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Clare County Council

Springfield Flood Relief Scheme

Appropriate Assessment Natura Impact Statement

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Glossary of Terms and Abbreviations

AA	Appropriate Assessment
AASS	Appropriate Assessment Screening Statement
AEP	Annual Exceedance Probability
CFRAMS	Catchment Flood Risk Assessment and Management Study
CIEEM	Chartered Institute of Ecology and Environmental Management
CO	Conservation Objectives
EEC	European Economic Community
European Sites	Appropriate assessment tests whether a plan or a project is likely to have a significant negative impact on any Special Protection Areas, Special Areas of Conservation, and/or Ramsar sites. Jointly, these are called 'European sites'.
EU	European Union
FRS	Flood Relief Scheme
IROPI	Imperative Reasons of Overriding Public Interest
km	Kilometre
LSE	Likely significant effects
m	Metres
m^2	Square metres
mm	Millimetres
Natura 2000	Natura 2000 is a network of core breeding and resting sites for rare and threatened species, and some rare natural habitat types which are protected in their own right. It stretches across all 27 EU countries, both on land and at sea.
NBDC	National Biodiversity Data Centre
NIS	Natura Impact Statement
OPW	Office of Public Works
SAC	Special Area of Conservation
SCI	Special Conservation Interests
SEA	Strategic Environmental Assessment
SPA	Special Protected Area
QIs	Qualifying Interests
UoM	Unit of Management
Zone of Influence	The area where potential environmental changes may potentially impact upon sensitive environmental receptors, considering the spatial scope of the proposed scheme.

1 Introduction

1.1 Purpose of Report

This document is a Natura Impact Statement (NIS) to inform the Appropriate Assessment (AA) process, prepared in accordance with the requirements of the European Communities (Birds and Natural Habitats) Regulations 2011 (SI No. 477/2011), as amended[1].

This report has been prepared by ByrneLooby and their sub-consultant[2] on behalf of Clare County Council, in respect of a proposed flood relief project in Springfield, Clonlara, Co. Clare.

Clare County Council, in its role as the Competent Authority has confirmed that the proposed project may have significant effects, either individually or in combination, on The Lower River Shannon Special Area of Conservation (SAC 002165) and/or the River Shannon and River Fergus Estuaries SPA, considering their specific qualifying interests and conservation objectives. As such, a full AA must be carried out for the works, including the compilation of a Natura Impact Statement to inform the decision making (this report).

The primary purpose of this report is to provide relevant material to inform a decision by the Competent Authority, as required under Articles 6.3 and 6.4 of the EU Habitats Directive, as to whether the proposed development is likely to have any significant impacts on the Conservation Objectives of a Natura 2000 site. Where there are potential adverse impacts, an assessment of the potential mitigation of those impacts is presented.

1.2 Project Background

As part of the Shannon Upper and Lower River Basin (UoM 25_26) Catchment Flood Risk Assessment and Management Study (CFRAMS), Springfield was highlighted as an area where a flood relief scheme was required due to flooding of the River Shannon and its tributaries. Works are now proposed to be carried out as part of the Springfield Flood Relief Scheme (FRS).

Appropriate Assessment Screening was completed for the overall CFRAMS. In summary, the Commissioners of Public Works concluded that the Flood Risk Management Plan for the Shannon Upper and Lower River Basin would not, individually or in combination with other plans and projects, adversely affect the conservation objectives or integrity of any European Site. This AA determination was signed on behalf of the Commissioners of Public Works which was dated the 15th March 2018. However, an AA was not ruled out at project level and therefore this document addresses the project level Appropriate Assessment.

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[1] Natura 2000 sites consist of Special Areas of Conservation (SACs) designated under European Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Flora and Fauna (the 'Habitats Directive') and Special Protection Areas (SPAs) designated under Directive 2009/147/EC, (the codified version of 79/409/EEC as amended) on the conservation of wild birds (the 'Birds Directive.')

[2] Pascal Sweeney of Sweeney Consultancy was engaged to carry out this Appropriate Assessment and is responsible for the ecological assessment and observations within.

Appendix A of this report provides an overview of the work done to date in relation to the Strategic Environmental Assessment (SEA) and Appropriate Assessment (AA) for the Shannon Upper and Lower River Basin CFRAMS.

1.3 Scheme Objectives

The objective of these works is to prevent a number of properties from flooding. The proposed scheme consists of:

- the construction of an embankment in Springfield/Cappavilla;
- raising of a small portion of land to cut-off overland flows near Clonlara Golf Course;
- the installation of a pumping platform to accommodate mobile tractor driven pumps; and
- the installation of 1no. flood/penstock.

Full details of the scheme are provided in Chapter 3 of this report.

1.4 Preparation of this report

The primary author of this report is Pascal Sweeney M.Sc.

He is expert in ecological matters and the full spectrum of environmental assessment techniques, methodologies and statutes. Professionally, he is a member of relevant Institutes requiring the highest standards of professional competence and integrity. He is Secretary of the Irish Freshwater Sciences Association and a member of the Chartered Institute of Ecology and Environmental Management, the Freshwater Biological Association and the Botanical Society of the Britain and Ireland.

Pascal has practised for over 35 years, during which time he has undertaken complex Ecological Impact Assessments and Habitats Regulations Assessments for a variety of schemes. He has been involved with the proposed scheme since its inception and is familiar with both the proposed site and the full spectrum of environmental parameters which have influenced the design of the proposal.

2 Legislative Background and Guidance Documents

2.1 International Legislation

The Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, better known as the "Habitats Directive", provides legal protection for habitats and species of European importance. Articles 3 to 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. These 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/ECC) as codified by Directive 2009/147/EC.

Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to have a significant effect on or to adversely affect the integrity of European Sites (Annex 1.1). Article 6(3) establishes the requirement for AA:

"Any plan or project not directly connected with or necessary to the management of the [European] site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the 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) states:

"If, in spite of a negative assessment of the implications for the [European] 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, Member States shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 sites is protected. It shall inform the Commission of the compensatory measures adopted."

2.1.1 The requirement for AA Screening

Section 42 (1) of S.I. No. 477 of 2011, the European Communities (Birds and Natural Habitats) Regulations 2011 states:

"A screening for Appropriate Assessment of a plan or project for which an application for consent is received, or which a public authority wishes to undertake or adopt, and which is not directly connected with or necessary to the management of the site as a European Site, shall be carried out by the public authority to assess, in view of best scientific knowledge and in view of

the conservation objectives of the site, if that plan or project, individually or in combination with other plans or projects is likely to have a significant effect on the European site."

Where the screening process cannot exclude the possibility that a plan or project, individually or in combination with other plans or projects, could have a significant effect on a European site, there is a requirement under Article 42 (9) of these Regulations for the preparation of a Natura Impact Statement to inform the Appropriate Assessment process.

In the event that land use activities result in effects that do not have the potential to compromise the conservation objectives of a European Site, and that the judgement of such an effect has been made in the absence of reasonable scientific doubt, then such an effect is considered to be representative of a de-minimise effect and can be screened out for the need for Appropriate Assessment. This approach is supported by ECJ Case C/258/11 which states that:

"the requirement that the effect in question be 'significant' exists in order to lay down a de-minimise threshold. Plans or projects that have no appreciable effect on a European site are thereby excluded. If all plans or projects capable of having any effect whatsoever on the site were to be caught by Article 6(3), activities on or near the site would risk being impossible by reason of legislative overkill".

2.1.2 Screening Determination

In accordance with Regulation 42(7) of the Birds and Natural Habitats Regulations 2011 (S.I. No. 477/2011) as amended:

"The public authority shall determine that an Appropriate Assessment of a plan or project is not required where the plan or project is not directly connected with or necessary to the management of the site as a European Site and if it can be excluded on the basis of objective scientific information following screening under this Regulation, that the plan or project, individually or in combination with other plans or projects, will have a significant effect on a European site."

Further, under Regulation 42(8):

"(a)Where, in relation to a plan or project for which an application for consent has been received, a public authority makes a determination that an Appropriate Assessment is required, the public authority shall give notice of the determination, including reasons for the determination of the public authority, to the following—

i. the applicant,

ii. if appropriate, any person who made submissions or observations in relation to the application to the public authority, or

iii. if appropriate, any party to an appeal or referral.

(b) Where a public authority has determined that an Appropriate Assessment is required in respect of a proposed development it may direct in the notice issued under subparagraph (a) that a Natura Impact Statement is required."

2.2 National Legislation

The Habitats Directive has been transposed into Irish law by Part X of the Planning and Development Act, 2000 - 2015 and the European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477/2011) as amended.

2.3 Guidance Documents on Appropriate Assessment

Where an AA is necessary, the AA requirements of Article 6(3) of the Habitats Directive 92/43/EEC (European Communities 2001) follow a sequential approach as outlined in the following guidance documents:

- Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities. Department of Environment, Heritage and Local Government, 2010 revision.
- Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. Circular NPWS 1/10 and PSSP 2/10.
- Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites: Methodological Guidance on the provisions of Article 6(3) and 6(4) of the Habitats Directive 92/43/EEC (European Commission Environment Directorate-General, 2002).
- Managing Natura 2000 Sites: The provisions of Article 6 of the Habitat's Directive 92/43/EEC (European Commission Environment Directorate-General, 2000).
- Guidance Document on Article 6(4) of the 'Habitat's Directive 92/43/EEC. Clarification of the Concepts of Alternative Solutions, Imperative Reasons of Overriding Public Interest, Compensatory Measures, Overall Coherence. Opinion of the European Commission (European Commission January 2007).
- Guidelines for Good Practice Appropriate Assessment of Plans Under Article 6(3) Habitats Directive (International Workshop on Assessment of Plans under the Habitats Directive, 2011).
- The Department of the Environment, Heritage and Local Government guidance *"Appropriate Assessment of Plans and Projects in Ireland – guidance for Planning Authorities, 2009"* and the European Commission (2001) guidelines *"Assessment of plans and projects significantly affecting Natura 2000 sites - Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC"*.

3 The Proposed Scheme

3.1 The Proposed Scheme

The proposed scheme is for flood defences in the Springfield area to prevent a number of properties from flooding. The location of the scheme is at Clonlara, Co. Clare as shown in Figure 3-1 below.

