planning Application Database, An Bord Pleanála's online map viewer and the EIA Portal.

In addition, data from ecological surveys and site visits previously undertaken at the location of the proposed project were also reviewed, having due regard to the *Advice note on the lifespan of ecological reports and surveys* (CIEEM, 2019).

Information from the aforementioned data sources was last access 06/12/2024.

## 3.3 Site Visit

AtkinsRéalis ecologists conducted site walkover surveys along the route of the proposed Boyne Greenway Scheme on 20/09/2023, 21/09/2023, 22/09/2023, 26/09/2023, 04/10/2023, 26/06/2024 and 27/06/2024. The purpose of these surveys was to identify ecological features of importance, habitats, any evidence of protected species, invasive non-native species and any potential ecological constraints to be considered prior to the proposed greenway and associated GI Works. In addition otter surveys were undertaken along the River Boyne by Triturus Environmental Ltd.



The otter surveys were commissioned by AtkinsRéalis to inform the development of the proposed Greenway Scheme and were undertaken along 38km linear length of the River Boyne and contiguous Boyne Navigation (canal) corridor during May-June 2023 and May 2024. The otter survey evidence has been used to inform the locations and scope of the proposed GI Works project.

## 3.4 Statement of Authority

The report was prepared by Kevin Coogan and Colin Wilson. Owen O’Keefe provided peer review and support.

**Kevin Coogan** (AtkinsRéalis) has a BSc (Hons) in Zoology from University College Dublin. He has developed ecological surveying skills through country-wide small river sampling experience, as well as habitat evaluation experience in Spain and Ireland. He has volunteer experience in bird surveying on North Bull Island SPA and Ireland’s Eye SPA. Kevin collated background information for this assessment.

**Colin Wilson** (AtkinsRéalis) has a BSc (Hons) in Environmental Science and is a Full Member of the Chartered Institute of Ecology and Environmental Management (MCIEEM). He has over 17 years working in the fields of ecology and environmental management. He is a Senior Ecologist with experience in ecological surveying, environmental assessment, on-site ecological supervision and mitigation. He has experience on multiple infrastructure projects regarding all elements of surface and groundwater management, monitoring, sampling and associated reporting. Colin also has a broad range of experience in invasive species management, biosecurity and control. Colin has prepared AA screening reports, Natura Impact Statements and has also been involved in the development of Environmental Operating Plans and Construction Environmental Management Plans for a number of national infrastructure projects. Colin is the author of this report.

**Owen O’Keefe** is a Senior Ecologist at AtkinsRéalis. He holds a BSc (Hons) in Ecology from University College Cork (2015) and is a Full Member of the Chartered Institute of Ecology and Environmental Management (MCIEEM). He has 8 years’ professional experience in ecological consultancy, including extensive experience in Appropriate Assessment. He has prepared a large number of AA Screening Reports and Natura Impact Statements, as well as carried out technical appraisals of such reports for competent authorities. Owen undertook the peer review of this report.



# 4. Proposed Project

## 4.1 Scope of Investigation

The ground investigation works will consist of fieldwork followed by laboratory testing and factual reporting. The fieldwork will include boreholes, trial pits, dynamic probes, window samples, slit trenches, foundation pits and geophysical surveying at the locations shown on Drawings in Appendix A.

### 4.1.1 Sampling

- Geotechnical sampling is required in both boreholes and trial pits including small and bulk disturbed samples, undisturbed samples (not less than 100mm diameter) in boreholes. Large bulk/ earthworks samples are required in some trial pits.
- Cores in Soil and/or rock are required.
- Groundwater samples are to be taken in boreholes when water strikes are encountered if water has not been added to the borehole.
- Environmental samples are also required at select locations.

### 4.1.2 Laboratory Testing

Laboratory testing is to be carried out for the determination of geotechnical parameters including classification, chemical, earthworks acceptability and strength properties of soil and rock. Environmental testing and waste acceptance criteria testing will also be required.

All laboratory testing to be INAB accredited or equivalent EU bodies accredited for the specified tests.

### 4.1.3 Reporting

Submission of a Ground Investigation Factual on the ground investigation for the site, including details of utilities encountered, for the proposed works is required.

The draft Ground Investigation Factual Report for the associated proposed scheme shall be submitted to the Investigation Supervisor within 10 weeks from the date the Employer gives permission to start the investigation of that particular site. The Contractor shall submit the Final factual report to the Investigation Supervisor within 12 weeks from the date the Employer gives permission to start the investigation allowing in his programme 1 week for the Investigation Supervisor to check the draft factual report and issue comments.

### 4.1.4 Field work/site operations

The site operations shall be completed within 10 weeks from the date the Employer gives permission to start the investigation. The Contractor is required to provide all necessary resources (plant, equipment, labour) to complete the works within the prescribed performance period. Proposed exploratory hole locations are indicative only and final locations to be confirmed with the Investigation Supervisor prior to commencing site operations summarised below:



## **Trial Pits**

- 43 no. trial pits are to be excavated by machine to an anticipated maximum depth of 3m below ground level (bgl).
- TRL Dynamic Cone Penetrometer will be required in all trial pits.
- Hand vanes will be required in all the trial pits where cohesive material is encountered.

## **Inspection Pits**

- 14 no. inspection pits are to be excavated by hand, where access is limited, to an anticipated maximum depth of 1.5m bgl.

## **Boreholes**

- A total of 22 no. boreholes are required with depths ranging from 7m to 17m.
- The boreholes will consist of cable percussive boreholes not less than 200mm diameter which are continued by rotary coring in soil and/or rock. The range of casing diameters brought to site and used at the start of the hole shall be compatible with achieving the scheduled depths and quality of sample in the expected ground conditions
- The scheduled depth is indicative only and the final depth of the boreholes is to be agreed with the Investigation Supervisor.

## **Slit Trenches**

- 10 no. slit trenches are to be carried out to a depth of 2.5m as specified.
- The scheduled depth is indicative only and the final depth of the slit trenches is to be agreed with the Investigation Supervisor
- The location of the slit trench shall be confirmed on by the Investigation Supervisor.

## **Foundation Pits**

- 10 no. foundation pits are to be carried out to an anticipated maximum depth of 2m to expose the underside of the existing foundations. The foundation pits adjacent to the existing bridges are for exposing the existing foundation to determine the depth, width and size as well as determining the founding material.
- The foundation pits are to be excavated to an adequate depth to expose the top and bottom of existing foundations and the founding material whilst ensuring the integrity of the existing foundations is not compromised.
- The scheduled depth of the Foundation Pits is indicative, and the final depth of the foundation pit is to be agreed with the Investigation Supervisor.





## Dynamic Probing

- 20 no. dynamic probes are to be carried out to an anticipated depth of 15m as specified in Schedule 2 of this report.

## Geophysical Survey

- A geophysical survey comprising of seismic refraction and electrical resistivity methodologies shall be carried out prior to the intrusive ground investigation and the results of which will be used to inform the final location of the boreholes.

There are a total 119 no. GI Works locations. Area of excavation and borehole diameters and estimated durations of works for each GI Work type are outlined in Table 4.1 below.

**Table 4-1 Area of excavation and borehole diameters and estimated durations of works**

GI Works	Area of excavation / bore diameter	Duration
Trial Pit	2m x 1.5m	1 hour
Borehole	20cm	2 days
Slit Trench	3m x 1m	< 1 day
Foundation Pit	0.6m x 1m	2 hours
Dynamic Probe	20cm	30 minutes
Hand Dug Inspection Pit	0.5m x 0.5m	2-3 hours
Geophysical Survey	0	4 hours

Details of works locations and depths of Trial Pits, Boreholes, Slit Trenches, Foundation Pits, Dynamic Probing and Geophysical Surveying are included in tabularised form in Appendix B.

## 4.1.5 Plant and Equipment

Typical plant and equipment which the GI Works Contractor will employ for the various types of investigatory works are detailed as follows;

### Mini Digger

The 43 no. Trial pits will be undertaken by means of a 3 tonne Mini Digger. 10 no. Foundation pits will also be undertaken using the Mini Digger. A typical example of the plant is illustrated below. Note; 14 no. Inspection pits will be hand dug.





### Cable Percussion Boring Rig

22 no. Boreholes will be undertaken by means of a cable percussion boring rig which will bore through softer overburden (soils and gravels) down to rock level. This will be followed by rotary drilling through rock levels. A standard cable percussion boring rig and rotary drilling rig are illustrated below.



Cable percussion boring rig



Rotary boring rig

### Dynamic Probing Rig

The 20 no. dynamic probe investigations will be undertaken by a dynamic probing rig as illustrated below.



## Geophysical Surveying Equipment

The seismic refraction survey is undertaken by means of a hammer and seismic refraction monitoring equipment as illustrated below. The electrical resistivity testing will involve hand drilling a small hole to insert a probe followed by collecting data using geophysical resistivity meter, typical equipment is illustrated below.



Seismic refraction (hammer and monitoring equipment)      Electrical resistivity monitoring equipment.

### 4.1.6 Post Investigation Reinstatement

All areas of excavation on hardstanding surfaces will be backfilled immediately post GI data collection. Following infill hardcore surfaces (gravel paths and roadways) will be replaced like for like.

For areas that are outside of hardstanding surfaces and which have ground vegetation cover (i.e. informal grassed paths) the sods will be removed from the footprint of the works areas and will be set aside for reinstatement following backfilling of the excavations.

For the boreholes and dynamic probes the 20cm diameter bore will be infilled with bentonite clay pellets.

All excavations and boreholes will be infilled immediately following sample and data collection.

Figure 4.1 below illustrates the overall locations of GI Works along the alignment of the proposed Boyne Greenway. Detailed figures illustrating the locations of GI Works are included in Appendix A. Appendix B provides GPS locations for all GI Works locations.



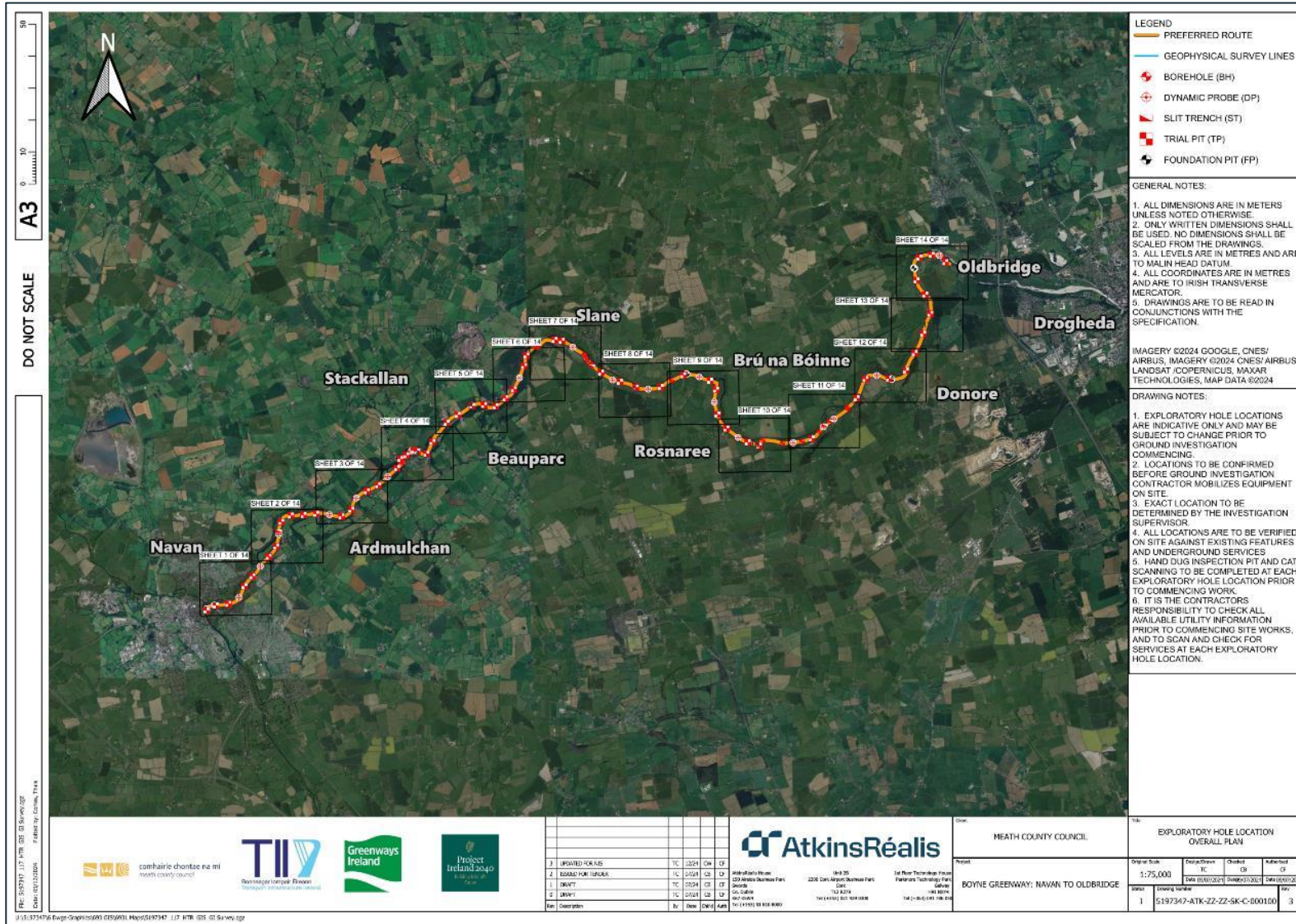


Figure 4-1 - Overall Locations of proposed GI Works.



# 5. Existing Environment

## 5.1 General Overview

The proposed project lies along 26.4 km of the Boyne River which includes 8 no. proposed and 5 no. existing structures comprising of bridges and boardwalk sites. The scheme will comprise of a 3.0m to 4.0m wide two-way shared path accommodating both pedestrians and cyclists.

Currently the alignment of the proposed greenway consists mainly of formal managed pathways (historic towpaths) and informal, seldom used pathways along the historic Boyne navigation routes with accompanying defunct canal sections. In addition some sections of the site of the proposed greenway are heavily overgrown where historic towpaths are largely enveloped in vegetation.

## 5.2 Designated Sites

### 5.2.1 European Sites

There are 2 no. European sites within the project site; River Boyne and River Blackwater SAC and River Boyne and River Blackwater SPA. These 2 no. European sites stretch throughout the entirety of the project site. The qualifying interest (QI) habitats and species of these two designated conservation sites are detailed in Table 5-1 below.

**Table 5-1 Natura 2000 sites within the project site.**

Site Name	Features of Interest <sup>1</sup>
River Boyne and River Blackwater SAC (Site Code: 002299)	Alkaline fens [7230] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> ) [91E0] River Lamprey ( <i>Lampetra fluviatilis</i> ) [1099] Salmon ( <i>Salmo salar</i> ) [1106] Otter ( <i>Lutra lutra</i> ) [1355]
River Boyne and River Blackwater SPA (Site Code: 004232)	Kingfisher ( <i>Alcedo atthis</i> ) [A229]

The European sites outside of the project site, are outlined in Table 5-2 below. Also detailed within this table are the distances to the Natura 2000 sites from the project site. Potential connectivity from the study area to these sites is discussed further in Chapter 6.

**Table 5-2 Natura 2000 sites within potential zone of influence of the proposed project.**

Natura 2000 Site	Distance from Study Area
Boyne Coast and Estuary SAC (Site Code: 001957)	ca. 7.2km east (ca. 7.4km downstream)
Boyne Estuary SPA (Site Code: 004080)	ca. 6km east (ca. 6.2km downstream)

<sup>1</sup> Site documentation sourced from <https://www.npws.ie/protected-sites>



<b>Natura 2000 Site</b>	<b>Distance from Study Area</b>
River Nanny Estuary and Shore SPA (Site code; 004158)	ca. 11.7km east
North-west Irish Sea SPA (Site Code: 004236)	ca. 11.3km north east

## 5.2.2 National Sites

Of national importance; there are 1 Natural Heritage Areas (NHAs) and 21 no. proposed Natural Heritage Areas (pNHAs) within 15km of the project site.

There are 7 no. pNHAs directly alongside or within the River Boyne: Boyne River Islands, King William's Glen, Dowth Wetland, Rossnaree Riverbank, Crewbane Marsh, Slane Riverbank and Boyne Woods. In addition to this Boyne Coast and Estuary pNHA is located downstream of the project site and is therefore connected via the River Boyne. Table 5-3 below details all NHA sites within 15km of the project site. Table 5-4 below details all pNHA sites within 15km of the project site.

Figure 5-1 illustrates all pNHA sites within or adjacent to the proposed project site.

**Table 5-3 - NHA sites within 15km of the project site**

<b>Natural Heritage Areas</b>	<b>NHA Site Code</b>	<b>Distance form project site</b>
Jamestown Bog	001324	8.5km

**Table 5-4 - pNHA sites within 15km of the project site**

<b>proposed Natural Heritage Areas</b>	<b>pNHA Site Code</b>	<b>Distance from project site</b>
Boyne River Islands	001862	(part) Within
King William's Glen	001804	Adjacent to the project site
Dowth Wetland	001861	Within
Rossnaree Riverbank	001589	Within
Crewbane Marsh	000553	Within
Boyne Woods	001592	Within
Slane Riverbank	001591	Within
Boyne Coast and Estuary	001957	6.5km Downstream
Thomastown Bog	001593	2.7km S
Duleek Commons	001578	2.8km S
Balrath Woods	001579	5.3km S
Mellifont Abbey Woods	001464	6.6km N
Laytown Dunes/Nanny Estuary	000554	9.8km E
Blackhall Woods	001293	9.9km NW



<b>proposed Natural Heritage Areas</b>	<b>pNHA Site Code</b>	<b>Distance from project site</b>
Cromwell's Bush Fen	001576	10.7km SW
Castlecoo Hill	001458	11.8km NW
Trim	001357	11.6km SW
Barmeath Woods	001801	12km NW
Kildemock Marsh	001806	13.7km N
Mentrim Lough	001587	13.8km N
Clogher Head	001459	14km NW



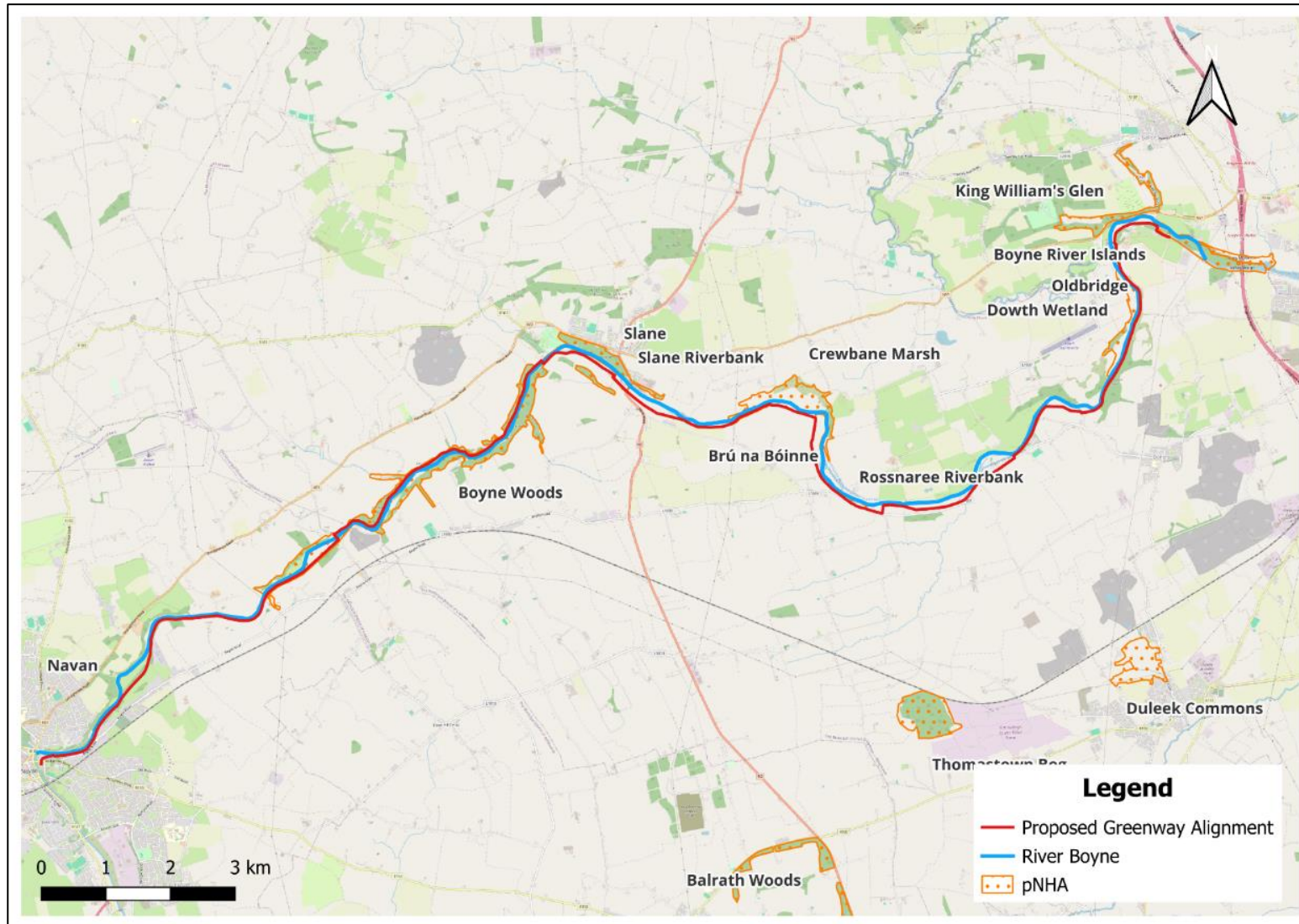


Figure 5-1 - pNHA Sites within or adjacent to the proposed project





The pNHAs within or adjacent to the project site, namely Boyne River Islands, King William's Glen, Douth Wetland, Rossnaree Riverbank, Crewbane Marsh, Slane Riverbank and Boyne Woods are within the site extents, and are associated with the River Boyne and River Blackwater SAC. The fact that these pNHAs are all within the SAC affords them protection at an international level under the EU Habitats Directive. Similarly the downstream Boyne Estuary pNHA is designated for protection for the same conservation objectives as the Boyne Estuary SAC/SPA and as such is of ecological importance at an international level. There is no direct or indirect connectivity to any other pNHA sites outside of the project site.

The NPWS does not provide any individual site synopsis for the 7 no. pNHAs within the Natura 2000 sites, however, site details and habitats descriptions are available for these areas of wetlands and woodlands from other sources. Some of the woodlands have been surveyed as part of the National Survey of Native Woodlands<sup>2</sup> (NSNW site survey reports 2005) and similarly the pNHA wetland sites have been surveyed as part of the Wetlands Survey Ireland (WSI). Site descriptions for the pNHA sites, where available, is as follows.

