



Appropriate Assessment Screening

Newtown Proposed Dwelling

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For: CraftStudio Architecture

Date of Issue: 2nd September 2022

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1. Introduction

This report comprises information in support of screening for Appropriate Assessment (AA) in line with the requirements of Article 6[3] of the EU Habitats Directive (EC 92/43/EEC) on the Conservation of Natural Habitats and of Wild Fauna and Flora; the Planning and Development (Amendment) Act 2010; and the European Union (Birds and Natural Habitats) Regulations 2011 as amended, for the development of a residential dwelling on a site in Newtown, Co Meath.

This screening exercise aims to determine whether the proposed works have the potential to significantly impact upon the conservation objectives and overall integrity of any Natura 2000 sites. This assessment is based upon a desk study and field work carried out by suitably qualified ecologists. Also included is a general assessment of the ecological status of the site and the potential impacts of the proposed works on the ecology of the surrounding area, including Designated Sites.

The following definitions are used for the terms “impact” and “effect”:

Impact – Actions resulting in changes to an ecological feature, e.g. the construction activities of a development removing a hedgerow.

Effect – Outcome to an ecological feature from an impact, e.g. the effects on an animal population from loss of a hedgerow.

The Competent Authority is obliged to examine the likely significant effects individually or in combination, of the proposed development on European Designated Sites in light of their specific Qualifying Interests (QIs) and Conservation Objectives (COs). If AA screening determines that there is likely to be significant effects on one or more of these sites, or the impacts are uncertain, then full AA must be carried out for the proposed development, including the compilation of a Natura Impact Statement to inform the decision making.

For the purposes of this assessment, a “significant effect” is:

“...an effect that either supports or undermines biodiversity conservation objectives for ‘important

ecological features' ... or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity).

Effects can be considered significant at a wide range of scales from international to local. A significant effect is an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project.

In broad terms, significant effects encompass impacts on structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution)."

- CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland (2018)

Sections 4 and 5 of the report comprises the AA Screening that specifically focuses on the potential for impacts on Natura 2000 sites deemed to be at risk from the proposed development.

1.1 Necessity for Environmental Impact Assessment

We would assess this project as being an 'urban development project' as defined by the pertinent EU legislation. It would therefore be a proscribed project type. It would also be within a built-up area. However, it would be far below the threshold of area being developed to require mandatory EIA. It would therefore be a 'sub-threshold' development.

The receiving environment is not of high sensitivity. Rather, the zone of influence would include only built areas. The project has been screened for Appropriate Assessment and no impacts on any Natura sites were predicted.

Given that works will be within a very contained area and this already built, no significant environmental impacts might be expected. Given that no novel technologies/techniques will be employed, no impacts on humans, infrastructure etc. are anticipated.

In summary, it is our opinion that the proposed development will not require EIA given the low sensitivity of the receiving environment and the very contained nature and scale of the proposed project.

2. Background to Screening for Appropriate Assessment

2.1. European Designated Sites

Sites designated for the conservation of nature in Ireland include:

- Special Areas of Conservation (SACs);
- Special Protection Areas (SPAs), and;
- Natural Heritage Areas (NHAs)

SPAs and SACs form the Natura 2000 network of sites. It is these sites that are of relevance to the screening process for this Appropriate Assessment Screening.

SPAs and SACs are prime wildlife conservation areas in the country, considered to be important on a European as well as Irish level. SPAs and SACs are designated under EU Habitats Directive, transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011), as amended.

Natural Heritage Area (NHA) is the basic designation for wildlife in Ireland. These are areas considered important for their habitats or species of plants and animals whose habitat requires protection and are protected by the Wildlife (Amendment) Act of 2000.

All European Designated Sites (henceforth simply referred to as “Designated Sites”) that are connected to the proposed development were considered during the desktop study in order to assess the potential for significant effects upon their QIs and COs. This stage of the process is used to determine whether any of the Designated Sites can be regarded as not being relevant to the process of Appropriate Assessment of the project, having no potential to be significantly affected.