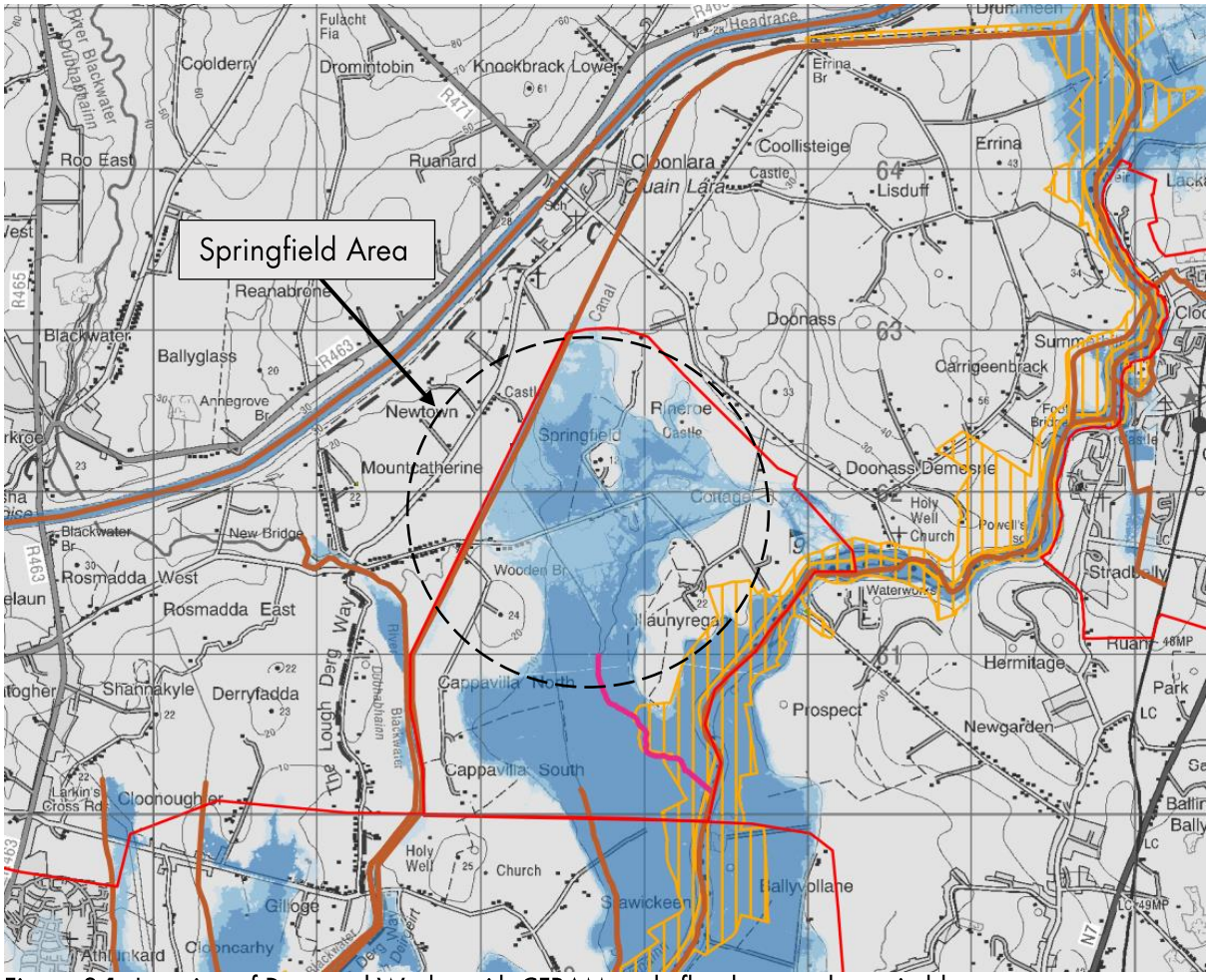

Figure 3.1: Location of Proposed Works, with CFRAM study flood extent shown in blue

The proposed works consist of approximately 850m of flood embankments with a penstock and a pumping platform with associated access road and a small area of land raising

A temporary site compound will be utilised during the construction phase.

The layout of the proposed works and the temporary site compound can be seen on Dwg. No. W3325-152 in Appendix B.

An assessment of the proposed works albeit at a location 850m further north, was undertaken under the Catchment Flood Risk Assessment and Management (CFRAM) study previously as described above.

This report is based on the extents of embankments and works shown in Appendix B and reproduced in Figure 3.2 below.

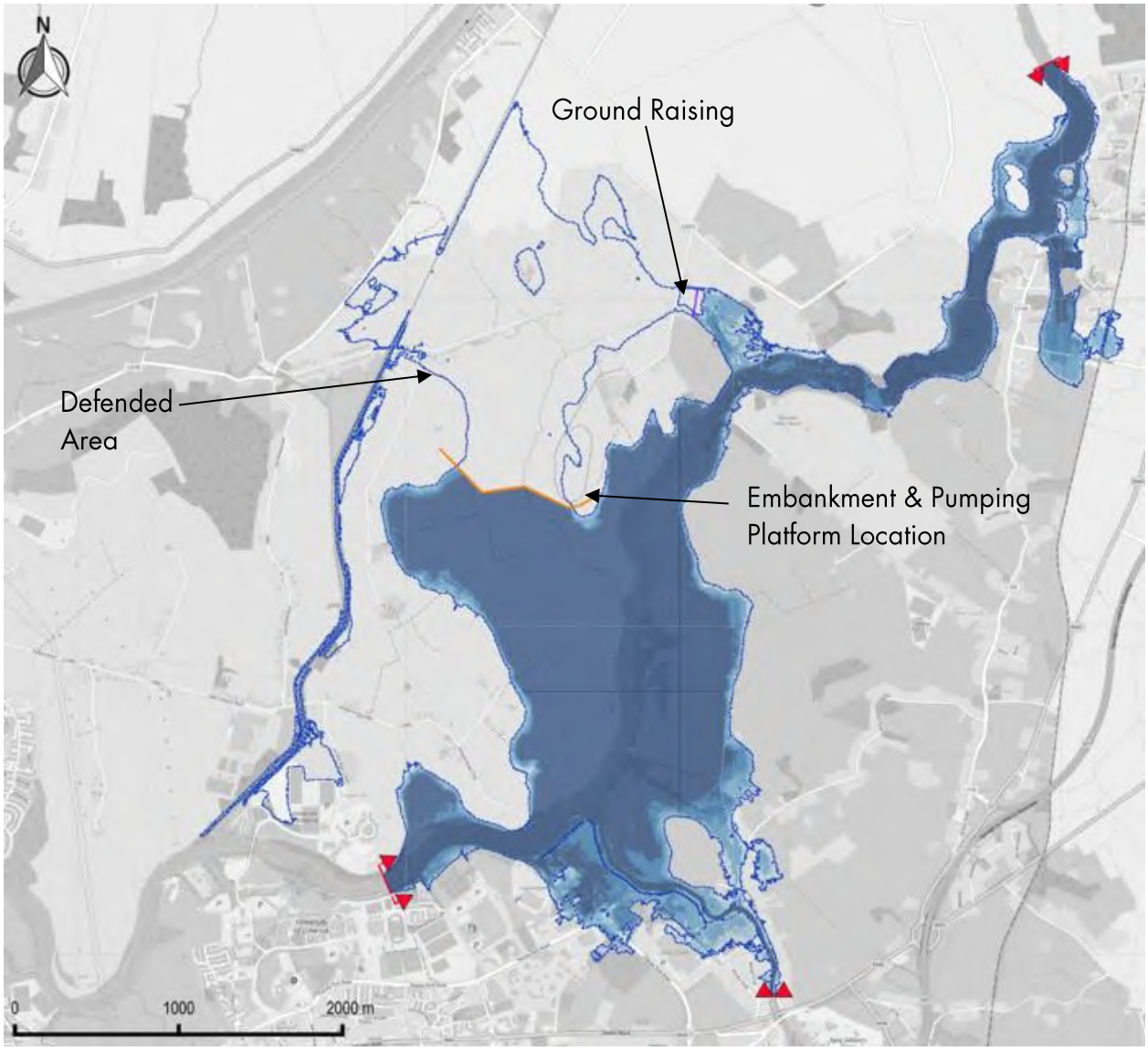

Figure 3.2: The proposed scheme layout and defenced area

A hydraulic model has been constructed to refine the design to support the detailed project level assessment. The purpose of the model is to establish and optimise the pumping requirements in the event of a flood in the River Shannon downstream on the proposed works and to determine the impacts on the flood level in the Shannon River upstream and downstream of the works. The modelling work is described in detail in the Stage 1 Report[3] that accompanies the documentation prepared as part of Clare County Council's statutory requirements under Part 10 of the Planning and Development Regulations 2001-2019.

The proposed development crosses a watercourse (Illaunyregan Steam), approximately 390m upstream of The Lower River Shannon Special Area of Conservation (SAC 002165) as shown

[3] Springfield FRS – Final Report, June 2020

in Figure 3.3. Throughout the period of the works, in order to comply with national legislation that prohibits any 'polluting matter' to enter 'waters', e.g. Fisheries (Consolidation) Act 1959, Environmental Protection Agency Acts 1992 and 2003, and Local Government (Water Pollution) Acts 1977 and 1990, standard operational procedures, both published and unpublished, will be implemented and adhered to. The adherence to these environmental protection measures would be implemented on-site irrespective of the presence of a designated European Site downstream. These standard operational procedures are listed in Appendix C.

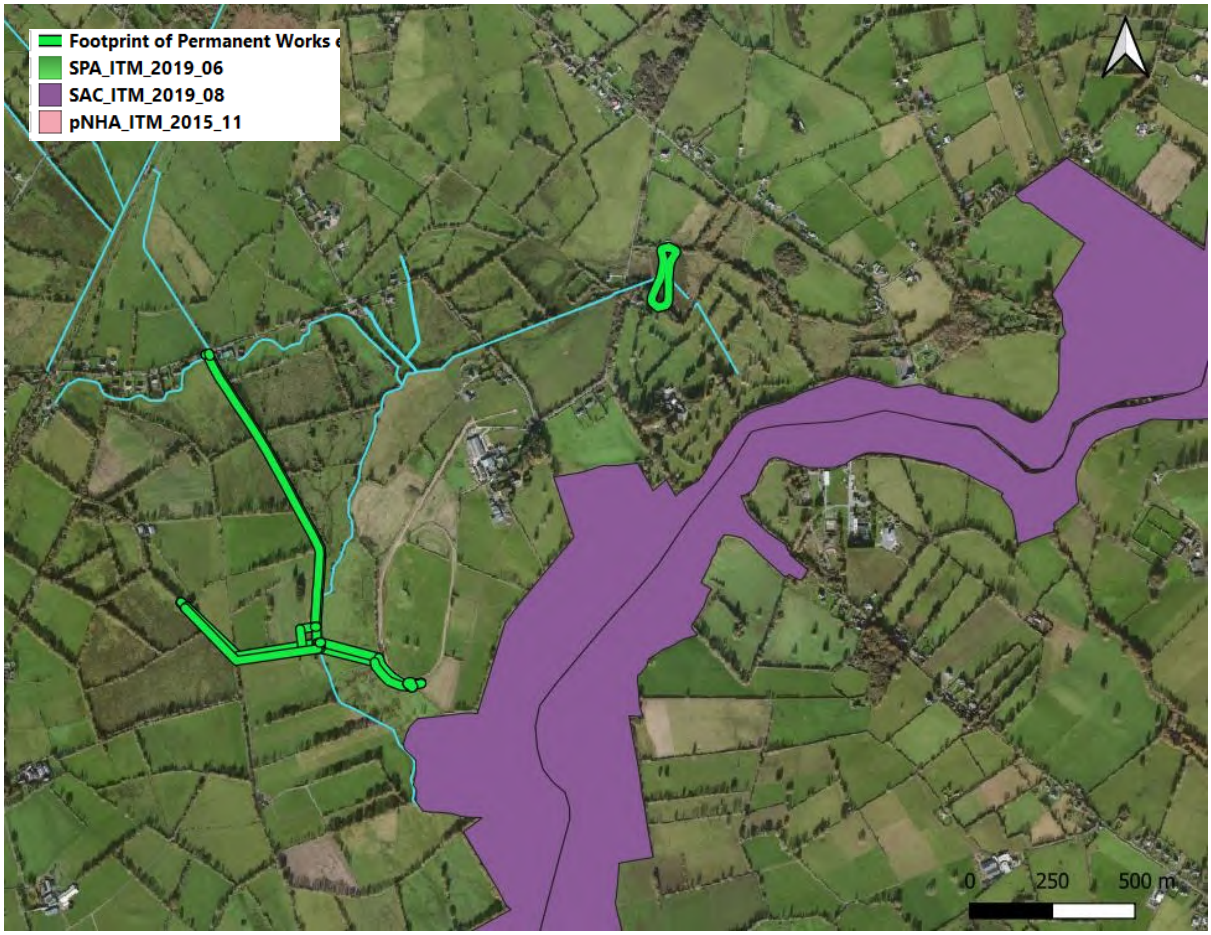

Figure 3.3: Prolixity of proposed works to SAC

3.2 Description of Works Elements

The Springfield Flood Relief Scheme is described below.