#### **Boyne River Islands pNHA** (NSNW Site No. 0688):

The NSNW summarises the Boyne River islands as follows; *'A medium sized woodland located on two islands in the River Boyne just west of Drogheda and on the southern bank side. The canopy is dominated by a range of Salix spp. (Salix cinerea, S. triandra, S. fragilis and S. viminalis) with some alder (Alnus glutinosa) and sycamore (Acer pseudoplatanus). The field layer is high and very dense consisting of Calystegium sepium, Urtica dioica, Filipendula ulmaria, Valeriana officinale, Galium aparine, Solanum dulcamara, Rorippa nasturtium- aquaticum, Oenanthe crocata, Myosotis scorpioides and Caltha palustris. The soil is an alluvial gley. A narrow channel separates the islands from the bank side: this makes the islands accessible at low water. To the northwest across the road and canal is a small alder stand.'*

#### **King William's Glen pNHA** (NSNW Site No. 0631):

The NSNW summarises the King William's Glen as follows; *'A medium sized woodland about 3 km west of Drogheda. The southern part of the site is on a very steep valley side overlooking the River Boyne. The canopy here is a mixture of ash (Fraxinus excelsior), pedunculate oak (Quercus robur), beech (Fagus sylvatica) and sycamore (Acer pseudoplatanus), with holly (Ilex aquifolium), elder (Sambucus nigra), hazel (Corylus avellana) and hawthorn (Crataegus monogyna) beneath. The field layer is a typical mix of Rubus fruticosus agg, Dryopteris dilatata, Polystichum setiferum, Geranium robertianum and Galium aparine etc. The site is extensively used as an amenity area and there are many broad paths through this area. Due to the steepness of the site, this has resulted in rather extensive erosion. There is also a large picnic area. Most of the woodland along King William's Glen itself, which runs north from the Boyne towards Tullyallen, was excluded due to dominance of non-native broadleaves, beech, horse- chestnut (Aesculus hippocastanum) and sycamore. There is a small area of younger woodland along the eastern side of the glen: this was not fully surveyed however due to steepness. The soils are well drained.'*

#### **Boyne Woods pNHA.**

This is the largest of the pNHA sites within the study area and extends for ca. 8.5km along the Boyne River and covers both the southern and northern banks of the river. 3 no. sections of this linear woodlands have been surveyed as part of the NSNW and these 3 sites are illustrated in Figure 2-4 below and are as summarised as follows:

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<sup>2</sup> Perrin, P., Martin, J., Barron, S., O'Neill, F., McNutt, K. & Delaney, A. (2008) National Survey of Native Woodlands - Volume 1 Main Report



**Dive Woods** (NSNW Site No. 0713, east side of Boyne Woods pNHA, north bank of River Boyne): *'The area surveyed was approximately 4 ha of relatively young (planted 1986-87) WD1 woodland adjoining a larger 12ha area of non-native broadleaved woodland. The site is immediately south of Slane village. The canopy was dominated by ash (Fraxinus excelsior), wych elm (Ulmus glabra), sycamore (Acer pseudoplatanus) and Salix caprea. In the subcanopy, elder (Sambucus nigra) was frequent and Hawthorn (Crataegus monogyna) was occasional. The ground flora was dominated by Hedera helix, Anthriscus sylvestris and Urtica dioica. Prunus laurocerasus was locally abundant and dominant beyond the site boundary. Rhododendron ponticum and Cotoneaster sp. were also present, but rare.'*

**Cruicetown Woods** (NSNW Site No. 0625, mid-section of Boyne Woods pNHA, north bank of River Boyne): *'A privately owned site approximately 3 km southwest of Slane village. The woodland is long and narrow and slopes steeply. The eastern parcel was excluded due to non-native species in the canopy. The western parcel is composed of WN2 woodland with ash (Fraxinus excelsior) in the canopy and Wych elm (Ulmus glabra), Hawthorn (Crataegus monogyna) and elder (Sambucus nigra) in the subcanopy. The field layer was dominated by Hedera helix and Ranunculus ficaria. The site is no longer actively managed, although there was evidence of red deer passing through the site. An active badger sett was observed.'*

**Rock Wood** (NSNW Site No. 0686, mid-section of Boyne Woods pNHA, south bank of River Boyne): *'A privately owned woodland approximately 3 km southwest of Slane village. The site consists of approximately 1 ha of WN2 woodland. It adjoins a large area of non-native WD1 mixed broadleaf woodland, which was excluded. The site slopes steeply. The canopy was dominated by ash (Fraxinus excelsior) with elder (Sambucus nigra) and hawthorn (Crataegus monogyna) frequent in the shrub layer, with occasional hazel (Corylus avellana) and wild cherry (Prunus avium). The field layer was dominated by Hedera helix with abundant Polystichum setiferum.'*

As with the woodland pNHA sites detailed above, the NPWS does not provide a site synopsis for the pNHA wetland sites within the study area, however the wetland sites have been surveyed as part of the Wetland Survey of Ireland (WSI) which details the following:

**Dowth Wetland pNHA** (WSI Site Code WMI MH107):

*'An area of floodplain marsh with an associated area of deciduous woodland on steep slopes. The marsh occurs on wet alluvial soils, regularly flooded by the river.'* This site at Dowth also encompasses grassland habitats which have been classified as conforming to Annex I habitat: Hydophilus Tall herb [6430]

**Rossnaree Riverbank pNHA** (WSI Site Code WMI MH33):

*'Single field beside the Boyne which floods in winter and contains Juncus compressus.'* This site at Rossnaree also encompasses grassland habitats which have been classified as conforming to Annex I habitat: Hydophilus Tall herb [6430]

**Crewbane Marsh pNHA** (WSI Site Code WMI MH35): *'Woodland area with interesting marsh community near the river.'*

**Slane Riverbank pNHA** (WSI Site Code WMI MH104): *'This small area of wet grassland along the banks of the Boyne is home to the rare round-fruited rush, Juncus compressus, known from only two other counties in Ireland.'*



## 5.3 Annex I Habitats

Annex I habitat is habitat protected under the Habitats Directive. The overall objective of the Habitats Directive is to achieve and maintain favourable conservation status for all habitats and species of community interest; and to contribute towards maintaining biodiversity of natural habitats and of wild flora and fauna in member states.

To this end, EU member states are obliged to monitor the conservation status of habitats and species. As all habitats (as listed in Annex I) and species of community are included, the monitoring requirements obliged to be undertaken by member states is not restricted to European sites (SACs and SPAs) but encompasses the total national resource of each habitat. Consequently, data on Annex I habitat must be collected both within and outside the Natura 2000 network.

In addition, member states are obliged, as detailed in Article 17 of the Habitats Directive, to report to the EU commission every six years on the implementation of measures taken towards meeting the objectives of the directive.

Annex I habitats are categorised into the following general habitat categories: - Bogs, mires and fens, Coastal habitats, Dunes habitats, Forests, Freshwater habitats, Grasslands, Heath and scrub and Rocky habitats.

Table 5-5 below details the known Annex I habitat adjacent to the project site. Locations of known examples of Annex I habitats were established through a review of NPWS Article 17 Data 2019.

**Table 5-5 - Annex I Habitat within study area**

Habitat Category	Habitat Type	Location
Forests	Alluvial forests* with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> ) [91E0]	Boyne River Islands. (X:705065, Y:775810)
Grasslands	Hydrophilous Tall herb fringe communities of plains and of the montane to alpine levels [6430]	Dowth. River Boyne north bank within Dowth Wetland. (X:703913, Y:774075) Rossnaree. River Boyne south bank. Rossnaree Riverbank Wetlands (X:700121, Y:771756)

\*Priority habitat

It is noted that NPWS Article 17 datasets may be incomplete. The River and tributaries may conform to Annex I habitat; 'Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation' [3260].

The examples of Annex I habitats listed above are all located with the eastern side of the project site. Figure 5-2 below illustrates these locations.



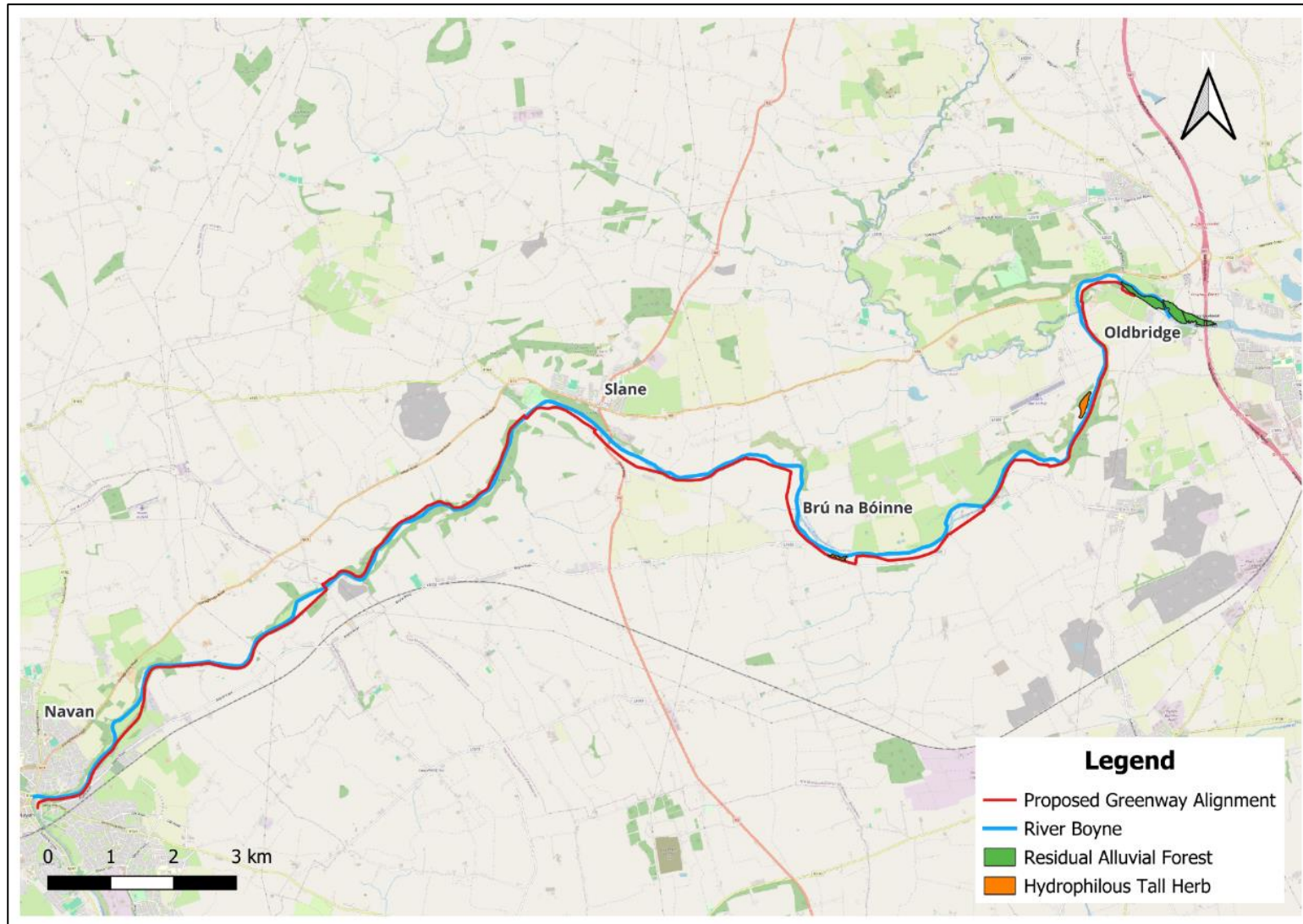


Figure 5-2 - Location of known examples of Annex I habitat (Annex I).

## 5.4 Surface Water Features

The River Boyne is the predominant ecological feature within the project site and this watercourse is protected as part of the Natura 2000 network. The stretch of the River Boyne within the study area is ca. 26km in length. This 'high-order' or large watercourse has many tributaries of varying size along its catchment and it is an important watercourse for salmon with many of its tributaries providing for spawning grounds and nursery habitats, as such the River Boyne is afforded protection at a national level as it is designated under Salmonid Regulations (S.I. 293 / 1988). The aquatic, mammal and bird species found along the River Boyne are detailed below.

Within the immediate vicinity of the project site the River Boyne combines with 27 no. smaller, or 'lower order', rivers and streams. Under the remit of the Water Framework Directive (WFD), an EU framework established for the protection of all waters, the Environmental Protection Agency (EPA) monitors the quality of the water within the streams and rivers within the project site.

Details of the river waterbody WFD Status, assigned Risk and Biological Q Value for the 27 no. watercourses connected to the project site are detailed within Table 5-6 below. As a larger watercourse, the EPA monitor water quality along the River Boyne in 5 no. locations within the study area and details from all 5 no. EPA monitoring locations are included within this table.

In addition to the watercourses there are numerous sections of canalised waterways with associated locks throughout the project site. These stretches of canal, predominantly along the south side of the river, are not identified as watercourses by the EPA and no water quality data is available.

The location and names of all watercourses are illustrated in Figure 5-3 below and Table 5-6 lists all watercourses connected to the project site (listed east to west).



**Table 5-6 - Watercourses long the alignment of the project site (listed east to west)**

Watercourse Name	EPA Waterbody Code / Segment Code	River Order	Confluence w/ River Boyne (Bankside)	Waterbody WFD Status 2016-2021	EPA assigned Waterbody Risk	River Q Values (2004-2018)
River Boyne (Eastern Study area / Boyne Estuary)	IE_EA_010_0100	6	-	Unassigned	At risk	4 'Good' (2020)
River Boyne (Central / Eastern Study area)	IE_EA_07B042150 / 07_2142	6	-	Good	Not at risk	4 'Good' (2020)
River Boyne (Central Western Study area)	IE_EA_07B042100 / 07_1680	6	-	Good	At risk	4 'Good' (2018)
River Boyne (Western Study area)	IE_EA_07B0421900 / 07_1488	6	-	Moderate	Under Review	3-4 'Moderate' (2018)
River Boyne (Western Study area)	IE_EA_010_0100	6	-	Unassigned	Not at risk	3 'Poor' (2018)
Tulaigh Álainn	IE_EA_07B042200 / 07_2206	2	North Bank	Good	Not at risk	-
Sheepgrange	IE_EA_07B042200 / 07_2205	2	North Bank	Good	Not at risk	-
Mattock River and its Tributaries (4no.)	IE_EA_07M010300 / 07_2150	4	North Bank	Good	Not at risk	4 'Good' (2020)
Oldbridge River	IE_EA_07B042200 / 07_1104	1	South Bank	Good	Not at risk	-
Roughgrange	IE_EA_07B042200 / 07_1857	1	South Bank	Good	Not at risk	-
Newgrange and its tributary (1no.)	IE_EA_07B042200 / 07_1200	2	North Bank	Good	Not at risk	-
Roughgrange (Main channel)	IE_EA_07B042200 / 07_1658	3	South Bank	Good	Not at risk	-
Unnamed Tributary of the River Boyne	IE_EA_07B042200 / 07_589	1	South Bank	Good	Not at risk	-
Rossnaree	IE_EA_07B042150 / 07_475	1	South Bank	Good	Under Review	-



Watercourse Name	EPA Waterbody Code / Segment Code	River Order	Confluence w/ River Boyne (Bankside)	Waterbody WFD Status 2016-2021	EPA assigned Waterbody Risk	River Q Values (2004-2018)
Fennor	IE_EA_07B042150 / 07_624	1	South Bank	Good	Under Review	-
Knowth	IE_EA_07B042150 / 07_1116	1	North Bank	Good	Under Review	-
Slanecastle	IE_EA_07B042100 / 07_1056	1	South Bank	Moderate	At risk	-
Castleparks	IE_EA_07B042100 / 07_467	3	North Bank	Moderate	Under Review	-
Thurstianstown and its tributary	IE_EA_07B042100 / 07_1140	2	South Bank	Moderate	At risk	-
Unnamed Tributary of the River Boyne	IE_EA_07B042100 / 07_1085	1	South Bank	Moderate	At risk	-
Unnamed Tributary of the River Boyne	IE_EA_07B042100 / 07_1258	3	North Bank	Moderate	At risk	-
Dollardstown	IE_EA_07B042100 / 07_1833	2	South Bank	Moderate	At risk	-
Harmanstown	IE_EA_07B042010 / 07_1733	1	North Bank	Moderate	At risk	-
Ardmulchan	IE_EA_07B042010 / 07_1489	1	South Bank	Moderate	At risk	-
Harristown	IE_EA_07B042010 / 07_1492	2	South Bank	Moderate	At risk	-
Dunmoe	IE_EA_07B042010 / 07_1491	1	North Bank	Moderate	At risk	-
Unnamed Tributary of the River Boyne	IE_EA_07B042010 / 07_1089	1	North Bank	Moderate	At risk	-
Antylstown	IE_EA_07B042010 / 07_1776	2	North Bank	Moderate	At risk	-
Batterstown	IE_EA_07B041900 /	1	North Bank	Moderate	Under Review	-
Ferganstown and Ballymacon	IE_EA_07B041900 / 07_1487	2	South Bank	Moderate	Under Review	-
Blackcastle	IE_EA_07B041900 / 07_1560	2	South Bank	Moderate	Under Review	-
Blackwater Kells	IE_EA_07B011800 / 07_2175	5	North Bank	Poor	At risk	Q Value 3 (2020)



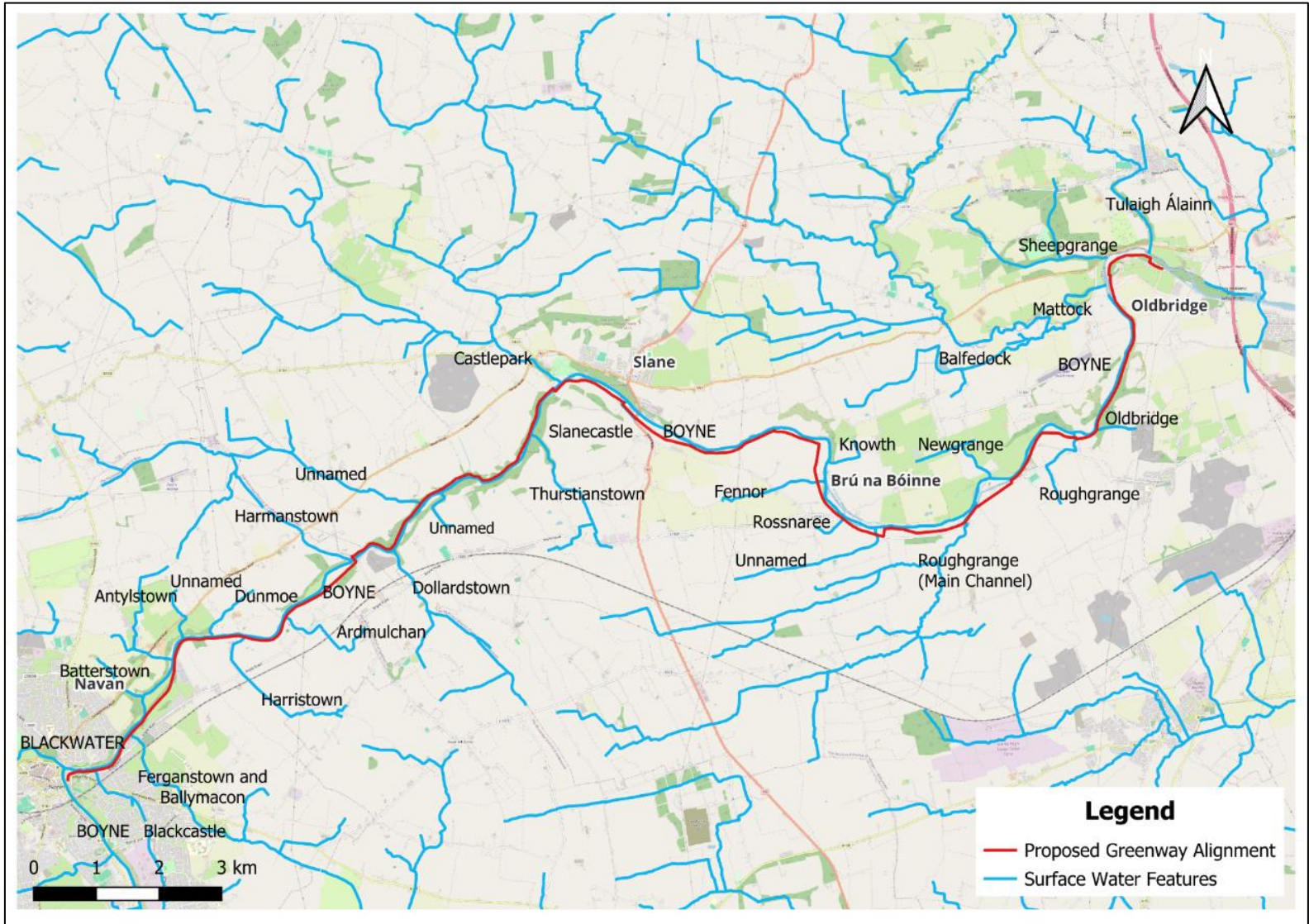


Figure 5-3 - Surface water features





## 5.5 Species

### 5.5.1 Aquatic Ecology

A review of the most recent available publications by Inland Fisheries Ireland<sup>3</sup> identifies the following aquatic species as having been recorded within the River Boyne main channel and estuary. Table 5-7 below lists the ERFB recorded aquatic species within the River Boyne catchment. It is noted that most species listed below are found in estuarine waters .

**Table 5-7 - Aquatic species recorded by ERFB within the River Boyne catchment**

<b>Common name</b>	<b>Scientific name</b>
Brown trout	<i>Salmo trutta</i>
Cod	<i>Gadus morhua</i>
European eel	<i>Anguilla anguilla</i>
Five-bearded rockling	<i>Ciliata mustela</i>
Flounder	<i>Platichthys flesus</i>
Greater pipefish	<i>Syngnathus acus</i>
Gunnel (Butterfish)	<i>Pholis gunnellus</i>
Herring	<i>Clupea harengus</i>
Lesser sand eel	<i>Ammodytes tobianus</i>
Long-spined sea scorpion	<i>Taurulus bubalis</i>
Minnow	<i>Phoxinus phoxinus</i>
Plaice	<i>Pleuronectes platessa</i>
Pogge	<i>Agonus cataphractus</i>
Pollack	<i>Pollachius pollachus</i>
Roach	<i>Rutilus rutilus</i>
Salmon	<i>Salmo salar</i>
Sand goby	<i>Pomatoschistus minutus</i>
Sea trout	<i>Salmo trutta</i>
Short-spined sea scorpion	<i>Myoxocephalus scorpius</i>
Sprat	<i>Sprattus sprattus</i>
Thick-lipped grey mullet	<i>Chelon labrosus</i>
Three-spined stickleback	<i>Gasterosteus aculeatus aculeatus</i>
Whiting	<i>Merlangius merlangus</i>
Gudgeon	<i>Gobio gobio</i>

<sup>3</sup> <https://www.fisheriesireland.ie/publications?search=boyne>



Common name	Scientific name
Lamprey species	<i>Lampetra</i> spp.
Freshwater White-clawed Crayfish*	<i>Austropotamobius pallipes</i>

## 5.5.2 Birds

The Irish Wetland Bird Survey (I-WeBS) undertakes surveys and counts of waterbirds across a wide range of wetlands throughout Ireland. There are 2 no. I-WeBS count sites along the River Boyne: River Boyne Site Code: OV301 (near Rossnaree) and River Boyne Site Code: OVS16 (near Knowth). OVS16 is a swan census subsite i.e. only counted at 5-yearly intervals for the International Swan Census. Datasets from I-WeBs for the Boyne count sites is summarised in Table 5-8 below.

The waterbird count data identifies the Knowth and Rossnaree areas of the River Boyne as providing foraging and roosting habitat for ca. recorded 28 waterbird species. The count site has notable numbers of Swans (both Mute and Whooper) as well as Golden Plover, Lapwing, Curlew, Wigeon and Mallard.

**Table 5-8 Summary of bird counts for Boyne I-WeBs site.**

Species	1% national*	1% international*	Mean 2011-2021
Mute Swan	90	100	4
Whooper Swan	150	340	22
Greylag Goose	35	980	0
Shelduck	100	2500	0
Wigeon	560	14000	174
Teal	360	5000	0
Mallard	280	53000	71
Goosander			0
Little Grebe	20	4700	2
Cormorant	110	1200	2
Little Egret	20	1100	1
Grey Heron	25	5000	2
Water Rail			0
Moorhen			2
Oystercatcher	610	8200	0
Golden Plover	920	9300	119
Lapwing	850	72300	117
Snipe			8
Curlew	350	7600	177
Redshank	240	2400	15



Species	1% national*	1% international*	Mean 2011-2021
Green Sandpiper			0
Common Sandpiper			0
Black-headed Gull			100
Common Gull			0
Lesser Black-backed Gull			6
Herring Gull			0
Great Black-backed Gull			1
Mediterranean Gull			0

\* Mean counts above this threshold would be of international / national importance

The most notable and significant habitat within and around the project site known to support significant numbers of rare and protected bird species is undoubtedly River Boyne. The 2no. of SPAs are of high ornithological importance for both wintering wildfowl as well as breeding passerine species.

Kingfisher are the only qualifying interest species of River Boyne and Blackwater River SPA. Kingfisher surveys (Cummins *et al.*, 2010) identify the following for the Boyne catchment:

*'A total of 25 waterways bird species were recorded (within 6 river systems: Barrow, Blackwater, Boyne, Clare, Moy and Nore Rivers), with the highest total of 21 species on both the Blackwater (Munster) and Boyne systems. Sand Martin (Riparia riparia) was the most abundant species on both systems, with Mallard (Anas platyrhynchos) also plentiful.'* and further details that 15-19 Kingfisher territories were identified along the River Boyne (densities of 0.09-0.12 territories/km). The surveys outline that the River Boyne consistently supported high numbers of Kingfisher.

Site surveys undertaken during 2023 and 2024 by AtkinsRéalis ecologists did not identify any earth banks suitable for Kingfisher nesting habitat within or directly adjacent to the proposed Boyne Greenway alignment. GI Works locations have been specifically designed and located in areas where Kingfisher nesting habitat does not occur.

The River Boyne and the wider area hosts a diverse range of waterbird species and is indicated by the presence of a dedicated I-WeBs count site on the River Boyne as detailed above. As well as the 28 no. waterbird species recorded within the I-WeBs count site the River Boyne accommodates other waterbirds and passerine species as detailed in Table 5-9 below. Bird species outlined below are protected under the Irish Wildlife Acts (as amended) and are summarised from NPWS and NBDC datasets (non-exhaustive list).

**Table 5-9 Bird species recorded within the study area.**

Waterbird Species	Passerine Species
Black-legged Kittiwake ( <i>Rissa tridactyla</i> )	Common Linnet ( <i>Carduelis cannabina</i> )
Common Coot ( <i>Fulica atra</i> )	Common Swift ( <i>Apus apus</i> )
Eurasian Curlew ( <i>Numenius arquata</i> )	Barn Owl ( <i>Tyto alba</i> )
European Golden Plover ( <i>Pluvialis apricaria</i> )	Barn Swallow ( <i>Hirundo rustica</i> )
Great Crested Grebe ( <i>Podiceps cristatus</i> )	Common Pheasant ( <i>Phasianus colchicus</i> )
Eurasian Woodcock ( <i>Scolopax rusticola</i> )	Common Kestrel ( <i>Falco tinnunculus</i> )



Waterbird Species	Passerine Species
Great Cormorant ( <i>Phalacrocorax carbo</i> )	Eurasian Sparrowhawk ( <i>Accipiter nisus</i> )
Little Egret ( <i>Egretta garzetta</i> )	Hen Harrier ( <i>Circus cyaneus</i> )
Mew Gull ( <i>Larus canus</i> )	Sand Martin ( <i>Riparia riparia</i> )
Goosander ( <i>Mergus merganser</i> )	Sky Lark ( <i>Alauda arvensis</i> )
Bar-tailed Godwit ( <i>Limosa lapponica</i> )	Yellowhammer ( <i>Emberiza citrinella</i> )
Common Goldeneye ( <i>Bucephala clangula</i> )	Rock Pigeon ( <i>Columba livia</i> )
Common Pochard ( <i>Aythya ferina</i> )	Spotted Flycatcher ( <i>Muscicapa striata</i> )
Greylag Goose ( <i>Anser anser</i> )	Merlin ( <i>Falco columbarius</i> )
Northern Pintail ( <i>Anas acuta</i> )	Peregrine Falcon ( <i>Falco peregrinus</i> )
Northern Shoveler ( <i>Anas clypeata</i> )	
Red-breasted Merganser ( <i>Mergus serrator</i> )	

### 5.5.3 Otter

Otter (*Lutra lutra*) have been recorded throughout the project site as identified through NBDC datasets. Otter sightings historically are located along the River Boyne with the most recent sightings in 2018 from the Mammals of Ireland 2016-2025 survey. This Near Threatened<sup>4</sup> species is listed on Annex II and Annex IV to the Habitats Directive as well as the Wildlife Acts.

