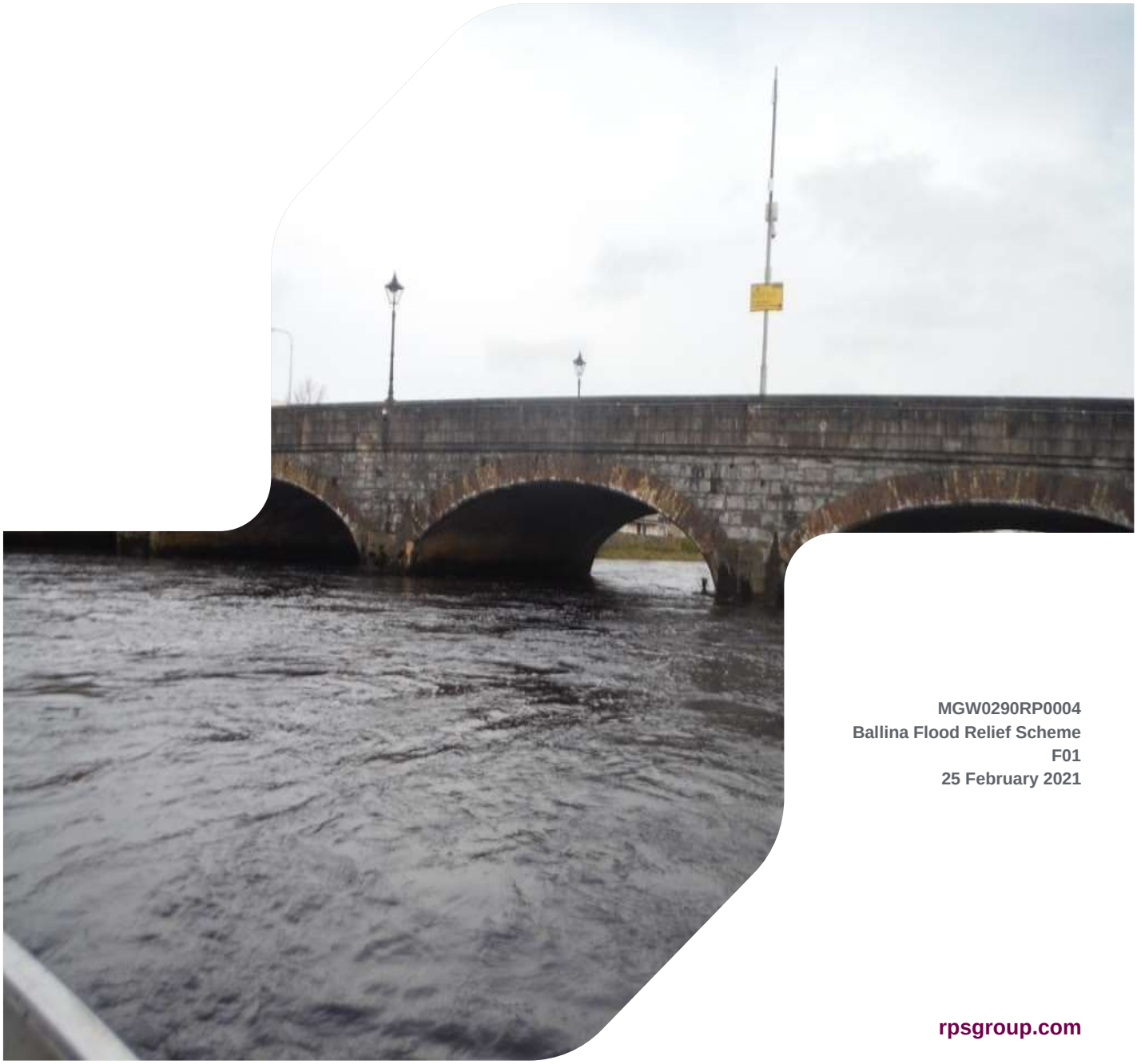
BALLINA FLOOD RELIEF SCHEME

Screening for Appropriate Assessment – Ground Investigation Works



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GLOSSARY

Term	Meaning
Annex I habitat	Habitat types listed on Annex I of the EU Habitats Directive whose conservation requires the designation of Special Areas of Conservation.
Annex II species	Species listed on Annex II of the EU Habitats Directive whose conservation requires the designation of Special Areas of Conservation.
Annex IV species	Species listed on Annex IV of the EU Habitats Directive which are afforded strict protection under EU and national legislation.
Appropriate Assessment	An assessment carried out under Article 6(3) of the Habitats Directive as to whether or not a proposed development would adversely affect the integrity of a European site
Appropriate Assessment Conclusion Statement	The determination by the competent authority under Article 6.3 of the Habitats Directive on an appropriate assessment and the reasons for the determination.
Biodiversity	The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems (UN Convention on Biological Diversity 1992).
Birds Directive	Council Directive 2009/147/EC on the conservation of wild birds
Catchment	An area of land contributing to a river, lake or other waterbody
Competent Authority	The term 'Competent Authority' is construed in accordance with section 177S of the Planning and Development Act 2000 as amended.
Cumulative Impacts	The addition of many minor or significant effects, including effects of other plans and projects, to create larger, more significant effects
Designated sites	Sites which have special status as protected areas because of their natural and cultural importance.
Disruption	Disruption caused to species or habitats for which the European site is selected.
Disturbance	Disturbance caused to species or habitats for which the European site is selected.
Ecology	The study of the inter-relationships between living organisms and their environment
Effect	The consequence of the impact on the environment
European Commission	The Commission of the European Communities.
European site	'European site' has the meaning given to it by section 177R of Part XAB of the Planning and Development Act 2000 as amended and Part 1(2)(1) of the European Communities (Birds and Natural Habitats) Regulations 2011 S.I No 477/2011 as amended. Collective term used when referring to nature conservation sites protected under the Habitats or Birds Directives (SACs or SPAs).
Ex situ	Outside – usually in the context of ex situ effects (or outside effects) on a European site. For example, abstraction of water from a river upstream of a European site located on the river could have an ex situ effect on the site.
Fragmentation	Impacting the connectivity of the site due to the works fragmenting the area which will have a direct impact to species or habitats.
Groundwater Vulnerability	Groundwater vulnerability denotes the intrinsic geological and hydrogeological characteristics that determine the ease at which groundwater may be contaminated by human activities
Habitat	A place in which a particular plant or animal lives. Often used in a wider sense, referring to major assemblages of plants and animals found together such as woodlands or grassland.
Habitats Directive	Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora
Impact	Changes to the environment resulting from the implementation of project.
In situ	Inside or within – usually in the context of in situ effects (or effects within) on a European site. For example, constructing a marina on the lakeshore in a European site could have an in situ effect.
Indirect Impact	Impacts on the environment, which are not a direct result of the project, often produced away from (the site) or as a result of a complex pathway.
Loss	Impact relating to loss of habitat, significance directly relating to the percentage of loss.
Magnitude	The size, extent and duration of an impact.
Mitigation Measures	Measures designed to avoid, reduce, remedy or offset impacts. These measures can mitigate impacts.
Moderate Effect	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Monitoring	The observation, measurement and evaluation of environmental data over a period of time, to assess the efficiency of control measures. This is typically a repetitive and continued process carried out during construction, operation or decommissioning of a project.

Term	Meaning
Natura 2000	The Natura 2000 network is defined under the Habitats Directive 92/43/EEC (Article 3) and the Birds Directive 2009/147/EC (Article 4) as a coherent European ecological network of Special Areas of Conservation (SAC) and Special Protection Areas (SPA).
Natura Impact Statement (NIS)	'Natura impact statement' shall be construed in accordance with section 177T of the Planning and Development Act 2000 (as amended) and Part 1(2)(1) of the European Communities (Birds and Natural Habitats) Regulations 2011 S.I No 477/2011 as amended. The report of a scientific examination of a plan or project and the relevant European sites, to identify and characterise any possible implications for the site(s) in view of the site's conservation objectives, to enable a consent authority to carry out an appropriate assessment.
Non-statutory stakeholder	Organisations with whom the regulatory authorities may choose to engage who are not designated in law but are likely to have an interest in a proposed development.
Pathway	The route by which an effect is conveyed between a source and a receptor.
Precautionary principle	A principle underlying the concept of sustainable development which implies that prudent action be taken to protect the environment even in the absence of scientific certainty.
Prescribed bodies	Organisations that are required to be consulted by the Regulatory Authorities, and who also have a duty to respond to that consultation within a set deadline. This includes consultees that the Applicant is required to consult with. Not all consultees will be statutory consultees.
Priority Annex I habitat	Annex I habitat types which are in danger of disappearance, and for which the European Community has particular responsibility in view of the proportion of their natural range which falls within the territory. Priority habitats are indicated by an asterisk (*) in Annex I of the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.
Priority species	Species for the conservation of which the Community has particular responsibility in view of the proportion of their natural range which falls within the territory, these priority species are indicated by an asterisk (*) in Annex II of the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. At present, Ireland does not have any priority species.
Public Authority	The term 'Public Authority' is construed in accordance with Part 1(2)(1) of the European Communities (Birds and Natural Habitats) Regulations 2011 S.I No 477/2011 as amended
Qualitative effect	An effect on the environment which cannot be measured precisely but can be determined by expert judgement
Quantitative effect	An effect on the environment that can be stated in figures/measurements
Receptor	The Special Conservation Interests (SCI) of SPAs or QI SACs for which conservation objectives have been set for the European sites being assessed.
Screening for Appropriate Assessment (AA)	The screening of a plan or project to establish if an appropriate assessment of the plan or project is required. The Screening for AA assesses whether, in view of best scientific knowledge, if the proposed development, individually or in combination with other plans or projects is likely to have a significant effect on a European site.
SEVESO Site	The catastrophic accident in the Italian town of Seveso in 1976 prompted the adoption of legislation the so-called Seveso-Directive (Directives 82/501/EEC - 2012/18/EU). The Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (the "COMAH Regulations"), implement the Seveso III Directive (2012/18/EU).
Significant Effect	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Source	The individual element of the proposed works that has the potential to impact on a European site, its qualifying features and its conservation objectives
Source-Pathway-Receptor model	A source-pathway-receptor model is a standard tool used in environmental assessment. In order for an effect to be likely, all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism results in no likelihood for the effect to occur.
Special Areas of Conservation (SACs)	SACs are sites designated under European Communities Directive 92/43/EEC known as the 'Habitats Directive'. This requires the conservation of important, rare or threatened habitats and species across Europe. SACs are composed of sites hosting the Qualifying Interest (QI) habitat types listed in Annex I and/or species listed in Annex II (under Habitats Directive Article 3).
Special Protection Areas (SPAs)	SPAs are sites designated under the European Communities Directive 2009/147/EC, known as the 'Birds Directive', to conserve the habitats of certain migratory or rare birds. SPAs are composed of sites supporting Special Conservation Interests (SCI) comprising Annex I bird species, regularly occurring migratory species and the supporting wetland habitats (under Article 4 Birds Directive).
Swallow Hole	A place where surface stream disappears underground in a limestone region.
Water Framework Directive (WFD)	The Water Framework Directive (2000/60/EC) requires all member states of the EU protect and improve the quality of their water within their respective states. This aims to achieve good ecological status of at least good by 2027 at the latest. It applies to rivers, lakes, groundwater, and transitional coastal waters.
Zone of Influence (ZOI)	The ZoI of the proposed development is determined by assessing the project's requirements and deliverables against the sensitive environmental receptors within the project footprint, in addition to environmental receptors that could be connected to and subsequently impacted by the project through abiotic and biotic vectors. The ZoI is identified using a source-pathway-receptor model of effects.

