Mountmellick Flood Relief Scheme – Screening for Appropriate Assessment

Final Report

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OPW Oifig na nOibreacha Poiblí Office of Public Works

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Contract

This report describes work commissioned by Laois County Council as part of the Laois County Council Mountmellick Flood Relief Scheme. William Mulville and Michael Coyle of JBA Consulting carried out this work.

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Purpose

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Abbreviations

AA	Appropriate Assessment
CIEEM	Chartered Institute of Ecology and Environmental Management
CJEU	Court of Justice of the European Union
DoEHLG	Department of Environment, Heritage and Local Government
EC	European Communities
EEA	European Environment Agency
EPA	Environmental Protection Agency
EU	European Union
FRS	Flood Relief Scheme
GSI	Geological Survey Ireland
INNS	Invasive Non-native Species
IROPI	Imperative Reasons of Over-riding Public Interest
LCC	Laois County Council
NBDC	National Biodiversity Data Centre
NIS	Natura Impact Statement
NOx	Nitrogen Oxides
NPWS	National Parks and Wildlife Service
OPR	Office of the Planning Regulator
OPW	Office of Public Works
QI	Qualifying Interest
RBMP	River Basin Management Plan
SAC	Special Area of Conservation
SPA	Special Protection Area
WFD	Water Framework Directive
WWTP	Waste Water Treatment Plant
ZoI	Zone of Influence

1 Introduction

1.1 Background

This report, which contains information to assist the competent authority to undertake a screening for Appropriate Assessment (AA) in respect of the proposed Flood Relief Scheme (FRS) for the Mountmellick area in Co. Laois, has been prepared by JBA Consulting Engineers and Scientists Ltd. (hereafter JBA) on behalf of Laois County Council (LCC). It provides information on, and assesses the potential in view of best scientific knowledge for the proposed Flood Relief Scheme (FRS) for the Mountmellick area in Co. Laois to have likely significant effects, either individually or in combination with other plans or projects, on any Natura 2000 site.

Article 6(3) of Council Directive 92/43/EEC of 21 May 1992 on the Conservation of Natural Habitats and of Wild Fauna and Flora (as amended) (the "Habitats Directive") requires that, any plan or project not directly connected with or necessary to the management of European sites, but likely to have significant effects thereon, either individually or in combination with other plans or projects, shall be subject to AA of its implications for the European sites in view of their conservation objectives. The requirements of Article 6(3) of the Habitats Directive, have been transposed into Irish law by Part XAB of the Planning and Development Act 2000 (as amended) and the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended)

1.2 Legislative Context

Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora, known as the 'Habitats Directive' - provides legal protection for habitats and species of European importance. Article 2 of the Directive requires the maintenance or restoration of habitats and species of European Community interest, at a favourable conservation status. Articles 3 - 9 provide the legislative means to protect habitats and species of Community interest through the establishment and conservation of an EU-wide network of sites known as Natura 2000 sites. Natura 2000 sites are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Conservation of Wild Birds Directive (79 / 409 / EEC).

Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans or projects affecting Natura 2000 sites. Article 6(3) establishes the requirement for Appropriate Assessment:

"*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*."

Article 6(4) deals with the steps that should be taken when it is determined, as a result of Appropriate Assessment, that a plan/project will adversely affect a European site. Issues dealing with alternative solutions, imperative reasons of overriding public interest and compensatory measures need to be addressed in such a case.

Article 6(4) states:

"*If, in spite of a negative assessment of the implications for the site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, the Member States shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.*

Where the site concerned hosts a priority natural habitat type and / or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest."

The requirements of Articles 6(3) and 6(4) of the Habitats Directive have been transposed into Irish legislation by means of *inter alia* the European Communities (Birds and Natural Habitats) Regulations 2011-2015 (S.I. No. 477 / 2011) as amended.

1.3 Appropriate Assessment Process

Guidance on the Appropriate Assessment (AA) process was produced by the European Commission in 2002, which was subsequently developed into guidance specifically for Ireland by the Department of Environment, Heritage and Local Government (DoEHLG) (2009, rev 2010). Office of the Planning Regulator (OPR) produced a Practice Note in 2021, PN01 - Appropriate Assessment Screening for Development Management (OPR, 2021). These guidance documents identify a staged approach to conducting an AA, as shown Figure 1-1.

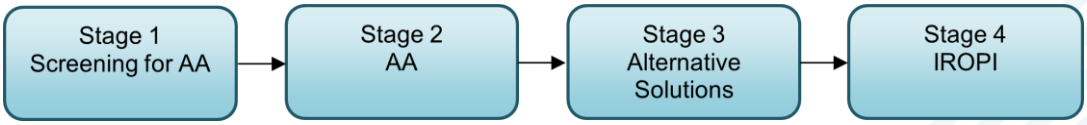


Figure 1-1: The Appropriate Assessment Process (from: Appropriate Assessment of Plans and Projects in Ireland-Guidance for Planning Authorities, DoEHLG, 2009)

1.3.1 Stage 1 - Screening for AA

The initial, screening stage of the Appropriate Assessment is to determine:

- whether the proposed plan or project is directly connected with or necessary for the management of the European designated site for nature conservation
- if it is likely to have a significant adverse effect on the European designated site, either individually or in combination with other plans or projects.

For those sites where, likely significant effects are identified, either alone or in combination with other plans or projects, further assessment is necessary to determine if the proposals will have an adverse effect on the integrity of a European designated site, in view of the site's conservation objectives (i.e., the process proceeds to Stage 2).

1.3.2 Stage 2 - AA

This stage requires a more in-depth evaluation of the plan or project, and the potential direct and indirect effects of them on the integrity and interest features of the European designated site(s), alone and in-combination with other plans and projects, taking into account the site's conservation objectives. Where required, mitigation or avoidance measures will be suggested.

The competent authority can only agree to the plan or project after having ascertained that it will not adversely affect the integrity of the site(s) concerned. If this cannot be determined, and where mitigation cannot be achieved, then alternative solutions will need to be considered (i.e., the process proceeds to Stage 3).

1.3.3 Stage 3 - Alternative Solutions

Where adverse effects on the integrity of Natura 2000 sites are identified, and mitigation cannot be satisfactorily implemented, alternative ways of achieving the objectives of the plan or project that avoid adverse effects need to be considered. If none can be found, the process proceeds to Stage 4.

1.3.4 Stage 4 - IROPI

Where adverse effects of a plan or project on the integrity of Natura 2000 sites are identified and no alternative solutions exist, the plan will only be allowed to progress if imperative reasons of overriding public interest can be demonstrated. In this case compensatory measures will be required.

The process only proceeds through each of the four stages for certain plans or projects. For example, for a plan or project, not connected with management of a site, but where no likely significant effects are identified, the process stops at stage 1. Throughout the process, the precautionary principle must be applied, so that any uncertainties do not result in adverse effects on a site.

This report is in support of a Stage 1 Screening for Appropriate Assessment.

1.3.5 Recent judgements of the Court of Justice of the European Union (CJEU) and how they are used in this assessment

The CJEU issued a ruling on the consideration of avoidance and reduction measures as a result of the case known as People over Wind, Peter Sweetman v Coillte Teoranta (Case C-323/17). This judgement stated that measures intended to reduce or avoid effects on a Natura 2000 site should only be considered within the framework of an Appropriate Assessment, and it is not permissible to take into account such measures at the screening stage.

More recently, the decision of the CJEU in case C-721/21 (Eco Advocacy CLG v An Bord Pleanála), delivered in June 2023, found that Article 6(3) of the Habitats Directive must be interpreted as meaning that: "in order to determine whether it is necessary to carry out an appropriate assessment of the implications of a plan or project for a site, account may be taken of the features of that plan or project which involve the removal of contaminants and which therefore may have the effect of reducing the harmful effects of the plan or project on that site, where those features have been incorporated into that plan or project as standard features, inherent in such a plan or project, irrespective of any effect on the site." (Para. 53(3) of the Judgement).

This recent judgement therefore clarifies that features which have been incorporated into a project as standard features, inherent in that project, and irrespective of any effect on any European site may be taken into account for the purposes of a Stage 1 Screening for Appropriate Assessment under Article 6(3) of the directive.

The CJEU ruling in the case of Grace & Sweetman [2018] (C-164/17) clarified the difference between avoidance and reduction (mitigation) measures and compensation. Measures intended to compensate for the negative effects of a project cannot be taken into account in the assessment of the implications of a project, and instead are considered under Article 6(4). This means that any project where an effect on the integrity of a Natura 2000 site remains and can only be offset by compensation, would need to proceed under Article 6(4), demonstrating "imperative reasons of overriding public interest".

The CJEU ruling in the case of Holohan v An Bord Pleanála (C-462/17) also clarified the importance in Appropriate Assessment of taking into account habitat types and species outside the boundary of the Natura 2000 site where implications of the effects on those habitat and species may affect the conservation objectives of the Natura 2000 site. In this assessment functionally linked and supporting habitat for species outside of Natura 2000 sites are assessed where they could potentially effect the conservation objectives of any Natura 2000 sites within the zone of Influence (ZoI).

1.4 Methodology

- The Screening for Appropriate Assessment has been prepared having regard to the Birds and Habitats Directives, the European Communities (Birds and Natural Habitats) Regulations 2011-15 as amended and relevant jurisprudence of the EU and Irish courts. The following documents have also been used to provide guidance for the assessment:
- DEHLG (2010). Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government (DEHLG, 2009).
- Office of the Planning Regulator (2021). OPR Practice Note PN01 - Appropriate Assessment Screening for Development Management.
- European Communities (EC) (2019). Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, (OJ C, C/33, 25.01.2019, p. 1.
- EEC (October 2021) Guidance document on the strict protection of species of Community interest under the Habitats Directive 92/43/EEC
- /12EC (2021). Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. , 2021/C 437/01 (OJ C, C/437, 28.10.2021, p. 1.
- CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland - Terrestrial, Freshwater and Coastal, Second Ed. (Chartered Institute of Ecology and Environmental), (updated 2022).

1.4.1 Desktop study

A desktop study was conducted of available published and unpublished information, along with a review of data available on the National Parks and Wildlife Service (NPWS) and National Biodiversity Data Centre (NBDC) web-based databases, in order to identify key habitats and species (including legally protected and species of conservation concern) that may be present within ecologically relevant distances from the project as explained below. The data sources below were consulted for the desktop study:

- Aerial photography available from www.osi.ie and Esri World Imagery.
- NPWS website (www.npws.ie) where Natura 2000 site synopses, data forms and conservation objectives were obtained along with Annex I habitat distribution data and status reports.
- River Basin Management Plans (www.wfdireland.ie)
- NBDC Biodiversity Maps (maps.biodiversityireland.ie)
- Catchments (www.catchments.ie)

- Environmental Protection Agency Maps (https://gis.epa.ie/EPAMaps)
- Geological Survey Ireland (GSI) website (www.gsi.ie)
- GSI - Groundwater data viewer (https://dcenr.maps.arcgis.com)
- Planning Applications (myplan.ie)

1.4.2 Ecological Site Survey

To inform this AA Screening, various ecological surveys were performed by JBA Ecologists, William Mulville, Colm O'Leary, Malin Lundberg, Niamh Burke, Mark Desmond and Michael Coyle. Table 1-1 contains further details on survey dates and types of surveys undertaken (which relate to the Qualifying Interests (QIs) of local Natura 2000 sites).

Table 1-1: Ecological surveys undertaken in the study area

Survey	Date	Surveyor
Invasive Non-native Species survey	12th September 2019	Colm O'Leary
Invasive non-native Species survey – incidental during Otter and Habitat surveys	Various (2019 – 2023)	William Mulville Mark Desmond Michael Coyle
Baseline ecological survey	26th September 2019	Malin Lundberg Niamh Burke
Otter and hydromorphology survey	8th January 2020	Hanah Mulcahy
Otter and camera-trap surveys	31st March 2022	William Mulville Mark Desmond
Otter and camera trap surveys Extended ecological baseline survey	28th April 2022	William Mulville Mark Desmond
Extended ecological baseline survey	11th May 2022	William Mulville Michael Coyle
Otter survey	26th January 2023	William Mulville Mark Desmond Michael Coyle
Otter and camera-trap surveys	29th March 2023	William Mulville Michael Coyle
Arborist Survey	10th May 2023	Sub-contractor Michael Gary of Arbor-care Ltd
Habitat survey and incidental invasive survey	12th June 2023	William Mulville Michael Coyle
Otter and eDNA surveys	17th July 2023	William Mulville Mark Desmond
Bat emergence survey (Owenass Bridge)	11th August 2023	William Mulville Michael Coyle

Survey	Date	Surveyor
Hydromorphology Survey	07th March 2024	Kate de Smith
Otter and Riparian Bird Surveys	09th May 2025	William Mulville Matt Hosking

1.4.3 Terrestrial Habitat Surveys

Habitat surveys of the terrestrial habitats were conducted on the 26th of September 2019. Following this initial surveying, additional sections were added to the scheme, and these were surveyed on the 28th of April and 11th of May 2022, with further changes to the scheme prompting an additional follow-up survey on the 12th of June 2023.

The ecological walkover survey recorded habitats and protected species, following the methods outlined in Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (NRA, 2009).

Aerial photographs and site maps assisted the surveys. All habitats located within the survey area of the proposed Scheme were mapped to level three of the Heritage Council's Fossitt (2000) habitat codes, and in accordance with Best Practice Guidance for Habitat Survey and Mapping (Smith et al. 2011). Floral species present that were either representative of a habitat or considered to be of conservation interest were recorded.

The habitat's extent was mapped onto an aerial photograph within the QField GIS Android application, with GPS points taken where any ecological features of note were observed. Any non-native invasive plant species listed on the Third Schedule of the Birds and Habitats Regulations were also recorded during the habitat surveys. Identification for vascular plants principally follows that given in Webb's An Irish Flora; while contemporary nomenclature is in line with The New Flora of the British Isles 4th Edition (Stace, 2019). Identification of Irish plants generally follows Webb's An Irish Flora (Parnell and Curtis, 2012).

There is one area of wet willow-alder-ash woodland within the scheme boundary. While this habitat type is a potentially linked with the QI Annex I habitat Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-padion, Alnion incanae, Salicion albae) (91E0), this habitat was deemed to not be Annex quality. Additionally, the conservation objectives of the River Barrow and River Nore do not map this QI as being present near to Mountmellick.

1.4.4 Tree Survey

An initial tree survey was conducted by Michael Garry of Arbor-Care Ltd on the 10th of May 2023. An Arboricultural Impact Assessment was written in accordance with BS5837:2012 Trees in relation to design, demolition, and construction (Arbor-Care Ltd., 2023).

1.4.5 Terrestrial Mammals

During all ecological surveys and visits to Mountmellick scheme area, signs for Otter *Lutra lutra*; Badger *Meles meles*; Irish Hare *Lepus timidus hibernicus*; Pine Marten *Martes martes*; Hedgehog *Erinaceus europaeus*; and Pygmy Shrew *Sorex minutus* within the surrounding vicinity of the proposed Scheme were searched for. Field signs include scat/ droppings, setts/ dens/ holts, and any mammal tracks.

A series of Otter surveys were completed on the 8th of January 2020, 31st of March 2022, 28th April 2022, 26th of January 2023, 29th of March 2023, 17th of July 2023 and 09th of May 2025. During these surveys, potential holts and

couches were identified and investigated, one near to the Owenass Bridge in the south-west of the town, and one in the north-east of the town behind the College Avenue housing estate.

Camera traps were deployed on the 31st of March 2022, 28th of April 2022 and 29th of March 2023 during these Otter surveys. These camera trap surveys included deployment over multiple weeks at the Owenass Bridge and further upstream of the bridge to establish the utilisation of the rivers by Otter, with one camera trap deployment taking place upstream of Convent Bridge (Figure 2-2).

1.4.6 Amphibians – Spawn and eDNA surveys

Ecological surveyors examined the proposed Scheme area in spring for the presence of amphibian species Common Frog *Rana temporaria* and Smooth Newt *Lissotriton vulgaris*, as well as suitable waterbodies and wetlands to support breeding amphibian populations. These species are included within the AA Screening as they would offer a feeding resource for Otter that would potentially be in the area of the Scheme. Surveying techniques were in line with those outlined in NRA (2009).

Additionally, an eDNA analysis of the pond south of the town near the garden centre was conducted on the 17th of July 2023 to determine the presence of Smooth Newt. Water samples were collected from this pond area and were sent for testing to SureScreen Scientifics. The collection methodology of samples can be found in: https://www.surescreenscientifics.com/wp-content/uploads/2023/03/Detailed-GCN-Sample-Collection-Guidance-V4-1.pdf, and this methodology can be summarised as:

- Identification of sampling locations
- Collection pond water free of sedimentation in a ladle provided with the eDNA kit
- Transferal of water to a plastic bag provided with the eDNA kit (repeated until 20 ladles of water have been collected)
- Vigorous shaking of the plastic bag
- Pipetting of 15ml of water to two tubes test filled with preservatives that are provided with the eDNA kit
- Vigorous shaking of the test tubes
- Returned to the laboratory for further analysis.

During DNA testing, the filter is incubated to obtain any DNA within the sample. A PCR is preformed to identify the DNA of the targeted species, primers are then used to amplify target DNA, allowing it to be detected.

1.5 Screening Method

This screening assessment uses the source-pathway-receptor model as outlined in guidance (OPR, 2021). Using the source-pathway-receptor model allows for the potential significant effects to be eliminated if no viable source, pathway or receptor is present.

The S-P-R method uses an examination of the construction methods or project description allows sources of impact to be determined. This also allows a zone of influence (ZoI) for the project to be generated based on the size, scale and nature of the works involved. The pathways for impact are also analysed to see

if a functional pathway for impact is present. This report analyses three pathways: surface water, groundwater and land. Using information gathered from desk sources (e.g. mapped qualifying interests from the Conservation Objectives for the site) and from field surveys, receptors within the zone of influence are identified. In some cases, sensitive receptors may also play a role in determining the zone of influence. If any of the three parts to the model are not present (source-pathway-receptor) the potential for a likely significant effect from the project on the Natura 2000 network can be discounted.

1.5.1 Likely Significant Effect Test

The test for AA screening is whether the project could have a 'likely significant effect' on any Natura 2000 site. A likely significant effect is defined as any effect that could undermine the conservation objectives of a Natura 2000 site, either alone or in combination with other plans or projects. There must be a causal connection between the project and the qualifying interest of the site which could result in possible significant effects on the site. The likely significant effect test is a lower threshold for the screening assessment than 'adverse effect on site integrity' considered at Appropriate Assessment stage (Stage 2) as screening is intended to be a preliminary examination for potential effects.

The Zone of Influence was used to identify Natura 2000 sites that could be impacted by the project. For each of these sites, the Qualifying Interest features and their associated conservation objectives were identified, and the possibility of a likely significant effect was determined by a combination of location, ecological and hydrological connectivity, sensitivity of receptor and magnitude of the source of impact.

1.5.2 Zone of Influence (ZoI)

An examination of the construction methods or project description allows sources of impact to be determined. This allows a Zone of Influence (ZOI) for the project to be generated based on the size, scale and nature of the works involved. The pathways for impact are also analysed to see if a viable pathway for impact is present. Using information gathered from desk sources (mapped qualifying interests from the Conservation Objectives for the site) and from field surveys, receptors within the zone of influence are identified. If any of the three parts to the model are not present (source-pathway-receptor) the potential for a significant effect from the project on the Natura 2000 network can be discounted.

This means the final 'Zone of Influence' can be a complex shape not easily defined by a simple distance figure, but in this way the assessment includes all relevant sites whilst avoiding unnecessary inclusion of other sites.

1.5.3 In-combination Effects

In relation to the assessment of potential in-combination effects, where there is no effect at all via a pathway, there is no possibility of in-combination effects. Where potential likely significant effects are identified, the in-combination assessment is carried forwards to a Stage 2 Appropriate Assessment.

1.6 Consultations

Consultation have been completed with a number of key stakeholders in relation to EU Natura 2000 sites which includes, but is not limited to the following:

- Laois County Council;
- Office of Public Works;

- National Parks and Wildlife Services - informal consultation with presentation of project formally through the scoping with the Development Applications Unit (DAU) -Online meeting 20/12/2023 where the project's ecological sensitivities and survey efforts were discussed at length, as well as the proposed FRS design. A document with details of ecological surveys carried out was emailed on 27/02/2024.
- Inland Fisheries Ireland (IFI) – informal consultation with presentation of project at online meeting 08/02/2024. IFI submitted letters of response on 26-02-2024. In-person meeting on site 6/03/2024.

1.7 Competent Persons

The assessment has been carried out by JBA ecologists Michael Coyle BA (Hons), MSc and William Mulville BSc (Hons), MSc, ACIEEM. Michael and William have undertaken numerous Appropriate Assessment Screening and NIS assessments for a variety of projects. The assessment has been reviewed by Principal Ecologist Patricia Byrne.

1.8 Limitations and Constraints

The screening assessment necessarily relies on some assumptions, and it was inevitably subject to some limitations. These would not affect the conclusion, but the following points are recorded in order to ensure the basis of the assessment is clear:

- Information on the works and conditions on site are based on current knowledge at the time of writing. Changes to the site since this report was drafted cannot be accounted for. However, the site surveys have followed CIEEM (2019) Advice note on the lifespan of ecological reports and surveys.
- This assessment is based on the methodology for proposed works as described in this report. Where changes to methodology occur, an ecologist will need to be consulted to determine if the changes are likely to alter the ecological impacts and would therefore need reassessment.
- JBA ecologists have been present at the site regularly since 2021 to 2025 when surveys have been undertaken. The last site visit made by an ecologist for this report was in May of 2025. Therefore, it is considered this data is current.
- The precautionary principle is utilised when determining potential ecological sensitivities within the proposed developments ZoI.
- Data from biological record centres or online databases is historical information, and datasets may be incomplete, inaccurate, or missing. The absence of records for an area may be due to the under recording in the area and not necessarily imply the absence of species. These records are therefore to be treated as minimum information available for the area.
- The AA Screening addresses issue around designated sites and does not exempt works from responsibilities related to habitats and species covered under separate national legislation.

The AA Screening addresses issue around designated sites and does not exempt works from responsibilities related to habitats and species covered under separate national legislation.

2 Project Description

2.1 The 'Project'

The proposed Mountmellick FRS project (hereafter referred to as 'the proposed development / works') is not directly connected with, or necessary to the management of any Natura 2000 sites. Therefore, the proposed project is subject to the requirements of the AA process.

2.2 Site Location

The proposed FRS is located in the environs of Mountmellick town (Figure 2-1). Mountmellick is a service town in the north of County Laois and has a role to play in supporting the other notably sized towns locally, namely Portlaoise in County Laois, and Tullamore in County Offaly. The town has a pivotal location along the N80 national route, which extends through to Portlaoise and provides access to Carlow, Waterford and Rosslare to the south, and Tullamore, Mullingar and Athlone to the north. Portarlington is located approximately 10km to the northeast along the R423. Mountmellick is the largest and most important service town in the county, performing vital retail, residential, service, amenity functions and support services to the surrounding hinterland, while supporting the upper tier of the urban hierarchy (LCC, 2018).

Mountmellick has four main local watercourses within its environs, namely the River Triogue, River Barrow, River Owenass and River Pound.

The work will primarily be along the Owenass River, with works also proposed along parts of the Clontygar, Pound, and Garroon streams, along with the Carron Stream, which is a minor offshoot of the Clontygar Stream. The proposed Flood Relief Scheme includes embankments and flood walls, to minimise the risks currently posed to people, the community, social amenities, the environment, and the landscape.

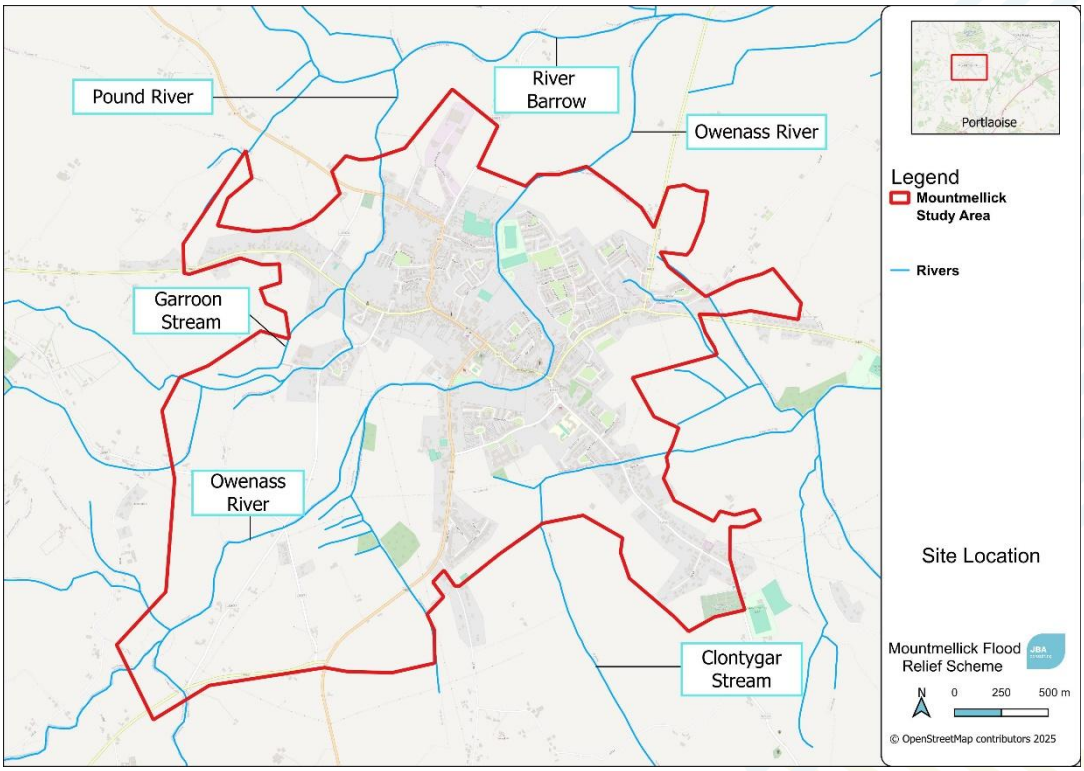


Figure 2-1: Proposed Scheme Location

2.3 Description of Proposed Development

This AA Screening will remain a live document until after the planning application stage, when the finalised detailed design of the scheme is complete.

Generally, the proposed flood relief scheme comprises 10No. continuous flood defences to defend properties from flooding from the Owenass River, Garroon Stream, Pound River and Clontygar River. The flood defences comprise a series of embankments with culverts and walls, one bridge (replacement Owenass Bridge), and one pumping station (subterranean precast storage tank, control panel kiosk and above ground gantry structure). There will be localised upgrades to surface water drainage around the walls, flow control measures on the Pound plus a diversion of the Clontygar Stream into a new stream channel to facilitate the works. A site compound will be set up at all defence locations with temporary haul routes off public roads.

The location and labelling of proposed defences is shown on Figure 2-2, listed in Table 2-1 and illustrated in engineering drawings Dwg 19105-JBB-XX-XX-DR-C-02801 to 19105-JBB-XX-XX-DR-C-02840. The construction sequence and engineering elements are summarised below. The undefended situation and defenced scheme are shown in Figure 2-3 and Figure 2-4.