#### Otter Survey 2023-2024

Triturus Environmental Ltd was commissioned by AtkinsRéalis to undertake an Otter survey of the River Boyne and adjacent Boyne Navigation canal sections between Navan and Mary McAleese Boyne Valley Bridge, Co. Meath. The survey was undertaken along 38km linear length of the River Boyne and contiguous Boyne Navigation (canal) corridor during May-June 2023 and May 2024. This baseline survey aimed to identify the most important areas for otters along the River Boyne corridor, inclusive of the Boyne Navigation sections.

Walkover and boat-based Otter surveys of the River Boyne, Boyne Navigation and numerous adjoining tributaries (at proposed watercourse crossings) were undertaken in the May-June 2023 and May 2024 time periods. The survey area comprised approximately 28km of linear riverine habitat (inclusive of both banks), c.10km of linear canal habitat (Boyne Navigation) and the lowermost 150m of Boyne tributaries in the vicinity of 11 no. proposed Greenway watercourse crossings. Otter presence was identified by observing and recording the locations of spraints, latrines, slides, holts (protected), and couches (protected). The study was carried out using an adapted Total Corridor Otter Survey (TCOS) method (Macklin, et al., 2019).

A total of 120 no. Otter signs were recorded over the course of the survey. 99 no. of these signs were recorded in River Boyne Corridor. 14 no. signs were recorded along the Boyne navigation / canal sections. 7 no. signs were

<sup>4</sup> Marnell, F., Kingston, N. and Looney, D. (2009). *Ireland Red List No. 3: Terrestrial Mammals*. National Parks & Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin.



recorded at watercourse crossing points of the proposed Boyne Greenway. Outlined in Table 5-10 below are the number and type of each sign recorded.

**Table 5-10 - Type and number of each otter sign identified**

<b>Otter Sign</b>	<b>Total No.</b>
Spraint	77
Latrine	18
Slide	4
Couch	5
Holt	5
Total	120

The locations and details of all Triturus Environmental Ltd otter survey evidence is provided for in Appendix C.

All holts (5 no.) identified were located within 150m of the proposed Boyne Greenway route. A couch located near the Rossnaree Stream confluence fell within 10m of the proposed Greenway route. The majority of holt locations were associated with river islands, mature woodland or mature riparian treelines. A low number of couches (resting areas) were identified (5 no.) with most associated with riparian tree cover in areas poorly accessible to people.

The proposed GI Works locations have been specifically designed and located so as to avoid known otter holt and couch areas.

There are no GI Works locations within 150m of an otter holt or couch.

The GI works locations in relation to protected otter refugia are detailed and graphically illustrated in Section 6.3 below.

## 5.5.4 Invasive Species

Records of alien non-native invasive species were accessed through NBDC datasets. Certain non-native invasive species have been identified as having the potential to significantly impact the habitats they infest often leading to a reduction and loss of local biodiversity. These invasive species are identified as 'High-Risk Impact' species<sup>5</sup>. NBDC records of the high-risk impact invasive species found within the study area are discussed in this section of the report.

Certain invasive alien species are subject to statutory regulations as detailed in the Third Schedule of EC (Birds and Natural Habitats) Regulations 2011. It is an offence to introduce, disperse or spread the plant and animal species list on the Third Schedule of the 2011 Regulations. Those invasive species recorded within the study area that are subject to these statutory regulations are outlined below. The available invasive species records, dated within the last 12 years, are presented below.

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<sup>5</sup> O'Flynn, C., Kelly, J. and Lysaght, L. (2014). Ireland's invasive and non-native species –trends in introductions. *National Biodiversity Data Centre Series No. 2*, Waterford.



Japanese Knotweed (*Fallopia japonica*): This is a high impact legally restricted invasive plant species. Japanese knotweed has been historically recorded near Boyne River Islands, Donore townland, Dunmoe (roadside verge of N51) and in Navan at the confluence of the Boyne and Blackwater.

Giant Knotweed (*Fallopia sachalinensis*): This is a high impact legally restricted invasive plant species. Giant knotweed has been historically recorded near, Dunmoe (roadside verge of N51)

Himalayan Balsam (*Impatiens glandulifera*): This is a high impact legally restricted invasive plant species. Himalayan balsam is often associated with riverbanks as watercourses provide for a dispersal mechanism. This invasive species has been recorded along the River Boyne and one of its tributaries as follows: Tullyallen townland, Towneyhall townland, near Littlegrange townland, Newgrange townland and also on the banks of the River Boyne near Navan town.

Giant Hogweed (*Heracleum mantegazzianum*); This is a high impact legally restricted invasive plant species. Giant Hogweed has been identified along the banks of the River Boyne in the area of Glenmore Fox Covert.

Cherry Laurel (*Prunus laurocerasus*) and/or Rhododendron (*Rhododendron ponticum*) have been record within the area of Glenmore Fox Covert, the town of Slane, along the banks of the River Boyne near the townlands of Painestown, Cruicetown and Navan town.

Site surveys undertaken in 2023 and 2024 recorded areas of Himalayan Balsam along sections of the proposed Boyne Greenway alignment. The proposed GI Works locations have been designed so as to avoid areas of Himalayan Balsam. No other legally restricted invasive plant species were recorded during site surveys.

## 5.6 Groundwater Body

The proposed project is located within the Trim (Code IE\_EA\_G\_002) and Donore (Code IE\_EA\_G\_0021) groundwater bodies (GWB). These GWBs are of 'Good' WFD status with an overall objective to 'Restore' and 'Protect' the current status. The route is primarily underlain by a locally important aquifer that is generally moderately productive in local zones only. The groundwater vulnerability beneath the route is predominately 'Extreme' with portions 'High' and 'Rock at or near Surface' vulnerability intercepted. This indicates that the bedrock would be shallow in this area and highly vulnerable to potential contamination.



# 6. Connectivity to Natura 2000 Sites

## 6.1 Zone of Influence

The “Zone of Influence” of a plan or project is the area which may experience ecological effects as a result of its implementation, including any ancillary activities. The various impacts of a plan or project will each have their own characteristics, e.g. nature, extent, magnitude, duration etc. Accordingly, the area subject to each impact (“zone of impact”) will vary depending on characteristics of the impact and the presence of pathways for its propagation. Ecological features within or connected to one or more zones of impact could, depending on their sensitivities, be affected by the plan or project under consideration. The area containing such features may be regarded as the Zone of Influence. As such, in establishing the Zone of Influence for a plan or project, regard must be had to the characteristics of its potential impacts, potential pathways for impacts and the sensitivities of ecological features in the receiving environment.

In its guidance on selecting Natura 2000 sites to include in AA, *Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities* (DEHLG, 2010a) recommends inclusion of sites in the following three categories: -

- Any Natura 2000 sites within or adjacent to the plan or project area,
- Any Natura 2000 sites within the Zone of Influence of the plan or project (generally within 15km for plans, to be established on a case-by-case basis for projects, having regard to the nature, scale and location of the project, the sensitivities of the ecological receptors and the potential for in-combination effects), and
- Following the precautionary principle, any other Natura 2000 sites for which the possibility of significant effects cannot be excluded, e.g. for a project with hydrological impacts, it may be necessary to check the full extent of the catchment for Natura 2000 sites with water-dependent qualifying interests.

In addition, *Assessment of plans and projects in relation to Natura 2000 sites: Methodological guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC* (EC, 2021a) recommends consideration of Natura 2000 sites hosting fauna which could move to the plan or project area or its zone(s) of impact, and the potential for the plan or project to sever ecological connectivity within or between Natura 2000 sites. *Appropriate Assessment Screening for Development Management* (OPR, 2021) emphasises the importance of employing the source-pathway-receptor model (rather than arbitrary distances such as 15km) when selecting Natura 2000 sites for inclusion in AA.

Based on the nature, scale and location of the proposed project and the baseline conditions in the receiving natural environment, the zones of impact of the proposed project are defined as: -

- For direct impacts, all areas within and immediately adjoining the works area.
- For habitat loss and fragmentation, all areas within the proposed project boundary, including any areas temporarily required during GI works,
- For disturbance to birds and other fauna, all areas within a precautionary buffer of 500m from the GI Works.
- For water quality impacts, all surface waters which intersect the proposed project or are located within 100m thereof, as well as connected upstream and downstream stretches, and



- For the introduction or spread of invasive alien species, the proposed project site, and adjoining areas, as well as access routes to/from the project site.

The Zone of Influence was defined as the above zones of impact as well as other areas with potential ecological connectivity to them, i.e., woodlands and other semi-natural habitats connected to the proposed project by proximity or linear landscape features such as hedgerows or treelines and connected wetlands and waterbodies.

Publicly available spatial data for river, transitional and coastal waterbodies (*EPA Maps*) was used in conjunction with aerial imagery to identify pathways and zones of impact for disturbance and water quality impacts from the proposed project. These were then mapped in relation to Natura 2000 sites (see Figures 6-1 and 6-2 below). In addition, the Zone of Influence was examined to identify any other Natura 2000 sites with potential ecological connections to these zones of impact.





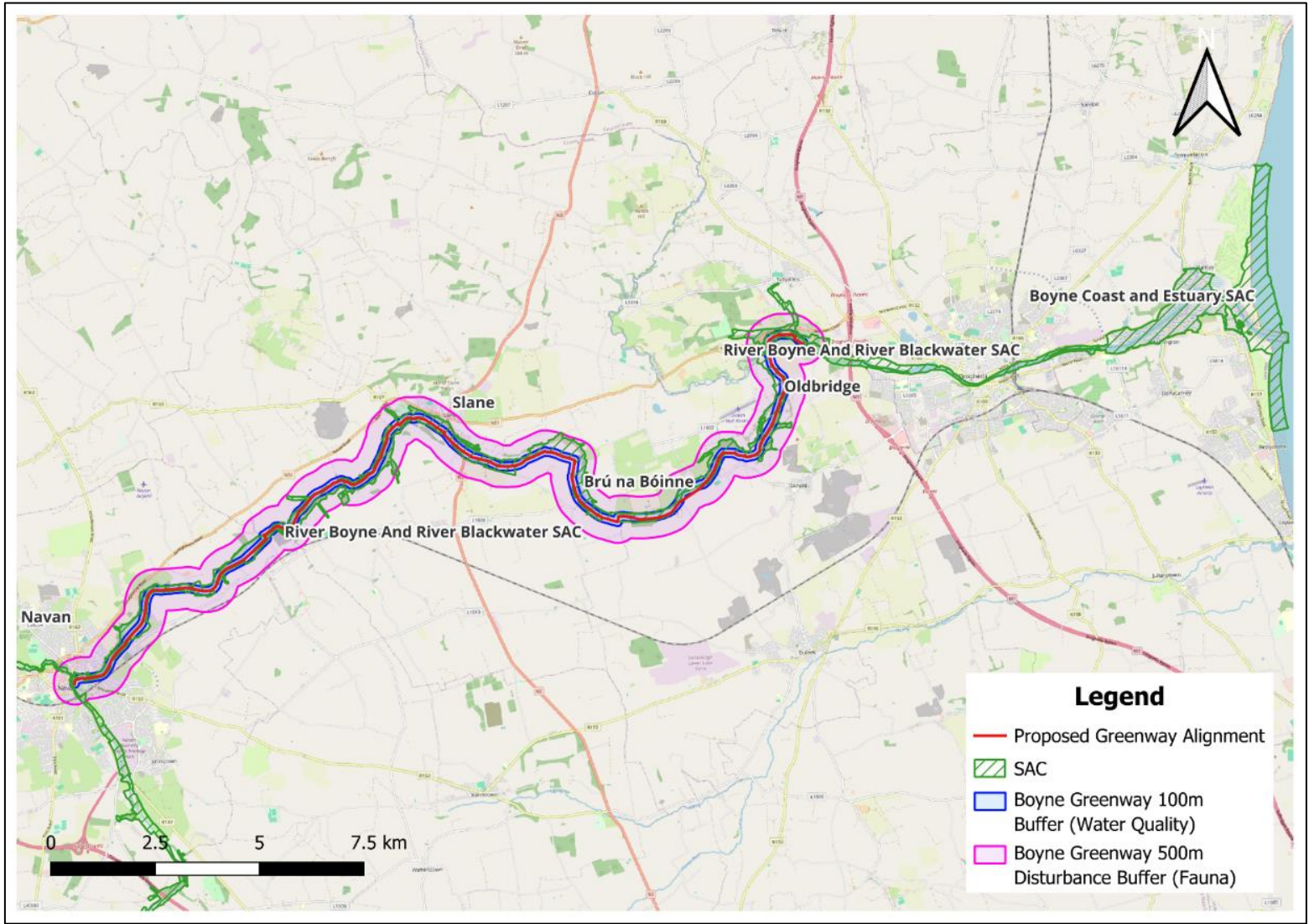


Figure 6-1 - SACs within the potential Zone of Influence of the Proposed Project.



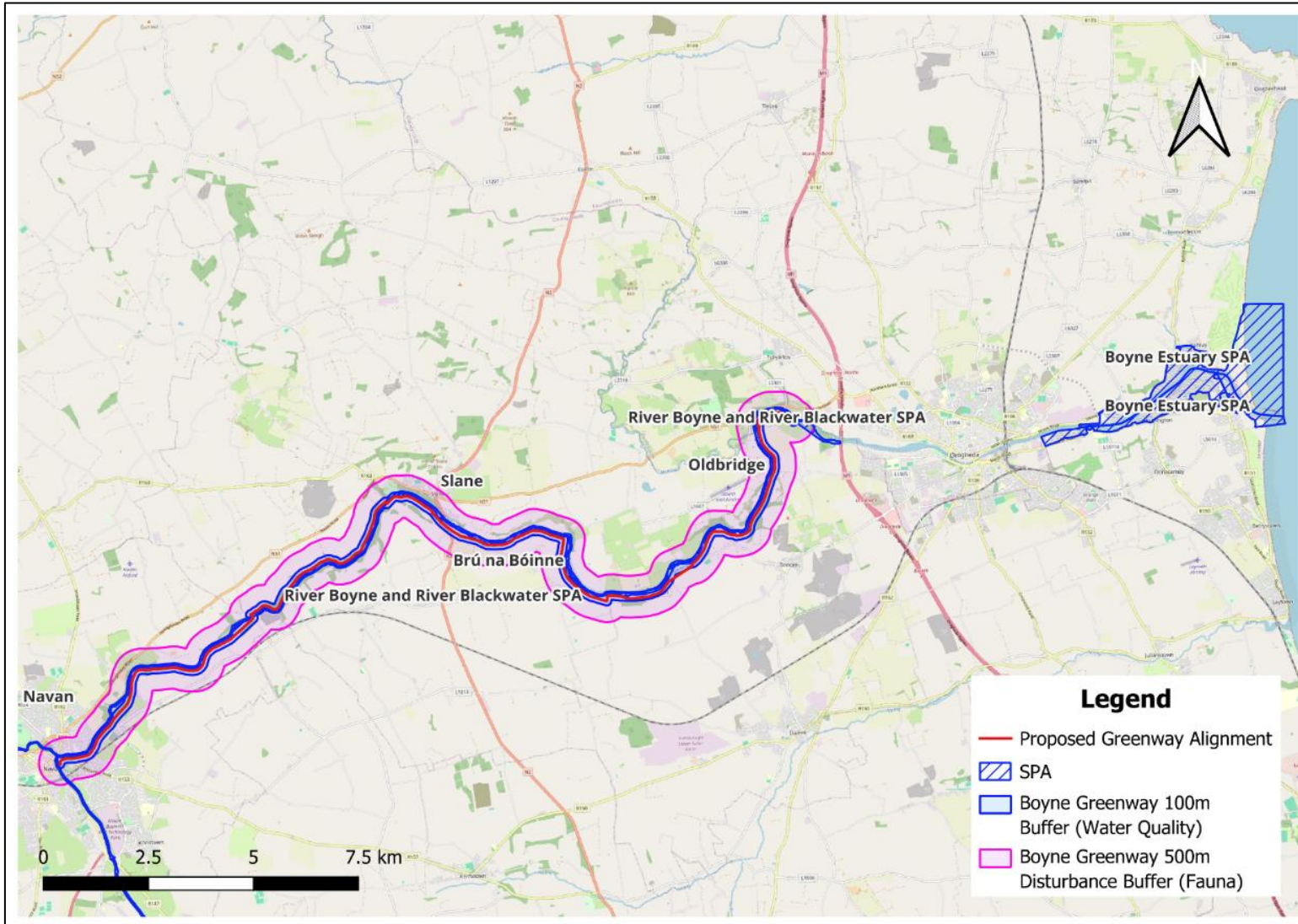


Figure 6-2 - SPAs within the potential Zone of Influence of the Proposed Project.



## 6.2 Identification of Sites

### 6.2.1 Direct Impacts

Direct impacts include those such as habitat loss and fragmentation which occur as a direct result of works. Such impacts are limited to the works footprint and the immediate vicinity. Almost the entirety of the proposed GI Works locations are within the River Boyne and River Blackwater SAC (site code: 002299) and are directly adjacent to the River Boyne and River Blackwater SPA (site code: 004232). Therefore, there is a risk of direct impacts to these sites.

#### Disturbance to birds and other fauna

Disturbance impacts include noise, vibration, visual and other forms of disturbance to animal species. The extent of such impacts is highly dependent on their magnitude and the sensitivity of the receptors. In the case of the proposed works, a precautionary distance of 500m from the works was used. As noted above, the proposed project site is located within or adjacent to the River Boyne and River Blackwater SAC and River Boyne and River Blackwater SPA. The SAC is selected for River Lamprey (*Lampetra fluviatilis*), Salmon (*Salmon salar*), and Otter (*Lutra lutra*) which are highly mobile and rely on the river habitat in the vicinity of the proposed GI Works locations. The SPA is selected for Kingfisher which are highly mobile and so could potentially use habitats in the immediate vicinity of the proposed project. Therefore, disturbance is considered to be a potential risk to the qualifying interest species of both Natura 2000 sites.

#### Water quality impacts

Water quality impacts include pollution of surface waters and groundwater by soils, sediments, hydrocarbons (e.g. diesel, hydraulic oils and lubricating oils), cementitious materials, bitumen and other deleterious matter arising from the proposed project. In the case of the proposed GI Works, these predominantly include fine sediment and soils from trial pits and boreholes and fuels and other hydrocarbons from vehicles and machinery. The reinstatement of concrete may be required at 1 no. location; Broadboyne Bridge. There are GI Works proposed along Staleen Road (near Brú na Bóinne Visitor Centre) which is outside of the River Boyne and River Blackwater SAC/SPA, works will include the re-statement of the roadway with bitumen, however, no water quality impacts will occur from GI Works along Staleen Road as the roadway is remote from the River Boyne and any tributaries.

The zone of impact is illustrated in Figure 5-1. Two Natura 2000 sites occur within this zone of impact, namely the River Boyne and River Blackwater SAC and the River Boyne and River Blackwater SPA. Both of these sites are designated for species which are either sensitive to water quality impacts (salmon and lamprey) or are dependent on prey that are sensitive to water quality impacts (otter and kingfisher).

#### Invasive alien species

Site walkover surveys have informed the locations and extent of invasive alien plant species; Himalayan Balsam along the alignment of the proposed Boyne Greenway. Identified IAPS which are legally restricted do not occur near any of the GI Works locations. Therefore, the proposed project is considered highly unlikely to result in the inadvertent spread of invasive plant species within the River Boyne and River Blackwater SAC and SPA.

#### Indirect effects

As noted above, there are 2 no. additional Natura 2000 sites present within the downstream estuarine stretches of the River Boyne. There is indirect hydrological connectivity between the project site and the Boyne Coast and Estuary SAC and Boyne Estuary SPA via the River Boyne. Given the small scale of the GI Works at any one location, the Zol for water quality impacts is established as 100m. As such the ca. 6km-7km downstream Natura 2000 sites; Boyne



Coast and Estuary SAC and Boyne Estuary SPA are outside the Zol of the proposed project. The possibility of likely significant effects on other Natura 2000 sites can be ruled out at this stage, due to distance from the proposed project, and the dilution factor of potential adverse water quality impacts arising from the project.

## Summary

Based on the above examination, the following Natura 2000 sites are selected for assessment: -

- River Boyne and River Blackwater SAC (site code: 002299)
- River Boyne and River Blackwater SPA (site code: 004232)

## 6.3 Site Descriptions

The descriptions of Natura 2000 sites presented in this section are based on the Site Synopsis, Conservation Objectives and Natura 2000 Standard Data Form documents for the sites concerned, augmented by information from the supporting documents available on the site-specific pages of the NPWS website.

Annex I habitat types marked with an asterisk (\*) are “priority habitat types”, i.e., natural habitat types in danger of disappearing and for the conservation of which the EU has a particular responsibility given the proportion of their natural ranges falling within the European territory of Member States.

### 6.3.1 River Boyne and River Blackwater SAC

#### Overview

The following description is taken from the Site Synopsis (NPWS, 2014) and Conservation Objectives Document (NPWS, 2021).

*‘This site comprises the freshwater element of the River Boyne as far as the Boyne Aqueduct, the Blackwater as far as Lough Ramor and the Boyne tributaries including the Deel, Stoneyford and Tremblestown Rivers. These riverine stretches drain a considerable area of Meath and Westmeath, and smaller areas of Cavan and Louth. The underlying geology is Carboniferous Limestone for the most part, with areas of Upper, Lower and Middle well represented. In the vicinity of Kells Silurian Quartzite is present while close to Trim are Carboniferous Shales and Sandstones. There are many large towns adjacent to but not within the site, including Slane, Navan, Kells, Trim, Athboy and Ballivor’*

The River Boyne and River Blackwater SAC is of ecological importance for its examples of Alkaline fens, and alluvial forests\*. Both habitats are fairly restricted in area. The alkaline fens are concentrated to Lough Shesk, Freehan Lough, and Newtown Lough. Despite their restricted range, the fen habitats support a highly diverse range of flora and fauna. The alluvial forests are found at a small chain of river islands 2.5km west of Drogheda and formed as a result of deposition at slow flowing sections of the River Boyne. The River Boyne as well as its tributaries are important habitat that support aquatic species such as Atlantic salmon, River Lamprey, and Otter. This SAC also supports populations of wintering Whooper Swans.

#### Qualifying Interests and Conservation Objectives

The River Boyne and River Blackwater SAC was selected for the following qualifying interests: -

- Alkaline fens [7230]



- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) [91E0]
- *Lampetra fluviatilis* (River Lamprey) [1099]
- *Lutra lutra* (Otter) [1355]

The conservation objectives of the River Boyne and River Blackwater SAC are as follows:

- *To maintain the favourable conservation condition of Alkaline fens in River Boyne and River Blackwater SAC*
- *To restore the favourable conservation condition of Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)\* in River Boyne and River Blackwater SAC*
- *To restore the favourable conservation condition of River Lamprey (Lampetra fluviatilis) in River Boyne and River Blackwater SAC*
- *To restore the favourable conservation condition of Atlantic Salmon (Salmo salar) in River Boyne and River Blackwater SAC*
- *To maintain the favourable conservation condition of Otter (Lutra lutra) in River Boyne and River Blackwater SAC*

The Conservation Objectives document for the site (NPWS, 2021) also states the following: “Please note that this SAC overlaps with Boyne Estuary SPA (004080) and River Boyne and River Blackwater SPA (004232). The SAC is also adjacent to Boyne Coast and Estuary SAC (001957) The conservation objectives for this site should be used in conjunction with those for the overlapping and adjacent sites as appropriate.”

### Threats, Pressures and Activities

Table 6-1 lists the threats, pressures, and activities with negative impacts on the site, as per its Natura 2000 Standard Data Form<sup>6</sup>. Highlighted in grey are the threats and pressures the proposed project could potential generate.

**Table 6-1 - Threats, pressures, and activities with negative impacts on the River Boyne and River Blackwater SAC**

Rank	Threat, pressure or activity (code)	Threat, pressure or activity (description)	Inside, outside or both
M	J02.11	Siltation rate changes, dumping, depositing of dredged deposits	i
M	E03.02	Disposal of industrial waste	i
L	D01.05	Bridge, viaduct	i
M	A07	Use of biocides, hormones and chemicals	i

<sup>6</sup> <https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=IE0002299>



<b>Rank</b>	<b>Threat, pressure or activity (code)</b>	<b>Threat, pressure or activity (description)</b>	<b>Inside, outside or both</b>
H	J02.15	Other human induced changes in hydraulic conditions	i
M	G02.10	Other sport / leisure complexes	i
M	J02.10	Management of aquatic and bank vegetation for drainage purposes	i
M	A01	Cultivation	i
L	G05	Other human intrusions and disturbances	i
L	G01	Outdoor sports and leisure activities, recreational activities	i
M	E01.04	Other patterns of habitation	i
H	H01	Pollution to surface waters (limnic, terrestrial, marine & brackish)	i
M	A10.01	Removal of hedges and copses or scrub	i
M	A05.02	Stock feeding	o
M	D01.02	Roads, motorways	i
L	G05.06	Tree surgery, felling for public safety, removal of roadside trees	i
M	E05	Storage of materials	i
H	E02	Industrial or commercial areas	i
M	A08	Fertilisation	i
H	I01	Invasive non-native species	i
M	C01.01	Sand and gravel extraction	i
M	J02	Human induced changes in hydraulic conditions	i
M	B01.02	Artificial planting on open ground (non-native trees)	i
H	E03.04	Other discharges	i
M	A10.01	Removal of hedges and copses or scrub	i



## 6.3.2 GI Works in relation to Protected Otter Refugia in River Boyne and River Blackwater SAC

Note; Sensitive ecological data has been redacted within this section.