3.2.1 Flood Defence Embankment

The proposed scheme involves the construction of an embankment of approximate length 850m. This embankment is to be constructed on agricultural land and will vary in height extending up to 2.75m at its highest point. The proposed embankment, by necessity, crosses the Illaunyregan Stream. At this location a penstock will be constructed. Details on the specific environmental

management measures to be implemented during construction are provided in section 6.4 of this report.

In the event of a flood in the River Shannon, the penstock in the Illaunyregan Stream will be closed to prevent inundation of the Springfield Catchment. In order to permit discharge from the defended area, it will be necessary to over-pump stream flows during a flood event in the River Shannon. This will be achieved from a common pumping platform location as shown in the drawings in Appendix B.

3.2.2 Penstock

A penstock is proposed on the Illaunyregan Steam connecting to the proposed embankment. During normal operation the penstock will be open and there will be no change in river discharge regime. In the event of a significant flood in the River Shannon, the penstock will be closed and flow in the Illaunyregan Stream will be over-pumped. A typical penstock/embankment arrangement is provided in Figure 3.4 below.

Figure 3.4: Proposed Penstock Option

3.2.3 Ground Raising

The proposed scheme also includes for raising an area of ground of 435m^2 with a maximum increase of 500mm. It is positioned crossing the Cottage Stream near to its source (within meters) to prevent shallow flood waters from the River Shannon entering the Springfield catchment. It is intended to regrade the existing stream in part to provide cut-off. Details on the specific environmental management measures to be implemented during 'ground raising' are provided in section 6.4 of this report.

3.2.4 Pumping Platform

The proposed pumping platform is to be located immediately north of the embankment. Mobile pumps will over-pump flows from the Springfield catchment during a flood in the Shannon River when the proposed penstock is closed. Pumping is only required during events with a return period greater than the 20% AEP event (1 in 5 year return period) in the River Shannon. Natural drainage as per the existing regime will be maintained from Springfield when the Shannon is not in flood. Details on the specific environmental management measures to be implemented during construction are provided in section 6.4 of this report.

4 Methodology for Appropriate Assessment

4.1 Overview of the stages of Appropriate Assessment

The AA process is a sequential process consisting of four potential stages. If at the first stage in the process it is determined that there will be no significant effect on a European Site, the process is effectively completed. If there is potential for significant effects, then the assessment must proceed to the second stage. The four stages are as follows:

- Screening of the proposed plan or project for AA;
- An AA of the proposed plan or project and production of a Natura Impact Statement (NIS) (current stage);
- Assessment of alternative solutions; and
- Imperative Reasons of Overriding Public Interest (IROPI)/ Derogation.

The first stage relates to Regulation 42 of the Birds and Natural Habitats Regulations; and the second relates to Article 6(3) of the Habitats Directive; and third and fourth stages to Article 6(4) of the Habitats Directive.

4.1.1 Screening

The aim of screening is to assess if the plan or project is directly connected with or necessary to the management of European Site(s); or in view of best scientific knowledge, if the plan or project, individually or in combination with other plans or projects, is likely to have a significant effect on a European site. This is done by examining the proposed plan or project and the conservation objectives of any European Sites that might potentially be affected. If screening determines that there are likely to be significant effects, or the significance of effects are uncertain or unknown then it will be recommended that a project is brought forward to full AA.

4.1.2 Appropriate Assessment

The aim of this stage of the AA process is to identify any adverse impacts that the plan or project might have on the integrity of relevant European Sites. As part of the assessment, a key consideration is 'in combination' effects with other plans or projects. Where adverse impacts are identified, mitigation measures can be proposed that would avoid, reduce or remedy any such negative impacts and the plan or project should then be amended accordingly, thereby avoiding the need to progress to the third stage.

4.1.3 Assessment of Alternative Solutions

If it is not possible during the second stage to reduce impacts to acceptable, non-significant levels by avoidance and/or mitigation, there must be an objective assessment as to whether alternative solutions exist by which the objectives of the plan or project can be achieved. Explicitly, this means alternative solutions that do not have significant negative impacts on the integrity of a European Site. It should also be noted that EU guidance on this stage of the process

states that, 'other assessment criteria, such as economic criteria, cannot be seen as overruling ecological criteria' (EC, 2002). In other words, if alternative solutions exist that do not have negative impacts on European Sites; they should be adopted regardless of economic considerations.

4.1.4 Imperative Reasons of Overriding Public Interest (IROPI)/Derogation

This stage of the AA process is undertaken when it has been determined that negative impacts on the integrity of a European Site will result from a plan or project, but that no alternatives exist. At this stage of the AA process, it is the characteristics of the plan or project itself that will determine whether the competent authority can allow the plan or project to progress. This is the determination of 'over-riding public interest'. It is important to note that in the case of European Sites that include in their qualifying features 'priority' habitats or species, as defined in Annex I and II of the Directive, the demonstration of 'overriding public interest' is not sufficient and it must be demonstrated that the plan or project is necessary for 'human health or safety considerations'. Where plans or projects meet these criteria, they can be allowed, provided adequate compensatory measures are proposed. This final stage of the process defines and describes these compensation measures.

4.2 Information Consulted for this Report

A general assessment of the site was carried out in line with the Heritage Council Best Practice Guidance for Habitat Survey and Mapping (Smith *et al.,* 2011) and habitats were classified to level 3 of the Fossitt (2000) classification system. To illustrate the general habitat quality, photographs were taken using a digital camera. Grid references were recorded using a GPS handset. Site evaluation is based on the guidelines of the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018).

Sources of data reviewed as part of the Screening process for this project included:

- Conservation Objectives: Lower River Shannon SAC 002165 (NPWS, 2012)
- National Biodiversity Data Centre mapping (https://maps.biodiversityireland.ie)
- Igoe *et al.* (2004).
- Reid *et al.* (2013).
- Springfield FRS Stage 1 Report, April 2020
- Springfield FRS River Shannon Hydraulics Report, January 2020
- Springfield FRS Planning Report & Drawings, April 2020

4.3 Cumulative and In-combination Impacts

It is a requirement of Appropriate Assessment that the cumulative or in-combination effects of the proposed development together with other plans or projects are assessed. Cumulative impacts can be defined as the additional changes caused by a proposed development in conjunction with other similar developments, or as the combined effect of a set of developments, taken together.

4.3.1 Methodology

In accordance with EC Article 6 Guidance Document (EC2000), in order to ensure all impacts upon the site are identified, including those direct and indirect impacts that are a result of cumulative impacts, the following steps were completed:

- Identify all projects/ plans which might act in combination: Identify all possible sources of effects from the project or plan under consideration, together with all other sources in the existing environment and any other effects likely to arise from other proposed projects or plans.
- Impacts identification: Identify the types of impacts that are likely to affect aspects of the structure and functions of the site vulnerable to change.
- Define the boundaries for assessment: define boundaries for examination of cumulative effects which will be different for different types of impact and may include remote locations.
- Pathway identification: Identify potential cumulative pathways (e.g. via water, air etc.; accumulations of effects in time or space).
- Prediction: Prediction of magnitude/extent of identified likely cumulative effects.
- Assessment: Comment on whether or not the potential cumulative impacts are likely to be significant.

5 Screening of European Sites

5.1 Methodology for AA Screening

As discussed above, the first stage of an appropriate assessment is to consider whether a project could cause 'likely significant effect' on the conservation objectives/qualifying features of the Natura 2000 site(s), alone or in-combination with other plans/projects.

The AA screening was completed in the following logical order:

- Definition of the zone of influence for the proposed works;
- Identification of the European Sites that are situated (in their entirety or partially) within the zone of influence of the proposed works;
- Identification of the most up-to-date Qualifying Interests (QIs) for each European Site occurring either wholly or partially within the zone of influence;
- Identification of the environmental conditions that maintain the QIs at the desired target of Favourable Conservation Status;
- Identification of the threats/impacts – actual or potential that could negatively impact the environmental conditions of the QIs within the European Sites;
- Highlighting the activities of the proposed works that could give rise to significant negative impacts; and
- Identification of other plans or projects, for which In-combination impacts would likely have significant effects.

The following issues were considered:

- The nature and quality of habitats within the site of the proposed development;
- Information relating to the ecology of the Natura 2000 site;
- The status of Qualifying Interests of the Natura 2000 site (Annex I habitats and Annex II species of the EU Habitats Directive) and the relevant conservation status and objectives for these species;
- The key structural and functional relationships maintaining the integrity of the Natura 2000 site;
- The status of other annexed habitats and species occurring in proximity to the site of the proposed development; and
- The scale and nature of the aspects of the project in relation to the Natura 2000 site.

5.2 Summary of European Sites within the 15km Zone of Influence

There are 7 sites within the 15km zone of influence as summarised in Table 5-1. Their locations are shown in Appendix D.

Table 5.1: European Sites within 15km of the proposed scheme

European Site	Site Code	Approximate Distance (km) from proposed scheme	Potential for source-pathway-receptor links
Lower River Shannon SAC	SAC 002165	Approx. 390m downstream of scheme	There is a direct fluvial connection from the proposed development site (The Illaunyregan steam drains into the Shannon). **Further assessment required.**
Glenomra Woods SAC	SAC 001013	Approx. 6.2km north west	There is no direct physical link. Potential impacts are **screened out** and this SAC is not considered further.
Slieve Bernagh Bog SAC	SAC 002312	Approx. 12.7km to the north	There is no direct physical link. Potential impacts are **screened out** and this SAC is not considered further.
Danes Hill Pulnalecka SAC	SAC 000030	Approx.14.2km to the north west	There is no direct physical link. Potential impacts are **screened out** and this SAC is not considered further.
Glenstal Woods SAC	SAC 001432	Approx. 12.0km to the east	There is no direct physical link. Potential impacts are **screened out** and this SAC is not considered further.
Slievefelim & Silvermines mountains SPA	SPA 004165	Approx. 10.5km to the east	There is no direct physical link. Potential impacts are **screened out** and this SPA is not considered further.
River Shannon and River Fergus Estuaries SPA	SPA 004077	Approx. 6.9 km to the southwest by straight line, but approx. 12.7km by the fluvial route of the Illaunyregan Stream and River Shannon main channel.	The physical link via the fluvial route is approximately 12.7km. As the designated site is in estuarine habitat, downstream of Limerick City, but within 15km, potential impacts on the Qualifying Interests of this SPA cannot be screened out. **Further assessment required.**

5.3 Screening Statement

Due to the uncertainty of significant impacts on two Natura 2000 sites at this stage, it is recommended that the assessment proceed to Natura Impact Statement for the two Natura 2000 sites and their habitats and species. Chapter 6 provides details of the NIS assessment.

6 Appropriate Assessment Natura Impact Statement

6.1 Introduction

This chapter reports the results of the Appropriate Assessment process for the Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA.

A brief description of each potentially affected site is provided, followed by a detailed description of the potential impacts associated with the construction and operation of the proposed scheme. Where required, mitigation measures are described. The impacts have been categorised as follows:

- Construction Phase Impacts, including:
    - loss of primary or qualifying habitat or species where construction of the proposed scheme will require removal of habitat or species within the site/s
    - loss of primary or qualifying habitat or species within the site/s as a result of release of sediments or other pollutants, such as oils and petrochemicals, into watercourses within or outside and upstream of the site/s during construction;
    - accidental spillage resulting in contamination of watercourses within or associated with the site/s and consequent detrimental impact on primary or qualifying habitats or species.
- Operation Phase Impacts, including loss of primary or qualifying habitat or species within the site/s as a result of the release of sediments or other pollutants associated with the operation of the scheme under normal and flood conditions;
- Potential Impacts from Invasive Plants; and
- Cumulative Impacts.