2.2. Legislative Context

The methodology for this screening statement is clearly set out in a document prepared for the Environment DG of the European Commission entitled ‘Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6 paragraphs 3 and 4 of the Habitats Directive 92/43/EEC’ (Oxford Brookes University, 2001). This report and contributory fieldwork were carried out in accordance with guidelines given by the Department of Environment, Heritage and Local Government (2009, amended February 2010).

The assessment process is given in Articles 6[3] and 6[4] of the Habitats Directive and is commonly referred to as “Appropriate Assessment” or AA.

Article 6 of the Habitats Directive sets out provisions which govern the conservation and management of Natura 2000 sites. Article 6[3] and 6[4] of the Habitats Directive set out the decision-making tests for plans

and projects likely to affect Natura 2000 sites (Annex 1.1). Article 6[3] establishes the requirement for Appropriate Assessment:

“Any plan or project not directly connected with or necessary to the management of the [Natura 2000] site but likely to have a significant effect thereon, either individually or in combination with other plans and projects, shall be subjected to appropriate assessment of its implications for the site in view of the site’s conservation objectives. In light of the conclusions of the assessment of the implication 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.”

Article 6[4] continues:

“If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of social or economic nature, the Member State shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted. Where the site concerned hosts a priority natural habitat type and/or a priority species the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest.

It is the responsibility of the proponent of the plan or project to provide the relevant information (ecological surveys, research, analysis etc.) for submission to the ‘competent national authority’. If satisfied that the information is complete and objective, the competent authority will use this information to screen the project, i.e. to determine if an AA is required and to carry out the AA, if one is deemed necessary. The competent authority shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned.”

The appropriate assessment process has four stages. Each stage determines whether a further stage in the process is required. If, for example, the conclusions at the end of Stage One are that there will be no significant impacts on the Natura 2000 site, there is no requirement to proceed further. The four stages are:

1. Screening to determine if an appropriate assessment is required;
2. Appropriate assessment;

3. Consideration of alternative solutions, and;
4. Imperative reasons of overriding public interest/derogation.

Stage 1: Screening for AA

This report provides a stage one Screening for Appropriate Assessment. It aims to establish whether the plan or project is directly connected with or necessary to the management of Designated Sites; or in view of best scientific knowledge, if the plan or project, individually or in combination with other plans or projects, is likely to have a significant effect on a Designated Site. This is done by examining the proposed plan or project and the COs of any Designated Sites that might potentially be affected.

The study is based on a preliminary impact assessment using both publicly available data and data collected during site surveys. This is followed by a determination of whether there is a risk that the effects identified could significantly impact any Natura 2000 sites, and if so an Appropriate Assessment (AA) is required. The need to apply the precautionary principle in making any key decisions in relation to the tests of AA has been confirmed by European Court of Justice case law. Therefore, where significant effects are likely, possible or uncertain at screening stage, a stage two AA will be required.

3. Methodology

3.1. Desk Study

A desktop study was carried out as part of this screening process to gain an understanding of the surrounding human and natural environments. This included a review of available data from a range of sources on the site and its immediate environs.

3.2. Data used to carry out the assessment

The following sources of data were employed:

- Environmental Protection Agency (EPA) Appropriate Assessment Tool;
- EPA Maps (to identify watercourses, hydrology and Natura 2000 site boundaries);
- NPWS protected species database and online mapping;
- The Geological Survey of Ireland hydrological and lidar data and map viewer;
- The National Biodiversity Data Centre archives;
- Inland Fisheries Ireland, and;
- An Bord Pleanála's online database

3.3. SPR Model

This assessment was carried out using the source-pathway-receptor (SPR) approach, a standard tool in environmental assessment. The SPR concept in ecological impact assessment relates to the idea that for the risk of an impact to occur, a source is needed (e.g., a development site); an environmental receptor is present (a lake); and finally, there must a pathway between the source and the receptor (a watercourse linking the development site to the lake). Even though there might be a risk of an impact occurring, it does not necessarily mean that it will occur, and in the event that it does occur, it may not have significant effects on the receiving environment. Identification of a risk means that there is a possibility of ecological or environmental damage occurring, with the level and significance of the impact depending upon the nature and exposure to the risk and the characteristics of the receptor.