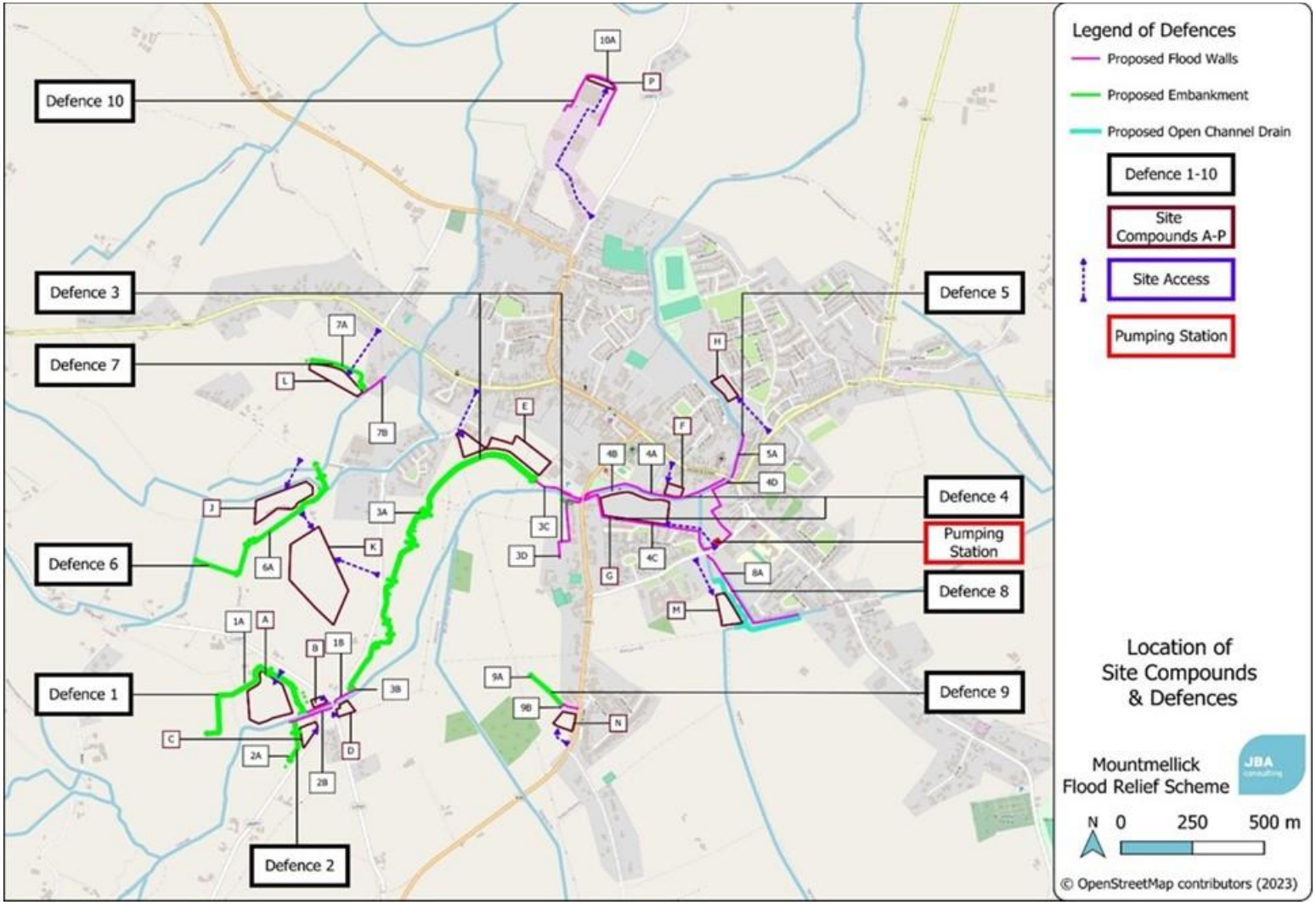


Figure 2-2: Study area; FRS defences and local watercourses (OSM, 2023)

Flood Embankment Design

Approximately 3,160 linear metres of embankment will be formed. The volume of material required to form the embankment is approximately 105,000m3 of engineering fill, comprising impermeable clay, subsoil landscape fill (class 4) and topsoil. The topsoil will be reused from the excavation of embankment areas.

Imported fill - The total material imports from the scheme will be approximately 105,000m3 which may be reduced to 85,000m3 if the opportunity arises that excavated material can be classified as suitable for reuse as backfill. Detailed site investigated due to be carried out at Stage 3 (Detailed Design Stage) will confirm ground conditions at the location of proposed flood defences and will confirm the suitability for reuse of existing soil. The total embankment material volume includes above-ground infrastructure, below-ground foundations and backfill.

Excavated Fill - The total material to be excavated will be approximately 77,000m3. Most of this material will need to be disposed of at a licenced soil recovery facility. If excavated material can be reused as backfill then the volume of material to be disposed of from site will be in the region of 56,000m3. Seven licenced sites within Co Laois have been sourced that have capacity to received unsuitable material (https://facilityregister.nwcpo.ie/).

The embankment height will be between 1.2m and 3.0m above surrounding ground level. The embankment will be constructed of impermeable clay, with a top width of 3m, typically, with local widening points. The clay will typically slope down at a 1(V):2(H) slope on both sides. Excavation to a depth of up to 2m will be required subject to confirmation of ground conditions from the site investigation, to key the proposed embankment into the existing ground and block seepage below the base of the embankment. Additional landscape fill and topsoil will be placed at a shallower gradient (typically 1(V):1.3(H)) along the slopes of the proposed embankments in order to blend into the surrounding landscape. The embankment will be either grass seeded or sewn with an indigenous wildflower mix to suit the location. Overall, with the total embankment width will range from 5.8 to 14m bottom width and 3m to 6m top width. A temporary haul road varying between 3-5m in width is proposed around both sides of the embankment. Beyond the haul road temporary fencing ('heras' fencing) will be erected to define the limits of construction.

Flood Wall Design

Approximately 3,500 linear metres of wall will be formed. For the purposes of environmental assessment and mitigation, four types of wall construction are proposed for the proposed development, as shown on drawing Dwg 19105-JBB-XX-XX-DR-C-02770-Typical Details, see Appendix A. The final design of walls at each location will be subject to confirmation of ground conditions from site investigation at detailed design stage and construction methodology.

- Type 1 In situ reinforced concrete foundation up to 3m depth below ground, constructed from the bank, and in situ reinforced concrete wall up to 1.9m high.
- Type 2 – Concrete micro piling (instream) (bored mini piles) up to 3m depth below formation, constructed from the bank, in situ reinforced concrete wall or precast wall above ground (clad) up to 1.9m high.
- Type 3 - Sheet piling typically 3m depth below ground or bed level, constructed from the bank or instream, sheet piling wall or in situ reinforced concrete wall above ground (clad) up to 1.9m high.
- Type 4 (instream) – precast concrete wall up to 3m below existing ground level, constructed instream, wall (clad) up to 1.2m high.

The walls will have a masonry finish reusing existing stone where possible to match existing masonry finish and to provide a similar capping in areas adjacent to public realm, within the Architectural Conservation Areas and adjoining stone clad bridges. Elsewhere the finish will be smooth concrete.

Grove Park Pumping Station on Davitt Road

The low-lying areas of Davitt Road and Irishtown Road in Mountmellick have historically flooded during fluvial events from the nearby Clontygar Stream. The existing situation is compounded by the insufficient and defective surface water drainage networks serving these areas. The introduction of new FRS defences to contain floodwaters will prevent flood waters from the Owenass and the Clontygar from reaching the Davitt Road area but will ultimately lead to an increase in water levels in the Clontygar Stream. If not mitigated against, this has the effect of increasing the flood risk from existing drainage networks as the water level at the outfalls from the drainage networks will be higher. To mitigate against this, it is proposed to install a pumping station on the drainage network to effectively increase the capacity of the network to match that of the pre-scheme condition.

The pumping station will be located just to the north side of Irishtown Road and will be protected from flooding by a flood wall. Access will be provided from the public highway into the compound allowing the safe movement of vehicles required to operate and maintain the pumping station.

The works to construct the pumping station will include the diversion of a length of the existing drainage network adjacent to the point where it outfalls into the Clontygar. The diversion extends through a storm overflow chamber that includes a storm overflow weir that separates the drainage flow from the drainage network and the wet well of the pumping station. The overflow chamber measures approximately 4.5m x 3.8m with a depth of 2.35m and will be formed using reinforced concrete. The storm overflow chamber then connects via an overflow pipe to a wet well chamber which is 6m deep and 5.5m in diameter and formed using concrete rings. The pumps are housed in the wet well chamber along with tilt switches which control the levels at which the pumps are switched on and off. The wet well is then connected to a valve chamber by the rising mains from the pumps. The valve chamber measures approximately 3.5m x 2.8m with a depth of 2m and will be formed using reinforced concrete. From the valve chamber, the 450mm diameter rising main extends to a new reinforced concrete headwall at the Clontygar. The pumping station is shown in Drawings 19105-JBB-XX-XX-DR-C-02860 and 02861.

In addition to the structures above, the pumping station will also include the provision of a steel gantry above the wet well, approximately 5m long and 3m high to allow the pumps to be safely lifted out, and a control kiosk measuring 5m long x 1m wide and 2m high. Security of the site will be maintained by a palisade gate at the access point.

During normal conditions, the existing drainage network will carry the flow, and pumping station will not be required. Only during significant flood events will the water level in the drainage network increase to the point where it will flow over a control side weir within the storm overflow chamber and enter the wet well of the pumping station where it will be pumped via the rising main at a rate of up to 170l/s into the Clontygar.

Clontygar Stream realignment

The existing alignment of the Clontygar to the east of the houses on Davitt Close is a straight line along the boundary between the properties and the field. The proposed scheme requires the construction of a concrete flood wall along the line of the existing Clontygar at this location and so gives the opportunity to realign the stream on a more natural and sinuous route considering the local

topography and ground conditions. The new alignment will help slow down the movement of flow in the Clontygar at this location as well support habitat creation and a naturalisation of the stream at this location over a length of approximately 200m.

2.4 Location of Defences

Table 4.1 describes defence lengths and heights, compound locations and construction access points. These are also shown on Figure 2-5.

2.4.1 Owenass River- Area West of /Upstream of Owenass Bridge

Existing Condition

The land north of the River Owenass (left bank facing downstream) is agricultural, comprising small fields with mature boundary hedgerow, and currently used for pasture and growing arable crops. The L2097 road runs to the northwest of the river and provides access to several residential properties. The river is part of the River Barrow and River Nore SAC, a hedgerow bounds the river on the northern side and west of the Owenass Bridge.

The land south of the River Owenass (right bank facing downstream) is agricultural, comprising small fields with mature boundary hedgerow, and currently used for growing arable crops. The L2097 road runs to the south of and parallel to the river. A residential property is located close to the river edge and is accessed off L2097. The river is part of the River Barrow and River Nore SAC, a hedgerow bounds the river on the southern side and west of the Owenass Bridge.

Defence No.1 (left bank)

Defence No. 1 comprises a river edge wall on left bank/northern side of Owenass River and an embankment connected to the wall located in the adjacent fields also on the western side of the river. The location of the proposed wall and embankment is shown on engineering drawings Dwg 19105-JBB-XX-XX-DR-C-02829, Dwg 19105-JBB-XX-XX-DR-C-02830, Dwg 19105-JBB-XX-XX-DR-C-02831 and Dwg 19105-JBB-XX-XX-DR-C-02832 (sheets 29-32).

Riverbank vegetation, approximately 90m in length will be required to be removed on northern bank for the wall construction. A further five sections of hedgerow in fields north of river will be removed for construction of the embankment.

A flood defence embankment (location 1A on Figure 2-5) (side slope of 1:2) of 630m in length and up to 1.4m in height located in the agricultural lands to the north of the river. The embankment will be 7.2-8.2m in width at ground level with haul roads up to 15m wide on either side, total maximum working width of 38.2m. In order to maintain access to all the areas of the field, three access ramps are proposed to cross the embankment and four culverts.

A new flood defence wall (Type 3- sheet piling will be constructed set back from the top of the bank) (location 1B on Figure 2-5) of 84m in length and up to 1m in height will be constructed on the northern riverbank from the proposed Owenass Bridge replacement works.

Construction compounds (location A and B on Figure 2-5) will be accessed off L2097 road and in the field close to the location for the embankment but set back from the river to provide protection for the SAC.

The preliminary construction methodology includes details of programming, restrictions, temporary works, traffic management and site compounds.

Defence No.2 (right bank)

Defence No.2 comprises a river edge wall on right bank/southern side of Owenass River and an embankment connected to the wall located in the adjacent fields also on the southern side of the river. The location of the proposed wall and embankment is shown on engineering drawings Dwg 19105-JBB-XX-XX-DR-C-02832 and Dwg 19105-JBB-XX-XX-DR-C-02833 (sheets 32 and 33).

Riverbank vegetation will be required to be removed on southern bank for the wall construction. Hedgerow in field south of river will be removed for construction of the embankment.

A flood defence embankment (location 2A on Figure 2-5) (side slope of 1:2) of 148m in length and up to 1.1m in height located in the agricultural lands to the south of the river. The embankment will be 5.8-11.2m in width at ground level with haul roads up to 15m wide on either side, total maximum working width of 41.2m. In order to maintain access to all the areas of the field, one access ramp is proposed to cross the embankment and one culvert.

A new flood defence wall (Type 3- sheet piling will be constructed set back from the top of the bank) (location 2B on Figure 2-5) of 155m in length and up to 1.1m in height will be constructed on the southern riverbank (adjoining an existing residential property) A temporary haul road in the river (made up sung clean stone and using a coffer dam arrangement) will be constructed to implement the flood wall.

Construction compound (location C and D on Figure 2-5) will be accessed off L2097 road and in the field close to the location for the embankment but set back from the river to provide protection for the SAC. This compound may be used for the bridge replacement works.

The preliminary construction methodology includes details of programming, restrictions, temporary works, traffic management and site compounds.

2.4.2 Replacement Owenass Bridge

Existing Condition

The land either side of the River Owenass bridge is agricultural, comprising small fields with mature boundary hedgerow, and currently used for pasture and growing arable crops. The L2097 road runs to from the south to the northwest of the river passing over the bridge. The L20977 road runs from the southwest to the northeast of the river passing over the bridge. Ten residential properties are within 300m of the bridge. The river and the bank to the northeast of the bridge are part of the River Barrow and River Nore SAC, a hedgerow bounds the river on the northern side and west of the Owenass Bridge. The bridge is of local industrial heritage significance but not sufficiently special to justify inclusion in the Record of Protected Structures (Hammond, 2009).

The land south of the River Owenass (right bank facing downstream) is agricultural, comprising small fields with mature boundary hedgerow, and currently used for growing arable crops. The L2097 road runs to the south of and parallel to the river. A residential property (Riverside Lodge) is located close to the river edge and is accessed off L2097.

Replacement Bridge

Riverbank vegetation on three sides of the existing bridge will be removed for proposed defences. Minor hedgerow clearance on southeastern bank will be required for the proposed bridge wing wall construction.

The proposed bridge is shown on engineering drawing Dwg 9105-JBB-XX-XX-DR_S-02401,. The bridge walls will tie into Defences No.1 and No.2 as shown on engineering drawing Dwg 19105-JBB-XX-XX-DR-S-02828 (sheet 28). The works comprise a replacement for Owenass bridge with a new larger span arch structure which will be 18.1m in width, up to 2.8m in height and 15m in length

(the latter is the dimension of the clear span across the river). Reinforced concrete wing walls are also proposed to tie onto the bridge replacement works.

The wing wall from the upstream face of the new Owenass Bridge extends along the riverbank to a point where there is sufficient room for the earth embankment Defence No 1 to be constructed.

The preliminary construction methodology includes details of programming, restrictions, temporary works, traffic management and site compounds.

2.4.3 Owenass River - Owenass Bridge to Mountmellick Mill Bridge

Existing Condition

The land on the left bank of the River Owenass between the Owenass Bridge and Mountmellick Mill Bridge is agricultural, comprising fields with mature boundary hedgerow, and currently used for pasture and growing arable crops. The land is accessed off Manor Road and R422 to the north and is overlooked by residential properties in Manor Grove and Manor Court. The river is part of the River Barrow and River Nore SAC along this section, and intermittent trees and riparian vegetation run along the riverbank.

The land on the right bank is also agricultural, comprising fields with mature boundary hedgerow, and currently used for pasture and growing arable crops. The land is overlooked by residential properties off Pearse Street / N80.

Defence No.3 (left and right bank)

Defence No.3 comprises a river edge wall on the left bank/ tied into the downstream side of the replacement Owenass River, then a long-curved embankment passing through Baker's filed and set back from the river. Defence No.3 finishes with a wall adjacent to the river to pass to the south of the Mountmellick Mill and to connect to the Mill Bridge.

The location of the proposed walls and embankment are shown on engineering drawings Dwg 19105-JBB-XX-XX-DR-C-02817 to 19105-JBB-XX-XX-DR-C-02828 (sheets 17-28).

Sections of hedgerow at seven locations will be required to be removed on left side fields for the wall and embankment construction. A section of scrub within the SAC will also be removed for the embankment.

The proposed flood defence measures between Owenass Bridge and Mill Bridge consist of the following:

A flood defence embankment (location 3A on Figure 2-5) (side slope of 1:2) of 1275m in length and up to 2.5m in height extending from Owenass Bridge to the Mill Bridge. There are five access banks crossing the embankment to maintain access to fields on both sides and three culverts. A section of the embankment passes over the SAC.

Immediately downstream of the Owenass Bridge (left bank) (location 3B on Figure 2-5), a new flood defence wall (Type 3- instream sheet piling) of 87m in length and up to 1.6m in height will be constructed from the proposed bridge replacement works, to its tie-in point with a proposed flood defence embankment.

To the north of the Owenass River and adjoining the MDA, the flood defence measure changes from a flood defence embankment to a wall (location 3C on Figure 2-5) (Wall Type 3 –sheet piling). The proposed structure is expected to be 315m in length and up to 2m in height (2m above stream bed level).

There is a public footpath that extends along the riverbank at this location, the route of the footpath will be moved to run within the edge of the MDA site.

To the south of the Owenass River (right bank) and adjoining existing residential properties, a new flood defence wall (location 3D on Figure 2-5) (Wall

Type 1 – in situ reinforced concrete or Type 2 Micro piling) of 284m in length and up to 1.9m in height (above stream bed level) will be constructed. The flood wall includes one access bank.

Construction compound (location E on Figure 2-5) will be accessed off Manor Road and located north of embankment. A further compound on higher ground to the west (location K on Figure 2-5) will be used to store soil for forming the embankment.

The preliminary construction methodology includes details of programming, restrictions, temporary works, traffic management and site compounds.

2.4.4 Owenass River - Mountmellick Bridge to Convent Bridge

Existing Condition

The land on the left bank of the River Owenass between the Mountmellick Mill Bridge and Convent Bridge includes the town park playground and amenity space associated with the Mountmellick Arts Centre and on residential properties on Sarsfield Street. The river is part of the River Barrow and River Nore SAC along this section, and intermittent trees and riparian vegetation run along the riverbank.

The land on the right bank (southern bank) includes an informal river walkway and 3 fields beyond which are overlooked by properties on Grove Park and Connolly Street. The SAC extends into the eastern part of the open space and is improved agricultural grass land at this point.

Defence No.4 (left and right bank)

Defence No.4 is shown on engineering drawings Dwg 19105-JBB-XX-XX-DR-C-02807 to Dwg 19105-JBB-XX-XX-DR-C-02813 (sheets 7-13).

The proposed flood defence measures between Mill Bridge (Pearse Street) and Convent Bridge (Sarsfield Street) consists of the development of flood defences walls and a formalised floodplain to the south of the Owenass River. This will consist of the following:

Raising height of parapet walls on Mountmellick bridge by 300mm (reinforced concrete). Existing railings to be put back in place on top of raised parapets.

Construction of new flood defence wall (location 4A on Figure 2-5) (Wall Type 1 in situ reinforced concrete or Type 2 Micro piling) 525m length and between 0.6m and 4.0m high along the left bank of the Owenass River between Mill Bridge and Convent Bridge. The wall (left bank) then extends and connects into the upstream face of Convent bridge. There is an existing access ramp down the left bank immediately upstream of Convent bridge and this access will be maintained using an appropriate flood gate.

Removal of parts of the existing stone boundary wall along the right bank of the Owenass River to allow the flood flows to easily enter and leave the floodplain. The existing footpath will be suitably graded to an elevation which will remove the need to have flood gates along the existing pathway. This will be constructed by raising footpaths adjoining the proposed flood walls at the eastern and western extents of the proposed works area.

Construction of new flood defence wall (right bank) (location 4B on Figure 2-5) downstream of Mountmellick Mill Bridge, right side of Owenass River, with a raised footpath. Height up to 1.9m, Length 115m (Wall Type 3 - sheet piling will be constructed set back from the top of the bank)

Construction of new flood defence wall (right bank) (location 4C on Figure 2-5) 965m length and up to 3.1m in height is proposed along the rear of Grove Park properties to the south of Owenass River. (Wall Type 1 – in situ reinforced concrete outside SAC, and Type 4 - precast concrete wall inside the SAC)

Construction of new flood defence wall (right bank) (location 4D on Figure 2-5) 112m length and up to 1.9m in height is proposed upstream of Convent Bridge, to the south of Owenass River. (Wall Type 3- instream sheet piling)

Installation of flow control measures to an existing ditch (located Grove Park to the north of the properties) which discharges to the Clontygar Stream.

Construction compounds (location F and G on Figure 2-5) will be accessed off Sarsfield Road and Irishtown and set back from the river to provide protection for the SAC.

The preliminary construction methodology includes details of programming, restrictions, temporary works, traffic management and site compounds.

2.4.5 Owenass River - North/Downstream of Convent Bridge

Existing Condition

The land on the right side of the Owenass River comprises garages, sheds and amenity space to the rear of residential properties on Lord Edward Street. The river is part of the River Barrow and River Nore SAC along this section, and intermittent trees and riparian vegetation run along the riverbank.

Defence No.5 (right bank)

Defence No.5 is shown on engineering drawings Dwg 19105-JBB-XX-XX-DR-C-02805 to Dwg 19105-JBB-XX-XX-DR-C-02806 (sheets 5-6). The proposed flood defence measure downstream of Convent Bridge consist of a new wall along the right bank 164m in length and up to 1.3m and 3.3m high from existing top of bank and stream levels respectively. Given the access restrictions and uncertainties with Site investigations associated with the proposed works at this location a combination of construction methodologies and proposed flood defence types will be required.

This will consist of the following:

Construction of a new flood defence wall (location 5A on Figure 2-5) (Wall Type 3- instream sheet piling or Wall Type 1 in situ reinforced concrete) 164m in length and up to 1.3m and 3.3m high from existing top of bank and stream levels respectively along the right bank of the Owenass River. The new flood defence wall will be constructed of sheet piling. This foundation has been specifically designed to mitigate any impact the foundations may have on the integrity of the existing riverbank, on existing mature trees and ground water cut-off. The new wall will be clad with stone on both façades and hand railings will be installed as required.

Construction compound (location H on Figure 2-5) will be accessed off R422 Lord Edward Street, Briar Lane, by way of enabling temporary access through the palisade fence via Kirwan Park and set back from the river providing protection for the SAC.

The preliminary construction methodology includes details of programming, restrictions, temporary works, traffic management and site compounds.

2.4.6 Pound River - Manor House and Manor Road

Existing Condition

The land either side of the Pound River is agricultural, comprising small fields with mature boundary hedgerow, and currently used for pasture and growing arable crops. An access road (Sandy Lane) which links Manor Road to L2097 runs parallel to the Pound River.

Defence No.6

Defence No.6 is shown on engineering drawings Dwg 19105-JBB-XX-XX-DR-C-02834 to Dwg 19105-JBB-XX-XX-DR-C-02838 (sheets 34-38). The purpose of this embankment is to provide a storage area to hold flow back from the Pound River.

The proposed flood defence measures along Pound Stream will consist of new hard defence around Manor House and Manor Road. The defences will include the following elements:

Construction of a flood earth embankment (location 6A on Figure 2-5) 705m length and up to 1.4m in height south from Manor House and adjacent to Manor Road. The top of the embankment will be 3.0m wide, with 2/1 slopes, maximum width at the base of approximately 24m and foundation depth of TBC. This embankment restricts flooding from Garroon Stream flowing from the southwest to northeast direction.

A land drain which flows into the Pound Stream will be cut off with construction of the flood earth embankment (location 6A on Figure 2-5). Installation of a culvert 18m in length and construction of a v-channel 66m in length will provide connection from land drain onto Pound Stream through the proposed flood defence. A flow control measure will be installed at the northeastern end of the culvert to reduce the rate of flow allowed to enter the Pound Stream during the design event and the embankment will retain the flooding upstream. As the event dissipates the attenuated water volume will be released into the Pound River with lands returning to their pre-event condition.

There are four access banks crossing the embankments to maintain access to fields on both sides and four culverts.

Construction compounds (location J and K on Figure 2-5) will be accessed off Manor Road and in the field close to the location for the embankment.

The preliminary construction methodology includes details of programming, restrictions, temporary works, traffic management and site compounds.

2.4.7 Garroon Stream - Houses off Wolf Tone Street

Existing Condition

The land on the left bank of the Garroon Stream is agricultural, comprising small fields with mature boundary hedgerow, and currently used for pasture and growing arable crops and as amenity for the properties off Wolfe Tone Steet R422.

Defence No 7

Defence No.7 is shown on engineering drawing Dwg 19105-JBB-XX-XX-DR-C-02802 to Dwg 19105-JBB-XX-XX-DR-C-02804 (sheet 3 and 4). The proposed flood defence measures along the Garroon Stream will consist of new hard defence around eastern side of one property and a flood embankment. The defences will include the following elements:

Construction of a flood earth embankment (location 7A on Figure 2-5) 230m length and up to 1.3m in height, along the southern end of the properties and adjoining fields. This embankment restricts flooding from Garroon Stream flowing from the southwest to northeast direction.

Construction of a reinforced concrete flood defence wall (location 7B on Figure 3-5) (Wall Type 1 - Insitu reinforced concrete) of 92m length and up to 1.3m in height, tying up to the proposed embankments (north and south) restrict flooding onto Manor Road. A new 3m wide flood gate will be installed within the proposed flood defence wall to facilitate continued access to the adjoining agricultural lands.

Construction compound (location L on Figure 2-5) will be accessed off Wolfe Tone Street and in the field close to the location for the embankment

The preliminary construction methodology includes details of programming, restrictions, temporary works, traffic management and site compounds.

2.4.8 Clontygar Stream – South and West of Davitt Road

Existing Condition

The land is agricultural, comprising small fields with mature boundary hedgerow, and currently used for pasture. It is overlooked by properties on Davitt Court and St. Joseph's National School to the east and St Vincent's Community Nursing unit to the west.

Defence No.8

Defence No.8 is shown on engineering drawings Dwg 19105-JBB-XX-XX-DR-C-02812 and Dwg 19105-JBB-XX-XX-DR-C-02814 to Dwg 19105-JBB-XX-XX-DR-C-02816 (sheets 12, 14-16). Starting at Irishtown Road and moving eastwards i.e., upstream along the Clontygar stream.

The proposed flood defence measures associated with the Clontygar Stream consist of the following:

Construction of a new flood defence wall (location 8A on Figure 2-5) (Wall Type 1 – In situ reinforced concrete or Type 2 Micro piling) 475m in length and up to 1.9m height adjoining the existing property boundaries of Davitt Road, Brockview, Davitt Crescent, St. Joseph's National School, and Irishtown Road.

A crossing point is to be included to allow access from the school play area to the area created between the wall and the new alignment of the Clontygar stream.

Diversion of the existing Clontygar stream to allow suitable space to construct the proposed flood defence wall. Construction of a proposed new stream channel of 385m length and an average width of 6m to replace existing stream. One culvert is proposed.

Decommissioning of 350m of the existing Clontygar Stream.

Construction compound (location M on Figure 2-5) will be accessed off Irishtown and will involve removal of hedgerow.

The preliminary construction methodology includes details of programming, restrictions, temporary works, traffic management and site compounds.

2.4.9 The Garden Centre (Irishtown Garden Centre)

Existing Condition

The land is agricultural, comprising small fields with mature boundary hedgerow, and currently used for growing crops. It is overlooked by Irishtown Garden Centre to the east.