Otter surveys were carried out along the River Boyne during 2023 and 2024 which recorded 5 no. otter holts and 5 no. otter couches along the River Boyne between Navan and Oldcastle. The GI Works have been specifically located so as to ensure that all GI Works are located greater than 150m from protected otter holts and couches. This is in line with TII guidelines for the treatment of otters<sup>7</sup> which details ‘No (construction) works should be undertaken within 150m of any holts at which breeding females or cubs are present’.

Table 6-2 below outlines all the GI Works that are closest to protected otter refugia, lists the types of works, distance from otter holts and couches and also outlines the duration of proposed works.

Figures 6-3 – 6-11 below depict the locations of GI works and otter holts and couches (working east to west along the River Boyne).

**Table 6-2 – Distance and duration of GI works in relation to protected otter refugia.**

Otter Site	Works Name	Nearest Proposed Work	Distance from Holt / Couch	Duration of works
		Trial Pit		1 hour
		Hand Dug Pit		4 – 5 hours
		Trial Pit		1 hour
		Foundation Pit		2 hours
		Hand Dug Pit		4 – 5 hours
		Dynamic Probe		30 mins
		Hand Dug Pit		4 – 5 hours
		Slit Trench		< 1 day
		Trial Pit		1 hour
		Dynamic Probe		30 mins

<sup>7</sup> NRA, 2006b. Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes.



**Figure 6-3 – redacted**

**Figure 6-4 – redacted**

**Figure 6-5 – redacted**

**Figure 6-6 – redacted**

**Figure 6-7 – redacted**

**Figure 6-8 – redacted**

**Figure 6-9 – redacted**

**Figure 6-10 – redacted**

**Figure 6-11 – redacted**





### 6.3.3 GI Works Locations in River Boyne and River Blackwater SAC

There are 119 no. proposed GI Works locations as detailed in Section 4. The following section outlines the site conditions found directly within the footprint of the GI Work locations. Site conditions were identified from ecological walk over surveys undertaken during 2023 and 2024 (Refer to Section 3.3 for details). The GI Works locations are categorised into four types;

1. Outside of River Boyne and Blackwater SAC
2. Hardstanding surfaces within River Boyne and Blackwater SAC
3. Informal pathways and agricultural grasslands
4. Woodlands and wet grassland – hand dug inspection pits

Details of these sections are described below and the locations are illustrated in Figure 6-12 below.

In regard to the footprint / size of the GI Works at any one location;

- Boreholes and Dynamic Probe elements of the works involve drilling a **20cm** hole.
- Trial pits involve excavation of a c. **2m x 1.5m** pit
- Foundation pits involve excavation of a **0.6m x 1m** pit
- Slit Trenches involve excavation of a **3m x 1m** pit
- Inspection pits involve a hand dug hole c. **0.5m x 0.5m**

All excavations will be backfilled immediately following GI data collection.

#### 1. Outside of River Boyne and Blackwater SAC

11 no. of GI works locations are outside of the boundary of the River Boyne and River Blackwater SAC<sup>8</sup>, these are predominantly located on roadways (R135 Boyne Road, Staleen Road). There is also 1 no. GI Works location in Oldbridge Grounds (Battle Boyne Visitor Centre) outside of the SAC site extents..

A further 6 no. GI Works locations are located on the roadway surface of Broadboyne Bridge, these locations are considered not to be within any natural or semi-natural habitats of the River Boyne and River Blackwater SAC.

#### 2. Hardstanding Surfaces within River Boyne and Blackwater SAC

The majority of the GI Works locations are located on the hardstanding gravel bound surfaces of the existing towpaths. Existing hardstanding towpaths are located in 5 no. areas;

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<sup>8</sup> SAC boundary taken from NPWS datasets / shapefiles. <https://www.npws.ie/maps-and-data/designated-site-data/download-boundary-data>



- Towpath Boyne Ramparts Heritage Walk – 25 no. GI Works locations
- Towpath Ramparts East of Slane Bridge – 12 no. GI Works locations
- Towpath Rossnaree Walk and neighbouring roadways – c. 15 no. GI Works locations
- Towpath Staleen Lock area – c. 4 no. GI Works locations
- Towpath Oldbridge towpath – c. 8 no. GI Works locations

Plates 6-1 – 6-5 below depict the 5 no. towpath sections.



**Plate 6-1 Boyne Ramparts Heritage Walk. Plate 6-2 Ramparts Walk, east of Slane Bridge to Morgan’s Lock.**



**Plate 6-3 Rossnaree Walk towpath.**

**Plate 6.4 Staleen Lock towpath.**

**Plate 6.5 Oldbridge towpath.**



### 3. Informal Pathways and Agricultural Grasslands

There are 4 no. sections along the alignment of Boyne Greenway route where GI Works locations are predominantly located along informal pathways, riverside grassland areas and agricultural grassland areas. These are detailed below and Plates 6-6 – 6-13 below provide site photos taken from these sections.

North of Broadboyne Bridge – 9 no. GI works locations on riverbank grasslands and informal pathways (disused towpath)



**Plate 6-6 Grassland on riverbank north Broadboyne Br.**



**Plate 6-7 Informal path towards woodlands.**

South of Slane Castle – 8 no. GI works locations on managed horse ride, informal wide path.



**Plates 6.8 & 6.9 Managed (mown) informal pathway / horse ride (c. 1.3km long) Slane Castle south.**



West side of Slane Bridge – 6no. GI Works locations along informal pathways



**Plate 6.10 & 6.11 Informal pathway (fisherman pathways) located directly west of Slane Bridge.**

Agricultural lands east of Morgan’s Lock – 5 no. GI Works locations with improved agricultural grasslands.



**Plate 6.12 & 6.13 Grassland fields elevated above river valley east of Morgan’s Lock to Rossnaree House.**

#### **4. Woodlands and Wet grasslands - Hand Dug Inspection Pits**

There are 3 no. areas where GI Works locations are within riparian woodlands and 1 no. location within wet grassland, where there is no formal pathway or where the existing informal pathways (fisherman’s paths and horse rides) have no easy access for GI Works plant and equipment. In these areas, so as to ensure there are no negative effects on woodland and wet grassland habitat, no plant or machinery will be used and the GI Works will involve hand dug inspection pits with no plant or machinery.

A total of 14 no. of GI Works locations are within these areas; 12 no. within woodlands and 2 no. within wet grassland area. GI Works at all of these 14 no. locations involves hand dug inspection holes.





**Plate 6-14 & 6-15 Areas for hand dug inspection pits in woodlands between Broadboyne Bridge and Slane Castle grounds and wet grasslands west of Slane Bridge (respectively).**



**Plate 6-14 & 6-15 Areas for hand dug pits in woodlands near Boyne Visitor Centre and south of Oldbridge (respectively).**

The various sections; Towpaths, Informal Pathways and Hand dug areas, are illustrated in Figure 6-12 below for the entirety of the GI Works locations.



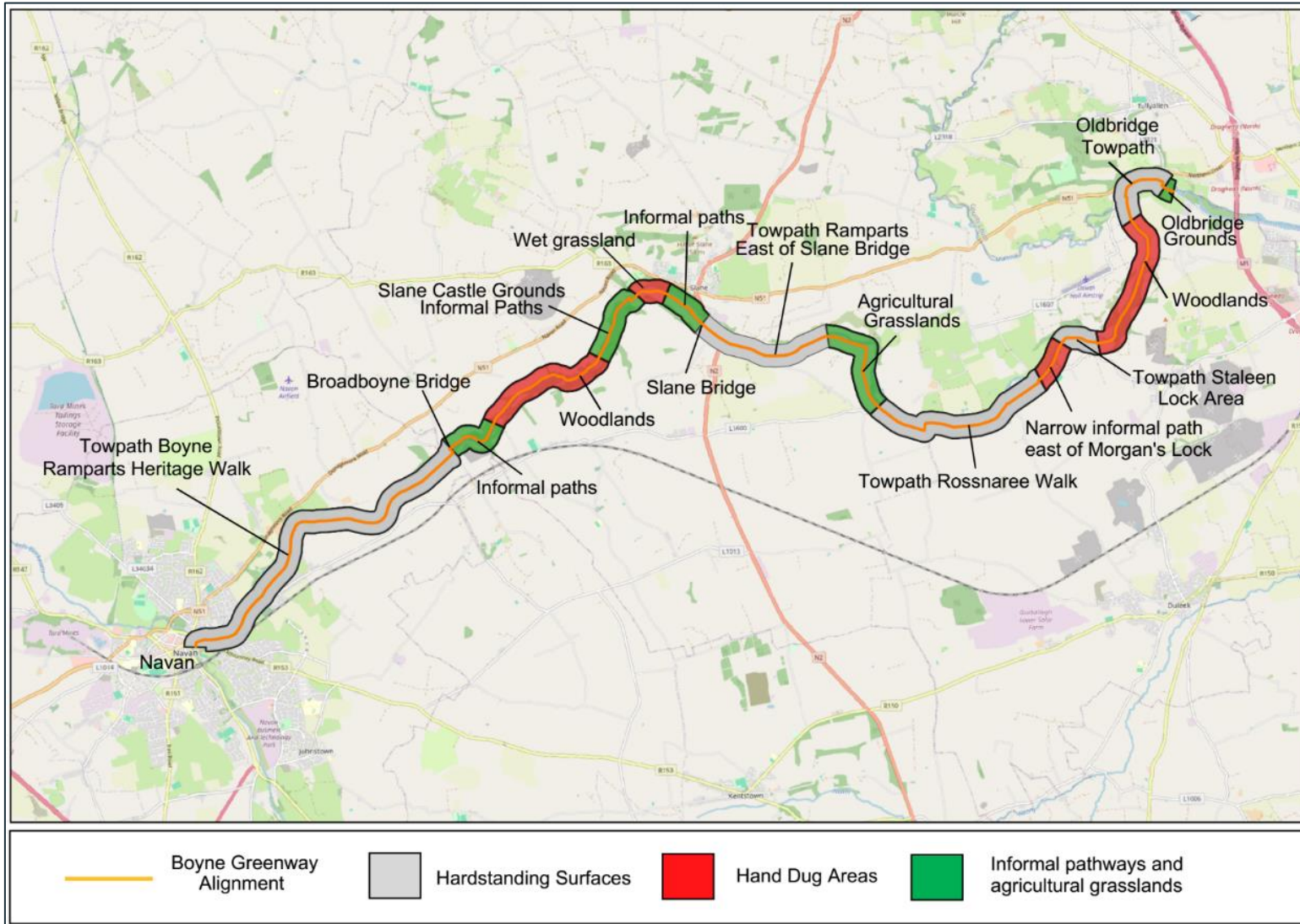


Figure 6-12 – Towpaths, informal pathways and hand dug areas.



## 6.3.4 River Boyne and River Blackwater SPA

### Overview

The following description is taken from the Site Synopsis (NPWS, 2010) and Conservation Objectives Document (NPWS, 2024).

*“The River Boyne and River Blackwater SPA is a long, linear site that comprises stretches of the River Boyne and several of its tributaries; most of the site is in Co. Meath, but it extends also into Cos Cavan, Louth and Westmeath. It includes the following river sections: the River Boyne from the M1 motorway bridge, west of Drogheda, to the junction with the Royal Canal, west of Longwood, Co Meath; the River Blackwater from its junction with the River Boyne in Navan to the junction with Lough Ramor in Co. Cavan; the Tremblestown River/Athboy River from the junction with the River Boyne at Kilnagross Bridge west of Trim to the bridge in Athboy, Co. Meath; the Stoneyford River from its junction with the River Boyne to Stonestown Bridge in Co. Westmeath; the River Deel from its junction with the River Boyne to Cumber Bridge, Co. Westmeath. The site includes the river channel and marginal vegetation. Most of the site is underlain by Carboniferous limestone but Silurian quartzite also occurs in the vicinity of Kells and Carboniferous shales and sandstones close to Trim. The site is a Special Protection Area (SPA) under the E.U. Birds Directive of special conservation interest for the following species: Kingfisher. A survey in 2010 recorded 19 pairs of Kingfisher (based on 15 probable and 4 possible territories) in the River Boyne and River Blackwater SPA. A survey conducted in 2008 recorded 20-22 Kingfisher territories within the SPA. Other species which occur within the site include Mute Swan (90), Teal (166), Mallard (219), Cormorant (36), Grey Heron (44), Moorhen (84), Snipe (32) and Sand Martin (553) – all figures are peak counts recorded during the 2010 survey.”*

### Qualifying Interests and Conservation Objectives

The River Boyne and River Blackwater SPA was selected for the following qualifying interests: -

- Kingfisher (*Alcedo atthis*) [A229]

The conservation objectives of the River Boyne and River Blackwater SPA are as follows (NPWS, 2024): -

- To maintain the Favourable conservation condition of Kingfisher in River Boyne and River Blackwater SPA

### Threats, Pressures and Activities

Table 6-2 lists the threats, pressures and activities with negative impacts on the site, as per its Natura 2000 Standard Data Form<sup>9</sup>.

**Table 6-3 - Threats, pressures, and activities with negative impacts on the River Boyne and River Blackwater SPA**

Rank	Threat, pressure or activity (code)	Threat, pressure or activity (description)	Inside, outside or both
H	E01.03	Dispersed habitation	o

<sup>9</sup> <https://natura2000.eea.europa.eu/Natura2000/SDF.aspx?site=IE0004232>



<b>Rank</b>	<b>Threat, pressure or activity (code)</b>	<b>Threat, pressure or activity (description)</b>	<b>Inside, outside or both</b>
H	D01.02	Roads, motorways	o
M	J02	Human induced changes in hydraulic conditions	i
H	E01	Urbanised areas, human habitation	o
H	D01.02	Roads, motorways	i





# 7. Identification of Adverse Effects

The identification of likely effects in this section follows the “source-pathway-receptor” model. According to this model, for an effect to exist, all three of the following criteria must be met: -

- Some aspect of the plan or project must act as a source of an impact,
- There must be a pathway capable of conveying the impact to a receptor, and
- The receptor must be sensitive to the impact.

Types of impacts likely to arise from the proposed project and their sources are described in Section 6, potential pathways for those impacts are described and illustrated in Sections 6.1 and 6.2 and receptors are described in Section 6.3. The following subsections detail the specific effects on each receptor and evaluate their significance in view of the relevant conservation objectives.

## 7.1.1 River Boyne and River Blackwater SAC

Potential adverse effects on the River Boyne and River Blackwater SAC are identified, in view of the conservation objectives of the site, in Table 7-1 below.

**Table 7-1 - Identification of impacts and evaluation of effects on the River Boyne and River Blackwater SAC**

Qualifying interest	Identification of potential adverse effects	Potential Adverse Effects
Alkaline fens	As per NPWS Conservation Objectives, this habitat occurs at least 21km west from the proposed project site. This habitat is hydrologically isolated from any potential impacts from the proposed project  Therefore, adverse effects on the conservation objectives for this qualifying interests can be ruled out at this stage.	No
Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> )	This habitat occurs at the eastern end of the proposed project route near Mary McAleese Bridge. Given the location, scale, and duration of the proposed GI Works, likely significant effects on the conservation objectives for this qualifying interests can be ruled out at this stage. It should be noted that any GI Works directly within riparian woodland habitat within the SAC only involves hand dug inspection pits which will have no effect on any woodland habitat irrespective of type.	No
<i>Lampetra fluviatilis</i> (River Lamprey)	The proposed project does not necessitate any in-stream works and as such there will be no direct impacts on River Lamprey or their habitat.  The potential for Lamprey to be disturbed or displaced by GI Works noise and vibration has been considered. The GI Works at 71 no. land based locations will generate no noise or vibration or very low noise and negligible vibration levels as follows; hand dug pits (no noise or vibration) and trial pits, foundation pits and slit trenches (mini digger – very levels of low noise and negligible vibration). As such there will be no likely significant disturbance or displacement effects on aquatic species from these GI Works.  The GI Works that will produce noise will be Borehole and Dynamic Probing mini rigs. There are 20 no. locations for Dynamic Probes (duration 30	Yes



Qualifying interest	Identification of potential adverse effects	Potential Adverse Effects
	<p>minutes) and 22 no. Boreholes (max duration 2 days). Whilst the likelihood of noise relate disturbance to aquatic species is considered to be extremely low, following a high precautionary approach, noise mitigation measures are outlined below.</p> <p>The potential for vibrations generated by the drilling of boreholes and dynamic probing to adversely affect aquatic species has also been considered. The drilling of bore holes and dynamic probing will utilise mini rigs, are based entirely on land and are of short duration and cannot produce vibration levels to the magnitude that could result in likely significant effects to any aquatic species given the nature of the work (drilling) size of the plant and the land based locations of these works.</p> <p>In the absence of mitigation measures, given the potential impacts to water quality at a localised scale, it is not possible to rule out potential indirect impacts to River Lamprey habitat. River Lamprey are known to inhabit the low reaches of the River Boyne where the proposed project is located. Given that 119 individual ground investigations are proposed, many of which are intrusive and located in close proximity to the River Boyne, the habitat of this species, likely significant impacts to water quality affecting this species habitat cannot be entirely ruled out. Mitigation measures for surface water protection are required and are prescribed below.</p>	
<i>Salmo salar</i> (Salmon)	<p>The proposed project does not necessitate any in-stream works and as such there will be no direct impacts on Salmon or their habitat.</p> <p>As detailed above the potential GI Works to cause noise relate disturbance effects to aquatic species is considered to be extremely low, however following a high precautionary approach, noise mitigation measures are outlined below. As outlined above, the GI Works cannot produce vibration levels that would lead to likely significant effects on the aquatic environment.</p> <p>In the absence of mitigation measures, given the potential impacts to water quality at a localised scale, it is not possible to rule out potential indirect impacts to salmonoid habitat. Atlantic salmon are known to inhabit the River Boyne, especially as they migrate upstream to spawning grounds. Given that 119 individual ground investigations are proposed, many of which are intrusive and located in close proximity to the habitat of this species, likely significant impacts to water quality affecting this species habitat cannot be entirely ruled out. Mitigation measures for surface water protection are required and are prescribed below.</p>	Yes
<i>Lutra lutra</i> (Otter)	<p>Extensive Otter surveys undertaken during 2023 and 2024 recorded a number of Otter holts and couch sites within the project site. The locations of the GI Works have been specifically developed so as to avoid known Otter refugia and all GI Works locations are greater than 150m from holts and couches. GI Works locations are located along formal and informal pathways and do not involve any works directly on the earth banks or the banks of any water feature. As such there will be no likely significant effects on Otter holts or their couch sites.</p>	Yes



Qualifying interest	Identification of potential adverse effects	Potential Adverse Effects
	<p>As detailed above there will be no noise or insignificant levels of noise at 71 no. GI Works locations. There are 42 no. GI Works locations where proposed works will produce noise and as such the potential for noise related disturbance to otters has been considered. The noise levels are of very short duration for 20 no. Dynamic Probing (30 mins) and relatively short duration for 22 no. of Boreholes (max. 2 days) and the proposed works will be undertaken during daylight hours and as otters are predominantly nocturnal the GI works will not likely disturb otters from feeding or commuting in the river. There are no works, noise generating or otherwise, within 150m of identified holts (as per NRA guidelines<sup>10</sup> for the treatment of otters) and as such there will be no likely significant disturbance effects to otters utilising their holts. Notwithstanding this and following a high precautionary approach, noise mitigation measures are outlined below.</p> <p>As detailed above, the GI Works will not produce any vibration levels of a magnitude that could cause likely significant effects to the aquatic environment accommodating otters nor can they produce an vibrations that could result in likely significant effects to otter within their holts as works have been designed to be greater than 150m from holts (as per NRA guidelines for the treatment of otters).</p> <p>In the absence of mitigation measures, given the potential impacts to water quality at a localised scale, it is not possible to rule out potential indirect impacts to riverine Otter habitat and their prey species. Otter are known to inhabit the low reaches the River Boyne where the proposed project is located. The Otter survey summarised in Section 5 provides evidence for otter habitat use directly within the proposed project site. Given that 119 individual ground investigations are proposed, many of which are intrusive and located within the habitat of this species, likely significant impacts to water quality which could potentially affect this species habitat cannot be entirely ruled out. Mitigation measures for surface water protection are required and are prescribed below.</p>	

<sup>10</sup> NRA, 2006b. Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes.



## 7.1.2 River Boyne and River Blackwater SPA

Potential adverse effects on the River Boyne and River Blackwater SPA are identified, in view of the conservation objectives of the site, in Table 7-2 below.

**Table 7-2 - Identification of impacts and evaluation of effects on the River Boyne and River Blackwater SPA**

Qualifying interest	Identification of potential adverse effects	Potential Adverse Effects
Kingfisher ( <i>Alcedo atthis</i> )	<p>Site surveys undertaken during 2023 and 2024 did not note any banks suitable for Kingfisher nesting along the alignment of the proposed Boyne Greenway. GI Works are not located within or near any suitable nesting habitat for Kingfisher. As such there will be no likely significant effects on Kingfisher nesting habitats.</p> <p>The works are occurring in numerous localised areas where the footprint of the works at any one location is very small with the largest being slit trenches ca. 3m long x 0.5 m wide of which there are 10 no. Also the duration of works at any one location is very short with the longest being 2 days for a borehole of which there are 22 no.</p> <p>Given the small works area and the short duration of works at any given location there will be no likely adverse effects in terms of disturbance or displacement of Kingfishers. Notwithstanding this, mitigation measures have been developed to further reduce any potential for noise disturbance effects.</p> <p>As noted above, in the absence of mitigation measures, there is the potential for water quality impacts as a result of the proposed project. Given that 119 individual ground investigations are proposed, many of which are intrusive and located adjacent to the River Boyne and tributaries, likely significant impacts to water quality affecting this species prey (fish) cannot be entirely ruled out. Mitigation measures for surface water protection are required and are prescribed below.</p>	Yes



## 7.2 AA Screening Conclusion

On the basis of objective information presented in Sections 4, 5, and 6, the evaluation in Section 7.1 has found that, in the absence of mitigation measures, there are potential water quality impacts as a result of the proposed project works which could give rise to likely significant effects on the Qualifying Interests species of the River Boyne and River Blackwater SAC and the Qualifying Interests species of the River Boyne and River Blackwater SPA.

The Qualifying Interests for which the possibility of adverse effects could not be excluded are as follows: -

- River Boyne and River Blackwater SAC; *River Lamprey, Salmon and Otter*
- River Boyne and River Blackwater SPA; *Kingfisher*

It is concluded by the author of this report that in the absence of additional measures, it is not possible to 'screen-out' likely significant effects on the Qualifying Interests species River Boyne and River Blackwater SAC and the River Boyne and River Blackwater SPA in view of their conservation objectives.

As the possibility of adverse effects on the above qualifying interests could not be ruled out, appropriate mitigation is required in order to avoid or reduce the impacts of the proposed GI Works on those qualifying interests such that they no longer represent adverse effects in view of the relevant conservation objectives.

In addition to the mitigatory measures developed for SAC and SPA QI species, additional mitigatory measures are also prescribed below to offset any potential effects on the non-qualifying interest habitats at GI Works locations.



# 8. Mitigation

## 8.1 Requirement and Approach

Section 7 of this NIS found that, in the absence of appropriate mitigation, the proposed works have the potential to adversely affect the conservation objectives for River Lamprey, Salmon and Otter in the River Boyne and River Blackwater SAC and Kingfisher in the River Boyne and River Blackwater SPA. The potential for such effects arises due to the risk of water quality impacts and potential disturbance to species. This section prescribes mitigation measures to address these impacts and, thereby, eliminate the possibility of adverse effects.

The development of the mitigation measures prescribed in this section has followed the “mitigation hierarchy”, which prioritises avoidance over reduction, and actions at source over pathway over receptor, as follows: -

1. Eliminate the source of the impact,
2. Minimise or reduce the impact at its source,
3. Block or weaken the pathway for effects, and
4. Abate effects at the receptor.

This approach assists with more complete removal of the effects, minimises the risk of effects occurring by less obvious pathways, also protects non-target receptors, and minimises the risks of unintended harm associated with measures focussed at or near the receptors.

## 8.2 Mitigation Measures

### 8.2.1 Design Phase

The following design phase mitigation measures have been included;

- The GI Works locations have been specifically developed so as to avoid working within watercourses (including the River Boyne, tributaries of the River Boyne, wetted canal sections, field drains and ditches).
- The GI Works locations have been specially developed so as to avoid known Otter habitats including holts and couches. No works are proposed within 150m of protected Otter habitats (holts and couches). Works will only be permitted during daylight hours when there will be no significant otter activity.
- The GI Works locations have been specially developed so as to avoid working directly on watercourse banks or earth banks so as not to affect any potential Kingfisher nesting habitat.
- The GI Works locations have been specifically developed to undertake works in areas where there is ease of access for plant and equipment. GI Works locations have been developed to ensure there will be no loss of hedges, trees or woodland habitat.
- Where access is restricted for plant and equipment, due to the narrow width of informal pathways, manual / hand dug inspection pits have been prescribed. No plant, e.g. excavators or mechanic drilling rigs etc., are



permitted within these restrictive areas (Refer to Section 6.3.3. and Appendix A & B for locations of hand dug inspection pits.)

- GI Works locations have been specifically developed so as to avoid known areas of legally restricted invasive plant species.

## 8.2.2 Works Phase

### GI Works Environmental Management Plan

The Contractor shall prepare an Environmental Management Plan (EMP) for the GI Works. The EMP will outline works methodologies and prescribed mitigation measures which will include (at minimum):- surface water protection measures, species protection measures, groundwater protection measures, habitat protection measures and invasive plant biosecurity measures.