In this instance, the most relevant receptors are any relevant Natura 2000 sites with connectivity of the proposed works. These were considered during the desktop study stage of this screening assessment in order to assess the potential for significant effects upon their QIs and COs.

3.4. Field Survey

The field survey was carried out on 31st August 2022. Baseline ecological conditions were assessed. Habitats were classified according to A Guide to Habitats in Ireland (Fossitt, 2000). Where applicable, the habitat types and species usage were recorded (Smith et al. 2011; Scannell and Synnott, 1987; Wyse Jackson et al. 2016). Habitats were classified and dominant plant species noted according to the guidelines

given by the JNCC (2010) with reference to best practice guidance for habitat survey and mapping (Smith et al., 2011) and Census Catalogue of the Flora of Ireland (Scannell & Synnott, 1987).

4. Screening of Designated Sites

4.1. Site Location

The proposed development site is located in the southern part of Navan Town, Co Meath, on a derelict site at the junction of Swan Lane and Balreask Old.

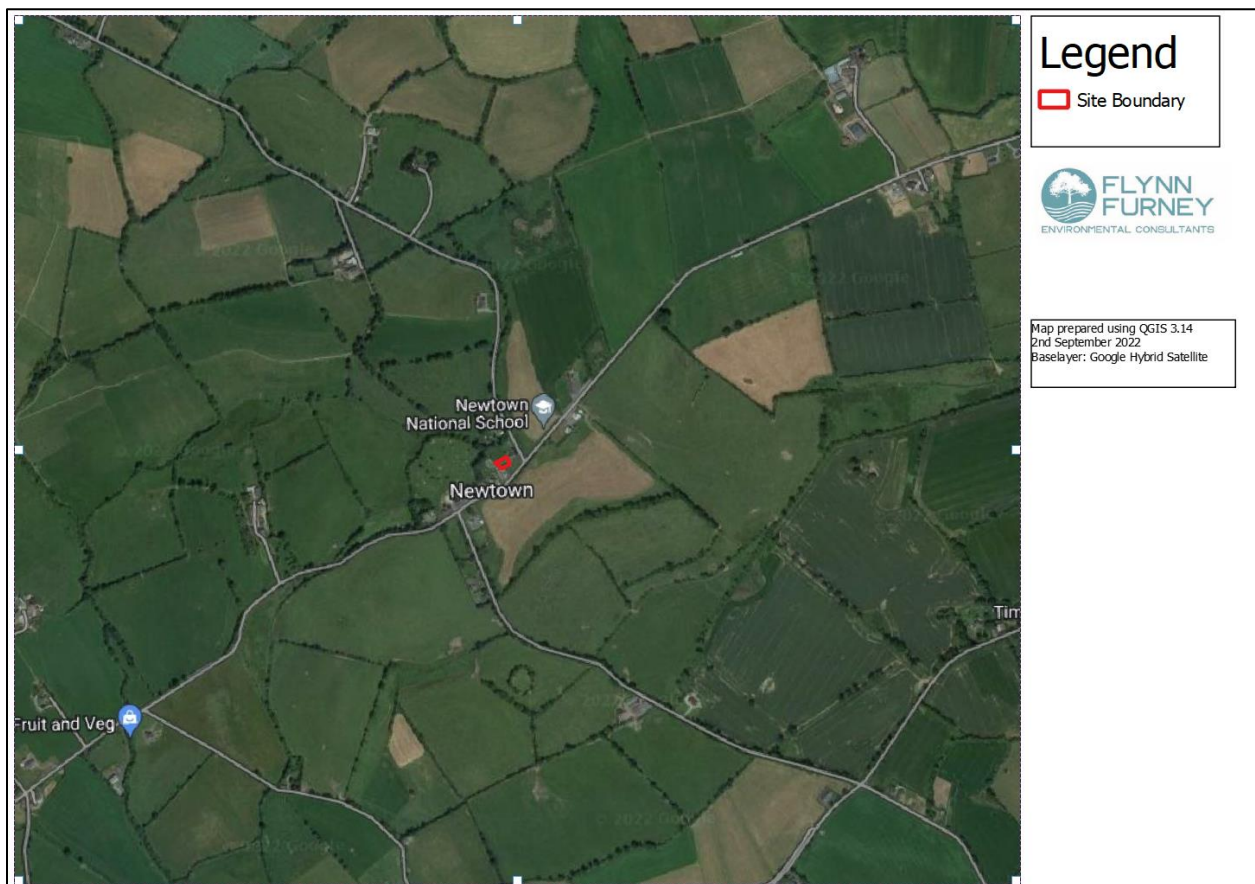


Figure 1 Overview of the proposed works area

4.2. Receiving Environment

A description of the habitats of significant ecological value that were observed within the immediate surroundings of the works area are listed below, with descriptions adapted from "A Guide to Habitats in Ireland" by Julie A. Fossitt, 2000.

A description of the habitats of significant ecological value that were observed within the immediate surroundings of the works area are listed below (Figure 2).

The proposed works area is a vacant plot of land of approximately 460m² adjacent to an existing property in a small development in Newtown, Co Meath. The ground within the property is largely a mixture of amenity grassland **GA2** which has become overgrown and recolonised bare ground **ED3**. Species noted within include false oat *Arrhenatherum elatius*, docks *Rumex* spp., creeping thistle *Cirsium arvense*, ragwort *Jacobaea vulgaris*, spear thistle *Cirsium vulgare* and white clover *Trifolium repens*. The property is enclosed within an existing bare masonry wall **BL3**.



Figure 2 Proposed works area

4.2.1 Surface water

The nearest watercourse to the proposed works area is the Batestown Stream, ca30m to the north. No surface water connections between the proposed works area and the receiving watercourse that might provide a pathway for impact on the wider environment were noted.

4.2.1. Groundwater