Defence No.9

Defence No.9 is shown on engineering drawings Dwg 19105-JBB-XX-XX-DR-C-02839 and Dwg 19105-JBB-XX-XX-DR-C-02840 (sheets 39 and 40). The proposed flood defence measures associated with the Garden centre area consist of the following:

A flood defence embankment (location 9A on Figure 2-5) (side slope of 1:2) of 155m in length and up to 0.8m in height, located in the agricultural lands to south and west of the garden centre.

Construction of a new flood defence wall (location 9B on Figure 2-5) (Wall Type 1 - In situ reinforced concrete or Type 2 Micro piling) of 70m in length and up to 0.8m in height to replace the existing boundary fencing between the agricultural lands and the garden centre to the south and north respectively. The wall will

extend to its proposed tie-in point with a proposed flood defence embankment to the west.

Construction compound (location N on Figure 2-5) will be accessed off N80 and will involve removal of hedgerow.

The preliminary construction methodology includes details of programming, restrictions, temporary works, traffic management and site compounds.

2.4.10 Midland Steel

Existing Condition

The land surrounding Midland Steel is agricultural, comprising small fields with mature boundary hedgerow, and currently used for grazing. The Pound River and River Barrow are to the west and north. The site is overlooked by residential properties on Bay Road to the east and Chapel Drive to the southwest.

Defence No.10

Defence No.10 is shown on engineering drawings Dwg 19105-JBB-XX-XX-DR-C-02801 and Dwg 19105-JBB-XX-XX-DR-C-02802 (sheets 1 and 2). The proposed flood defence measures associated with Midland Steel consist of the following:

Construction of a new reinforced concrete flood wall (location 10A on Figure 2-5 (Wall Type 1 - In situ reinforced concrete or Type 2 Micro piling) along the existing western boundary of the business. The proposed defence will be 428m in length and up to 1.1m height from existing ground level. An existing block boundary wall on the south-western section of the site will be replaced along with the localised upgrades to the surface water drainage. The alignment of the flood defence wall will follow the existing property boundary and to the west of the existing land drain.

The site compound (location P on Figure 2-5) will be located within the Midland Steel site, specifically in the HGV park on the northern part of the site. There is also an additional area available for a potential site compound to be established to the west of Midland Steel. Access for construction traffic to this possible compound will be via Chapel Street (N80).

The preliminary construction methodology includes details of programming, restrictions, temporary works, traffic management and site compounds.

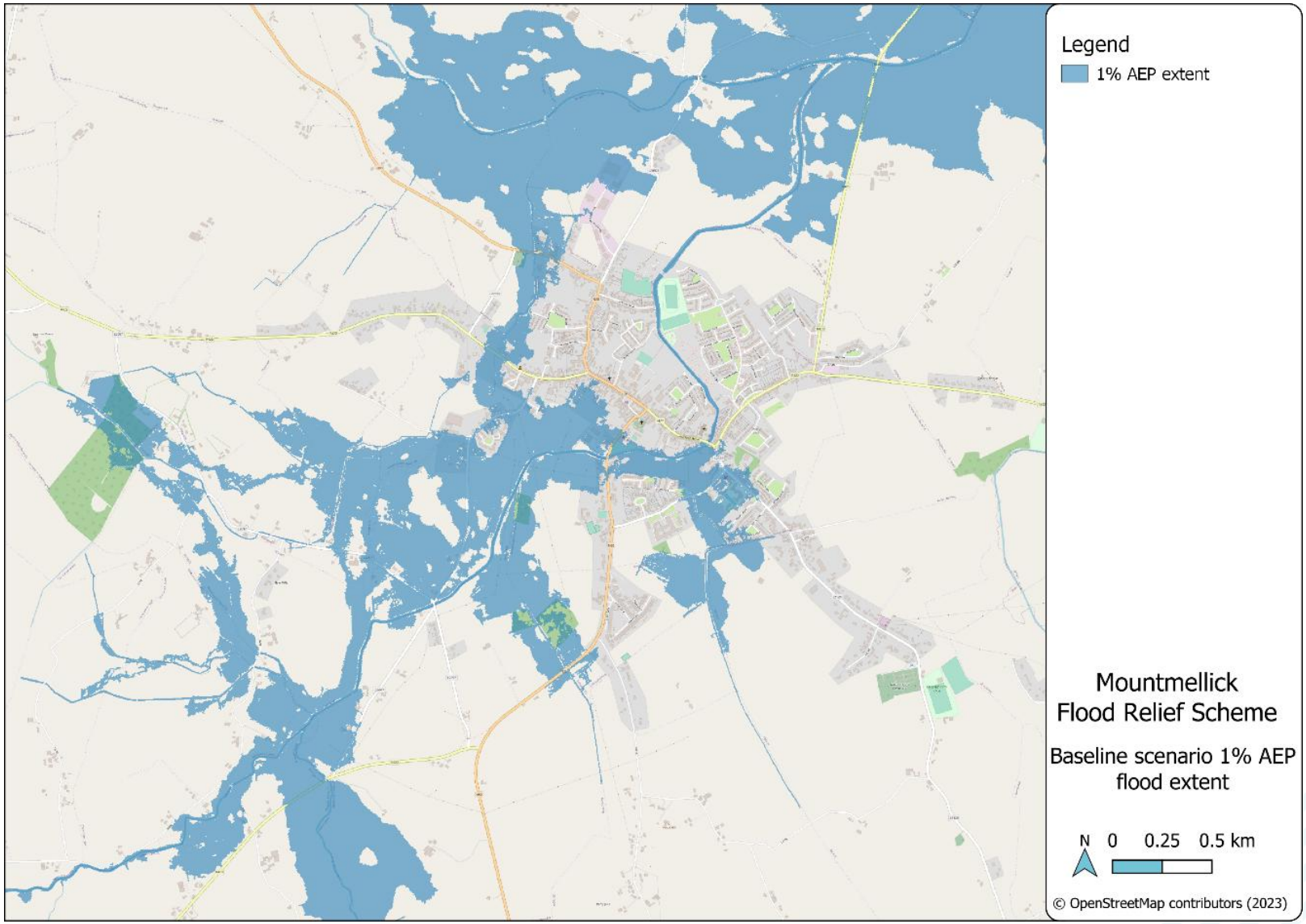


Figure 2-3: Undefended Scheme

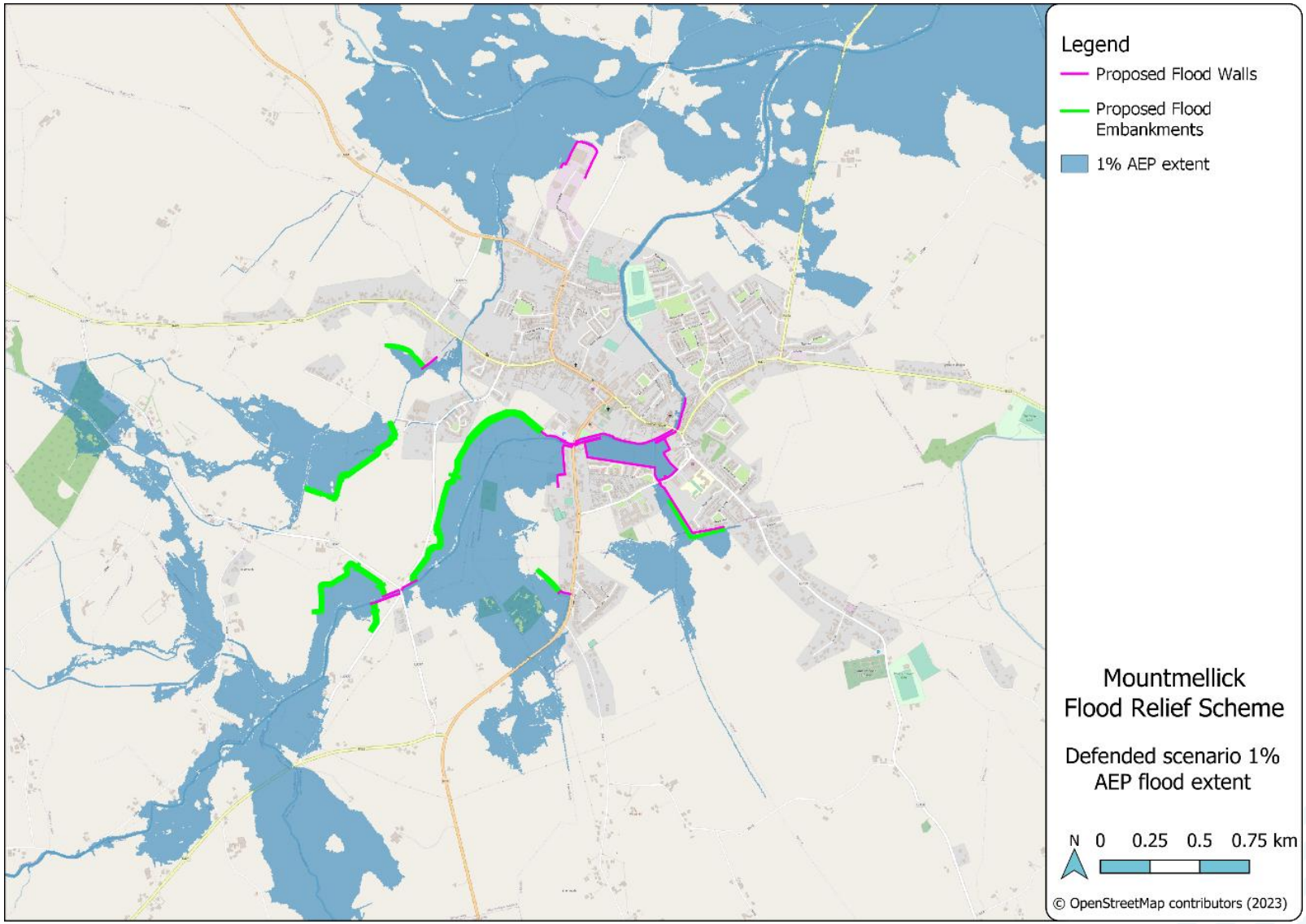


Figure 2-4: Defended Scheme

Table 2-1: Summary of Flood Defences

Flood Defences and Construction Compound Summary				
Water course	**Location on Watercourse**	**Proposed Defence No. (see Figure 3-2) and Engineering Dwg No.**	**Defence position, approx length, height** **Wall Type (see location on Figure 2-5: Construction Defences, Compound Locations and Access points)** **Construction compound and access (see location on Figure 2-5: Construction Defences, Compound Locations and Access points)**	**Wall finish material**
Owenass River	Upstream of Owenass Bridge	Defence No.1 Left Bank Embankment and Wall Engineering Sheets29, 30, 31, 32 Dwg 19105-JBB-XX-XX-DR-C-02829, 02830, 02831 and 02832	1A - Embankment upstream of Owenass Bridge, on left side of Owenass River, Height up to 1.4m, Length 630m 1B - Wall upstream of Owenass Bridge, on left side of Owenass River, Height up to 1m, Length 84m Wall Type 3-sheet piling will be constructed set back from the top of the bank. Site compound - left side of Owenass River. Note river is Special Area of Conservation (SAC), compound located away from river edge. Construction access off L2097	Concrete, rural location, wall not visible
		Defence No.2 Right Bank Embankment and Wall Engineering Sheets 32, 33 Dwg 19105-JBB-XX-XX-DR-C-02832 and 02833	2A - Embankment upstream of Owenass Bridge, on right side of Owenass River, Height up to 1.1m, Length 148m 2B - Wall upstream of Owenass Bridge, on right side of Owenass River, Height up to 1.1m, Length 155m Wall Type 3-sheet piling will be constructed set back from the top of the bank. Site compound - right side of Owenass River. Note river is SAC, compound located away from river edge. Construction access off L20977	Concrete, rural location, wall not visible
		Replacement Bridge (Bridge walls tie into Defences No.1 and No.2)	Replacement of Owenass bridge with a new larger span arch structure, 18.1m in width, up to 2.8m in height and 15m in length. Retaining RC wing walls are also proposed (see Defence No.1, 2 and 3) to tie onto the bridge replacement	Stone facing to bridge using stone from existing bridge

Flood Defences and Construction Compound Summary				
Water course	**Location on Watercourse**	**Proposed Defence No. (see Figure 3-2) and Engineering Dwg No.**	**Defence position, approx length, height** **Wall Type (see location on Figure 2-5: Construction Defences, Compound Locations and Access points)** **Construction compound and access (see location on Figure 2-5: Construction Defences, Compound Locations and Access points)**	**Wall finish material**
		Engineering Sheets 28 Dwg 19105-JBB-XX-XX-DR-S-02401 and 02828	works. Construction to take place from in-stream for the removal of the existing bridge, and the construction of replacement bridge, Site compound - left side of Owenass River. Note river is SAC, compound located away from river edge. Construction access off L2097	supplemented by new stone, finish to be random rubble
	Owneass Bridge to Mountmellick Mill Bridge	Defence No.3 Embankment and Walls Engineering Sheets 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28 Dwg 19105-JBB-XX-XX-DR-C-02817, 02818, 02819, 02820, 02821, 02822, 02823, 02824, 02825, 02826, 02827 and 02828	3A- Embankment on left side of Owenass River in Bakers field, Height up to 2.5m, Length 1275m 3B- Wall down stream of Owenass Bridge, on left side of Owenass River, Height 1.6m, Length 87m Wall Type 3- sheet piling will be constructed set back from the top of the bank. 3C- Wall upstream of Mountmellick Mill Bridge, on left side of Owenass River along the riverside until a ramp up for the pathway, Height up to 2m, Length 315m Wall Type 3 – 5m of the proposed wall will be instream, remaining 310m of sheet piling will be constructed set back from the top of the bank 3D - Wall upstream of Mountmellick Mill Bridge, on right side of Owenass River, to rear of Pearse St/ M80 Wall Type 1 -in situ reinforced concrete or Type 2 Micro piling Wall 284m in length and up to 1.9m in height (above stream bed level). Walls will be setback from the river and the floodplain will be reconnected. The existing Mill bridge parapet and adjoining wing walls will be raised to meet the required design level. Site compound- Note river is SAC, compound located away from river edge, avoid 2 areas of the SAC which extends into embankment.	Stone facing to wall adjacent to Mill Bridge on northside of Owneass River.

Flood Defences and Construction Compound Summary				
Water course	**Location on Watercourse**	**Proposed Defence No. (see Figure 3-2) and Engineering Dwg No.**	**Defence position, approx length, height** **Wall Type (see location on Figure 2-5: Construction Defences, Compound Locations and Access points)** **Construction compound and access (see location on Figure 2-5: Construction Defences, Compound Locations and Access points)**	**Wall finish material**
			Soil storage in raised area of land south of Manor Gardens. Construction access off Manor Street	
	Mountmellick Mill Bridge to Convent Bridge	Defence No.4 Wall Engineering Sheets 7, 8, 9, 10, 11, 12 and 13 Dwg 19105-JBB-XX-XX-DR-C-02807, 02808, 02809, 02810, 02811, 02812 and 02813	4A – Wall between Mountmellick Mill Bridge and Convent Bridge, left side of Owenass River, adjacent to playground, Height between 0.6m and 4.0m high, Length 525m Wall Type 1 -insitu reinforced concrete or Type 2 Micro piling. Further downstream the walls to be a minimum of 5m from the top of the bank along its entire length to Convent bridge. 4B - Wall downstream of Mountmellick Mill Bridge, right side of Owenass River, Raised footpath and wall. Height up to 1.9m, Length 115m Wall Type 3- sheet piling will be constructed set back from the top of the bank 4C - Wall right side of Owenass River, to rear of properties in Grove Park, wrapping around the green space and to rear of Connolly St, Height up to 3.1m, Length 965m Mix Wall Type 1 -in situ reinforced concrete outside SAC, and Type 4 - precast concrete wall inside SAC 4D - Wall upstream of Convent Bridge, right side of Owenass River, Raised footpath and wall. Height up to 1.9m, Length 112m Wall Type 3- sheet piling, with 20m of the sheet piling occurring instream and the remainder of the sheet piling will be constructed set back from the top of the bank. The works will also include removal of parts of the existing stone boundary wall along the south bank (right side) of the Owenass River to allow the flood flows to easily enter and leave the flood plain. Installation of flow control measures to	Stone facing to playground wall adjacent to Mill Bridge and Convent bridge and on northside of Owneass.

Flood Defences and Construction Compound Summary				
Water course	**Location on Watercourse**	**Proposed Defence No. (see Figure 3-2) and Engineering Dwg No.**	**Defence position, approx length, height** **Wall Type (see location on Figure 2-5: Construction Defences, Compound Locations and Access points)** **Construction compound and access (see location on Figure 2-5: Construction Defences, Compound Locations and Access points)**	**Wall finish material**
			an existing ditch (located Grove Park to the north of the properties) which discharges to the Clontygar Stream Site compound - in green open space to rear of properties in Grove Park, south of Owenass River. Note middle field/section of open space is SAC and links to river which is SAC. Construction access off Irishtown Road	
	North of Convent Bridge	Defence No.5 Wall Engineering Sheet 5, 6 Dwg 19105-JBB-XX-XX-DR-C-02805 and 02806	5A - Wall downstream of Convent Bridge, right side of Owenass River, Height 1.0m, Length 164m Wall Type 3-instream sheet piling or Wall Type 1 in situ reinforced concrete Site compound - north of Briar Lane. Note river is SAC. Access of Lord Edward St R422	Stone facing with handrailing
Pound River	Near Manor House and Manor Road	Defence No.6 Embankment Engineering Sheets 34, 35, 36, 37, 38 Dwg 19105-JBB-XX-XX-DR-C-02834, 02835, 02836, 02837 and 02838	6A - Embankment on right side of Pound River, Height up to 1.4m, Length 705m Site compound - southwest of Manor House. Access via gates along Manor Road.	N/A
Garroon Stream	Houses off Wolf Tone Street	Defence No.7 Embankment and Wall Engineering Sheet 3,	7A - Embankment on western side of Garroon Stream, Height 1.3m, Length 230m 7B - Wall left side of Garroon Stream, 92m length and up to 1.3m in height Wall Type 1 - Insitu reinforced concrete, set	Concrete, rural location, wall not visible

Flood Defences and Construction Compound Summary				
Water course	**Location on Watercourse**	**Proposed Defence No. (see Figure 3-2) and Engineering Dwg No.**	**Defence position, approx length, height** **Wall Type (see location on Figure 2-5: Construction Defences, Compound Locations and Access points)** **Construction compound and access (see location on Figure 2-5: Construction Defences, Compound Locations and Access points)**	**Wall finish material**
		4 Dwg 19105-JBB-XX-XX-DR-C-02803 and 02804	back from the bank Site compound - north of flood defence. Access off R422	
Clontygar River	South and west of Davitt Court	Defence No.8 Wall Engineering Sheets 12, 14, 15, 16 Dwg 19105-JBB-XX-XX-DR-C-02812, 02814, 02815, 02816	8A - Wall left side of Clontygar River, Height 1.9m, Length 475m Wall Type 1 - Insitu reinforced concrete or Type 2 Micro piling Diverted stream, new channel 385m in length. Site compound - adjacent to propose channel, west of Davitt Court. Access via Irishtown or Davitt Court	Concrete, wall not visible
Wood Stream	Irish town Garden Centre	Defence No.9 Embankment and Wall Engineering Sheet 39, 40 Dwg 19105-JBB-XX-XX-DR-C-02839 and 02840	9A - Embankment right side of Wood Stream Height 0.8m, Length 155m 9B - Wall south of Garden Centre Height 0.8m, Length 70m Wall Type 1 -In situ reinforced concrete or Type 2 Micro piling Site compound - south of flood defence, south of Garden centre. Access off N80	Concrete, wall not visible
Pound /Barrow River	Midland Steel	Defence No.10 Wall Engineering Sheet 1, 2 Dwg 19105-JBB-XX-	10A - Wall around western, northern and eastern side of factory, Height 1.1m, Length 428m high Wall Type 1 -In situ reinforced concrete or Type 2 Micro piling Site compound - in rear HGV parking area on northern side of site, agreed with owner. Access via Bay Road into Industrial	Concrete, wall not visible

Flood Defences and Construction Compound Summary				
Water course	**Location on Watercourse**	**Proposed Defence No. (see Figure 3-2) and Engineering Dwg No.**	**Defence position, approx length, height** **Wall Type (see location on Figure 2-5: Construction Defences, Compound Locations and Access points)** **Construction compound and access (see location on Figure 2-5: Construction Defences, Compound Locations and Access points)**	**Wall finish material**
		XX-DR-C-02801 and 02802	Estate on southern side.	

2.5 Construction Sequence

The proposed flood relief measures will be implemented in four phases and in the following sequence, from downstream to upstream on the Owenass River. The sequence is to ensure that flood defences downstream are commissioned prior to works upstream commencing:

Phase 1 on the eastern side of the town

Starting with works downstream of Convent bridge, (Defence No. 5);

The new pumping station at Davitt Road, adjoining Grove Park; and

The proposed flood defence measures between Mill Bridge & Convent Bridge (Defence No. 4) and to the Clontygar Stream (Defence No. 8).

Phase 2 on the northern, western and southern side of the town

Proposed works at the Garroon Stream (Defence No. 7) followed by flood defences at Manor Road (Defence No. 6);

Works at Midland Steel (Defence No. 10); and

Works at Irish town garden Centre (Defence No. 9).

Phase 3 on the southwestern side of the town

Owenass Bridge to downstream of Convent Bridge. (Defence No. 3)

Phase 4 on the southwestern side of the town

Replacement Owenass Bridge; and

Followed by works upstream of Owenass Bridge (Defences 1 and 2)

Each phase of construction will be approximately 12-18 months duration. This is to ensure that construction activity can be managed to avoid traffic congestion, dust and noise within the town centre.

2.5.1 Construction Compounds

Several compound areas will be established during the construction phase, for use in different geographical areas of the scheme. Construction defences (Walls and Embankments), Compound locations (A to P) and access points are shown in Figure 2-5 below.

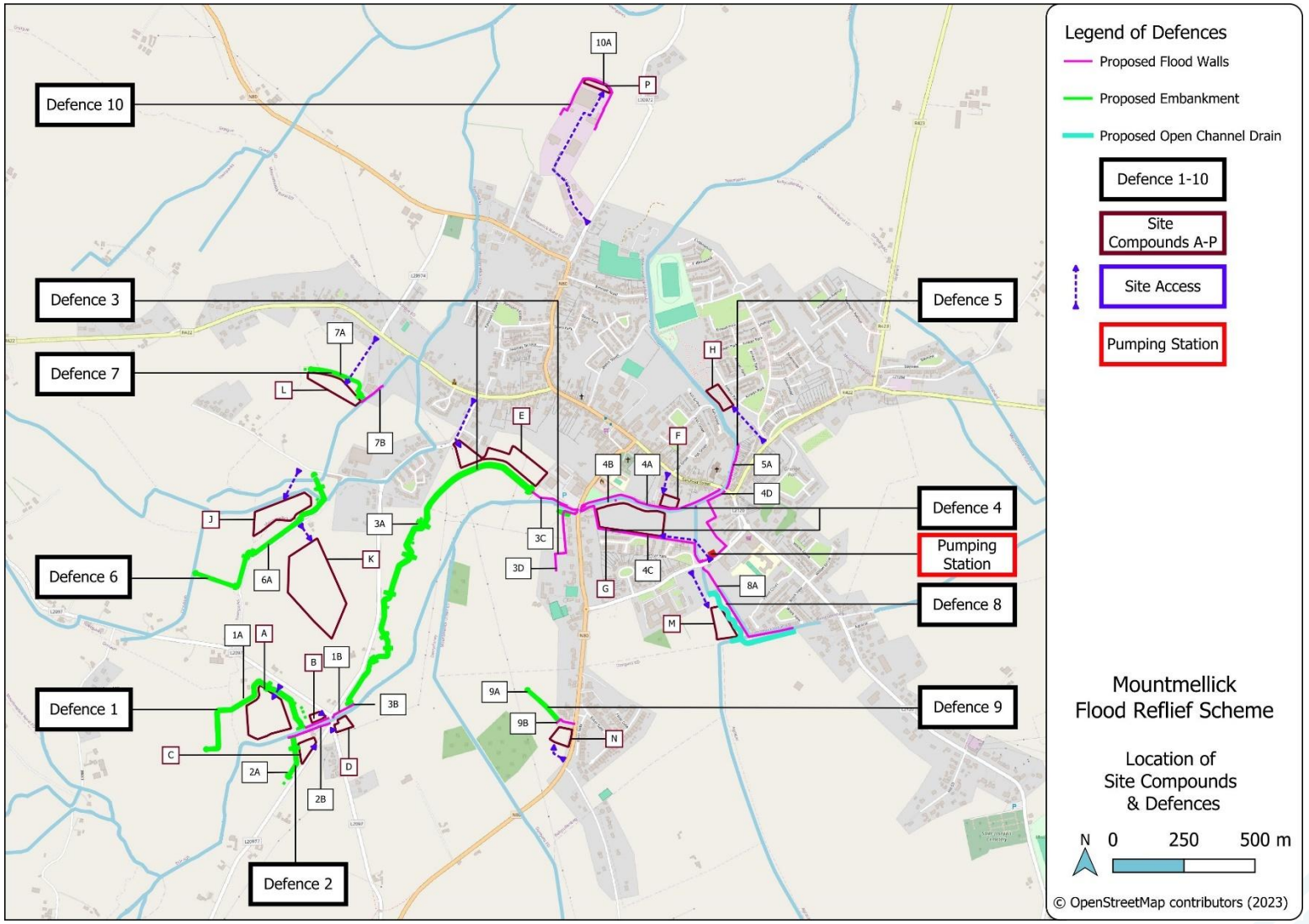


Figure 2-5: Construction Defences, Compound Locations and Access points

Establishment of Site compounds will include the following:

- Site office
- Site facilities (canteen, toilets, drying rooms, etc.).
- Secure compound for the storage of all on-site machinery and materials.
- Temporary car parking facilities.
- Temporary fencing.
- Site Security to restrict unauthorized entry.
- Bunded storage of fuels and refuelling area. Bunds shall be 110% capacity of the largest vessel contained within the bunded area.
- A separate container will be located in the Contractors compound to store absorbents used to contain spillages of hazardous materials. The container will be clearly labelled, and the contents of the container will be disposed of by a licenced waste contractor at a licenced site. Records will be maintained of material taken off site for disposal.
- A maintenance programme for the bunded areas will be managed by the site environmental manager. The removal of rainwater from the bunded areas will be their responsibility. Records will be maintained of materials taken off site for disposal.
- The site environmental manger will be responsible for maintaining all training records.
- The contents of any tank will be clearly marked on the tank, and a notice displayed requiring that valves and trigger guns be locked when not in use.
- Drainage collection system for washing area to prevent run-off into surface water system; and
- All refuelling of vehicles will be carried out at the fuel stores within the main site compound and only ADR trained personnel will be permitted to operate fuel bowsers.

2.5.2 Groundwater Pumping

Groundwater pumping will be required where the water table is encountered during excavations.

The possibility of groundwater pumping interventions in relation to the construction of walls and embankments strictly depends on their seasonality. An increase in the river level corresponds to an increase in the groundwater level, this will make the groundwater pumping work necessary.

Groundwater pumping will be required at the proposed wall on the Owenass Bridge, Mountmellick Bridge, Convent Bridge, Davitt Court, Irish town Garden Centre, and Midland Steel. This has the potential to temporarily alter the groundwater level locally and affect the water quality.

2.5.3 Instream works

Instream works are scheduled to take place as part of five of the measures outlined within the scheme. The measures associated with instream works are outlined in Table 2-2 below.

