Panther Environmental Solutions Ltd
Units 3 & 4, Innovation Centre
Institute of Technology
Green Road, Carlow
Ireland
R93 W248

Telephone: 059-9134222
Email: info@pantherwms.com
Website: www.pantherwms.com

NATURA IMPACT STATEMENT

BRIARGATE DEVELOPMENTS NEWBRIDGE LTD,
BALLYMANY,
NEWBRIDGE,
CO KILDARE

2022

REPORT NO:	PES_NIS_20_9794R1	**AUTHOR:**	Ross Donnelly-Swift, PhD.
DATE:	19th January 2022	**REVIEWED:**	Mike Fraher, BSc.

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EXECUTIVE SUMMARY

This report has been prepared by Panther Environmental Solutions Ltd. to accompany an application for planning permission to An Bord Pleanala by the applicant, Briargate Developments Newbridge Ltd. for the proposed construction of a residential development, comprising of comprising of 336 units and all associated site development works, at Ballymany, Newbridge, Co. Kildare.

This report identified the presence of European sites within the potential zone of influence of the proposed development and noted that the proposed development site is hydrologically connected to the Pollardstown Fen SAC (Site Code 000396) and the River Barrow and River Nore SAC. It also close to Mouds Bog SAC (Site Code 002331). The potential for impacts to European sites as a result of the proposed development such as potential surface water quality impacts, introduction of invasive species, habitat destruction and impacts from noise and dust were considered and the level of risk posed assessed.

During Stage 1 Screening for Appropriate Assessment, it was considered that there may be potential for an indirect impact upon the qualifying interests / special conservation interests of Pollardstown Fen SAC, Mouds Bog SAC and the River Barrow and River Nore SAC due to a potential deterioration in water quality during the construction phase. Therefore, a Natura Impact Statement was prepared.

Due to the recommended control measures and standard practice during the demolition phase, it is considered that there would be no significant risks to the conservation objectives of the habitats and species for which the Pollardstown Fen SAC, Mouds Bog SAC and the River Barrow and River Nore SAC have been designated.

It is considered that there would be no significant risk of negative impact, either alone or in combination with other plans or projects, to the integrity of the Natura 2000 network.

1.0 INTRODUCTION

Briargate Developments Newbridge Ltd. is seeking planning permission for a residential development as part of a strategic housing development that will be constructed at Ballymany, Newbridge, Co. Kildare.

The principal aim of this study is to assess whether significant effects to European sites (the Natura 2000 network) are likely to occur as a result of this project in accordance with Article 6(3) of the Habitats Directive and the Planning and Development (Amendment) Act, 2001, as amended. This report has been prepared with regards to the European Communities (Natural Habitats) Regulations 1997 (S.I. No. 94 of 1997), and the later amendment regulations (S.I. No. 233 of 1998; S.I. No. 237 of 2005).

A study was undertaken by Dr Ross Donnelly-Swift (BSc (Hons) Biology, MSc Environmental Science, PhD Biosystems Engineering) of Panther Environmental Solutions Limited. This comprised a review of the proposed development, a site visit on the 6th August 2020 to examine the ecological context of the proposed development, a desk study of the information on European sites within the potential zone of influence of the site and an analysis of the information in the context of the guidance to determine if a Natura Impact Statement is required.

The Appropriate Assessment and Natura Impact Statement shall be undertaken in accordance with the guidance outlined in "*Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities*" (DoEHLG, Dec 2009) and "*Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites*" (EC, Nov 2001) and "*Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive*" (EC, 2018).

- DoEHLG (2009) "*Appropriate Assessment of Plans & Projects in Ireland*"
- Environment DG, European Commission (2002) "*Assessment of plans and projects significantly affecting Natura 2000 sites - Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*" Oxford Brookes University, 2001
- Department of the Environment Heritage and Local Government (DoEHLG) Circular Letter SEA 1/08 and NPWS 1/08.
- Department of the Environment Heritage and Local Government (DoEHLG) Circular letter NPWS 1/10 and PSSP 2/10

2.0 LEGISLATIVE CONTEXT

The EU Habitats Directive (92/43/EEC) on the conservation of natural habitats and of wild fauna and flora, as amended by council directive 97/62/EC, 2006/105/EC, and Regulation EC1882/2003 of September 2003, as transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/11), provides the framework for legal protection for habitats and species of European importance. The Natura 2000 network provides an ecological infrastructure for the protection of sites that are of particular importance for rare, endangered or vulnerable habitats and species within the EU. The Natura 2000 network in Ireland is made up of European Sites which include:

- Special Areas of Conservation (SACs)
- Special Protection Areas (SPAs)

Article 6(3) of the Habitats Directive establishes the requirement for appropriate assessment when planning new developments that might affect a Natura 2000 site. Article 6(3) of the Habitats Directive 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.*"

Stage 1: Screening for Appropriate Assessment
This stage involves an initial screening assessment of the potential impacts of the project, either alone or in combination with other projects, upon a Natura 2000 site. If it can be concluded that there would be no significant impacts upon Natura 2000 sites, the assessment stops at this stage. If not, or if further assessment is required, the assessment proceeds to Stage 2.

Stage 2: Appropriate Assessment / Natura Impact Statement (NIS)
This stage assesses the impact of the project, alone or in combination with other projects or plans, on the integrity of the Natura 2000 site, with respect to the site's conservation objectives, the site's ecological structure and function and its overall integrity. The output of this stage is an NIS, which also includes any mitigation measures required to avoid, reduce or offset negative impacts of the project. If this stage determines that adverse effects on the Natura 2000 site cannot be excluded, then the plan or project should proceed to Stage 3 or be abandoned.

3.0 METHODOLOGY

Stage 1 - Screening

Screening is the first stage in the Appropriate Assessment process, and is carried out to determine whether a Stage 2 Appropriate Assessment and a Natura Impact Statement (NIS) is required. Screening addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3);

1. Whether a plan or project is directly connected to or necessary for the management of the European (Natura 2000) site; and

2. Whether a plan or project, alone or in combination with other plans or projects, is likely to have significant effects on a European (Natura 2000) site, in view of its conservation objectives.

Screening should be undertaken without the inclusion of mitigation measures. If the effects are deemed to be significant, potentially significant, or uncertain, or if the screening process becomes overly complicated, then the process must proceed to Stage 2 AA and a NIS.

The findings and conclusions of the screening process should be documented, with the necessary supporting evidence and objective criteria. This is of particular importance in the cases where the Appropriate Assessment process ends at the screening stage because the conclusion is that no significant effects are likely.

Following Stage 1 Screening, it was considered that there may be potential for an indirect impact upon the qualifying interests of a European site, therefore, the assessment progressed to Stage 2.

Stage 2 – Natura Impact Assessment

The scope of this assessment follows the appropriate assessment statement methodology as defined within the European Commission guidance document "*Assessment of plans and projects significantly affecting Natura 2000 sites"* (2002), Section 3, Part 2. Guidance from the Department of the Environment, Heritage and Local Government "*Appropriate Assessment of Plans and Projects in Ireland*" (2009) and "*Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive*" (2018) have also been used in the preparation of this report. In accordance with this guidance, the following methodology has been used to produce this Natura Impact Statement:

Step 1**:** Information Required
Identifying the conservation objectives of the Natura 2000 site and the aspects of the project, alone or in combination with other projects or plans, which have the potential to affect those conservation objectives.

This process involves gathering information for the Natura 2000 site, including the conservation objectives of the site, factors contributing to conservation value, aspects sensitive to change and the existing baseline condition of the site. The principal source of information used for Natura 2000 sites, their qualifying interests and conservation objectives is the National Parks and Wildlife Service (NPWS). Information is also required for the project including the size and scale of the project, the relationship (distance, connectivity etc.) of the project to the Natura 2000 site and the characteristics of existing, proposed or other projects which have the potential to affect the Natura 2000 site.

Step 2: Impact Prediction
This process predicts and identifies the likely impacts of the project on the Natura 2000 site. Potential impacts are identified as; direct and indirect; short or long-term duration; construction, operational or decommissioning; and isolated, interactive and cumulative effects.

Step 3: Conservation Objectives
Once the potential impacts of the project have been predicted and identified, it will be necessary to assess whether these impacts will adversely impact upon the integrity of the Natura 2000 site, as defined by the site's conservation objectives and status of the site. Where it cannot be demonstrated that there will be no adverse impacts upon the Natura 2000 site, mitigation measures must be proposed for the project.

Step 4: Mitigation Measures
Upon the identification of potential impacts, the project will have on the Natura 2000 site (alone or in combination with other projects or plans), mitigation measures will be proposed to eliminate, reduce or offset these negative impacts. Mitigation measures should be considered with preference to the hierarchy of preferred options outlined in the guidance document "*Assessment of plans and projects significantly affecting Natura 2000 sites"*.

3.1 Methodology guidelines

This Appropriate Assessment has been carried with reference to the following guidelines:

- *Appropriate Assessment of Plans and Projects in Ireland. Guidelines for Planning Authorities*. DoEHLG, 2009.
- Circular NPWS 1/10 & PSSP 2/10 Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities
- *Managing Natura 2000 sites – The Provisions of Article 6 of The Habitats Directive 92/43/EEC.* European Commission, 2000.
- Circular L8/08 Water Services Investment and Rural Water Programmes – Protection of Natural Heritage and National Monuments 2 September 2008
- *Assessment of Plans and Projects Significantly Affecting Natura 2000 sites. Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC.* European Commission, 2002.
- Commission Notice "Managing Natura 200 sites The provisions of Article 6 of the Habitats Directive 92/43/EEC. European Commission, 21.11.2018
- CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal*, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester.

3.2 Desktop Research

- Desktop research was carried out to gather information on the ecology of the site and surrounding areas. The locations of the Natura 2000 sites within 15km of the proposed development at Ballymany, Newbridge, Co. Kildare were identified from National Parks and Wildlife Service (NPWS) online map viewer. Other Natura sites beyond 15km were also reviewed and considered for the potential for the project to have a negative effect.

- Water quality data from the EPA was reviewed for the assessment of biological and environmental data collected on waterbodies in Ireland (Water Quality in Ireland 2013-2018 (2019))

- Information on the characteristics of the Natura 2000 sites within the potential zone of influence was reviewed from the conservation objectives documents, site synopses and Standard Natura 2000 data forms available on the NPWS website.

3.3 Site Survey

A site characterisation assessment was undertaken on the 6th August 2020 to examine the ecological context of the development site, by systematically walking the site, adjacent land and boundaries and determining the habitats present. The habitat survey was undertaken in accordance with the standard methodology outlined in Fossitt's "*A Guide to Habitats in Ireland*", a hierarchical classification scheme based upon the characteristics of vegetation present. The Fossitt system also indicates when there are potential links with Annex I habitats of the E.U. Habitats Directive (92/43/EEC). Cognisance was also taken of the Heritage Council guidelines, "*Best Practice Guidance for Habitat Survey and Mapping*", (Smith *et al.*, 2011).

Bird species and signs of fauna activity and dwellings were also noted. Particular attention was given to the possible presence of habitats and/or species, which are legally protected under Irish and European legislation and to assessing any potential ecological connectivity with Natura 2000 sites or supplementary or steppingstone habitats of relevance to Natura 200 sites.

4.0 DESCRIPTION OF PROPOSED DEVELOPMENT AND EXISTING SITE

4.1 PROPOSED DEVELOPMENT

The applicant is proposing to submit a Strategic Housing Development Application to An Bord Pleanala for a proposed residential development at Ballymany, Newbridge, Co. Kildare. See Figure 4.1 below. The development is within the local area plan boundary of Newbridge and will comprise of the construction of a mixed residential development of 336 units comprising of 245 no. two storey houses, 27 no apartments, within one building and 64 no. duplex units arranged in 6 no. 2 & 3 storey buildings. A childcare facility is also proposed as a stand-alone 2 storey building to serve the development. The total site area is 11.4ha. This includes car parking spaces, bicycle parking and green spaces, internal roads, pumping station, landscaping, boundary treatments and all associated site development works. In addition to footpath improvements along Standhouse Road. The heating system of the residential development will be Air to Water heat pumps. Vehicular access will be from the R445 road (as permitted under Ref.16/658).

As per the surface water drainage system designed by the engineering consultants MUIR associates will consist of a drainage pipe network with inspection holes, tapped gullies and attenuation areas with geotextile layer with hydrocarbon treatment with eco modular units in addition to filter drains to be located within the proposed development. The runoff from the roof areas is considered to be clean runoff, free from silt and other contaminants while potential silts and hydrocarbons from the road network will be captured within the drainage system. Foul water will connect to the existing public sewer network along the R445 and connect with the local WWTP. The proposed development will not require any works within a Special Area Conservation (SAC) or a Special Protected Area (SPA). Pollardstown Fen SAC site (Site Code: 000396) is located approximately 620m to the northwest of the proposed site, as shown in Figure 4.2

A landscaping plan has been prepared for the development by and will include native species to complement the surrounding environment and the exclusion of all potential invasive species. Further details of planting design and specifications are contained within the landscaping plan.

During the construction phase, site clearance works would be undertaken, which would involve the removal of scrub and recolonising plants. Mature trees and hedgerows along the boundary of the site will be maintained with additional information on tree protection in the arborist report. The removal of gravel within the proposed development would be exported offsite via a licenced contractor for use in construction or to a suitably licenced waste facility.

During excavation works, excavated soil would be temporarily stored onsite, for re-use in landscaping and reinstatement works where possible. Following site clearance works, construction of the residential dwelling, drainage systems and associated works would commence. The expected construction timeframe, including landscaping activities, would be approximately five years.

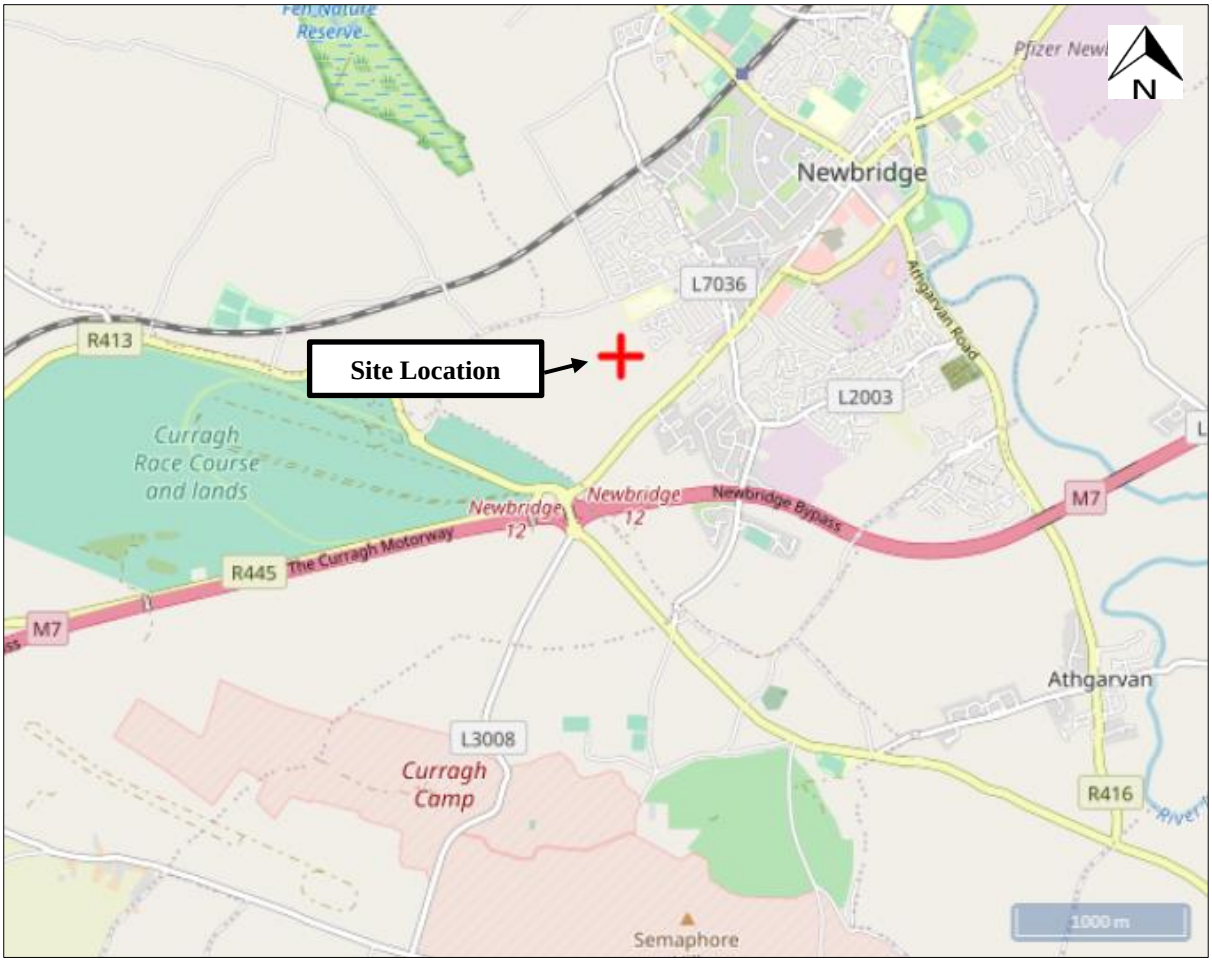


Figure 4.1: Location of Proposed Development at Ballymany, Newbridge, Co. Kildare

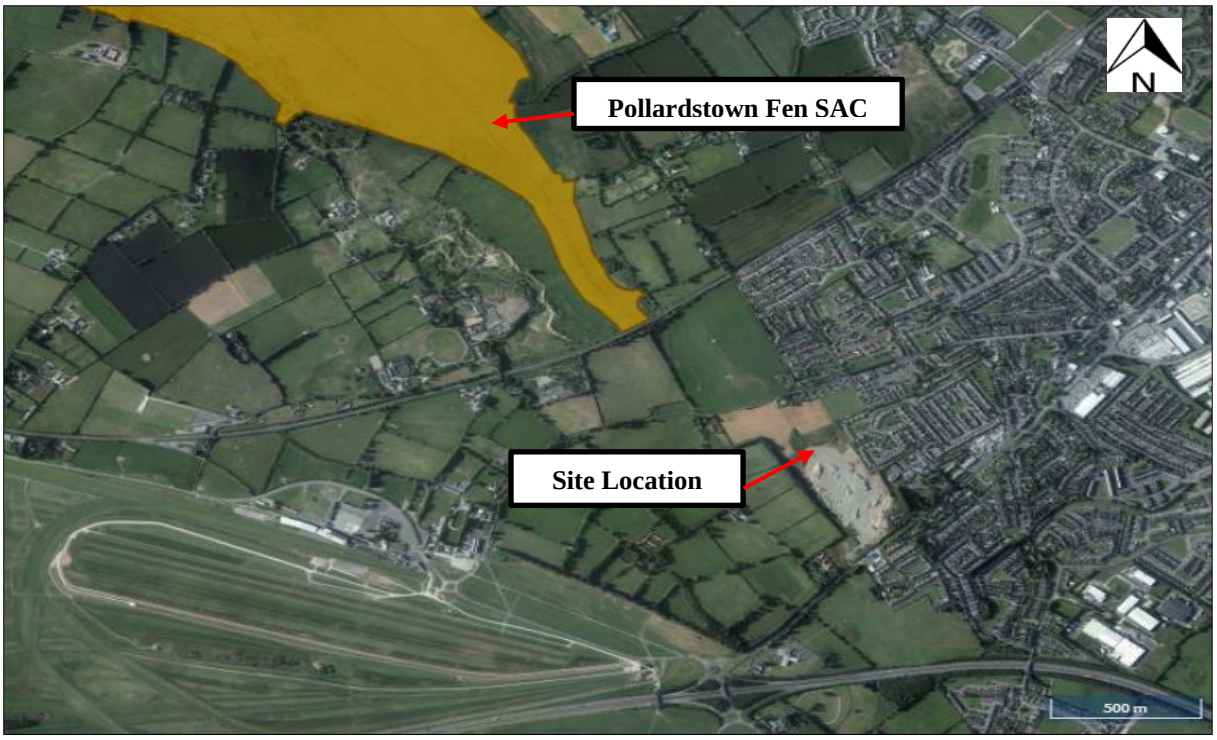


Figure 4.2: Location of Proposed Development and Pollardstown Fen SAC

4.2 EXISTING ENVIRONMENT

The proposed development site, measuring approximately 11.4ha, is located in the town of Newbridge (within the town limit) along the R445 road. Junction 12 of the M7 motorway is approximately 760m to the south-west of the proposed development. The Curragh Racecourse is approximately 810m and the Curragh Army Camp 2.5km to the south-west. The Curragh is designated as a proposed National Heritage Area (pNHA) (Site Code 000392). The River Liffey is approximately 1.8km to the east of the proposed development site.