The proposed construction works are described in detail in Chapter 3 of this report. Sections 6.4 – 6.7 below consider whether a project could cause 'likely significant effect' on the qualifying features of the Natura 2000 site(s), alone or in-combination with other plans/projects.

6.2 Methodology

Available literature and data were checked to establish the known distribution of species listed as Qualifying Interest of the Natura 2000 sites.

Initial field work was carried out on 15th April 2018. A repeat survey was completed on 8th April 2020.

A summary of the results of the desk study and field work is provided in Appendix H and site photographs are in Appendix I.

6.2.1 Identification of the zone of influence

The area of potential impact within the site is taken as being the aquatic habitat downstream. While the aquatic zone of potentially highest impact is from the location of the proposed development to 5km downstream (Escauriaza *et al.*, 2017), potential impacts on protected habitats and species in the entire downstream section of the river were also considered.

6.2.2 Identification of potential impact on the relevant Conservation Objectives

6.2.2.1 The Lower River Shannon SAC Qualifying Interest Habitats

Floating River Vegetation (Habitat Code 3260).

The aquatic vegetation consists mainly of *Phalaris arundinacea, Apium nodiflorum, Oenanthe crocata, Mentha aquatica* and *Iris pseudacorus*. These species are not included in the definition of the Annex I habitat type "*Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation*". This Qualifying Interest occurs in the River Shannon, over 400m downstream at the nearest point.

Alluvial Wet Woodlands (Habitat Code 91E0).

Alluvial wet woodland occurs along banks of the River Shannon upstream of Limerick City, just within the 5km potential impact zone.

Molinia meadows on calcareous, peaty or clavey-silt-laden soils *(Molinion caeruleae)* (Habitat Code 6410)

Molinia meadow is found beside the River Shannon at World's End, Castleconnell, upstream of the confluence of the drains from the proposed development site and therefore is not within the potential impact zone.

Estuary (Habitat Code 1130), Sandbanks which are slightly covered by sea water all the time (Habitat Code 1110), Tidal Mudflats & Sandflats (Habitat Code 1140), Salicornia Mudflats (Habitat Code 1310), Atlantic Salt Meadows (Habitat Code 1330), Mediterranean Salt Meadows (Habitat Code 1140), Perennial Vegetation of Stony Banks (Habitat Code 1220), Salicornia and other annuals colonizing mud and sand (Habitat Code 1310), Spartina swards *(Spartinion maritimae)* (Habitat Code 1320), Vegetated sea cliffs of the Atlantic and Baltic coasts (Habitat Code 1130), Coastal Lagoons (Habitat Code 1150), Large shallow inlets and bays (Habitat Code 1160) and Reefs (Habitat Code 1170).

These habitats are found in saline conditions, downstream of the potential impact zone of proposed development.

6.2.2.2 The Lower River Shannon SAC Qualifying Interest Species

Atlantic Salmon (*Salmo salar*) **(Species Code 1106)**.

The drainage channels and Illaunyregan steam are unsuitable for salmon. This Qualifying Interest occurs in the River Shannon, over 400m downstream at the nearest point.

Sea Lamprey (*Petromyzon marinus*) (Species Code 1095), Brook Lamprey (*Lampreta planeri*) (Species Code 1096) and River Lamprey (*Lampreta fluviatilis*) (Species Code 1099).

The drainage channels are unsuitable for lampreys. These Qualifying Interests occur in the River Shannon over 400m downstream at the nearest point.

Otter (*Lutra lutra*) **(Species Code 1355)**.

Within the Shannon River Basin District, Baily and Rochford (2006) recorded positive results at nearly 70.5% of the sites surveyed, indicating a widespread distribution of the species. The habitat quality along the drainage ditches is unsuitable for otters and no signs of their presence were found. This Qualifying Interest occurs along the River Shannon, over 400m downstream at the nearest point.

Freshwater Pearl Mussel (*Margaritifera margaritifera*) **(Species Code 1029)**.

Within the SAC, the freshwater pearl mussel only occurs in the Rivers Cloon and Feale. Only the Cloon is designated for the protection of this species under the European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009. It does not occur downstream of the proposed development site.

Bottle-nosed Dolphin (*tursiops truncatus*) **(Species Code 1349)**.

This species only occurs in saline waters in the Shannon Estuary.

6.2.2.3 The River Shannon and River Fergus Estuaries SPA Features of Interest

All the Features of Interest primarily occur in saline waters in the Shannon Estuary, but a few are found farther upstream, along freshwater parts of the River Shannon, outside the SPA.

Cormorant (*Phalacrocorax carbo*) **(Species Code A017)**

Cormorants would not occur at the site of the proposed development, but feed in the River Shannon downstream (*pers. obs.*)

Black-headed Gull (*Chroicocephalus ridibundus*) **(Species Code A1790)** and **Teal** *(Anas crecca)* **(Species Code A052)**

While the drains at the proposed development site are too small, black-headed gull and teal could potentially visit the watercourses within a short distance downstream, but such occurrence would be very infrequent in occurrence and would be of low abundance. The

NBDC website shows records of both these species within 1km to the northeast of the subject site.

Whooper Swan *(Cygnus cygnus)* **(Species Code A038)** and **Wigeon** *(Anas penelope)* **(Species Code A050)**

Whooper swan and wigeon graze on grass beside the freshwater parts of the River Shannon in winter.

Curlew *(Numenius arquata)* **(Species Code A160)** and **Lapwing** *(Vanellus vanellus)* **(Species Code A142)**

Curlew and lapwing nest inland. The NBDC website shows records of both these species along the Shannon catchment. The subject site does not contain suitable nesting habitat for these species, but it is possible that they could nest within 1km.

Light-bellied Brent Goose (*Branta bernicla hrota)* **(Species Code A046), Shelduck** *(Tadorna tadorna)* **(Species Code A048), Pintail** *(Anas acuta)* **(Species Code A054), Shoveler** *(Anas clypeata)* **(Species Code A056), Scaup** *(Aythya marila)* **(Species Code A062), Ringed Plover** *(Charadrius hiaticula)* **(Species Code A137), Golden Plover** *(Pluvialis apricaria)* **(Species Code A140), Grey Plover** *(Pluvialis squatarola)* **(Species Code A141), Knot** *(Calidris canutus)* **(Species Code A143), Dunlin** *(Calidris alpina)* **(Species Code A149), Black-tailed Godwit** *(Limosa limosa)* **(Species Code A156), Bar-tailed Godwit** *(Limosa lapponica)* **(Species Code A157), Redshank** *(Tringa totanus)* **(Species Code A162)** and **Greenshank** *(Tringa nebularia)* **(Species Code A164)**

These species are found in estuarine habitats in winter.

Wetland and Waterbirds (Habitat Code A999)

This refers to estuarine habitats within the SPA.

6.2.3 Development Site Habitat Assessment Methods

The likely of presence of each Natura 2000 habitat and species is summarised in Appendix H.

Potential impacts on the following habitats and species which are known to be present, or are possibly present within the zone of potential impact (to 5km downstream) must be considered.

The Lower River Shannon SAC:

- Floating River Vegetation.
- Alluvial Wet Woodlands.
- Atlantic Salmon.
- Sea Lamprey.
- River Lamprey.

- Brook Lamprey.
- Otter.

The River Shannon and River Fergus Estuaries SPA:

- Black-headed Gull.
- Teal.
- Cormorant.
- Whooper Swan.
- Wigeon.
- Curlew.
- Lapwing.

6.3 Characteristics of Relevant Sites

6.3.1 Description of The Lower River Shannon Natura 2000 Site SAC 002165

The Site Synopsis and Conservation Objectives for The Lower River Shannon SAC for the site are available on http://www.npws.ie/protected-sites/sac/002165. The location of this SAC in the vicinity of the proposed development is shown in Appendix D.

This very large SAC stretches along the Shannon valley from Killaloe to Loop Head/ Kerry Head and encompasses the Shannon, Feale, Mulkear and Fergus Estuaries, the freshwater lower reaches of the River Shannon, the freshwater stretches of much of the Feale and Mulkear catchments and the marine area between Loop Head and Kerry Head.

Fifteen habitats, listed in Annex I, and seven species listed in Annex II of the EU Habitats Directive are Qualifying Interests, which must be maintained in favourable conservation status. The Qualifying Interests are listed in Appendix E.

6.3.2 Description of The River Shannon and River Fergus Estuaries SPA 004077

The Site Synopsis and Qualifying Interests for The River Shannon and River Fergus Estuaries SPA for the site are available on http://www.npws.ie/protected-sites/spa/004077. The location of this SAC in the vicinity of the proposed development is shown in Appendix D, while the Features of Interest are listed in Appendix F.

The estuaries of the River Shannon and River Fergus form the largest estuarine complex in Ireland. The site comprises the entire estuarine habitat from Limerick City westwards as far as Doonaha in Co. Clare and Dooneen Point in Co. Kerry.

The site has vast expanses of intertidal flats which contain a diverse macro-invertebrate community, e.g. Macoma-Scrobicularia-Nereis, which provides a rich food resource for the wintering birds. Salt marsh vegetation frequently fringes the mudflats and this provides important high tide roost areas for the wintering birds. Elsewhere in the site the shoreline comprises stony or shingle beaches.

Twenty one bird species and one habitat are listed in Annex I of the EU Birds Directive, are Features of Interest which must be maintained in favourable conservation status. The Features of Interest are listed in Appendix F.

6.4 Construction Phase Impacts

6.4.1 Floating River Vegetation, Alluvial Wet Woodlands, Atlantic Salmon, Sea Lamprey, River Lamprey and Brook Lamprey. Bird species within SPA.

There are no works proposed directly within the SAC or SPA. Works are proposed for the banks and instream in the streams leading into the SAC/SPA where the proposed penstock is required. There will not be any land-take which directly removes qualifying habitat features. The construction of the approx. 850m long embankment, the pumping station and the ground raising will be carried out adjacent to the watercourses/drains but the probability of significant impact is low as it would require extensive mismanagement of the works including the absence of any thought as to environmental consequence of the works. With appropriate management measures in place, the risk of impact from silt laden run-off or fuel spills can be fully controlled.

While the penstock is being constructed there will be direct works within the stream channel some 390m upstream of the River Shannon SAC. The main risk to the qualifying interests in the SAC is sedimentation arising from the works. The probability of a significant impact on the SAC is very low given the low sediment transport capacity of the stream and the diluting effect of the River Shannon flows which are orders of magnitude higher than the stream flows. None-the-less, the following measures are proposed for the working methodology which are considered to eliminate the possibility of significant impact to the River Shannon SAC and/or the SPA.

1. A diversion channel will be dug (in the dry) in advance of the river works such that the subsequent works can be undertaken on a dried up stream bed. The diversion channel shall be lined with 1mm HDPE plastic over its length or piped such that soil erosion will be minimised.

2. Once the diversion is in place, the stream flows will be diverted into the channel/pipe and works on the penstock walls, and adjoining embankment can commence.

3. 3no. silt traps/curtains located at 15m, 30m and 50m downstream of the works area to control any sediment arising from the river diversion works shall be installed.