Table 2-2: Instream works along the River Owenass

Water course	Location on Watercourse	Proposed Defence No. (see Figure 2-5) and Engineering Drawing.	Instream works
Owenass River	Owenass Bridge	Replacement Bridge (Bridge walls tie into Defences No.1 and No.2) Engineering Sheets 28 Dwg 19105-JBB-XX-XX-DR-S-02401 and 02828	*The proposed flood defence scheme will include the removal of an existing masonry bridge which forms part of the Derrycloney Road and traverses the Owenass River to the south of Mountmellick. The existing bridge structure is intended to be removed as part of the flood defence scheme and replaced with a new clear span structure to improve conveyance and alleviate the risk of scour.* *Replacement of Owenass bridge with a new larger span arch structure, 18.1m in width, up to 2.8m in height and 15m in length. Retaining RC wing walls are also proposed (see Defence No.1, 2 and 3) to tie onto the bridge replacement works. Construction from bank.* *Instream works will be necessary for the demolition of the existing bridge, the excavations and construction of foundations and wing walls.* *Note the foundations will be constructed out of the stream on the riverbank however some temporary works may be required instream to prevent flows interacting with the works area. The preliminary construction methodology lists the sequence in which work is expected. Measures "iv" to measure "xiv "are involved in instream works. These include* *iv. Install instream temporary works to support the bridge arch during demolition. This may consist of an arch structure built of plywood and/or steel under the existing bridge arch and a cushion material between both arches to mitigate the impact of falling debris over the temporary structure.* *vi. Strip the bituminous surfaces from the bridge top and all the layers underneath to the deck level.* *vii. Dismantle the bridge arch, commencing by breaking down the*

Water course	Location on Watercourse	Proposed Defence No. (see Figure 2-5) and Engineering Drawing.	Instream works
			top of the arch first and moving towards the sides, ensuring that any falling debris is retained by the temporary structure. *viii. Install temporary works (cofferdam sheet pile) on a stage basis to segregate the works area from the river to facilitate demolition (i.e. rock breaking) of the existing bridge abutments.* *ix. Demolish the existing bridge abutments with the dry working space and excavate to the required formation level/foundation depth for the new abutments. The final excavation depth is dependent on the depth of the suitable in-situ bearing stratum.* *x. Install new bridge abutments (cast is situ concrete) in accordance with the detailed design including any steel fixing. The recess connection for the precast bridge sections will be cast into the top of the foundation structure. A mammal pass will be accommodated during this task.* *xi. Once the concrete has cured to the required strength (verified with cube tests) for both sections, the precast bridge arches can be lifted into place. A temporary working platform will be established to the north and south of the river to accommodate the precast sections for the arch being lifted into place by crane/ excavator (depends on machinery capabilities and contractor's proposed methodology). The precast arch is expected to arrive onsite in two sections for logistical purposes.* *xiii. The precast elements of the arch will be installed according to the manufacturer's specifications and the contractor's methodology. If the contractor determines that instream works are required to guide the installation of these elements, then this will need to be accommodated.* *xiv. The proposed bridge parapets and wingwalls will then be installed. These are likely to be cast in situ concrete sections with a masonry finish to match the existing bridge structure. The use of precast sections as a construction alternative will be evaluated and considered at detailed design stage and may be dependent on the*

Water course	Location on Watercourse	Proposed Defence No. (see Figure 2-5) and Engineering Drawing.	Instream works
			contractor's preferred approach. Some temporary works will be required instream to facilitate these works. *A cofferdam or similar temporary works will be required to accommodate a safe working dry space for construction works associated with the bridge abutments/ foundations. This will mitigate flows from the river channel spilling into the adjoining works area.*
	Owneass Bridge to Mountmellick Mill Bridge	Defence No.3 Embankment and Walls Engineering Sheets 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28 Dwg 19105-JBB-XX-XX-DR-C-02817, 02818, 02819, 02820, 02821, 02822, 02823, 02824, 02825, 02826, 02827 and 02828	3C- Wall upstream of Mountmellick Mill Bridge, on left side of Owenass River, Height up to 2m, Length 315m Wall Type 3 - instream sheet piling *Instream works will be necessary for the construction of culvert crossings at land drain and stream locations traversing the proposed flood defence embankment. New flow control measures will be installed as part of the culvert works.* *It is expected that due to restricted space available for constructing a flood defence wall adjacent to Mill bridge, that some temporary works may be required within the stream (approx. 5m of proposed wall in stream, butting up against existing wall), however this is dependent on construction methodology. Pre-condition structural surveys of the Mill Bridge and Owenass bridge will be undertaken.*
	Mountmellick Mill Bridge to Convent Bridge	Defence No.4 Wall Engineering Sheets 7, 8, 9, 10, 11, 12, 13 Dwg 19105-JBB-XX-XX-DR-C-02807, 02808, 02809, 02810, 02811, 02812 and 02813	*4D - Wall upstream of Convent Bridge, right side of Owenass River, Raised footpath and wall. Height up to 1.9m , Length 112m Wall Type 3- instream sheet piling* *The works will also include removal of parts of the existing stone boundary wall along the south bank (right side) of the Owenass River to allow the flood flows to easily enter and leave the flood plain. Installation of flow control measures to an existing ditch (located Grove Park to the north of the properties) which discharges to the Clontygar Stream*

Water course	Location on Watercourse	Proposed Defence No. (see Figure 2-5) and Engineering Drawing.	Instream works
			Preliminary Construction Methodology *Where works are expected to take place instream, a cofferdam sheet pile will be used to create a temporary dry working area within the existing river. Excess water will be over pumped from the dry cell until works can be complete. The limited working space inhibits the required working space for construction vehicles. Therefore, it is envisaged temporary construction access roads at localised areas will need to be constructed instream to facilitate the works.* *A series of existing land drains which flow towards the Clontygar Stream & eventually discharge into the Owenass River will need to be protected during the works.* *A cofferdam or similar temporary works will be required to accommodate a safe working dry space for instream construction works. This will create a temporary restriction of the existing channel width.* *Continual over pumping of groundwater will be required to maintain the safe working space.* *These dry cell structures will permit safe access from the storage / compound area to the immediate works area. In addition, instream works will be necessary for the installation of new flow control devices and reinstatement of existing surface water connections affected by the works.* *It is expected that due to the limited available working space for constructing the proposed flood defence walls within this area that instream works will be required. As noted above temporary works will be required to create a dry working space for operatives. A cofferdam or similar structure with pumped overflows will be required to avoid interaction with existing river flows whilst the excavation takes place for riverbank works. Furthermore, these dry cell structures will permit*

Water course	Location on Watercourse	Proposed Defence No. (see Figure 2-5) and Engineering Drawing.	Instream works
			safe access from the storage / compound area to the immediate works area. In addition, instream works will be necessary for the installation of new flow control devices and reinstatement of existing surface water connections affected by the works.
	North of Convent Bridge	Defence No.5 Wall Engineering Sheet 5, 6 Dwg 19105-JBB-XX-XX-DR-C-02805 and 02806	5A - Wall downstream of Convent Bridge, right side of Owenass River, Height 1.0m, Length 164m Wall Type 3- instream sheet piling or Wall Type 1 in situ reinforced concrete 5.2 v. *Where works are expected to take place instream, a cofferdam sheet pile may be used to create a temporary dry working area within the existing river. Excess water will be over pumped from the dry cell until works can be complete. The limited working space inhibits the required working space for construction vehicles. Therefore, it is envisaged temporary construction access roads will need to be constructed instream to facilitate the works.* *5.3* *Trench supports or other temporary works may be required to accommodate a safe working space for construction of the flood defence embankments. Continual over pumping of water will be required to maintain the safe working space.* *Instream works and works within the riparian corridor will be necessary for the construction of flood defence wall along the riverbanks on the Owenass River as outlined in methodologies above. It is expected that due to the restricted space available for constructing the flood defence walls on the riverbanks that some temporary works may be required within the river.*

2.6 Operation

A Maintenance Plan will be put in place whereby Laois County Council will conduct annual inspections of the embankments, together with investigations of its performance after each flood event. Monitoring of seepage will be recommended. Inspection of entire scheme will follow a flood event.

The following section demonstrates the changes in flow rate due to the scheme, these are deemed to be insignificant (

Table 2-3) and the operational impacts are not anticipated to impact QIs of the River Nore and River Barrow SAC within the Scheme boundary or downstream.

2.7 Embedded mitigation

Extension of flood plains have been incorporated within the design of the project at the farmland between Owenass Bridge and Mill Bridge, also referred to as Baker's Field (Defence 3) and between Mill Bridge and Convent Bridge (Defence 4), while a realignment of the Clontygar Stream will take place around the planned embankment of Defence 8.

The area of the extended floodplain adjacent to the river at Baker's field will include some mitigation measures, such as shallow scraping of soil to allow development of small areas of wetland, which will enhance overall riparian habitat.

Prior to the realignment of the Clontygar Stream, investigations to establish the prevailing bed and bank material will be conducted to inform the need for the proposed clay and geotextile linings. This includes:

- Visual survey of the existing riverbed and bank material, and
- Ground investigation (e.g. augering) along the bank of the existing stream to just below bed level. This aims to identify prevailing sediment type underneath and alongside the channel and the connectivity of the river to groundwater.

Along the proposed realignment, the same ground investigation will be conducted.

Sediment types along the lengths of the affected and proposed channel should be compared to evaluate whether there is a substantial difference e.g. a low permeability layer under the existing channel that is not present under the proposed realignment. Survey should be conducted by a geomorphologist and/or hydrogeologist and expert judgement must be considered during detailed design. The default position should be that no clay lining is applied unless proven necessary. Survey should be conducted in summer months as normal flow conditions will be most susceptible to the impacts of surface-groundwater disconnection.

The alignment of the stream shall have a diverse plane form and a channel cross section with lateral connectivity to the bankside and floodplain habitats. The realigned stream shall be re-naturalised, possessing a sinuous form, be shallow, and have an active lateral connection to adjacent lands.

The embedded mitigation measures related to the alignment of the Clontygar Stream and the development of the wetlands at Baker's field will overall improve both the water quality and the river and riparian ecology of the River Owenass and Clontygar Stream and benefit local aquatic fauna, within the context of the project. These measures are repeated within Section 8.

Overall, the Scheme will not have an impact on water course velocities of the River Owenass, with very little difference between undefended (baseline) and defended (design) velocities at 50% Annual Exceedance Probability (AEP) event peak velocities (m/s) and 20% AEP event peak velocities (m/s) (

Table 2-3).

Table 2-3: 50% AEP event peak velocities (m/s) and 20% AEP event peak velocities (m/s) for the River Owenass

	50% AEP event peak velocities (m/s)		
Node	undefended velocity	defended velocity	Difference
14OWEN00444	1.25	1.6	0.35
14OWEN00435	1.85	1.77	-0.08
14OWEN00370	1.38	1.38	0
14OWEN00320	1.42	1.42	0
14OWEN00292	1.18	1.18	0
14OWEN00262	1.4	1.42	0.02
14OWEN00247	1.61	1.62	0.01
14CARO00009	0.43	0.15	-0.28
14GARR00065	0.38	0.78	0.4
14GARR00027	0.55	0.67	0.12
14CLOT00148	0.14	0.12	-0.02

	20% AEP event peak velocities (m/s)		
Node	undefended velocity	defended velocity	Difference
14OWEN00444	1.25	1.61	0.36
14OWEN00435	1.86	1.79	-0.07
14OWEN00370	1.39	1.39	0
14OWEN00320	1.42	1.42	0
14OWEN00292	1.18	1.18	0
14OWEN00262	1.41	1.43	0.02
14OWEN00247	1.62	1.63	0.01
14CARO00009	0.43	0.15	-0.28
14GARR00065	0.38	0.78	0.4
14GARR00027	0.55	0.67	0.12
14CLOT00148	0.14	0.13	-0.01

2.8 Project Zone of Influence (ZoI)

An examination of the construction methods or project description allows sources of impact to be determined. This also allows a zone of influence for the project to be generated based on the size, scale and nature of the works involved. Using the source-pathway-receptor model the pathways for impact are also analysed to see if a functional pathway for impact is present. This report analyses three pathways: surface water, groundwater, and land and air.

As the works are confined to Mountmellick village and environs and will largely use existing infrastructure the project will primarily impact the area within its site boundary, but a wider zone of influence is used for impacts relating to surface water, groundwater, land and air source-receptor-impact pathways.

As the scale of proposed works are considered of 'Project' status, Natura 2000 sites within the wider 10km range of the proposed development were examined initially in relation to surface water and groundwater / ground-to-surface water pathways (i.e., local surface water sub-catchments and groundwater bodies / aquifers), with an extended 15km range for those with a downstream hydrological connection. However, the range of was then refined to include only the Natura 2000 sites with connections via the source-pathway-receptor model.

In respect to ZoI for air pollution (emissions and dust), Natura 2000 sites within a 50m buffer zone of the development were considered as per the Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2024).

Furthermore, a 300m disturbance buffer from boundaries of the proposed development has been incorporated into the ZoI in order to account for QI species potentially foraging within ex-situ habitats.

3 Existing Environment

3.1 Baseline conditions

The proposed development area is comprised of a wide range of habitats, including artificial urban landscapes, amenity grasslands, dry meadows, parkland, woodland, treelines / hedgerows, scrub, drainage ditches and rivers.

This section will summarise the baseline information pertaining to Annex Habitats and Species listed in the EU habitats directive which are QI features of the screened in River Barrow and River Nore SAC.

3.2 Habitats

A list of habitats recorded during the ecological habitat survey is listed in Table 3-1 below and are presented in detail in the following sub-sections.

The table below also contains QI species associated with Natura 2000 sites within the ZoI. These QI species have been recently recorded by Inland Fisheries Ireland (IFI) or JBA Ecologists within specific habitats. Habitat maps of are also provided within Figure 3-1 and Figure 3-2.

Table 3-1: Habitats recorded during site visit

Habitat	Fossitt Code	Linked Annex Habitats and Species
Arable crops	BC1	-
Stone walls and other stonework	BL1	-
Buildings and artificial surfaces	BL3	-
Other artificial lakes and ponds	FL8	Otter *Lutra lutra* [1355]
Depositing / lowland rivers	FW2	Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430] Otter *Lutra lutra* [1355] Atlantic Salmon *Salmo salar* [1106] River Lamprey *Lampetra fluviatilis* [1099] Brook Lamprey *Lampetra planeri* [1096] White-clawed Crayfish *Austropotamobius pallipes* [1092]
Drainage ditches	FW4	-
Improved agricultural grassland	GA1	-
Mosaic: Improved agricultural	GA1 / WS1	-

Habitat	Fossitt Code	Linked Annex Habitats and Species
grassland / Scrub		
Amenity grassland (improved)	GA2	-
Dry meadows and grassy verges	GS2	-
Mosaic: Dry meadows and grassy verges / Scrub	GS2 / WS1	-
Mosaic: Wet grassland / Improved agricultural grassland	GS4 / GA1	-
(Mixed) broadleaved woodland	WD1	-
Mixed broadleaved / conifer woodland	WD2	-
Hedgerows	WL1	Otter *Lutra lutra* [1355]
Mosaic: Hedgerows / Scrub	WL1 / WS1	Otter *Lutra lutra* [1355]
Treelines	WL2	Otter *Lutra lutra* [1355]
Wet willow-alder-ash woodland	WN6	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0]
Scrub	WS1	Otter *Lutra lutra* [1355]

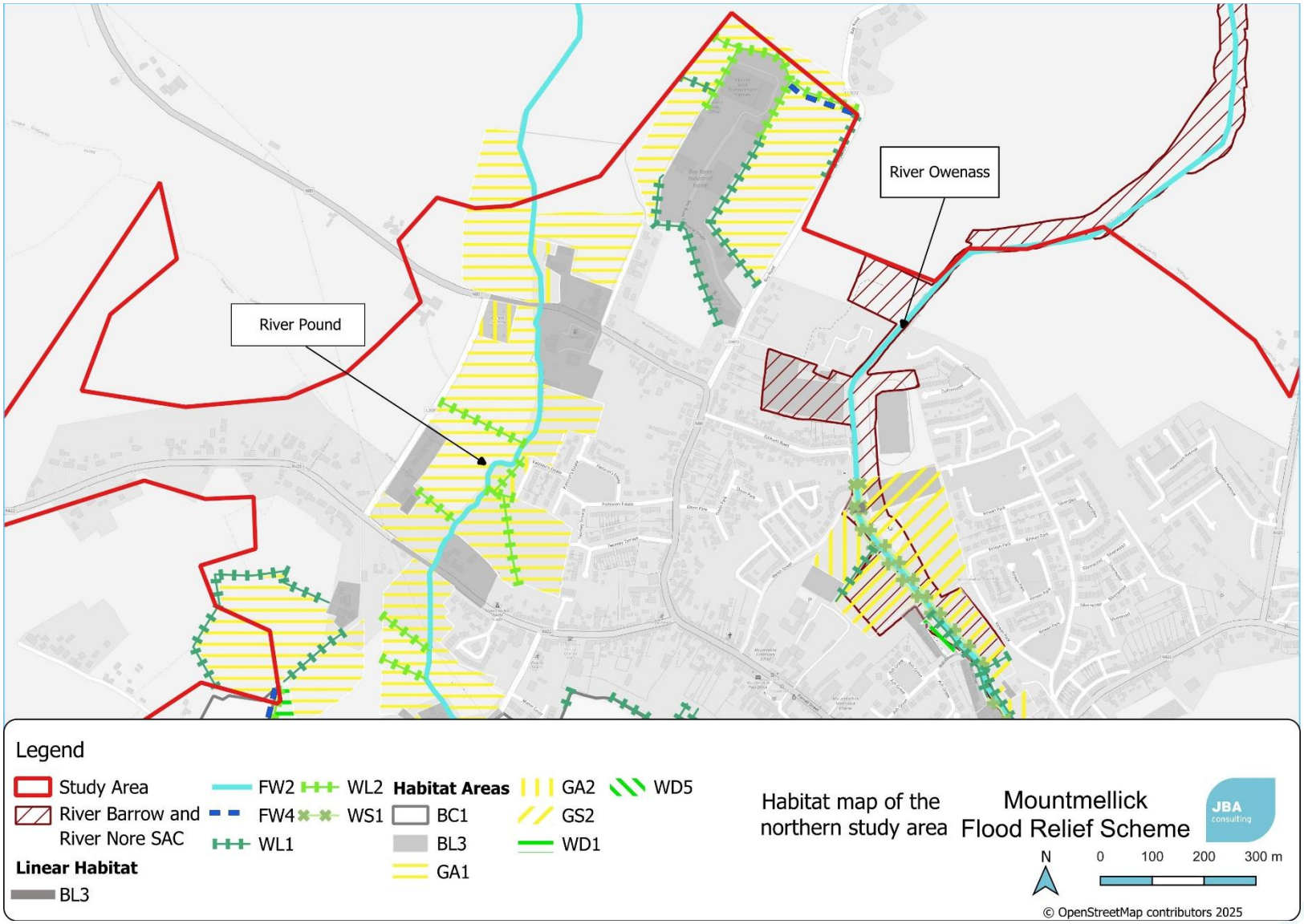


Figure 3-1: Habitat map of the northern study area

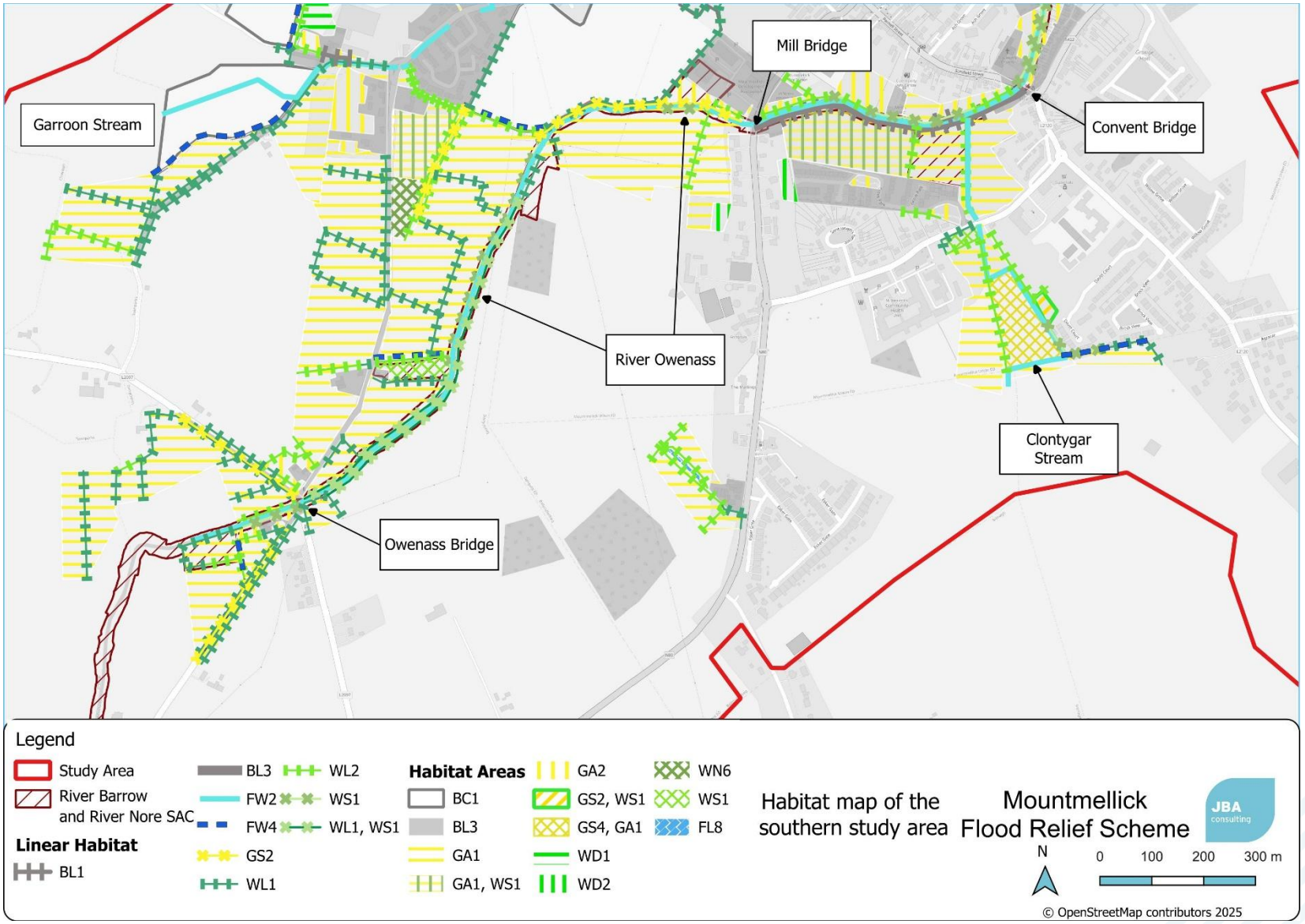


Figure 3-2: Habitat map of the southern study area

3.2.1 Other artificial lakes and ponds FL8

There is a pond located between two treelines just west of the Irishtown Garden Centre, along the N80. The pond was dominated by Duckweed *Lemna* spp., with the pond's banks fringed with Nettle *Urtica dioica*; Bramble; Cow Parsley *Anthriscus sylvestris*; Hogweed *Heracleum sphondylium*; and Willow *Salix* spp. saplings (). An eDNA analysis of the pond confirmed the presence of Smooth Newt *Lissotriton vulgaris*.

Figure 3-3: A small linear pond enclosed by two bordering treelines

3.2.2 Depositing / lowland rivers (FW2)

The River Owenass displays a mixture of eroding and deposition characteristics within the study area. The instream physical characteristics vary along the river with areas of riffles and small rock weirs with gravel substrate and pool areas with slow flowing water and sandy/silty substrate. There is sparse instream vegetation (,).

Herbs and grasses present on the riverbanks include Hedge Bindweed *Calystegia sepium*; Vetches *Vicia* spp.; Bramble; Herb Robert; Ribwort Plantain *Plantago lanceolata*; Hogweed; Butterbur *Petasites hybridus*; Great Willowherb *Epilobium hirsutum*; Nettle, Field Horsetail; Common Knapweed *Centaurea nigra*; Creeping Cinquefoil; Figwort *Scrophularia* spp.; Yarrow *Achillea millefolium;* Ragwort; Thistles *Cirsium spp.*; Meadowsweet *Filipendula ulmaria*; Reed Sweet-grass *Glyceria maxima*; Docks *Rumex* spp.; and the invasive non-native species Montbretia *Crocosmia x crocosmiiflora*; Snowberry *Symphoricarpos albus*; and Traveler's-joy *Clematis vitalba.*

Tree species occur along the river banks include Willow *Salix* spp., Sycamore *Acer pseudoplatanus,* Ash *Fraxinus excelsior,* Black Poplar *Populus nigra*, and Alder *Alnus glutinosa*.

Figure 3-4: The River Owenass upstream of Owenass Bridge

Figure 3-5: The River Owenass upstream of Mill Bridge

The River Pound is a low-energy, relatively small, lowland river which is partly culverted in the built-up area of Mountmellick. The substrate is a mixture of silt, sand and gravel (). Instream vegetation is abundant and include Fool's Watercress *Apium nodiflorum*, Duckweed spp. and Starwort *Callitriche* spp. Riverbank vegetation comprises Docks; Nettle; Cock's-foot; Meadowsweet; Great Willowherb; Bramble; False Oat-grass; Thistles, Ribwort Plantain; and Yarrow. Hawthorn trees are also sparsely present along the banks of the River Pound.

Figure 3-6: The River Pound south of Manor Road

3.2.3 Depositing / lowland rivers / Drainage ditches (FW2 / FW4)

The Clontygar Stream passes through a mixture of agricultural and wet grasslands in lands south of Mountmellick town, before flowing north into the River Owenass. This stream had been notably channelised / widened resulting in a low energy watercourse; and while its width and substrate would suggest it is a lowland stream, sections of this stream display stagnant water characteristics, resulting in it functioning more like a large drainage ditch system in regard to ecology ().

Instream vegetation within the Clontygar Stream includes Starworts and Common Reed *Phragmites australis*; with frequent algal matts; while bank vegetation consisted of Cuckoo-flower *Cardamine pratensis*; Marsh Marigold *Caltha palustris* and Common Reed; Yellow Iris *Iris pseudacorus*; Dog-rose *Rosa canina*; Bramble; Horse-Chestnut *Aesculus hippocastanum*; Ash and Hawthorn.

Figure 3-7: The low-energy, channelised section of the Clontygar Stream

3.2.4 Hedgerows (WL1)

Hedgerows occur along roadsides, riverbanks, and field boundaries throughout much of the study area (). Floral species recorded in this habitat include Hawthorn; Ivy; Ash Elm *Ulmus* spp.; Silverweed; Cotoneaster *Cotoneaster* spp.; Honeysuckle; Nettle; Elder; Holly *Ilex aquifolium*; Field Maple; Privet *Ligustrum* sp.; Bramble; Meadowsweet; Blackthorn; Cleavers; Hogweed; Bush Vetch; and the invasive Sycamore and Snowberry.

Figure 3-8: One of the roadside hedgerows, which will run parallel to one of the proposed western embankments

3.2.5 Treelines (WL2)

Treelines appear mainly along field boundaries () and sections of the River Owenass and River Pound. Across these linear treeline habitats JBA Ecologists recorded a range flora, including Grey Willow *Salix cinerea*; Hawthorn; Ash; Crab Apple *Malus sylvestris*; Alder; Beech; English Elm *Ulmus procera*; Larch *Larix* sp.; Sycamore; Bramble; Dog-rose; Elder; Nettle; Great Willowherb; Ragwort; Horse Chestnut; Creeping Thistle; Docks; Ivy; Hogweed; Downy Birch *Betula pubescens*; Meadowsweet; Marsh Marigold; Common Reed; Blackthorn; Cherry *Prunus* sp.; Cow Parsley; Holly; White Willow *Salix alba*; Snowberry; Wood Anemone *Anemone nemorosa*; Field Maple; Male-fern *Dryopteris filix-mas*; Bush Vetch; Cleavers; Yarrow; Scots Pine; and Herb-Robert.