Groundwater vulnerability is a term used to represent the natural ground characteristics that determine the ease with which infiltrating water and potential contaminants may reach groundwater in a vertical or sub-vertical direction. Subsoil permeability indicates how readily water from the surface can permeate through to the groundwater below.

The proposed works area lies within an area of Extreme groundwater vulnerability; subsoil permeability within the area has not been mapped. (Figs. 3 and 4).



Figure 3 Groundwater vulnerability in the proposed works area



Figure 4 Subsoil permeability in the proposed works area

4.2.3. Breeding Birds

All species of wild bird that occur naturally in Ireland are fully protected at all times by the Wildlife Act and relevant amending legislation. Similarly, all birds naturally occurring in the wild state are afforded a measure of protection by the EU Birds Directive, but derogations may reduce protection for specific reasons. As such, any vegetation clearance must be carried out outside of the bird nesting season (March 1st - August 31st).

A dedicated bird survey was not carried out for this project; the proposed works do not involve removal of trees/other vegetation that might support nesting species, and very little if any suitable habitat for nesting exists within the proposed works area. Were this to be the case, a pre-construction nesting survey may need to be carried out, depending on the timing of works.

4.2.4. Amphibians

An amphibian survey was not carried out as part of this project, due to the lack of suitable habitat for spawning common frog *Rana temporaria* or smooth newt *Lissotriton vulgaris* within the proposed works area.

4.2.5. Mammals

No mammal signs were observed during the course of this survey.

4.2.6. Invasive Species

The Wildlife Acts, 1976 and 2000, contain a number of provisions relating to invasive non-native species (INNS), covering several sections and subsections of the Acts. It is prohibited, without licence, to plant or otherwise cause to grow in a wild state, in any place in the State, any species of flora, or the flowers, roots, seeds or spores of invasive flora listed on the Third Schedule. Articles 49 and 50 of the aforementioned Acts set out the legal implications associated with alien invasive species and Schedule 3 (the Third Schedule) of the regulations lists non-native species subject to the restrictions of Articles 49 and 50, which make it an offence to plant, disperse, allow dispersal or cause the spread of invasive species.

No Schedule 3 species or other invasive non-native species were recorded within the proposed works area during this survey.