4. Visual monitoring of the water colour downstream of the works between and immediately below each slit trap while the river diversion works be constructed will be undertaken. A spike in siltation will occur when the river is initially turn over – this will be a very short

negative impact and will be assimilated by the flows in the Shannon downstream without significant impact to the SAC or SPA features. Sampling shall be undertaken every 30 minutes after the river turnover and samples tested for turbidity as an indicator of suspended sediment concentration. Any works affecting the NTU levels shall be halted if the turbidity levels increase above 50 NTU for more than 2 consecutive readings downstream of the final silt trap, or if the NTU value on a single reading is above 350 NTU.

5. Halted works shall not recommence until the NTU readings are below 50NTU.
6. Works shall not take place if the following combination of parameters can be reasonably expected to be encountered:
    - NTU >30 for any duration combined with water temperature above 17 degrees Celsius
7. On completion of the permanent works, the river shall be re-diverted to its original course with the arrangements in point 3, 4 and 5 above being retained.
8. Once the diversion is complete, the silt traps shall be removed starting with the furthest downstream. The removal shall entail removing the silt captured by the trap initially, waiting a period of 30 minutes and then carefully removing the silt trap itself. This process shall be repeated for each silt trap installed, working in an upstream direction with 1 hours between the removal of each trap.

The remainder of the embankments, access roads, pumping platform and land raising are to be constructed on agricultural land in close proximity to land drains and streams. Standard best practice construction measures as identified in Appendix C shall be implemented to avoid silt laden run-off entering the drainage ditches and streams while these works are ongoing.

A small section of drain at the upper end of Cottage Stream may need to be regraded to facilitate the land raising. This section of channel could not be located onsite and appears to have already been filled in. If this is the case, further works will not be necessary. If encountered, it will be hydrological disconnected from the Cottage stream by placing clean stone in the channel and then backfilled with suitable material. The reach of channel to the east of the land raising will then be regraded to flow westwards. It is anticipated that these reaches of channel will be dry in the summer when works are completed and there is therefore no significant risk to the Natura 2000 sites.

During the diversion/realignment of the field drain on the western side of the Illaunyregan stream at the location of the pumping platform the drain shall be cut off from the stream by backfilling with clean stone. The drain is expected to be dry, but any water encountered can be pumped out to a settlement area before discharging to the stream. The new drain shall then be dug and the arisings filled into the old drain.

The proposed scheme will not involve the winning or use of resources within the designated site or along watercourses associated with the River Shannon upstream of the designated site. Transportation of equipment through the SAC or SPA is not required, although works near to the watercourse will require machinery to be in close proximity (within 80m of the SAC).

Due to the location and nature of the proposed works, along with the measures outlined above, negative impacts on these Qualifying Interests will be avoided.

Therefore, it is considered that there will be no significant impacts on floating river vegetation, Atlantic salmon, sea lamprey, river lamprey, brook lamprey or bird species arising from the construction works.

6.4.2 Otter

Otters do not occur in close proximity to the site of the proposed works, as such, impacts from disturbance during construction can be screened out.

The predominant prey for otters is fish. Significant impacts on fish species arising from the project has been discussed in Section 6.4.1 above. As such, there will not be any significant impacts on otter with regard to the availability of prey.

6.5 Operational Phase Impacts

6.5.1 During Typical Operation (Non-Flood)

During typical operation, the penstock will be open and there will be no change in the regime of the watercourses in Springfield. i.e. the streams will discharge as per their current discharge regime. Therefore, there is no change in the normal hydrological and/or physical regime and there will no negative impact on long term silt transport or management.

As such, there will be no significant impacts on any of the Qualifying Interests of the SAC or SPA during 'typical' operation.

6.5.2 During Flood Event Operation

In certain flood conditions, the penstock in the embankment will be closed and natural (gravity) drainage from within the Springfield catchment will not be possible. At such times, the entire area downstream of the embankment will be inundated with flood waters from the River Shannon. Pumps will pass forward all flows from the Springfield catchment including suspended solids so that even in flood conditions, sediment transport will continue. While some flood waters from within the Springfield Catchment will be detained within the catchment to reduce the pumping requirements,, this is akin to the existing situation, whereby the flood water in the Shannon 'hold up' flows from Springfield in large food events. There will therefore be no significant change in the normal hydrological regime of the Springfield watercourses and as such, there will be no negative impacts on silt management in the long term that might affect any qualifying interests downstream.

The loss of the available floodplain upstream of the embankment will have an impact on the River Shannon hydrological regime of the river for events greater that the 10% AEP event (an event with a 10% chance of occurrence in any one year). During a 1% AEP event (1% chance of occurring in a given year) the hydrological regime will be slightly altered arising from the loss of the floodplain. This has been assessed in detail by completing hydraulic modelling[4]. The results show that there is no significant increase in flood levels arising from the proposed works. The greatest impact observed in the Shannon River was a localised effect near the confluence with the Illaunyregan Stream and it showed peak water levels increased by 3mm compared to the existing scenario. This effect was not seen elsewhere. During the event, the maximum observed increase in flood level was 22mm on days 7 and 8. This is approximately 7-8 days before peak levels occur in the Shannon River. In summary, peak flood levels in the River Shannon are not significantly altered (increased) by the proposed scheme.

In flood conditions, any terrestrial habitats or species that are occasionally affected by flooding are not Qualifying Interests of the SAC or Features of Interest of the SPA and therefore are not considered further.

6.6 Potential Impacts from Invasive Plants

The integrity of the Natura 2000 sites would be negatively impacted by the further spread of certain invasive plant species. Under Section 42 (1) of S.I. No. 477 of 2011, the European Communities (Birds and Natural Habitats) Regulations 2011, it is an offence to allow or cause to disperse, any plant which is included in Part 1 of the Third Schedule of this S.I.

The main listed invasive plants of relevance to the current proposal are Giant hogweed (*Heracleum mantegazzianum*), Japanese knotweed (*Fallopia japonica*), and Himalayan balsam (*Impatiens glandulifera*), which, although not recorded within the site of the proposed scheme, are quite common in the general area and could be spread with soil or by adhering to machinery. In accordance with standard appropriate environmental actions, to avoid invasive species being imported to this site via seeds or plant material adhering to construction machinery, all such machinery will be cleaned of soil by power-washing, prior to arrival at the site.

6.7 Cumulative Impacts

The Clare County Council website shows a single residential planning application in the townland of Springfield since 2013. No other proposed plans or projects that could add to the cumulative impact are known.

It should be noted that the CFRAM studies are not considered plans or projects as they do not purport to be an intention to develop. There are numerous other potential developments along the Shannon that may or may not become developments in the future. These have been assessed

[4] Springfield FRS Stage 1 Report, June 2020

at a high level in the CFRAM study as referred to in Section 1 above. Should this scheme obtain consent, other schemes may need to consider the cumulative impacts related to this scheme.

The proposed development will not, on its own, negatively impact on the biological water quality of the River Shannon, nor on the Qualifying interests of either Natura 2000 site. Neither will it add to the other cumulative impacts on either Natura 2000 site from other sources.

7 Summary of Potential Impacts and Conclusion

7.1 Summary

Table 7.1 below provides a summary of the potential impacts on each of the SAC/SPA Qualifying Interests and their Conservation Objectives. Impacts and mitigation are described in full in chapter 6 above and should be referred to for full details.

Table 7.1 Summary of Potential Impacts

QI / CO of SAC / SPA	Summary of Potential Impacts
Construction Phase Impacts	
Floating River Vegetation, Alluvial Wet Woodlands, Atlantic Salmon, Sea Lamprey, River Lamprey and Brook Lamprey. Bird species within SPA.	There are no works proposed directly within the SAC or SPA. Works are proposed for the banks and instream in the streams leading into the SAC/SPA where the proposed penstock is required. There will not be any land-take which directly removes qualifying habitat features. The construction of the approx. 850m long embankment, the pumping station and the ground raising will be carried out adjacent to the watercourses/drains but the probability of significant impact is low as it would require extensive mismanagement of the works including the absence of any thought as to environmental consequence of the works. With appropriate management measures in place, the risk of impact from silt laden run-off or fuel spills can be fully controlled.
Otter	Otters do not occur in close proximity to the site of the proposed works, as such, impacts from disturbance during construction will not occur.
Operational Phase Impacts	
Floating River Vegetation, Alluvial Wet Woodlands, Atlantic Salmon, Sea Lamprey, River Lamprey and Brook Lamprey. Bird species within SPA.	During typical operation, the penstock will be open and there will be no change in the regime of the watercourses in Springfield. i.e. the streams will discharge as per their current discharge regime. Therefore, there is no change in the normal hydrological and/or physical regime and there will no negative impact on long term silt transport or management. As such, there will be no significant impacts on any of the Qualifying Interests of the SAC or SPA during 'typical' operation. During 'flood conditions' there will be no significant change in the normal hydrological regime of the Springfield watercourses and as such, there will be no negative impacts on silt management in the long term that might affect any qualifying interests downstream.
Otter	The predominant prey for otters is fish. Significant impacts on fish species arising from the project has been discussed in Section 6 above. As such, there will not be any significant impacts on otter with regard to the availability of prey.
Invasive Plants	The main listed invasive plants of relevance to the current proposal are Giant hogweed (*Heracleum mantegazzianum*), Japanese knotweed (*Fallopia japonica*), and Himalayan balsam (*Impatiens glandulifera*), which are not recorded within or adjacent to the site. In accordance with standard appropriate environmental actions, to avoid invasive species being imported to this site via seeds or plant material adhering to construction machinery, all such machinery will be cleaned of soil by power-washing, prior to arrival at the site.
Cumulative Impacts	The proposed development will not, on its own, negatively impact on the biological water quality of the River Shannon, nor on the Qualifying interests of either Natura 2000 site. Neither will it add to the other cumulative impacts on either Natura 2000 site from other sources.

7.2 Conclusion

This Appropriate Assessment Natura Impact Statement has been completed in compliance with the relevant European Commission and national guidelines. The potential impacts during the construction and operation of the proposed Flood Relief Scheme at Springfield have been considered in the context of the European Sites potentially affected, their Qualifying Interests, Features of Interest, Special Conservation Interests and Conservation Objectives.

This assessment has shown that given the suggested mitigation measures and based on the best scientific knowledge available, there will be no significant adverse impact on the Lower River Shannon SAC or the River Shannon and River Fergus Estuaries SPA as a result of the proposed scheme:

- The scheme has been designed to avoid features related to Natura 2000 sites as far as possible;
- Best practice mitigation has been included in the scheme design (which would be implemented in any case i.e. even without a Natura Site being in the vicinity);
- Additional mitigation will be put in place during construction phase;
- The proposed scheme will not result in any loss or fragmentation of habitats for which the SAC or the SPA are designated;
- The proposed scheme will not have any significant impact on the water quality or water levels of the River Shannon or its tributaries; and
- The proposed scheme will not have any significant negative impacts on the Qualifying Interests for which the SAC or the SPA are designated.

It is concluded that the conservation objectives and integrity of the SAC and SPA will not be adversely affected by the proposed scheme.

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APPENDIX A – Previous Studies

The following text provides an overview of the work done to date in relation to the Strategic Environmental Assessment (SEA) and Appropriate Assessment (AA) for the Shannon Upper and Lower River Basin (UoM 25_26) CFRAMS.

CFRAM Study Assessments

Appropriate Assessment Screening Statement

Under the Regulations, the Office of Public Works (OPW) was the proponent and Competent Authority for the Screening for AA of the draft FRMP for UoM 25_26. An Appropriate Assessment Screening Statement (AASS) of the draft FRMP for UoM 25_26 was produced on behalf of the OPW in May 2016.