1 INTRODUCTION

RPS Consulting Engineers have been commissioned by Mayo County Council to assist in the delivery of the Ballina Flood Relief Scheme. The objective of this project is the identification, design and submission (for planning consent) of a Flood Scheme, that is technically, socially, environmentally and economically acceptable, to alleviate the risk of flooding to the Community of Ballina to a determined Standard of Protection, and to procure, manage and oversee the construction of that Scheme.

The overall project is divided into five stages which are as follows;

- **Stage I:** Identification and Development of a Preferred Scheme
- **Stage II:** Planning process
- **Stage III:** Detailed Construction Design, Compilation of Work Packages and the Preparation of Tenders for Contracts
- **Stage IV:** Construction Supervision and Project Management Services
- **Stage V:** Handover of Works

RPS have been commissioned by Mayo County Council to prepare a Screening for Appropriate Assessment (AA) for proposed Ground Investigation (GI) Works required to inform the pre-planning and design of the Ballina flood Relief Scheme. This report has been prepared to provide Mayo County Council as the competent authority, the necessary scientific information required to carry out the Appropriate Assessment (AA) in accordance with Article 6(3) of the Habitats Directive 92/43/EEC.

1.1 Statement of Authority

This report has been prepared by Kate O' Donnell, BSc. and reviewed by Paula Kearney BSc. Kate is a Graduate Ecologist with RPS, and she holds a BSc (Hons) in Ecology and Environmental Biology. Paula is Technical Director in Ecology with RPS and holds a BSc (Hons) Ecology and is a Chartered Ecologist (CEcol) and full member of CIEEM (MCIEEM), with 19 years' experience in ecological assessment and AA.

1.2 Legislative Context for Appropriate Assessment

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.

The Natura 2000 network is defined under the Habitats Directive 92/43/EEC (Article 3) and the Birds Directive 2009/147/EC (Article 4) as a coherent European ecological network of Special Areas of Conservation (SAC) and Special Protection Areas (SPA). SACs are composed of sites hosting the Qualifying Interest (QI) habitat types listed in Annex I and/or species listed in Annex II (under Habitats Directive Article 3). SPAs are composed of sites supporting Special Conservation Interests (SCI) comprising Annex I bird species, regularly occurring migratory species and the supporting wetland habitats (under Article 4 Birds Directive). The purpose of the network is to enable the natural habitat types and the species' habitats concerned to be maintained or, where appropriate, restored at a favourable conservation status in their natural range.

The Habitats Directive has 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 (S.I. 477/2011) as amended. In Ireland, these SAC and SPA sites are included within the meaning of 'European site' as per section 177U of the Planning and Development Act, 2000 as amended and Part 1(2) of the European Communities (Birds and Natural Habitats) Regulations 2011, as amended. Articles 6(3) 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 Appropriate Assessment (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.

1.2.1 Role of the Competent Authority

In accordance with subsection 177U(I) of the Planning and Development Act, 2000 as amended, the Screening for AA of an application for consent for proposed development shall be carried out by the competent authority, Mayo County Council, to assess in view of best scientific knowledge, whether the proposed development, individually or in combination with other plans and projects, is likely to have a significant effect on the European site. This report provides the necessary information to the competent authority in making their determination on the Screening for AA.

1.3 Scheme Area

The site location of the proposed GI works is within the Ballina Flood Relief Scheme Area. The Scheme Area is Ballina town located in County Mayo. The Scheme Area is comprised of the following:

- Area within which physical works are proposed to be constructed, accessed and maintained as part of any feasible scheme;
- Areas that are intended to benefit from, and be protected by, any such scheme;
- Lengths of river channel/watercourse upstream and downstream that are likely to be impacted hydraulically by such scheme.

Figure 1-1 below shows the proposed scheme area. See **Appendix A** for the locations of the proposed GI works within the scheme area. See **Appendix B** for the grid reference locations of the proposed works within the scheme area.

Figure 1-1: Scheme Area Location

2 METHODOLOGY

2.1 Appropriate Assessment Methodology

Both EU and national guidance exists in relation to Member States fulfilling their requirements under the EU Habitats Directive, with particular reference to Article 6(3) of that Directive. The methodology followed in relation to this assessment has had regard to the following guidance and legislation:

Guidance

- EC (2000). *Communication from the Commission on the Precautionary Principle*. Office for Official Publications of the European Communities, Luxembourg;
- EC (2002). *Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*, Office for Official Publications of the European Communities, Luxembourg. European Commission;
- EC, 2007b, *Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC*. European Commission;
- DoEHLG (2009, rev. 2010) *Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities.* Department of the Environment, Heritage and Local Government;
- EC (2013). *Interpretation Manual of European Union Habitats*. Version EUR 28. European Commission, Luxembourg;
- Balmer, D.E., Gillings, S., Caffrey, B.J., Swann, R.L., Downie, I.S. & Fuller, R.J. 2013. *Bird Atlas 2007–11: The Breeding and Wintering Birds of Britain and Ireland*. BTO Books, Thetford.
- NPWS (2013). Ireland's Summary Report for the period 2008 – 2012 under Article 12 of the Birds Directive. National Parks and Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland;
- EC (2018). *Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC*, Office for Official Publications of the European Communities, Luxembourg;
- CIEEM (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland*. Chartered Institute of Ecology and Environmental Management;
- NPWS (2019), *The Status of EU Protected Habitats and Species in Ireland. Habitat Assessments* Volume 2. Version 1.0. Unpublished Report, National Parks and Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland;
- NPWS (2019), *The Status of EU Protected Habitats and Species in Ireland. Species Assessments* Volume 3, Version 1.0. Unpublished Report, National Parks and Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland;

Legislation

- European Union (Environmental Impact Assessment and Habitats) Regulations 2011 S.I No 473/2011 as amended,
- European Communities (Birds and Natural Habitats) Regulations 2011 S.I No 477/2011 as amended;
- Planning and Development Act 2000, as amended;
- Planning and Development Regulations 2001, as amended; and
- Recent Irish and European case law on the Habitats Directive.

2.2 Stages of Appropriate Assessment

The Department of the Environment Heritage and Local Government guidelines (DoEHLG, 2010)[1] outlines the European Commission's methodological guidance (EC, 2002) promoting a four-stage process to complete the AA and outlines the issues and tests at each stage. An important aspect of the process is that the outcome at each successive stage determines whether a further stage in the process is required.

The four stages are summarised diagrammatically in **Figure 2-1** below, and an outline of the steps and procedures involved in completing each stage follows. Stages 1-2 deal with the main requirements for assessment under Article 6(3). Stage 3 may be part of the Article 6(3) Assessment or may be a necessary precursor to Stage 4. Stage 4 is the main derogation step of Article 6(4).

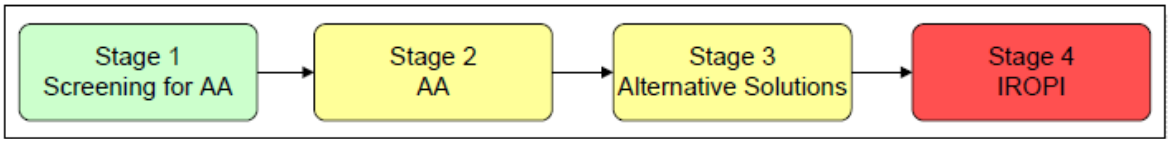


Figure 2-1: Four Stages of Appropriate Assessment

2.2.1 Stage 1 – Screening for Appropriate Assessment

Screening is the process that addresses and records the reasoning and conclusions in relation to the first two tests of Article 6(3):

- whether a plan or project is directly connected to or necessary for the management of the site, and
- whether a plan or project, alone or in combination with other plans and projects, is likely to have significant effects on a European site in view of its conservation objectives.

In complying with the obligations under Article 6(3) and following the EC2002 and EC2018 Guidelines, this AA has been structured as a stage by stage approach as follows:

Stage 1 - Screening for AA

- Description of the project;
- Identification of European Sites potentially affected;
- Identification and description of likely individual and cumulative impacts on the conservation objectives European Sites;
- Assessment of the significance of the impacts identified above on-site integrity;
- Exclusion of sites where it can be objectively concluded that there will be no significant effects; and
- Screening conclusion.

If the effects are deemed to be significant, potentially significant, or uncertain, or if the screening process becomes overly complicated, then the process must proceed to Stage 2 (AA). Screening should be undertaken without the inclusion of mitigation, unless potential impacts clearly can be avoided through the modification or redesign of the plan or project, in which case the screening process is repeated on the altered plan. The greatest level of evidence and justification will be needed in circumstances when the process ends at screening stage on grounds of no impact.

2.2.2 Stage 2 – Appropriate Assessment (Natura Impact Statement)

The aim of Stage 2 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

[1] Now the Department of Culture, Heritage and the Gaeltacht

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 Step 3.

This stage considers whether the plan or project, alone or in combination with other projects or plans, will have adverse effects on the integrity of a European site, and includes any mitigation measures necessary to avoid, reduce or offset negative effects. The proponent of the plan or project will be required to submit a Natura Impact Statement, i.e. the report of a targeted professional scientific examination of the plan or project and the relevant European sites, to identify and characterise any possible implications for the site in view of the site's conservation objectives, taking account of in-combination effects. This should provide information to enable the public authority to carry out the AA.

If the assessment is negative, i.e. adverse effects on the integrity of a site cannot be excluded, then the process must proceed to Stage 3, or the plan or project should be abandoned. The competent authority must make a determination to that effect before proceeding to the next stage.

2.2.3 Stage 3 – Alternative Solutions

If it is not possible during the stage 2 to reduce impacts to acceptable, non-significant levels by avoidance and/or mitigation, stage 3 of the process must be undertaken which is to objectively assess 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 negative impacts on the integrity of a European site. It should also be noted that EU guidance on this step 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.