4.3. Proposed Works

The proposal is for the development of a single residential dwelling on a plot adjacent to another dwelling in a small development in Newtown, Co Meath, as well as a driveway and private amenity area. (Fig. 5)

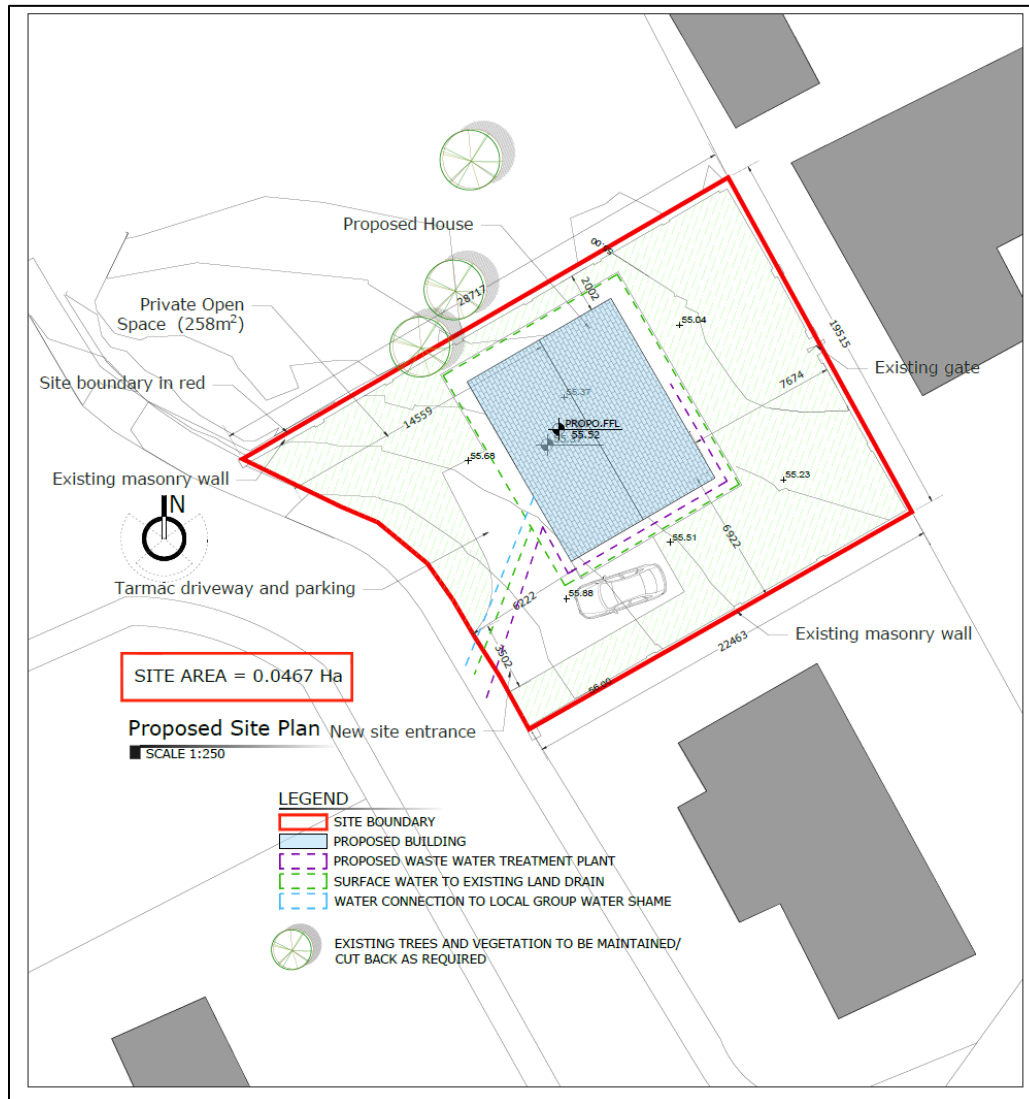


Figure 5 Plan of proposed works

4.4. Works, Site Characteristics and Risks to the Environment

The principal risks from the proposed works to the receiving environment are the mobilisation of fine sediment and the resulting contamination of surface and groundwaters with fines/nutrient and disturbance of the surrounding area resulting in negative impacts to one or more species, the latter a

consideration both during the construction and operational phases of the project. Of note is the nature and scale of the works, the existing highly modified site contained within a semi-urban landscape and the lack of any species of conservation significance within the proposed works area; the risk to the receiving environment from the proposed works is considered to be negligible.