The Contractor's CEMP will be reviewed and approved by the client; Meath County Council in advance of the GI Works. The EMP will include the prescribed mitigation measures detailed in this report which are outlined below. The EMP will be reviewed and approved by an Investigation Supervisor and Ecological Clerk of Works (details of these roles are presented below).

The Contractor shall strictly adhere to the EMP to ensure that there are no adverse effects to biodiversity, including to QIs for the River Boyne and River Blackwater SAC and River Boyne and River Blackwater SPA, from the works.

### Investigation Supervision

An Investigation Supervisor has been prescribed to oversee and supervise the Contractor appointed to undertake the GI Works. The Investigation Supervisor will monitor the works undertaken by the Contractor and the Investigation Supervisor will monitor the mitigation measures employed by the Contractor. The Investigation Supervisor has been appointed by the client; Meath County Council and is independent of the Contractor.

All Contractor works methodologies including, but not limited to, water quality protection measures, use of potentially contaminating materials, access routes, noise mitigation and vegetation management will be reviewed by the Investigation Supervisor prior to any GI Works. GI Works will only be undertaken by the Contractor following approval of the method statements by the Investigation Supervisor.

### Ecological Clerk of Works

An Ecological Clerk of Works (ECoW) will be appointed by the client Meath County Council and as such will be independent of the Contractor. The ECoW will be appointed in advance of the GI Works.

The ECoW will monitor the GI Works where surface water protection measures, species protection measures, groundwater protection measures, habitat protection measures and invasive plant biosecurity measures are prescribed in the Contractor's EMP and which are detailed in this report.

The ECoW will: -

- be a full member of a relevant environmental institute, such as the Chartered Institute of Ecology and Environmental Management (CIEEM), the Institute of Environmental Management, or equivalent; and
- have demonstrable experience with overseeing works in designated conservation sites.



In the EMP, which the Contractor will be required to adhere to, the Contractor will provide all necessary method statements to the ECoW to demonstrate how mitigation measures within this NIS will be implemented. Such method statements will include the installation and removal of silt control measures (silt fence, silt traps), disposal of any groundwater encountered, reinstatement of excavated areas and implementation of acoustic barriers etc.

The ECoW will be responsible for monitoring the Contractor, and (importantly) identifying to the Contractor any additional or refined mitigation measures (i.e., adaptive management measures required). The ECoW will concisely report the findings of monitoring, including any adaptive management measures recommended to the Contractor, and the effectiveness of same.

The ECoW will have the authority to ensure all mitigation measures are being implemented effectively and will have the authority to stop works activities if required. The Contractor will provide ECoW monitoring reports to the Client and Investigation Supervisor, and to prescribed bodies should they request reports.

The ECoW will monitor Met Éireann's weather forecast and will instruct the Contractor that works adjacent to the Boyne River are not be permitted within 24hrs of Met Éireann issuing a yellow, orange or red weather warning.

The Contractor will be responsible for the implementation of mitigation measures. In the unlikely event that the implemented measures are not performing effectively, emergency measures will be put in place e.g., bunding or spill kits and all works will cease immediately. Such measures are included in an Emergency Response Plan (ERP) which is included in the submitted CEMP which the Contractor will be required to adhere to. This will ensure that mitigation measures are responsive to unexpected issues that may arise on-site during the GI Works.

## Water Quality

The proposed GI works are located within the River Boyne and River Blackwater SAC and River Boyne and River Blackwater SPA. The following water quality mitigation measures have been developed so as to ensure there are no water quality impacts that could affect the qualifying interest species of the SAC and SPA;

- The Contractor will be required to provide details on proposed water containment and management measures for ground water encountered at any works location to ensure that no surface water run-off and / or fines / silt arising from the drilling works enters the adjacent River Boyne, SAC and SPA. The Contractor shall utilise silt fencing (Hytex Terrastop premium standard, or similar as agreed with the Investigation Supervisor) around works areas near watercourses.
- The Contractor shall identify all surface water features near works locations (including watercourses and ditches, which may be affected by the works) and no temporary discharge to these watercourses is permitted unless agreed in advance with the Investigation Supervisor. Any water for discharge shall pass through proprietary settling tanks to ensure suitable treatment. Only treated / settled waters shall be allowed to be temporarily discharged following agreement with the Investigation Supervisor and Local Authority (Meath County Council). All water for discharge shall pass through proprietary settling tanks resulting in suitable treatment as necessary. Any deficiencies shall be immediately repaired or work ceased.
- Should groundwater be encountered and the dewatering of excavations be required the Contractor will remove the groundwater generated from the dewatering process for offsite disposal by means of a mobile tank (Intermediate bulk containers, IBC tanks or similar) and no groundwater shall be discharged to any watercourse, field drain or ditch within the project site.
- The Contractor shall note that failure to provide suitable preventative measures to control surface water run-off and implement silt and pollution control measures on site could lead to prosecution under the Local Government (Water Pollution) Acts 1977 and 1990 and the Water Services Act 2007 to 2013 and the Protection of the Environment Act 2003.





- The Investigation Supervisor's approval for discharges will be required and the Investigation Supervisor can suspend work until adequate pollution prevention measures have been carried out. Notwithstanding this, approval or otherwise of any method statement shall not absolve the Contractor of any of his duties in relation to the above Environmental Considerations.
- The Contractor shall develop an Emergency Response Plan prior to works. Emergency spill kits will be available on site and staff will be trained in their use. In the event of an accidental spillage of any polluting substance and/or pollution of any surface water features, the Contractor must notify the Investigation Supervisor and Local Authority's immediately by telephone. In this regard, it should be noted that Local Authorities can be contacted on a 24-hour basis.
- Materials which may cause pollution shall not be stored near surface water features (within 50m) nor shall they be stored in such a manner that they may fall or be carried into surface water features. All waste materials, refuse or debris arising from the works site in the vicinity of surface water features shall be collected and removed as required so that none may fall or be carried into the surface water features.
- Construction plant washing facilities (including wheel washes) shall be designed to operate on total recirculation wherever possible. Where this cannot be achieved, the disposal of wash water to any Controlled Waters shall not take place without adequate settlement and oil removal prior to discharge. The Contractor will require the Investigation Supervisor's approval for such discharges.
- Borehole drilling or other ground investigations can produce a polluting effluent, which must be subject to treatment / settlement before any discharge. The Local Authority must be advised by the Contractor of the mitigation measures to be taken to prevent pollution before the commencement of any such operations liable to give rise to an effluent. All mitigation measures proposed to be employed must be approved by the Investigation Supervisor and ECoW in advance of any works.

### Noise Barriers

At GI Works locations for the 22 no. Boreholes and 20 no. Dynamic Probes the Contractor shall install temporary noise barriers.

The Contractor shall install the following or similar;

- Temporary Heras Fence Acoustic Noise Barriers <https://tradefence.ie/products/temporary-fence-acoustic-noise-barrier>

The noise barriers shall be installed so as to deflect and dampen noise emanating from works areas towards the river corridor of the River Boyne.

The installation of the noise barriers will be supervised by the ECoW who will provide recommendations where necessary.

The noise barriers shall stay in situ for the duration of the works.

### Hydrocarbon Pollution

The following mitigation measures are prescribed for the use of hydrocarbons (fuels, oils etc.) required for plant and equipment;

- The Contractor must ensure that oil is stored a minimum of 50m from any drain or surface water feature. Oil storage tanks must be located on an impermeable base and be surrounded by an impervious bund with no



surface water outlet. The bund must be capable of retaining at least 110% of the volume of the tanks. Biodegradable oils and fuels will be used where possible.

- Drip trays will be placed underneath any standing machinery to prevent pollution by oil/fuel leaks. Where practicable, refuelling of vehicles and machinery will be carried out off site. If refuelling takes place on site, it will be carried out on an impermeable surface in a designated and bunded area a minimum of 50m from any waterbody or drain.
- All temporary construction fuel tanks will also be located in a suitably bunded area and all tanks will be double skinned. Relevant Material Safety Data Sheets along with oil absorbent materials will be kept on Site in close proximity to any fuel storage tanks or bowsers during proposed Site development works.
- The Contractor shall develop an Emergency Response Plan prior to works. Emergency spill kits will be available on site and staff will be trained in their use.
- Operators will check their vehicles on a daily basis before starting work to confirm the absence of leakages. Any leakages shall be reported immediately.
- Daily checks will be carried out and records kept on a weekly basis and any items that have been repaired/replaced/rejected noted and recorded. Any items of plant machinery found to be defective will be removed from site immediately or positioned in a place of safety until such time that it can be removed. All items of plant will be checked prior to use before each shift for signs of wear/damage.
- Valves and couplings connected to oil storage tanks must be located within the bund and delivery hoses should be fitted with trigger-type handles suspended back within the bund after use. Valves and trigger filler handles must be kept padlocked when not in use.
- The transportation of fuel and oil across the site in drums or other containers must be avoided as far as practicable. Where this is unavoidable, extreme caution must be taken to avoid spillages or leaks. The Contractor shall hold adequate stocks of oil absorbent and containment materials on site (e.g. spill kits, absorbent pads, containment booms). The Contractor must ensure that relevant staff are familiar with the use of these materials.
- Surface water, together with any material which accumulates within the storage tank bund, must be removed by means of a mutually controlled positive lift pump. Oil-contaminated water must be disposed of at an appropriate licensed waste facility or oil recovery plant.
- The Contractor shall ensure that personnel are nominated as being responsible for the supervision of the filling of oil storage tanks, vehicles etc. and that a "Nominated Person" is available at all appropriate times. Diesel pumps, generators and similar equipment shall be placed on drip trays to collect minor spillages or leaks.
- Mobile fuel and lubricant servicing units must be provided with appropriate quality delivery hoses with trigger-type delivery nozzles. These vehicles, when not in use must be parked in a secure area within an impermeable bund. Vehicles and plant must not be refuelled near drains or surface water feature. Oil-powered pumps, generators and the like shall be positioned on impervious drip trays surrounded by earth or sand bunds and located at least 10 metres from any surface water feature. The use of such plant adjacent to Controlled Waters is not permitted and the disposal of waste oil/oily waters from the drip trays must be to an appropriate licensed waste facility or oil recovery plant.
- The Contractor shall take all reasonable measures to ensure the security of his oil storage facilities from acts of wilful damage or vandalism.



- Procedures are to be put in place to ensure the identification, remediation and correct reporting of any fuel, oil, chemical or other pollution incidents that may occur.

## Concrete Works

There is one location where underground concrete may be encountered namely on Broadboyne Bridge. Encountering concrete is not considered likely but should small amounts be encountered it will need to be reinstated post-ground investigations. The following mitigation measures are prescribed;

- If grout pumps or concrete mixing is to occur on site, all washings will be carried out in the designated area 50m from a waterbody, such as in a lined bunded compound area. At no point will such equipment be washed out at the worksite or adjacent to a waterbody or drain.
- Cement, grout and unset concrete (unless specialist products as approved by the Investigation Supervisor are used) must not be allowed to enter any surface water feature.
- The Contractor must ensure that drainage from excavations where concrete is being, or has been, newly poured shall not be pumped or allowed to issue directly into surface water feature without the prior approval of Local Authority and the Investigation Supervisor and appropriate treatment.
- Tools and equipment must not be washed in any surface water feature. If it is necessary to wash equipment on site, this must be done away from surface water feature and wash water must not be discharged directly into surface water feature or road drains without appropriate treatment.
- The Contractor must ensure that if concrete has to be sprayed in the vicinity of a surface water feature, suitable protective sheeting is provided to prevent rebounded or windblown concrete from entering into surface water feature. Rebounded material must be cleared away before sheeting is removed.
- The direct discharge from any concrete batching plant to any surface water feature will not be permitted. Subject to consultation and agreement with the Investigation Supervisor a discharge to a soakaway may be permissible.

## Vegetation Clearance

- For any trial pits, foundation pits and/or slit trenches that are outside of hardstanding areas (outside of gravelled towpaths) and which are located along informal pathways (Refer to Section 6.3.3. for these areas) the Contractor shall salvage the grass swards in the areas to be excavated and shall reinstate the grass swards upon completion of works and hole infill. The reinstatement of surface vegetation will be monitored by the ECoW and will be noted in the ECoW reporting to the Client. Note; hand dug inspection pits and 20cm diameter boreholes/probe holes are not included for surface vegetation salvage.
- The site investigation works locations have been designed and located so as to avoid any loss of trees or woodland habitat.
- Any removal of vegetation required to facilitate access to works locations (such as small / thin overhanging branches or ground cover vegetation along pathway edges) shall only be permitted subject to the area being surveyed by the ECoW and approved by the ECoW.
- Any vegetation clearance required to facilitate access and/or works shall be kept to an absolute minimum.
- Any vegetation clearance shall not be permitted with bird nesting season - March 1<sup>st</sup> to August 31<sup>st</sup> inclusive.



## Biosecurity Mitigation Measures

- Given the risk of invasive species (such as Himalayan balsam) growing in the vicinity of the River Boyne, the Contractor will be required to carry out an invasive species survey (undertaken by suitably qualified personnel) at each proposed works location and access / egress routes to each location, in advance of commencing the site works. The Contractor will be obliged to inform the Client of the presence of any invasive species and the exploratory hole locations or access routes shall be amended as required to ensure that there is no interaction with invasive plant species and the site works does not result in the spread of invasive species.
- All equipment intended to be used at the site shall be dry, clean and free from debris prior to being brought to site.
- For the duration of the proposed project, if equipment is removed off-site to be used elsewhere, the said equipment shall be cleaned and free of debris prior to being brought back to the works area of the proposed project.
- Appropriate facilities shall be used for the containment, collection, and disposal of material and/or water resulting from washing facilities of vehicles, equipment and personnel.
- Any importation of materials and works shall comply with Regulation 49 of the EC (Birds and Natural Habitats) Regulations 2011.
- Circa 1 year post completion of works the ECoW shall inspect all the locations of disturbed ground at completed trial pits, foundation pits and/or slit trenches that are outside of hardstanding areas (gravelled towpaths) and which are located along informal pathways (Refer to Section 6.3.3. for these areas) as well as access to these locations. The aim of the inspections will be to determine if any invasive plant species have established at these GI Works locations or access routes. The ECoW will present inspection findings to the Client and any necessary biosecurity measures should they be required. Note; hand dug inspection pits and 20cm diameter boreholes/probe holes are not included for invasive plant species inspection.

## Excavations

- All waste on site, including soil, made ground or subsoil, will be segregated into appropriate categories, i.e., inert, non-hazardous and hazardous, according to EPA waste classifications (EPA, 2018) and disposed of by an appropriate EPA or Local Authority approved waste management contractor.
- Light weight / low ground pressure plant and equipment will be utilised at GI Works locations where there are no hard surfaces / formalised pathways.
- Any encountered made ground / waste soil requiring offsite disposal will also be transported and disposed of in accordance with all relevant waste management legislation. Any temporary stockpiles of excavated materials from trial pits awaiting removal from the project site will be covered and surrounded by silt fencing to prevent potential silt laden run off. All waste soils / material removed from site will need to be classified in accordance with EPA guidelines (2018)<sup>11</sup> oils testing will be required; the results of which should inform the preparation of a waste classification tool (to determine the appropriate List of Waste (LoW) code), and then screened against relevant waste acceptance criteria to determine the appropriate regulated disposal / recovery facility for each waste stream. All waste will be segregated and removed from site for disposal or recycling, in accordance with all relevant Waste Management Legislation.

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<sup>11</sup> <https://www.epa.ie/publications/monitoring--assessment/waste/national-waste-statistics/2019--FULL-template.pdf>



## Other Mitigation Measures

- The Contractor shall take suitable precautionary measures as agreed with the Investigation Supervisor and ECoW to prevent any material from falling into any surface water feature when works are being carried out near surface water features.
- The Contractor shall provide to Waterways Ireland and the Local Authority in advance of the commencement of the Works the names of responsible personnel on site together with 24-hour contact telephone numbers.
- The Contractor shall provide specific nuisance control measures to limit dust as required.
- The Contractor shall adhere to guidance documents for the protection of the environment during the construction phase as outlined by Transport Infrastructure Ireland in guidance publications; <https://www.tii.ie/en/technical-services/environment/construction/>



## 8.3 Assessment of Residual Effects

Given the full and proper implementation of the mitigation prescribed in this section, the potential for residual impacts and effects from the proposed works can be summarised as follows: -

- The probability and likely magnitude, extent and duration of any water quality impacts from the proposed works have been reduced such that they will not result in adverse effects on River Lamprey, Salmon, Otters or Kingfishers.
- In particular the likely magnitude of any potential water quality impacts has been reduced to low and any duration has been reduced to brief or temporary.
- The design of the proposed GI Works will ensure that there is no adverse effects on Otter or Kingfisher refugia or the aquatic environment or habitats suitable for accommodating Otters and Kingfishers.
- The design of the proposed GI Works will ensure that there is no change to the substratum composition (particle size distribution) of the riverbed of the River Boyne, either directly or indirectly, and therefore there will be no loss of suitable spawning gravels for salmonids.
- The mitigation measures ensure that there will be no likely significant disturbance or displacement effects to Otters, Kingfishers, Salmon or Lamprey.
- The mitigation measures ensure that there will be no permanent or temporary barrier to connectivity for Otter, Kingfishers, Salmon or Lamprey moving along the river or riparian corridor through the works areas.

Thus, the mitigation prescribed in Section 8.2 has successfully addressed all of the potential impacts from the proposed GI Works such that they no longer represent a risk of adverse effects on any of the qualifying interests concerned, in view of their conservation objectives.



# 9. Potential In-combination Effects

## 9.1.1 Requirement for Assessment

The requirement for AA arising out of Article 6(3) of the Habitats Directive covers plans and projects that, “*either individually or in combination with other plans or projects*”, are likely to have a significant effect on one or more Natura 2000 sites. This means that AA is required for any plan or project that, in combination with other plans or projects, would have a significant effect on one or more Natura 2000 sites, irrespective of the presence or absence of such effects from that plan or project on its own. Therefore, regardless of the significance of the effects of the plan or project individually, the potential for significant effects in combination with other plans and projects must be considered in all cases.

## 9.1.2 Approach and Methodology

The objective of this requirement is to capture significant effects potentially arising from the cumulation or other interaction of non-significant effects from multiple plans and projects. Consequently, the assessment of potential in-combination effects is not a pair-wise assessment, rather, it considers the totality of the effects arising from all plans and projects affecting the Natura 2000 site(s) in question. In identifying the plans and projects to be included in this assessment, it is important to define an appropriate geographical scope and timescale over which potential in-combination effects are to be considered and the sources of information to be consulted, as described below. It is also important to consider the nature of the interactions between effects, which may be additive, antagonistic, synergistic or complex.

## 9.1.3 Geographical Scope

In defining the geographical scope for identifying potential in-combination effects, it is important to remember that effects are evaluated in view of the conservation objectives of the Natura 2000 site(s) concerned. As such, two or more effects relating to the same conservation objective for a given Natura 2000 site would combine even if their geographical extents did not overlap. For example, the loss of a small area of an Annex I habitat type listed as a qualifying interest of a Natura 2000 site would combine with the loss of an entirely unconnected area of the same habitat type from a remote part of the same site to produce an in-combination effect, the significance of which would need to be evaluated in view of the relevant conservation objective. On that basis, the scope of the assessment of in-combination effects extends to all plans and projects affecting the same conservation objectives as the plan or project under consideration, irrespective of whether those effects are significant or not.

In this case, however, given the scale of the proposed project and sensitivities of the Natura 2000 sites in its Zol, it was deemed most appropriate to include areas in close proximity to the proposed project and its Zol (as described in Section 5.1) within the geographical scope for identifying potential in-combination effects

## 9.1.4 Timescale

The timescale over which potential in-combination effects were considered in this case covered plans and projects from 5 years ago (i.e. 2019) to the present and all reasonably foreseeable future plans and projects, i.e. published draft plans and projects which are already in the planning system or have received planning permission.



## 9.1.5 Sources of Information

The following sources of information were consulted to gather information on other plans and projects:

- Meath County Council Planning Data viewed through;  
<https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=9cf2a09799d74d8e9316a3d3a4d3a8de>
- An Bord Pleanála Planning Applications viewed through;  
<https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=d7d5a3d48f104ecbb206e7e5f84b71f1>
- Meath Development Plan 2021-2027<sup>12</sup>
- Transport Infrastructure Ireland<sup>13</sup>
- Irish Water<sup>14</sup>

The threats, pressures and activities with negative impacts on the above SACs and SPAs were used to identify plans and projects which, by their nature, are likely to give rise to potential impacts on the sites concerned.

## 9.1.6 Assessment

Meath County Development Plan (CDP) sets out policies and objectives for the development of the county. The CDP aims to promote the sustainable development and improvement of the economic, environmental, cultural and social aspects of County Meath. The CDP also requires that any developments must be subject to AA process and that permitted developments comply with the requirements of the WFD, the relevant River Basin Management Plans and the Habitats Directive. A Strategic Environmental Assessment (SEA) was prepared for the CDP and it went through the AA process. The findings of which were integrated into the objectives of the CDP resulting in a plan that affords high levels of protection to the environment and Natura 2000 sites.

A review of Transport Infrastructure Ireland (TII) publicly available planned projects<sup>15</sup> did not identify any major road projects with connectivity to the proposed project.

A review of Uisce Éireann (Irish Water) projects<sup>16</sup> identified 1 water project in the vicinity of the proposed project which is detailed in Table 9-1 below.

A search of Meath County Council planning and An Bord Pleanála planning applications has been undertaken for applications submitted within the last 5 years in the vicinity the proposed project (last accessed 19/06/2024). Near the proposed works, projects that have been granted planning permission include retention of existing developments, typical extensions to domestic dwellings or the construction of new domestic dwellings. Regarding potential impacts to water quality, these projects will have to comply with the EPA's *Code of Practice for Domestic Wastewater Treatment Systems* (EPA, 2021). These developments have conditions attached to their planning permission relating to sustainable development, such as siting of septic tanks, foul surface water and effluent drainage facilities, and clean surface water run-off drainage facilities. Therefore, it is not anticipated that the developments that have been granted permission will have any significant effects in combination with the proposed project.

Key developments which shall be considered are large-scale developments in the region of the proposed project, there are 15 no. of these developments which have been further assessed in terms of in-combination effects with the proposed project and are presented in Table 9-1 below.

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<sup>12</sup> <https://consult.meath.ie/en/consultation/consolidated-meath-county-development-plan-2021-2027-incl-variations-1-2>

<sup>13</sup> <https://www.tii.ie/projects/>

<sup>14</sup> <https://www.water.ie/projects/>

<sup>15</sup> <https://www.tii.ie/public-transport/projects-and-improvements/>

<sup>16</sup> <https://www.water.ie/projects/?map=our-projects&id=627>





It is considered that there are no An Bord Pleanála or Council approved developments or projects that will act in combination with the proposed project to give rise to significant in-combination effects on the Qualifying Interests of the River Boyne and River Blackwater SAC or the River Boyne and River Blackwater SPA.