The process must return to Stage 2, as any alternative proposal must be subject to a Stage 2 AA before it can be subject to the Article 6(4) test. If it can be demonstrated that all reasonable alternatives have been considered and assessed, the AA progresses to Stage 4.

2.2.4 Stage 4 – Imperative Reasons for Overriding Public Interest (IROPI)

This stage of the 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 and there are no alternative solutions. At this stage of the AA process, it is the characteristics of the plan or project itself that will determine whether or not the public authority can allow it to progress. This is the determination of IROPI.

Stage 4 of the process defines and describes these compensatory measures. The Commission must be informed of the compensatory measures. Compensatory measures must be practical, implementable, likely to succeed, proportionate and enforceable, and they must be approved by the Minister of Housing, Planning and Local Government.

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 'over-riding public interest' is not sufficient and it must be demonstrated that the plan or project is necessary for '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'.

For the proposed project, a Screening for AA is presented in **Section 5** below.

2.3 Scheme Area and Zone of Influence

2.3.1 Scheme Area

The Scheme Area encompasses Ballina town as shown in **Figure 1-1** above.

2.3.2 Establishing a Zone of Influence

The identification of relevant European sites to be included in this report was based on the identification of the ZoI of the proposed development using a source-pathway-receptor model of effects, and the likely significance of any identified effects.

2.3.2.1 Source-Pathway-Receptor Model

The likely effects of the proposed development on any European site from has been assessed using a source-pathway-receptor model, where:

- A 'source' is defined as the individual element of the proposed works that has the potential to impact on a European site, its qualifying features and its conservation objectives;
- A 'pathway' is defined as the means or route by which a source can affect the ecological receptor; and
- A 'receptor' is defined as the SCI of SPAs or the QI of SACs for which conservation objectives have been set for the European sites being assessed.

A source-pathway-receptor model is a standard tool used in environmental assessment. In order for an effect to be likely, all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism results in no likelihood for the effect to occur. The source-pathway-receptor model was used to identify the European sites, and their QIs/SCIs, to which the proposed development site could be potentially linked.

2.3.2.2 Zone of Influence

Determination of the project's ZoI was achieved by assessing the project's requirements and deliverables against the ecological receptors within the project footprint, in addition to ecological receptors that could be connected to and subsequently impacted by the project through abiotic and biotic vectors.

The proximity of the proposed development to European sites, and more importantly QIs/SCIs of the European sites, is of importance when identifying potentially likely significant effects. A conservative approach has been used, which minimises the risk of overlooking distant or obscure effect pathways, while also avoiding an over reliance on buffer zones (e.g. 15 km), within which all European sites should be considered. This approach follows the DoEHLG 2010 Guidance on AA which states that:

"*For projects, the distance could be much less than 15 km, and in some cases less than 100m, but this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors, and the potential for in combination effects*" (DoEHLG, 2010; p.32, para 1).

The proposed project has been evaluated based on an identified ZoI with regard to the potential impact pathways to ecological feature (e.g. mobile and static). The ZoI of the proposed development on mobile species (e.g. birds, mammals, and fish), and static species and habitats (e.g. saltmarshes, woodlands, and flora) is considered differently. Mobile species have 'range' outside of the European site in which they are QI/SCI. The range of mobile QI/SCI species varies considerably, from several metres (e.g. in the case of whorl snails *Vertigo* spp.), to hundreds of kilometres (in the case of migratory wetland birds). Whilst static species and habitats are generally considered to have ZoIs within close proximity of the proposed development, they can be significantly affected at considerable distances from an effect source; for example, where an aquatic QI habitat or plant is located many kilometres downstream from a pollution source.

Due to the proximity of European sites, air pollution from construction activities may affect the sensitive habitats in the vicinity of the GI works. Dust or particles falling onto plants can physically smother the leaves affecting photosynthesis, respiration and transpiration. The potential distance for significant vegetation effects from the source on major construction sites is 25m and 10m from minor construction site[2]s. The principal pollutants of concern which originate from construction plant and machinery are the nitrogen oxides (NOx), in terms of impact on sensitive ecosystems. Nitrogen oxides (NOx) may have a positive or negative impact by acting as

[2] NRA's 'Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes' (2011)

a fertiliser or a phytotoxicant. Effects are mainly on vegetation growth, photosynthesis, and nitrogen assimilation/metabolism.

The GI works are considered to be minor construction works and existing road infrastructure will be utilised to access and egress from the site. In addition, the woks will be localised and short term in nature and the air emissions from plant and machinery used in the GI works will be similar to vehicular emissions currently found in the urban environment. Therefore, potential for impacts from air pollution and dust emissions is thought to be restricted only to the European sites proximal to the GI works, and potential impacts to same will be assessed.

Hydrological linkages between a proposed GI works and European site (and their QIs/SCIs) can occur over significant distances; however, any effect will be site specific depending on the receiving water environment, nature of the linkage and consequent nature of the potential impact. As a precautionary measure, a reasonable worst-case ZoI for water pollution from the proposed GI works site in this case extends to the Moy and Killala Bay Water Framework Directive (WFD) Catchment (Catchment ID:34), and sensitive receptors downstream in transitional waters and marine environment including the Moy Estuary and Killala Bay.

Hydrogeological linkages between a proposed GI works and European sites (and their QIs/SCIs) are highly variable based on the characteristics of the groundwater body, construction methodologies, operational practices, and the presence of groundwater dependant habitats and species. As a precautionary measure, a reasonable worst-case ZoI for water pollution from the proposed GI works site in this instance is considered to comprise the entirety of each groundwater body the proposed GI works overlies.

The ZoI, see **Figure 2-2**, is the area that contains the:

- Lengths of river channel/watercourse that have hydraulic influence on the area intended to benefit from, and be protected by, any feasible scheme;
- Full hydrological catchment areas draining to the downstream ends of those river channels/ watercourses;
- Areas that require environmental assessments as part of the development of any such scheme.

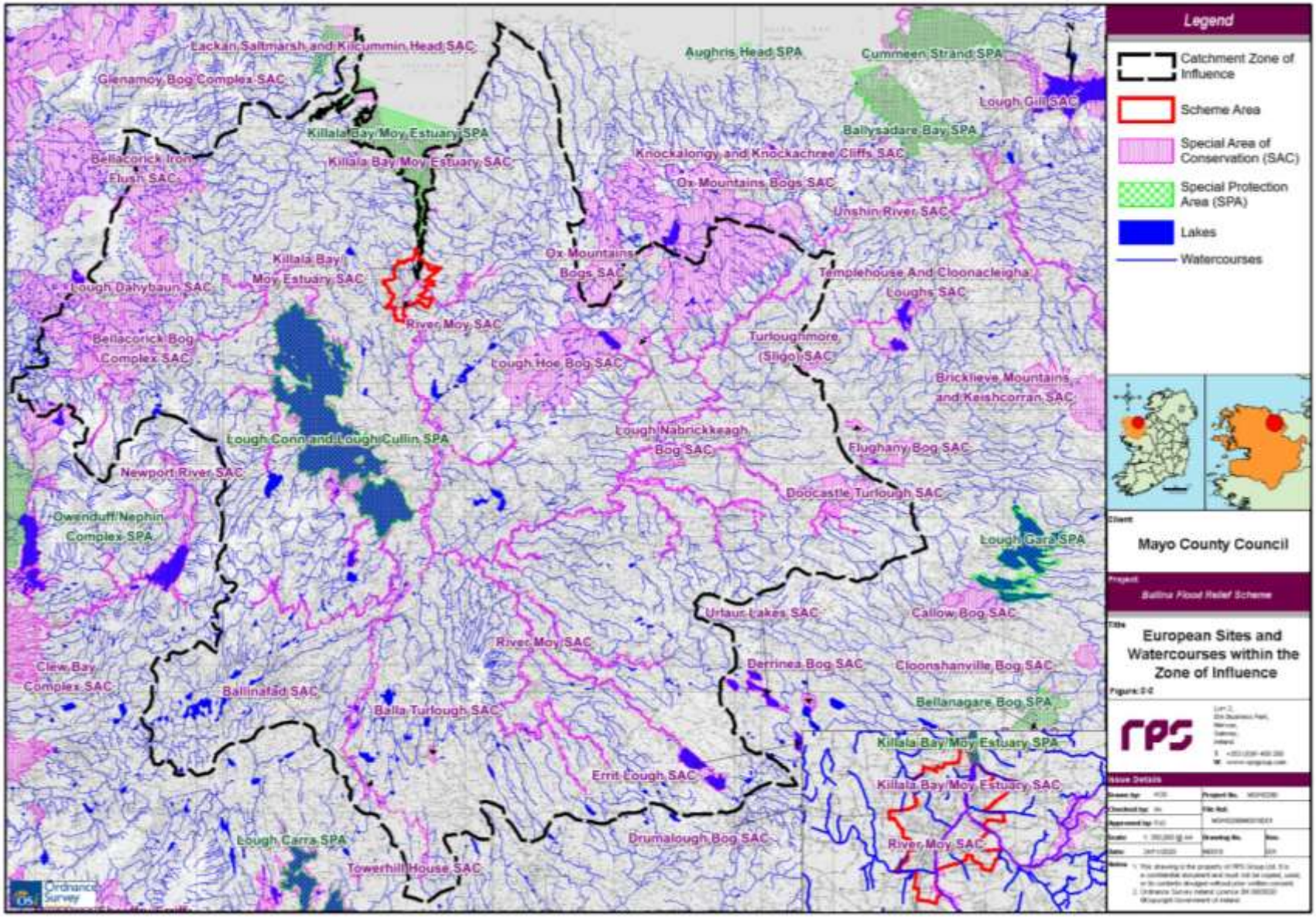


Figure 2-2: European sites and Watercourses within the ZoI

2.4 Desk Study

A desk study was completed to assess the potential for the QI and SCI of European sites to occur within the ZoI, given their ecological requirements identified by Balmer *et al*. (2013) for SCIs, and the National Parks and Wildlife Service (NPWS) for QIs (NPWS, 2019, Volumes 1, 2 &3).