According to the Preliminary Flood Risk Assessment (PFRA) mapping tool by the OPW the development site is located outside any areas of low-high risk of fluvial flooding. However, it should be noted that this mapping system is based on broad-scale simple analysis and may not be accurate for a specific location. In addition the Site Specific Flood Risk Assessment by Muir Associates Ltd concludes the site is appropriate in terms of meeting the flood risk and stormwater impact policies and objectives of the Kildare County Development Plan 2017-2023 and that the proposed development is considered to have the required level of flood protection. Does not increase the flood risk to other third parties or lands and meets the various requirements of the OPW Guidelines in relation to flood risk.

A site characterisation assessment was undertaken on the 6th August 2020 to examine the ecological context of the development site, by systematically walking the site and boundaries and determining the habitats present. The habitat survey was undertaken in accordance with the standard methodology outlined in Fossitt's "*A Guide to Habitats in Ireland*", a hierarchical classification scheme based upon the characteristics of vegetation present. The Fossitt system also indicates when there are potential links with Annex I habitats of the E.U. Habitats Directive (92/43/EEC). Cognisance was also taken of the Heritage Council guidelines, "*Best Practice Guidance for Habitat Survey and Mapping*", (Smith *et al.*, 2011).

Bird species and signs of fauna activity and dwellings were also noted. Particular attention was given to the possible presence of habitats and/or species, which are legally protected under Irish and European legislation.

During the site survey eleven habitats were identified. A dominant habitat found at the proposed development is recolonising bare ground (ED3). The dominant species found here are Ragwort (*Senecio jacobaea*), Spear Thistle (*Cirsium vulgare*), Creeping Buttercup (*Ranunculus repens*) and Dock (*Rumex* spp.). Other flora found here include Creeping Thistle *(Cirsium arvense*), Hogweed (*Heracleum sphondylium*), Lesser Burdock (*Arctium minus*), Ribwort Plantain (*Plantago lanceolata*), Colt's Foot (*Tussilago farfara*), Common Figwort (*Scrophularia nodosa*), Weld (*Reseda luteola*), Rosebay Willowherb (*Chamerion angustifolium*), Ox-eye Daisy (*Leucanthemum vulgare*), Poppy (*Papaver* spp.), Nettle (*Urtica dioica*), Hedge Mustard (*Sisymbrium officinale*), Lesser Hawkbit (*Leontodon taraxacoides*), Greater Plantain (*Plantago major*), Dandelion (*Taraxacum* spp.) and Yarrow (*Achillea millefolium*).

Along the boundary of the development site is hedgerows (WL1) habitat with tree species such as Ash (*Fraxinus excelsior*), Sycamore (*Acer pseudoplatanus*), Blackthorn (*Prunus spinosa*), Hawthorn (*Crataegus monogyna*), Elder (*Sambucus nigra*), Elm (*Ulmus* spp.) and Oak (*Quercus* spp.). Other species commonly found in this habitat are Bramble (*Rubus fruticosus*), Cow Parsley (*Anthriscus sylvestris*), Dog-rose (*Rosa canina agg.*), Herb-Robert (*Geranium robertianum*), Laurel (*Prunus laurocerasus*), Ivy (*Hedera helix*), Cleavers (*Galium aparine*), and Nettle (*Urtica dioica*). Also, along the boundary is treelines (WL2) habitat. This will contain the tree species found in WL1, additional species includes Copper Beech (*Fagus sylvatica f. purpurea*), Leyland Cypress (*Cuprocyparis leylandii*), Willow (*Salix* spp.), Monkey Puzzle (*Araucaria araucana*) and Sitka Spruce (*Picea sitchensis*).

Dry meadows and grassy verges (GS2) habitat is present at the site. Flora species found here include grasses such as Ryegrasses (*Lolium* spp.), as Cock's-foot (*Dactylis glomerata*), Bent grasses (*Agrostis* spp) and Meadow-grasses (*Poa* spp.). Frequent species include Dandelion (*Taraxacum* spp.), Dock (*Rumex* spp.), Spear Thistle (*Cirsium vulgare*), Greater Plantain (*Plantago major*) Common Vetch (*Vicia sativa* ssp. *segetalis*), Common Knapweed (*Centaurea nigra*), Daisy (*Bellis perennis*), Speedwell (*Veronica* spp.) and Nettle (*Urtica dioica*).

The road into the development site and construction prefabs are classified as buildings and artificial surfaces (BL3) habitat with few flora species present such as Groundsel (*Senecio vulgaris*) and Dandelion (*Taraxacum* spp.).

Scrub (WS1) habitat is found within the site at various points. Flora species include are Grass spp, Gorse (*Ulex europaeus*), Bramble (*Rubus fruticosus*), Willow (*Salix* spp.), Dock (*Rumex spp*.) and Rosebay Willowherb (*Chamerion angustifolium*).

A small pond found at the southern end of the site is classified as other artificial lakes and ponds (FL8) habitat. With Bulrush (*Typha latifolia*), Silverweed (*Potentilla anserina*), Horsetail (*Equisetaceae agg.*) and Soft Rush (*Juncus effusus*).

Along the road boundary is an area of ornamental/non-native shrub (WS3) habitat. Flora found here includes Silverleaf cotoneaster (*Cotoneaster Pannosus*) and Spreading cotoneaster (*Cotoneaster divaricatus*).

Exposed sand, gravel and till (ED1) and spoil and bare ground (ED2) habitat can be found at the southern part of the site. Species found here are similar to ED3 and WS1 with the addition of Willow (*Salix* spp.) Butterfly-bush (*Buddleja davidii*) and Birch (*Betula* spp.).

Earth banks **(**BL2) habitat along the east and west boundaries of the site with similar flora to GS2 but also found here is Bramble (*Rubus fruticosus*), Creeping Cinquefoil (*Potentilla reptans*), Lesser Burdock (*Arctium minus*), Willowherb (*Epilobium* spp.), Sow-thistle (*Sonchus* spp.), Spear Thistle (*Cirsium vulgare*), and Common Chickweed (*Stellaria media*).

The majority of habitats identified during the onsite assessment were generally considered to be modified and of low conservation value with the boundary hedge to the east of moderate conservation value. No plant species of conservation significance or high impact invasive plant species were noted during the site assessment. See Table 4.2 for summary for habitats located at and adjacent the proposed development.

Table 4.2 Habitats found in and adjacent to the development site

HABITAT CLASSIFICATION HIERARCHY		
LEVEL 1	**LEVEL 2**	**LEVEL 3**
B – Cultivated and built land	**BL** – Built Land	**BL2** - Earth Banks
		BL3 – Buildings and artificial surfaces
E – Exposed rock and disturbed ground	**ED –** Exposed rock	**ED1** - Exposed sand, gravel and till
		ED2 – Spoil and bare ground
		ED3 – Recolonising bare ground
F – Freshwater	**FL** – Lakes and ponds	**FL8** – Other artificial lakes and ponds
G – Grassland and marsh	**GS** – Semi-natural grassland	**GS2** - Dry meadows and grassy verges
W – Woodland and scrub	**WS** – Scrub / transitional woodland	**WS1** - Scrub
		WS3 - Ornamental/non-native shrub
	WL – Linear woodland / scrub	**WL1** – Hedgerows
		WL2 – Treelines

Given the agricultural and urban land use of the surrounding area it would be expected that common grassland, garden and hedgerow bird species would be present in the area. Bird species noted during the site walkover included Blackbird (*Turdus merula*), Blue Tit (*Parus caeruleus*), Dunnock (*Prunella modularis*), Jackdaw (*Corvus monedula*), Magpie (*Pica pica*), Woodpigeon (*Columba palumbus*), Chaffinch (*Fringilla coelebs*), Robin (*Erithacus rubecula*), Rook (*Corvus frugilegus*), House Sparrow (*Passer domesticus*), House Martin (*Delichon urbicum*), Goldfinch (*Carduelis carduelis*), Wren (*Troglodytes troglodytes*), Swallow

(*Hirundo rustica*), Greenfinch (*Carduelis chloris*), Skylark (*Alauda arvensis*) and Great Black-backed Gull (*Larus marinus*).

No species are red listed under the BoCCI classification and six species Great Black-backed Gull, Greenfinch, House Martin, House Sparrow, Skylark and Robin, are amber listed. None of the bird species recorded are listed under Annex I of the E.U. Birds Directive.

No fauna was noted during the survey. Along the east boundary within the mature hedgerow is evidence of Badger (*Meles meles*) (sets). Evidence of Rabbit (*Oryctalagus cuniculus*) (disused borrows) and Fox (*Vulpes vulpes*) (faeces) were found within the site. Other fauna typical of that found throughout the rest of Ireland, which would be expected to be found in the area include Bat species, Badger (*Meles meles*), Otter (*Lutra lutra*), Pine Marten (*Martes martes*), Stoat (*Mustela erminea hibernica*), American Mink (*Mustela vison*), Deer, Irish Hare (*Lepus timidus hibernicus*), Hedgehog (*Erinus europaeus*), Red Squirrel (*Sciurus vulgaris*), Grey Squirrel (*Sciurus carolinensis*), Wood Mouse (*Apodemus sylvaticus*), Pygmy Shrew (*Sorex minutus*) and Brown Rat (*Rattus norvegicus*). See accompanying EcIA report for additional information on flora, fauna and bat survey results. (Document Ref: PES_EcIA_ 21367)

In addition to the site walkover, flora and fauna records were reviewed on the National Biodiversity Data Centre (NBDC) website for the proposed development site and vicinity. No protected flora species under the Flora Protection Order 2015 (S.I. No. 356 of 2015), were recorded for the 10km square (Tetrad - N71) in which the development site is located. Threatened species recorded were Blue Fleabane (*Erigeron acer*) and Tea-leaved Willow *(Salix phylicifolia*). Three invasive plant species listed in the Third Schedule of the European Communities Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011) were recorded within the 10km square; Fringed Water-lily (*Nymphoides peltata*), Giant Hogweed (*Heracleum mantegazzianum*) and Japanese Knotweed (*Fallopia japonica*).

Fauna records for the previous thirty years were reviewed on the NBDC website for the 10km square in which the proposed development is located (Tetrad - N71). Bird species of note recorded within the 10km square include Barn Owl (*Tyto alba*), Barn Swallow (*Hirundo rustica*), Black-headed Gull (*Larus ridibundus*), Coot (*Fulica atra*), Grasshopper Warbler (*Locustella naevia*), Kestrel (*Falco tinnunculus*), Kingfisher (*Alcedo atthis*), Linnet (*Carduelis cannabina*), Pheasant (*Phasianus colchicus*), Redshank (*Tringa totanus*), Snipe (*Gallinago gallinago*) Starling (*Sturnus vulgaris*), Swift (*Apus apus*), Wood Pigeon (*Columba palumbus*) Curlew *(Numenius arquata*), Marsh Harrier (*Circus aeruginosus*), Eurasian Teal (*Anas crecca*), Wigeon (*Anas penelope*), Woodcock (*Scolopax rusticola*), Golden Plover (*Pluvialis apricaria*), Gadwall (*Anas strepera*), Great Cormorant (*Phalacrocorax carbo*), Grey Plover (*Pluvialis squatarola*), Hen Harrier (*Circus cyaneus*), Herring Gull (*Larus argentatus*), House Martin *(Delichon urbicum*), House Sparrow (*Passer domesticus*), Jack Snipe (*Lymnocryptes minimus*), Lesser Black-backed Gull (*Larus fuscus*), Little Egret (*Egretta garzetta*), Little Grebe (*Tachybaptus ruficollis*), Mallard (*Anas platyrhynchos*), Merlin (*Falco columbarius*), Mew Gull (*Larus canus*), Mute Swan (*Cygnus olor*), Northern Lapwing (*Vanellus vanellus*), Northern Shoveler (*Anas clypeata*) Rock Pigeon (*Columba livia*), Peregrine Falcon (*Falco peregrinus*), Sand Martin (*Riparia riparia*), Sky Lark (*Alauda arvensis*) Spotted Flycatcher (*Muscicapa striata*), Stock Pigeon (*Columba oenas*), Tufted Duck (*Aythya fuligula*), Water Rail (*Rallus aquaticus*), Whinchat (*Saxicola rubetra*) and Yellowhammer (*Emberiza citrinella*).

Fauna of note include the protected species Common Frog (*Rana temporaria*), Smooth Newt (*Lissotriton vulgaris*), Common Lizard (*Zootoca vivipara*), Badger (*Meles meles*), Pygmy Shrew (*Sorex minutus*), Red Squirrel (*Sciurus vulgaris*) Lesser Noctule (*Nyctalus leisleri*), Pine Marten (*Martes martes*), Pipistrelle *(Pipistrellus pipistrellus sensu lato*), Red Deer (*Cervus elaphus*), Soprano Pipistrelle (*Pipistrellus pygmaeus*) Hedgehog (*Erinaceus europaeus*) and European Otter (*Lutra lutra*).
Invasive species within the 10km square are American Mink (*Mustela vison*), Brown Rat *(Rattus norvegicus*), Grey Squirrel (*Sciurus carolinensis*), Rabbit (*Oryctolagus cuniculus*), Greylag Goose (*Anser anser*) and Sika Deer (*Cervus nippon*).

Protected invertebrates of note include Marsh Fritillary (*Euphydryas aurinia*), Desmoulin's Whorl Snail (*Vertigo* (*Vertigo*) *moulinsiana*), Geyer's Whorl Snail (*Vertigo* (*Vertigo*) *geyeri*) and Narrow-mouthed Whorl Snail (*Vertigo* (*Vertilla*) *angustior*).

4.2.1 Information on Water Quality

The proposed development is located within the Barrow Catchment (ID 14) and Liffey and Dublin Bay Catchment (ID 09). Watercourses located near the proposed development are Cloncumber Stream (EPA Code 14C17, Order 2). Rosberry 14 (EPA Code: 14R08, Order 1), River Liffey (EPA Code: 09L01, Order 6) and the Grand Canal (Milltown Feeder). The Grand Canal connects with Pollardstown Fen as does the Cloncumber Stream and Rosberry 14. Pollardstown Fen has approximately 40 springs that supply water to it. See Figure 4.3 for watercourses relative to the propose development.

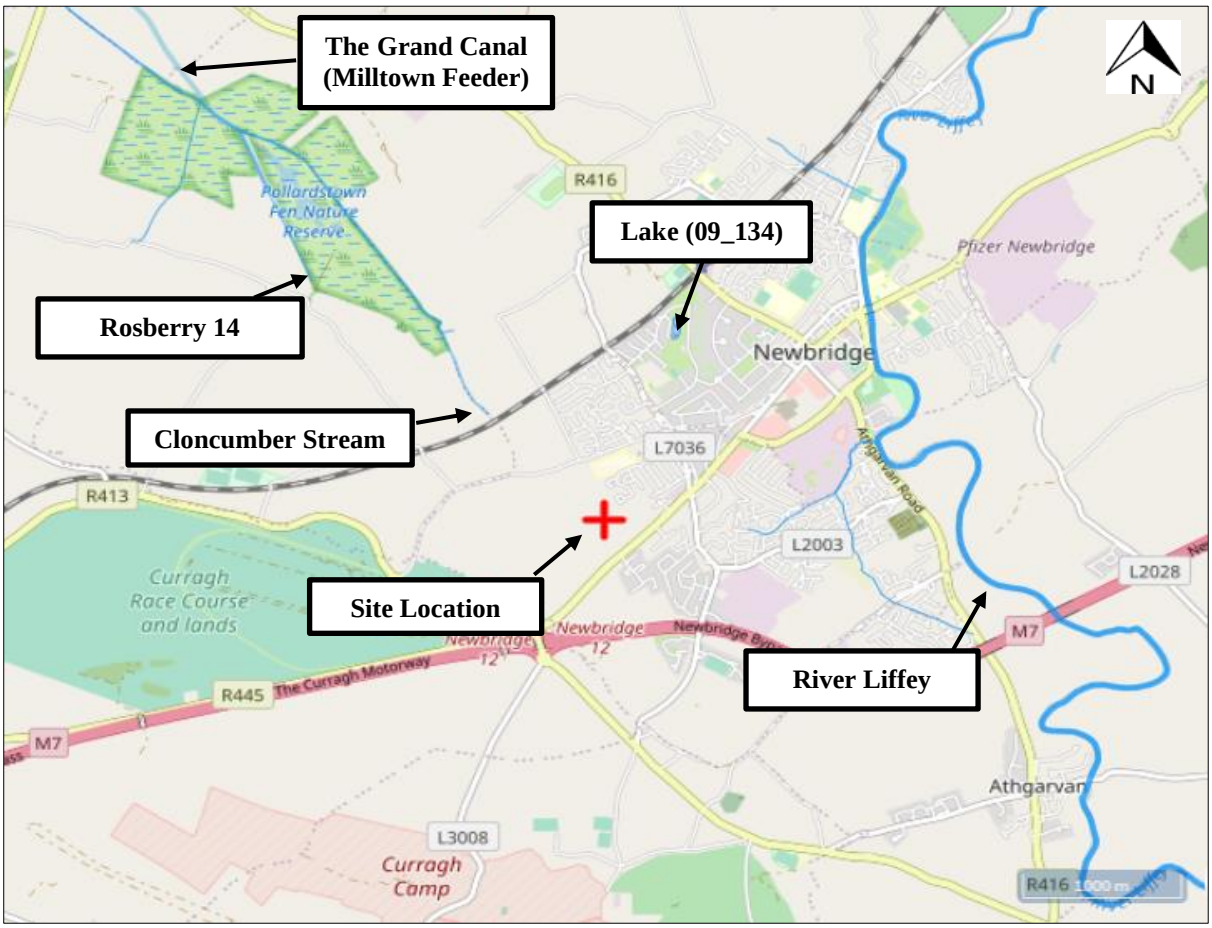


Figure 4.3: Watercourses within vicinity of the proposed development

The Environmental Protection Agency (EPA) undertake surface water monitoring along the River Liffey and Cloncumber Stream. The results for the nearest monitoring stations with available information (as per Table 4.3) for the period 2000 – 2019 are summarised in Figure 4.5 below for indicative purposes. As can be seen in Figure 4.5 below, the River Liffey is mainly achieving a water quality status of between Q4 (good) and Q4.5 (high) in recent years. The Cloncumber Stream is achieving a status of Q3 (poor) and Q4 (good) in recent years. EPA comments on the most recent monitoring results for the River Liffey are as follows "*Ecological conditions were found to be satisfactory at the majority (14) of the 16 stations surveyed on the River Liffey in 2019. Satisfactory ecological conditions were maintained in the upper reaches (0100, 0200, 0250). Stations 0400 and 0500 (Ballymore Estuce) improved for the first time since 1991 and 2010, respectively. At both stations 0700 (Kilcullen) and 0850 (Connell Ford) High ecological condition were noted, despite obvious signs of nutrient enrichment (and excess filamentous algae), an improvement since 2016. Similarly, station 1200 (Castlekeely Ford (RHS)) improved from Moderate to Good. However, a note of caution is advised regarding this recovery as there were still signs of nutrient pressure with significant amounts of filamentous algae. In contrast, the macroinvertebrate community indicated a decline at both station 2100 (Lucan) which dropped to Moderate and station 2360 (0.2 km d/s Chapelizon Br (Lynch's Lane)) which dropped to Poor ecological conditions. Sewage fungus and Chironomus sp were found at this site. Station 0400 (Ballymore Eustace Br) was reassessed in July 2020 and remained at Good ecological condition, although signs of enrichment were very evident."* EPA comments on the most recent monitoring results for Cloncumber Stream are as follows "*The macroinvertebrate fauna continue to indicate unsatisfactory moderate ecological conditions on the Cloncumber Stream at Old River Bridge (0200) in August 2020.*" In 2015 the Cloncumber Stream had a Q value (Q3*) which indicates something worthy of special attention, typically heavy siltation of the substratum.