**Table 9-1 - Planning applications near the proposed project**

<b>Ref. No.</b>	<b>Project / Applicant</b>	<b>Project Summary</b>	<b>In-combination Assessment</b>
Meath CC Ref: 2460066	Uisce Éireann	The development will consist of a new wastewater pumping station that discharges to the inlet pipework of the Navan WWTP via two new rising main sewerage pipes.	A Natura Impact Statement has been developed for this project with the following conclusion: “the proposed development, either individually or in combination with other plans or projects, will not have any adverse effects on the integrity of any European site(s), given the implementation of mitigation measures outlined.” – Flynn Furney Environmental Consultants Based on the scale and nature of this project, in-combination effects associated with the proposed project on the receiving environment will not occur.
Meath CC Ref: 23458	EirGrid PLC	The proposed development will consist of an uprate of the existing Gorman to Platin 110 kV Overhead line (OHL) (19.76 km long and comprising 109no. supporting structures between the existing Gorman substation in the townland of Causetown, Co. Meath and the existing Platin 110kV substation in the townland of Platin, Co. Meath)	A Natura Impact Statement has been developed for this project with the following conclusion: “it has been concluded by the authors of this report that there will be no adverse effects on the integrity of the River Boyne and River Blackwater SAC, River Boyne and River Blackwater SPA, River Nanny Estuary and Shore SPA, Boyne Coast and Estuary SAC and Boyne Estuary SPA, or any other European site either alone or in-combination with other plans or projects.” - Atkins Based on the scale and nature of this project, in-combination effects associated with the proposed project on the receiving environment will not occur.
Meath CC Ref: 2360296	EirGrid PLC	EirGrid PLC, with the consent and approval of the Electricity Supply Board (ESB), intends to apply to Meath County Council for permission for works associated with the proposed uprate of the existing Louth – Woodland 220	A Natura Impact Statement has been developed for this project with the following conclusion: “Therefore, it can be concluded beyond reasonable scientific doubt that the Proposed Development, both alone and in combination with other



		kV overhead powerline (OHL) between the existing Louth 220 kV substation in the townland of Monavallet, County Louth and the existing Woodland 220 kV substation in the townland of Woodland, County Meath.	developments, will not adversely affect the integrity of any of the European sites concerned” - WSP Based on the scale and nature of this project, in-combination effects associated with the proposed project on the receiving environment will not occur.
Meath CC Ref: 211046	Albert Developments Ltd	the development (Phase 1A) will consist of the demolition of existing agricultural structures (c. 530sqm) and the construction of 98 no. residential units comprising 41 no. houses, 23 no. apartments, and 24 no. duplex apartments, and associated ancillary facilities.	A Natura Impact Statement has been developed for this project with the following conclusion: “in view of the conservation objectives of the site and in view of best scientific knowledge the project, alone or in combination with other projects, will not adversely affect the integrity of the River Boyne and River Blackwater SAC.” – Openfield Ecological Services Based on the scale and nature of this project, in-combination effects associated with the proposed project on the receiving environment will not occur.
Meath CC Ref: 22395	Glenveagh Homes Ltd	the construction of: 36 no. sheltered housing units, carparking and communal spaces	A Natura Impact Statement has been developed for this project with the following conclusion: “it can be clearly demonstrated that no elements of the project (subject to appropriate mitigation measures) will result in any effect on the integrity or Qualifying Interests/Special Conservation Interests of any relevant European site, either on their own in-combination with other plans or projects, in light of their conservation objectives.” – BioSphere Environmental Services Based on the scale and nature of this project, in-combination effects associated with the proposed project on the receiving environment will not occur.
Meath CC Ref: 22924	Glenveagh Homes Ltd	LARGE SCALE RESIDENTIAL DEVELOPMENT for the construction of 138 no. residential units	A Natura Impact Statement has been developed for this project with the following conclusion: “...the proposed development will not have any significant effects on any Natura 2000 site, as required under Article 6(3) of the Habitats Directive (92/43/EEC)” – bec Consultants



			Based on the scale and nature of this project, in-combination effects associated with the proposed project on the receiving environment will not occur.
Meath CC Ref: SH306021	Coindale Limited	The construction of a residential development of 544 no. dwellings, 2 no. creches & open space areas	A Natura Impact Statement has been developed for this project with the following conclusion: “With the implementation of these measures no adverse effects to the integrity of the SAC will occur. This conclusion is based on best scientific knowledge.” – Openfield Ecological Services Based on the scale and nature of this project, in-combination effects associated with the proposed project on the receiving environment will not occur.
Meath CC Ref: SH305552	Trailford Ltd	demolition of existing farm buildings/structures (1160sqm) on site; (ii) construction of 661 no. residential dwellings and a neighbourhood centre adjacent to the site’s eastern boundary, consisting of a childcare facility (486sqm), café (63sqm) and retail unit (318sqm); (iii) a 4-arm signalised junction and works to Rathmullan Road,	A Natura Impact Statement has been developed for this project with the following conclusion: “In conclusion, in the light of the best scientific knowledge, it is concluded that no reasonable scientific doubt remains as to the absence of adverse effects from the proposed development on any European site.” – Scott Cawley Based on the scale and nature of this project, in-combination effects associated with the proposed project on the receiving environment will not occur.
Meath CC Ref: 211669	Glenveagh Homes Ltd	the construction of 96 no. dwellings consisting of 4 no. one-bed apartments, 6 No.2 bedroom two storey terraced dwellings, and 83 no. 3 bedroom terraced and semi-detached dwellings	A Natura Impact Statement has been developed for this project with the following conclusion: “As a result, I conclude that the proposed development will not adversely affect the integrity of any Natura 2000 sites, and that the local authority will not need to proceed beyond this Stage 2 of the Appropriate Assessment process.” – Meehan Ecology Based on the scale and nature of this project, in-combination effects associated with the proposed project on the receiving environment will not occur.



Meath CC Ref: 21424	Dawn Meats Ireland	The development consists of the construction of an extension to an existing wastewater treatment plant (WWTP)	<p>A Natura Impact Statement has been developed for this project with the following conclusion:</p> <p>“it can be concluded, beyond all reasonable scientific doubt, that the Project, either alone or in combination with other plans and projects will not undermine the conservation objectives of any European Sites and therefore would not have an adverse effect on the integrity of any European sites, in view of the sites’ conservation objectives and best scientific knowledges” – Panther Environmental Solutions Ltd.</p> <p>Based on the scale and nature of this project, in-combination effects associated with the proposed project on the receiving environment will not occur.</p>
ABP Planning Ref: 315410	Meath County Council	Development at the former Spicer's Bakery (Registered Protected Structure), the Ramparts car park and Andy Brennan Park	<p>A Natura Impact Statement has been developed for this project with the following conclusion:</p> <p>“it has been submitted that no adverse effects on the integrity of the European sites will occur in light of the conservation objectives of those sites.” – Inspectors Report</p> <p>Based on the scale and nature of this project, in-combination effects associated with the proposed project on the receiving environment will not occur.</p>
ABP Planning Ref: JP17.309332	Meath County Council	2 no. 4-storey apartment blocks, 8 no. 3-storey Duplex Units and 10 no. 2-storey semi-detached units	<p>A Natura Impact Statement has been developed for this project with the following conclusion:</p> <p>“it has been ascertained that the proposed development, individually or in combination with other plans or projects would not adversely affect the integrity of the European sites River Boyne and River Blackwater SAC and River Boyne and River Blackwater SPA, or any other European site, in view of the sites’ Conservation Objectives.” Inspectors Report</p> <p>Based on the scale and nature of this project, in-combination effects associated with the proposed project on the receiving environment will not occur.</p>



ABP Planning Ref: TA15.311678	Loughdale Properties Ltd.	237 no. residential units (86 no. houses, 151 no. apartments), creche and associated site works.	<p>A Natura Impact Statement has been developed for this project with the following conclusion:</p> <p>“the proposed development, by itself or in combination with other plans or projects, would not adversely affect the integrity of European Sites in view of the sites’ conservation objectives.” – Inspectors Report</p> <p>Based on the scale and nature of this project, in-combination effects associated with the proposed project on the receiving environment will not occur</p>
ABP Planning Ref: JP15.308226	Louth County Council	Refurbishment of Obelisk Bridge, Co. Louth	<p>A Natura Impact Statement has been developed for this project with the following conclusion:</p> <p>“it has been ascertained that the proposed development, individually or in combination with other plans or projects would not adversely affect the integrity of the River Boyne &amp; River Blackwater cSAC (002299), the River Boyne and River Blackwater SPA (004232), Boyne Coast and Estuary cSAC (001957), or Boyne Estuary SPA (004080), or any other European site, in view of the site’s Conservation Objectives” – Inspectors Report</p> <p>Based on the scale and nature of this project, in-combination effects associated with the proposed project on the receiving environment will not occur</p>
ABP Planning Ref: HA17.307434	Meath County Council	The construction of a new distributor road approximately 1.15km of single carriageway together with all ancillary and consequential works. It comprises an urban Arterial Street, incorporating both footpath and cycle path provisions, and a bridge traversing the River Blackwater.	<p>A Natura Impact Statement has been developed for this project with the following conclusion:</p> <p>“Following implementation of mitigation measures, the Proposed Development, individually and/or in combination with other plans and projects, will not adversely affect the integrity of any European site.” - Aecom</p> <p>Based on the scale and nature of this project, in-combination effects associated with the proposed project on the receiving environment will not occur</p>



# 10. Conclusions

This NIS has examined the details of the proposed Ground Investigation Works along the alignment of the proposed Boyne greenway, Co. Meath and the Natura 2000 sites in their Zone of Influence. It has analysed the potential impacts of the proposed GI Works on the receiving natural environment and evaluated their effects, both individually and in combination with other plans and projects, in view of the conservation objectives of the relevant Natura 2000 sites. This report has been prepared in line with the Habitats Directive, as transposed into Irish law by the Habitats Regulations, relevant case law and guidance from the European Commission, the Department of the Environment, Heritage and Local Government and the Office of the Planning Regulator, on the basis of objective information and adhering to the precautionary principle.

Given the mitigation measures detailed in Section 8 of this NIS, it can be concluded beyond reasonable scientific doubt that the proposed GI Works will not, either individually or in combination with other plans or projects, give rise to any impacts which would constitute adverse effects on the River Boyne and River Blackwater SAC or the River Boyne and Blackwater SPA or any other Natura 2000 site, in view of their conservation objectives. Therefore, it is the recommendation of the authors of this report that Meath County Council, as the competent authority in this case, may determine that the proposed works, either individually or in combination with other plans or projects, will not adversely affect the integrity of any Natura 2000 site, provided that the mitigation prescribed in this NIS is fully and properly implemented.



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Planning and Development Regulations, 2001. *S.I. No. 600/2001* (as amended). *Unofficial consolidation (updated January 2024)* <<https://www.gov.ie/pdf/?file=https://assets.gov.ie/135619/1ef55833-465c-48da-afc0-592a164fdd1d.pdf>> [accessed 15/02/2024]. Department of Housing, Local Government and Heritage, Dublin.

Planning and Development (Amendment) (No. 2) Regulations, 2011. *S.I. No. 454/2011*.

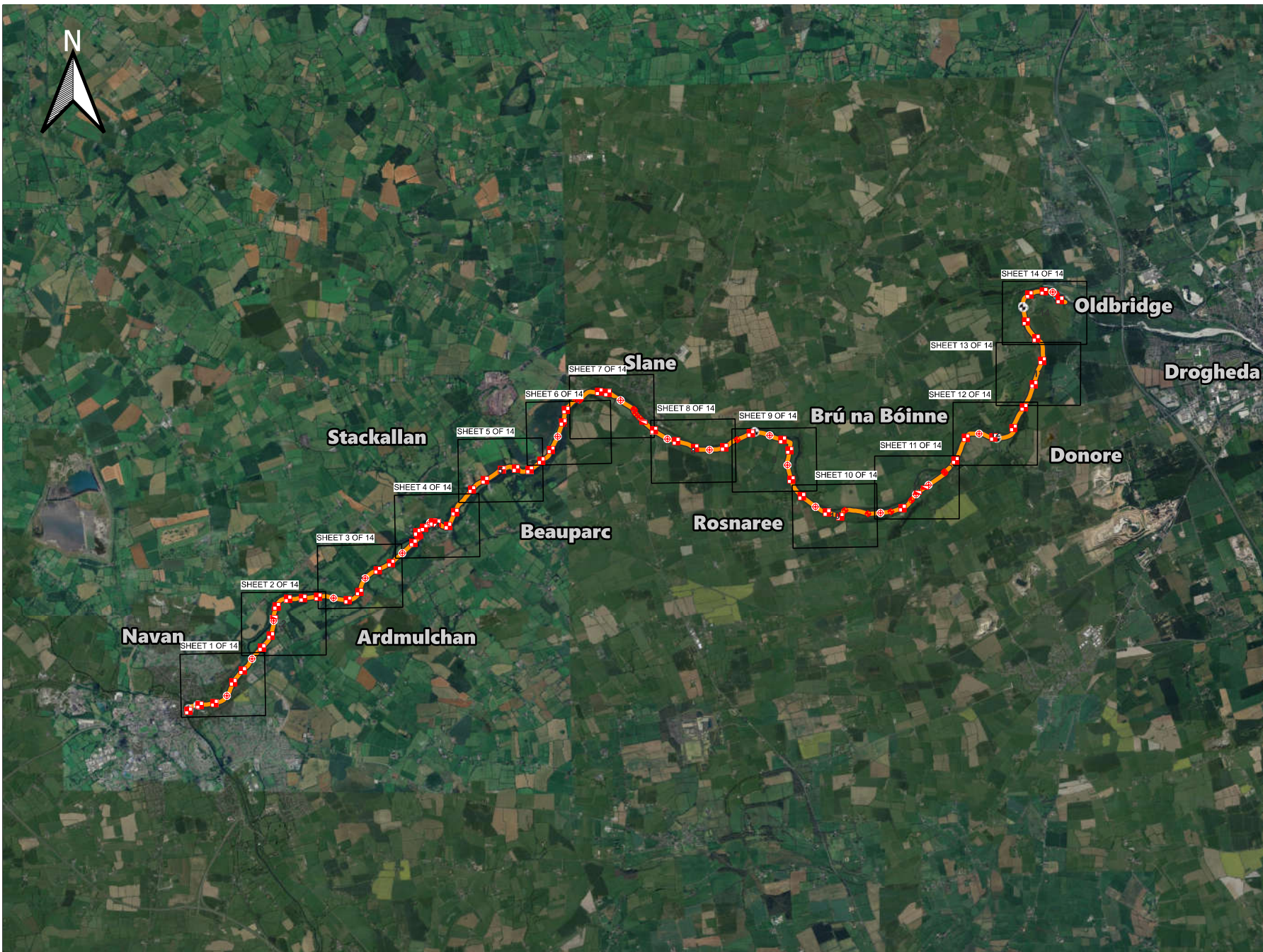
Scott Wilson and Levett-Therivel, (2006). *Appropriate Assessment of Plans*. Scott Wilson, Levett-Therivel Sustainability Consultants, Treweek Environmental Consultants and Land Use Consultants.

Wildlife Act, 1976. *No. 39 of 1976* (as amended). In: *Revised Acts* <<http://revisedacts.lawreform.ie/eli/1976/act/39/revised/en/html>> [accessed 15/02/2024]. Law Reform Commission, Dublin.



# Appendix A. Ground Investigation Works Location Drawings





**LEGEND**

- PREFERRED ROUTE
- GEOPHYSICAL SURVEY LINES
- ⊕ BOREHOLE (BH)
- ⊕ DYNAMIC PROBE (DP)
- ⊕ SLIT TRENCH (ST)
- ⊕ TRIAL PIT (TP)
- ⊕ FOUNDATION PIT (FP)

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**DRAWING NOTES:**

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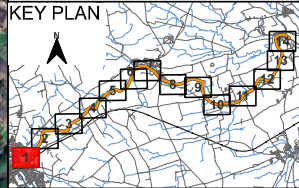
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Client		MEATH COUNTY COUNCIL		Title		EXPLORATORY HOLE LOCATION OVERALL PLAN	
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Status	I	Drawing Number	5197347-ATK-ZZ-ZZ-SK-C-000100	Checked	CB	Authorised	CF
Rev	3	Date	09/07/2024	Date	07/2024	Date	09/07/2024



**LEGEND**

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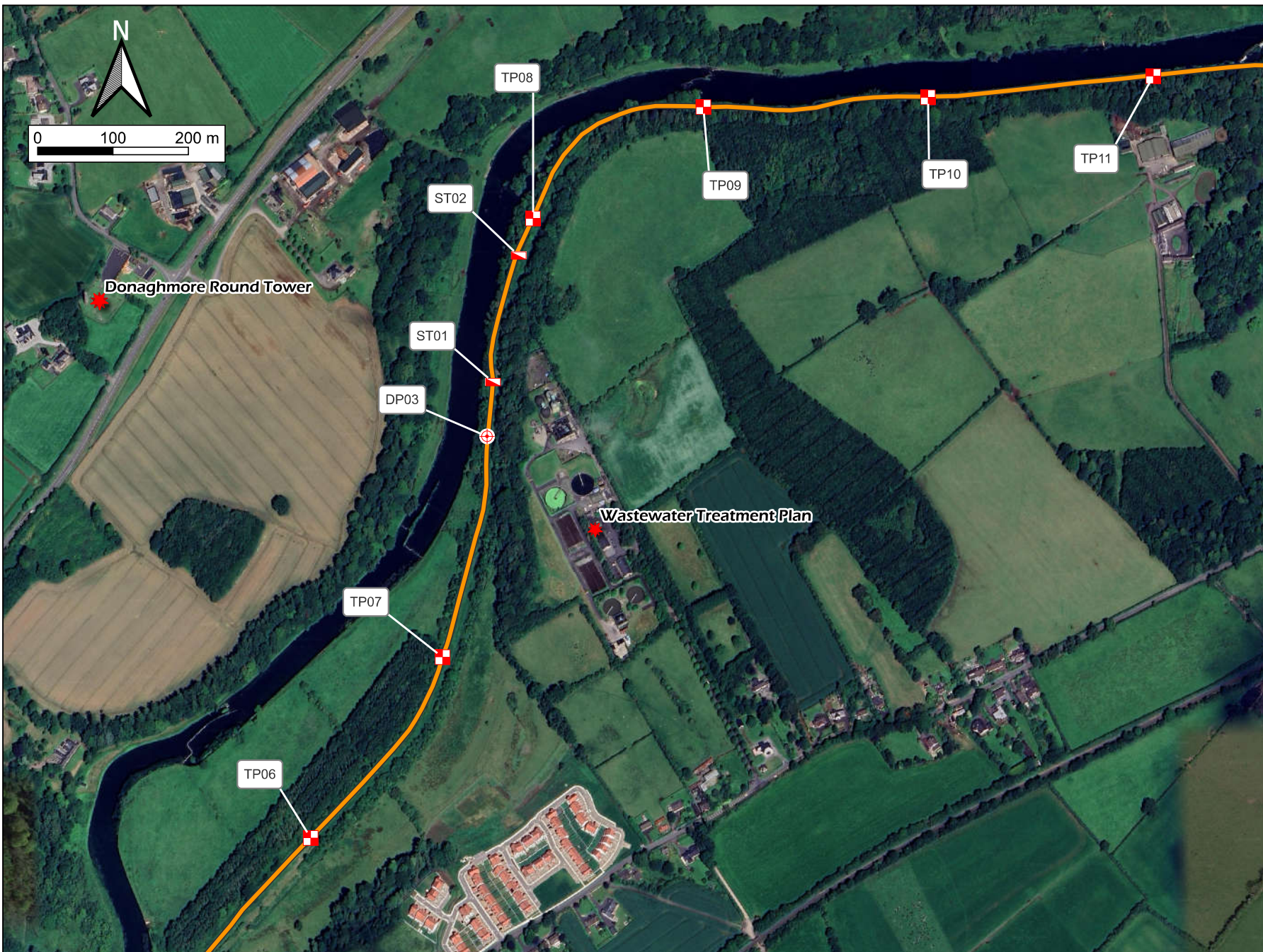
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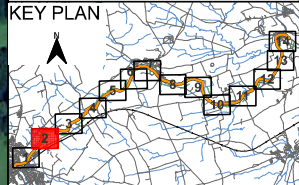
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Client: MEATH COUNTY COUNCIL

Project: BOYNE GREENWAY: NAVAN TO OLDBRIDGE

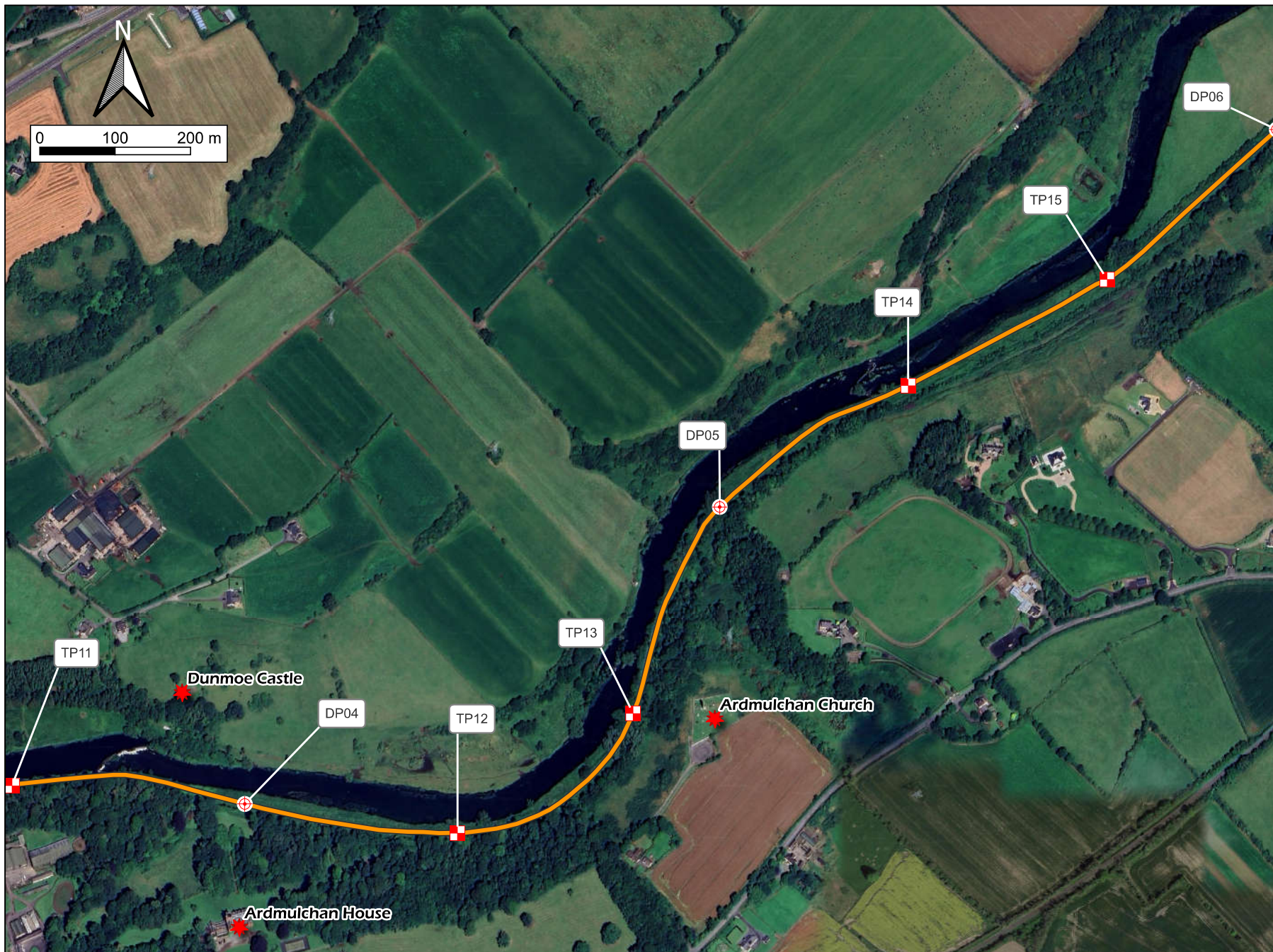
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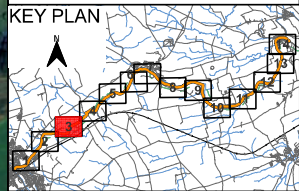
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**LEGEND**

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- GEOPHYSICAL SURVEY LINES
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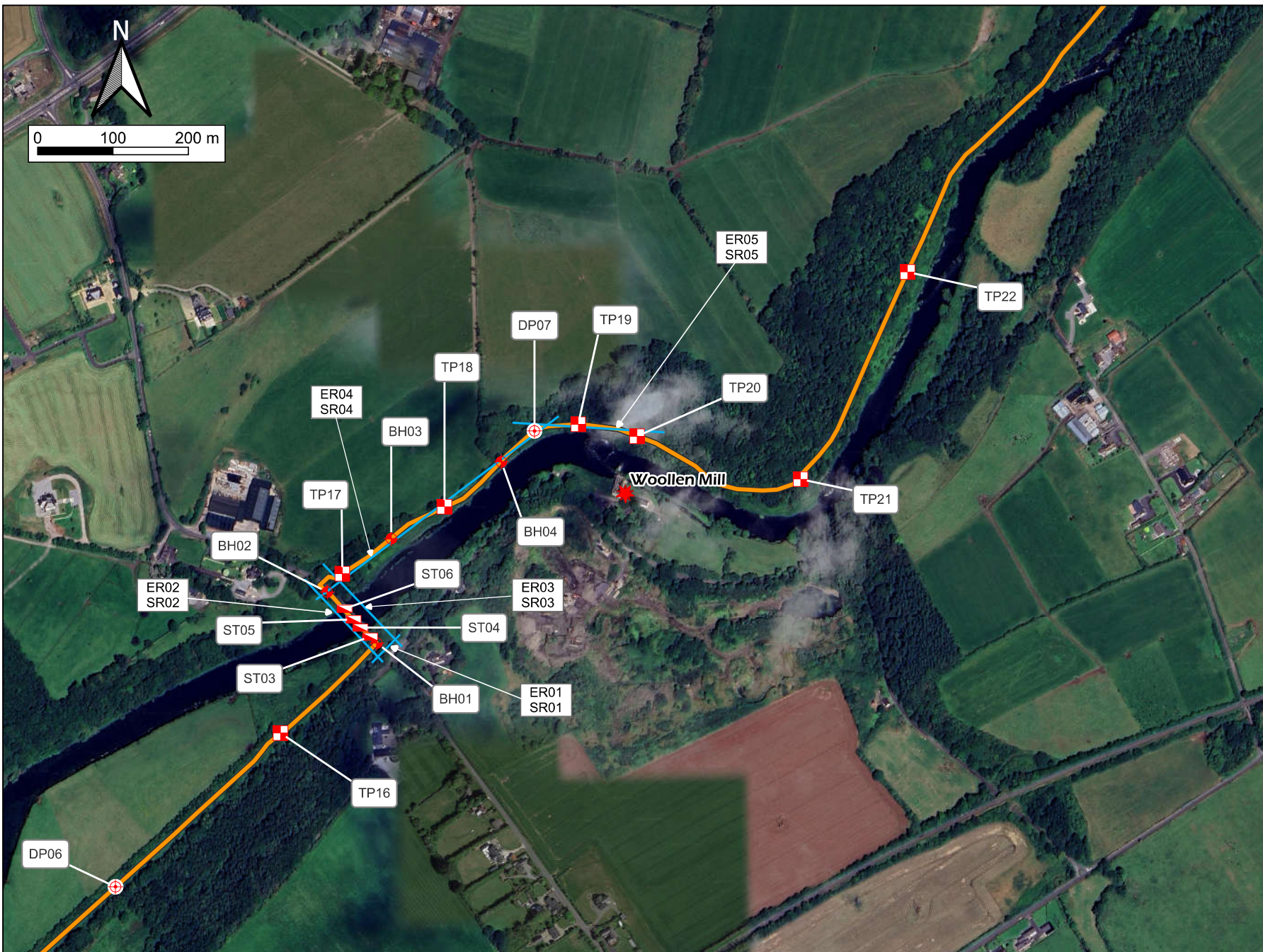
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Project: BOYNE GREENWAY: NAVAN TO OLDBRIDGE