SCI birds and mobile QI species can travel many kilometres from their core areas, and desktop surveys assessed the potential presence of such species beyond the defined boundaries of the European sites for which they are listed as QIs/SCIs. Desktop studies had particular regard for the following sources:

- Information on the location, nature and design of the proposed project;
- Department of Housing, Planning, Community and Local Government – online land-use mapping www.myplan.ie/en/index.html;
- Environmental Protection Agency (EPA) online interactive mapping tools (https://gis.epa.ie/EPAMaps) and (https://www.catchments.ie/maps/) for water quality data including surface and ground water quality status, and river catchment boundaries;
- Information on ranges of mobile QI populations in Volume 1 of NPWS' Status of EU Protected Habitats and Species in Ireland (NPWS, 2019a), and associated digital shapefiles obtained from the NPWS Research Branch;
- Inland Fisheries Ireland mapping http://wfdfish.ie/;
- BirdWatch Ireland (https://birdwatchireland.ie/)
- Mapping of European Site boundaries and Conservation Objectives for relevant sites, available online from the NPWS included site synopsis, Natura 2000 Data form and Conservation Objective Supporting Documents where available (https://www.npws.ie/protected-sites);
- Distribution records for QI and SCI species of European sites held online by the National Biodiversity Data Centre (NBDC) www.biodiversityireland.ie;
- Geohive online Environmental Sensitivity Mapping tool (https://airomaps.geohive.ie/ESM/);
- Boundaries for catchments with confirmed or potential freshwater pearl mussel (FWPM) *Margaritifera* populations in GIS format available online from the NPWS;
- Geological Survey Ireland (GSI) (https://www.gsi.ie/en-ie/Pages/default.aspx); and
- Any local surveys of flora, fauna and habitat available using the Heritage Councils mapping website (https://heritagemaps.ie/WebApps/HeritageMaps/index.html)
- Information on the River Basin Management Plan 2018 – 2021 - https://www.housing.gov.ie/sites/default/files/publications/files/rbmp_full_reportweb.pdf;
- Ordnance Survey of Ireland – Mapping and Aerial photography www.osi.ie.

2.5 Walkover Surveys and Site Visits

Following a full desktop study of available biological information pertaining to the scheme area, RPS ecologists carried out ecological site walkovers on the 4th June and 5th August 2020.

The data collected during these surveys provided detailed information on the existing environment. The survey assessed the potential for QIs/SCIs of European sites within the ZoI of the proposed development and invasive species listed in the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 as amended, to occur within the proposed development boundary.

Under Regulation 49(2) of the 2011 Regulations, it is an offence to plant, disperse, allow or cause to disperse, spread or otherwise cause to grow in any place, any plant included in Part 1 of the Third Schedule without a licence from the Minister for Arts, Heritage and the Gaeltacht.

The findings of the site visits are provided in **Section 4.1**.

3 PROJECT DESCRIPTION

3.1 Proposed Ground Investigation Works

The proposed GI works proposed along the River Moy will be within the urban townscape of Ballina, within the road pavement or footpath on either side of the River. The GI works proposed in Marian Crescent are within a residential area with amenity grassland proximal to a treeline and a channelised partially culverted watercourse. The proposed GI works near Killala road are within agricultural grassland and scrub to the rear of houses. The proposed commencement and completion dates/ duration of works is thirty days[3]. The working hours for the proposed GI works are 08.00-19.00 Monday to Friday and 08.00 to 16.00 Saturday.

3.2 Proposed Ground Investigation Works - Methodology

The methodologies for the various GI methods proposed to inform the design and location of the proposed flood relief measures for the Ballina Flood Relief Scheme are outlined in detail below in **Sections 3.2.1 - 3.2.4. Appendix A** provides details of the proposed GI works locations.

3.2.1 Borehole Rotary Core (BHRC)

There are twenty-two Borehole Rotary Cores proposed as part of the GI works. They will have a diameter of 150mm. The rig will generally arrive to site on a low loader truck and is unloaded close to the investigation location. Depending on the type of rig and ground conditions it can be, towed or tracked to the proposed investigation location. An external air compressor may be required and may also be towed to the investigation location. The methodology for Borehole Rotary Core is as follows:

- The proposed location is cleared for underground services using utilities mapping, cat and genny equipment and/or a GPR survey.
- The drillers will set up a working area around the investigation location, approximately 2-3 m either side of the rig, with approximately 5-10 m in front of the mast for working rod set/up storage. This working area may include space for vehicle parking, equipment and tool storage, temporary sample storage, rod and sample racks, IBC/tank for water supply and runoff, and drill casings and rods etc.
- The investigation location is generally dug by hand to 1.2m for safety. The size of this pit is dependent on the diameter of the boreholes, specified in this instance at 75mm minimum diameter core, so the pit is usually less than $1m^2$.
- Drilling commences and uses a cutting drill bit to generate the overburden soil samples. Occasionally small amounts of water (by bucket) are introduced to the borehole to aid drilling. No other drilling fluids or lubricants would be used.
- Disturbed and/or undisturbed soil samples/arisings derived from the overburden drilling (open holing or otherwise) are collected in buckets/bags/core boxes as they are generated for logging by a geologist/engineer and taken to the site office or logging shed if the engineer is not present. Special equipment can be used if specified to collect undisturbed samples at the base of each run. Standard penetration tests (SPTs) are conducted downhole at agreed depth intervals using rods and a hammer attached to the rig.
- When rock is encountered the drill bit will be changed and a rock coring installed onto the rig. Rock is cored and may require the addition of water and/or drilling fluids to the hole from the tanker on-site.
- Rock core is retrieved from the hole in lengths determined by the rod lengths and is stored in core boxed marked by depth for logging.

[3] This duration is provisional, pending confirmation by the Project Supervisor (Construction Stage) that they are practicable. This timescale is based upon engineering judgement using knowledge from previous similar projects and is dependent on all plant and equipment being delivered to site on time and on the assumption, that works will be carried out in accordance with the proposed plan.

- Once the desired depth has been reached (maximum of 50m specified) the drilling rods are withdrawn, and slotted PVC/HDPE tubes are installed to the desired depth (determined by the supervising engineer) if a standpipe installation is specified at this location.
- The hole is backfilled using the excess drill arisings and a bentonite seal if required. Bentonite to be used on site is in a dry pellet form which expands to form a seal on contact with water. Bentonite reacts with water to form a viscous, gel-like fluid which dries to form a seal at the top of the borehole which prevents surface water and any contaminants from entering the borehole. There is no evidence of Bentonite in this form being mobilised through soil or groundwater due to its viscous nature.
- The rig is removed from the investigation location and the field/driveway/garden etc is restored to previous state, which may require re-seeding, concrete or asphalt backfill or plant replacement depending on the requirements of the accommodation works and planning rules. Unavoidable damage such as rutting by machinery must be reinstated by the Contractor. All surfaces will be reinstated to their original condition to the satisfaction of the Investigation Supervisor.
- The purpose of the boreholes and standpipe installations is to measure the depths to groundwater and assess the aquifer parameters (if required) as they are. The standpipes will also be sealed and locked to prevent surface water and/or potential contaminant ingress.

3.2.2 Slit Trenches/Trial Pits

There are fifteen slit trenches and nine trial pits proposed as part of the GI works. Slit Trenches and Trial Pits are undertaken using excavators usually between 2 and 15 metric tonnes depending on the depth of slit trench required (maximum required depth specified 3.5m below ground level). The excavators will generally arrive to site on a low-loader truck and is unloaded close to the investigation location. Tracked or rubber tyred excavators are then brought to the proposed investigation location. The methodology for Slit Trenches/Trial Pits is as follows:

- The proposed location is cleared for underground services using utilities mapping, cat and genny equipment and/or a GPR survey. The excavator driver will determine a safe working area around the investigation location, based on the size of the slit trench and the swing radius of the excavator arm which can be up to 5m in length. The working area will comprise the slit trench, the spoil/sample stockpiles, and space for the supervising engineer to take notes, measurements, photographs, and to log the utilities located.
- Trial pits and observation pits shall have a minimum base area of 1.5m^2 and trial trenches and observation trenches shall be a minimum of 0.6m wide. The trial pits will be up to 4m deep.
- The slit trench across the full width of road will be carried out in two phases (one road lane at a time) to allow minimum disruption to traffic flow.
- Prior to excavation the road surface will be saw cut to give a clean edge. Excavation of the trench (one road lane at a time) will be carried out using a toothless bucket with a labourer on hand to excavate more cautiously close to services. Excavated material will be removed off site by the contractor.
- All exposed services will be logged and photographed by an Engineer.
- On completion of the excavation of one road lane this part of the trench will be backfilled with compacted hardcore bearing/wearing course tarmacadam as instructed by Mayo county Council. The saw-cut edges will be sealed using a bituminous seal. The reinstatement will take place immediately after the completion of the final slit trench/trial pit.
- All material excavated will be placed on the upstream side of the slit trench such that any run off will be back into the trench.

3.2.3 Lighting

No external lighting is proposed/required as part of the works.

3.2.4 Access and Haul Roads

Temporary haul roads will not be required as part of the works. Machinery will access the GI locations using existing road infrastructure and access points to fields. No new watercourse crossing will be required as part of the proposed works.

3.3 Description of European Sites

3.3.1 European sites within the Zone of Influence

There are twelve European Sites located within the ZoI of the proposed works, see **Figure 3-1**, these are as follows:

1. Killala Bay/ Moy Estuary SAC (Site Code: 000458);
2. River Moy SAC (Site Code: 002298);
3. Killala Bay/ Moy Estuary SPA (Site Code: 004036);
4. Lackan Saltmarsh and Kilcummin Head SAC (Site Code: 000516);
5. Bellacorick Bog Complex SAC (Site Code: 001922);
6. Lough Conn and Lough Cullin SPA (Site Code: 004228);
7. Owenduff/ Nephin Complex SAC (Site Code: 000534);
8. Balla Turlough SAC (Site Code: 000463);
9. Lough Hoe Bog SAC (Site Code: 000633);
10. Lough Nabrickkeagh Bog SAC (Site Code: 000634);
11. Ballinafad SAC/pNHA (Site Code: 002081); and
12. Ox Mountains Bogs SAC (Site Code: 002006).

3.3.2 Assessment of Connectivity

The assessment of connectivity between the European Sites and the proposed works follows the potential source-pathway-receptor model, which identifies the source of likely significant impacts, if any, the pathway (land, air, hydrological, hydrogeological pathways, etc) along which those impacts may be transferred from the source to the receiving environmental receptors (i.e. European Sites and/ or features for which the sites are designated). An assessment of the baseline environment is provided in **Section 4** to understand the potential biotic and abiotic vectors to European sites.

Where it is evident that there is no connectivity between the proposed works and receptors (i.e. European Sites and/ or features for which the sites are designated), the receptors are excluded from the AA screening process. Where connectivity exists between the proposed work and receptors an assessment on the likely significant effects to the receptors carried out in **Section 5**.

Table 3-1 provides details on the distance and hydrological and hydrogeological connectivity from the proposed works.