Table 4.1: Monitoring Stations on the River Liffey and Cloncumber near development site

STATION NO.	STATION LOCATION	EASTING	NORTHING	APPROX. LOCATION FROM SITE
RS14C170200	Old River Br (W)	274420	220919	8km NW
RS09L010850	Connell Ford	281396	213613	4.6km NE
RS09L011000	2.5 km d/s Newbridge	281860	217762	5.87km N

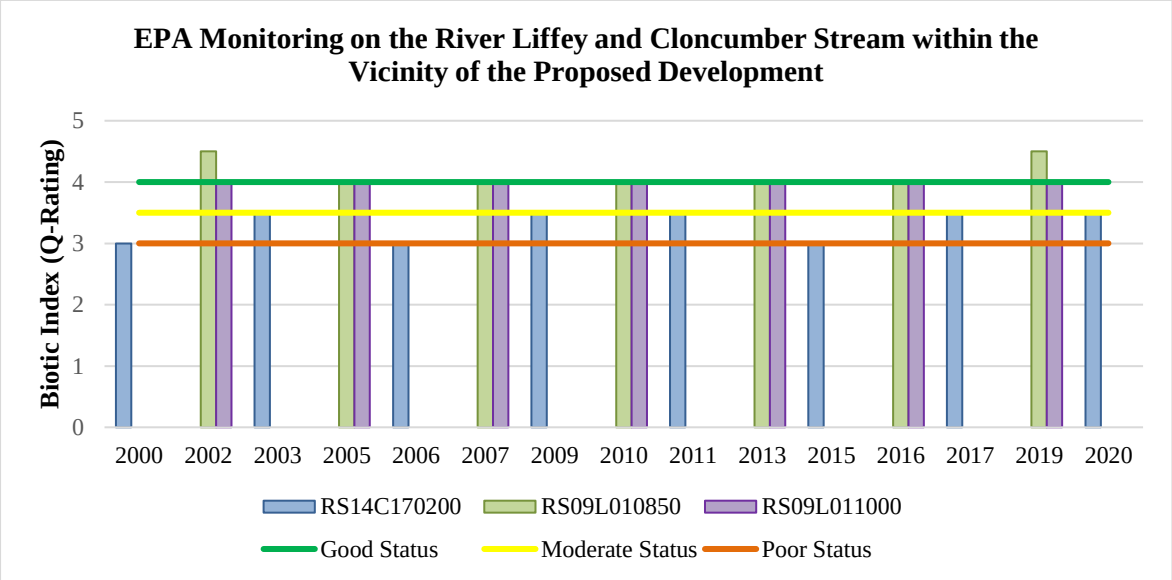


Figure 4.4: EPA Ecological Monitoring of the River Liffey and Cloncumber Stream

5.0 EUROPEAN SITES (NATURA 2000 SITES) within zone of influence

In assessing the zone of influence of this project upon European sites, the following factors must be considered:

- Potential impacts arising from the project;
- The location and nature of European sites;
- Pathways between the development and European sites.

There is no standard radius that can be used to select which European sites are to be analysed. This can only be determined by looking at the zone of influence of the project at hand. A rule of thumb often used is to include all European sites within a distance of 15km.

No Special Protection Area (SPA) sites occur within 15km of the proposed development. Five Special Area of Conservation (SAC) sites occur within 15km of the proposed development and are shown in the following table:

SITE NAME	DESIGNATION	SITE CODE	DISTANCE
Pollardstown Fen	SAC	000396	620m NW
Mouds Bog	SAC	002331	3.6km N
River Barrow and River Nore	SAC	002162	11km SW
Ballynafagh Lake	SAC	001387	11.3km NE
Ballynafagh Bog	SAC	000391	13km NE

Maps detailing European sites within 2km and 15km of the proposed site are included as Appendix A.

For this assessment, the sites considered to be within the zone of influence of the proposed development are Pollardstown Fen SAC (Site Code 000396) and River Barrow and River Nore SAC (Site Code 002162) due to the hydrological connectivity to the site and Mouds Bog SAC (Site Code 002331) due to the distance.

Ballynafagh Lake (Site Code 001387) is hydrologically to the development site via the Grand Canal however this connectivity is approximately 17.63km in distance. Any deterioration in water quality during the construction and/or operational phase would not be significant on the qualifying interests of this SAC. Given the distances from the development, this SAC site has been screened out.

The proposed development is not directly hydrologically connected to Ballynafagh Bog SAC (Site Code 000391). The proposed development site does not contain any of the habitats associated with these SACs. Therefore, in the absence of a source-pathway-receptor relationship and given the distances from the development, these two SACs have been screened out.

5.1 POLLARDSTOWN FEN SAC (SITE CODE 000396)

Pollardstown Fen is situated on the northern margin of the Curragh of Kildare, approximately 3 km north-west of Newbridge. It lies in a shallow depression, running in a north-west/south-east direction. About 40 springs provide a continuous supply of water to the fen. These rise chiefly at its margins, along distinct seepage areas of mineral ground above the fen level. The continual inflow of calcium-rich water from the Curragh, and from the limestone ground to the north, creates waterlogged conditions which lead to peat formation. There are layers of calcareous marl in this peat, reflecting inundation by calcium-rich water. This peat-marl deposit reaches some 6 m at its deepest point and is underlain by clay. The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

ANNEX I HABITATS	
CODE	**DESCRIPTION**
7210	Cladium Fens*
7220	Petrifying Springs*
1016	Alkaline Fens

ANNEX II SPECIES		
CODE	**COMMON NAME**	**SCIENTIFIC NAME**
1016	Desmoulin's Whorl Snail	*Vertigo moulinsiana*
1014	Narrow-mouthed Whorl Snail	*Vertigo angustior*
1013	Geyer's Whorl Snail	*Vertigo geyeri*

The conservation objectives for the SAC are to maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected. An excerpt from the site synopsis for Pollardstown Fen SAC is included below.

"The fen has ornithological importance for both breeding and wintering birds. Little Grebe, Coot, Moorhen, Teal, Mallard, Mute Swan, Water Rail, Snipe, Sedge Warbler and Reed Bunting all breed annually within the fen vegetation. Reed Warbler and Garganey, both rare breeding species in Ireland, have been recorded at Pollardstown and may have bred. In recent years two very specialised bird species associated with fens, Marsh Harrier and Savi's Warbler, have been seen at Pollardstown. Otter and Brook Lamprey (*Lampetra planeri*), two species listed in Annex II of the E.U. Habitats Directive, occur at Pollardstown. Various groups of the invertebrate fauna have been studied and the system has been shown to support a true fen fauna. The species complexes represented are often rare in Ireland, with the sub-aquatic organisms are particularly well-represented. A number of internationally important invertebrates (mostly Order Diptera, i.e. two winged flies) have been recorded from the site. Of particular conservation importance, however, is the occurrence of all three of the Whorl Snails (*Vertigo spp.*) that are listed on Annex II of the E.U. Habitats Directive. Pollardstown is the only known site in Ireland (or Europe) to support all three species (*Vertigo geyeri, V. angustio*r and *V. moulinsiana*), and it therefore provides a unique opportunity to study their different habitat and hydrological requirements. Much of the site with fen vegetation is now owned by the Office of Public Works and is a Statutory Nature Reserve. Pollardstown fen is the largest spring-fed fen in Ireland and has a well-developed and specialised flora and fauna. Owing to the rarity of this

habitat and the numbers of rare organisms found there, the site is rated of international importance."

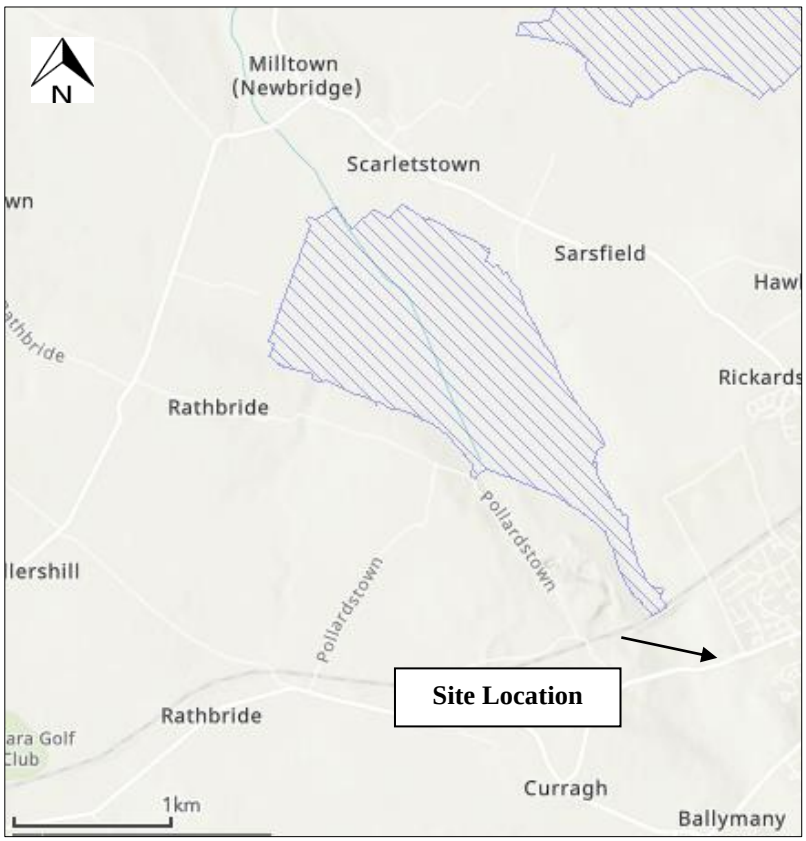


Figure 5.1 Pollardstown Fen SAC

Pollardstown Fen SAC Conservation Objectives

The Habitats Directive requires the Appropriate Assessment process to assess the potential impacts of the development "in *view of the site's conservation objectives*". Site specific conservation objectives (SSCOs) for the qualifying interests of the Pollardstown Fen SAC are provided in the table below, where available from the NPWS document "*Conservation Objectives: Pollardstown Fen SAC* 000396" (NPWS, 2022).

ATTRIBUTE	MEASURE	TARGET
[7210] Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae**		
Habitat area	Hectares	Area stable or increasing, subject to natural processes
Community distribution	Occurrence	No decline, subject to natural processes
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil pH and nutrient status within natural ranges
Ecosystem function: peat formation	Percentage cover of peat-forming vegetation and water table levels	Maintain active peat formation, where appropriate
Ecosystem function: hydrology - groundwater levels	Water levels (centimetres); duration of levels; hydraulic gradients; water supply	Maintain, or where necessary restore, appropriate natural hydrological regimes necessary to support the natural structure and functioning of the habitat
Ecosystem function: hydrology - surface water flow	Drain density and form	Maintain, or where necessary restore, as close as possible to natural or semi-natural, drainage conditions
Ecosystem function: water quality	Various	Maintain, or where necessary restore, appropriate water quality, particularly pH and nutrient levels, to support the natural structure and functioning of the habitat
Vegetation composition: cover of *Cladium mariscu*	Percentage cover at a representative number of monitoring stops	Cover of *Cladium mariscus* at least 25%
Vegetation composition: typical vascular plants	Percentage cover at a representative number of monitoring stops	Maintain adequate cover of typical vascular plant species
Vegetation composition: native negative indicator species	Percentage cover at a representative number of monitoring stops	Cover of native negative indicator species at insignificant levels
Vegetation composition: non-native species	Percentage cover at a representative number of monitoring stops	Cover of non-native species less than 1%

ATTRIBUTE	MEASURE	TARGET
Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 10%
Vegetation composition: algal cover	Percentage cover at, and in local vicinity of, a representative number of monitoring stops	Cover of algae less than 2%
Vegetation structure: vegetation height	Percentage cover at a representative number of monitoring stops	At least 10% of live shoots more than 1m high
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of monitoring stops	Cover of disturbed bare ground not more than 10%
Physical structure: tufa formations	tufa formations Percentage cover in local vicinity of a representative number of monitoring stops	Disturbed proportion of vegetation cover where tufa is present is less than 1%
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat; maintain features of local distinctiveness, subject to natural processes
Transitional areas between fen and adjacent habitats	Hectares; distribution	Maintain/restore adequate transitional areas to support/protect the Cladium fen habitat and the services it provides
[7220] Petrifying Springs		
Habitat area	Square metres	Area stable or increasing, subject to natural processes
Habitat distribution	Occurrence	No decline, subject to natural processes
Hydrological regime: height of water table; water flow	Metres; metres per second	Maintain appropriate hydrological regimes
Physical structure: tufa formations	Seepage rate to the spring and groundwater quality (saturated calcium carbonate, pH, temperature and alkalinity conditions)	Maintain appropriate levels of tufa formation

ATTRIBUTE	MEASURE	TARGET
Ecosystem function: water quality - nitrate level	mg/l	Maintain/restore nitrate levels to less than 10mg/l
Ecosystem function: water quality - phosphate level	µg/l	Maintain/restore phosphate levels to less than 15µg/l
Vegetation composition: community diversity	Variety of vegetation communities	Maintain/restore variety of vegetation communities, subject to natural processes
Vegetation composition: positive indicator species	Number per spring	At least three positive/high quality indicator species as listed in Lyons and Kelly (2016) and no loss from baseline number
Vegetation composition: negative indicator species	Cover (DAFOR scale)	Potentially negative indicator species should not be Dominant or Abundant; woody species should be absent in unwooded springs; invasive
Vegetation composition: algal cover	Percentage cover at, and in local vicinity of, a representative number of monitoring stops	Cover of algae less than 2%
Vegetation structure: sward height	Centimetres	Field layer height between 10cm and 50cm (except for bryophyte-dominated ground
Physical structure: trampling/dung	Cover (DAFOR scale)	Cover should not be Dominant or Abundant
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat; maintain features of local distinctiveness, subject to natural processes
[7230] Alkaline fens		
Habitat area	Hectares	Area stable or increasing, subject to natural processes
Community distribution	Occurrence	No decline, subject to natural processes
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil pH and nutrient status within natural ranges
Ecosystem function: peat formation	Percentage cover of peat-forming vegetation and water table levels	Maintain active peat formation, where appropriate
Ecosystem function: hydrology - groundwater levels	Water levels (centimetres); duration of levels; hydraulic gradients; water supply	Maintain, or where necessary restore, appropriate natural hydrological regimes necessary to support the natural structure and functioning of the habitat

ATTRIBUTE	MEASURE	TARGET
Ecosystem function: hydrology - surface water flow	Drain density and form	Maintain, or where necessary restore, as close as possible to natural or semi-natural, drainage conditions
Ecosystem function: water quality	Various	Maintain, or where necessary restore, appropriate water quality, particularly pH and nutrient levels, to support the natural structure and functioning of the habitat
Vegetation composition: community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes
Vegetation composition: typical brown mosses	Percentage cover at a representative number of monitoring stops	Maintain adequate cover of typical brown moss species
Vegetation composition: typical vascular plants	Percentage cover at a representative number of monitoring stops	Maintain adequate cover of typical vascular plant species
Vegetation composition: native negative indicator species	Percentage cover at a representative number of monitoring stops	Cover of native negative indicator species at insignificant levels
Vegetation composition: non-native species	Percentage cover at a representative number of monitoring stops	Cover of non-native species less than 1%
Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 10%
Vegetation composition: algal cover	Percentage cover at, and in local vicinity of, a representative number of monitoring stops	Cover of algae less than 2%
Vegetation structure: vegetation height	Percentage cover at a representative number of monitoring stops	At least 50% of the live leaves/flowering shoots are more than either 5cm or 15cm above ground surface depending on community type
Physical structure: disturbed bare ground	Percentage cover at, and in local vicinity of, a representative number of monitoring stops	Cover of disturbed bare ground not more than 10%

ATTRIBUTE	MEASURE	TARGET
Physical structure: tufa formations	tufa formations Percentage cover in local vicinity of a representative number of monitoring stops	Disturbed proportion of vegetation cover where tufa is present is less than 1%
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat; maintain features of local distinctiveness, subject to natural processes
Transitional areas between fen and adjacent habitats	Hectares; distribution	Restore adequate transitional areas to support/protect the alkaline fen habitat and the services it provides
[1013] Geyer's Whorl Snail *Vertigo geyeri*		
Distribution	Number of occupied 1km square	No decline, subject to natural processes. There is one known site for this species in the SAC within the 1km grid squares N7615, N7616, N7715 and N7716.
Occurrence in suitable habitat	Percentage positive records in a representative number of samples	No decline, subject to natural processes. A baseline figure of 50% positive samples is set
Habitat area	Hectares	Area of suitable habitat stable or increasing, subject to natural processes; no less than 2ha of at least suboptimal habitat, with at least 50% in optimal condition
Habitat quality	Percentage of samples classified as suitable habitat	No decline, subject to natural processes
Habitat quality: soil wetness	Soil wetness criteria	No decline, subject to natural processes
[1014] Narrow-mouthed Whorl Snail *Vertigo angustior*		
Distribution	Number of occupied 1km square	No decline, subject to natural processes. There is one known site for this species in the SAC within the 1km grid squares N7615, N7616, N7715 and N7716.
Occurrence in suitable habitat	Percentage positive records in a representative number of samples	No decline, subject to natural processes. A baseline figure of 50% positive samples is set
Habitat area	Hectares	Area of suitable habitat stable or increasing, subject to natural processes; no less than 2ha of at least suboptimal habitat, with at least 50% in optimal condition
Habitat quality	Percentage of samples classified as suitable habitat	No decline, subject to natural processes

ATTRIBUTE	MEASURE	TARGET
Habitat quality: soil wetness	Soil wetness criteria	No decline, subject to natural processes
[1016] Desmoulin's Whorl Snail *Vertigo moulinsiana*		
Distribution	Number of occupied 1km square	No decline, subject to natural processes. There is one known site for this species in the SAC within the 1km grid squares N7615, N7616, N7715 and N7716.
Population size: adults	Percentage positive records in a representative number of samples	No decline, subject to natural processes. A baseline figure of 75% positive samples is set
Density within habitat	Number of individuals per sample	No decline, subject to natural processes; at least 50% of samples should have at least 20 individuals
Habitat area	Hectares	Area of suitable habitat stable or increasing, subject to natural processes; no less than 10ha of at least suboptimal habitat
Habitat quality	Percentage of samples classified as suitable habitat	No decline, subject to natural processes
Habitat quality: soil wetness	Soil wetness criteria	No decline, subject to natural processes

Pollardstown Fen SAC Conservation Status

According to the Habitat's Directive, favourable conservation status of a habitat is achieved when:

- Its natural range and areas it covers within that range are stable or increasing, and
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- The conservation status of its typical species is favourable as defined below.