Figure 3-9: One of a number of treelines that border the agricultural grasslands

3.2.6 Wet willow-alder-ash woodland (WN6)

A small area in the south-west of the study area, between the Rivers Pound and Owenass, approx. 150 m from the latter is covered with a wet willow-alder-ash woodland with both mature and young trees (). The woodland is dominated by Ash; Willow spp.; and Alder; with Sycamore and Hawthorn also present. The understorey species included Guelder-rose; Bramble; Blackthorn; Dock spp.; Ivy; Lords-and-ladies; Wood Avens *Geum urbanum* and Great Willowherb.

The wet willow-alder-ash woodland is a potentially linked with the Annex I habitat Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-padion, Alnion incanae, Salicion albae) (91E0), however, as mentioned above it is approximately 150m west of the River Owenass and the boundary of the River Barrow and River Nore SAC.

Figure 3-10: Wet willow-alder-ash woodland

3.2.7 Scrub (WS1)

Scrub habitat most commonly occurs in small patches or linearly within the study. Floral species present within this habitat type includes Bramble; Elder; Gorse; Yarrow; Bush Vetch; Nettles; Hedge Bindweed; Hogweed; Creeping Thistle; Dock spp., and saplings of Ash; Sycamore and Willows, as well as the invasive Butterfly-bush *Buddleia davidii*; Montbretia; and Snowberry.

3.2.8 Arable crops (BC1)

Arable crops habitat was recorded within the south-western outskirts of Mountmellick town, adjacent to the River Owenass and River Pound in the south.

3.2.9 Stone walls and other stonework (BL1)

The Owenass Bridge located in the south-west of the site is an old stone-work bridge (Figure 3-11). This bridge was not covered by notable vegetation (Ivy has since been removed) and lacked potential bat roosting within the structure. A bat emergence survey was conducted at this bridge, and there were no bats seen exiting or entering it.

Figure 3-11: Owenass Bridge

A section of River Owenass that runs between the Mill Bridge and Convent Bridge is bounded by a walkway and a stonewall (Figure 3-12). The stonewall supports a range of flora including moss species *Racomitrium* spp.; *Tortula* spp.; *Fissidens* spp.; *Thamnobryum* spp.; *Andreaea* spp.; as well as Maidenhair Spleenwort *Asplenium trichomanes*; Irish Ivy *Hedera hibernica*; Ivy-leaved Toadflax *Cymbalaria muralis*; Herb Robert *Geranium robertianum*; Cleavers *Galium aparine*; Ragwort *Jacobaea vulgaris*; Nipplewort *Lapsana communis*; Shiny Crane's-bill *Geranium lucidum*; Common Polypody *Polypodium vulgare*; Field Horsetail *Equisetum arvense*; False Oat-grass *Arrhenatherum elatius*; Creeping Cinquefoil *Potentilla reptans*; Bramble *Rubus fruticosus*; Wood Nightshade *Solanum dulcamara*; Cock's-foot *Dactylis glomerata* and Rosebay Willowherb *Chamaenerion angustifolium*.

Figure 3-12: The vegetated stonewall along the River Owenass walkway

3.2.10 Buildings and artificial surfaces (BL3)

This habitat refers to the man-made structures and artificial surfaces which occur throughout the proposed development area, such as pedestrian footpaths, bridges (Mill Bridge (stonework and concrete) and Convent Bridge (concrete) see Figure 3-14), cycleways, roads, car parks, buildings, and playground.

Figure 3-13: Convent Bridge

Figure 3-14: Mill Bridge

3.2.11 Drainage ditches (FW4)

There are additional smaller drainage ditches scattered along the southern half of the study area, all of which connect to either the River Owenass or River Pound. There is also one other drainage ditch along the northern border of the study area. The floral assemblage of these drainage ditches typically included Duckweed spp.; Fools Watercress; Great Willowherb; Nettle; Hogweed and Cleavers.

3.2.12 Improved agricultural grassland (GA1)

The majority of the land within the study area is improved agricultural grassland (Figure 3-15). These habitats are dominated by species such as Perennial Rye-grass *Lolium perenne* and Yorkshire-fog *Holcus lanatus*, with occasional Meadow Foxtail *Alopecurus pratensis*; Cock's-foot; and Soft Rush *Juncus effusus*. Other floral species present include Creeping Buttercup *Ranunculus repens*; Dandelions *Taraxacum* spp.; Meadow Buttercup *Ranunculus acris*; Common Knapweed; Nettle; Ribwort Plantain; Ragwort; Dock spp.; Ribwort Plantain; Creeping Thistle *Cirsium arvense*; Greater Plantain *Plantago major*; Hogweed; Crosswort *Cruciata laevipes*; Pineappleweed *Matricaria discoidea*; Rosebay Willowherb; Daisy *Bellis perennis*; Meadowsweet; Cow Parsley; and some sporadic Gorse *Ulex europaeus* and Bramble.

Figure 3-15: Improved agricultural grassland bounded by stonewall and a walkway next to the river.

3.2.13 Mosaic: Improved agricultural grassland, Scrub (GA1, WS1)

Scrub species were observed encroaching in some agricultural grasslands, with dense patches of Gorse; Bramble; Thistles; Great Willowherb.

3.2.14 Amenity grassland (improved) (GA2)

Amenity grassland in the study area include private gardens, sportsgrounds, cemetery lands, and public amenity areas such as children's playground. Plant species composition with these grassland habitats was typically comprised of Perennial Rye-grass; Yorkshire Fog; Cock's-foot; Nettles; Dandelions; White Clover *Trifolium repens*; Daisy; Thistles; and Docks. The invasive Japanese Knotweed *Reynoutria japonica* and Traveller's-joy *Clematis vitalba* were also recorded along the borders of two gardens.

3.2.15 Dry meadows and grassy verges (GS2)

Dry grassy verge habitat is relatively frequent within the southern section of the study area. These dry grass verge habitats contained a range of floral species including Cock's-foot; False Oat-grass; Perennial Ryegrass; Hogweed; Bramble; Broomrape *Orobanchaceae* sp.; Field Horsetail; Meadowsweet; Common Knapweed; Ribwort Plantain; Self-heal *Prunella vulgaris*; Guelder-rose *Viburnum opulus*; Dog-rose; Dogwood *Cornus sanguinea*; Bush Vetch *Vicia sepium*; Dandelion spp.; Ribwort Plantain; Cowslip *Primula veris*; Meadow Buttercup; Yarrow; Bird's-foot Trefoil *Lotus corniculatus*; Columbine *Aquilegia vulgaris*; Hairy Vetch *Vicia villosa*; Red Clover *Trifolium pratense*; Creeping Buttercup; Lords and Ladies *Arum maculatum*; Field Maple *Acer campestre* saplings; Cleavers; Nettle; Creeping Cinquefoil; and Cuckoo-flower.

Sporadic patches of the invasive non-native species Three-cornered Garlic *Allium triquetrum* were present in these grassy verges.

In the north-eastern most surveyed section of the study area, an extensive dry meadow dominates the lands on the right bank (Figure 3-16). Plant species

present within this habitat include Creeping Buttercup; Meadow Buttercup; White Clover; Silverweed *Potentilla anserina*; Ribwort Plantain; Smooth Bent *Agrostis capillaris*; Common Knapweed; Dock; Daisy; Yorkshire Fog; Lesser Stitchwort *Stellaria graminea*; Red Clover; Ragwort; Field Forget-me-not *Myosotis arvensis*; Hedge Mustard *Sisymbrium officinale*; Smooth Brome *Bromus racemosus*; Nettle; False Oat-grass; Ragwort; Cock's-foot; Common Plantain; Hogweed; Red Fescue *Festuca rubra*; Clustered Dock *Rumex conglomeratus*; Cleaver; Perennial Ryegrass; Bramble; Silverweed; Thistle; Goat's-beard *Tragopogon pratensis*; Toothpick Weed *Visnaga daucoides*; Field Horsetail; Creeping Cinquefoil; Yarrow; Bramble; Creeping Thistle; Brome *Bromus* spp.; Lesser Trefoil *Trifolium dubium*; Lady's Bedstraw *Galium verum*; Square-stalked St John's Wort *Hypericum tetrapterum* and Dogrose.

Figure 3-16: Large dry meadow in north-easternmost surveyed study area

3.2.16 Dry meadows and grassy verges / Scrub (GS2/WS1)

There is one section of mosaiced scrub and dry meadow adjacent to the Clontygar Stream. The grassland species are similar to those mentioned in the above sub-section, while the scrub species consisted of Willows; Bramble; Great Willowherb; Blackthorn *Prunus spinosa*, and Alder.

3.2.17 Mosaic: Wet grassland / Improved agricultural grassland (GS4 / GA1)

West of the Clontygar Stream as it flows north towards the River Owenass, lies a pastural grassland that contains similar species as to the other improved agricultural grasslands but it also mosaiced by patches of Soft-rush; Marsh Thistle *Cirsium palustre*; Meadowsweet and Marsh Marigold *Caltha palustris* (Figure 3-17).

These areas of wet grassland are considered to be of less than local ecological importance, given their low species diversity and low contribution to local wildlife.

Figure 3-17: Mosaiced wet and improved agricultural grassland

3.2.18 (Mixed) broadleaved woodland (WD1)

A small mixed broadleaved woodland is located north of Manor Road, along the western boundary of the study area. This habitat is dominated by Beech *Fagus sylvatica;* with an understorey of Bramble; Ivy; Herb-Robert; Elder *Sambucus nigra*; and Nettle.

3.2.19 Mixed broadleaved / conifer woodland (WD2)

There are two small woodland patches in the centre of the study area, south of the Mountmellick Bridge. These woodland patches contain a mixture of broadleaved and conifer species including Hawthorn; Bramble; Honeysuckle *Lonicera periclymenum*; Beech; Scots Pine *Pinus sylvestris*; Leyland Cypress *Cupressus* × *leylandii*; Elder; and the invasive Sycamore and Laurel *Prunus laurocerasus*.

3.2.20 Mosaic: Hedgerows / Scrub (WL1 / WS1)

Mixed hedgerow and linear scrub section were common along the riverbanks within the study area. Floral species recorded within this habitat included Dog-rose; Bramble; Bush Vetch; Ivy; Ash; Hawthorn; Hogweed; Willow spp.; Field Speedwell; Creeping Cinquefoil; Holly; Meadowsweet; Harts-tongue Fern *Asplenium scolopendrium*; Nettle; Cleavers; Lesser Celandine *Ficaria verna* subsp. *Verna*; Dandelions; Cow Parsley; Docks; Meadow Foxtail; Perennial Ryegrass; Cock's-foot; Snowberry; Sorrel *Rumex acetosa*; Hazel *Corylus avellana*; Meadow Buttercup; Creeping Buttercup; False Oat-grass; Yorkshire Fog; Creeping Thistle; Alpine Rose *Rosa penduline*; Sycamore; Soft Shield-fern *Polystichum setiferum;* Great Willowherb; and Hedge Speedwell *Veronica chamaedrys*.

3.2.21 Annex I habitats of River Barrow and River Nore SAC

While the riverine habitats within the Scheme contained species of Starwort, which is an indicator of the Annex I habitats "Water courses of plain to montane levels with the Ranunculion fluitanis and Callitricho-Batrachion vegetation" and "Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels", these Annex I habitats were considered to be within the area of the FRS during the ecological surveys due to the overall low presence of Starwort and a lack of overall definition of these habitats. These Annex I habitats however, are known to occur downstream of the site and in the River Barrow. The full distribution of this habitat and its sub-types in this site is

currently unknown. The basis of the selection of the SAC for the habitat is the presence of an excellent example of the vegetation community (nutrient-rich type) associated with extensive tufa deposits on the river bed in the Kings tributary of the Nore, both of which were absent from the rivers within the Scheme at the time of surveying. Other examples of this or other sub-types may be present within the SAC (NPWS, 2011).

3.2.22 Protected Fauna

During the ecological surveys, a range of protected fauna were recorded via visual sighting of individuals or observation of scat / spraint / prey remains or recorded birdsong. These species are protected under the Wildlife Act, 1976 and its amendments, and/or Annexes of the EU Habitats Directive and EU Birds Directive. However, only two of these species, namely Otter and Atlantic Salmon, are QIs of the Natura 2000 sites within the development's ZoI. These two species will be examined in greater detail in the below sub-section along with supporting desktop data. Other QI species (River Lamprey, Brook Lamprey and White-clawed Crayfish) present within the study area as confirmed by existing desktop data and communication with NPWS and IFI, will also be examined further in the below sub-sections.

3.2.23 QI Mammals: Otter

Suspected Otter holts were recorded along River Owenass along the section between Mill Bridge and Convent Bridge. Two of the suspected holts were located on the left bank side (looking downstream), one next to the children's playground and the other approximately 170m downstream. Upon further inspection, these areas were too shallow to facilitate Otter, however the area was confirmed to be used as a latrine, with fresh spraint recorded at the time of surveying.

Additional potential holts and couches were investigated, one near to the Owenass Bridge in the south-west of the town, and one in the north-east of the town behind the College Avenue housing estate, however, neither of these locations were shown to be Otter holts or couches, though they were occasionally visited and used as latrines (Figure 3-18).

Figure 3-18: Otter using a latrine site under the River Owenass Bridge

3.2.24 QI Fish: Atlantic Salmon, River Lamprey and Brook Lamprey

A dedicated fish survey was not conducted by JBA ecologist. During the Otter surveys, the atlas bone of Atlantic Salmon was present within some Otter spraint, indicating the presence of Salmon within the River Owenass (Conroy, J.W.H, et al 2005). However, the JBA hydromorphology report highlights many key aspects of the river's structure and its provision of habitats for many fish species. Brown Trout *Salmo trutta* was recorded within the River Pound during this survey.

The Garroon Stream was noted to have a bed of sand and gravel. The Owenass was split into seven different areas, containing sand and gravel beds, gravel bar deposits, boulder, cobble gravel and sand near to the walls, riffle pool sequences, sand bars and a larger series of riffle pools near to Owenass Bridge. The River Pound was identified to have bedding mixture of boulder, sand, cobble, and gravel, with areas of silt deposition and shallow riffle sections, and sand deposits inside of the river bends.

Large materials such as boulders and bars lead to the creation of complex structures and pockets of slower river's flow that allow for rest locations of local fish and additionally lead to the creation of riffle pools and bedding of finer sediments including sand and gravel. These finer materials from sand to silt are utilized by ammocoetes (lamprey). While no fishery survey was taken place, the geomorphology survey highlighted plenty of available habitat for spawning.

Fishery surveys have been conducted by IFI (IFI 2017, IFI 2019, IFI 2021). These surveys recorded Salmon, Brown Trout and lamprey species within the area of the FRS as well as European Eel downstream of the site. The JBA hydromorphological findings listed above have been mapped together with the IFI data and are shown below in Figure 3-19, Figure 3-20, Figure 3-21, and Figure 3-22.

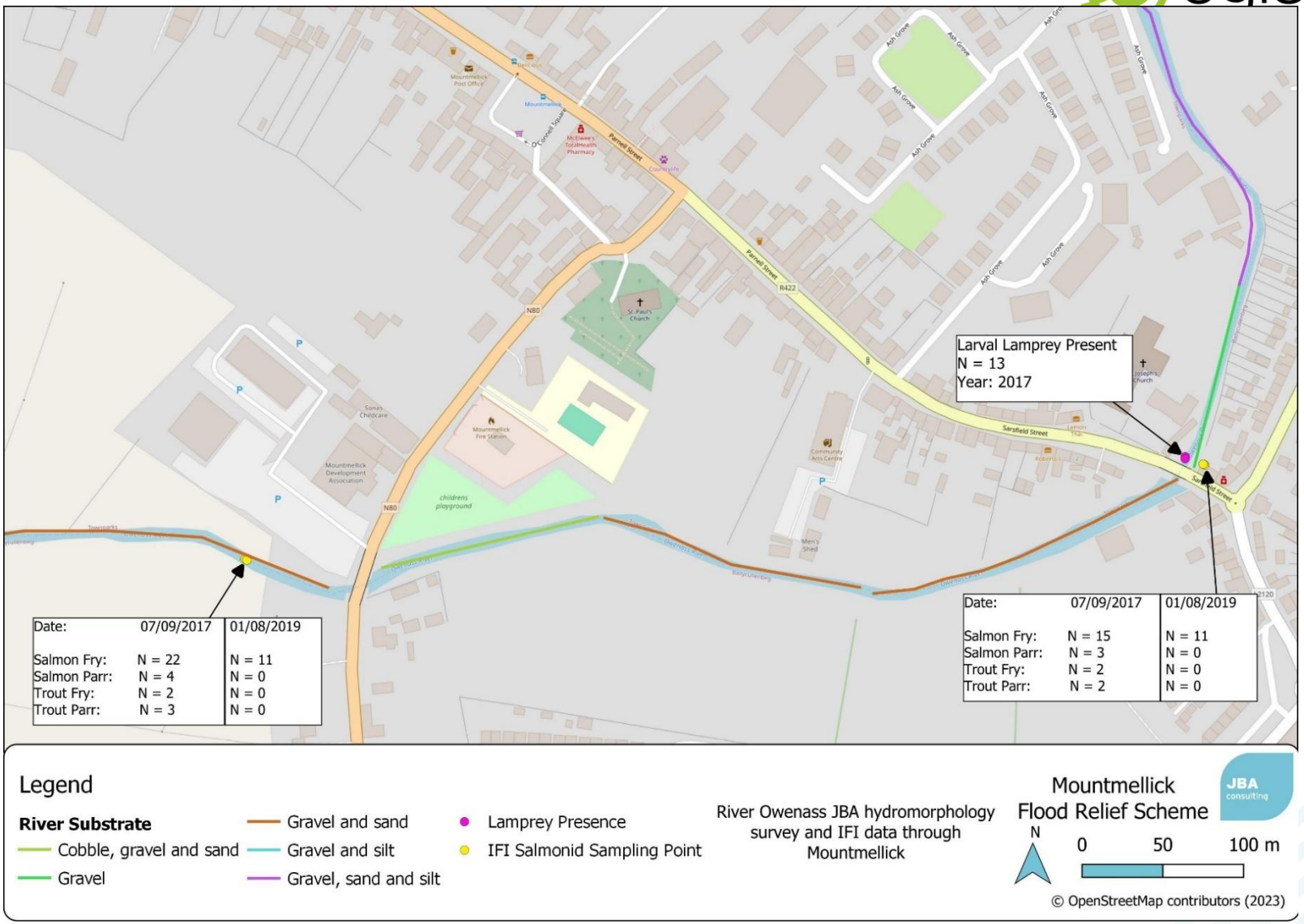


Figure 3-19: River Owenass JBA hydromorphology survey and IFI survey results through Mountmellick

Figure 3-20:River Pound JBA hydromorphology survey and IFI survey results

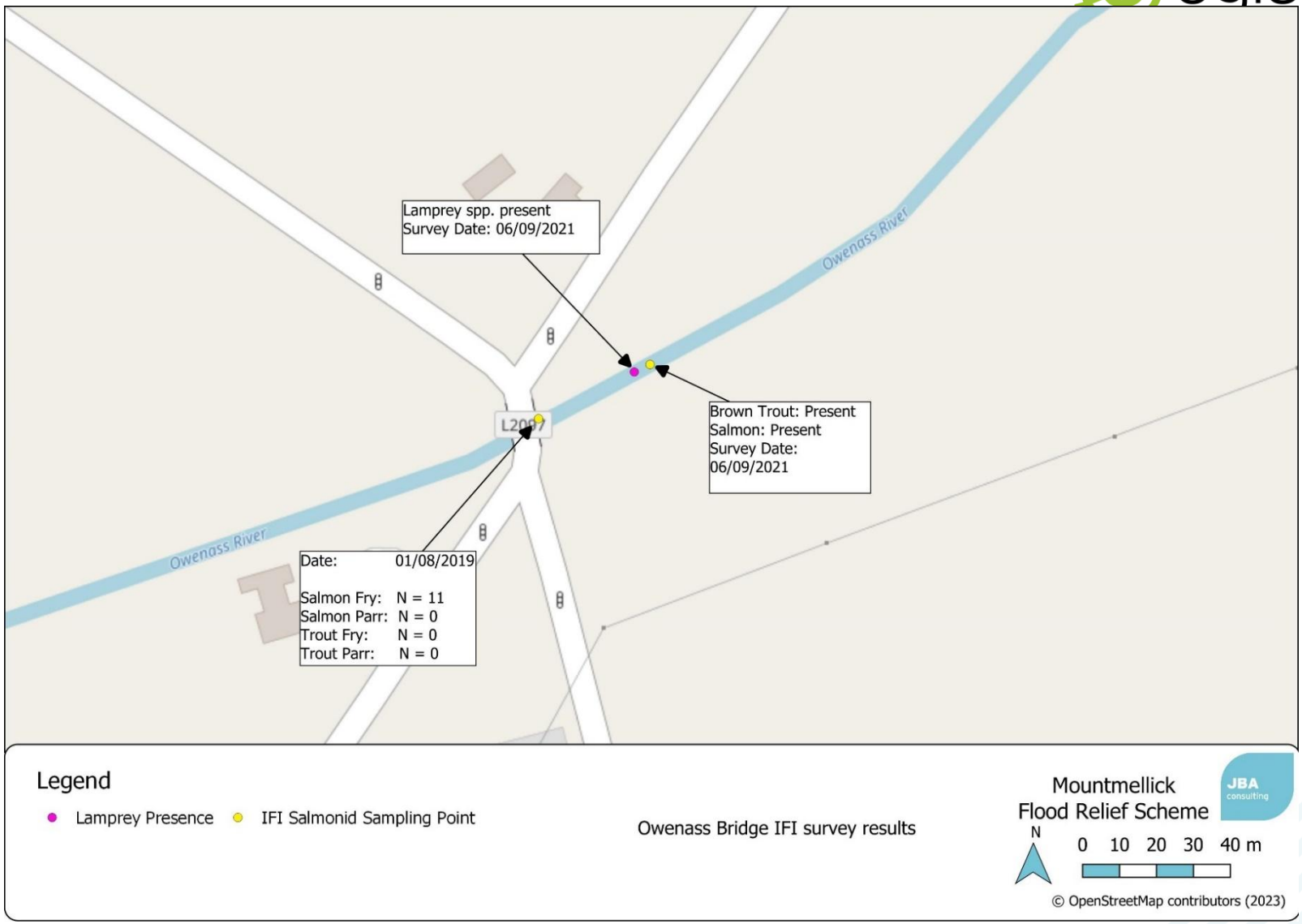


Figure 3-21: River Owenass Bridge IFI survey results

Figure 3-22: Areas of the Garroon Stream with suitable river substrate habitats

A desktop review was carried out to identify the areas of importance for fish within the study area and ZOI. An electro-fishing survey took place in 2021 upstream of Mountmellick, near the Owenass Bridge (IFI, 2022) Fish within the river that were noted during the survey include Brown trout; Dace; Lamprey sp.; Salmon; Stone loach. An additional survey was conducted downstream of Mountmellick, in the River Barrow, which contained the species Lamprey spp.; Minnow and Stone loach.

A fish stock survey was carried out during summer 2015 in the River Barrow catchment, including the sub-catchments Owenass and Triogue (Delanty et al., 2017). Species present in the River Owenass include Brown Trout, Atlantic Salmon, Three-spined Stickleback *Gasterosteus aculeatus*, Dace *Leuciscus leuciscus*, Stone Loach *Barbatula barbatula* and Minnow *Phoxinus phoxinus*. The Fish Ecological Status is classified as **Moderate** and **Poor** at the two survey locations in the river. Owenass was identified as key sub-catchment for Brown Trout spawning and also an important nursery site.

Species present in the River Triogue include the same species as in Owenass and in addition European Eel *Anguilla anguilla* and Gudgeon *Gobio gobio* were recorded. All species found in relatively low densities apart from the Dace which was found in reasonable densities in the two lower sample sites. The Fish Ecological Status in River Triogue is **Moderate** and **Poor**. Species present in River Barrow include all the above mentioned and in addition Roach *Rutilus rutilus*, Perch *Perca fluvialtilis*, Pike *Esox lucius* and Flounder *Platicthys flesus* were recorded.

Fisheries Surveys were conducted by Inland Fisheries Ireland in 2019 at the Derrycloney Bridge, located upstream of Mountmellick. Brown trout; Dace *Leuciscus leucisus*; Lamprey sp.; Salmon and Stone loach *Barbatula barbatula* were recorded. It is expected that each of these species are found throughout the scheme area.

A baseline biodiversity survey of the River Owenass located from Convent Bridge and downstream towards the area along its confluence with the River Barrow was performed by WS Atkins Ireland Ltd (2019). During this survey, both nursery and spawning habitats for Lamprey spp were recorded towards the confluence with the River Barrow, while there were also large numbers of adult and juvenile salmon recorded downstream of Convent Bridge, which are all QI species of the River Barrow and River Nore SAC.

3.2.25 QI Aquatic Invertebrates – White-clawed Crayfish

No signs of burrows or no incidental records of White-clawed Crayfish were seen during the surveys, even though suitable habitat was present. A dedicated, White-clawed Crayfish survey was not conducted by JBA ecologist, however, during a hydromorphology survey highlighting key aspects of the river's structure, it was noted that the River Owenass and River Pound both exhibited areas of boulder presence within the water, with boulders being a feature of interest for White-clawed Crayfish as refuge. Additionally, during four Otter surveys, while suitable refuge (boulders and banksides present) there was no incidental recorded White-clawed Crayfish present, nor were there any evidence of White-clawed Crayfish present within the Otter spraint over the span of two years.

A desk-based assessment of White-clawed Crayfish was conducted which came up with records present approximately 4.8km downstream of Mountmellick (NBDC, 2023), while it has also been recorded in River Barrow and River Owenass (NPWS, 2011). The upper stretches of River Barrow and particularly the River Owenass are very important for spawning Salmon (NPWS, 2016).

White-clawed crayfish surveys were conducted in River Owenass in 2003, approximately 5km upstream of Mountmellick. These surveys indicated presence

of White clawed crayfish with a population abundance grade of Moderate (Gammell et al, 2021). White-clawed crayfish were also recorded in 2020 at this same location however Crayfish Plague was also recorded. In 2021, the following year, White-clawed crayfish were no longer recorded at this location. The presence of crayfish plague has likely significantly reduced the White Clawed Crayfish population within the river. (Swords and Griffin, 2022).

The White-clawed Crayfish is on the IUCN Red List as 'Endangered' at a global level (Füreder et al., 2010) protected in Annex II and V of the E.U. Habitats Directive (Nelson, B et al., 2019). White-clawed Crayfish are listed on Annex II and Annex V of the Habitats Directive and the species is protected in Ireland under the Wildlife Acts and is also a QI species for the River Barrow and River Nore SAC.

3.3 Invasive Non-native Species (INNS)

Table 3-2 below provides a list of other invasive non-native species recorded during the ecological surveys on the 12/09/2019, 26/09/2019 and on 11/05/2022, Figure 3-23 displays where they were located. It includes species, their level of impact, and whether they are listed on the Third Schedule of the EC (Birds and Natural Habitats) Regulations 2011 S.I. No. 477/2011. Two species are listed on the Third Schedule; Japanese Knotweed *Reynoutria japonica* and Three-cornered Garlic *Allium triquetrum*. It is important to note that the Japanese Knotweed recorded during the initial 2019 ecological invasive species surveys, has since been treated and while it is no longer seen as a major conservation concern, All About Trees Ltd. & NM Ecology Ltd. (2023) have recommended further treatment to ensure the remaining plants are eradicated.. Japanese Knotweed it is the most likely invasive species to be accidentally spread downstream, posing a risk to bank stability and biodiversity.

There should be no spread of Third Schedule non-native species within or from the vicinity of the proposed scheme.