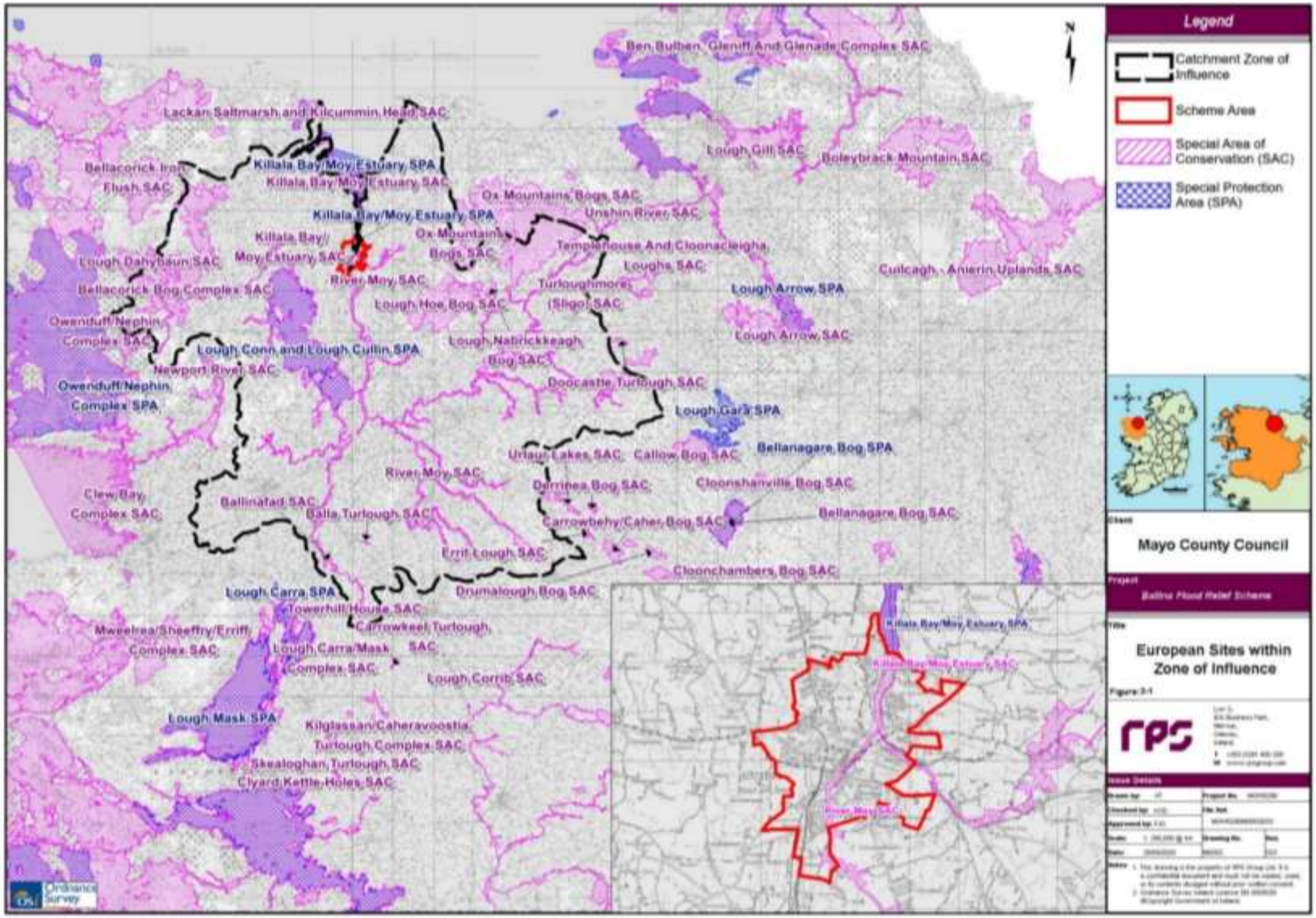


Figure 3-1: European sites within the ZoI

Table 3-1: European sites within the ZoI of the scheme area.

Site Name and Code	Qualifying Interests Habitats and species (*=Priority)	Distance from Scheme Area	Connectivity	Sites Brought Forward for Further Assessment
Killala Bay/ Moy Estuary SAC (000458)	**Habitats** Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Annual vegetation of drift lines [1210] Salicornia and other annuals colonizing mud and sand [1310] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes') [2120] *Fixed coastal dunes with herbaceous vegetation ('grey dunes') [2130] Humid dune slacks [2190] **Species** Narrow-mouthed Whorl Snail (*Vertigo angustior*) [1014] Sea Lamprey (*Petromyzon marinus*) [1095] Harbour Seal (*Phoca vitulina*) [1365]	Within scheme area	The Moy Estuary (IE_WE_420_0300) is located within the scheme area and is designated as part of the Killala Bay/ Moy Estuary SAC/ pNHA. Therefore, there is direct downstream hydrological connectivity between the scheme area and SAC. The SAC/ pNHA is located within the Ballina (IE_WE_G_0035), Foxford (IE_WE_G_0034), Bellacorick-Killala (IE_WE_G_0041) and Killala South (IE_WE_G_0047) groundwater bodies. The scheme area and SAC/ pNHA are both located within the Ballina (IE_WE_G_0035) groundwater body. Therefore, there is potential for hydrogeological connectivity between the SAC/ pNHA and the scheme area.	**Yes** Potential source-pathway-receptor connectivity exists; therefore, this site will be carried forward for further assessment. **Annex I Habitats:** There are no GI sites located within the qualifying habitats of the SAC. Therefore, no impact is anticipated. **Annex II species:** Some GI sites are proximal to the Moy Estuary, therefore there is potential for impacts to the qualifying species of the SAC.
River Moy SAC (002298)	**Habitats** Active raised bogs* [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the *Rhynchosporion* [7150] Alkaline fens [7230] 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] **Species** White-clawed Crayfish (*Austropotamobius pallipes*) [1092] Sea Lamprey (*Petromyzon marinus)* [1095] Brook Lamprey (*Lampetra planeri*) [1096]	Within scheme area	The River Moy is located within the scheme area and is designated as part of River Moy SAC. Therefore, there is direct connectivity between the scheme area and the SAC. The SAC is located within multiple groundwater bodies including the Ballina (IE_WE_G_0035) and Ballina Gravels Group 1 (IE_WE_G_0113) groundwater bodies. The scheme area intersects these two groundwater bodies therefore there is potential for hydrogeological connectivity between the SAC and the scheme area.	**Yes** Potential source-pathway-receptor connectivity exists; therefore, this site will be carried forward for further assessment. **Annex I Habitats:** There are no GI sites located within the qualifying habitats of the SAC, however the QI habitat Estuaries [1130] is located in proximity to some of the GI sites. **Annex II species:** Some GI sites are proximal to the River Moy, therefore there is potential for impacts to the qualifying species of the SAC.

Site Name and Code	Qualifying Interests Habitats and species (*=Priority)	Distance from Scheme Area	Connectivity	Sites Brought Forward for Further Assessment
	Salmon (*Salmo salar)* [1106] Otter (*Lutra lutra)* [1355]			
Killala Bay/ Moy Estuary SPA (004036)	**Species** Ringed Plover (*Charadrius hiaticula)* [A137] Golden Plover (*Pluvialis apricaria)* [A140] Grey Plover (*Pluvialis squatarola)* [A141] Sanderling (*Calidris alba)* [A144] Dunlin (*Calidris alpina alpina)* [A149] Bar-tailed Godwit (*Limosa lapponica)* [A157] Curlew (*Numenius arquata)* [A160] Redshank (*Tringa totanus)* [A162] **Habitats** Wetlands [A999]	Within scheme area	Moy Estuary (IE_WE_420_0300) is located within the scheme area and is designated as part of the Killala Bay/ Moy Estuary SPA. Therefore, there is direct hydrological connectivity between the scheme area and SPA. The SPA is located within the Ballina (IE_WE_G_0035), Foxford (IE_WE_G_0034), Bellacorick-Killala (IE_WE_G_0041), Killala South (IE_WE_G_0047), Killala North (IE_WE_G_0046) and Belmullet (IE_WE_G_0057) groundwater bodies. The scheme area and SPA are both located within the Ballina (IE_WE_G_0035) groundwater body. Therefore, there is potential for hydrogeological connectivity between the SPA and the scheme area.	**Yes** Potential source-pathway-receptor connectivity exists; therefore, this site will be carried forward for further assessment. **Annex I Habitats:** There are no GI sites located within the qualifying habitats of the SAC. Therefore, no impact is anticipated. **Annex II species:** Some GI sites are proximal to the Moy Estuary, therefore there is potential for impacts to the qualifying species of the SAC.
Lackan Saltmarsh and Kilcummin Head SAC (000516)	**Habitats** Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes)* [2130]	15.85km north	There is indirect hydrological connectivity between the SAC/ pNHA and scheme area via Moy Estuary, Killala Bay and Lackan Bay. The Moy Estuary is located within the scheme area, this then flows into Killala Bay which is connected to Lackan Bay. The SAC is located within Lackan Bay. The SAC/ pNHA is located within the Killala South (IE_WE_G_0047), Killala North (IE_WE_G_0046) and Belmullet (IE_WE_G_0057) groundwater bodies, none of which are intersected by the scheme area.	**Yes** Potential source-pathway-receptor connectivity exists; therefore, this site will be carried forward for further assessment. **Annex I Habitats:** There are no GI sites located within the qualifying habitats of the SAC however there is remote connectivity to this site from the GI works.
Bellacorick Bog Complex SAC (001922)	**Habitats** Natural dystrophic lakes and ponds [3160] Northern Atlantic wet heaths with *Erica tetralix* [4010] Blanket bogs (* if active bog) [7130] Depressions on peat substrates of the *Rhynchosporion* [7150] Alkaline fens [7230] **Species** Geyer's Whorl Snail (*Vertigo geyeri)* [1013] Marsh Saxifrage (*Saxifraga hirculus)* [1528]	14.52km west	The SAC/ pNHA is located upstream of the scheme area, therefore no suitable source-vector pathway hydrological connectivity between the scheme area and the SAC exists. The SAC/ pNHA is located within the Bellacorick-Killala (IE_WE_G_0041), Belmullet (IE_WE_G_0057), Deel (IE_WE_G_0031), Laherdaun (IE_WE_G_0030) and Ballina (IE_WE_G_0035) groundwater bodies. The scheme area intersects the Ballina groundwater body therefore there is potential for hydrogeological	**No** SAC is upstream of the scheme area and source-pathway-receptor connectivity via direct river systems does not exist between the proposed works and the designated site. This is due to existing barriers to connectivity or distance of GI works from potential vectors. Therefore, the site will not be carried forward for further assessment as part of this report.