According to the Habitat's Directive, favourable conservation status of a species is achieved when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

The conservation status for the qualifying interests of the Pollardstown Fen SAC are outlined below.

CODE	QUALIFYING INTEREST	NATIONAL CONSERVATION STATUS*	SITE LEVEL CONSERVATION STATUS**
7210	*Cladium* fens	Inadequate	Good
7220	Petrifying springs	Inadequate	Good
7230	Alkaline fens	Bad	Good
1013	Geyer's Whorl Snail	Bad	Good
1014	Narrow-mouthed Whorl Snail	Inadequate	Good
1016	Desmoulin's Whorl Snail	Inadequate	Good

**Sourced from the Status of EU Protected Habitats and Species in Ireland (NPWS, 2019a)*
***Sourced from NPWS (2020)*

5.2 MOUDS BOG SAC (SITE CODE 002331)

Mouds Bog is located about 3 km north-west of Newbridge in Co. Kildare, close to the Hill of Allen, and includes amongst others, the townlands of Grangehiggin, Barretstown and Hawkfield. The site comprises a raised bog that includes both areas of high bog and cutover bog. Much of the margins of the site are bounded by trackways. The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

ANNEX I HABITATS	
CODE	DESCRIPTION
7110	Raised Bog (Active)*
7120	Degraded Raised Bog
7150	Rhynchosporion Vegetation

An excerpt from the site synopsis for Mouds Bog SAC is included below;

"This site consists of two basins of high bog separated by a central ridge. Otherwise the bog is flat, with slopes at its margins. An area of wet quaking bog with welldeveloped pools occurs either side of the central ridge. The western high bog supports a number of small flush areas along with a wet quaking soak with scattered Downy Birch (*Betula pubescens*). The margins have extensive areas of cutover, especially to the west. This is an example of a Midland Raised Bog at the eastern extremity of its current range. It supports typical species including Heather (*Calluna vulgaris*), along with Bog-rosemary (*Andromeda polifolia*) and Cranberry (*Vaccinium oxycoccos*). The central high bog supports wet flat quaking areas on both sides of the mineral ridge with frequent small pools supporting bog mosses *(Sphagnum cuspidatum, S. magellanicum* and *S. capillifolium*) and Great Sundew (*Drosera anglica*). Abundant Heather dominates the drier central ridge. The three flush areas along the southern perimeter of the east and west dome support a hummock/hollow system with Heather, Bogmyrtle (*Myrica gale*) and in places Crowberry (*Empetrum nigrum*). The wet hollows support a variety of bog mosses, including *S. tenellum*. A wet quaking soak to the south supports abundant bog moss (*S. cuspidatum*) and tall Common Cottongrass (*Eriophorum angustifolium*). Cutover areas to the north-east support Purple Moorgrass (*Molinia caerulea*), Soft Rush (*Juncus effusus*) and there is encroaching Downy Birch and Gorse (*Ulex europaeus*) in places. Red Grouse, a Red Listed species and one that is becoming increasingly rare in Ireland, has been recorded on this site. Other birds noted on the site include Skylark, Meadow Pipit, Curlew and Kestrel."

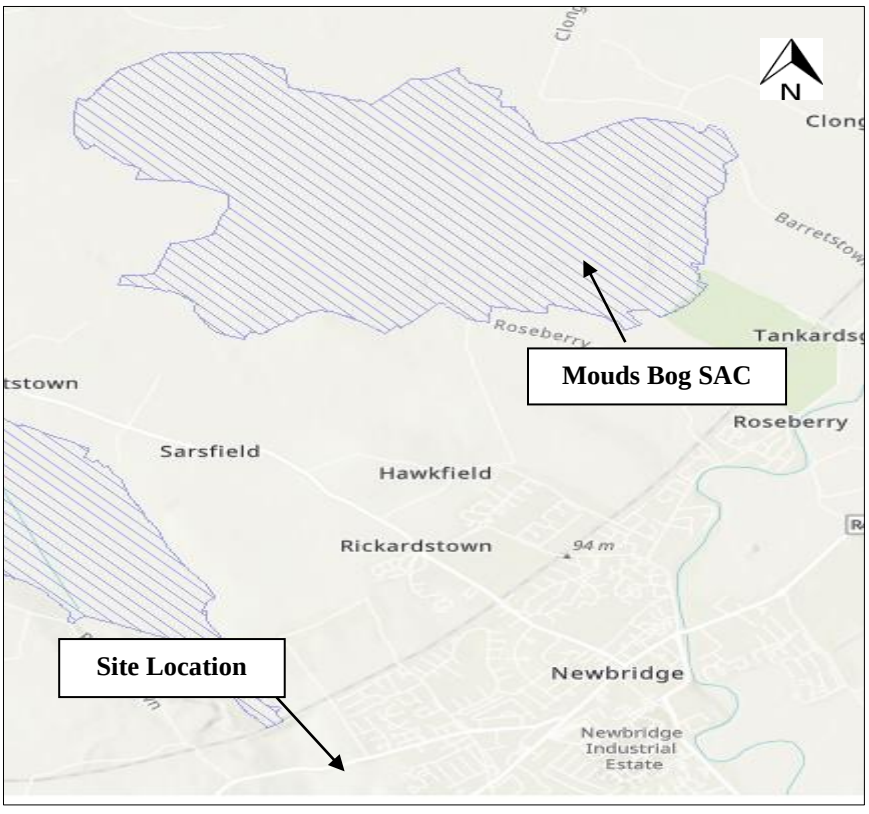


Figure 5.2: Mouds Bog SAC

The conservation objectives for the SAC are to maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected;

ATTRIBUTE	MEASURE	TARGET
[7110] Active raised bogs		
Habitat area	Hectares	Restore area of active raised bog to 105.8ha, subject to natural processes
Habitat distribution	Occurrence	Restore the distribution and variability of active raised bog across the SAC.
High bog area	Hectares	No decline in extent of high bog necessary to support the development and maintenance of active raised bog
Hydrological regime: water levels	Centimetres	Restore appropriate water levels throughout the site
Hydrological regime: flow patterns	Flow direction; slope	slope Restore, where possible, appropriate high bog topography, flow directions and slopes.
Transitional areas between high bog and adjacent mineral soils (including cutover areas)	Hectares; distribution	Restore adequate transitional areas to support/protect active raised bog and the services it provides
Vegetation quality: central ecotope, active flush, soaks, bog woodland	Hectares	Restore 52.9ha of central ecotope/active flush/soaks/bog woodland as appropriate
Vegetation quality: microtopographical features	Hectares	Restore adequate cover of high quality microtopographical features
Vegetation quality: bog moss (*Sphagnum*) species	Percentage cover	Restore adequate cover of bog moss (*Sphagnum*) species to ensure peat forming capacity
Typical ARB species: flora	Occurrence	Restore, where appropriate, typical active raised bog flora
Typical ARB species: fauna	Occurrence	Restore, where appropriate, typical active raised bog fauna

ATTRIBUTE	MEASURE	TARGET
Elements of local distinctiveness	Occurrence	Maintain features of local distinctiveness, subject to natural processes
Negative physical indicators	Percentage cover	Negative physical features absent or insignificant
Vegetation composition: native negative indicator species	Percentage cover	Native negative indicator species at insignificant levels
Vegetation composition: non-native invasive species	Percentage cover	Non-native invasive species at insignificant levels and not more than 1% cover
Air quality: nitrogen deposition kg N/ha/year	Air quality surrounding bog close to natural reference conditions.	The total N deposition should not exceed 5kg N/ha/yr
Water quality	Hydrochemical measures	Water quality on the high bog and transitional areas close to natural reference conditions
[7210] Degraded Raised Bog		
None specified		
[7150] Rhynchosporion Vegetation		
None specified		

Mouds Bog SAC Conservation Status

According to the Habitat's Directive, favourable conservation status of a habitat is achieved when:

- Its natural range and areas it covers within that range are stable or increasing, and
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- The conservation status of its typical species is favourable as defined below.

According to the Habitat's Directive, favourable conservation status of a species is achieved when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

The conservation statuses for the qualifying interests of the Mouds Bog SAC are outlined below.

CODE	QUALIFYING INTEREST	NATIONAL CONSERVATION STATUS*	SITE LEVEL CONSERVATION STATUS**
7110	Active raised bogs	Bad	Reduced
7120	Degraded Raised Bog	Bad	Reduced
7150	Rhynchosporion Vegetation	Bad	Reduced

**Sourced from the Status of EU Protected Habitats and Species in Ireland (NPWS, 2019a)*
***Sourced from NPWS (2018)*

5.3 RIVER BARROW AND RIVER NORE SAC (SITE CODE: 002162)

This SAC is composed of the freshwater stretches of the Barrow and Nore catchments, as far upstream as the Slieve Bloom Mountains, and the tidal elements and estuary as far downstream as Creadun Head in Waterford. The larger tributaries include the Lerr, Fushoge, Mountain, Aughavaud, Owenass, Boherbaun and Stradbally Rivers of the Barrow and the Delour, Dinin, Erkina, Owveg, Munster, Arrigle and King's Rivers on the Nore. The site is a SAC selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive:

ANNEX I HABITATS	
CODE	**DESCRIPTION**
1130	Estuaries
1140	Tidal Mudflats and Sandflats
1170	Reefs
1310	*Salicornia* Mud
1330	Atlantic Salt Meadows (*Glauco-Puccinellietalia maritimae*)
1410	Mediterranean Salt Meadows (*Juncetalia maritimi*)
3260	Floating River Vegetation
4030	Dry Heath
6430	Hydrophilous Tall Herb Communities
7220	Petrifying Springs*
91A0	Old Oak Woodlands
91E0	Alluvial Forests*

** denotes a priority habitat*

ANNEX II SPECIES		
CODE	**COMMON NAME**	**SCIENTIFIC NAME**
1016	Desmoulin's Whorl Snail	*Vertigo moulinsiana*
1029	Freshwater Pearl Mussel	*Margaritifera margaritifera*
1092	White-clawed Crayfish	*Austropotamobius pallipes*
1095	Sea Lamprey	*Petromyzon marinus*
1096	Brook Lamprey	*Lampetra planeri*
1099	River Lamprey	*Lampetra fluviatilis*
1103	Twaite Shad	*Alosa fallax*
1106	Atlantic Salmon	*Salmo salar*
1355	Otter	*Lutra lutra*
1421	Killarney Fern	*Trichomanes speciosum*
1990	Nore Freshwater Pearl Mussel	*Margaritifera durrovensis*

The conservation objectives for the SAC site are to maintain or restore the favourable conservation condition of the qualifying interests. An excerpt from the Natura 2000 Data Form for the River Barrow and River Nore SAC is included below, while further details are available within the site's site synopsis (NPWS, 2016).

"This site consists of most of the freshwater stretches of the Barrow/Nore River catchments. The Barrow is tidal as far upriver as Graiguenamanagh while the Nore is tidal as far upriver as Inishtioge. The site also includes the extreme lower reaches of the River Suir and all of the estuarine component of Waterford Harbour extending to Creadan Head. The larger of the many tributaries include the Lerr, Fushoge, Mountain, Aughavaud, Owenass, Boherbaun and Stradbally Rivers of the Barrow and the Delour, Dinin, Erkina, Owveg, Munster, Arrigle and King's Rivers on the Nore. Both rivers rise in the Old Red Sandstone of the Slieve Bloom Mountains. They traverse limestone bedrock for a good proportion of their routes, though the middle reaches of the Barrow and many of the eastern tributaries run through Leinster Granite. A wide range of habitats associated with the rivers are included within the site, including substantial areas of woodland (deciduous, mixed), dry heath, wet grassland, swamp and marsh vegetation, salt marshes, a small dune system, biogenic reefs and intertidal sand and mud flats. Areas of improved grassland, arable land and coniferous plantations are included in the site for water quality reasons.

The site supports many Annexed habitats including the priority habitats of alluvial woodland and petrifying springs. Quality of habitat is generally good. The site also supports a number of Annex II animal species – Atlantic Salmon (*Salmo salar*), Freshwater Pearl Mussel (*Margaritifera margaritifera*), Nore Freshwater Pearl Mussel (*Margaritifera durrovensis*), Twaite Shad (*Alosa fallax*), White-clawed Crayfish (*Austropotamobius pallipes*), Sea Lamprey (*Petromyzon marinus*), Otter (*Lutra lutra*), River Lamprey (*Lampetra fluviatilis*) and Brook Lamprey (*Lampetra planeri*). Annex I Bird species include Greenland White-fronted Goose (*Anser albifrons flavirostris*), Peregrine Falcon (*Falco peregrinus*), Whooper Swan (*Cygnus cygnus*), Bewick's Swan (*Cygnus columbianus bewickii*), Bar-tailed Godwit (*Limosa lapponica*), Golden Plover (*Pluvialis apricaria*) and Kingfisher (*Alcedo atthis*). A range of rare plants and invertebrates are found in the woods along these rivers and rare plants are also associated with the saltmarsh."

The main site vulnerabilities, including any key pressures or trends within and around the River Barrow and River Nore SAC that have been identified as impacting upon the site, may be summarised as agricultural intensification, pollution to surface waters, human induced changes in hydraulic conditions and erosion.

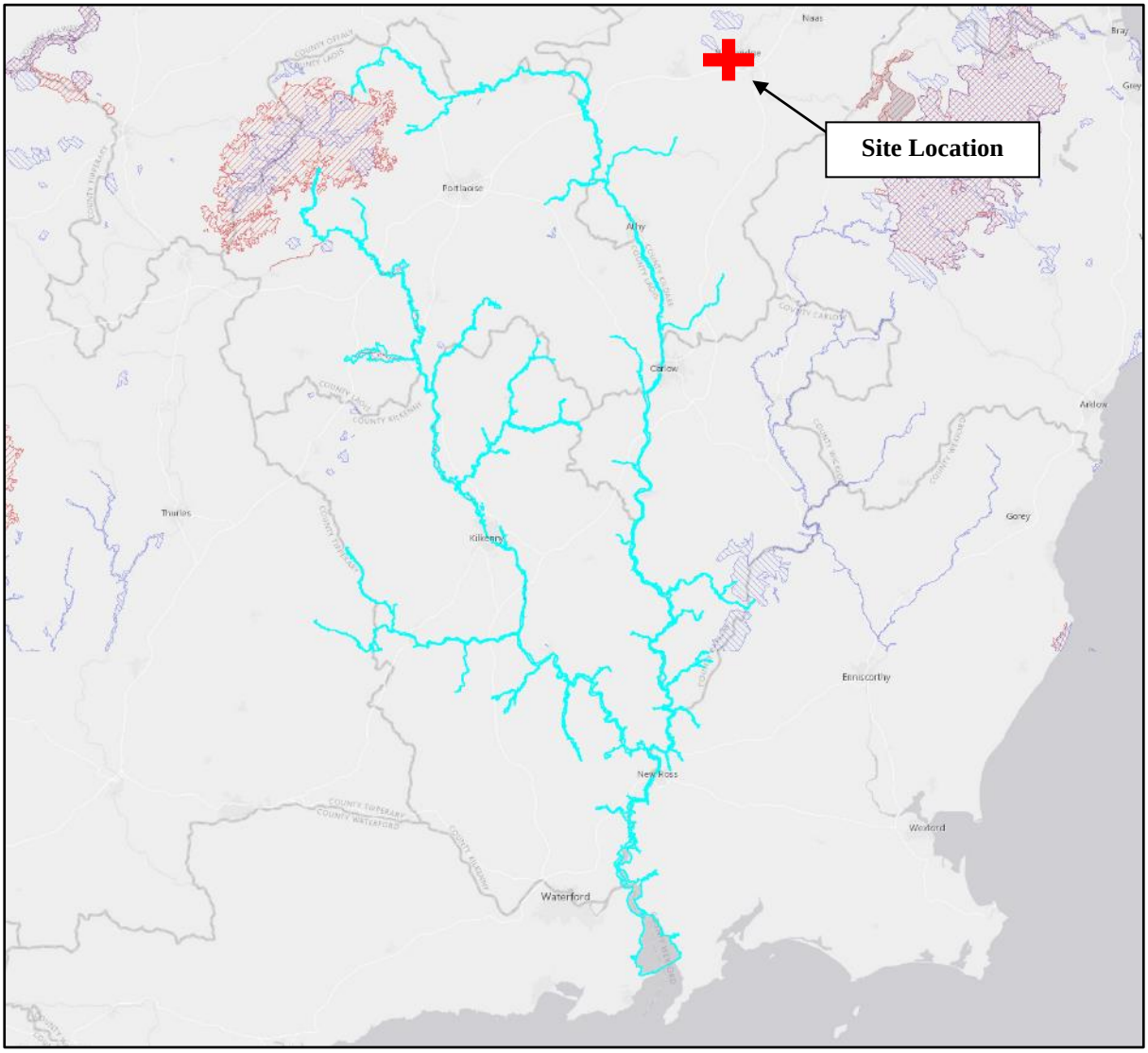


Figure 5.3: River Barrow and River Nore SAC

River Barrow and River Nore SAC Conservation Objectives

The Habitats Directive requires the Appropriate Assessment process to assess the potential impacts of the development "in *view of the site's conservation objectives*". Site specific conservation objectives (SSCOs) for the qualifying interests of the River Barrow and River Nore SAC are provided in the table below, where available from the NPWS document "*Conservation Objectives: River Barrow and River Nore SAC 002162*" (NPWS, 2011).

ATTRIBUTE	MEASURE	TARGET
[1130] Estuaries		
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes
Community distribution	Hectares	The following sediment communities should be maintained in a natural condition: Muddy estuarine community complex; Sand to muddy fine sand community complex; Fine sand with *Fabulina fabula* community.
Community extent	Hectares	Maintain the natural extent of the *Sabellaria alveolata* reef, subject to natural process
[1140] Tidal Mudflats and Sandflats		
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.
Community distribution	Hectares	The following sediment communities should be maintained in a natural condition: Muddy estuarine community complex; Sand to muddy fine sand community complex
[1170] Reefs		
None Specified	-	-
[1310] Salicornia Mud		
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession.
Habitat distribution	Occurrence	No decline, subject to natural processes
Physical structure: sediment supply	Presence/absence of physical barriers	Maintain or where necessary restore natural circulation of sediments and organic matter, without any physical obstructions
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession
Vegetation structure: zonation	Occurrence	Maintain range of saltmarsh habitat zonations including transitional zones, subject to natural processes including erosion and succession
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated.
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of sub- communities with typical species listed in Saltmarsh Monitoring Project
Vegetation structure: negative indicator species: *Spartina anglica*	Hectares	No significant expansion of Spartina. No new sites for this species and an annual spread of less than 1% where it is already known to occur

ATTRIBUTE	MEASURE	TARGET
[1330] Atlantic Salt Meadows		
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession
Habitat distribution	Occurrence	No decline, subject to natural processes
Physical structure: sediment supply	Presence/absence of physical barriers	Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession
Vegetation structure: zonation	Occurrence	Maintain range of saltmarsh habitat zonations including transitional zones, subject to natural processes including erosion and succession.
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward
Vegetation structure: vegetation cover	Percentage cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated
Vegetation composition: typical species and sub-communities	Percentage cover at a representative sample of monitoring stops	Maintain range of sub- communities with typical species listed in Saltmarsh Monitoring Project
Vegetation structure: negative indicator species: *Spartina anglica*	Hectares	No significant expansion of *Spartina*. No new sites for this species and an annual spread of less than 1% where it is already known to occur
[1410] Mediterranean Salt Meadows		
Habitat area	Hectares	Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Dunbrody Abbey - 0.08ha, Rochestown - 0.04ha, Ringville - 6.70ha
Habitat distribution	Occurrence	No decline, subject to natural processes
Physical structure: sediment supply	Presence/absence of physical barriers	Maintain or where necessary restore natural circulation of sediments and organic matter, without any physical obstructions
Physical structure: flooding regime	Hectares flooded; frequency	Maintain natural tidal regime
Physical structure: creeks and pans	Occurrence	Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession
Vegetation structure: zonation	Occurrence	Maintain range of saltmarsh habitat zonations including transitional zones, subject to natural processes including erosion and succession
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward
Vegetation structure: vegetation cover	% cover at a representative sample of monitoring stops	Maintain more than 90% of area outside creeks vegetated.