Table 3-2: INNS recorded within or immediately adjacent to study area

Invasive Non-Native Species	Impact	Regulation S.I. 477/2011
Japanese Knotweed *Reynoutria japonica*	High	Yes
Cherry Laurel *Prunus laurocerasus*	High	No
Sycamore *Acer pseudoplatanus*	Medium	No
Butterfly-bush *Buddleja davidii*	Medium	No
Traveller's-Joy *Clematis vitalba*	Medium	No
Three-cornered Garlic *Allium triquetrum*	Medium	Yes
Snowberry *Symphoricarpos albus*	Low	No
Montbretia *Crocosmia x crocosmiiflora*	Low	No

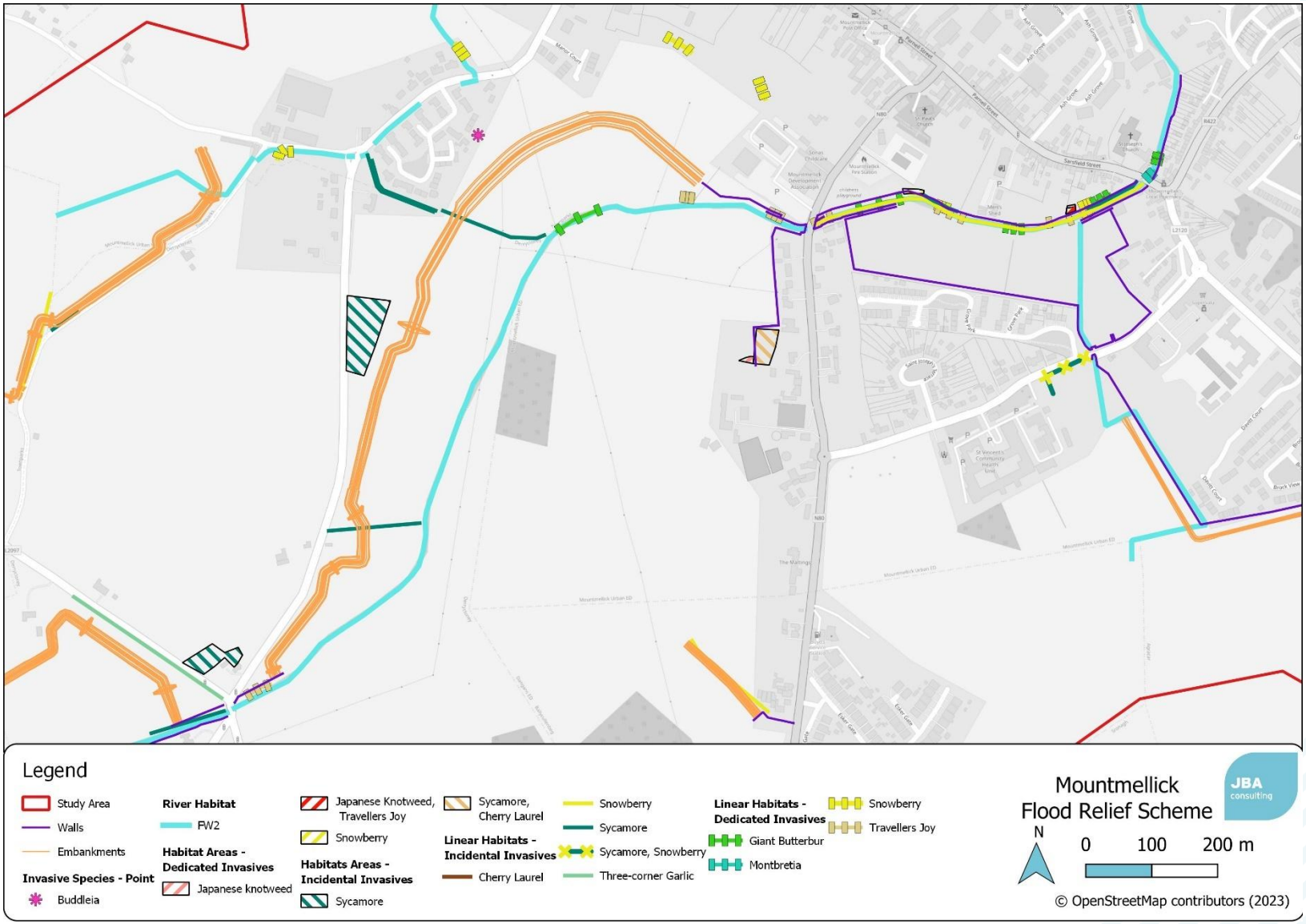


Figure 3-23: Invasive non-native species recorded within the scheme

3.4 Waterbodies within the Vicinity of the Proposed Site

The entirety of the proposed project is located within the Water Framework Directive (WFD) Barrow catchment and is split between the Barrow_SC_010 and Barrow_SC_020 sub-catchments (EPA, 2023). The proposed flood relief scheme will primarily be restricted to River Owenass (Owenass_020 waterbody), while the River Pound (Barrow_040 waterbody) and the Clontygar Stream (Triogue_040 waterbody) will also be affected by the development. All three of these rivers drain into the main body of the River Barrow (Figure 3-24).

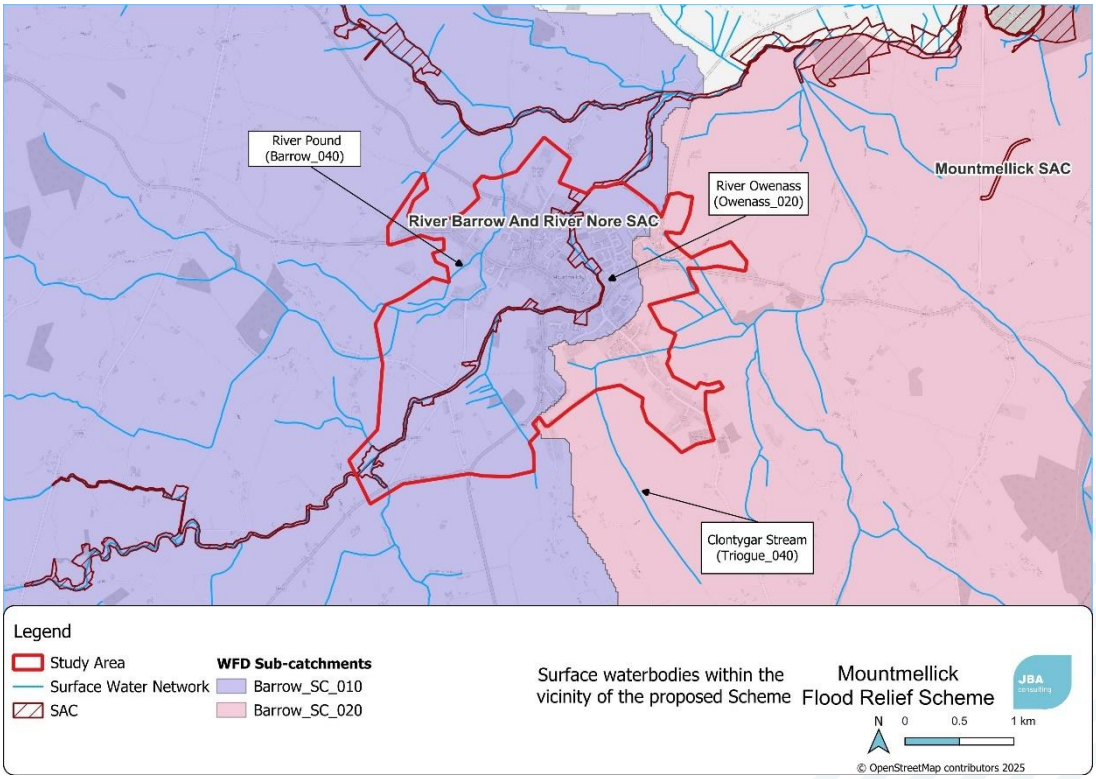


Figure 3-24: Surface waterbodies in the vicinity of site (OSM, 2025)

Other waterbodies that are located within vicinity of the plan's site includes additional segments of the River Barrow (including Barrow_040 through to Barrow_060), and the River Blackwater (Blackwater (Laois)_010), which joins the River Owenass at the southern end of the scheme boundary.

All of these waterbodies, along with their WFD status (2016-2021) and current risk are listed in Table 5 3.

Table 3-3: WFD status and risk of local watercourses

WFD Sub-Catchment	WFD Watercourse	WFD Status	WFD Risk	Approx. Distance from Site
Barrow_SC_010	Barrow_040	Moderate	At Risk	Within site
	Owenass_020	Moderate	At Risk	Within site
	Blackwater (Laois)_010	Good	Not at Risk	A small portion Within site
Barrow_SC_020	Triogue_040	Poor	At Risk	Within site
Barrow_SC_020 / Barrow_SC_030	Barrow_050	Moderate	At Risk	0.5km
	Barrow_060	Moderate	Review	2.4km

3.5 Groundwater

The majority of the site is located within the Portlaoise groundwater body, with a small section within the Rosenallis Gravels groundwater body (Figure 3-25). Both of these groundwater bodies currently hold a 'Good' WFD status (2016-2021); and are considered to be 'Not At Risk' (EPA, 2023).

The underlying bedrock of the site is dominated by dark muddy limestone and shale of the Ballysteen Formation. and the soil is derived of sections of Made Ground, till derived chiefly from limestone, and alluvial soils deposited along the banks of the river waterbodies, while the areas around the town consisting of cut peat. The permeability of the majority of the town's area is classified as moderate, with the north reaches of the town having a high permeability, which can be seen within the vulnerability of the groundwater being moderate for the majority of the town, and a high vulnerability in the north (Figure 3-26). The townland has a largely varied recharge capacity, with the peatland sections having a low recharge capacity of 4%, the areas within the centre of the townland having a low recharge of 20-25%, and the areas of alluvial soil having the highest recharge capacity of 60%.

The aquifer within the underlying bedrock of the entirety of the townland is considered to be Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones. In the context of this site, this means that water that enters the local aquifer will have a low storage and low flow path, and will rapidly discharge to nearby watercourses.

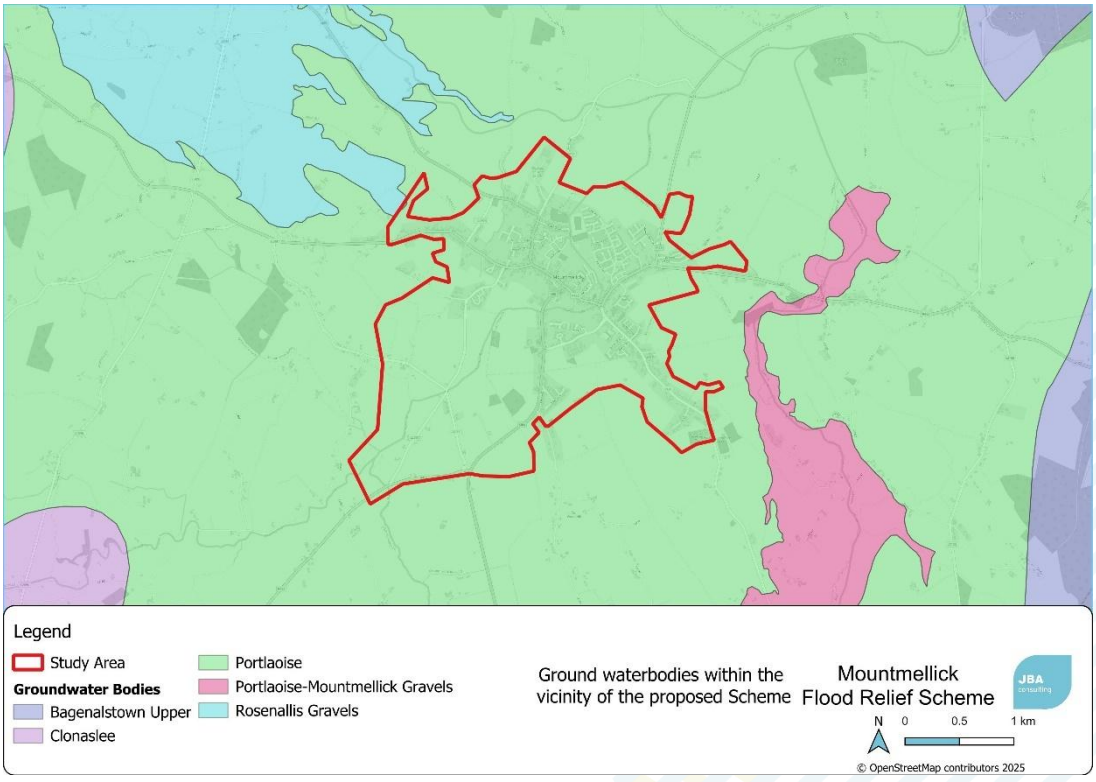


Figure 3-25: Groundwater bodies in the vicinity of site (OSM, 2025)

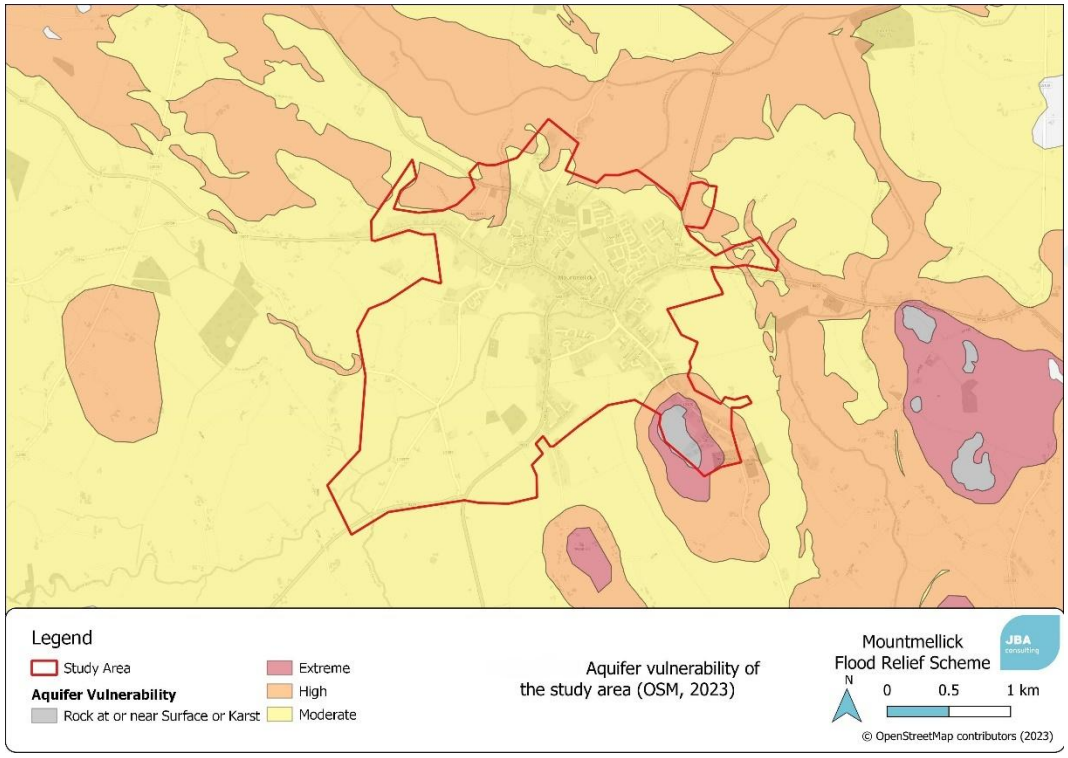


Figure 3-26: Aquifer vulnerability of the study area (OSM, 2025)

4 Natura 2000 Sites

4.1 Determining likely Zone of Impact (ZoI)

The DEHLG (2009) guidance identifies that Screening for Appropriate Assessment of a plan or project should consider the following Natura 2000 sites:

- Any Natura 2000 sites within or adjacent to the plan or project area.
- Any Natura 2000 sites within the likely zone of effect of the plan or project. This is dependent on the nature and scale of the plan, with 15km generally recommended for plans, but potentially much less for projects.
- Any Natura 2000 sites that are more than 15km from the plan or project area, but may potentially be effected upon, for example, through a hydrological connection.

As the scale of proposed works are considered of 'Project' status, all European (Natura 2000) sites within 15km buffer zone of the proposed Scheme were considered, as per Appropriate Assessment of Plans and Projects in Ireland - Guidance. Within this 15km buffer zone a source-pathway-receptor model was used to identify the sites which are present within the ZoI, as per OPR Practice Note PN01 Appropriate Assessment Screening for Development Management (Office of the Planning Regulator, 2021).

Natura 2000 sites were examined in relation to surface water and groundwater / ground-to-surface water pathways (i.e., local surface water sub-catchments and groundwater bodies / aquifers), with an extended potential pathway range for downstream hydrological connections (including potentially linked flood zones).

In respect to ZoI for air pollution (emissions and dust), Natura 2000 sites within a 500m buffer zone of the site were considered' as per the Institute of Air Quality Management's 'Guidance on the Assessment of Dust from Demolition and Construction' (IAQM, 2014), including ex-situ foraging habitats utilised by QI species associated with these local Natura 2000 sites. Additionally, a 300m disturbance buffer from boundaries of the proposed development has been incorporated into the ZoI in order to account for local QI species potentially foraging within ex-situ habitats. The potential impact on such species and their Natura 2000 sites will also be assessed in Section 6.

Natura 2000 sites are listed in Figure 4-1 below and their location are shown in Figure 4-1 (overleaf). Site descriptions, all Qualifying Interests (QIs) and threats/pressures for the below Natura 2000 sites are provided in Table 4-1: Natura 2000 sites located within the Zone of Influence (ZoI).

Table 4-1: Natura 2000 sites located within the Zone of Influence (ZoI)

Natura 2000 site	Site Code	Approximate Distance from Site	Hydrological Links
River Barrow and River Nore SAC	002162	Within Site	SAC within site
Mountmellick SAC	002141	2.2km	no hydrological links between the Scheme and the SAC, and the Mountmellick SAC is not considered further in the report

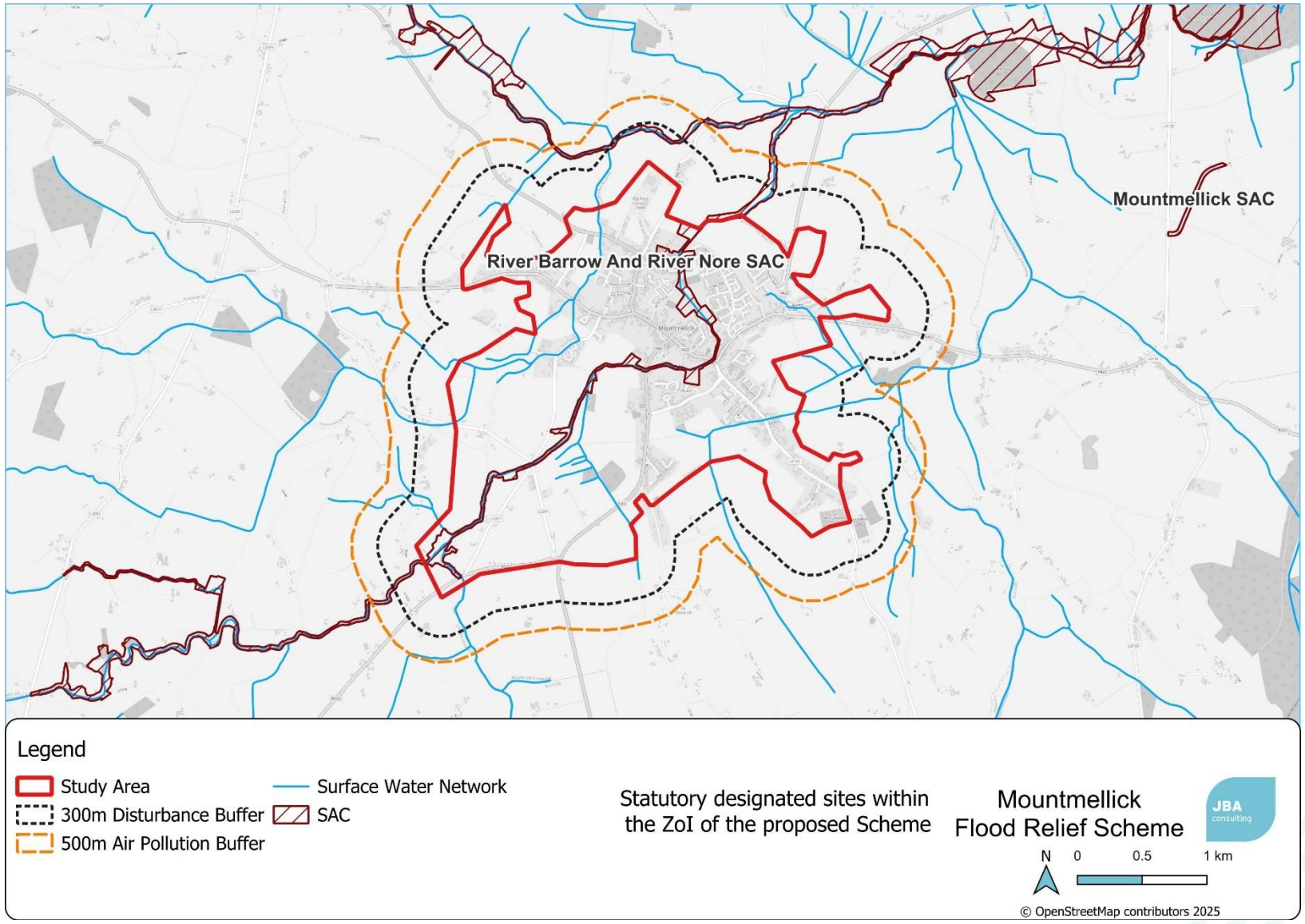


Figure 4-1: Statutory designated sites within the ZoI of the development (OSM, 2025)

Table 4-2: Site briefs; Qualifying Interests; and project-relevant threats /pressures and their impacts and sources to the Natura 2000 sites within the ZoI

Site Name	Brief	Qualifying Interests that could be potentially impacted are listed below	Project-relevant Threats / Pressures: Impact (Source) +
River Barrow and River Nore SAC	This site includes the Barrow and Nore River Catchments all the way from Slieve Bloom Mountains in the north to Creadun Head in Waterford in the south. The upper parts of the Barrow run through limestone, while the middle reaches and many of the eastern tributaries runs through Leinster Granite. Within the site are several locations with alluvial forest, which is a priority Annex 1 habitat. Accessioned with the alluvial forests are eutrophic tall herb vegetation and elsewhere where the flood plain of the river is intact. Petrifying springs is another priority Annex 1 habitat found within this SAC along the Nore River. Old oak woodlands are found both along the Nore and the Barrow. Floating river vegetation is well represented in the Barrow and in the many tributaries of the site. The water quality of the Barrow has improved since the vegetation survey was carried out in 1996. In pockets along the steep valleys of the rivers habitats of dry heath are occurring and is especially prominent in the Barrow Valley and along the tributaries at the foothills of the Blackstairs Mountains. The dry heath generally grades into wet woodland or swamp vegetation closer to the riverbank. The southernmost area of the SAC is characterised by coastal habitats such as estuaries, mudflats and salt meadows. The site is important for the presence of a number of E.U. Habitats Directive Annex II species, including Freshwater Pearl Mussel Margaritifera	- Floating River Vegetation [3260] - Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430] - Otter *Lutra lutra* [1355] - Brook Lamprey *Lampetra planeri* [1096] - River Lamprey *Lampetra fluviatilis* [1099] - Atlantic Salmon *Salmo salar* [1106] - Sea Lamprey *Petromyzon marinus* [1095] (ZoI) - - White-clawed Crayfish *Austropotamobius pallipes* [1092] (NPWS, 2011)	Pollution to surface waters: High impact (source of threat both inside and outside SAC boundary) Modifying structures of inland water courses: High (Inside) Embankment and flooding defense walls in inland water systems: High (Inside) Erosion: High (Inside) Removal of Hedges and Copses or Scrub: High (Inside) Human induced changes in hydraulic

Site Name	Brief	Qualifying Interests that could be potentially impacted are listed below	Project-relevant Threats / Pressures: Impact (Source) +
	margaritifera and M. m. durrovensis, White-clawed Crayfish Austropotamobius pallipes, Salmon Salmo salar, Twaite Shad Alosa fallax fallax, three lamprey species – Sea Lamprey Petromyzon marinus, Brook Lamprey Lampetra planeri and River Lamprey Lampetra fluviatilis, the whorl snail Vertigo moulinsiana and Otter Lutra lutra. (NPWS, 2016a)		conditions: Moderate (source of threat both inside and outside SAC boundary) Reduction in migration/migration barriers: Moderate (Inside) (European Environment Agency, 2020)

* = priority Annex I habitat

= indirect threat via the increase in the local populace and recreational activities as a result of the development.

+ = Project relevant threats occur at Low, Medium and High impact rates, and these threats come from sources originating Inside or Outside (or a mixture of Both) of the Natura 2000 site boundary.

QIs of the River Barrow and River Nore SAC that would be located within the ZoI of the proposed FRS development are listed below:

- Water courses of plain to montane levels with the *Ranunculion fluitanis* and *Callitricho-Batrachion* vegetation [3260]
- Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]
- Otter *Lutra lutra* [1355]
- Brook Lamprey *Lampetra planeri* [1096]
- River Lamprey *Lampetra fluviatilis* [1099]
- Atlantic Salmon *Salmo salar* [1106]
- White-clawed Crayfish *Austropotamobius pallipes* [1092]

5 Other Relevant Plans and Projects

5.1 Cumulative Effects

As part of the Screening for an Appropriate Assessment, in addition to the proposed works, other relevant projects and plans in the region that may induce cumulative effects must also be considered at this stage.

The following projects or plans were identified as potential sources of cumulative effects:

- Laois County Development Plan 2021-2027
- Third Cycle River Basin Management Plan for Ireland 2022-2027
- Planning Applications (retrieved from Data.gov.ie - Planning Application Sites, June 2024)

5.2 Plans

5.2.1 Laois County Development Plan 2021-2027

The purpose of the Plan is to enhance the quality of life for the current and future population of Laois and manage the county in the interests of the common good. Laois County will develop in line with the availability and integration of services, transport, infrastructure and economic activity whilst also preserving its natural environment and amenities (LCC, 2022).

Mountmellick is predicted to have a strong growth during the period of this Plan and will as such act as a base for strong and sustained growth of both settlement and enterprise due to stability and coordination. An Appropriate Assessment Conclusion Statement has been conducted, taking into account Laois County Development Plan 2017-2023, the Strategic Environmental Report and the Natura Impact Report (CAAS Ltd, 2022). The development plan has no provisions for fire management or mowing and grazing regimes, and so there are no sources for effects relating to these impacts.

It has been determined that threats associated with the development plan that may have an impact on the River Barrow and River Nore SAC include: industrial or commercial areas, agricultural intensification, dykes and flooding defence in inland water systems, removal of hedges and coppices or scrub, fishing and harvesting aquatic resources, Sand and gravel quarries, reduction in migration or migration barriers, forestry activities not referred to above, invasive non-native species, peat extraction, netting, forest replanting (native trees), human induced changes in hydraulic conditions, port areas, changes in abiotic conditions, modifying structures of inland water courses, leisure fishing, pollution to surface waters (limnic and terrestrial; marine and brackish), forest and plantation management & use, intensive cattle grazing, dredging or removal of limnic sediments, water abstractions from surface waters, use of fertilizers (forestry), intensive fish farming, intensification, erosion.

Of these impacts, a series of policy objectives have been incorporated to mitigate these potential effects. The objectives and policies have been outlined below. None of these objectives or policies have been determined to have potential interaction with the Mountmellick FRS.

Policies and objectives concerned with direct land take include:

- BNH 1: Protect, conserve, and seek to enhance the county's biodiversity and ecological connectivity.
- BNH 2: Conserve and protect habitats and species listed in the Annexes of the EU Habitats Directive (92/43/EEC) (as amended) and the Birds Directive (2009/147/EC), the Wildlife Acts 1976 and 2010 (as amended) and the Flora Protection Orders.