Site Name and Code	Qualifying Interests Habitats and species (*=Priority)	Distance from Scheme Area	Connectivity	Sites Brought Forward for Further Assessment
			connectivity between the SAC/ pNHA and the scheme area. The groundwater flows towards the nearest rivers and lakes, therefore groundwater is most likely to flow from the GI locations to the River Moy. The SAC is also located a considerable distance from the GI Works. Consequently, it is not expected that there will be any hydrogeological impacts.	
Lough Conn and Lough Cullin SPA (004228)	**Species** Tufted Duck (*Aythya fuligula)* [A061] Common Scoter (*Melanitta nigra)* [A065] Common Gull (*Larus canus)* [A182] Greenland White-fronted Goose (*Anser albifrons flavirostris)* [A395]	4.23km south west	The SPA is located upstream of the scheme area, therefore no suitable source-vector pathway hydrological connectivity between the scheme area and the SPA exists. The SPA is located within the Ballina (IE_WE_G_0035), Laherdaun (IE_WE_G_0030), Beltra Lough North (IE_WE_G_0025) and Foxford (IE_WE_G_0034) groundwater bodies. The SPA and scheme area are both located within the Ballina (IE_WE_G_0035) groundwater body. Therefore, there is potential for hydrogeological connectivity between the SPA and the scheme area. The groundwater flows towards the nearest rivers and lakes, therefore groundwater is most likely to flow from the GI locations to the River Moy. Consequently, it is not expected that there will be any hydrogeological impacts.	**No** SPA is upstream of the scheme area and source-pathway-receptor connectivity via direct river systems does not exist between the proposed works and the designated site. This is due to existing barriers to connectivity or distance of GI works from potential vectors. Therefore, the site will not be carried forward for further assessment as part of this report.
Owenduff/ Nephin Complex SAC (000534)	**Habitats** Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or *Isoeto-Nanojuncetea* [3130] Natural dystrophic lakes and ponds [3160] Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] Northern Atlantic wet heaths with *Erica tetralix* [4010] Alpine and Boreal heaths [4060]	23.86km south west	The SAC is located upstream of the scheme area, therefore no suitable source-vector pathway hydrological connectivity between the scheme area and the SAC exists. The SAC is located within the Belmullet (IE_WE_G_0057), Bangor (IE_WE_G_0052), Malranny (IE_WE_G_0027), Laherdaun (IE_WE_G_0030) and Deel (IE_WE_G_0031) groundwater bodies, none of which are intersected by the scheme area.	**No** SAC is upstream of the scheme area and source-pathway-receptor connectivity via direct river systems does not exist between the proposed works and the designated site. This is due to existing barriers to connectivity or distance of GI works from potential vectors. Therefore, the site will not be carried forward for further assessment as part of this report.

Site Name and Code	Qualifying Interests Habitats and species (*=Priority)	Distance from Scheme Area	Connectivity	Sites Brought Forward for Further Assessment
	Juniperus communis formations on heaths or calcareous grasslands [5130] Blanket bogs (* if active bog) [7130] Transition mires and quaking bogs [7140] **Species** Salmon (*Salmo salar)* [1106] Otter (*Lutra lutra)* [1355] Slender Green Feather-moss (*Drepanocladus vernicosus)* [1393] Marsh Saxifrage (*Saxifraga hirculus)* [1528]		Consequently, there is no suitable source-vector pathway hydrogeological connectivity between the scheme area and the SAC.	
Balla Turlough SAC (000463)	**Habitats** Turloughs* [3180]	31.55km south	The SAC is located within the Castlebar_SC_020 sub catchment, which is not intersected by the scheme area, therefore no suitable source-vector pathway hydrological connectivity between the scheme area and the SAC/ pNHA exists. The SAC/ pNHA is located within the Swinford (IE_WE_G_0033) and Kilkelly Charlestown (IE_WE_G_0032) groundwater bodies, neither of which are located within the scheme area. Consequently, there is no suitable source-vector pathway hydrogeological connectivity between the scheme area and the SAC/ pNHA.	**No** SAC is upstream of the scheme area and source-pathway-receptor connectivity via direct river systems does not exist between the proposed works and the designated site. This is due to existing barriers to connectivity or distance of GI works from potential vectors. Therefore, the site will not be carried forward for further assessment as part of this report.
Lough Hoe Bog SAC (000633)	**Habitats** Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] Blanket bogs (* if active bog) [7130] **Species** Geyer's Whorl Snail (*Vertigo geyeri)* [1013] White-clawed Crayfish (*Austropotamobius pallipes)* [1092]	7.6km south east	The SAC is located upstream of the scheme area, therefore no suitable source-vector pathway hydrological connectivity between the scheme area and the SAC exists. The SAC/ pNHA is located within the Foxford (IE_WE_G_0034) and Ballina Gravels Group 2 (IE_WE_G_0116) groundwater bodies, neither of which are intersected by the scheme area. Consequently, there is no suitable source-vector pathway hydrological or hydrogeological connectivity between the scheme area and the SAC/ pNHA.	**No** SAC is upstream of the scheme area and source-pathway-receptor connectivity via direct river systems does not exist between the proposed works and the designated site. This is due to existing barriers to connectivity or distance of GI works from potential vectors. Therefore, the site will not be carried forward for further assessment as part of this report.
Lough Nabrickkeagh	**Habitats** Blanket bogs (* if active bog) [7130]	13.67km south east	The SAC/ pNHA is located upstream of the scheme area, therefore no suitable source-vector pathway	**No**

Site Name and Code	Qualifying Interests Habitats and species (*=Priority)	Distance from Scheme Area	Connectivity	Sites Brought Forward for Further Assessment
Bog SAC (000634)			hydrological connectivity between the scheme area and the SAC/ pNHA exists. The SAC/ pNHA is located within the Foxford (IE_WE_G_0034) groundwater body which is not intersected by the scheme area. Consequently, there is no suitable source-vector pathway hydrogeological connectivity between the scheme area and the SAC/ pNHA.	SAC is upstream of the scheme area and source-pathway-receptor connectivity via direct river systems does not exist between the proposed works and the designated site. This is due to existing barriers to connectivity or distance of GI works from potential vectors. Therefore, the site will not be carried forward for further assessment as part of this report.
Ballinafad SAC (002081)	**Species** Lesser Horseshoe Bat (*Rhinolophus hipposideros*) [1303]	34.8km south	The SAC is located upstream of the scheme area, therefore no suitable source-vector pathway hydrological connectivity between the scheme area and the SAC exists. The SAC is located within the Swinford (IE_WE_G_0033) groundwater body which is not intersected by the scheme area. Consequently, there is no suitable source-vector pathway hydrogeological connectivity between the scheme area and the SAC.	**No** SAC is upstream of the scheme area and source-pathway-receptor connectivity via direct river systems does not exist between the proposed works and the designated site. This is due to existing barriers to connectivity or distance of GI works from potential vectors. Therefore, the site will not be carried forward for further assessment as part of this report.
Ox Mountains Bogs SAC (002006)	**Habitats** Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] Natural dystrophic lakes and ponds [3160] Northern Atlantic wet heaths with *Erica tetralix* [4010] European dry heaths [4030] Blanket bogs (* if active bog) [7130] Transition mires and quaking bogs [7140] Depressions on peat substrates of the *Rhynchosporion* [7150] **Species** Geyer's Whorl Snail (*Vertigo geyeri)* [1013] Marsh Saxifrage (*Saxifraga hirculus)* [1528]	10.13km east	The SAC/ pNHA is located upstream of the scheme area, therefore no suitable source-vector pathway hydrological connectivity between the scheme area and the SAC exists. The SAC/ pNHA is located within the Collooney (IE_WE_G_0048), Foxford (IE_WE_G_0034) and Easky East (IE_WE_G_0050) groundwater bodies, none of which are intersected by the scheme area. Consequently, there is no suitable source-vector pathway hydrogeological connectivity between the scheme area and the SAC/ pNHA.	**No** SAC is upstream of the scheme area and source-pathway-receptor connectivity via direct river systems does not exist between the proposed works and the designated site. This is due to existing barriers to connectivity or distance of GI works from potential vectors. Therefore, the site will not be carried forward for further assessment as part of this report.

3.3.3 Assessment of Connectivity Conclusion

Due to potential for direct and indirect connectivity with the proposed works, the four European sites listed below are brought forward in the screening assessment. The remaining European Sites located within the ZoI of the proposed works do not support connectivity and therefore are not considered further in this assessment. The European sites being assessed in this Screening for AA report are as follows:

- Killala Bay/ Moy Estuary SAC (Site Code: 000458);
- River Moy SAC (Site Code: 002298);
- Killala Bay/ Moy Estuary SPA (Site Code: 004036); and
- Lackan Saltmarsh and Kilcummin Head SAC (Site Code: 000516).

3.3.4 Conservation Objectives of European Sites

The integrity of a European site (referred to in Article 6(3) of the EU Habitats Directive) is determined based on the conservation status of the qualifying features of the European Site(s) as set out above.

European and national legislation places a collective obligation on Ireland and its citizens to maintain at favourable conservation status areas designated as SAC and SPA. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

Favourable conservation status of a habitat is achieved when:

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

The favourable conservation status of a species is achieved when:

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

3.3.4.1 Killala Bay/ Moy Estuary SAC (Site Code: 000458)

North of Ballina town, the River Moy flows to the sea via a long, narrow estuarine channel. After approximately 8 km, the estuary widens to form a north-facing triangular bay, with the towns of Enniscrone (Co. Sligo) and Killala (Co. Mayo) situated on the eastern and western shores, respectively. The estuary itself forms the County boundary along its northern part. A long sandy island (Bartragh Island) separates the south-western side of the bay from the open water. Much of the inner part of the bay is intertidal. The northern part shelves to approximately 10 m.

This composite site has an excellent range of good quality coastal habitats, including a number listed on Annex I of the E.U. Habitats Directive. In particular, the dune complex at Bartragh Island is relatively undisturbed and is considered to be one of the best in the country in terms of its naturalness and intact state. The presence of the Annex II snail, *Vertigo angustior*, and the importance of the area for wintering waterfowl, including two Annex I Birds Directive species, adds further significance to this area. The site is extremely

scenic and is a significant regional amenity area for its beaches and for fishing (NPWS, 2015).[4] **Table 3-2** and **Table 3-3**

Table 3-3 below display the qualifying interests of Killala Bay/ Moy Estuary SAC as detailed on the Natura 2000 Data Form (2018)[5].

Site specific Conservation Objectives have been published for the features of Qualifying Interest of the Killala Bay/ Moy Estuary SAC and are available on the NPWS website[6].