ATTRIBUTE	MEASURE	TARGET
Vegetation composition: typical species and sub-communities	% cover at a representative sample of monitoring stops	Maintain range of sub- communities with typical species listed in Saltmarsh Monitoring Project
Vegetation structure: negative indicator species: *Spartina anglica*	Hectares	No significant expansion of *Spartina*. No new sites for this species and an annual spread of less than 1% where it is already known to occur
[3260] Floating River Vegetation		
Habitat distribution	Occurrence	No decline, subject to natural processes
Habitat area	Kilometres	Area stable or increasing, subject to natural processes
Hydrological regime: river flow	Metres per second	Maintain appropriate hydrological regimes
Hydrological regime: groundwater discharge	Metres per second	The groundwater flow to the habitat should be permanent and sufficient to maintain tufa formation
Substratum composition: particle size range	Millimetres	The substratum should be dominated by large particles and free from fine sediments
Water chemistry: minerals	Milligrammes per litre	The groundwater and surface water should have sufficient concentrations of minerals to allow deposition and persistence of tufa deposits
Water quality: suspended sediment	Milligrammes per litre	The concentration of suspended solids in the water column should be sufficiently low to prevent excessive deposition of fine sediments
Water quality: nutrients	Milligrammes per litre	The concentration of nutrients in the water column should be sufficiently low to prevent changes in species composition or habitat condition
Vegetation composition: typical species	Occurrence	Typical species of the relevant habitat sub-type should be present and in good condition
Floodplain connectivity	Area	The area of active floodplain at and upstream of the habitat should be maintained
[4030] Dry Heath		
Habitat distribution	Occurrence	No decline from current habitat distribution, subject to natural processes
Habitat area	Hectares	Area stable or increasing, subject to natural processes. Habitat area is not known but estimated as less than 400ha of the area of the SAC, occurring in dispersed locations
Physical structure: free-draining, acid, low nutrient soil; rock outcrops	Occurrence	No significant change in soil nutrient status, subject to natural processes. No increase or decrease in area of natural rock outcrop
Vegetation structure: sub- shrub indicator species	Percentage cover	Cover of characteristic sub- shrub indicator species at least 25%: gorse (*Ulex europaeus*) and where rocky outcrops occur bilberry (*Vaccinium myrtillus*) and woodrush (*Luzula sylvatica*). Some rock outcrops support English stonecrop (*Sedum anglicum*), sheep's bit (*Jasione montana*) and wild madder (*Rubia peregrina*) as well as important moss and lichen assemblages
Vegetation structure: senescent gorse	Percentage cover	Cover of senescent gorse less than 50%
Vegetation structure: browsing	Percentage cover	Long shoots of bilberry with signs of browsing collectively less than 33%

ATTRIBUTE	MEASURE	TARGET
Vegetation structure: native trees and shrubs	Percentage cover	Cover of scattered native trees and shrub less than 20%
Vegetation composition: positive indicator species	Number	Number of positive indicator species at least 2 e.g. gorse and associated dry heath/ acid grassland flora
Vegetation structure: positive indicator species	Percentage cover	Cover of positive indicator species at least 60%. This should include plant species characteristic of dry heath in this SAC including gorse, bilberry and associated acid grassland flora
Vegetation composition: bryophyte and non-crustose lichen species	Number	Number of bryophyte or non- crustose lichen species present at least 2
Vegetation composition: bracken (*Pteridium aquilinum*)	Percentage cover	Cover of bracken less than 10%
Vegetation structure: weedy negative indicator species	Percentage cover	Cover of agricultural weed species (negative indicator species) less than 1%
Vegetation composition: non-native species	Percentage cover	Cover of non-native species less than 1%.
Vegetation composition: rare/scarce heath species	Location, area and number	No decline in distribution or population sizes of rare, threatened or scarce species, including Greater Broomrape (*Orobanche rapum-genistae*) and the legally protected clustered clover (*Trifolium glomeratum*)
Vegetation structure: disturbed bare ground	Percentage cover	Cover of disturbed bare ground less than 10% (but if peat soil less than 5%)
Vegetation structure: burning	Occurrence	No signs of burning within sensitive areas
[6430] Hydrophilous Tall Herb Communities		
Habitat distribution	Occurrence	No decline, subject to natural processes
Habitat area	Hectares	Area stable or increasing, subject to natural processes
Hydrological regime: Flooding depth/height of water table	Metres	Maintain appropriate hydrological regimes
Vegetation structure: sward height	Centimetres	30-70% of sward is between 40 and 150cm in height
Vegetation composition: broadleaf herb: grass ratio	Percentage	Broadleaf herb component of vegetation between 40 and 90%
Vegetation composition: typical species	Number	At least 5 positive indicator species present
Vegetation composition: negative indicator species	Occurrence	Negative indicator species, particularly non-native invasive species, absent or under control- NB Indian balsam (*Impatiens glandulifera*), monkeyflower (*Mimulus guttatus*), Japanese knotweed (*Fallopia japonica*) and giant hogweed (*Heracleum mantegazzianum*)
[7220] Petrifying Springs		
Habitat area	Square metres	Area stable or increasing, subject to natural processes

ATTRIBUTE	MEASURE	TARGET
Habitat distribution	Occurrence	No decline
Hydrological regime: height of water table; water flow	Metres; metres per second	Maintain appropriate hydrological regimes
Water quality	Water chemistry measures	Maintain oligotrophic and calcareous conditions
Vegetation composition: typical species	Occurrence	Maintain typical species
[91A0] Old Oak Woodlands		
Habitat area	Hectares	Area stable or increasing, subject to natural processes, at least 85.08ha for sub-sites surveyed
Habitat distribution	Occurrence	No decline.
Woodland size	Hectares	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size
Woodland structure: cover and height	Percentage and metres	Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types
Woodland structure: natural regeneration	Seedling:sapling:pole ratio	Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy
Woodland structure: dead wood	m^3 per hectare; number per hectare	At least $30m^3$/ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter
Woodland structure: veteran trees	Number per hectare	No decline
Woodland structure: indicators of local distinctiveness	Occurrence	No decline
Vegetation composition: native tree cover	Percentage	No decline. Native tree cover not less than 95%
Vegetation composition: typical species	Occurrence	A variety of typical native species present, depending on woodland type, including oak (*Quercus petraea*) and birch (*Betula pubescens*)
Vegetation composition: negative indicator species	Occurrence	Negative indicator species, particularly non-native invasive species, absent or under control
[91E0] Alluvial Forests		
Habitat area	Hectares	Area stable or increasing, subject to natural processes, at least 181.54ha for sites surveyed
Habitat distribution	Occurrence	No decline.
Woodland size	Hectares	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size
Woodland structure: cover and height	Percentage and metres	Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer

ATTRIBUTE	MEASURE	TARGET
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types
Woodland structure: natural regeneration	Seedling:sapling:pole ratio	Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy
Hydrological regime: Flooding depth/height of water table	Metres	Appropriate hydrological regime necessary for maintenance of alluvial vegetation
Woodland structure: dead wood	m^3 per hectare; number per hectare	At least 30m^3/ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter (greater than 20cm diameter in the case of alder)
Woodland structure: veteran trees	Number per hectare	No decline
Woodland structure: indicators of local distinctiveness	Occurrence	No decline
Vegetation composition: native tree cover	Percentage	No decline. Native tree cover not less than 95%
Vegetation composition: typical species	Occurrence	A variety of typical native species present, depending on woodland type, including ash (*Fraxinus excelsior*) alder (*Alnus glutinosa*), willows (*Salix* spp) and locally, oak (*Quercus robur*)
Vegetation composition: negative indicator species	Occurrence	Negative indicator species, particularly non-native invasive species, absent or under control
[1016] Desmoulin's Whorl Snail		
Distribution: occupied sites	Number	No decline. Two known sites: Borris Bridge, Co. Carlow S711503; Boston Bridge, Kilnaseer S338774, Co. Laois.
Population size: adults	Number per positive sample	At least 5 adults snails in at least 50% of samples
Population density	Percentage positive samples	Adult snails present in at least 60% of samples per site
Area of occupancy	Hectares	Minimum of 1ha of suitable habitat per site
Habitat quality: vegetation	Percentage of samples with suitable vegetation	90% of samples in habitat classes I and II
Habitat quality: soil moisture levels	Percentage of samples with appropriate soil moisture levels	90% of samples in moisture class 3-4
[1029] Freshwater Pearl Mussel		
The status of the FPM as a qualifying Annex II species for the River Barrow and River Nore SAC is currently under review		
[1092] White-clawed Crayfish		
Distribution	Occurrence	No reduction from baseline
Population structure: recruitment	% occurrence of juveniles and females with eggs	Juveniles and/or females with eggs in at least 50% of positive samples
Negative indicator species	Occurrence	No alien crayfish species

ATTRIBUTE	MEASURE	TARGET
Disease	Occurrence	No instances of disease
Water quality	EPA Q value	At least Q3-4 at all sites sampled by EPA
Habitat quality: heterogeneity	Occurrence of positive habitat features	No decline in heterogeneity or habitat quality
[1095] Sea Lamprey		
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem length of rivers accessible from estuary
Population structure of juveniles	Number of age/size groups	At least three age/size groups present
Juvenile density in fine sediment	Juveniles/m²	Juvenile density at least 1/m²
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds
Availability of juvenile habitat	Number of positive sites in 3rd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive
[1096] Brook Lamprey		
Distribution	% of river accessible	Access to all water courses down to first order streams
Population structure of juveniles	Number of age/size groups	At least three age/size groups of brook/river lamprey present
Juvenile density in fine sediment	Juveniles/m²	Mean catchment juvenile density of brook/river lamprey at least 2/m²
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds
Availability of juvenile habitat	Number of positive sites in 2nd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive
[1099] River Lamprey		
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem and major tributaries down to second order accessible from estuary
Population structure of juveniles	Number of age/size groups	At least three age/size groups of river/brook lamprey present
Juvenile density in fine sediment	Juveniles/m²	Mean catchment juvenile density of brook/river lamprey at least 2/m²
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds
Availability of juvenile habitat	Number of positive sites in 2nd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive

ATTRIBUTE	MEASURE	TARGET
[1103] Twaite Shad		
Distribution: extent of anadromy	% of river accessible	Greater than 75% of main stem length of rivers accessible from estuary
Population structure- age classes	Number of age classes	More than one age class present
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning habitats
Water quality- oxygen levels	Milligrammes per litre	No lower than 5mg/l
Spawning habitat quality: Filamentous algae; macrophytes; sediment	Occurrence	Maintain stable gravel substrate with very little fine material, free of filamentous algal (macroalgae) growth and macrophyte (rooted higher plants) growth
[1106] Atlantic Salmon		
Distribution: extent of anadromy	% of river accessible	100% of river channels down to second order accessible from estuary
Adult spawning fish	Number	Conservation Limit (CL) for each system consistently exceeded
Salmon fry abundance	Number of fry/5 minutes electrofishing	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 min sampling
Out-migrating smolt abundance	Number	No significant decline
Number and distribution of redds	Number and occurrence	No decline in number and distribution of spawning redds due to anthropogenic causes
Water quality	EPA Q value	At least Q4 at all sites sampled by EPA
[1355] Otter		
Distribution	% positive survey sites	No significant decline
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 122.8ha above high water mark (HWM); 1136.0ha along riverbanks / around ponds
Extent of marine habitat	Hectares	No significant decline. Area mapped and calculated as 857.7ha
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 616.6km
Extent of freshwater (lake) habitat	Hectares	No significant decline. Area mapped and calculated as 2.6ha
Couching sites and holts	Number	No significant decline
Fish biomass available	Kilograms	No significant decline
[1421] Killarney Fern		
Distribution	Location	No decline. Three locations known, with three colonies of gametophyte and one sporophyte colony
Population size	Number	Maintain at least three colonies of gametophyte, and at least one sporophyte colony of over 35 fronds
Population structure: juvenile fronds	Occurrence	At least one of the locations to have a population structure comprising sporophyte, unfurling fronds, 'juvenile' sporophyte and gametophyte generations
Habitat extent	m²	No loss of suitable habitat, such as shaded rock crevices, caves or gullies in or near to, known colonies. No loss of woodland canopy at or near to known locations
Hydrological conditions: visible water	Occurrence	Maintain hydrological conditions at the locations so that all colonies are in dripping or damp seeping habitats, and water is visible at all locations

ATTRIBUTE	MEASURE	TARGET
Hydrological conditions: humidity	Number of dessicated fronds	No increase. Presence of dessicated sporophyte fronds or gametophyte mats indicates conditions are unsuitable
Light levels: shading	Percentage	No changes due to anthropogenic impacts
Invasive species	Occurrence	Absent or under control
[1990] Nore Freshwater Pearl Mussel		
Distribution	Kilometres	Maintain at 15.5km.
Population size: adult mussels	Number	Restore to 5,000 adult mussels
Population structure: recruitment	Percentage per size class	Restore to at least 20% of population no more than 65mm in length; and at least 5% of population no more than 30mm in length
Population structure: adult mortality	Percentage	No more than 5% decline from previous number of live adults counted; dead shells less than 1% of the adult population and scattered in distribution
Habitat extent	Kilometres	Restore suitable habitat in length of river corresponding to distribution target (15.5km) and any additional stretches necessary for salmonid spawning
Water quality: Macroinvertebrate s and phytobenthos (diatoms)	Ecological quality ratio (EQR)	Restore water quality- macroinvertebrates: EQR greater than 0.90; phytobenthos: EQR greater than 0.93
Substratum quality: Filamentous algae (macroalgae), macrophytes (rooted higher plants)	Percentage	Restore substratum quality- filamentous algae: absent or trace (<5%)
Substratum quality: sediment	Occurrence	Restore substratum quality- stable cobble and gravel substrate with very little fine material; no artificially elevated levels of fine sediment
Substratum quality: oxygen availability	Redox potential	Restore to no more than 20% decline from water column to 5cm depth in substrate
Hydrological regime: flow variability	Metres per second	Restore appropriate hydrological regimes
Host fish	Number	Maintain sufficient juvenile salmonids to host glochidial larvae

River Barrow and River Nore SAC Conservation Status

According to the Habitat's Directive, favourable conservation status of a habitat is achieved when:

- Its natural range and areas it covers within that range are stable or increasing, and
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- The conservation status of its typical species is favourable as defined below.

According to the Habitat's Directive, favourable conservation status of a species is achieved when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

The conservation statuses for the qualifying interests of the SAC site are outlined below.

CODE	QUALIFYING INTEREST	NATIONAL CONSERVATION STATUS*	SITE LEVEL CONSERVATION STATUS**
4010	Wet Heath	Inadequate	Good
1140	Tidal Mudflats and Sandflats	Inadequate	Good
1170	Reefs	Inadequate	Excellent
1310	*Salicornia* Mud	Favourable	Good
1330	Atlantic Salt Meadows	Inadequate	Excellent
1410	Mediterranean Salt Meadows	Inadequate	Excellent
3260	Floating River Vegetation	Inadequate	Good
4030	Dry Heath	Bad	Good
6430	Hydrophilous Tall Herb Communities	Bad	Good
7220	Petrifying Springs*	Inadequate	Good
91A0	Old Oak Woodlands	Bad	Good
91E0	Alluvial Forests	Bad	Excellent
1016	Desmoulin's Whorl Snail	Inadequate	Good
1029	Freshwater Pearl Mussel	Bad	Good
1092	White-clawed Crayfish	Bad	Excellent
1095	Sea Lamprey	Bad	Good
1096	Brook Lamprey	Favourable	Good
1099	River Lamprey	Unknown	Good
1103	Twaite Shad	Bad	Good
1106	Atlantic Salmon	Inadequate	Good
1355	Otter	Favourable	Excellent
1421	Killarney Fern	Favourable	Excellent
1990	Nore Freshwater Pearl Mussel	Bad	Reduced

**Sourced from the Status of EU Protected Habitats and Species in Ireland (NPWS, 2019b & 2019c)*
***Sourced from NPWS (2020)*

6. ASSESSMENT OF LIKELY EFFECTS: STAGE 1 SCREENING

6.1 DISTURBANCE TO PROTECTED HABITATS AND SPECIES

The proposed development does not directly impinge on any part of a European site, and as such would not be expected to impact upon a protected site through destruction of habitat, fragmentation of habitat, disturbance of habitat or direct reduction in species density.

It is not considered that the proposed development site would contain the habitats or species for which the Pollardstown Fen SAC, Mouds Bog SAC or River Barrow and River Nore SAC have been designated. No areas of woodland exist within the development site, therefore the site does not contain any habitat which would have potential links to Old Oak Woodlands [91A0] or Alluvial Forests [91E0]. No areas of bog, heath, fen or marsh / swamp habitats occur on the development site, therefore the site does not contain any habitat which would have potential links to Raised Bog [7110], Alkaline fens [7230], *Cladium* fens [7210], Degraded Raised Bog [7120], Rhynchosporion Vegetation [7150], Dry Heath [4030] or Hydrophilous Tall Herb Communities [6430].

The proposed development site is located a considerable distance from the tidal stretches of the River Barrow, thus qualifying interests associated with saltwater and tidal conditions would not be present. While it is noted that the River Barrow and River Nore SAC is located at its closest approximately 11km to the south west of the development site, no aquatic habitats of note are present within the development site itself (the small pond being of limited aquatic importance). Therefore, there would be no direct impacts upon designated aquatic species or habitats, due to works being outside of any potential habitat for these species.

During the site assessment, no Killarney Fern [1421] was present. In the absence of swamp, fen and marsh habitat at the site, and in the absence of historic records, it is not considered that the proposed development site would be suitable to support populations of Desmoulin's Whorl Snail.

Given that the River Barrow and River Nore SAC is located approximately 11km from the development site, it is possible that Otter (*Lutra lutra*) may be present within the nearby watercourses surrounding the proposed development. However, given that the site is mainly comprised of gravel and recolonising agricultural land, which is of low biodiversity value, and in the absence of evidence of otter (including spraints and tracks) during the site assessment, it is unlikely that the site would support this species.

The potential disturbance on protected species due to noise would not be considered significant, given the residential nature and location of the proposed development. While there would be increased noise emissions during the construction phase, these would not be considered to pose a significant risk owing to the transient nature of construction works.

The potential disturbance on protected habitats and species due to dust during the construction phase could have an impact, however this would be considered low. During the operational phase of the proposed development there would be no significant impact upon air quality from the development due to the residential nature of the development and the proposed heating system.