- BNH 3: Support and co-operate with statutory authorities and others in support of measures taken to manage proposed or designated sites in order to achieve their conservation objectives and maintain the favourable conservation status and conservation value of Sites under National and European legislation and International Agreements and maintain and /develop linkages between them where feasible.
- BNH 4: Protect and maintain the conservation value of all existing and future Natural Heritage Areas, Nature Reserves, Ramsar Sites, Wildfowl Sanctuaries and Biogenetic Reserves in the county: and
- BNH 5: Projects giving rise to significant cumulative, direct, indirect or secondary impacts on Natura 2000 sites arising from their size or scale, land take, proximity, resource requirements, emissions (disposal to land, water or air), transportation requirements, duration of construction, operation, decommissioning or from any other effects shall not be permitted on the basis of this Plan (either individually or in combination with other plans or projects). Screening for AAs and AAs undertaken shall take into account invasive species as relevant

Processes involving the removal of hedgerows or coppicing will be managed in according with policy objectives,

- BNH 19: Specific to areas of Green Infrastructure are identified, protected, enhanced, managed and created to provide a wide range of environmental, social and economic benefits to communities
- BNH 20: Develop and implement a Green Infrastructure Strategy for Laois in partnership with key stakeholders and the public which reflects a long-term perspective, including the need to adapt to climate change. Ensure the Green Infrastructure Strategy for Laois protects existing Green Infrastructure resources and plans for future Green Infrastructure provision
- BNH 21: Require all Local Area Plans and Master Plans to protect, enhance, provide and manage Green Infrastructure in an integrated and coherent manner. Set targets for the provision of Green Infrastructure elements such as trees and green roofs as part of the preparation of Local Area Plans and
- BNH 22: Promote a network of paths and cycle tracks to enhance accessibility to the Green Infrastructure network, while ensuring that the design and operation of the routes respect and where possible enhances the ecological potential of each site.
- BNH 23: Encourage, pursuant to Article 10 of the Habitats Directive, the management of features of the landscape, such as traditional field boundaries and laneways, important for the ecological coherence of the Natura 2000 network and essential for the migration, dispersal and genetic exchange of wild species
- BNH 24: To identify and map Green Infrastructure assets and sites of local biodiversity value over the lifetime of the Plan.
- BNH 25: Undertake a study within the lifetime of the Plan and for all Local Area Plans to document and map significant trees and groups of trees that require preservation and prepare Tree Preservation Orders for individual trees, groups of trees or woodland areas where expedient and in the interests of visual amenity, biodiversity and the environment.

- BNH 26: Protect individual trees, groups of trees and woodland in the interests of landscape conservation (including townscapes) and nature conservation as part of the development management process.
- BNH 27: Protect existing hedgerows, particularly of historical and archaeological importance of townland boundaries, from unnecessary removal in order to preserve the rural character of the countryside ad promote biodiversity.
- BNH 28: Ensure that hedgerow removal to facilitate development is kept to an absolute minimum and, where unavoidable, a requirement for mitigation planting will be required comprising a hedge of similar length and species composition to the original, established as close as is practicable to the original and where possible linking in to existing adjacent hedges. Native plants of a local provenance should be used for any such planting.
- BNH 29: Promote and develop urban forests in parkland and street trees in urban settlements to enhance public realm and increase tree canopy coverage and diversity., and
- BNH 30: Ensure that hedgerow and mature tree removal to facilitate development is kept to an absolute minimum and, where unavoidable, a requirement for mitigation planting will be required comprising a hedge of similar length and species composition to the original, established as close as is practicable to the original and where possible linking in to existing adjacent hedges. Native plants of a local provenance should be used for any such planting.

Habitat connectivity will be maintained through the policy objectives of

- BNH 15: In dealing with applications for new developments, the Planning Authority will have regard to the inclusion of swift nesting opportunities in new buildings through use of swift brick or swift nest boxes where appropriate

- LCA 17: Maintain the rivers throughout the county whilst ensuring that all works are carried out subject to appropriate environmental assessment in accordance with Article 6 of the Habitats Directive, in respect of any proposed development likely to have an impact on a designated natural heritage site, site proposed to be designated and any additional sites that may be designated during the period of this Plan.
- LCA 18: Preserve riverside historic features and their landscape settings and Conserve valuable habitats focused on and around river corridors and estuaries including European and national designations.,
- LCA 19: Recognise the potential constraints on development created by river flood plains and the value of these flood plains as increasingly rare habitats.,
- LCA 25: Support the identification of projects that have the potential to achieve commercial value such as industrial developments, renewable energy, tourism developments etc. while at the same time promoting high environmental standards and supporting Biodiversity objectives.

Surface and groundwater are not to receive adverse effects due to the correct implementation of the objectives

- ABT 6: Promote and investigate the feasibility of, subject to compliance with the habitats and Birds Directives, sustainable developing and improving of facilities and infrastructure supporting water based tourism activities, (including shore side interpretive centres and jetties). Development proposals outside settlement centres will be required to demonstrate a need to locate in the area and will be required to ensure that the ecological integrity and water quality of the river or lake, including lakeshore and riparian habitats, is not adversely affected by the development.,
- WS 3: Protect both ground and surface water resources and to work with Irish Water to develop and roll-out Drinking Water Safety Plans across all water schemes to protect sources of public water supply and their contributing catchments and to ensure that good water quality is sustained in all public water supplies.,
- WS 21: Continue to draw up and implement annual programmes for the monitoring of water quality in Group Water Schemes in accordance with the European Union (Drinking Water) Regulations 2014, as amended and as approved by the EPA.,
- ES 17: Implement the provisions of water pollution abatement measures in accordance with National and EU Directives and other legislative requirements in conjunction with other agencies as appropriate.,
- ES 18: Maintain and improve the water quality in rivers and other water courses in the county, including ground waters. The Council will have cognizance of, where relevant, the EU's Common Implementation Strategy Guidance Document No. 20 and 36 which provide guidance on exemptions to the environmental objectives of the Water Framework Directive.,
- ES 19: Minimise the impact on groundwater of discharges from domestic wastewater treatment systems and other potentially polluting sources. The Council will comply with the Environmental Protection Agency's 'Code of Practice: Wastewater Treatment and Disposal Systems Serving Single Houses' (2009) and the Environmental Protection Agency's 'Code for Treatment Systems for Small Communities, Business, Leisure Centres and Hotels',
- ES 20: Assist and support with the Blue Dots Catchment Programme which been established under the current River Basin Management Plan specifically for the protection and restoration of high ecological status water bodies.,
- ES 21: Ensure the protection of all High Status Water Bodies in the county by complying with the requirements of the Local Government (Water Pollution) Act 1977, (as amended), the Nitrates Directive (91/676/EEC), the European Communities Environmental Objectives (Surface Waters) Regulations 2009, the European Communities (Groundwater) Regulations 2010 which standards and objectives are included in the River Basin Management Plans, and other relevant Regulations.,
- WS 22: Ensure where private wastewater treatment systems are permitted by virtue of their remoteness from Public Wastewater Schemes to serve commercial and business developments, e.g Motorway Service Stations, Tourism and the Hospitality Sector etc,

that their performance is monitored and audited so that they are operated in compliance with their wastewater discharge license, in order to protect water quality.,

- ES 23: Ensure, through the implementation of the relevant River Basin Management Plan and their associated Programmes of Measures and any other associated legislation, the protection and improvement of all drinking water, surface water and ground waters throughout the county.,
- ES 24: Protect and develop, in a sustainable manner, the existing groundwater sources and aquifers in the County and control development in a manner consistent with the proper management of these resources, in accordance with the County Water Source Protection Zones.,
- ES 25: Assist and co-operate with the EPA, LAWPRO and IW in the Continued implementation of the EU Water Framework Directive,
- ES 26: Minimise the impact on groundwater of discharges from septic tanks and other potentially polluting sources through compliance with the Environmental Protection Agency's 'Code of Practice: Wastewater Treatment and Disposal Systems Serving Single Houses' (2009).,
- ES 27: Ensure the protection of groundwater dependant Natura 2000 sites which rely on the continued supply of groundwater resources to secure the key environmental conditions that support the integrity of the site and through the protection of groundwater standards as defined by the National River Basin Management Plan 2018 – 2021 (and any subsequent Plan). Where no detailed Plan for protection of a specific source is available wastewater discharge will not be permitted within a radius of 200 metres of that source.,
- ES 28: Ensure that Source Protection Areas are identified for any public and group scheme water supplies or multiple unit housing developments with private water supplies,
- ES 29: Continue efforts to improve water quality under the Local Government (Water Pollution) Act 1977, (as amended) and by implementing the measures outlined under the Nitrates Directive (91/676/EEC) and complying with the requirements of the Surface Water Legislation Environmental Objectives (Surface Waters) Regulations 2009, the European Communities (Groundwater) Regulations 2010; which standards and objectives are included in the River Basin Management Plans, and other relevant Regulations.,
- ES 30: Ensure that all industrial development is appropriately located, to seek effluent reduction and 'clean production' where feasible, and require that waste water treatment facilities are adequate, and that effluents are treated and discharged in a satisfactory manner.,
- ES 31: New developments which include on-site wastewater treatment in an Extreme Vulnerability Inner Source Protection Area shall be restricted to the following categories:
- a. A dwelling for a full-time farmer;
- b. An existing inhabited dwelling in need of replacement;
- c. A second family dwelling on a farm where this is required for management of the farm
- Permission may be granted in the above instances subject to the following stipulations:

- a. That an alternative site outside the Extreme vulnerability Inner Protection Area is not available
- b. The existing water quality of the source is not subject to any significant nitrate and /or microbiological contamination
- c. The existing water quality of the groundwater source is in compliance with the environmental objectives set out in relevant River Basin District Management Plan.,
- ES 32: Control intensive agriculture development e.g. intensive pig unit productions in order to minimise their impact on soil and ground water quality. Developments involving intensive pig units shall be required to show compliance with the following requirements:
- a. The developer shall demonstrate that all lands available are suitable for land spreading of manures and have satisfactory Nutrient Management Plans for such lands
- b. Satisfactory arrangement for storage, management and spreading of slurries are provided.
- ES 33: Encourage the use of catchment-sensitive farming practices, in order to meet Water Framework Directive targets, European Union (Good Agricultural Practice for Protection of Waters) Regulations 2017, as amended and comply with the relevant River Basin Management Plan.,
- ES 34: Consult as necessary with other competent authorities with responsibility for environmental management.,
- ES 35: To work in co-operation with relevant organisations and major stakeholders, to ensure a co-ordinated approach to the protection and improvement of the county's water resources,
- ES 36: Ensure that developments that may adversely affect water quality will not proceed unless mitigation measures are employed, such as settlements ponds, interceptors etc. and
- ES 37: Promote public awareness of water quality issues and the measures required to protect both surface water and groundwater bodies.

While there are no provisions for mowing or grazing regimes, there will be the promotion of agricultural activities, however these agricultural activities will be managed and appropriately mitigated through the implementation of policy objectives:

- ES 32 and ES 33, as mentioned above.

There are policies in place to handle the management of peatlands, including

- LCA 23: Recognise the importance of peatlands for ecology, history, culture and for alternative energy production,
- LCA 24: Conserve valuable habitats including any European and national designations.,
- LCA 25: Support the identification of projects that have the potential to achieve commercial value such as industrial developments, renewable energy, tourism developments etc. while at the same time promoting high environmental standards and supporting Biodiversity objectives.,
- LCA 26: Support the restoration of peatlands on suitable sites.,
- LCA 27: Recognise that intact boglands are critical natural resources for ecological and environmental reasons and recognise that cutaway

and cut-over boglands represent degraded landscapes and/or brownfield sites and thus are potentially robust to absorb a variety of appropriate developments.,

- BNH 31: Protect waterbodies and watercourses from inappropriate development, to ensure they are retained for their biodiversity and flood protection values and to conserve and enhance where possible, the wildlife habitats of the County's rivers and riparian zones, lakes, canals and streams which occur outside of designated areas to provide a network of habitats and biodiversity corridors throughout the county.,
- BNH 32; Promote and develop the Barrow Blueway initiative and work with State Agencies, landowners, local communities and other relevant groups to protect and manage inland waters, river corridors and their floodplains from degradation and damage, and to recognise and promote them as natural assets of the urban and rural environment.,
- BNH 33: Promote and Facilitate the development of the Grand Canal for cycling, walking and nature study in conjunction with the relevant bodies including Waterways Ireland to enhance its amenity. Investigate the possibility of developing long distance walking routes/Greenway, within the lifetime of the Plan, along the disused Mountmellick Grand Canal Line.,
- BNH 34: Protect riparian corridors by reserving land along their banks for ecological corridors and maintain them free from inappropriate development. Where developments are proposed adjacent to waterways in previously undeveloped areas, the Planning Authority will require a general setback distance of a minimum of 10 metres from the waterways edge, subject to site-specific characteristics and the nature and design of the development. In previously developed areas, for example, within town centres, this general setback distance is likely to be reduced and should be part of any pre-planning consultations with the Council.,
- BNH 35: Require that development along rivers set aside lands for pedestrian routes and cycleways that could link to the broader area and established settlements in the area.,
- BNH 36: Provide for public access to waterways where feasible and appropriate, in partnership with the National Parks and Wildlife Service (NPWS), Waterways Ireland and other relevant stakeholders, whilst maintaining them free from inappropriate development, subject to Ecological Impact Assessment and Appropriate Assessment, as appropriate.,
- BNH 37: Protect the Nore Pearl Mussel through the measures set out in the Freshwater Pearl Mussel Nore Sub-Basin Management Plan (2009).and
- BNH 6.

Overarching developmental Policies including DM HS 19 and Objective BHM 5 will require the developments within residential areas will require a landscape plan and Screening for AA or NIS to both account for invasive species.

It has been determined that the risk of impact on any QIs and conservation objectives of all European Sites have been addressed by the inclusion of mitigation measures within the County Development Plan. Avoidance of effects is prioritised, and mitigation implemented where it cannot be avoided. In

addition, any lower level plans and projects arising through the implementation of the Plan will themselves be subject to relevant stages of Appropriate Assessment when further details of design and location are known.

Therefore, the Laoise County Development Plan 2021-2027 is not anticipated to contribute to cumulative or on-combination effects.

5.2.2 Third Cycle River Basin Management Plan for Ireland 2022-2027 (DoHPLG, 2022)

The first cycle of River Basin Management Plans included the Eastern River Basin District - River Basin Management Plan (ERBDMP) 2009 – 2015 (WFD (2010). The plans summarised the waterbodies that may not meet the environmental objectives of the WFD by 2015 and identified which pressures are contributing to the environmental objectives not being achieved. The plans described the classification results and identified measures that can be introduced in order to safeguard waters and meet the environmental objectives of the WFD.

- Prevent deterioration of water body status.
- Restore good status to water bodies.
- Achieve protected areas objectives.
- Reduce chemical pollution of water bodies

The 2nd cycle River Basin Management Plan (RBMP) for Ireland 2018-2021 sets out the actions that Ireland will take to improve water quality and achieve 'good' ecological status in water bodies (rivers, lakes, estuaries and coastal waters) by 2021 (DoHPLG, 2018a). Changes from previous River Basin Management Plans is that all River Basin Districts are merged as one national River Basin District. The Plan provides a more coordinated framework for improving the quality of our waters — to protect public health, the environment, water amenities and to sustain water-intensive industries, including agri-food and tourism, particularly in rural Ireland.

The 3rd and current cycle aims to build on the initiatives of the second cycle, particularly the governance and implementation structures, and to improve the establishment of Irish Water, An Forum Uisce, the Local Authority Waters Programme and the Agricultural Sustainability Support and Advisory Programme.

The 3rd cycle draft Catchment Report for Barrow Catchment (EPA, 2021) identified that between Cycles 2 and 3 there has been an overall slight decline in the catchment's status. The overall change in quality between Cycles 2 and 3 include three waterbodies achieving a High Status, which is an increase one, 91 which are achieving a Good Status which is a decrease by six between Cycles, 51 achieving a Moderate Status which is an increase by two waterbodies, 24 achieving a Poor Status which is an increase by five waterbodies between Cycles, and the number of waterbodies achieving a Bad Status remains unchanged.

Given the nature of the Third-Cycle River Basin Management Plan for Ireland it is not anticipated to contribute to cumulative or on-combination effects in respect to the proposed development.

5.3 Other Projects

Other projects dating back three years, which are not retention applications, home extensions and/or internal alterations (except where they are taking place adjacent to or in close proximity to the proposed defences) that have potential overlapping construction (i.e., 2025 onwards) and short-term residual effect phases with the proposed development are listed in

Table 5-1and shown in Figure 5-1.

Table 5-1: Other projects within the locality which may have an accumulative effect on the development of the project

Planning Reference	Location	Description	Application Status	Rationale
22568	Davitt Road, Mountmellick, Co. Laois.	A) demolish existing building, B) build 32 two bedroom apartments, in four, two storey blocks, C) bin bays and cycle shelters, D) 61 parking spaces, E) site entrance and all associated site works. The planning application may be inspected, or purchased at a fee not exceeding the reasonable cost of making a copy, at the offices of the planning authority during its public opening hours. Note: a Natura impact statement will be submitted to the planning authority with the application and the natura impact statement will be available for inspection or purchase at a fee not exceeding the reasonable cost of making a copy during office hours at the office of the relevant planning authority.	Permission granted (conditional) 23/8/2023	Potential impacts from this development include contaminated sewage and surface water discharges to the River Owenass, contamination of infill material into the the spread of Japanese Knotweed. Mitigation measures including the eradication of Japanese Knotweed, separation of the combined sewer system into a separate surface and sewer water system, and the utilisation of a silt interceptor prior to the attenuation of runoff. The implementation of these measures will prevent any effect on an Natura 200 sites
19558	Cullenbeg Park, Ballycullenbeg, Mountmellick	construct 70 no. 2-storey houses and associated site development works. The houses proposed will consist of 2 no. 4-bedroom end-of-terrace houses, 41 no. 3-bedroom terraced houses and 27 no. 2-bedroom terraced houses in 16 no. 2-storey blocks. A Natura Impact Statement has been prepared in respect of this application	Permission granted 05/10/2020. Expires 04/10/2025	Potential impacts from the development include the contamination and pollution of the River Owenass due to concrete and cement. Suspended solid or, hydrocarbons and chemicals entering the local waterbody and impacting on local flora and fauna. Mitigation measures in place include concrete and cement management protocol, the addition of a silt fence and stockpiling of materials, and scheduled fuelling to occur in

Planning Reference	Location	Description	Application Status	Rationale
				the furthest point away from the River Owenass. The implementation of these measures will prevent any effect on Natura 2000 sites
20208	St Vincent's Hospital, Ballycullenbeg, Mountmellick	construct a new build 50 bed unit for the replacement of existing beds including support services, associated site works, reconfiguration/ upgrade landscaping works and associated minor works	Permission granted 12/10/2020. Expires 11/10/2025	Project is located in an urban environment will be subject to having mitigations in place to reduce dust, noise and water pollutants which will prevent any in-combination impacts
21204	Townparks, Mountmellick, Co. Laois	construct a dwelling house, detached domestic garage / shed, waste water treatment system and all associated site works	Permission granted 24/06/2021. Expires 23/06/2026	Lack of connection between the Plan and Natura 2000 site QIs and no in-combination impacts are anticipated
19428	Patrick Street, Mountmellick, Co. Laois	construct a 62 bedroom two-storey nursing home, 8 two storey step down apartment units, landscaped gardens, parking area, service yard, refuse areas, esb transformer room, new service connections and all ancillary work	Permission granted 09/10/2020. Expires 06/07/2026.	Project is located in an urban environment will be subject to having mitigations in place to reduce dust, noise and water pollutants which will prevent any in-combination impacts
16536	Acragar, Mountmellick, County Laois	erect a 4.2MVA solar farm comprising photovoltaic panels on ground mounted frames, four single storey inverter/transformer stations, one single storey terminal station, one single storey electrical switchroom, security fencing, CCTV and all associated ancillary development works	Permission granted 30/01/2017. Expires 29/01/2027	Lack of connection between the Plan and Natura 2000 site QIs and no in-combination impacts are anticipated
16505	Sronagh, Mountmellick, Co. Laois	construct for 10 years a Solar PV Energy Development comprising installation of photovoltaic panels on ground mounted frames/ support structures; underground cabling and ducting; 3 no. inverter/ transformer stations with 2 no. HV cabins; 1 no. communications and storage structure; 2 no. substations; perimeter (stock proof) security fencing (2m high, c. 13.91 hectares); CCTV security cameras; site access road; landscaping and all associated ancillary site development works. Temporary works will also include a construction compound and passing-bay adjoining the existing access road	Approved 20/07/2017. Expires 19/07/2027	Lack of connection between the Plan and Natura 2000 site QIs and no in-combination impacts are anticipated
216	Ballycullenbeg, off Harbour	develop 54 dwelling units comprising of the following: 1. 48No. dwellings in terraces of 4 dwellings, comprising of 22No. 3 bedroom 2 storey end-terrace units, 14 No. 3 bedroom 2 storey	Approved 25/01/2022. Expires	Project will have mitigations in place to reduce dust, noise and water pollutants which

Planning Reference	Location	Description	Application Status	Rationale
	Street, Mountmellick	mid-terrace units, 8No. 2 bedroom 2 storey mid-terrace units, 2No, 2 bedroom bungalow end-terrace units & 2No, 2 bedroom bungalow mid-terrace units, and 6No. semi-detached 3 bedroom 2 storey dwellings. 2. Remove part of existing boundary screen wall and create new entrance road, vehicular entrances and footpaths onto Grange Hall. Continue the existing entrance wall facing onto Harbour street to No. 1 Harbour Street and returning alongside No. 1 Harbour Street. 3. Installation of all necessary and associated site works to include foul drains connecting onto Harbour Street and surface water drains with underground attenuation connecting to existing watercourse, telecommunications, water and service ducts, roadways, footpaths, green spaces, landscaping, public lighting, ESB and communications mini-pillars, car parking , signage, bin storage areas etc.	15/12/2027	will prevent any in-combination impacts
22439	Townparks, Mountmellick , Co.Laois	construct 49 dwelling units consisting of 23 no. House Type A (3 bedroom semi-detached house), 4 no. House Type B (3 bedroom semi-detached house), 8 no. House Type C Duplex units (1 bed dwelling), 10 no. House Type D (2 bedroom semi-detached house), 2 no. House Type H (2 bedroom single storey semi-detached house), 1 no. House Type F (2 bedroom two storey semi-detached house), 1 no. House Type G (3 bedroom two storey semi-detached house), 1 no. communal refuse storage pavilion, bicycle storage, provision of internal roads and footpaths, surface level car parking, entrance point to adjoining public roads, pedestrian links, public lighting, landscaping, public open space, boundary treatments, provision of foul and surface water disposal, upgrade works and traffic calming to surrounding road network and all associated site works - A Natura Impact Statement (NIS) has been prepared in respect of the proposed development and accompanies this application	Approved 08/05/2023. Expires 07/05/2028.	Potential impacts from the development include the contamination and pollution of the River Owenass through the release of uncured concrete, hydrocarbons and infiltration of runoff. Mitigation measures in place include the adoption of a water control protocol following best practices and the reseeding of the banks as soon as possible to allow for early stabilisation of the banks, along with the inclusion of a silt fence and daily inspections, the storage of materials, equipment, materials and the preparation works for construction (fuelling, cement mixing) will take place away from the River. The implementation of these measures will prevent any effect on Natura 2000 sites.

Planning Reference	Location	Description	Application Status	Rationale
2460542	Townparks and Smiths Field, Ballycullenbeg, Mountmellick, Co. Laois	Replace the existing grass pitch with a new Astro turf playing surface, new perimeter fencing to pitch, new footpaths and public lighting, new footbridge over the River Owenass linking Townparks and Ballycullenbeg, including all services and associated site works. This site is located with a Natura 2000 designated area. A Natura Impact Statement (NIS) has been submitted with this application.	Permission granted 03/03/2025 Expires 06/04/2030	Potential impacts from the development include the contamination and pollution of the River Owenass through the release of excavated silt, the release of contaminants into the surface water, hydrocarbons and infiltration of runoff. Mitigations include the application of interceptors and silt fences, appropriate use of bunding, and limiting of work to dry weather conditions.

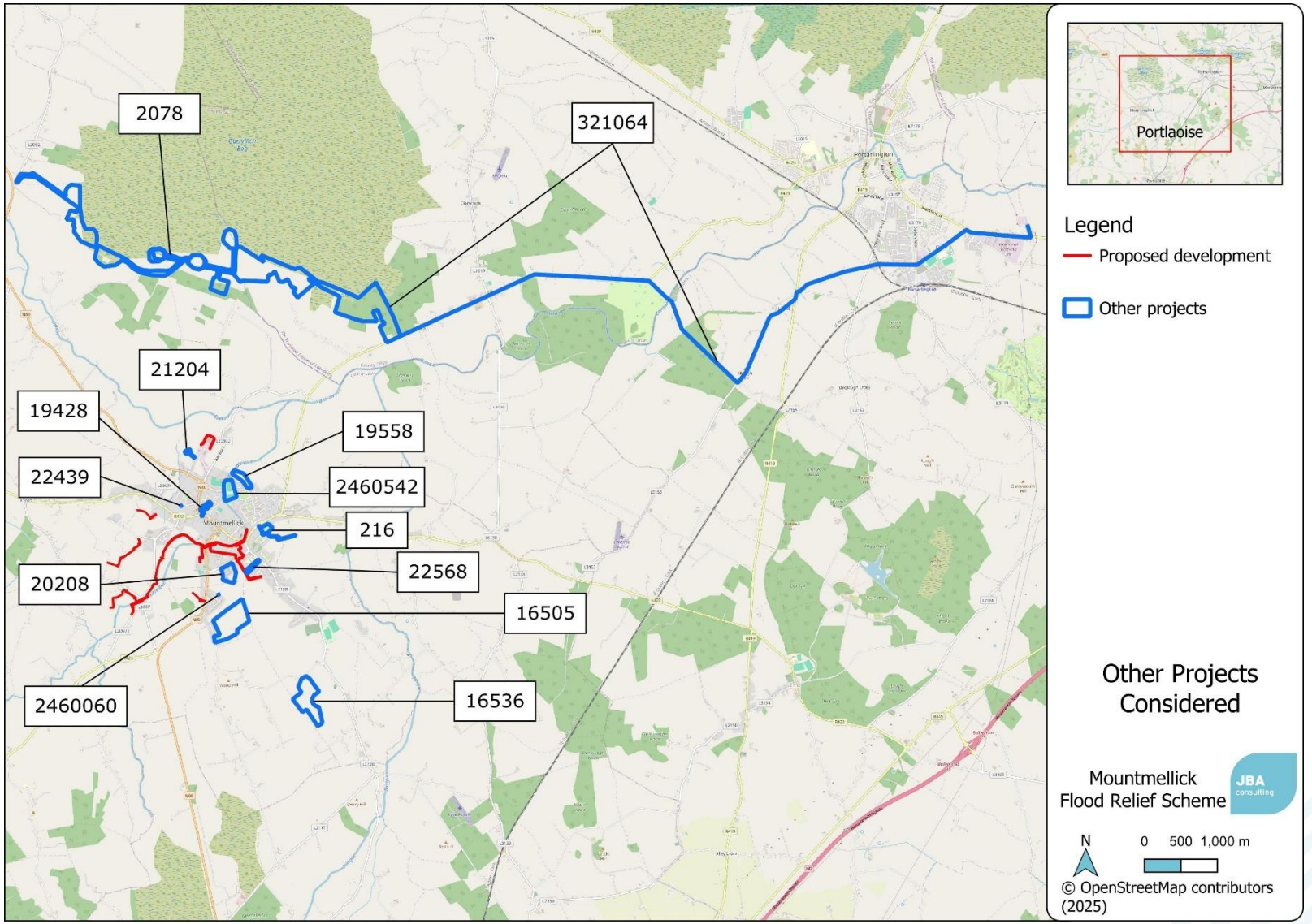


Figure 5-1: Other projects considered for cumulative effect

5.4 Summary

The developments permitted above have the potential to have overlapping construction phases with the proposed development and therefore, in the absence of mitigation measures, may result in potential in-combination or cumulative impacts on Natura 2000 sites.