4.5. Nearby Designated Sites

All designated sites with the potential for connectivity with the proposed development were considered as part of this screening process (Fig. 6). Two sites with potential connectivity to the works area were found, *Dundalk Bay SPA 004026* and *Dundalk Bay 000455*; all others are a substantial distance from the works area with no reasonable pathway for any impact (Table 1).

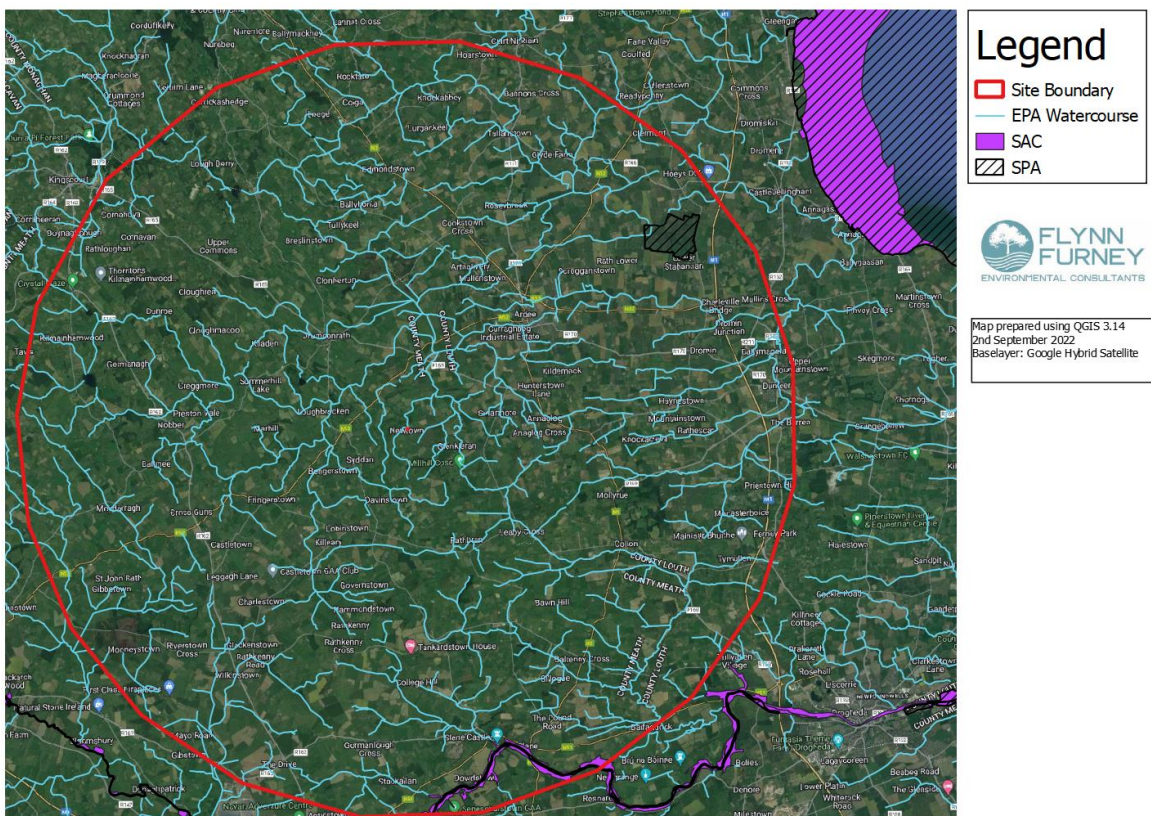


Figure 6 Designated sites in the vicinity of works area

Table 1 Designated sites with connectivity to the works area

Site Name and Code	Qualifying Interests (* denotes a priority habitat)	Distance (km)	Connectivity to Project
Dundalk Bay SAC 000455	<ul style="list-style-type: none"> • Estuaries [1130] • Mudflats and sandflats not covered by seawater at low tide [1140] • Perennial vegetation of stony banks [1220] • Salicornia and other annuals colonising mud and sand [1310] • Atlantic salt meadows (<i>Glaucopuccinellietalia maritima</i>) [1330] • Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410] 	30	European site is 30km downstream from the nearest receiving watercourse; the proposed works area is not hydrologically connected to the site, nor does it contain any qualifying habitat relevant to the Natura 2000s site or suitable for any listed QI species.
Dundalk Bay SPA 004026	<ul style="list-style-type: none"> • Great Crested Grebe (<i>Podiceps cristatus</i>) [A005] • Greylag Goose (<i>Anser anser</i>) [A043] • Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046] • Shelduck (<i>Tadorna tadorna</i>) [A048] • Teal (<i>Anas crecca</i>) [A052] • Mallard (<i>Anas platyrhynchos</i>) [A053] • Pintail (<i>Anas acuta</i>) [A054] • Common Scoter (<i>Melanitta nigra</i>) • Red-breasted Merganser (<i>Mergus serrator</i>) [A069] • Oystercatcher (<i>Haematopus ostralegus</i>) [A130] • Ringed Plover (<i>Charadrius hiaticula</i>) • Golden Plover (<i>Pluvialis apricaria</i>) • Grey Plover (<i>Pluvialis squatarola</i>) • Lapwing (<i>Vanellus vanellus</i>) [A142] • Knot (<i>Calidris canutus</i>) [A143] • Dunlin (<i>Calidris alpina</i>) [A149] • Black-tailed Godwit (<i>Limosa limosa</i>) • Bar-tailed Godwit (<i>Limosa lapponica</i>) • Curlew (<i>Numenius arquata</i>) [A160] • Redshank (<i>Tringa totanus</i>) [A162] • Black-headed Gull (<i>Chroicocephalus</i>) 	30	European site is 30km downstream from the nearest receiving watercourse; the proposed works area is not hydrologically connected to the site, nor does it contain any qualifying habitat suitable for any listed SCI species.

	<ul style="list-style-type: none">• ridibundus) [A179]• Common Gull (<i>Larus canus</i>) [A182]• Herring Gull (<i>Larus argentatus</i>) [A184]• Wetland and Waterbirds [A999]		