Informed by this AASS, the OPW determined that the AA could not be excluded, on the basis of objective scientific information, alone or in-combination with other plans or projects that the draft FRMP for UoM 25_26 could have likely significant effects (LSEs) on a large number of European sites. This triggered the requirement for an AA of the draft FRMP for UoM 25_26 to be undertaken by the OPW. A NIS was also prepared to allow OPW assess the likely effects.

Review of Natura Impact Statement of UoM 25/26

As part of the National CFRAM programme, OPW commissioned consultants to prepare a Natura Impact Statement (NIS) associated with the national suite of Flood Risk Management Plans. The NIS was prepared to inform OPW as to whether the plans are likely to have significant effects on the environment and whether an Appropriate Assessment of a plan or project is required and, if required, whether or not the plans shall adversely affect the integrity of any European site.

Although the area of Springfield is not designated as a SAC or SPA, there is however, overlap when it comes to the presence of qualifying interests for a European Designated Site. Atlantic Salmon and Lamprey Species (Brook, River and Sea) are noteworthy qualifying interests of particular sensitivity and are located downstream of the Springfield catchment. These species are sensitive in the context of a project specific plan for Springfield due to the direct risk to spawning gravels potentially posed by any instream works associated with upstream flood alleviation works that might affect downstream water quality. The Lower River Shannon SAC is the only European site designated for these species within the UOM boundary. Springfield is discussed briefly in the Natura Impact Statement for River Basin (25/26) Shannon Upper and Lower Flood Risk Management Plan. Springfield is an area where a degree of existing or potential flood risk exists but is not located in a Natura 2000 site. As such there is no assessment at the FRMP scale of effects from the proposed Springfield works.

The NIS concluded that given the dual approach to 'down the line' project level assessment that there would be no adverse effects on the integrity of any European sites, either alone or in-

combination with other plans or projects but that a project level AA screening be undertaken on a per project basis.

Review of Strategic Environmental Assessment Statement for UoM 25/26

Similar to the NIS as mentioned above, the SEA Statement was prepared in relation to the Flood Risk Management Plan for the Shannon Upper and Lower River Basin in accordance with national and European Union (EU) Legislation. The SEA is required under EU Council Directive 2001/42/EC on the Assessment of the Effects of Certain Plans and Programmes on the Environment. The overall aim of the SEA Directive is to:

> *'provide a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view to promoting sustainable development.'*

A number of factors such as climate change, land use change (e.g. afforestation) and urban growth can influence future changes in flooding in the Shannon Upper and Lower River Basin.

SEA is a process for evaluating, at the earliest appropriate stage, the environmental effects of plans or programmes before they are adopted. Unlike NIS, it looks at all environmental impacts, rather than just those to Natura 2000 listed sites. The key stages of the SEA process are as follows:

- Screening
- Scoping
- Environmental Assessment and Evaluation
- Consultation, Revision and Adoption Activities
- Post-Adoption Activities

The draft SEA Plan did not include specific measures for the AFA of Springfield, but the final Plan outlined that due to the addition of structural measures for protection at Springfield that an addendum was prepared. This addendum has not been made available for review, but the Final SEA outlines that the SEA process has influenced the development of the FRMP and that SEA process has ensured that the potential for adverse environmental effects will be subject to appropriate action if the measures recommended by the Plan are implemented.

In summary, the necessary precautions and assessment will be undertaken at project level as the plan is implemented. It is therefore be necessary for the proposed scheme to be reconsidered for EIA and AA at project level as part of the planning process.

Appropriate Assessment Determination of CFRAM Measures

The Commissioners of Public Works concluded that an Appropriate Assessment has been carried out in accordance with regulations 42(11) and 42(12) of the European Communities (Birds and Natural Habitat) Regulations 2011-2015 and has had regard to the findings of the Natura

Impact Statement, the measures set out in the Flood Risk Management Plan, and the submissions and observations received on the (draft) Flood Risk Management Plan.

It is noted that approval of the Plan does not confer consent to the construction of any physical works. The Plan sets out only the recommendation to progress the project-level assessment and development (rather than the implementation) of Flood Relief Schemes, including environmental assessment as necessary and further public consultation, for refinement and preparation for Planning/Exhibition and if appropriate, then implementation may be progressed. Environmental Impact Assessment and Project-level Appropriate Assessment Screening and Appropriate Assessment must be undertaken in accordance with the relevant legislation where relevant as part of the consenting process for the progression of proposed measures that involve physical works. If the AA of a project at site level determines that adverse effects on the integrity of a European Site are likely, or cannot be ruled out, the project will not be pursued without an Assessment of Alternatives being undertaken to identify alternative options that would not lead to adverse effects on the integrity of any European Site.

In summary, the Commissioners of Public Works concluded that the Flood Risk Management Plan for the Shannon Upper and Lower River Basin (UoM 25/26) would not, either individually or in combination with other plans or projects, adversely affect the conservation objectives or integrity of any European Site. This AA determination was signed on behalf of the Commissioners of Public Works which was dated the 15th March 2018.

APPENDIX B – The Proposed Scheme & Defended Area

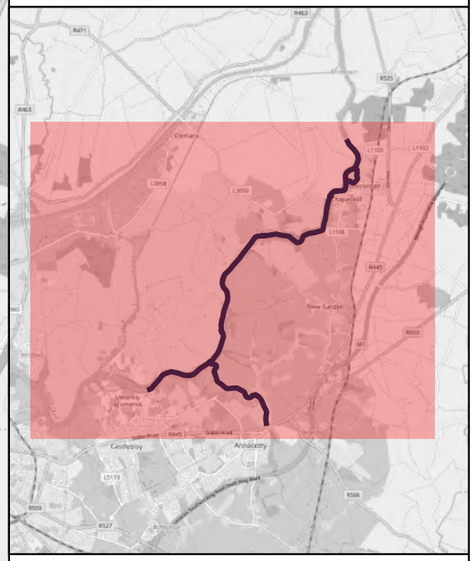
160000
162000
164000
166000

162000
160000
158000

N

0
1000
2000 m

MODEL OVERVIEW



LEGEND

- Extent of Modelled Watercourse
- Modelled Watercourse
- Existing Undefended 0.1% AEP Flood Extent

Proposed 0.1% AEP Flood Extent Banded by Depth (m)

- < 0.3
- 0.3 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- > 1.5

Proposed Defence Location

- CCC Bund
- Land Raising Crest

NOTES
1. ALL LEVELS INDICATED ARE TO ORDNANCE DATUM.

2. FLOOD EXTENTS ARE PLOTTED ON 2m DTM PROVIDED BY THE OPW FOR USE IN THIS STUDY.

3. ALL GRID COORDINATE INFORMATION IS TO IRISH NATIONAL GRID.

McCloy Consulting
BYRNELOOBY

PROJECT SPRINGFIELD FLOOD RELIEF SCHEME		**HYDROLOGY SCENARIO** PRESENT DAY	**SCALE** 1:25000	**ORIGINAL SIZE** A3
MAP TYPE FLOODING COMPARISON / DEPTH MAPPING OVERVIEW		**GEOMETRY SCENARIO** PROPOSED / DEFENDED	**DRAWN BY** DL	**APPROVED** SN
SOURCE FLUVIAL	**FLOOD EVENT** 0.1% AEP	**FIGURE NUMBER** M02136-01_FL400_OP2	**REVISION** 2	**DATE** 16/01/2020

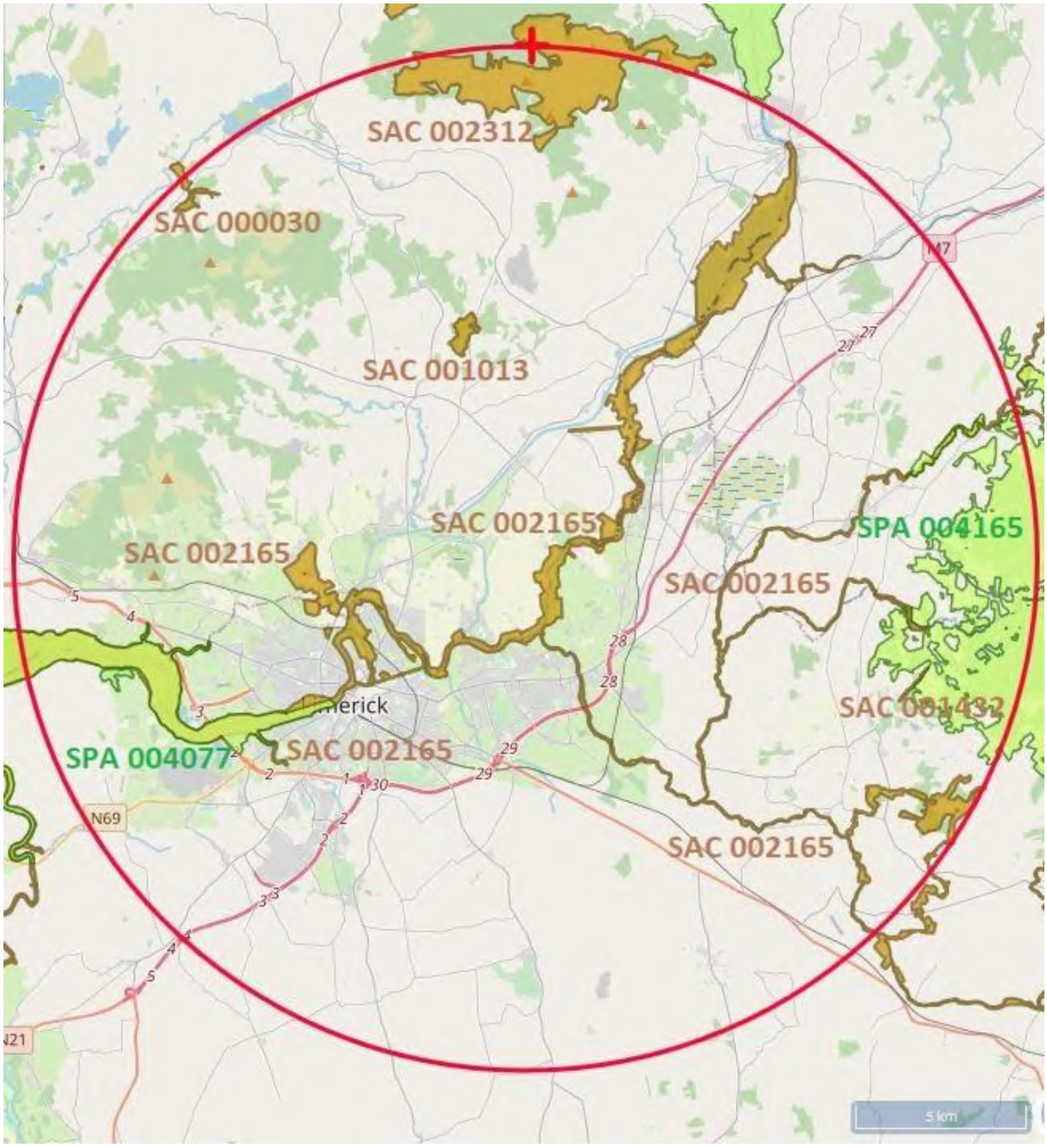
COMHAIRLE CONTAE AN CHLÁIR
CLARE COUNTY COUNCIL

APPENDIX C - Standard Operational Procedures[5]

- Avoidance of working during very wet weather conditions to minimise the occurrence of silt mobilisation;
- Any widening or diversion of drains to be done in the dry to minimise the occurrence of silt mobilisation;
- Retention of eroded sediments close to watercourses with erosion and sediment control structures, including the use of biodegradable matting over exposed soil within 5m of channels where necessary;
- Fuels, lubricants and hydraulic fluids for equipment used on the construction site, as well as any solvents and oils, will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment;
- Fuelling and lubrication of equipment will not be carried out within 10m of watercourses where this is possible, and shall only be undertaken in designated bunded areas;
- Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the site and properly disposed of;
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or re-cycling;
- Raw or uncured waste concrete will not be disposed of within 15m of watercourses;
- Wash down water from exposed aggregate surfaces, cast-in-place concrete and from concrete trucks will be trapped on-site in a dedicated area, to allow sediment to settle out and reach neutral pH before clarified water is allowed to percolate into the ground;
- Temporary portable toilet facilities are to be provided for staff during the construction period. These units would be maintained regularly and the waste disposed of by an appropriate contractor;
- Construction machinery is to be power-washed prior to arrival at the site, to avoid importation of invasive species;
- While no invasive species have been found on-site, all excavation/access areas are to be pre-checked for invasive species;
- If any invasive species are found in the pre-check, the infested areas are to be fenced off and appropriate warning signage erected; and
- No machinery is to enter these fenced-off locations, unless instructed by the Client or his Representative's and appropriate management measures are put in place.