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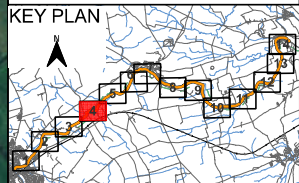
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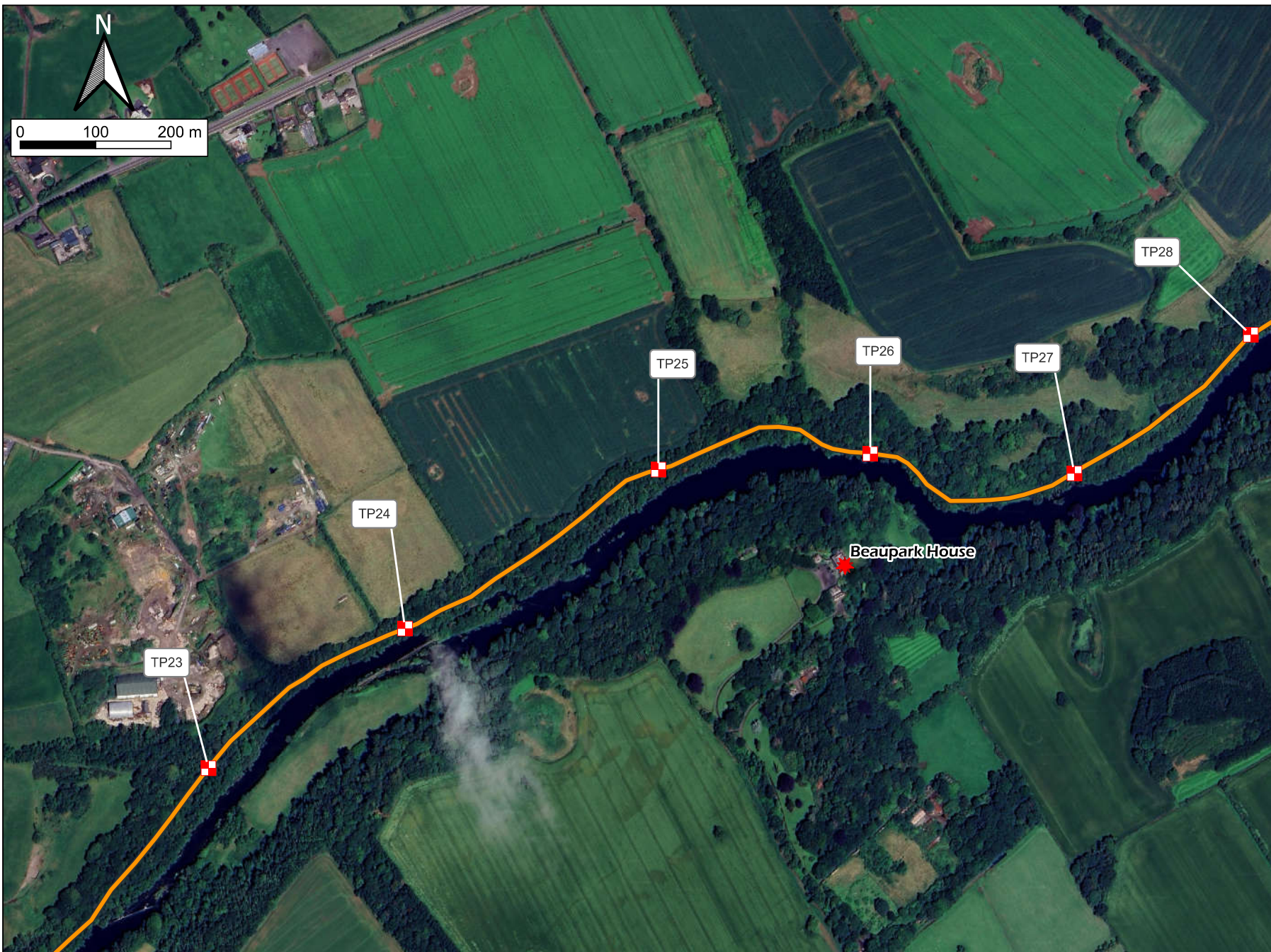
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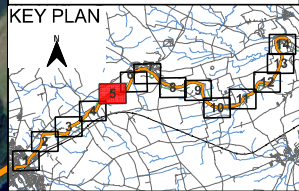
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Status	I	Drawing Number	5197347-ATK-ZZ-ZZ-SK-C-000104	Rev	3



**LEGEND**

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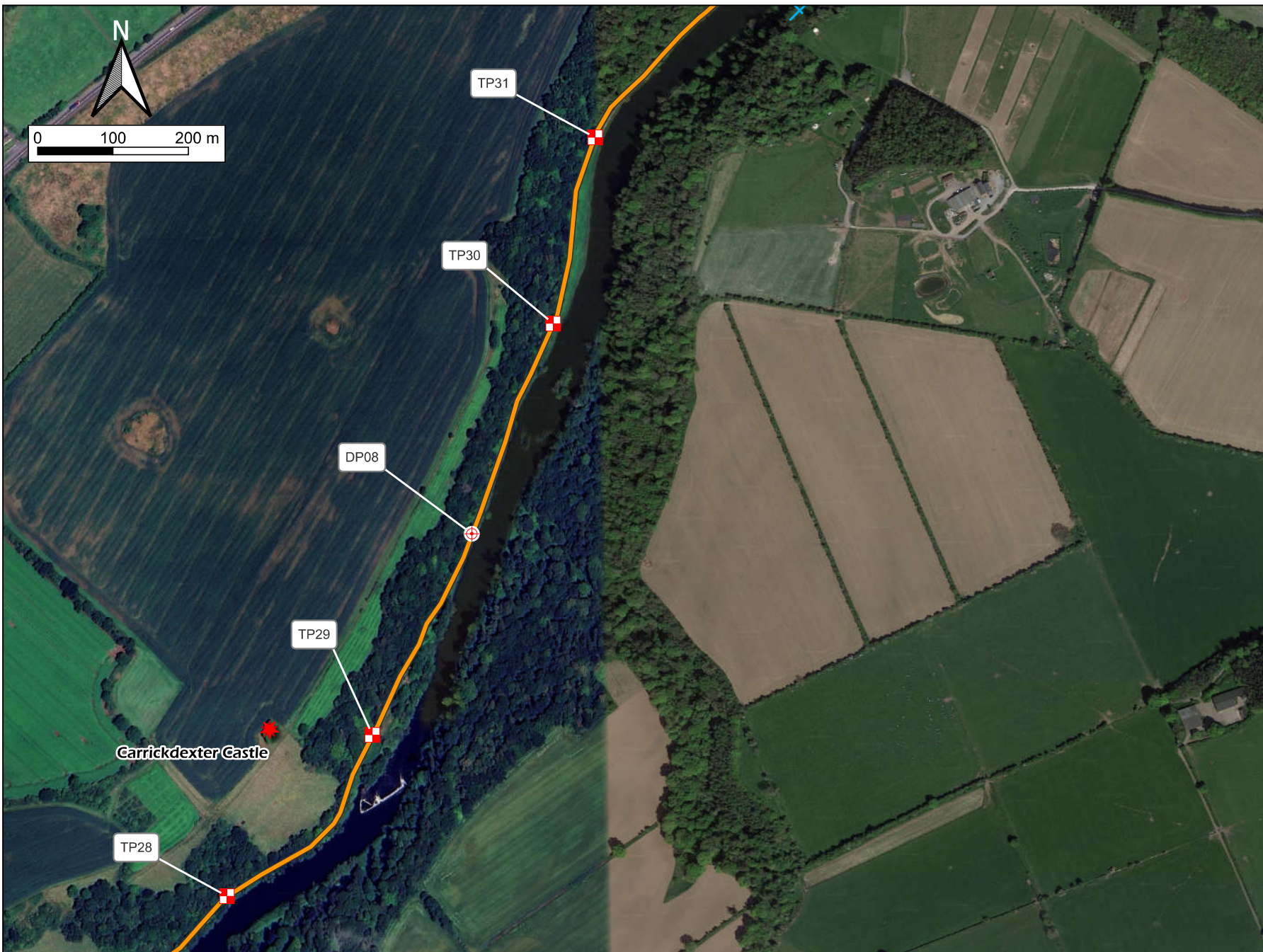
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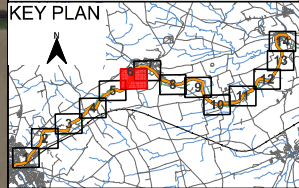
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I	5197347-ATK-ZZ-ZK-S-C-000105	3								



**LEGEND**

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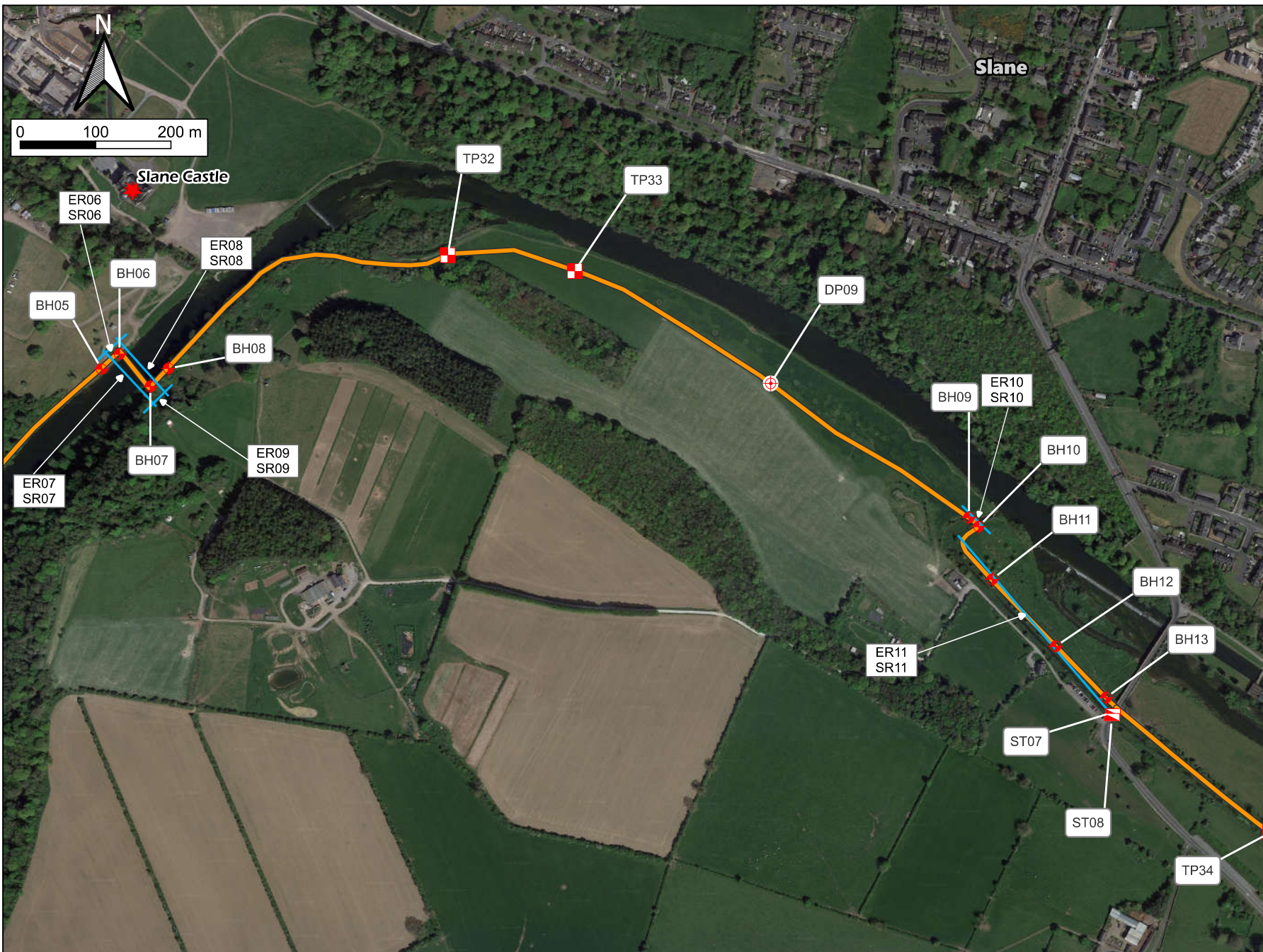
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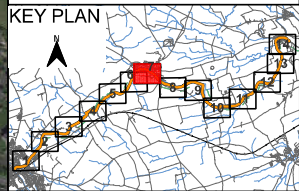
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**LEGEND**

- PREFERRED ROUTE
- GEOPHYSICAL SURVEY LINES
- ◆ BOREHOLE (BH)
- ⊕ DYNAMIC PROBE (DP)
- ▬ SLIT TRENCH (ST)
- TRIAL PIT (TP)
- ⊗ FOUNDATION PIT (FP)



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Client: MEATH COUNTY COUNCIL

Project: BOYNE GREENWAY: NAVAN TO OLDBRIDGE

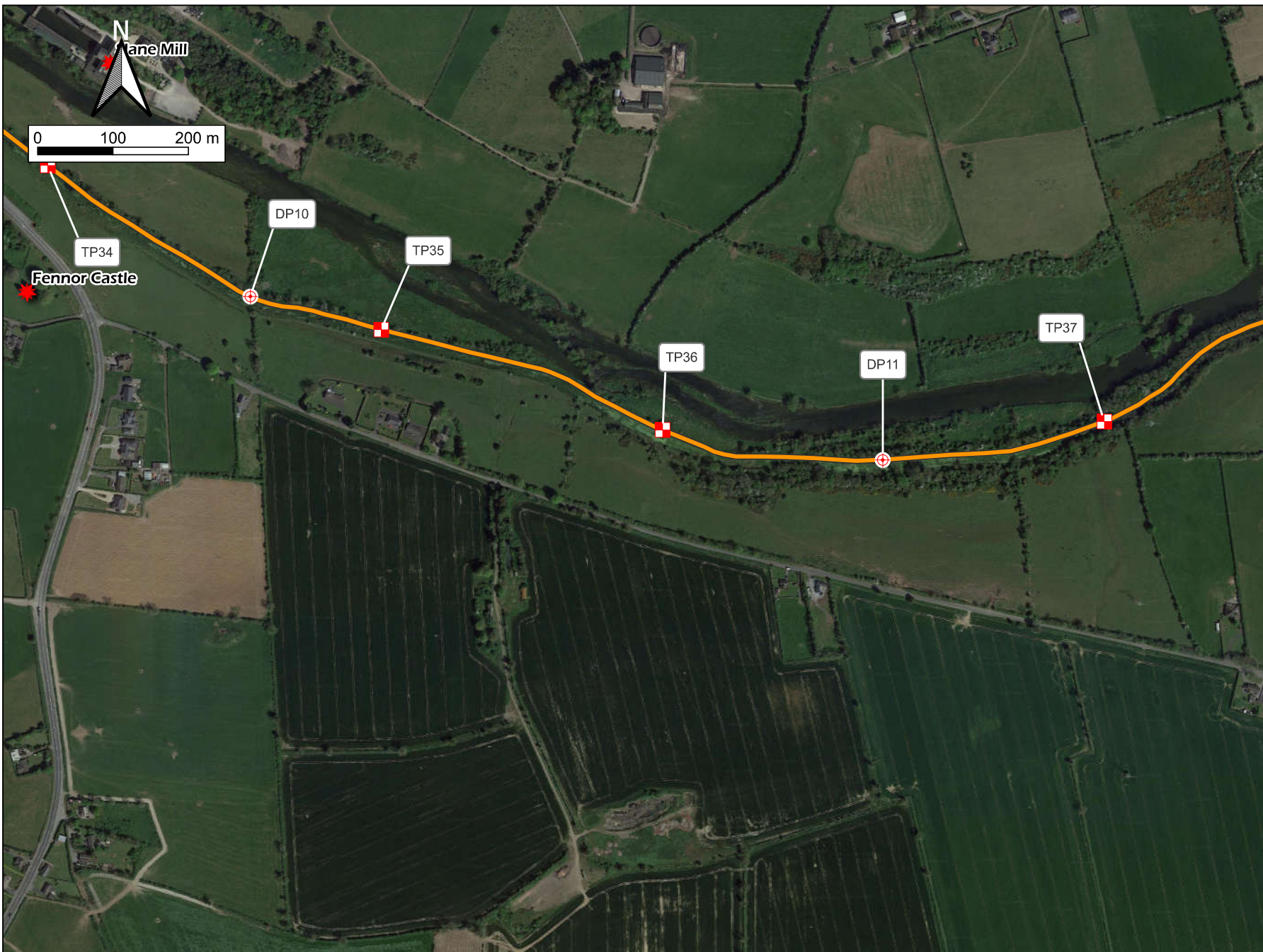
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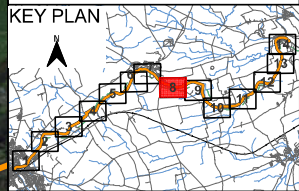
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**LEGEND**

- PREFERRED ROUTE
- GEOPHYSICAL SURVEY LINES
- ⊕ BOREHOLE (BH)
- ⊕ DYNAMIC PROBE (DP)
- ⊠ SLIT TRENCH (ST)
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**Client**  
MEATH COUNTY COUNCIL

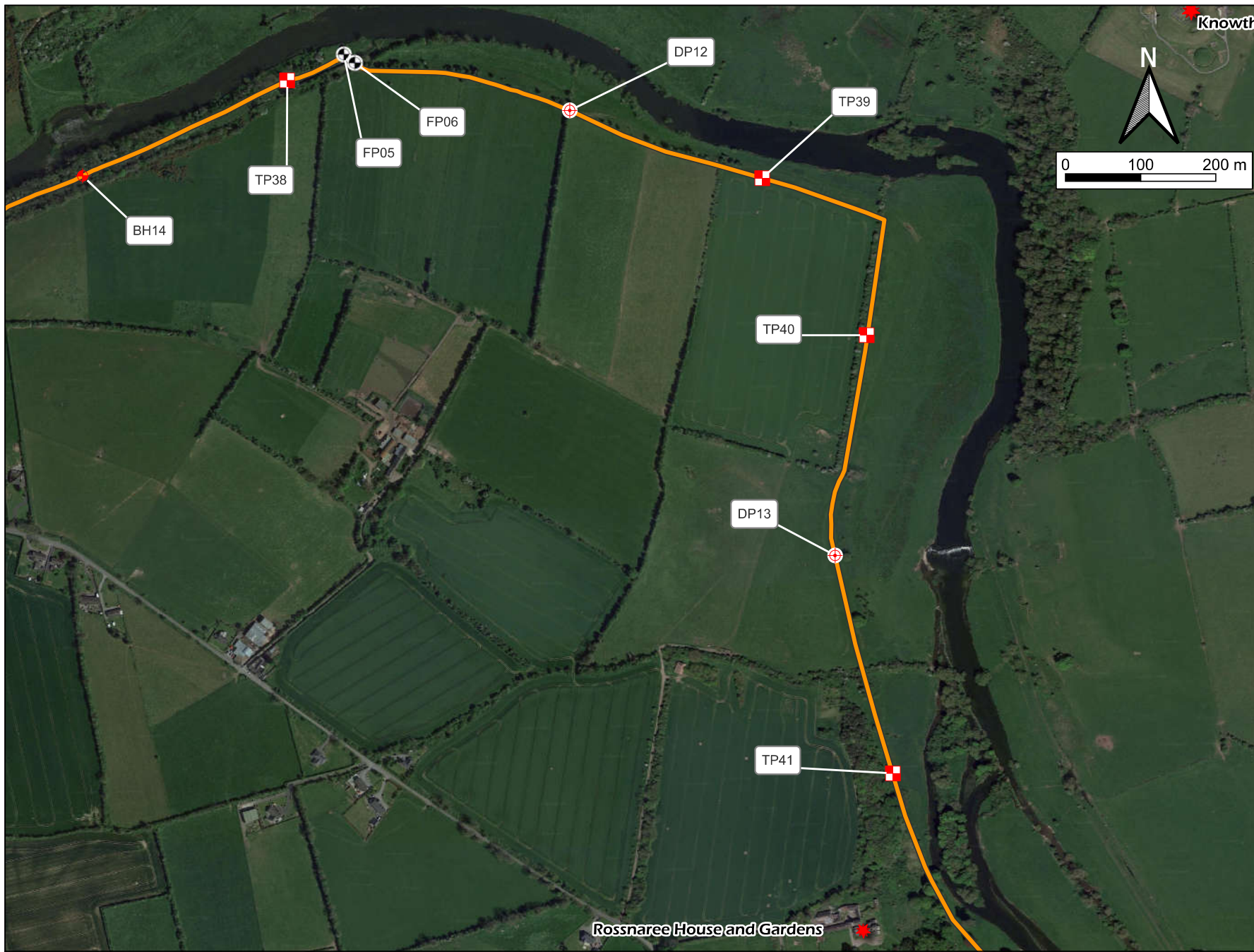
**Project**  
BOYNE GREENWAY: NAVAN TO OLDBRIDGE

<b>Title</b> EXPLORATORY HOLE LOCATION PLAN SHEET 8 OF 14			
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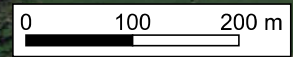
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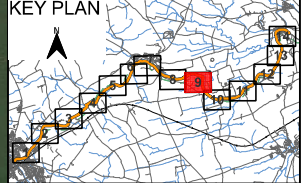


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**LEGEND**

- PREFERRED ROUTE
- GEOPHYSICAL SURVEY LINES
- ⊕ BOREHOLE (BH)
- ⊕ DYNAMIC PROBE (DP)
- ⊠ SLIT TRENCH (ST)
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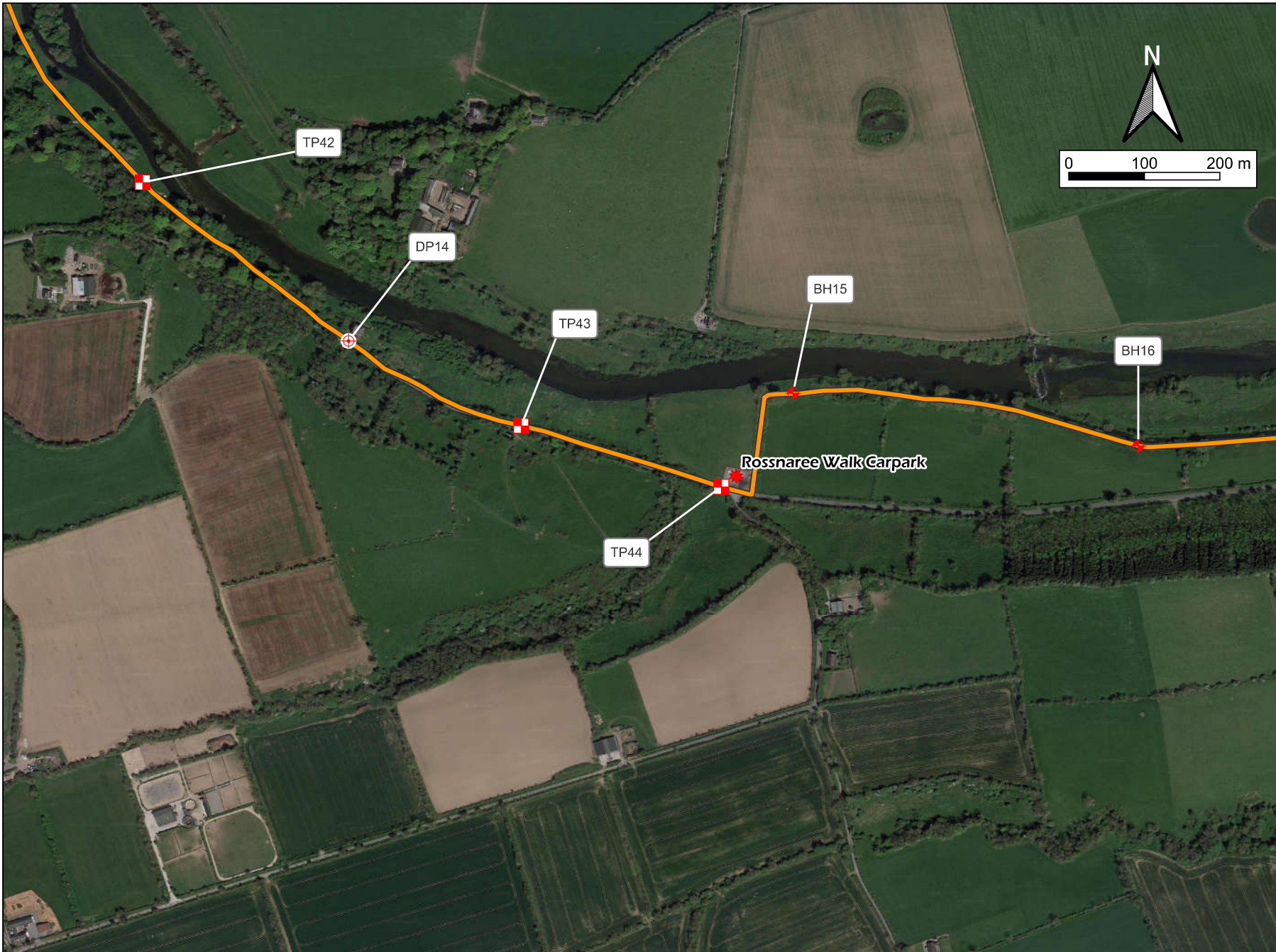
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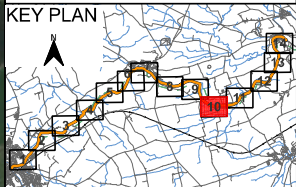
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Project	BOYNE GREENWAY: NAVAN TO OLDBRIDGE

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Date	09/07/2024	Date	07/2024	Date	09/07/2024
Status	I	Drawing Number	5197347-ATK-ZZ-ZK-SC-000109	Rev	3