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5. ASSESSMENT CRITERIA

5.1. Relation to management of nearby Designated Site(s)

The proposed project is not necessary to or connected with the management of any designated sites.

5.2. Direct Or Indirect Impacts

The proposed project lies entirely outside the boundary of any European site. Two European sites, *Dundalk Bay SPA 004026* and *Dundalk Bay 000455*, were considered as part of this screening. However, they both lie ca30km downstream from the nearest receiving watercourse, via the River Dee, and are not hydrologically connected to the proposed works area. Additionally, both are designated for coastal/estuarine habitats and species. Given the nature and scale of the works, the nature of the qualifying interests of the sites and the lack of reasonable pathways for impact, the potential for direct or indirect impact on any European site is negligible.

5.2.1. Surface and groundwater pollution

The proposed works are not connected hydrologically to the wider receiving environment and lie within a highly modified sem-urban environment with an existing road drainage system. No pathway for impact on any European site exists.

5.2.3. Construction/installation of infrastructure and potential QI habitat loss

No infrastructure will be constructed or installed within a European site or affecting any supporting ecological features as part of this project

5.2.4. Invasive Species

No schedule 3 species were found within the boundary of the proposed works area or its environs.

5.3. Cumulative And In-Combination Impacts

A search of Meath County Council’s planning application database on 2nd September 2022 showed no developments that could contribute to a cumulative or in-combination effect with the proposed works.

5.4. Likely Changes to the Designated Site(s)

No changes are predicted to any designated site, positive or negative.

6. Screening Conclusions

This report presents the information for the relevant authority, Meath County Council, to carry out a screening for AA. A recommendation that a stage II is/is not required is made below, based on the findings of this assessment, which are summarised in Table 2. It is for the relevant authority to reach one of the following conclusions:

- (i) A stage II AA of the proposed development is required if it *cannot* be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or projects, will not have a significant effect on any European Designated Sites.
- (ii) A stage II AA of the proposed development is not required if it *can* be excluded, on the basis of objective information, that the proposed development, individually or in combination with other plans or projects, will not have a significant effect on any European Designated Sites.