It is therefore considered that the proposed development would not result in any significant risk to the protected habitats and species of the Pollardstown Fen SAC, Mouds Bog SAC and the River Barrow and River Nore SAC due to habitat fragmentation or loss, disturbance or reduction in species density.

6.2 INVASIVE SPECIES

Under Regulation 49(2) of the European Communities (Birds and Natural Habitats) Regulations 2011, save in accordance with a licence granted under paragraph (7), any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow in any place specified in relation to any plant which is included in Part 1 of the Third Schedule shall be guilty of an offence.

Materials containing invasive species such as Japanese Knotweed are considered "controlled waste" and, as such, there are legal restrictions on their handling and disposal. Under Regulation 49(7) of the European Communities (Birds and Natural Habitats) Regulations 2011, it is a legal requirement to obtain a license to move "vector materials" listed in the Third Schedule, Part 3.

The risk of invasive species being introduced onto the site during the construction phase of the project is considered to be low, with no import of materials with the potential to contain invasive flora species. Soils excavated during construction works would be stockpiled and re-used for site levelling and site landscaping, therefore no importation of topsoil or subsoil would be required as part of the development works.

6.3 POTENTIAL IMPACTS ON WATER QUALITY

The proposed development is located within both the Barrow Catchment and Liffey and Dublin Bay Catchment, thus the proposed development would be hydrologically linked to the River Barrow and River Nore SAC and Pollardstown Fen SAC. However, the proposed development would not be considered to impact upon the listed habitats and species of these SACs sites during the operational phase due to the design of the drainage system and attenuation system.

During the construction phase of projects, a deterioration in water quality can arise through the release of suspended solids during soil disturbance works, the release of uncured concrete and the release of hydrocarbons (fuels and oils). A deterioration in water quality has the potential to have an adverse impact upon the qualifying interests of Pollarstown Fen SAC and the River Barrow and River Nore SAC, particularly qualifying interests which have conservation objectives relating to water quality, such as White-clawed Crayfish and Atlantic Salmon.

6.4 SCREENING CONCLUSION

In order for an effect to occur, there must be a pathway between the source and the receptor (the SAC or SPA). Where a pathway does not exist, an impact cannot occur.

The proposed development site is hydrologically connected to both Pollardstown Fen SAC (Site Code: 000396) and the River Barrow and River Nore SAC (Site Code: 002162). As detailed above, it is considered that the proposed development would not result in any significant risk to the protected habitats and species of the Pollardstown Fen SAC, Mouds Bog SAC and the River Barrow and River Nore SAC due to habitat fragmentation or loss, disturbance, reduction in species density or species diversity, or due to the potential introduction of invasive species.

However, the assessment has determined that during construction works, the proposed development has the potential to impact upon the qualifying interests / special conservation interests of the Pollardstown Fen SAC, Mouds Bog SAC and the River Barrow and River Nore SAC due to a potential deterioration in water quality and dust. Therefore, a Natura Impact Statement is required.

7. ASSESSMENT OF LIKELY EFFECTS: STAGE 2 APPROPRIATE ASSESSMENT

Describe the significant effects, if any, on the relevant European site which have occurred, which are occurring or which can reasonably be expected to occur as a result of the project or plan (alone or in combination).

The proposed development has the potential to impact upon the qualifying interests of the Pollardstown Fen SAC, Mouds Bog SAC and the River Barrow and River Nore SAC due to increased dust and a potential deterioration in water quality during the construction phase.

During construction works, there is potential for water quality deterioration through the release of suspended solids during soil disturbance works. Suspended solids could become entrained in surface water run-off and could affect aquatic qualifying interests / special conservation interests through deposition. Nutrients can be bound in suspended solids, therefore, a significant increase in suspended solids can result in excessive eutrophication, leading to the deoxygenation of waters and subsequent asphyxia of aquatic species. An increase in sediments has the potential to impact upon fish species by damaging gravel beds required for spawning, smothering fish eggs and in extreme cases, by interfering with the gills of fish. An increase in suspended solids also has the potential to reduce water clarity, which can impact the light penetration of water and may also affect certain behaviours of aquatic fauna such as foraging success.

A potential source of chemical contamination would be from the release of hydrocarbons (oils, fuels) from construction plant, equipment and removal of home heating system. Hydrocarbons can affect water quality, potentially resulting in toxic conditions for aquatic flora and fauna. Oil films on the water surface can disrupt oxygen diffusion from the atmosphere, resulting in de-oxygen of waters.

Another potential source of contamination would be the release of uncured concrete. In the event of uncured concrete entering a waterbody, the pH would be altered locally, potentially leading to the death of aquatic flora and fauna and an alteration to the waterbody substrate.

The tables below briefly outline the occurrence of the qualifying interests of the River Barrow and River Nore SAC in relation to the proposed development site, taking cognisance of the NPWS "*Conservation Objectives: Pollardstown Fen SAC 000396, Mouds Bog SAC 002331* and the *River Barrow and River Nore SAC 002162"*, in addition to Volumes 1, 2 and 3 of the 2019 NPWS Reports, "The *Status of EU Protected Habitats and Species in Ireland*".

The following tables also outline which of the qualifying interests and special conservation interests may be impacted upon by a potential deterioration in water quality from the proposed development.

RIVER BARROW AND RIVER NORE SAC		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
[1140] Tidal Mudflats and Sandflats [1170] Reefs [1310] Salicornia Mud [1330] Atlantic Salt Meadows (*Glauco-Puccinellietalia maritimae*) [1410] Mediterranean salt meadows (*Juncetalia maritimi*) [1130] Estuaries	The proposed development is located outside the current known distribution, current range and favourable reference range of these qualifying interests (NPWS, 2019b). The nearest examples of these qualifying interests are located approximately 122km downstream of the proposed development (NPWS, 2011). Given the considerable distance, it is not anticipated that the development would have the potential to negatively impact upon these qualifying interests.	No
[3260] Floating River Vegetation	The development site is located within the current distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019b). While this habitat is noted in the SAC site synopsis as being well represented in the River Barrow and its tributaries. The Conservation Objectives for this qualifying interest include water quality attributes. Therefore, there is potential for the proposed development to have an impact upon this qualifying interest due to a potential deterioration in water quality during construction works.	Yes
[4030] Dry Heath	The proposed development is located within the current range, favourable reference range and the current known distribution of this qualifying interest (NPWS, 2019b). The SAC Conservation Objectives report notes that the spatial extent of this habitat is currently unmapped, but is indicated as occurring on steep, free-draining river valley sides. Dry heath is a terrestrial habitat under pressure from agricultural activities and temperature changes therefore a potential deterioration in water/air quality during construction works would not be anticipated to have a significant adverse impact upon this qualifying interest should it be present adjacent the Barrow River.	No
[6430] Hydrophilous Tall Herb Communities	The proposed development is not located within the current known distribution but is within the current range and favourable reference range of this qualifying interest (NPWS, 2019b). The SAC Conservation Objectives report notes that the distribution of this habitat within the SAC site is currently unknown, but is considered to occur at some riverside woodlands, river islands and in narrow bands along the floodplain of slow-flowing river stretches. Water/air quality is not listed as a conservation objective for this qualifying	No

RIVER BARROW AND RIVER NORE SAC		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
	interest. Therefore, a potential deterioration in water quality during construction works would not be anticipated to have a significant adverse impact upon this qualifying interest.	
[7220] Petrifying Springs*	The proposed development is located within the current known distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019b). The nearest example of this qualifying interest is located at the River Nore (NPWS, 2011). Given the considerable distance and that it is above the tidal reach of the River Nore, it is not anticipated that the proposed development would have direct or indirect negative impacts upon this qualifying interest for this SAC.	No
[91A0] Old Oak Woodlands	The proposed development is located outside the current known distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019b). According to the SAC Conservation Objectives report, the closest old oak woodlands are located close to Graiguenamanagh approximately 70km from the proposed site (greater hydrologically). However, the report notes that further unsurveyed areas may be present within the SAC. Old oak woodlands are a terrestrial habitat, therefore a potential deterioration in water/air quality during construction works would not be anticipated to have a significant adverse impact upon this qualifying interest.	No
[91E0] Alluvial Forests*	The proposed development is located outside the current range but within the favourable reference range and the current known distribution of this qualifying interest (NPWS, 2019b). According to the SAC Conservation Objectives report, alluvial forests are located approximately 21km from the proposed site (approximately 48km hydrologically). However, the report also notes that further unsurveyed areas may be present within the SAC. Water quality is listed as a minor threat to this habitat. Therefore, precautionary protective measures would need to be undertaken during construction works.	Yes
[1016] Desmoulin's Whorl Snail (*Vertigo moulinsiana*)	The Desmoulin's whorl snail is the largest of the whorl snail species occurring in wetlands in Ireland. It favours damp or wet habitats such as swamps, fens and marshes, where it lives mostly in moss, leaves and decaying vegetation (NPWS, 2019c). Desmoulin's whorl snails feed on living and dead stems and leaves of tall plants in wetland habitats. The proposed development is located within the current known distribution, current range and the favourable reference range of this qualifying interest (NPWS, 2019c). According to the SAC Conservation Objectives report, the nearest record of Desmoulin's whorl snail for this SAC is located approximately 65km from (greater hydrologically) the proposed development site. The nearest records on the NBDC for Desmoulin's whorl snail are located within the Pollardstown Fen. Given that water/air quality is not listed as a conservation objective for this qualifying interest, it is not anticipated	No

RIVER BARROW AND RIVER NORE SAC		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
	that the proposed development would have the potential to adversely impact upon the Desmoulin's whorl snail.	
[1029] Freshwater Pearl Mussel (*Margaritifera margaritifera*) [1990] Nore Freshwater Pearl Mussel (*Margaritifera durrovensis*)	Freshwater pearl mussels (both *Margaritifera margaritifera* and *M. m. durrovensis*) are long-lived, bivalve molluscs found in clean, fast-flowing rivers. *M. margaritifera* is widespread in Ireland, however, the population has been in decline for a long time, with the current decline attributed to a combination of hydrological and morphological changes, sedimentation and enrichment of its habitat (NPWS, 2019a). The Nore pearl mussel (*M. m. durrovensis*) is a hard-water form of the freshwater pearl mussel and is only found within the River Nore's main channel. Previously, the Nore pearl mussel was reported separately as taxon 1990 (*M. durrovensis*), however genetic research has since placed the Nore population within the *Margaritifera margaritifera* taxon (NPWS, 2019c). The species has an unusual life cycle. Eggs develop into the larval stage (glochidia), which are brooded in the female gills before being released into open water. A small number are inhaled by passing salmonid fish, which act as the mussels' temporary hosts. Once mature enough to exist independently, they fall off their hosts and bury into gravel where they filter feed (Moorkens, 2000). The proposed development is located outside the current known distribution, current range and favourable reference range of the freshwater pearl mussel (NPWS, 2019c). The SAC Conservation Objectives report notes that the status of *Margaritifera margaritifera* as a qualifying interest for the site is currently under review, while *M. m. durrovensis* is confined to a 15km (approximate) stretch of the River Nore, this is located above the tidal reach of the River Nore. There are no NBDC records for pearl mussel within the vicinity of the proposed development. The Freshwater Pearl Mussel Strategic Environmental Assessment (DoEHLG, 2010a) and Freshwater Pearl Mussel Nore Sub-Basin Management Plan (DoEHLG, 2010b) reports note that the River Nore is failing in its habitat quality and population demographic profile. The catchment fails most of the requirements as specified in the European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009. The population in the Nore is known to be critically endangered, with evidence that there has been no recruitment for some time. Freshwater Pearl Mussel are sensitive to sedimentation and nutrient enrichment. Furthermore, as the larval stages rely on salmonid fish hosts, any potential impact on salmonid fish can have an impact upon the Pearl Mussel. Water quality downstream of the proposed development will not have a direct impact on the	Yes Yes

RIVER BARROW AND RIVER NORE SAC		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
	populations that exist within the River Nore as the population exists above the tidal reach, there remains a possibility that water quality could impact on salmonid fish. Therefore, there is potential for the proposed development to have an impact upon this qualifying interest due to a potential deterioration in water quality during construction works.	
[1092] White-clawed Crayfish (*Austropotamobius pallipes*)	The White-clawed Crayfish is the only native crayfish species found in Ireland and is a relatively long-lived species with a maximum life of 10 years. It occurs in both streams and lakes in Ireland and requires relatively hard water with a pH of 7 or above and calcium concentrations of at least 5mg/l. White-clawed crayfish are omnivorous, with young crayfish more reliant than adults on animal foods. The development site is located within the current distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019c). The SAC Conservation Objectives report notes that crayfish are present almost throughout the SAC. According to the Conservation Objectives report, the nearest records for white-clawed crayfish are located within the River Barrow. The conservation status of crayfish in the SAC is dependent on good water quality status, as this species requires clean water (Q3-4). Therefore, there is potential for the proposed development to have an impact upon this qualifying interest due to a potential deterioration in water quality during construction works.	Yes
[1095] Sea Lamprey (*Petromyzon marinus*)	Sea lamprey are an anadromous species, with adults living at sea and migrating to freshwater for spawning in late May or June. The fertilised eggs hatch within days, with the larvae burrowing into fine sediment where they filter feed for a number of years. Transformation to young adults occurs in summer and young adults can be found migrating downriver to estuarine waters in autumn – winter. The proposed development is located outside the current known distribution, current range and favourable reference range of the Sea Lamprey (NPWS, 2019b). The SAC Conservation Objectives report notes that upstream migration may be inhibited by artificial barriers, and that artificial barriers are currently preventing juvenile lampreys from accessing the full extent of suitable habitat. Changes in water quality have the potential to impact on the population of Sea Lamprey, the main water quality impacts are from agricultural runoff however potential pollutants from construction runoff cannot be ruled out therefore mitigation measures must be put in place to prevent changes in water quality.	Yes

RIVER BARROW AND RIVER NORE SAC		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
[1096] Brook Lamprey (*Lampetra planeri*)	The brook lamprey is the smallest of the three lampreys native to Ireland and is the only species that is non-parasitic and spends all its life in freshwater. Adults spawn in spring, excavating shallow nests in gravel areas of reduced flow. Adult fish die after spawning. After hatching, larvae drift/swim downstream to areas with a fine silt composition. They burrow into this bed material and live as filter feeders for years before transforming into young adult fish. The young adults overwinter before migrating short distances upstream to gravelled areas where they spawn. River lamprey are an anadromous species, with adults living at sea and migrating to freshwater for spawning in March and April. The adult fish die after spawning. The fertilised eggs hatch within days, with the larvae burrowing into fine sediment where they filter feed for a number of years before transforming into adult fish. The young river lamprey then migrates downriver to estuarine waters. River and brook lamprey are indistinguishable as larvae. The mature adult forms are distinguishable on the basis of body size. Lamprey surveys have necessarily focussed on juvenile lamprey. Consequently, the vast majority of available data relates to "*Lampetra* sp." and cannot be assigned to one species or the other. The proposed development is located within the current known distribution, current range and favourable reference range of brook lamprey, but outside of the current known distribution, current range and favourable reference range of river lamprey (NPWS, 2019c). The SAC Conservation Objectives report notes that diffuse source pollution maybe having localised impacts on populations of *L. fluviatilis*. Water quality impacts are from runoff have the potential to impact on the populations of both species. Therefore, there is potential for the proposed development to have an impact upon these qualifying interests due to a potential deterioration in water quality during construction works.	Yes
[1099] River Lamprey (*Lampetra fluviatilis*)		
[1103] Twaite Shad (*Alosa fallax*)	Twaite Shad spend most of their life in estuaries and coastal waters but migrate upriver to spawn in late spring. Following spawning, adult Twaite Shad return to estuaries. Limited knowledge indicates that Irish Twaite Shad may live in estuarine waters for at least two full years prior to going to sea.	Yes

RIVER BARROW AND RIVER NORE SAC		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
	The proposed development is located within the outside known distribution, current range and favourable reference range of the Twaite Shad (NPWS, 2019c). The nearest records on the NBDC for Twaite Shad are located along the River Barrow at St Mullins. Water quality impacts are from runoff have the potential to impact on the populations of this species. Therefore, there is potential for the proposed development to have an impact upon the qualifying interests due to a potential deterioration in water quality during construction works.	
[1106] Atlantic Salmon (*Salmo salar*)	Atlantic Salmon use rivers to reproduce and as nursery areas. Eggs are deposited during winter in river gravels. The eggs hatch into alevins in spring, which in turn develop into fry. The fry feed for the summer and autumn, gradually becoming parr. Fry and parr feed primarily upon invertebrates. The Irish population generally comprises fish that spend two winters in freshwater before going to sea in spring as smolts. Adults spend 1-3 years at sea, feeding upon crustaceans and fish as they migrate to feeding grounds in the North Atlantic. The majority of Irish fish spend one winter at sea before returning to their natal rivers, mainly during the summer, as grilse. The proposed development is located within the current known distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019c). Salmon are present throughout much of the Barrow catchment, and the River Nore is designated as a Salmonid Water EC (Quality of Salmonid Waters) Regulations (S.I. no. 293 of 1988). It is probable that Atlantic Salmon are present within the vicinity of the proposed development. Atlantic Salmon. Therefore, there is potential for the proposed development to have an impact upon this qualifying interest due to a potential deterioration in water quality during construction works.	Yes
[1355] Otter (*Lutra lutra*)	Otters have two basic requirements: aquatic prey and safe refuges where they can rest. Otters are opportunistic predators with a broad and varied diet. In freshwater areas, a variety of fish will be taken, while crayfish and frogs can be important locally or seasonally. The proposed development is located within the current distribution, current range and favourable reference range of otter (NPWS, 2019c). The NBDC has no otter records within the proposed development site. The National Otter Survey of Ireland 2010/12 (Reid *et al.*, 2013) report noted that the occurrence of otter within survey sites for the south-eastern river basin district was 70.8%. No evidence of otter were recorded during	Yes

RIVER BARROW AND RIVER NORE SAC		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
	the site assessment, given that watercourses are within the proximity of the proposed development and given the NBDC records have Otter within the vicinity of the proposed development, it is likely that otters are in the general area. A significant impact on water quality could indirectly impact upon this qualifying interest by causing a reduction in prey populations and availability. Therefore, there is potential for the proposed development to have an impact upon this qualifying interest due to a potential deterioration in water quality during construction works.	
[1421] Killarney Fern (*Trichomanes speciosum*)	The Killarney fern is a type of filmy fern, with characteristically thin, membranous, translucent fronds. This fern grows in deeply shaded, humid areas such as dripping caves, crevices and overhangs of cliffs, within stream gullies, by waterfalls and on the floor of damp woodlands (NPWS, 2019c). The proposed development is located outside the current known distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019c). According to the SAC Conservation Objectives report, the nearest record of Killarney fern to the proposed site is located approximately 72km south of the proposed development site. The NBDC has no records within the proposed development site. It is therefore not anticipated that the proposed development would have any adverse impacts upon this qualifying interest.	No