[5] Procedures to comply with National Legislation. These measures are implemented on all sites as part of 'normal' working procedures.

APPENDIX D - Natura 2000 Sites within 15km



APPENDIX E - SAC Qualifying Interests

Lower River Shannon SAC Qualifying Interests

(from www.npws.ie)

Annex I Habitats

EU Habitat Code	Habitat Name
1110	Sandbanks which are slightly covered by sea water all the time
1140	Mudflats and sandflats not covered by seawater at low tide
1310	Salicornia and other annuals colonizing mud and sand
1320	Spartina swards *(Spartinion maritimae)*
1130	Estuaries
1330	Atlantic salt meadows *(Glauco-Puccinellietalia maritimae)*
1410	Mediterranean salt meadows *(Juncetalia maritimi)*
1130	Vegetated sea cliffs of the Atlantic and Baltic coasts
1220	Perennial vegetation of stony banks
1150	Coastal Lagoons
1160	Large shallow inlets and bays
1170	Reefs
6410	Molinia meadows on calcareous, peaty or clavey-silt-laden soils *(Molinion caeruleae)*
3260	Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation
91E0	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)*

Annex II Species

EU Species Code	Species Taxonomic Name	Species Common Name
1029	*Margaritifera margaritifera*	Freshwater Pearl Mussel
1095	*Petromyzon marinus*	Sea Lamprey
1096	*Lampetra planeri*	Brook Lamprey
1099	*Lampetra fluviatilis*	River Lamprey
1106	*Salmo salar*	Atlantic Salmon
1355	*Lutra lutra*	European Otter
1349	*Tursiops truncatus*	Bottle-nosed dolphin

APPENDIX F - SPA Features of Interest

River Shannon and River Fergus Estuaries SPA Features of Interest

(from www.npws.ie)

Cormorant (*Phalacrocorax carbo*) [A017]

Whooper Swan *(Cygnus cygnus)* [A038]

Light-bellied Brent Goose (*Branta bernicla hrota)* [A046]

Shelduck *(Tadorna tadorna)* [A048]

Wigeon *(Anas penelope)* [A050]

Teal *(Anas crecca)* [A052]

Pintail *(Anas acuta)* [A054]

Shoveler *(Anas clypeata)* [A056]

Scaup *(Aythya marila)* [A062]

Ringed Plover *(Charadrius hiaticula)* [A137]

Golden Plover *(Pluvialis apricaria)* [A140]

Grey Plover *(Pluvialis squatarola)* [A141]

Lapwing *(Vanellus vanellus)* [A142]

Knot (*Calidris canutus)* [A143]

Dunlin *(Calidris alpina)* [A149]

Black-tailed Godwit *(Limosa limosa)* [A156]

Bar-tailed Godwit *(Limosa lapponica)* [A157]

Curlew *(Numenius arquata)* [A160]

Redshank *(Tringa totanus)* [A162]

Greenshank *(Tringa nebularia)* [A164]

Black-headed Gull (*Chroicocephalus ridibundus*) [A179]

Wetland and Waterbirds [A999]

APPENDIX H – Ecological Methods and baseline

The following paragraphs provide a summary of the desk and field survey methodologies as well as a summary of the baseline ecological conditions on the site and its surrounds.

Habitats Assessment Methods

The floating river vegetation habitat was assessed, based on the criteria outlined by Hatton-Ellis and Grieve (2003).

Available literature and data were checked to establish the location and status of other listed Qualifying Interest habitats. Ordnance Survey maps and aerial photographs were also reviewed.

Species Assessment Methods

Available literature and data were first checked to establish the known distribution of species listed as Qualifying Interest of the Natura 2000 sites.

The status of protected species possibly occurring in the watercourses adjacent to, or downstream of the site of the proposed development was assessed as follows:

- Available records on the distribution of the freshwater pearl mussel (*Margaritifera margaritifera*) were checked.
- The habitat quality for salmon (*Salmo salar*) was assessed, based on the criteria outlined by Kennedy (1984) and by Bardonnet and Baglinière (2000) for the physical instream requirements of this species for spawning, nursery and adult habitat.
- The habitat quality for the three species of lamprey, the brook lamprey (*Lampetra planeri*), river lamprey (*Lampetra fluviatilis*), sea lamprey (*Petromyzon marinus*) was assessed, based on the criteria outlined by Maitland (1980) and by Johns (2002) for the physical instream requirements of these species for spawning, nursery and adult habitat. Available records on the distribution of these species were also checked.
- The presence of the otter (*Lutra lutra*) was checked for by a survey of the bankside for holts or couching sites and an examination of hard bankside surfaces for the presence of spraints and bankside mud/sand for imprints. The habitat quality for this species was assessed, based on the criteria outlined by Chanin (2003). Available records on the distribution of this species were also checked.

Development Site and Potentially Affected External Habitats/Species

Potential Impact Zone

The area of potential impact within the site is taken as being the aquatic habitat downstream. While the aquatic zone of potentially highest impact is from the location of the proposed development to 5km downstream (Escauriaza *et al.,* 2017), potential impacts on protected habitats and species in the entire downstream section of the river were also considered.

Development Site Habitats

The footprint of the proposed embankment runs by field boundaries and across an open field, in an area of agricultural grassland which is classified as GA1 (Improved agricultural grassland). The proposed temporary compound location and the new access road route are also located on agricultural grassland. The vegetation of this grassland is dominated by common grass species, mainly *Lolium sp., Holcus lanatus* and *Festuca rubra,* with common agricultural weeds, such as creeping thistle (*Cirsium arvense*) and field buttercup(*Ranunculus acris*) also present. In wetter areas, soft rush (*Juncus effusus*) is common. Field boundaries which will be impacted by the embankment consist of hedgerows/treelines (WL1/WL2).

Within the footprint of the proposed works, there are several open drains adjacent to field boundaries which are classified as drainage ditches (Habitat Code FW4) (see Photographs 1 to 4 and photograph locations in Appendix H). These contained varying amounts of standing water, but no discernible flow on 08 April 2020, The Illaunyregan Stream, the main watercourse within the site, is silted and slow flowing (see Photograph 5, Appendix H). The approximate flow rate on 08 April 2020, calculated by the float method at a restricted point downstream, was less than 0.1m³/s. As the existing siltation of the Illaunyregan Stream is due to the gradient and flow-rate, this silted condition is natural and siltation here is not considered to be negative. By the Fossitt (2000) classification system, this watercourse does not fit into the given descriptions for streams or rivers and is best classified as a drainage ditch (Habitat Code FW4).

The Lower River Shannon SAC Qualifying Interest Habitats

Floating River Vegetation (Habitat Code 3260).

The aquatic vegetation consists mainly of *Phalaris arundinacea, Apium nodiflorum, Oenanthe crocata, Mentha aquatica* and *Iris pseudacorus*. These species are not included in the definition of the Annex I habitat type "*Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation*". This Qualifying Interest occurs in the River Shannon, over 400m downstream at the nearest point.

Alluvial Wet Woodlands (Habitat Code 91E0).

Alluvial wet woodland occurs along banks of the River Shannon upstream of Limerick City, just within the 5km potential impact zone.

Molinia meadows on calcareous, peaty or clavey-silt-laden soils *(Molinion caeruleae)* (Habitat Code 6410)

Molinia meadow is found beside the River Shannon at World's End, Castleconnell, upstream of the confluence of the drains from the proposed development site and therefore is not within the potential impact zone.

Estuary (Habitat Code 1130), Sandbanks which are slightly covered by sea water all the time (Habitat Code 1110), Tidal Mudflats & Sandflats (Habitat Code 1140), Salicornia Mudflats (Habitat Code 1310), Atlantic Salt Meadows (Habitat Code 1330), Mediterranean Salt Meadows (Habitat Code 1140), Perennial Vegetation of Stony Banks (Habitat Code 1220), Salicornia and other annuals colonizing mud and sand (Habitat Code 1310), Spartina swards *(Spartinion maritimae)* (Habitat Code 1320), Vegetated sea cliffs of the Atlantic and Baltic coasts (Habitat Code 1130), Coastal Lagoons (Habitat Code 1150), Large shallow inlets and bays (Habitat Code 1160) and Reefs (Habitat Code 1170).

These habitats are found in saline conditions, downstream of the potential impact zone of proposed development.

The Lower River Shannon SAC Qualifying Interest Species

Atlantic Salmon (*Salmo salar*) **(Species Code 1106)**.

The drainage channels and Illaunyregan steam are unsuitable for salmon. This Qualifying Interest occurs in the River Shannon, over 400m downstream at the nearest point.

Sea Lamprey (*Petromyzon marinus*) (Species Code 1095), Brook Lamprey (*Lampreta planeri*) (Species Code 1096) and River Lamprey (*Lampreta fluviatilis*) (Species Code 1099).

The drainage channels are unsuitable for lampreys. These Qualifying Interests occur in the River Shannon over 400m downstream at the nearest point.

Otter (*Lutra lutra*) **(Species Code 1355)**.

Within the Shannon River Basin District, Baily and Rochford (2006) recorded positive results at nearly 70.5% of the sites surveyed, indicating a widespread distribution of the species. The habitat quality along the drainage ditches is unsuitable for otters and no signs of their presence were found. This Qualifying Interest occurs along the River Shannon, over 400m downstream at the nearest point.

Freshwater Pearl Mussel (*Margaritifera margaritifera*) **(Species Code 1029)**.

Within the SAC, the freshwater pearl mussel only occurs in the Rivers Cloon and Feale. Only the Cloon is designated for the protection of this species under the European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009. It does not occur downstream of the proposed development site.

Bottle-nosed Dolphin (*tursiops truncatus*) **(Species Code 1349)**.

This species only occurs in saline waters in the Shannon Estuary.

The River Shannon and River Fergus Estuaries SPA Features of Interest

All the Features of Interest primarily occur in saline waters in the Shannon Estuary, but a few are found farther upstream, along freshwater parts of the River Shannon, outside the SPA.

Cormorant (*Phalacrocorax carbo*) **(Species Code A017)**

Cormorants would not occur at the site of the proposed development, but feed in the River Shannon downstream (*pers. obs.*)

Black-headed Gull (*Chroicocephalus ridibundus*) **(Species Code A1790)** and **Teal** *(Anas crecca)* **(Species Code A052)**

While the drains at the proposed development site are too small, black-headed gull and teal could potentially visit the watercourses within a short distance downstream, but such occurrence would be very infrequent in occurrence and would be of low abundance. The NBDC website shows records of both these species within 1km to the northeast of the subject site.

Whooper Swan *(Cygnus cygnus)* **(Species Code A038)** and **Wigeon** *(Anas penelope)* **(Species Code A050)**

Whooper swan and wigeon graze on grass beside the freshwater parts of the River Shannon in winter.