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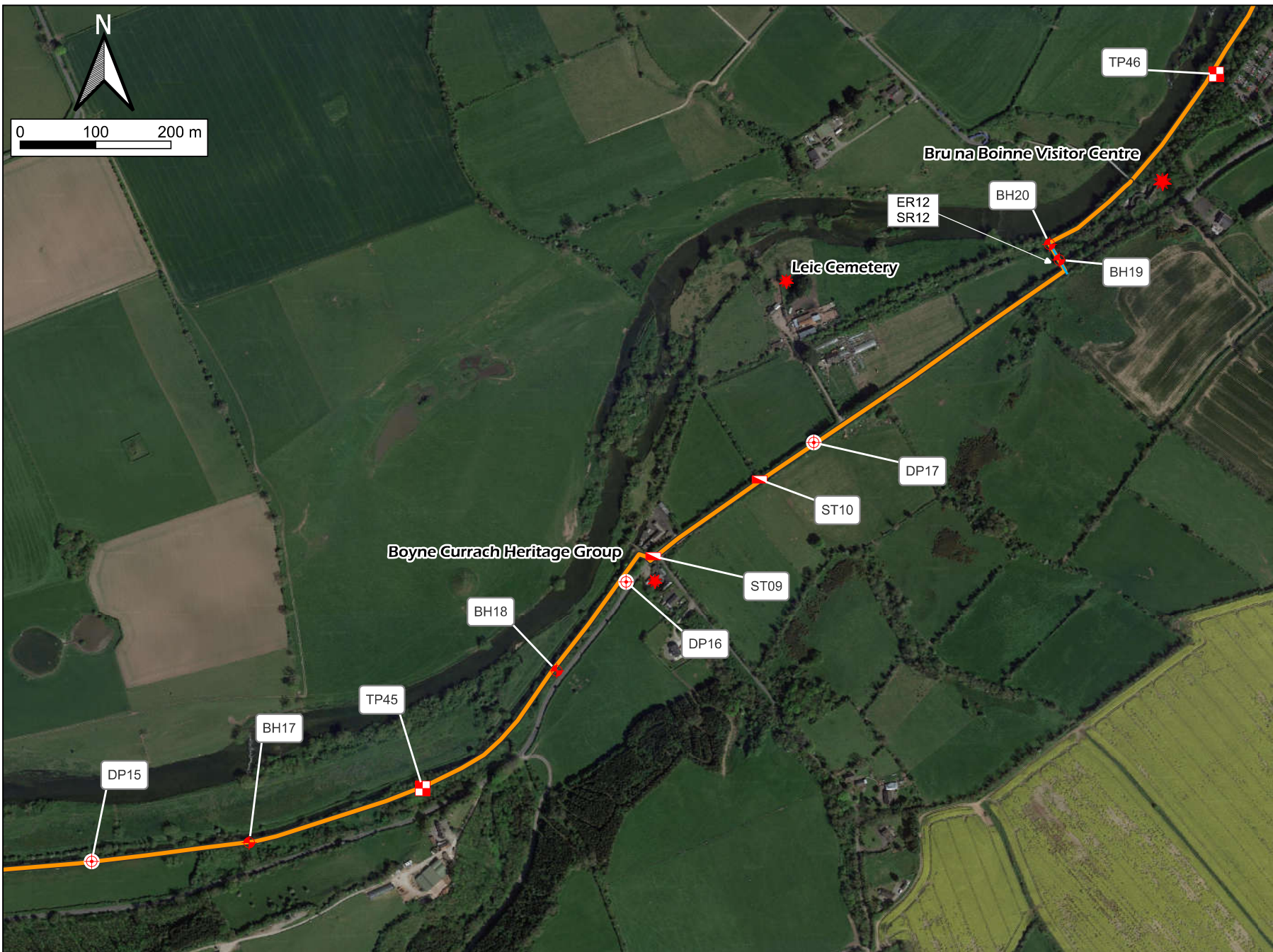
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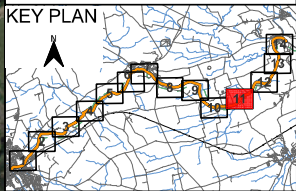
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Project	BOYNE GREENWAY: NAVAN TO OLDBRIDGE

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Authorised	CF	Date	09/07/2024
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Rev	3		



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Project: BOYNE GREENWAY: NAVAN TO OLDBRIDGE

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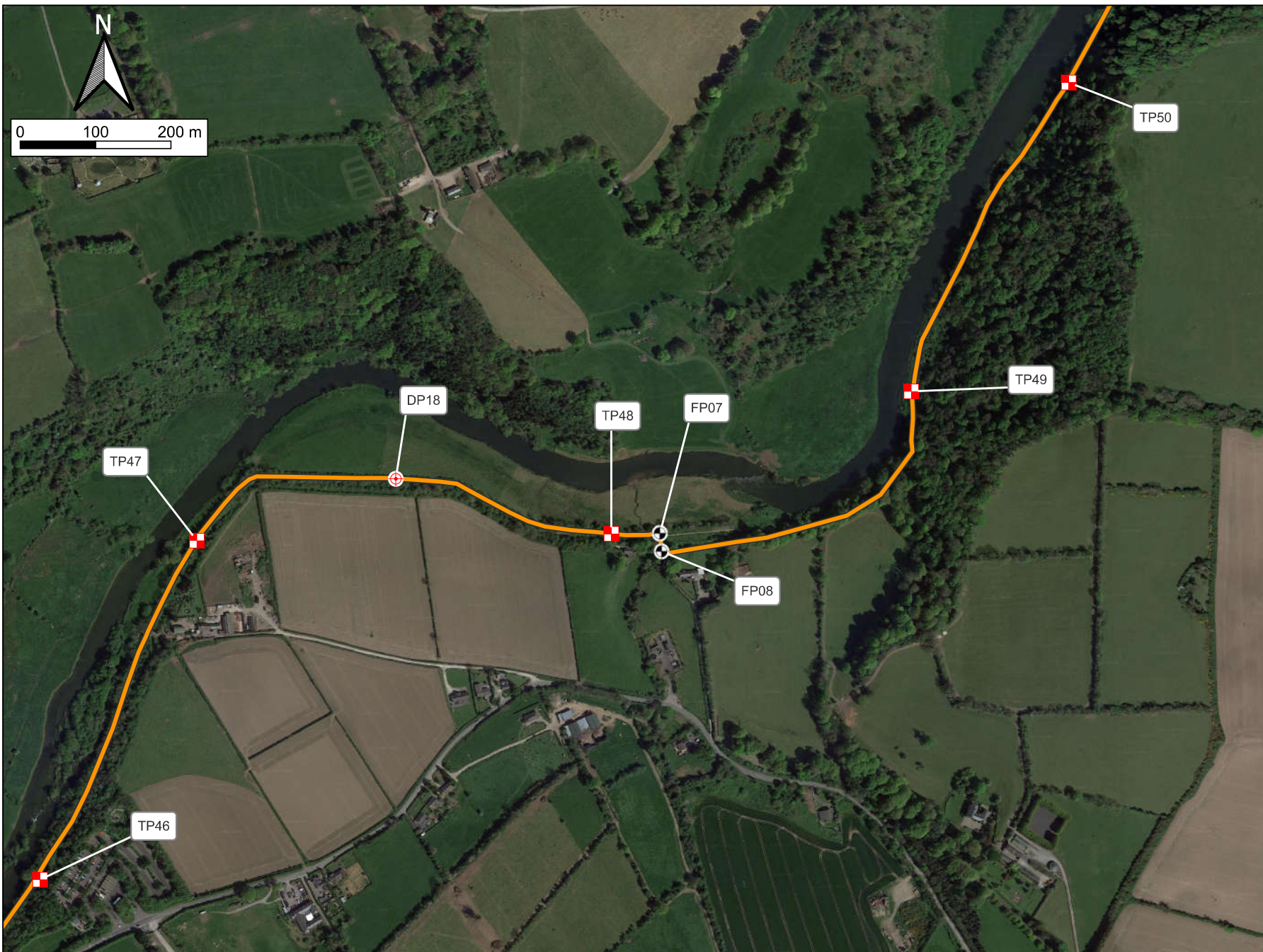
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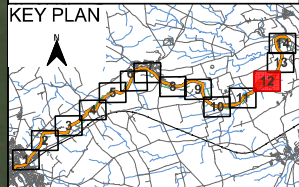
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Date: 05/12/2024  
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**LEGEND**

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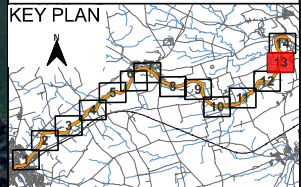
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Project	BOYNE GREENWAY: NAVAN TO OLDBRIDGE

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Original Scale	1:5,000	Design/Drawn	TC	Checked	CB	Authorised	CF
Status	I	Drawing Number	5197347-ATK-ZZ-ZZ-SK-C-000112	Date	09/07/2024	Date	09/07/2024
Rev	3						



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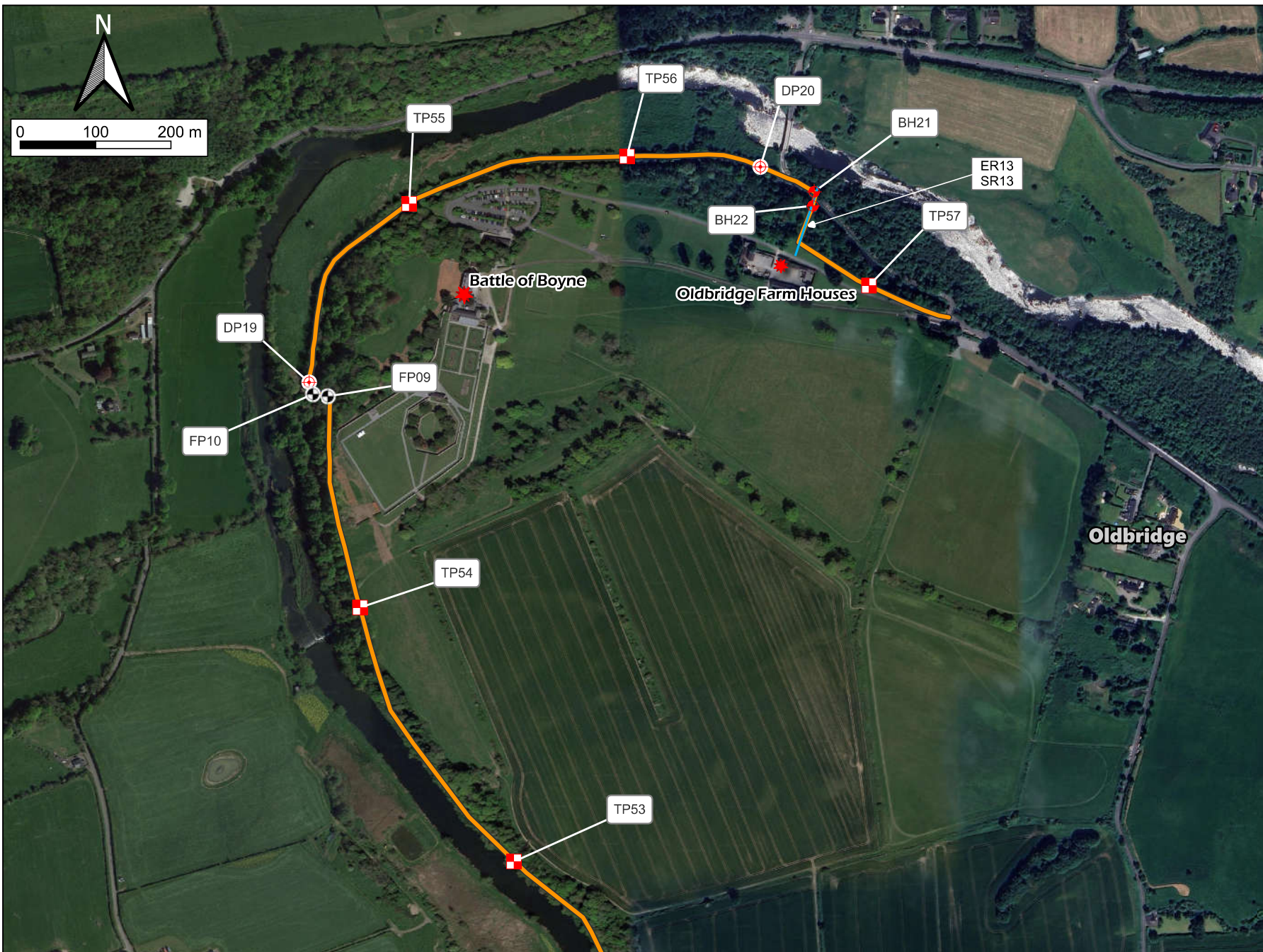
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Project: BOYNE GREENWAY: NAVAN TO OLDBRIDGE

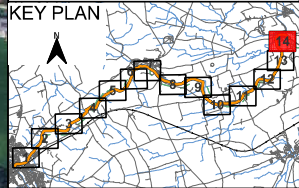
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Status	Drawing Number	Rev	
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**LEGEND**

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- ALL LOCATIONS ARE TO BE VERIFIED ON SITE AGAINST EXISTING FEATURES AND UNDERGROUND SERVICES
- HAND DUG INSPECTION PIT AND CAT SCANNING TO BE COMPLETED AT EACH EXPLORATORY HOLE LOCATION PRIOR TO COMMENCING WORK.
- IT IS THE CONTRACTORS RESPONSIBILITY TO CHECK ALL AVAILABLE UTILITY INFORMATION PRIOR TO COMMENCING SITE WORKS, AND TO SCAN AND CHECK FOR SERVICES AT EACH EXPLORATORY HOLE LOCATION.



Rev	Description	By	Date	Chk'd	Auth
3	UPDATED FOR NIS	TC	12/24	OV	CF
2	ISSUED FOR TENDER	TC	07/24	CB	CF
1	DRAFT	TC	07/24	CB	CF
0	DRAFT	TC	07/24	CB	CF

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Client	MEATH COUNTY COUNCIL
Project	BOYNE GREENWAY: NAVAN TO OLDBRIDGE

Title				EXPLORATORY HOLE LOCATION PLAN SHEET 14 OF 14			
Original Scale	1:5,000	Design/Drawn	TC	Checked	CB	Authorised	CF
Status	I	Drawing Number	5197347-ATK-ZZ-ZZ-SK-C-000114	Date	09/07/2024	Date	09/07/2024
Rev	3						

# Appendix B. Ground Investigation Works Location Tables



## Boreholes

Hole No.	Type	National Grid Reference		Scheduled Depth (m bgl)	Remarks
		Easting	Northing		
BH01	CP/RC	As shown on drawings		15	TM, S
BH02	CP/RC	As shown on drawings		17	TM
BH03	CP/RC	As shown on drawings		15	
BH04	CP/RC	As shown on drawings		10	S
BH05	CP/RC	As shown on drawings		17	
BH06	CP/RC	As shown on drawings		17	S
BH07	CP/RC	As shown on drawings		17	Difficult access
BH08	CP/RC	As shown on drawings		17	Difficult access
BH09	CP/RC	As shown on drawings		15	
BH10	CP/RC	As shown on drawings		15	S
BH11	CP/RC	As shown on drawings		15	
BH12	CP/RC	As shown on drawings		10	
BH13	CP/RC	As shown on drawings		15	
BH14	CP/RC	As shown on drawings		7	
BH15	CP/RC	As shown on drawings		10	
BH16	CP/RC	As shown on drawings		10	
BH17	CP/RC	As shown on drawings		10	S
BH18	CP/RC	As shown on drawings		10	TM
BH19	CP/RC	As shown on drawings		17	S
BH20	CP/RC	As shown on drawings		15	
BH21	CP/RC	As shown on drawings		15	TM
BH22	CP/RC	As shown on drawings		15	S

### Notes:

- The proposed exploratory locations are shown on drawings in Exploratory Hole Locations drawings. Final locations to be agreed on site with the Investigation Supervisor.
- CP: Cable Percussive Boreholes; CP/RC: Cable percussive with rotary core follow on Boreholes.
- S: Standpipe.
- TM: Traffic Management required.
- Anticipated depths are indicative only, termination of exploratory holes to be agreed with the Investigation Supervisor.
- Instrumentation: P: Standpipe Piezometer, S: Standpipe, W: Groundwater Well
- Undisturbed Samples U100 are required in all exploratory holes including thin wall samples or piston samples in soft deposits
- Rotary coring expected in superficial deposits. Recovery to be not less than 90% and SPTs required at 1.5m spacing. Rotary coring may be an acceptable alternative through the superficial deposits provided that a core of suitable diameter can be retrieved to obtain Class1 samples (eg. for triaxial, oedometer testing) in peat, soft clay, glacial till etc. Representative samples in granular layers are also required as well as SPT in cohesive & granular material at regular intervals.

## Trial Pits

Hole No.	Type	National Grid Reference		Scheduled Depth	Remarks
		Easting	Northing	(m bgl)	
TP01	TP	As shown on drawings		3	DCP
TP02	TP	As shown on drawings		3	DCP
TP03	TP	As shown on drawings		3	DCP
TP04	TP	As shown on drawings		3	DCP
TP05	TP	As shown on drawings		3	DCP
TP06	TP	As shown on drawings		3	DCP
TP07	TP	As shown on drawings		3	DCP
TP08	TP	As shown on drawings		3	DCP
TP09	TP	As shown on drawings		3	DCP
3TP10	TP	As shown on drawings		3	DCP
TP11	TP	As shown on drawings		3	DCP
TP12	TP	As shown on drawings		3	DCP
TP13	TP	As shown on drawings		3	DCP
TP14	TP	As shown on drawings		3	DCP
TP15	TP	As shown on drawings		3	DCP
TP16	TP	As shown on drawings		3	DCP
TP17	TP	As shown on drawings		3	DCP
TP18	TP	As shown on drawings		3	DCP
TP19	TP	As shown on drawings		3	DCP
TP20	TP	As shown on drawings		3	DCP
TP21	TP	As shown on drawings		3	DCP
TP22	TP	As shown on drawings		3	DCP
TP23	TP	As shown on drawings		1.5	HP. DCP
TP24	TP	As shown on drawings		1.5	HP. DCP
TP25	TP	As shown on drawings		1.5	HP. DCP
TP26	TP	As shown on drawings		1.5	HP. DCP
TP27	TP	As shown on drawings		1.5	HP. DCP
TP28	TP	As shown on drawings		1.5	HP. DCP
TP29	TP	As shown on drawings		3	DCP
TP30	TP	As shown on drawings		3	DCP
TP31	TP	As shown on drawings		3	DCP
TP32	TP	As shown on drawings		1.5	HP. DCP
TP33	TP	As shown on drawings		1.5	HP. DCP
TP34	TP	As shown on drawings		3	DCP

TP35	TP	As shown on drawings	3	DCP
TP36	TP	As shown on drawings	3	DCP
TP37	TP	As shown on drawings	3	DCP
TP38	TP	As shown on drawings	3	DCP
TP39	TP	As shown on drawings	3	DCP
TP40	TP	As shown on drawings	3	DCP
TP41	TP	As shown on drawings	3	DCP
TP42	TP	As shown on drawings	3	DCP
TP43	TP	As shown on drawings	3	DCP
TP44	TP	As shown on drawings	3	DCP
TP45	TP	As shown on drawings	3	DCP
TP46	TP	As shown on drawings	1.5	HP. DCP
TP47	TP	As shown on drawings	3	DCP
TP48	TP	As shown on drawings	3	DCP
TP49	TP	As shown on drawings	1.5	HP. DCP
TP50	TP	As shown on drawings	1.5	HP. DCP
TP51	TP	As shown on drawings	1.5	HP. DCP
TP52	TP	As shown on drawings	1.5	HP. DCP
TP53	TP	As shown on drawings	1.5	HP. DCP
TP54	TP	As shown on drawings	3	DCP
TP55	TP	As shown on drawings	3	DCP
TP56	TP	As shown on drawings	3	DCP, TM
TP57	TP	As shown on drawings	3	DCP, TM

**Notes:**

- The proposed exploratory locations are shown on the Exploratory Hole Locations drawings. Final locations to be agreed on site with the Investigation Supervisor.
- CBR (DCP): CBR using TRL Dynamic Cone Penetrometer required.
- HP: Hand dug Pit.
- EV: Environmental Samples
- Anticipated excavation depths are indicative only, termination of exploratory holes to be agreed with the Investigation Supervisor.  
If shallow bedrock is encountered, the excavation shall expose the solid/fresh bedrock across the full area of the pit.

**Slit Trenches**

Hole No.	Type	National Grid Reference		Scheduled Depth	Remarks
		Easting	Northing	(m blg)	
ST01	ST	As shown on drawings		2.0	Boyne Way (near Navan WwTP)

ST02	ST	As shown on drawings	2.0	Boyne Way (near Navan WwTP)
ST03	ST	As shown on drawings	2.0	Broadboyne Bridge
ST04	ST	As shown on drawings	2.0	Broadboyne Bridge
ST05	ST	As shown on drawings	2.0	Broadboyne Bridge
ST06	ST	As shown on drawings	2.0	Broadboyne Bridge
ST07	ST	As shown on drawings	2.0	Slane Bridge
ST08	ST	As shown on drawings	2.0	Slane Bridge
ST09	ST	As shown on drawings	2.0	Staleen Road (near Roughgrange)
ST010	ST	As shown on drawings	2.0	Staleen Road (near Roughgrange)

**Notes:**

- The proposed exploratory locations are shown on the Exploratory Hole Locations drawings.
- The location of slit trenches shall be confirmed prior to commencing the ground investigation works and agreed on site with the investigation supervisor.
- Pavement depths to be recorded for all Slit Trenches cut through carriageways (including footways).
- Anticipated excavation depths are indicative only, termination of exploratory holes to be agreed with the Investigation Supervisor.
- It is not expected to excavate into the bedrock (where present) but exposing the solid/fresh bedrock over the full area of the pit will be required.
- Pvmt: Pavement to be reinstated as per S1.11.6.

## Foundation Pits

Hole No.	Type	National Grid Reference		Scheduled Depth (m blg)	Remarks
		Easting	Northing		
FP01	FP	As shown on drawings		2.0	-
FP02	FP	As shown on drawings		2.0	-
FP03	FP	As shown on drawings		2.0	-
FP04	FP	As shown on drawings		2.0	-
FP05	FP	As shown on drawings		2.0	-
FP06	FP	As shown on drawings		2.0	-
FP07	FP	As shown on drawings		2.0	-
FP08	FP	As shown on drawings		2.0	-
FP09	FP	As shown on drawings		2.0	-
FP10	FP	As shown on drawings		2.0	-

**Notes:**

- The proposed exploratory locations are shown on the Exploratory Hole Locations drawings.
- The location of Foundation Pits shall be confirmed prior to commencing the ground investigation works and agreed on site with the investigation supervisor.



## Dynamic Probes

Hole No.	Type	National Grid Reference		Scheduled Depth	Remarks
		Easting	Northing	(m bgl)	
DP01	DP	As shown on drawings		4.5	-
DP02	DP	As shown on drawings		4.5	-
DP03	DP	As shown on drawings		4.5	-
DP04	DP	As shown on drawings		4.5	-
DP05	DP	As shown on drawings		4.5	-
DP06	DP	As shown on drawings		4.5	-
DP07	DP	As shown on drawings		4.5	-
DP08	DP	As shown on drawings		4.5	-
DP09	DP	As shown on drawings		4.5	-
DP10	DP	As shown on drawings		4.5	-
DP11	DP	As shown on drawings		4.5	-
DP12	DP	As shown on drawings		4.5	-
DP13	DP	As shown on drawings		4.5	-
DP14	DP	As shown on drawings		4.5	-
DP15	DP	As shown on drawings		4.5	-
DP16	DP	As shown on drawings		4.5	-
DP17	DP	As shown on drawings		4.5	-
DP18	DP	As shown on drawings		4.5	-
DP19	DP	As shown on drawings		4.5	-
DP20	DP	As shown on drawings		4.5	TM

### Notes:

- The proposed exploratory locations are shown on the Exploratory Hole Locations drawings. Final locations to be agreed on site with the Investigation Supervisor.
- Dynamic Probing Heavy (DPH) equipment shall be used with an automatic trip hammer and counter and should be capable of penetrating to a minimum depth of 15m
- Anticipated probe depths are indicative only, termination of exploratory holes to be agreed with the Investigation Supervisor.
- TM: Traffic Management required.

## Geophysical Survey

Survey No.	Technique	National Grid Reference				Scheduled Length	Descriptions
		Start		End		(m)	
		Easting	Northing	Easting	Northing		

ER01/SR01 ER02/SR02 ER03/SR03 ER04/SR04 ER05/SR05	ER/SR	As shown on drawings	As shown on drawings	950	Broadboyne Bridge & Boardwalk
ER06/SR06 ER07/SR07 ER08/SR08 ER09/SR09	ER/SR	As shown on drawings	As shown on drawings	300	Proposed bridge at Slane Castle
ER10/SR10 ER11/SR11	ER/SR	As shown on drawings	As shown on drawings	350	Boyne Meadows Bridge & Boardwalk
ER12/SR12	ER/SR	As shown on drawings	As shown on drawings	55	The Leck Donore
ER13/SR13	ER/SR	As shown on drawings	As shown on drawings	94	Oldbridge

Notes:

- The proposed geophysical survey locations are shown on the Exploratory Hole Locations drawings.
- ER: Electrical Resistivity
- SR: Seismic Resistivity
- Final locations to be agreed on site with the Investigation Supervisor.
- **Geophysical surveying shall be carried out prior to the intrusive ground investigation. Results from the geophysical survey shall be used to confirm the final location of the boreholes.**

# Appendix C. Otter Survey Data

Data redacted



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