POLLARDSTOWN FEN SAC		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
[7210] *Cladium* fens	The proposed development is located within the current known distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019b). The habitat is characterised by waterlogged peat soils, a high-water table (at or above the surface), and near neutral to alkaline oligotrophic to mesotrophic water. *Cladium* fens are found throughout Ireland, most commonly in lowland areas in the midlands, west and south-east. They are occasional elsewhere. A threat and pressure to this habitat is mixed source pollution to surface and ground waters. Therefore, there is potential for the proposed development to have an impact upon this qualifying interest due to a potential deterioration in water quality.	Yes
[7220] Petrifying springs	The proposed development is located within the current known distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019b). Species associated with petrifying springs are highly specialised. The ecological significance of petrifying springs is seldom confined to a point source; rather, there is often a continuum of intergrading hydrological conditions from the spring head, through a flushed slope and into small streams. The nearest example of this qualifying interest is located within Pollardstown Fen approximately 620m from the proposed development site. A threat and pressure to this habitat is mixed source pollution to surface and ground waters. Therefore, there is potential for the proposed development to have an impact upon this qualifying interest due to a potential deterioration in water quality.	Yes
[7230] Alkaline fens	The proposed development is located within the current known distribution, current range and favourable reference range of this qualifying interest (NPWS, 2019b). Alkaline fens are groundwater-fed, generally peat-forming systems with extensive areas of species-rich small sedge and brown moss communities. They occur in areas where there is a high-water table and a base-rich, often calcareous water supply. The nearest example of this qualifying interest is located within Pollardstown Fen approximately 620m from the proposed development site. A threat and pressure to this habitat is mixed source pollution to surface and ground waters. Therefore, there is potential for the proposed development to have an impact upon this qualifying interest due to a potential deterioration in water quality.	Yes
[1013] Geyer's Whorl Snail (*Vertigo geyeri*)	The Geyer's Whorl Snail is a whorl snail species occurring in wetlands in Ireland. It is stringent in its requirement for saturated water conditions in calcareous, groundwater-fed flushes. It is particularly sensitive to changes in hydrology. It is considered to be under threat in Ireland and was assessed as	No

POLLARDSTOWN FEN SAC		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
	Vulnerable on the Irish Red List. The proposed development is located within the current known distribution, current range and the favourable reference range of this qualifying interest (NPWS, 2019c). According to the SAC Conservation Objectives report, the nearest record of Geyer's Whorl Snail is located approximately 620m of the proposed development site. The nearest records on the NBDC for Geyer's Whorl Snail are located within Pollardstown Fen. Change in hydrology is a threat to this species however water quality/air are not listed as a threat to this species, it is not anticipated that the proposed development would have the potential to adversely impact upon the Geyer's Whorl Snail.	
[1014] Narrow-mouthed Whorl Snail (*Vertigo angustior*)	The Narrow-mouthed Whorl Snail is a whorl snail species occurring in wetlands in Ireland. It favours damp or wet habitats, where they live mostly in moss, leaves and decaying vegetation, and feeds on bacterial films and decaying vegetation. It is particularly sensitive to changes in vegetation. It is considered to be under threat in Ireland and was assessed as Vulnerable on the Irish Red List. The proposed development is located within the current known distribution, current range and the favourable reference range of this qualifying interest (NPWS, 2019c). According to the SAC Conservation Objectives report, the nearest record of Geyer's Whorl Snail is located approximately 620m of the proposed development site. The nearest records on the NBDC for Geyer's Whorl Snail are located within Pollardstown Fen. Changes in water/air quality are not listed as a threat to this species, it is not anticipated that the proposed development would have the potential to adversely impact upon the Narrow-mouthed Whorl Snail .	No
[1016] Desmoulin's Whorl Snail (*Vertigo moulinsiana*)	The Desmoulin's Whorl Snail is the largest of the whorl snail species occurring in wetlands in Ireland. It favours damp or wet habitats such as swamps, fens and marshes, where it lives mostly in moss, leaves and decaying vegetation (NPWS, 2019c). Desmoulin's Whorl Snails feed on living and dead stems and leaves of tall plants in wetland habitats. The proposed development is located within the current known distribution, current range and the favourable reference range of this qualifying interest (NPWS, 2019c). According to the SAC Conservation Objectives report, the nearest record of Desmoulin's whorl snail is located approximately 620m of the proposed development site. The nearest records on the NBDC for Desmoulin's Whorl Snail are located within Pollardstown Fen. Given that water/air quality are not listed as a conservation objective for this qualifying interest, it is not anticipated that the proposed development would have the potential to adversely impact upon the Desmoulin's whorl snail.	No

MOUDS BOG SAC		
QUALIFYING INTEREST	**OCCURRENCE / ASSESSMENT**	**POTENTIAL IMPACT**
[7110] Raised Bog	The proposed development is located within the current known distribution, current range and favourable reference range of these qualifying interests (NPWS, 2019b). According to the SAC Conservation Objectives report, the nearest examples of these qualifying interests are located approximately 3.6km from the proposed development site. Air quality from quarry activities or other atmospheric inputs can have a potential impact on this qualifying interest. It is therefore anticipated that the proposed development would have the potential to adversely impact upon these qualifying interests.	Yes
[7120] Degraded Raised Bog	Degraded raised bog is characterised by the complete absence (or patchy thin cover) of an acrotelm, which is the living, actively peat-forming upper layer. The proposed development is located within the current known distribution, current range and favourable reference range of these qualifying interests (NPWS, 2019b). The nearest example of this qualifying interests is located approximately 3.6km from the proposed development site. The main pressures on degraded raised bog come from peat extraction, drainage, afforestation and burning. It is not anticipated that the proposed development would have the potential to adversely impact upon this qualifying interest.	No
[7150] *Rhynchosporion* Vegetation	*Rhynchospora* species are associated with plant communities of the most sensitive and undisturbed parts of blanket bog and associated wetland habitats are they considered to correspond with the Annex I habitat. The proposed development is located within the current known distribution, current range and favourable reference range of these qualifying interests (NPWS, 2019b). The nearest example of this qualifying interests is located approximately 3.6km from the proposed development site. The main pressures on *Rhynchosporion* Vegetation comes from peat extraction, drainage, afforestation and burning. It is not anticipated that the proposed development would have the potential to adversely impact upon this qualifying interest.	No

8. MITIGATION MEASURES

This assessment has determined that the proposed development has the potential to impact upon the Pollardstown Fen SAC, Mouds Bog SAC and the River Barrow and River Nore SAC due to a potential deterioration in water quality and increased dust during the construction phase.

As discussed in Section 7, it is considered that the proposed development has the potential to impact upon the following qualifying interests of the Pollardstown Fen SAC, Mouds Bog SAC and the River Barrow and River Nore SAC:

- [3260] Floating River Vegetation
- [91E0] Alluvial Forests
- [1029] Freshwater Pearl Mussel
- [1095] Sea Lamprey
- [1096] Brook Lamprey
- [7220] Petrifying springs
- [7210] *Cladium* fens
- [1099] River Lamprey
- [1103] Twaite Shad
- [1106] Atlantic Salmon
- [1355] Otter
- [7110] Raised Bog
- [7230] Alkaline fens

8.1 WATER QUALITY

Measures that would be employed to ensure that there would be no significant impacts to the listed habitats or species, as listed above, of the Pollardstown Fen SAC, Mouds Bog SAC and the River Barrow and River Nore SAC due to a potential deterioration in water quality:

- Daily visual inspections would be undertaken of the R445 road and the Standhouse Road (L7037) during construction works;
- Provision of silt control features where appropriate, such as silt fencing;
- Silt fencing (comprising of a porous filter fabric which detains sediment) would be provided along the boundary of the development site. Silt fencing would remain in place until the completion of construction works;
- Additional silt fencing would be placed adjacent to storage areas of stockpiled soil, until such time as the excavated soil has been used in landscaping / re-instatement works;
- Silt control features would be inspected on a daily basis and maintained as appropriate;
- Where spoil is generated, this would only be stored temporarily and as far as possible from the boundary with Pollardstown Fen SAC. Where possible, spoil would be covered or alternatively, graded to avoid ponding or water saturation;
- Manhole covers and stormwater gullies will be protected by silt blankets and additional measures such as sandbags to be incorporated on steeper gradients if required;
- Excavations and earth-moving activities would be planned outside periods of heavy rainfall, to limit the potential for suspended solids to become entrained within surface water run-off;
- Should water be encountered during excavation works, water would be pumped to a constructed silt control feature, such as a settlement pond or detention pond. A filter

would be provided at the pump inlet and, where required, dewatering bags or silt fences would be used at the outlet to retain any potential silt entrained in the water. Pumping operations would be supervised at all times;

- All construction plant machinery and equipment would be maintained in good working order and regularly inspected;
- Any fuels, oils or chemicals would be stored in accordance with the EPA guidance on the storage of materials, in designated bunded areas with adequate bund provision to contain 110% of the largest drum volume or 25% of the total volume of containers;
- Deliveries of fuels and oils to the site would be supervised;
- Fuels / oils would be handled and stored with care to avoid spillage or leakage;
- Where appropriate, small construction plant equipment would be placed on drip trays;
- Any waste fuel / oils would be collected in bunded containers at a designated area and properly disposed of to an authorised waste contractor;
- Spill kits, adequately stocked with spill clean-up materials such as booms and absorbent pads, would be readily available onsite;
- In the unlikely event of a hydrocarbon spillage, contaminated spill clean-up material would be properly disposed of to an authorised waste contractor;
- Where re-fuelling of construction plant is required to take place onsite, re-fuelling would take place within a bunded area. Under no circumstances would re-fuelling take place within the vicinity of the mature treelines;
- Where construction plant shows signs of hydrocarbon leakage, site personnel would cease the operation of the item in plant in question. Any defective plant would be kept out of service until the necessary repairs are undertaken;
- The use of pre-cast concrete where possible;
- The delivery and pouring of concrete would be supervised at all times;
- The pouring of concrete would be avoided during periods of expected heavy rainfall;
- Concrete would be poured directly into the shuttered formwork from the Ready-Mix Truck, reducing the risk of spillage;
- The wash-out of Ready-Mix Truck drums would not be permitted onsite, in the environs of the site, or at a location which could result in a discharge to surface water;
- Surplus uncured concrete would be returned to the batching plant where possible;
- It is not envisaged that vehicle wheel wash facilities would be required. However, in particularly dry weather, additional dust control measures may be required, including the provision of a wheel wash facility. Should a wheel wash facility be required, it would be located at an area isolated from any drainage network and the associated run-off would be collected via a settling pond;
- In the unlikely event of a suspected deterioration in water quality within the Liffey, Cloncumber Stream, Rosberry 14 and Pollardstown Fen due to construction works at the development site, works would immediately cease, an investigation into the cause undertaken and the relevant NPWS and Inland Fisheries Ireland personnel informed.

In addition to the above measures, the construction works contractor would take cognisance of the following guidelines:

- CIRIA, 2001: *Control of Water Pollution from Construction Sites; guidance for consultants and contractors*;
- CIRIA, 2002: *Control of Water Pollution from Construction Sites – Guide to Good Practice*;
- IFI, 2016: *Guidelines on Protection of Fisheries During Construction Works in and adjacent to Waters*.

It is therefore considered that, due to the proposed design and proposed mitigation measures, there would be no significant risk to water quality and the protected habitats and species of the Pollardstown Fen SAC, Mouds Bog SAC and the River Barrow and River Nore SAC during the construction phase of the proposed development.

8.2 DUST CONTROL

During the site preparation phase the removal of large quantities of sand and gravel has the potential to impact upon air quality due to increased dust emissions. The construction works contractor would ensure the following:

- Deliveries to and from the site would be via suitably contained vehicles, with sheeting and covers where required;
- The construction traffic will be required to coordinate and schedule all deliveries to the site, ensure that all access roads are kept clear of mud and debris;
- Haulage contractors must plan an appropriate route to and from the site, and to adhere to good traffic management principles;
- Where possible, large-scale vehicle movements would be timed outside peak hours on the local road network.
- Deliveries to and from the site would be scheduled during the construction hours of 8:00am to 7:00pm Monday to Friday, and 8:00am to 2:00pm on Saturdays;
- Cognisance would be taken of the National Roads Authority's "*Guidelines for the Treatment of Noise and Vibration in National Road Schemes*", the British Standard 5228: Part 1 "*Code of practice for Noise Control on Construction and Open Sites*" and the CIRIA 2015 "*Environmental Good Practice on Site*";
- Care would be taken when unloading vehicles to minimise dust. Materials should be lowered, not dropped, insofar as practicable and safe;
- Regular visual inspections would be undertaken around the proposed site boundary and local road network to monitor the effectiveness of dust control measures;
- Should additional dust mitigation measures be required, for instance during particularly dry weather, dust suppression would be undertaken using water misting plant, such as bowsers and sprays, and wheel wash facilities to reduce the level of dust travelling offsite;

- Materials would not be delivered to the site until required.

It is therefore considered that, due to the proposed design and proposed mitigation measures, there would be no significant risk to air quality and the protected habitats and species of the Pollardstown Fen SAC, Mouds Bog SAC and the River Barrow and River Nore SAC during the construction phase of the proposed development.

9.0 IN COMBINATION EFFECTS

The following plans and projects were reviewed and considered for in-combination effects with the proposed development:

The following plans and projects were reviewed and considered for in-combination effects with the proposed development:

- Kildare County Development Plan 2017-2023;
- County Kildare Local Economic and Community Plan 2016-2021;
- Proposed and permitted developments in the area available on Kildare County Council planning system.

The proposed development site is located on the edge of Newbridge but within the town limit, with residential and commercial premises located within the vicinity. Recent planning applications within the vicinity include residential and commercial properties such as a planning application for the alteration of residential dwellings (Ref 20912) and a commercial planning application for the redevelopment of a garage/service station (Ref 20556). Both examples are within the area of Ballymany (Newbridge). There are also nineteen EPA licenced facilities located within approximately 10km of the development site, which are included in the table below.

Licence No.	Licence Name	Licence Type (First Schedule of EPA Act, 1992, as amended)	Approximate Distance from Development
P0087	Schloetter (Ireland) Limited	IPPC	1.66km E
P0772	Curragh Tintawn Carpets Limited	IPPC - 8.5.2	1.69km SE
P0297	Procter & Gamble (Manufacturing) Ireland Limited	IPC - 12.2.2	1.74km SE
P0242	Irish Ropes Limited	IEL	1.74km E
P0233	Curragh Tintawn Carpets Limited	IPPC - 8.5.2 (Surrendered)	1.95km NE
P0153	Pfizer Ireland Pharmaceuticals (Newbridge)	IEL - 12.2.1	3.23km NE
P0170	Kildare Chilling Company	IEL - 7.4.1	4.88km SW
P0814	Schloetter (Ireland) Limited	IEL - 5.13 (b)	5.93km NE
P0707	Messrs Thomas and Eddie O' Mahony	IEL - 8.3	7.48km NW
P0202	Oral B Laboratories Islands Ltd. T/A Oral B Laboratories Irl.	IEL	8km NE

Owing to the distances of the above facilities and the residential nature of the proposed development, it is considered that there would be no cumulative air or noise impacts which would pose a significant risk to designated sites or species.

Continued implementation of the Water Framework Directive would result in achieving, or maintaining, improvements to water quality in the Liffey and Dublin Bay Catchment. Developments such as this proposed development could act in combination with existing environmental pressures on the Liffey and Dublin Bay Catchment, including: agriculture, anthropogenic, domestic and urban waste water, urban run-off, industry (including extractive) and forestry. However, as noted in Section 6.3, it is not considered that the development would pose a significant risk upon any SAC/SPA site due to a deleterious effect on water quality, during either the construction or operational phase.

As discussed in Sections 6.1 – 6.3 above, it is considered that there would be no significant risk to any European site owing to the proposed development. As there are no anticipated significant risks from the development and proposed works, and given the nature of activities and distances of other facilities in the area, it is considered that there would be no cumulative water, noise or air impacts which would pose a significant risk to designated sites or species.

9.1 HABITAT LOSS / FRAGMENTATION

As discussed in Section 6.1, the proposed development does not directly impinge on any part of a European site, and as such would not be expected to have any in-situ effects upon a protected site through loss or destruction of habitat or fragmentation of habitat. With regards ex-situ effects, it is not considered that the proposed development site would contain the habitats or species for which the Pollardstown Fen SAC, Mouds Bog SAC and the River Barrow and River Nore SAC have been designated.

The surrounding land-use of the proposed development site is agricultural pasture to the west and urban to the east. The agricultural land which can be considered modified and of low biodiversity value. Further away are areas of open grassland (the Curragh) that also in use for recreational activities. Proposed developments were identified on the Kildare County Council planning site within the vicinity of the applicants proposed site, which are for residential dwellings and small scale commercial developments. Should future planning applications be submitted for the area, it is likely that they would also be located on agricultural land or within the urban centre of Newbridge. Therefore, it is unlikely that future proposed developments would result in the loss or fragmentation of designated habitats of the Pollardstown Fen SAC, Mouds Bog SAC and the River Barrow and River Nore SAC within the vicinity of the proposed site. Therefore, no in-combination effects on habitat loss / fragmentation are anticipated.

9.2 DISTURBANCE TO SPECIES

Disturbance to species may arise through noise emissions and human activity. The main in-combination noise and human activity effects would be from any commercial activities within the area. Pollardstown Fen SAC is 620m from the proposed development however fauna within the SAC and the general area around the proposed development site would be accustomed to human and urban noise. This SAC is partly accessible to the public as it also designated a nature reserve.

During site clearance works, the top layer of vegetation of the proposed development footprint would be removed and would be either stored for re-use in landscaping activities at the development site upon completion of construction works, or, in the instances of larger vegetation (i.e. shrubs) would be removed from the development site and appropriately disposed of to a licenced waste contractor. Where possible, no hedgerow / tree removal works would be undertaken during the bird nesting season, from the 1st of March to the 31st of August.

Therefore, owing to the urban land use and the EPA licenced facilities detailed in the table above, and given the nature of activity at the proposed development (residential), it is considered that there would be no cumulative noise impacts, or other disturbance effects due to human activity, which would pose a significant risk to designated sites or species.

9.3 AIR QUALITY

From mapping websites, including the EPA's Envision mapping system, there are no commercial or industrial enterprises located within the vicinity of the proposed development site. The nearest EPA licenced sites are located approximately 1.66km and 1.69km from the proposed development site. These facilities are obliged to operate their site in compliance with their IE / IPC licences, and therefore would be obliged to ensure air emissions are in compliance with any emission limit values outlined within their EPA licences.

The proposed development with the proposed heating system to be Air to Water heat pumps, it is considered that there would be no cumulative air quality impacts which would pose a significant risk to designated sites. Air emissions would be typical of residential dwellings, being primarily from heating and therefore low impact in-and-of-itself. In-combination residential impacts would be controlled by national energy policies and grant schemes.

In the event a future development is proposed within the general vicinity of the applicants' proposed development, no cumulative air quality impacts would be anticipated, given the residential nature of the development. Furthermore, should the future commercial / industrial development have air emissions of concern, they may be required to obtain an Air Pollution Licence from the relevant local authority if the industrial process has been identified as having a potential for major emissions under the Air Pollution Act of 1987, or alternatively, they may be required to obtain an IE / IPC Licence from the EPA prior to such activities being carried out. Where the local authority / EPA determine that there is potential for significant emissions to air, the applicant's licence may be refused, or alternatively, the local authority / EPA may stipulate conditions within the licence which must be adhered to.

9.4 DETERIORATION IN WATER QUALITY

Continued implementation of the Water Framework Directive would result in achieving, or maintaining, improvements to water quality in the Barrow Catchment and Liffey Catchment. Developments such as this proposed development could act in combination with existing environmental pressures on the Barrow/Liffey Catchments, including agriculture, anthropogenic, domestic and urban wastewater, urban run-off, industry and forestry. In particular, the proposed development could act in combination with other similar projects that generate wastewater to cause a deterioration in the water quality of Urban Wastewater Treatment Plant receiving watercourses. These could be from point or diffuse sources and could include licenced wastewater discharges, unsewered properties and agricultural run-off.