Curlew *(Numenius arquata)* **(Species Code A160)** and **Lapwing** *(Vanellus vanellus)* **(Species Code A142)**

Curlew and lapwing nest inland. The NBDC website shows records of both these species along the Shannon catchment. The subject site does not contain suitable nesting habitat for these species, but it is possible that they could nest within 1km.

Light-bellied Brent Goose (*Branta bernicla hrota)* **(Species Code A046), Shelduck** *(Tadorna tadorna)* **(Species Code A048), Pintail** *(Anas acuta)* **(Species Code A054), Shoveler** *(Anas clypeata)* **(Species Code A056), Scaup** *(Aythya marila)* **(Species Code A062), Ringed Plover** *(Charadrius hiaticula)* **(Species Code A137), Golden Plover** *(Pluvialis apricaria)* **(Species Code A140), Grey Plover** *(Pluvialis squatarola)* **(Species Code A141), Knot** *(Calidris canutus)* **(Species Code A143), Dunlin** *(Calidris alpina)* **(Species Code A149), Black-tailed Godwit** *(Limosa limosa)* **(Species Code A156), Bar-tailed Godwit** *(Limosa lapponica)* **(Species Code A157), Redshank** *(Tringa totanus)* **(Species Code A162)** and **Greenshank** *(Tringa nebularia)* **(Species Code A164)**

These species are found in estuarine habitats in winter.

Wetland and Waterbirds (Habitat Code A999)

This refers to estuarine habitats within the SPA.

APPENDIX G - Natura 2000 Habitats and Species

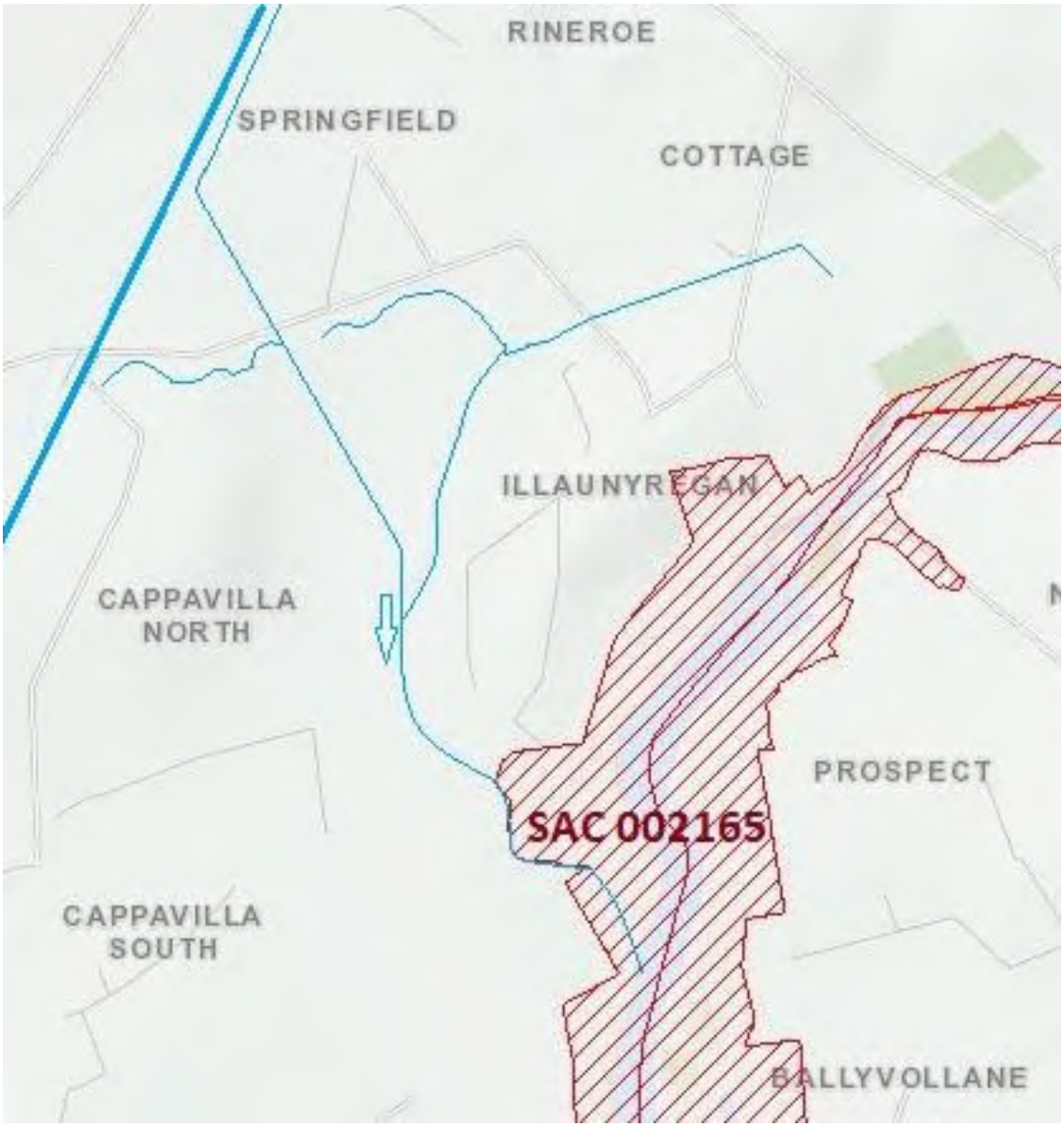
PRESENCE OF NATURA 2000 HABITATS AND SPECIES

(in the immediate vicinity of the works, or within 5km downstream)

Lower River Shannon SAC Qualifying Interests and River Shannon and River Fergus Estuaries SPA Features of Interest	Definitely or Probably Present	Possibly Present	Not Present
Sandbanks which are slightly covered by sea water all the time			✓
Mudflats and sandflats not covered by seawater at low tide			✓
Salicornia and other annuals colonizing mud and sand			✓
Spartina swards (*Spartinion maritimae*)			✓
Estuaries			✓
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)			✓
Mediterranean salt meadows (*Juncetalia maritimi*)			✓
Vegetated sea cliffs of the Atlantic and Baltic coasts			✓
Perennial vegetation of stony banks			✓
Coastal Lagoons			✓
Large shallow inlets and bays			✓
Reefs			✓
Molinia meadows on calcareous, peaty or clavey-silt-laden soils (*Molinion caeruleae*)			✓
Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)	✓		
Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	Not present in drains. Present in River Shannon downstream.		
Margaritifera			✓
Petromyzon marinus	Not present in drains. Present in River Shannon downstream.		
Lampetra planeri	Not present in drains. Present in River Shannon downstream.		
Lampetra fluviatilis	Not present in drains. Present in River Shannon downstream.		
Salmo salar	Not present in drains. Present in River Shannon downstream.		
Lutra	Not present in drains. Present in River Shannon downstream.		
Tursiops truncatus			✓
Chroicocephalus ridibundus		✓	
Anas crecca		✓	
Phalacrocorax carbo	Not present in drains. Present in River Shannon downstream.		

Lower River Shannon SAC Qualifying Interests and River Shannon and River Fergus Estuaries SPA Features of Interest	Definitely or Probably Present	Possibly Present	Not Present
Cygnus cygnus	Not present at subject site. Likely presence within 1km		
Anas penelope	Not present at subject site. Likely presence within 1km		
Numenius arquata	Not present at subject site. Likely presence within 1km		
Vanellus vanellus	Not present at subject site. Likely presence within 1km		
Other Bird species listed as SPA FI's			✓
Wetlands			✓

APPENDIX H – The Lower River Shannon SAC 002165



APPENDIX I – Site Photographs

All photographs were taken in April 2020.

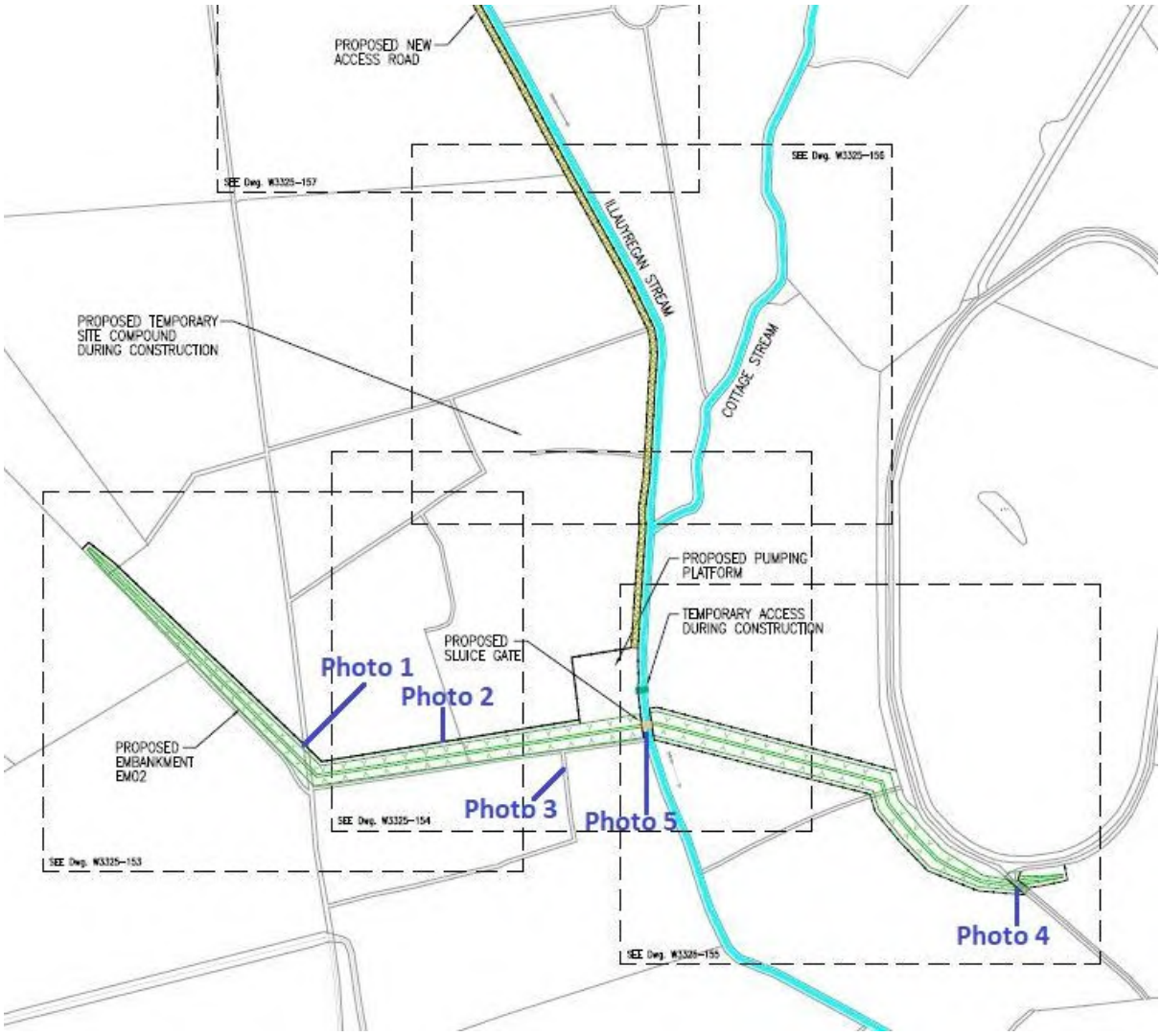


Photo 1

Photo 2

Photo 3

Photo 4

Photo 5