6 Screening Assessment

6.1 Introduction

This screening exercise will focus on assessing the likely adverse effects of the project on the Natura 2000 sites identified in Section 4 above.

This section identifies the potential effects which may arise as result of the proposed project. It then goes on to identify how these effects could potentially impact on Natura 2000 sites listed in Table 4-1. The significance of potential effects is also assessed, with any potential in-combination effects also identified.

The Natura 2000 sites to be assessed are:

- River Barrow and River Nore SAC [002162]
- Mountmellick SAC [002141]

6.2 Assessment Criteria

6.2.1 Description of the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to effects on the Natura 2000 sites

Potential impacts that could cause a likely significant effect on the qualifying interests of the Natura 2000 sites during the construction and operational phases of the project, will effect on the sites via surface water pathways, groundwater pathways and land and air pathways.

Surface water pathways can effect on surface water quality and surface water dependent habitats and species.

Groundwater pathways can transmit effects where there is contamination of water entering the groundwater body which is then discharged (sometimes over periods of several decades) and effects groundwater dependent habitats and species that rely on them.

Land pathways are related to physical disturbance of habitats or species and generally only occur over short physical distances. Air pathways relate to the transport of material, generally dust and atmospheric pollution, via air movements that are subsequently deposited on habitats and species in or connected to the Natura 2000 sites.

The proposed project is anticipated to effect on the qualifying interests of the River Barrow and River Nore SAC Natura 2000 site through surface and groundwater pollutants, and air and dust pollutants while also impacting on the riverine characteristics of the River Owenass, disrupting the QIs of the Natura 2000 site. The rationale for including impacts via the main pathways is given in more detail in the following sub-section.

6.2.2 Surface Water Pathways

The proposed project is located within the WFD Barrow catchment and is divided between Barrow_SC_010 and Barrow_SC_020 sub-catchments. (Figure 6-1, overleaf).

Mountmellick SAC

The site shares the Barrow_SC_020 sub-catchment with the Mountmellick SAC, linked by the Clontygar Stream and the downstream River Triogue. However, given that the Mountmellick SAC is located in an upstream position within this sub-catchment; and that the flooding modelling of the locality (JBA, 2023) highlights the absence of a flood zone link with the proposed development site; it can be screened out of any potential likely significant effects as a result of the construction and operational phases of the proposed developments works.

River Barrow and River Nore SAC

The River Barrow and River Nore SAC passes through the townland boundary and incorporates the River Owenass, its tributaries and its riparian zone, which the main focus of the FRS works.

QIs of the River Barrow and River Nore SAC that would be located within the ZoI of the proposed FRS development are listed below:

- Water courses of plain to montane levels with the *Ranunculion fluitanis* and *Callitricho-Batrachion* vegetation [3260]
- Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]
- Otter *Lutra lutra* [1355]
- Brook Lamprey *Lampetra planeri* [1096]
- River Lamprey *Lampetra fluviatilis* [1099]
- Atlantic Salmon *Salmo salar* [1106]
- White-clawed Crayfish *Austropotamobius pallipes* [1092]

The following QIs have not been included, with reasoning provided below:

- Freshwater Pearl Mussel *Margaritifera margaritifera* [1029]
- Twaite Shad *Alosa fallax fallax* [1103]
- Desmoulin's Whorl Snail *Vertigo moulinsiana* [1016]
- Killarney Fern *Vandenboschia speciosa* [6985]
- Estuaries [1130]
- Mudflats and sandflats not covered by seawater at low tide [1140]
- Reefs [1170]
- Salicornia and other annuals colonising mud and sand [1310]
- Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]
- Mediterranean salt meadows (Juncetalia maritimi) [1410]
- European dry heaths [4030]
- Petrifying springs with tufa formation (Cratoneurion) [7220]
- Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]
- Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0]

The Annex II species Nore Pearl *Mussel Margaritifera durrovensis* [1990] is only found in the upstream sections of River Nore. It is in a separate catchment and not within a pathway of the proposed maintenance works of the River Owenass and is therefore screened out.

Twaite Shad are present in the lower reaches of the River Barrow and there have been no records of Twaite Shad above the weir at St Mullins in Co. Carlow which is approximately 100km downstream of the Mountmellick and is outside the ZoI of this project.

Desmoulin's Whorl Snail and Killarney Fern are present in the lower reaches of the River Barrow, recorded in the areas of Borris, Co. Carlow, and

Gaiguenamanagh, Co. Kilkenny, approximately 99km and 110km downstream of the site, respectively/

Coastal and marine habitats including Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330], Mediterranean salt meadows (Juncetalia maritimi) [1410], Salicornia and other annuals colonising mud and sand [1310], Reefs [1170] and Estuaries [1130] are present in the lower reaches of the River Barrow, to the north-east of Waterford city, starting approximately 130km downstream of the Scheme.

Construction Phase

During site enabling works, removal of existing infrastructure, excavations, piling and construction of new walls and embankments, there is potential for accidental release of suspended solids and bound nutrients, as well as pollutants into the adjacent River Owenass system and associated habitats over the course of the construction phase.

Construction works can impact directly on QI fish populations through the direct mortality of adult cohorts and/or juvenile fish in addition to killing eggs on/or within river substrata should chemicals, such as hydrocarbons or concrete, be introduced into the surface water network. Indirect impacts can occur as a result of the smothering of spawning substrata with suspended solids making them unviable for spawning, and thus reducing the longer-term prospects of survival for QI fish populations. This would impact availability of prey for Otter.

Additionally, works such as flood defence wall and embankments installation may give rise to the release of suspended solids (and nutrients) into the local surface water network degrading the water quality. These would have knock-on impacts for the local Otter population. Furthermore, any deterioration in water quality from pollutants has the potential to adversely impact downstream Annex I habitats Water courses of plain to montane levels with the *Ranunculion fluitanis* and *Callitricho-Batrachion* vegetation and Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels.

Therefore, in the absence of mitigation measures, and given the nature of the works and the location of the River Barrow and River Nore SAC, likely significant effects via the surface pathway are anticipated during the construction phase.

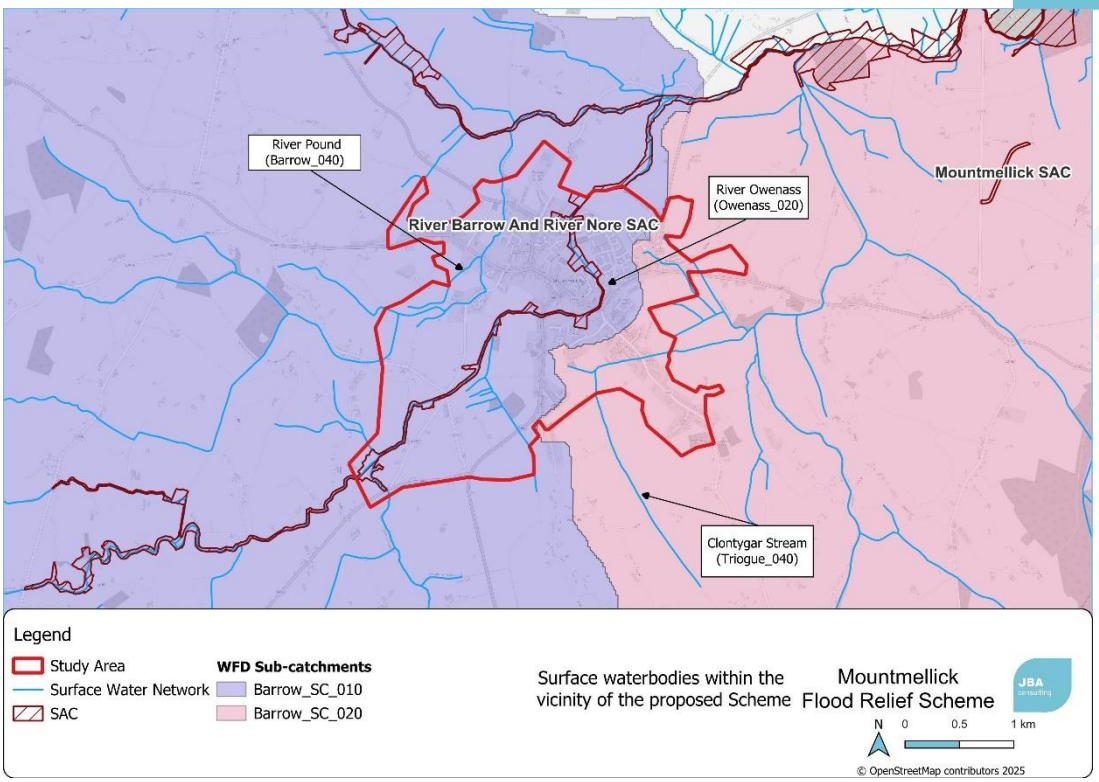


Figure 6-1: Study area location and Natura 2000 sites, with local surface water sub-catchments and watercourses (OSM, 2025)

Operation Phase

The main operational impact of the FRS works will be the relocation of the local watercourses' flood plains within the study area. The nature of this operational impact is mixed, as the flood defences will prevent flood waters entering major urbanised areas, reducing urban-based pollutants entering surface water network during flood events; however, the redirected flood waters will instead enter agricultural lands, which are likely to be nutrient enriched, which may in turn lead to increased nutrient levels within the local surface water network.

Therefore, in the absence of mitigation, likely significant effects are anticipated for the River Barrow and River Nore SAC via surface water pathway during the operational phase.

6.2.3 Groundwater

The majority of the site is encompassed by the Portlaoise groundwater body, with a small section which enters the Rosenallis Gravels groundwater body (Figure 6-2). The Mountmellick SAC shares this Portlaoise groundwater body with the site, however, given the low retention and low flow characteristics of this groundwater body, pollutants will discharge into the immediate watercourses adjacent to the proposed works, and therefore are unlikely to reach the Mountmellick SAC via the groundwater pathway given the distance between this SAC and the proposed works.

The River Barrow and River Nore SAC is within the same groundwater body as the project and given that the proposed works are located within the SAC, there is the potential for the pollution of the groundwater table within the terrestrial sections of the SAC.

Therefore, in the absence of mitigation, likely significant effects on the River Barrow and River Nore SAC via the groundwater pathway are

anticipated during the construction phase of the proposed development given the location of the proposed works.

Regarding the groundwater-to-surface water impact pathway, the characteristics of the underlying aquifer means it is likely to rapidly discharge to the nearby watercourses, i.e., the River Owenass, River Pound and their tributaries. Therefore, pollution spill events or leachates from stockpiles could lead to adverse impacts on River Barrow and River Nore SAC and the screened in QI species and habitats via the groundwater-to-surface water pathway.

Therefore, in the absence of mitigation, likely significant effects via the ground-to-surface water pathway are anticipated for the River Barrow and River Nore SAC during the construction phase of the proposed works.

Given the operational nature of the proposed development, adverse impacts via the ground-to-surface water pathway are not anticipated to result in likely significant effects for the River Barrow and River Nore SAC and its QI species and habitats during the operational phase.

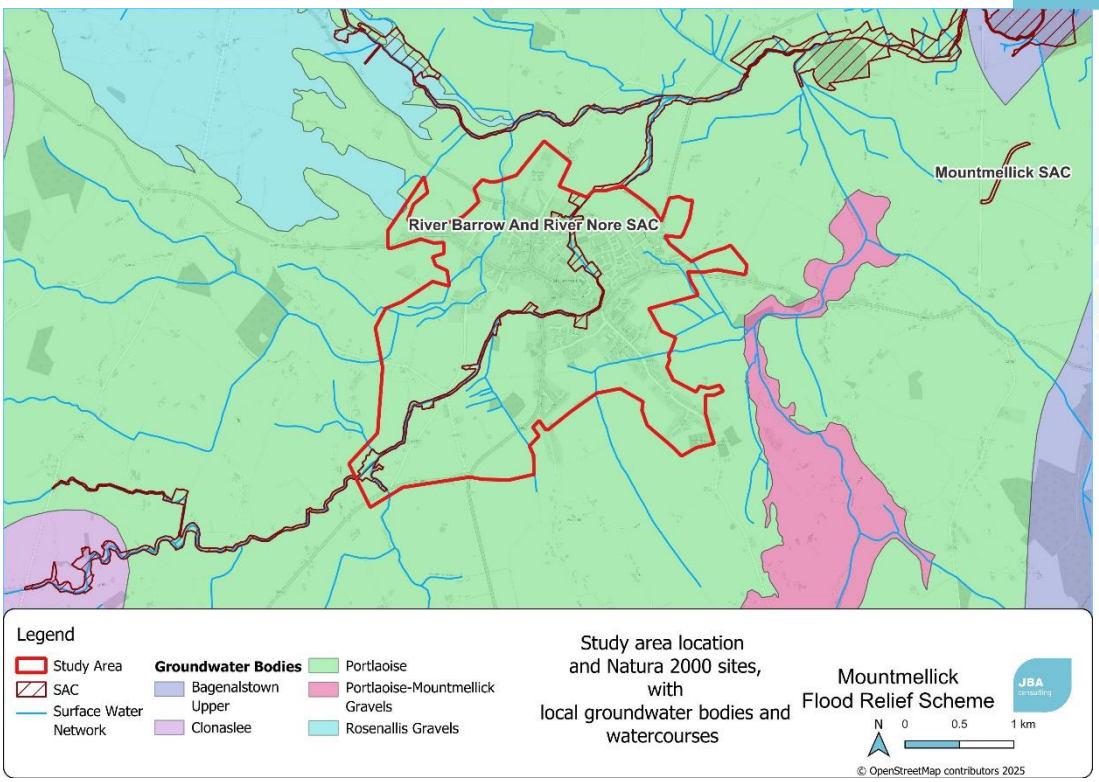


Figure 6-2: Study area location and Natura 2000 sites, with local groundwater bodies and watercourses (OSM, 2025)

6.2.4 Land and Air

The loss or degradation of supporting habitats outside the identified Natura 2000 sites via land- and air-based effects could have potential adverse effects on a number of the QIs associated with these Natura 2000 sites. Land and air pathways are assessed separately below.

As the proposed FRS works are located approximately 2.2km from the Mountmellick SAC, adverse impacts generated by the developments' construction phase leading to likely significant effects, via the land and air pathways, are not anticipated for this Natura 2000 site.

6.2.4.1 Land (habitat loss and disturbance)

River Barrow and River Nore SAC

The construction works will result in physical disturbance of the lands within and immediately adjacent to the River Barrow and River Nore SAC. The proposed works will result in both temporary and permanent habitat loss of riparian and riparian-adjacent habitats along the banks of the River Owenass, River Pound, Garroon Stream and Clontygar Stream.

Therefore, in the absence of mitigation, likely significant effects are anticipated for the River Barrow and River Nore SAC via the land pathway during the construction phase and operational phase of the proposed FRS development.

Direct physical effects and indirect effects, including visual and noise disturbance, have the potential to physically disturb the local Otter population's foraging activities, as well as their associated riparian habitats, which provide general refuge.

Therefore, in the absence of mitigation, disturbance-based impacts have to the potential to result in likely significant effects for the River Barrow and River Nore SAC's Otter population.

6.2.4.2 Air Pollution

Excavations at the site will produce loose top and sub-soil, and emissions may arise from working machinery and an increase in local traffic. Dust release and vehicle emissions can travel considerable distances and could potentially have an effect on the QIs of Natura 2000 sites. The recommended buffer for dust and air pollution is 500m as a baseline.

Of particular concern for the River Barrow and River Nore SAC is cement-based dust during the construction and installation of the concrete walls, and the replacement of the Owenass Bridge during the project, given its alkalinity and capacity to contain heavy metals, such as chromium, nickel, cobalt, lead and mercury (Jóźwiak & Jóźwiak, 2009), which can have notable negative impacts on sediments, flora, fauna and water quality where introduced (Shah et al., 2020). During construction cement-based dust has the potential to settle in the foraging grounds (supporting ex-situ habitats) of the QI species (Otter), leading to the degradation of the flora and fauna consumed by these protected species. Furthermore, cement-based dust has the potential to settle within the local watercourses, transporting these contaminants towards QI habitats potentially located downstream of the works.

Therefore, in the absence of mitigation, likely significant effects from cement-based dust via the air and air-to-surface water pathways are anticipated during the construction phase of the proposed development for the River Barrow and River Nore SAC.

6.2.5 Cumulative Effect

In the absence of mitigation, the proposed development is anticipated to potentially have a likely significant effect on QIs or conservation objectives of the River Barrow and River Nore SAC; and based on the screening statements of the planning applications, there is potential for these to act in combination with it to result in likely significant effect on River Barrow and River Nore SA**C**.

In the absence of mitigation, the proposed development is not anticipated to potentially have likely significant effects on the QIs or conservations objectives of the Mountmellick SAC, and based on the screening statements of the planning applications, there is no potential for these to act in combination with it to result in likely significant effect on the Mountmellick SAC

6.2.6 Summary

Due to the nature of the works and the location of the proposed development within the boundaries of the SAC, the proposed development is anticipated to have a likely significant effect via surface water, groundwater-to-surface water; air (visual and audible disturbance) pathways, air (dust settlement) and air-to-surface water (dust settlement) pathways to the River Barrow and River Nore SAC, and its QI species and habitats.

6.2.7 Description of likely direct, indirect or secondary effects of the project (either alone or in combination with other plans or projects) on the Natura 2000 sites

Project Elements	Comment
Size and scale	The proposed FRS development involves the construction of new bankside walls along with the alteration of existing walls, the creation of embankments, the deconstruction and reconstruction of the Owenass Bridge, realignment of local streams and ditches, the addition of

Project Elements	Comment	
	crossing points and the removal of vegetation to allow for the creation of managed flood areas.	
Land-take	There will be low level direct land take from any Natura 2000 sites through the removal of scrubland and the construction of embankments and walls.	
Distance from Natura 2000 site or key features of the site	River Barrow and River Nore SAC Mountmellick SAC	Within site 2.2km
Resource requirements (water abstraction etc.)	There will be no water abstraction requirement.	
Emissions (disposal to land, water or air)	**Construction Phase:** **Water** The proposed site contains direct hydrological links with the River Barrow and Nore SAC. Surface water-based emissions to the local freshwater systems flowing into the Natura 2000 sites is anticipated, while the implementation of a dry cell during instream works will temporarily alter of the flow and structure of the River Owenass during construction is also anticipated, which may disrupt local QI wildlife. Given the size of the project, groundwater-based pollutants are also anticipated to impact on the QI species of the River Barrow and River Nore SAC. The proposed site does not contain either direct surface water hydrological links, or a notably strong groundwater connection with the Mountmellick SAC, and the project is not anticipated to negatively affect the QIs of this Natura 2000 site via the water pathway during the construction phase. **Air** During construction cement-based pollutants have the potential to settle in the foraging grounds (supporting ex-situ habitats) of the QI species including Otter and fish species, leading to the degradation of the flora and fauna consumed and utilised by these protected species. Furthermore, cement-based pollution has the potential to settle within	

Project Elements	Comment
	the local watercourses within the ZoI, transporting these contaminants to Annex habitats potential present downstream. The Mountmellick SAC is located approximately 2.2km away from the Scheme, and it is considered to be outside of the zone of influence for air-based effects to occur. **Operation phase:** **Water** The integration of the flood plains of Baker's Field and the section of the SAC in the centre of Mountmellick town within the study area into the flood relief scheme. The nature of this operational impact is mixed, as the flood defences will prevent flood waters entering major urbanised areas, reducing urban-based pollutants entering surface water network during flood events; however, the redirected flood waters will instead enter agricultural lands (Baker's Field), which are likely to be nutrient enriched, which may in turn lead to increased nutrient levels within the local surface water network. There are no likely significant effects from the Scheme on the Mountmellick SAC, given the operational effects will be localised along the River Owenass, and will not be in the vicinity of the Mountmellick SAC.
Excavation requirements	Construction will require the excavation of foundations for flood walls, embankments and the abutments of the new Owenass Bridge.
Transportation requirements	**Temporary Impacts:** Levels of traffic to the site during the construction phase will increase traffic to the area but will be temporary in nature. All access to the site will be on pre-existing roads and transportation requirements will not affect Natura sites. **Permanent Impacts:** Given the size, scale and location of the proposed project, transportation requirements during operation will not

Project Elements	Comment
	affect Natura 2000 sites.
Duration of construction, operation, decommissioning etc.	Works are anticipated to take 36 months, plus any additional time due to unforeseen delays
Other	None

6.2.8 Description of likely changes to the Natura 2000 sites

Potential Effect	Comments
Reduction of habitat area	There will be slight reduction in habitat area for the River Barrow and River Nore SAC.
Disturbance to key species	**Temporary Effects:** The construction works will temporarily increase the noise level and disturbance locally, which will temporarily disrupt the foraging and activities of local species of Otter or local QI fish species. Significant effects are likely to key species given scale and temporary nature of the construction phase and distance from the Natura 2000 sites. **Permanent Effects:** Disturbance to key QI species is not anticipated during operation of the development; FRS is not anticipated to disturb local fish species and there will be in-built mitigation for the protection of local Otter. .
Habitat or species fragmentation	There will be temporary habitat fragmentation within the River Barrow and River Nore SAC during the utilisation of a dry cell within the River Owenass.
Reduction in species density	There will be no temporary or permanent reduction in species density within the River Barrow and Nore SAC, or any QIs of these sites.
Changes in key indicators of conservation value (water quality etc.)	**Temporary Effects:** The construction works have the potential to temporarily increase the pollutants generated in the vicinity of the River Owenass River Pound and Clontygar Stream, which will impact on the overall water quality in both the area and downstream and will lead to temporary changes in key indicators of conservation value (surface water, groundwater and air quality). This will include the distribution and location of indicator species that are vital to the SAC.
Climate change	N/A

6.2.9 Description of likely impacts on the Natura 2000 sites as a whole

Potential Impact	Comments
Interference with the key relationships that define the structure of the site	Interference with the key relationships that define the structure of the site (i.e. river) are anticipated, i.e., extending the functionality of Baker's field and the removal of barriers to the other flood plain within the centre of Mountmellick as a floodplain, disturbance of fish breeding environments.
Interference with key relationships that define the function of the site	Interference with key relationships that define the function of the sites are not anticipated.

Provide indicators of significance as a result of the identification of effects set out above in terms of:

Potential Impact	Comments
Loss (Estimated percentage of lost area of habitat)	Small scale temporary loss of vegetation during construction.
Fragmentation	Fragmentation of habitat and/or species is anticipated through the utilisation of a dry cell during instream works which could restrict the passage of QI Fish and Otter within the River Owenass.
Disruption & disturbance	Disruption and/ or disturbance of the following species are anticipated from the proposed project: Otter [1355]; White-clawed Crayfish [1092]; Brook Lamprey [1096]; River Lamprey [1099]; and Atlantic Salmon [1106].
Change to key elements of the site (e.g., water quality)	Potential temporary changes to key elements (i.e. water quality) of the site are anticipated due to pollution of the local watercourses.

6.2.10 Describe from the above those elements of the project or plan, or combination of elements, where the above effects are likely to be significant or where the scale or magnitude of effects is unknown

Based upon best scientific judgement, significant effects cannot be ruled out from the elements mentioned above, and there are no elements where the scale or magnitude of effects is unknown.

6.3 Concluding Statement

In carrying out this AA Screening, mitigation measures have not been taken into account.

On the basis of the screening exercise carried out above, it can be concluded that the possibility of any likely significant effects on the Mountmellick SAC Natura 2000 site within the ZoI, whether arising from the project itself or in combination with other plans and projects, can be excluded beyond a reasonable scientific doubt on the basis of the best scientific knowledge available.

However, likely significant effects on the River Barrow and River Nore SAC are likely in the form of disruption to the following Annex habitats and QI species:

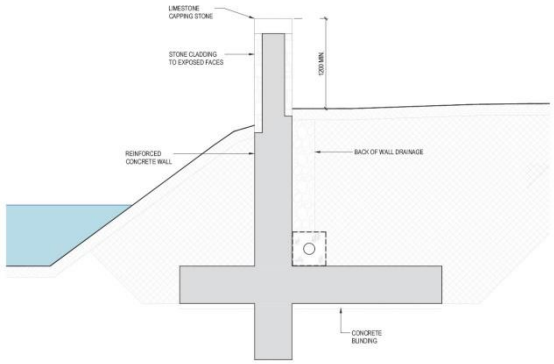
Water courses of plain to montane levels with the *Ranunculion fluitanis* and *Callitricho-Batrachion* vegetation [3260]

- Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]
- Otter *Lutra lutra* [1355]
- Brook Lamprey *Lampetra planeri* [1096]
- River Lamprey *Lampetra fluviatilis* [1099]
- Atlantic Salmon *Salmo salar* [1106]
- White-clawed Crayfish *Austropotamobius pallipes* [1092]

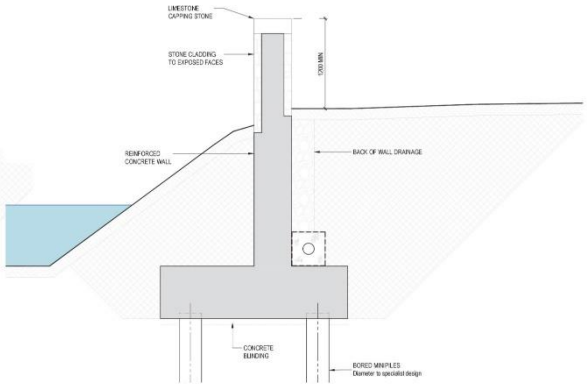
As a result of the proposed development, this report declares that this proposed project must progress to next stage, Stage 2: Appropriate Assessment / Natura Impact Statement (NIS), so that mitigation measures may be outlined and incorporated into the proposed construction works, in order to safeguard the Natura 2000 sites from any likely significant effects via the source-receptor-pathways highlighted in this report.

Appendices

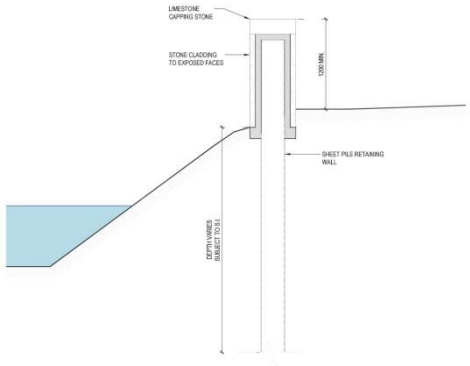
A Typical Flood Wall Details



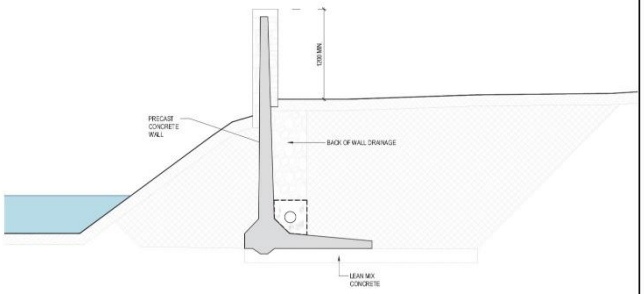
Typical Detail 1:
In situ reinforced concrete foundation up to 3m (TBC) depth below ground, constructed from the bank, and in situ reinforced concrete wall up to 1.9m (TBC) high



Typical Detail 2:
Concrete micro piling (instream) (bored mini piles) up to 3m (TBC) depth below formation, constructed from the bank, in situ reinforced concrete wall or precast wall above ground (clad) up to 1.9m (TBC) high.



Typical Detail 3:
Sheet piling typically 3m (TBC) depth below ground or bed level, constructed from the bank or instream, sheet piling wall or in situ reinforced concrete wall above ground (clad) up to 1.9m (TBC) high.



Typical Detail 4:
(instream) – Precast Concrete Wall up to 3m below existing ground level (TBC), constructed instream, wall (clad) up to 1.2m (TBC) high.

Typical Flood Wall Details

Mountmellick Flood Relief Scheme

Not to Scale

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