Table 3-2: Killala Bay/ Moy Estuary SAC Habitats of Qualifying Interest

Habitat Code	Qualifying Habitats	Cover (ha)	Representativity[7]
1130	Estuaries	736.94	A
1140	Mudflats and sandflats not covered by seawater at low tide	1332.34	B
1210	Annual vegetation of drift lines	0.58	C
1230	Vegetated sea cliffs of the Atlantic and Baltic coasts	27.35	A
1310	Salicornia and other annuals colonizing mud and sand	0.55	B
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	50.37	B
2110	Embryonic shifting dunes	1.56	B
2120	Shifting dunes along the shoreline with Ammophila arenaria ('white dunes')	12.75	B
2130	*Fixed coastal dunes with herbaceous vegetation ('grey dunes')	259.45	B
2190	Humid dune slacks	5.09	B

Table 3-3: Killala Bay/ Moy Estuary SAC Species of Qualifying Interest

Species Code	Qualifying Species	Population Significance[8]
1014	Narrow-mouthed Whorl Snail (*Vertigo angustior*)	B
1095	Sea Lamprey (*Petromyzon marinus*)	C
1365	Harbour Seal (*Phoca vitulina*)	B

3.3.4.2 River Moy SAC (Site Code: 002298)

This site comprises almost the entire freshwater element of the River Moy and its tributaries including both Loughs Conn and Cullin. The system drains a catchment area of 805 sq. km. Most of the site is in Co. Mayo, though parts are in west Sligo and north Roscommon. Apart from the Moy itself, other rivers included within the site are the Deel, Bar Deela, Castlehill, Addergoole, Clydagh and Manulla on the west side, and the Glenree, Yellow, Strade, Gweestion, Trimogue, Sonnagh, Mullaghanoe, Owengarve, Eighnagh and Owenaher on the east side.

The site supports populations of several species listed on Annex II of the E.U. Habitats Directive, and habitats listed on Annex I of this Directive, as well as examples of other important habitats. The presence of a fine example of broadleaved woodland in this part of the country increases the overall habitat diversity and adds to the ecological value of the site, as does the presence of the range of nationally rare and Red Data

[4] https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY000458.pdf
[5] https://www.npws.ie/sites/default/files/protected-sites/natura2000/NF000458.pdf
[6] https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000458.pdf
[7] Representativity gives a measure of 'how typical' a habitat type is. Representativity is ranked on a scale from A to D as follows; A - Excellent, B -Good, C – Significant and D - Non-significant.
[8] Population Significance is this regard relates to the size and density of a species population present within the designated site in relation to that species populations present within the national territory scale. The significance categories are divided into four alphabetised groups: **A**: 100% >=p>15%; **B**: 15% >= p> 2%; **C**: 2% >=p> 0%; **D**: Non-significant population.

Book plant and animal species (NPWS, 2014)[9]. **Table 3-4** and **Table 3-5**below display the qualifying interests of River Moy SAC as detailed on the Natura 2000 Data Form (2018)[10].

Site specific Conservation Objectives have been published for the features of Qualifying Interest of the River Moy SAC and are available on the NPWS website[11].

Table 3-4: River Moy SAC Habitats of Qualifying Interest

Habitat Code	Qualifying Habitats	Cover (ha)	Representativity
7110	Active raised bogs*	45.25	B
7120	Degraded raised bogs still capable of natural regeneration	82.12	B
7150	Depressions on peat substrates of the Rhynchosporion	2.51	B
7230	Alkaline fens	153.96	A
91A0	Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	153.96	A
91E0	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)*	153.96	B

Table 3-5: River Moy SAC Species of Qualifying Interest

Species Code	Qualifying Species	Population Significance
1092	White-clawed Crayfish (*Austropotamobius pallipes*)	C
1095	Sea Lamprey (*Petromyzon marinus*)	C
1096	Brook Lamprey (*Lampetra planeri*)	C
1106	Salmon (*Salmo salar*)	C
1355	Otter (*Lutra lutra*)	C

3.3.4.3 Killala Bay/ Moy Estuary SPA (Site Code: 004036)

This large site comprises the estuary of the River Moy and the inner part of Killala Bay, including Lackan Bay and Rathfran Bay, in County Mayo. It is a funnel-shaped estuary, c. 7 km wide at its outer limit. It is very well sheltered by a sandy island, Bartragh, and by a sandy peninsula that extends from Enniscrone on the eastern side. Extensive intertidal sand and mud flats are exposed at low tide.

Killala Bay/Moy Estuary SPA is of high ornithological importance as it supports eight species that have populations of national importance, including a very substantial population of Grey Plover (3.4% of the all-Ireland total). The presence of Red throated Diver, Golden Plover and Bar-tailed Godwit is of particular note as these species are listed on Annex I of the E.U. Birds Directive. Killala Bay/Moy Estuary is a Ramsar Convention site (NPWS, 2014)[12]. **Table 3-6** and **Table 3-7**below display the qualifying interests of Killala Bay/ Moy Estuary SPA as detailed on the Natura 2000 Data Form (2018)[13].

Site specific Conservation Objectives have been published for the features of Qualifying Interest of the Killala Bay/ Moy Estuary SPA and are available on the NPWS website[14]

Table 3-6: Killala Bay/ Moy Estuary SPA Habitats of Qualifying Interest

Habitat Code	Qualifying Habitats	Cover (ha)	Representativity
A999	Wetlands and Waterbirds	---	---

[9] https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY002298.pdf
[10] https://www.npws.ie/sites/default/files/protected-sites/natura2000/NF002298.pdf
[11] https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002298.pdf
[12] https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY004036.pdf
[13] https://www.npws.ie/sites/default/files/protected-sites/natura2000/NF004036.pdf
[14] https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004036.pdf

Table 3-7: Killala Bay/ Moy Estuary SPA Species of Qualifying Interest

Species Code	Qualifying Species	Population Significance
A137	Ringed Plover (*Charadrius hiaticula*)	C
A140	Golden Plover (*Pluvialis apricaria*)	C
A141	Grey Plover (*Pluvialis squatarola*)	B
A144	Sanderling (*Calidris alba*)	C
A149	Dunlin (*Calidris alpina*)	C
A157	Bar-tailed Godwit (*Limosa lapponica*)	C
A160	Curlew (*Numenius arquata*)	C
A162	Redshank (*Tringa totanus*)	C

3.3.4.4 Lackan Saltmarsh and Kilcummin Head SAC (Site Code: 000516)

Lackan Saltmarsh and Kilcummin Head are located at Lackan Bay, 8 km north-east of Killala, in Co. Mayo. Within this scenic and quite undisturbed area, there is an excellent diversity of coastal habitats including mature dunes, saltmarsh, rocky sea cliffs, dune grassland and estuarine sandflats. These areas provide a haven for many species of plant and animal. This coastal site is of considerable ecological importance for the range, quality and floristic richness of its coastal habitats, in particular the fixed dunes which are a priority habitat on Annex I of the E.U. Habitats Directive (NPWS, 2013)[15]. **Table 3-8**below displays the qualifying interests of Lackan Saltmarsh and Kilcummin Head SAC as detailed on the Natura 2000 Data Form (2019)[16].

Site specific Conservation Objectives have been published for the features of Qualifying Interest of the Lackan Saltmarsh and Kilcummin Head SAC and are available on the NPWS website[17].

Table 3-8: Lackan Saltmarsh and Kilcummin Head SAC Species of Qualifying Interest

Habitat Code	Qualifying Habitats	Cover (ha)	Representativity
1310	*Salicornia* and other annuals colonising mud and sand	10.8	B
1330	Atlantic Salt Meadows (*Glauco-Puccinellietalia maritimae*)	59.4	A
1410	Mediterranean Salt Meadows (*Juncetalia maritimi*)	59.4	A
2120	Shifting dunes along the shoreline with Ammophila arenaria (white dunes)	10.8	C
2130	Fixed coastal dunes with herbaceous vegetation (grey dunes)	113.41	A

3.3.5 Potential Pressures and Threats to European Sites

Table 3-9 to **Table 3-12** present the threats, pressures and activities that represent negative impacts to each European Site as quoted on the Natura 2000 data forms for the four European sites discussed in **Section 3.3.3** above.

Table 3-9: Potential Pressures and Threats to Killala Bay/ Moy Estuary SAC

European Site	Threat Code[18]	Threat Type	Rank[19]	I (inside) / o (outside) / b (both)
Killala Bay/ Moy Estuary SAC	G02.02	Skiing complex	H	b
	F02.03	Leisure fishing	L	i
	G02.08	Camping and caravans	H	b

[15] https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY000516.pdf
[16] https://www.npws.ie/sites/default/files/protected-sites/natura2000/NF000516.pdf
[17] https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000516.pdf
[18] Threat codes sourced from Natura 2000 data form and follow reference list provided on threats, pressures and activities for European Sites http://cdr.eionet.europa.eu/help/natura2000
[19] H – High, M – Medium, L - Low

European Site	Threat Code[18]	Threat Type	Rank[19]	I (inside) / o (outside) / b (both)
	M01.03	Flooding and rising precipitations	M	i
	H01.08	Diffuse pollution to surface waters due to household sewage and waste waters	H	b
	G01.02	Walking, horseriding and non-motorised vehicles	H	i
	E01	Urbanised areas, human habitation	H	b

Table 3-10: Potential Pressures and Threats to River Moy SAC

European Site	Threat Code	Threat Type	Rank	I (inside) / o (outside) / b (both)
River Moy SAC	I01	Invasive non-native species	H	b
	H01.05	Diffuse pollution to surface waters due to agricultural and forestry activities	H	b
	D04.02	Aerodrome, heliport	M	b
	A02.01	Agricultural intensification	H	b
	C01.03	Peat extraction	M	b
	B05	Use of fertilizers (forestry)	H	b
	B01	Forest planting on open ground	H	b

Table 3-11: Potential Pressures and Threats to Killala Bay/ Moy Estuary SPA

European Site	Threat Code	Threat Type	Rank	I (inside) / o (outside) / b (both)
Killala Bay/ Moy Estuary SPA	A08	Fertilisation	M	o
	G01.02	Walking, horseriding and non-motorised vehicles	M	i
	E01	Urbanised areas, human habitation	M	o
	F02.03	Leisure fishing	M	i

Table 3-12: Potential Pressures and Threats to Lackan Saltmarsh and Kilcummin Head SAC

European Site	Threat Code	Threat Type	Rank	I (inside) / o (outside) / b (both)
Lackan Saltmarsh and Kilcummin Head SAC	C01.01.02	Removal of beach materials	H	i
	K01.01	Erosion	H	i
	G01.03	Motorised vehicles	H	i

4 EXISTING ENVIRONMENT

4.1 Habitats within the Scheme Area

Preliminary site walkover surveys were conducted on the 4th June and 5th August 2020 and aerial photography was examined in order to identify areas of particular ecological interest. Using the preliminary site walkover surveys and analysis of aerial imagery, habitats were classified according to the Guidelines set out in *'A Guide to Habitats in Ireland*' (Fossitt, 2000) which classifies habitats based on the vegetation present and management history. The classification is a standard system for identifying, describing and classifying wildlife habitats in Ireland. The habitats found within the scheme area and their potential correspondence with Annex I habitats have also been identified.