Table 2 Assessment of likely effects on any Designated Sites

Assessment of Likely Effects	
Size and scale	The proposed works are less than 400m ² , extremely small in relation to the nearest European sites.
Land-take	The works take place outside any European sites; no land is being taken for this project.
Distance from the Natura 2000 site or key features of the site;	The works area lies ca30 km from the nearest European site(s) via any reasonable pathway for impact.
Resource requirements (water abstraction etc.);	No resources are required from any European site for this project.

Emissions (disposal to land, water or air);	There is a slight potential for emissions to water from the proposed works; these will be constrained within the existing drainage network of the adjoining road and have no reasonable pathway for impact on the nearest aquatic receptor. Given the nature and scale of the proposed works and the distance to the closest Natura 2000 site, no possibility of impact exists. No other emissions to land or water beyond those of a small construction project are expected, and none which will impact on any European site.
Excavation requirements;	There are no excavations within any European site.
Transportation requirements;	There are no requirements for any transportation of materials through any European site.
Duration of construction, operation, etc.;	As yet unknown, but likely to be less than a year.
Timing of works	As yet unknown, but given nature and scale of the works, distance to any designated site and the lack of any suitable habitat for any QI species in the vicinity of the works area, the timing will not influence any effect or lack thereof on any European site.
Cumulative or In-combination Impacts with other Projects and Plans	No projects are known that could in-combination with the proposed works cause any impact to any European site.

Based on the available information gathered during field and desk surveys, it is the professional opinion of the author that the likelihood of significant impacts arising from the proposed development on *Dundalk Bay SPA 004026* and *Dundalk Bay 000455*, or any other European site, can be ruled out on the basis of the following:

- Nature and scale of the proposed works
- The distance from the proposed works area to the designated sites.
- The lack of any connectivity with the designated sites.
- The nature of the qualifying interests of the designated sites.

Therefore, it is the conclusion of this report that the proposed development will not have a significant effect on any Natura 2000 sites and progression to Stage II Appropriate Assessment is not required.

References

Bruce-White, C., & Shardlow, M., 2011. Impact of Artificial Light on Invertebrates. Buglife – The Invertebrate Conservation Trust. March 2011. ISBN 978-1-904878-99-5:
https://cdn.buglife.org.uk/2019/08/A-Review-of-the-Impact-of-Artificial-Light-on-Invertebrates-docx_0.pdf

CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester. <https://cieem.net/wp-content/uploads/2019/02/Combined-EcIA-guidelines-2018-compressed.pdf>

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

Environmental Protection Agency, Appropriate Assessment Tool:
<https://gis.epa.ie/EPAMaps/AAGeoTool>

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

Geological Survey of Ireland (accessed 2022) Maps and Data: <https://www.gsi.ie/en-ie/data-and-maps/Pages/default.aspx>

JNCC (2010) Handbook for Phase 1 Habitat Survey. Joint Nature Conservation Committee, Peterborough, UK.

National Biodiversity Data Centre (accessed 2022) Biodiversity Maps:
<https://maps.biodiversityireland.ie/>

National Planning Application Map Viewer: <https://myplan.ie/national-planning-application-map-viewer/>

National Roads Authority (2009) Ecological Surveying Techniques for Protected flora and fauna during the Planning of National Road Schemes. NRA (now Transport Infrastructure Ireland), Dublin.

NPWS (2011) Conservation Objectives: Dundalk Bay SAC 000455 and Dundalk Bay SPA 004026. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Scannell, M J P and Synott, D M, 1987, Census Catalogue of the Flora of Ireland. Stationary Office, Dublin.

Smith, G.F., O'Donoghue, P., O'Hora, K. and Delaney, E., 2011. Best practice guidance for habitat survey and mapping. The Heritage Council: Ireland.

Wyse Jackson, M., FitzPatrick, Ú., Cole, E., Jebb, M., McFerran, D., Sheehy Skeffington, M. & Wright, M. (2016) Ireland Red List No. 10: Vascular Plants. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, Dublin, Ireland.

APPENDIX I – SITE PHOTOGRAPHS