However, stormwater drainage from the proposed development will enter the drainage and attenuation system within the site. All foul and domestic wastewater will connect with to Osberstown WWTP which serves the town of Newbridge. Oberstown WWTP was upgraded in 2016. Irish Water are currently in the process of upgrading the sewerage network within Newbridge as part of the Upper Liffey Valley Sewerage Scheme. This project aims to stop overflows and flooding during storms and to allow for additional capacity and for future growth in towns such as Newbridge. Should future housing developments of similar scale be constructed within the town limit of Newbridge there will be sufficient capacity within Oberstown WWTP and following the ongoing upgrades to the sewerage network. Similar housing developments would require appropriate stormwater drainage systems that are SuDS compliant. In addition, the proposed development is not in a Flood Risk Zone and would not increase the flood risk to other third parties or lands. Therefore, there would be no significant cumulative impacts due to flooding.

The proposed development is located within the Curragh Aquifer as is the town of Newbridge. The EPA monitor boreholes and record the groundwater level within the Curragh Aquifer in the vicinity of the site. In addition, a borehole within the Ballymany site was compared with the EPA boreholes and found to be consistent with the EPA recorded data. The average seasonal variation in groundwater level in the five EPA boreholes reviewed was 1.8m. The Curragh Aquifer was measured for recharge and the flow of groundwater to Pollardstown Fen after the significant impact of the M7 bypass of Kildare town on the Curragh. The analysis concluded Pollardstown Fen is actively recharging (Misstear et al., 2009). The proposed development would not significantly alter the flow of groundwater to Pollardstown Fen as the flow of groundwater from the Curragh Aquifer is in a northerly direction. All stormwater from the proposed site will pass through a drainage system that will prevent hydrocarbons and from discharging to groundwater. Therefore, there would be no significant cumulative impacts due to changes in groundwater.

There would be no significant risk of water quality deterioration as a result of uncured concrete, given that precast concrete / blockwork would be used where possible and surplus concrete would be returned to the batching plant. Given the duration of the proposed development works, and the type of construction plant and equipment required, there is considered to be no significant risk of water quality deterioration as a result of hydrocarbon spillage.

It is not anticipated that the operational phase of the proposed development has the potential to impact upon the listed habitats and species of the Pollardstown Fen SAC, Mouds Bog SAC and the River Barrow and River Nore SAC due to deleterious effects on water quality. No significant impact on water quality would take place due to drainage from the site, given the proposed drainage design.

10.0 CONCLUSION

It is not anticipated that the proposed development, subject to recommended mitigation measures, by itself or in combination with other developments, would impact negatively upon the Natura 2000 network during the site preparation or operational phases of the project.

The proposed development site is located approximately 620m from Pollardstown Fen SAC. It is considered that there would be no potential risk of significant impacts upon the qualifying interests / special conservation interests of the Pollardstown Fen SAC (Site Code: 000396),

Mouds Bog SAC (Site Code: 002331) and River Barrow and River Nore SAC (Site Code: 002162) due to the proposed mitigation measures to be employed.

It is the conclusion of this Natura Impact Statement that, subject to recommended mitigation measures, there would be no potential for significant impacts on European sites as a result of the proposed development and mitigation measures to be employed. This conclusion refers to the development by itself or in combination with other developments.

11.0 REFERENCES

Aas, G., Riedmiller, A. (1994) *Trees of Britain & Europe*. Harper Collins Publishers

Averis, B. (2013) *Plants and Habitats: An introduction to common plants and their habitats in Britain and Ireland*. United Kingdom: Swallowtail Print Ltd.

Botanical Society of Britain and Ireland flora distribution maps, available at: https://bsbi.org/maps

Byrne, A., Moorkens, E.A., Anderson, R., Killeen, I.J. & Regan, E.C. (2009) *Ireland Red List No. 2 – Non Marine Molluscs*. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.

Cabot, D. (2004*) Irish Birds*. Harper Collins Publishers, London

CIRIA (2002) *Control of Water Pollution from Construction Sites – Guide to Good Practice*.

CIRIA (2001) *Control of Water Pollution from Construction Sites; guidance for consultants and contractors*.

Council Directive (EC) 2009/147/EC of 30 November 2009 on the conservation of wild birds.

Council Directive (EC) 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.

Devlin, Z. (2014) *Wildflowers of Ireland: A Field Guide*. Cork: Collins Press.

DoEHLG (2009) *Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities*.

Environment DG, European Commission (2002) *Assessment of plans and projects significantly affecting Natura 2000 sites - Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*.

Environmental Protection Agency Licence public access information, Available at: http://www.epa.ie/licensing/iedipcse/

Fitzpatrick, U., Weeks, L., Wright, M. (2016) *Identification Guide to Irelands Grasses*. National Biodiversity Data Centre

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

Inland Fisheries Ireland (2016) *Guidelines on Protection of Fisheries During Construction Works in and adjacent to Waters.*

Johnson, O. and More, D. (2006) *Collins Tree Guide: The Most Complete Field Guide to the Trees of Britain and Europe*. London: HarperCollins Publishers.

Kelly, F.L., Connor, L., Matson, R., Feeney, R., Morrissey, E., Coyne, J. and Rocks, K. (2015) *Sampling Fish for the Water Framework Directive, Rivers 2014*. Inland Fisheries Ireland, 3044 Lake Drive, Citywest Business Campus, Dublin 24, Ireland.

King, J.L., Marnell, F., Kingston, N., Rosell, R., Boylan, P., Caffrey, J.M., FitzPatrick, Ú., Gargan, P.G., Kelly, F.L., O'Grady, M.F., Poole, R., Roche, W.K. and Cassidy, D. (2011). *Ireland Red List No. 5: Amphibians, Reptiles and Freshwater Fish*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

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

Misstear, B.D.R., Brown, L. & Johnston, P.M. (2009). Estimation of groundwater recharge in a major sand and gravel aquifer in Ireland using multiple approaches. Hydrogeol J 17, 693–706.

Moorkens, E. A. (2000). Conservation management of the freshwater pearl mussel *Margaritifera margaritifera*. Part 2: Water Quality Requirements. *Irish Wildlife Manuals,* No. 9. Dúchas, the Heritage Service, Dublin.

Moorkens, E. A. (1999). Conservation management of the freshwater pearl mussel *Margaritifera margaritifera*. Part 1: Biology of the species and its present situation in Ireland. *Irish Wildlife Manuals,* No. 8. Dúchas, the Heritage Service, Dublin.

Ní Dhúill, E., Smyth, N., Waldren, S. & Lynn, D. (2015) Monitoring methods for the Killarney Fern (Trichomanes speciosum Willd.) in Ireland. *Irish Wildlife Manuals*, No. 82. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Ireland.

NPWS (2011b) *Conservation Objectives: River Barrow and River Nore SAC 002162*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2013) Site Synopsis: Pollardstown Fen SAC. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2014) *Site Synopsis: Mouds Bog SAC 002331*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht

NPWS (2015) *Conservation Objectives: Mouds Bog SAC 002331*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2016) *Site Synopsis: River Barrow and River Nore SAC 002162.* National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht

NPWS (2018) Natura Standard Data Form for Mouds Bog SAC.

NPWS (2019a) The Status of Protected EU Habitats and Species in Ireland. Volume 1: Summary Overview Unpublished Report, National Parks and Wildlife Services, Department of Culture, Heritage and the Gaeltacht.

NPWS (2019b) The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitats Assessments. Unpublished report. National Parks and Wildlife Services, Department of Culture, Heritage and the Gaeltacht.

NPWS (2019c) The Status of EU Protected Habitats and Species in Ireland. Volume 3: Species Assessments. Unpublished report. National Parks and Wildlife Services, Department of Culture, Heritage and the Gaeltacht.

NPWS (2020a) Natura Standard Data Form for Pollardstown Fen SAC.

NPWS (2020b) Natura Standard Data Form for River Barrow and River Nore SAC.

NPWS (2022) Conservation Objectives: Pollardstown Fen SAC 000396. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

Parnell, J. and Curtis, T. (2012) *Webb's An Irish Flora*. Cork: Cork University Press.

Philips, R. (1980) *Grasses, Ferns, Mosses & Lichens of Great Britain and Ireland*. London: Pan Books.

Reid, N., Hayden, B., Lundy, M.G., Pietravalle, S., McDonald, R.A. & Montgomery, W.I. (2013) National Otter Survey of Ireland 2010/12. *Irish Wildlife Manuals,* No. 76. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

Reynolds, J.D. (1998) Conservation management of the white-clawed crayfish, Austropotamobius pallipes. Part 1. *Irish Wildlife Manuals*, No. 1. National Parks and Wildlife Service.

Rose, F. (2006) *The Wildflower Key: How to identify wild flowers, trees and shrubs in Britain and Ireland*. China: Frederick Warne & Co.

Smith, G.F., O'Donoghue, P., O'Hora, K. and Delaney, E. (2011) *Best Practice Guidance for habitat survey and mapping*. The Heritage Council, Kilkenny. Available at: www.heritagecouncil.ie/wildlife/publications/

Sterry, P. (2004) *Complete Irish Wildlife*. Harper Collins Publishers, London

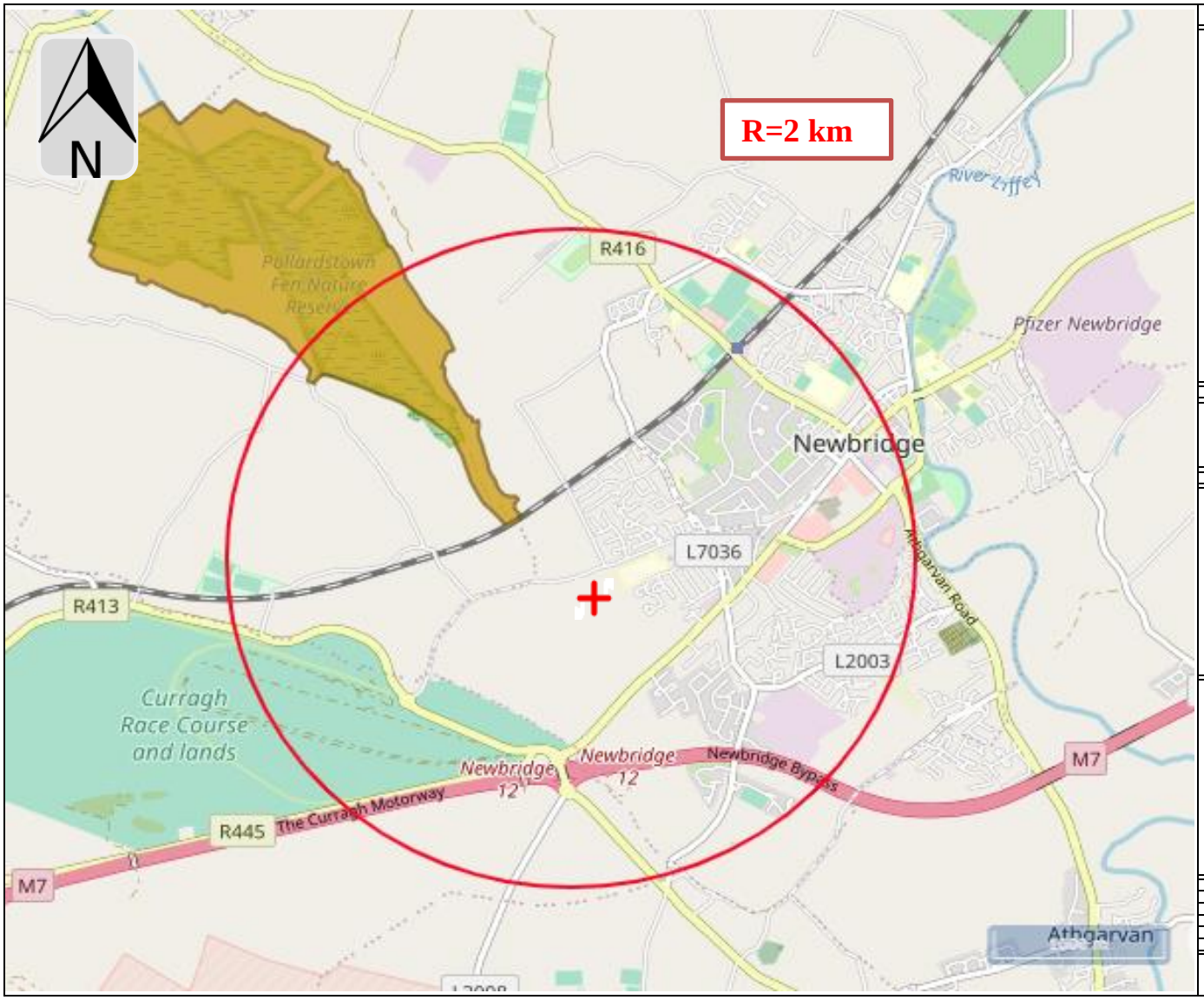
Streeter, D. and Hart-Davies, C. (2010*) Collins Flower Guide.* HarperCollins Publishers Limited.

Sutherland, W.J. (Ed.). (2006) *Ecological Census Techniques*. United Kingdom: Cambridge University Press.

Wheater, C.P., Bell, J.R. and Cook, P.A. (2011) *Practical Field Ecology: A Project Guide*. John Wiley & Sons.

APPENDIX A

- PROTECTED SITES -
AND
- PROPOSED SITE LAYOUT-



Notes

Site Location –

S.P.A. –

S.A.C. –

Project Title:

PROTECTED SITES MAP

Client Name:

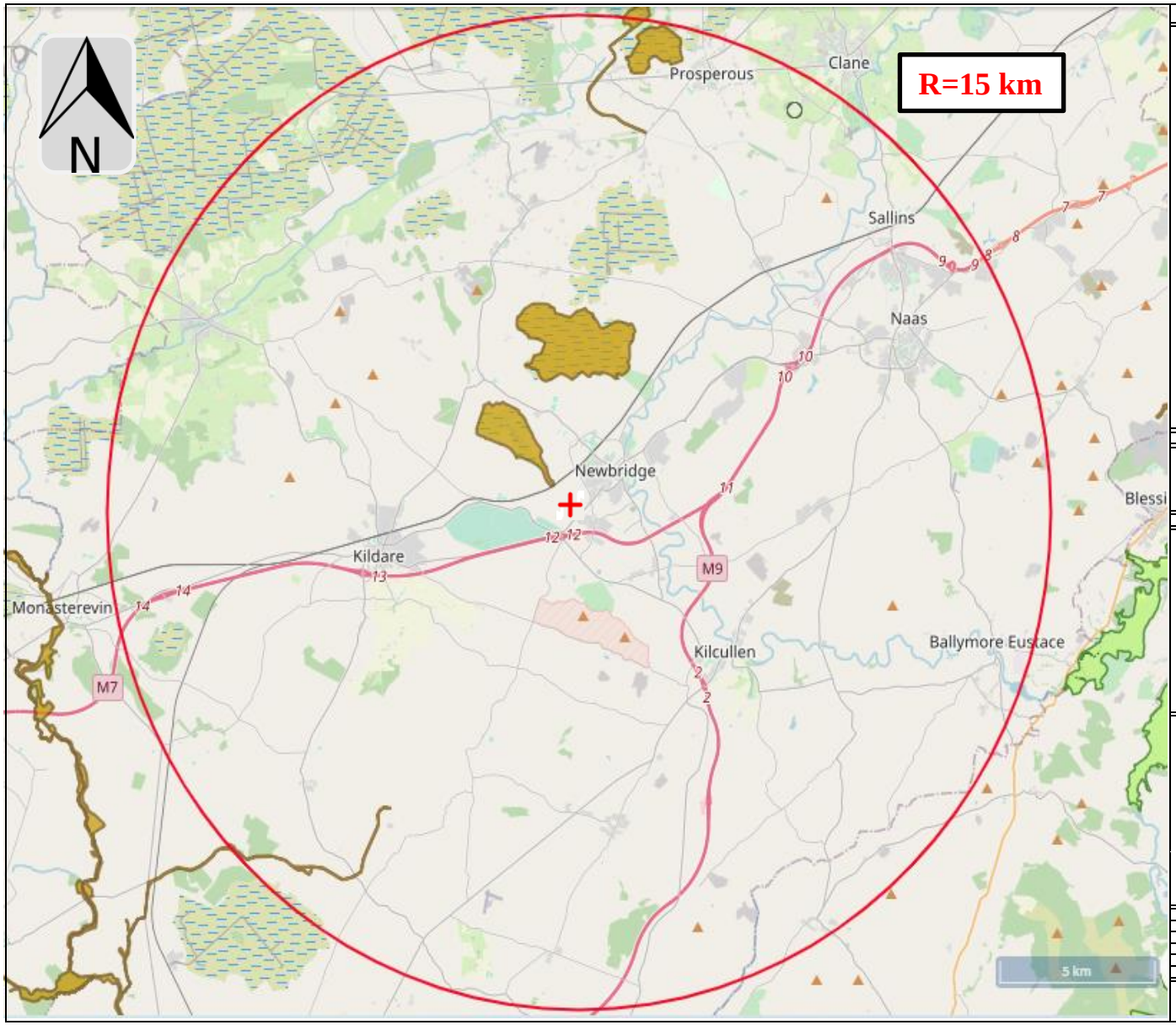
Briargate Developments Newbridge Limited

PANTHER ENVIRONMENTAL SOLUTIONS LTD

UNITS 3 & 4
INNOVATION CENTRE
GREEN ROAD
CARLOW
R93 W248

TELE: 059 91 34222
MOBILE: 087 851 9284
EMAIL: info@pantherwms.com
WEB: www.pantherwms.com

Drawing Status:	Scale:	NTS	A4
Report	Datum:	EPA Envision	
Drawing Number: NIS 9794	Drawn:	RDS	
	Checked:	MF	
Revision:	Approved:	-	
R0	Date:	01/09/2020	



Notes

Site Location –

S.P.A. –

S.A.C. –

Project Title:

PROTECTED SITES MAP

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R93 W248
TELE: 059 91 34222
MOBILE: 087 851 9284
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WEB: www.pantherwms.com

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Drawing Number: NIS 9794	Drawn:	RDS	
	Checked:	MF	
Revision:	Approved:	-	
R0	Date:	01/09/2020	


SCOIL MHUIRE
SENIOR SCHOOL
PHASE 2:
BALANCE OF
DEVELOPMENT
LANDS OUTSIDE OF
NEWBRIDGE LOCAL AREA
PLAN BOUNDARY
PHASE 1:
PLANNING
FOR 54 UNITS
BALLYMANY STUD


Phase 1
Boundary

APPENDIX B

- PHOTO LOG -

Plate 1: Treelines (WL2) and hedgerow (WL1) habitats.

Plate 2: Exposed sand, gravel or till (ED1) habitat.

Plate 3: Scrub (WS1) and earth banks (BL2) habitats.

Plate 4: Treelines (WL2) habitat.

Notes:

**BALLYMANY,
NEWBRIDGE,
CO. KILDARE**

**APPENDIX B
PHOTO LOG**

PANTHER
ENVIRONMENTAL SOLUTIONS LTD

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INNOVATION
CENTRE
GREEN ROAD
CARLOW

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MOBILE: 087 851 9284
EMAIL: info@pantherwms.com
WEB: www.pantherwms.com

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		drawn:	PES
drawing no.	rev	checked:	MF
NIS_20_9794	A	approved:	-
		date:	01/09/2020

Plate 5: Development site facing south

Plate 6: Development site facing north

Plate 7: Dry meadows and grassy verges (GS2) habitat

Plate 8: Development site near Standhouse Road facing east

Notes:

**BALLYMANY,
NEWBRIDGE,
CO. KILDARE**

**APPENDIX B
PHOTO LOG**

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MOBILE: 087 851 9284
EMAIL: info@pantherwms.com
WEB: www.pantherwms.com

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		date: 01/09/2020	