The scheme area encompasses Ballina town which is predominately composed of buildings and artificial surfaces (BL3). Ballina town is primarily surrounded by improved agricultural grassland (GA1) and field boundaries consist of hedgerows (WL1), treelines (WL2) and ditches (FW4). The River Moy which is a depositing lowland river (FW2) runs through the centre of the scheme area with areas of wet grassland (GS4), marsh (GM1) and Reed and large sedge swamps (FS1) along the banks. Belleek Wood (WD2) is a mixed woodland with conifer trees such as Norway spruce, Scots pine, silver fir together with beech, oak and ash. The woodland is home to red squirrel, which were reintroduced into the woodlands in 2007.

None of the habitats listed as QI for the River Moy SAC are located in proximity to the proposed works. The Killala Bay/ Moy Estuary SAC QI habitat Estuaries [1130], commences at Lower Bridge and is proximal to the works on Bachelors Walk and the Sligo Road. However, from Lower Bridge to Belleek the estuary does not support the typical estuarine habitat of Mudflats and sandflats not covered by seawater at low tide [1140] and estuarine muddy or fine sand subcommunities and this section is classified as "River" in the Site Specific Conservation Objectives for Killala Bay/ Moy Estuary SAC[20].

The habitats that were recorded within the scheme area or identified from aerial imagery and preliminary walk over surveys are detailed in **Table 4-1** and illustrated in **Figure 4-1.**

Table 4-1: Habitat Types Present within the Scheme Area

Fossitt Habitat Code	Habitat Type
GA1	Improved agricultural grassland
GA2	Amenity grassland (improved)
GS4	Wet grassland
WD2	Mixed broadleaved/ conifer woodland
WS1	Scrub
WL1	Hedgerows
WL2	Treelines
FW2	Depositing/lowland rivers
FW4	Drainage ditches
ED3	Recolonising Bare Ground
BL1	Stone Walls and Other Stonework
BL2	Earth Banks
BL3	Buildings and Artificial Surfaces
MW4	Estuaries (Annex I habitat Estuaries [1130])

[20] https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000458.pdf

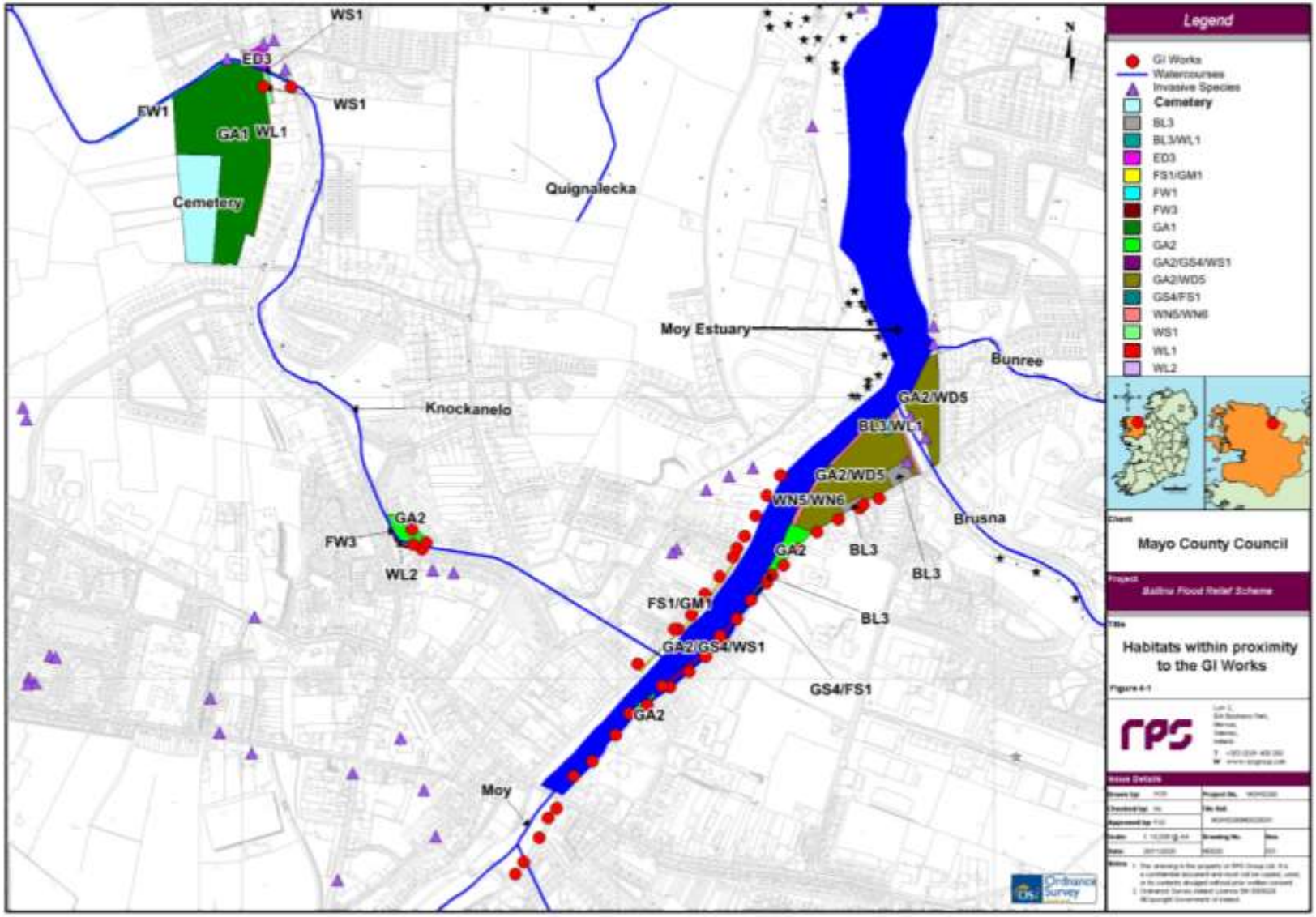


Figure 4-1: Habitats in proximity to the GI Works

Image 4.1 – Riparian vegetation on the banks of the River Moy near Bachelors Walk

Image 4.2 – Riparian vegetation on the banks of the River Moy near the Sligo Road

Image 4.3 – View GS2/GS4/GM1 Habitat on banks of River Moy - View towards Lower Bridge

Image 4.4 – Japanese Knotweed on the banks of the Brusna River, downstream of the N59 bridge

Image 4.5 – Buddleia on the quay walls

Image 4.6 – Japanese Knotweed on disturbed ground to the rear of houses on the Killala Road.

4.1.1 Invasive species

A search of National Biodiversity Data Centre (NBDC) online database was conducted for records of invasive species listed on the Third Schedule to the EC Birds and Natural Habitats Regulations 2011, as amended. Under Regulation 49(2) of the 2011 Regulations, it is an offence to plant, disperse, allow or cause to disperse, spread or otherwise cause to grow in any place, any plant included in Part 1 of the Third Schedule without a licence from the Minister for Arts, Heritage and the Gaeltacht.

Invasive species recorded on NBDC for grid squares G21 and G22 are displayed in **Table 4-2** below. Invasive species were recorded within the scheme area on the site walkover survey and are shown in **Table 4-3** below.

Table 4-2: Invasive Species records from NBDC

Common Name	Scientific Name	Grid Square	Designation
Japanese Knotweed	*Fallopia japonica*	G21, G22	High Impact Invasive Species, Regulation S.I. 477
Traveller's-joy	*Clematis vitalba*	G21, G22	Medium Impact Invasive Species
Wall Cotoneaster	*Cotoneaster horizontalis*	G21, G22	Medium Impact Invasive Species
Winter Heliotrope	*Petasites fragrans*	G21, G22	Medium Impact Invasive Species
Butterfly-bush	*Buddleja davidii*	G21, G22	Medium Impact Invasive Species
Canadian Waterweed	*Elodea cardensis*	G21	High Impact Invasive Species, Regulation S.I. 477
Cherry Laurel	*Prunus laurocerasus*	G21, G22	High Impact Invasive Species
Sycamore	*Acer pseudoplatanus*	G21, G22	Medium Impact Invasive Species
Giant Hogweed	*Heracleum mantegazzianum*	G22	High Impact Invasive Species, Regulation S.I. 477
Himalayan Knotweed	*Persicaria Wallichii*	G22	Medium Impact Invasive Species, Regulation S.I. 477
Rhododendron	*Rhododendron ponticum*	G22	High Impact Invasive Species, Regulation S.I. 477
Three-cornered Garlic	*Allium triquetrum*	G22	Medium Impact Invasive Species, Regulation S.I. 477
Virginia-creeper	*Parthenocissus quinquefolia*	G22	Medium Impact Invasive Species

Table 4-3: Invasive Species recorded within the Scheme Area.

Common Name	Scientific Name	Grid References (ITM)	Grid Square	Location
Giant Hogweed	*Heracleum mantegazzianum*	525088 819224	G21	Between Howley Street and the River Moy – opposite St Muredachs College
Buddleja	*Buddleja davidii*	524949.18, 819152.45 524949.18, 819152.45 524949.18, 819152.45 524949.18, 819152.45	G21	Growing on the quay walls downstream of Lower Bridge on both sides of the River Moy and at Upper Bridge on both banks of the River
Japanese Knotweed	*Fallopia japonica*	525375 819430	G21	Between the N59 and Tom Ruane Park
Japanese Knotweed	*Fallopia japonica*	525424 819507	G21	On the banks of the Brusna River, downstream of the N59 bridge
Winter Heliotrope	*Petasites pyrenaicus*	525518 819364	G21	On the banks of the Brusna River, upstream of the N59 bridge
Himalayan Knotweed	*Persicaria Wallichii*	525508 819511	G21	Adjacent to N59
Japanese Knotweed	*Fallopia japonica*	525691 819253	G21	On the banks of the Brusna River, upstream of the N59 bridge

4.2 Groundwater

There are thirty-five groundwater bodies within the Moy and Killala Bay WFD Catchment. The scheme area is located within Ballina GWB and Ballina Gravels Group 1 GWB. Ballina GWB is 265km^2 and is located between Crossmolina and Ballina. The land is relatively flat to undulating ground and the groundwater flow is generally towards rivers and lakes however due to the karstified nature of the GWB locally groundwater flow can be highly variable[21]. The groundwater bodies located within the Moy and Killala Bay WFD Catchment are detailed in **Table 4-4** below.

[21] https://secure.dccae.gov.ie/GSI_DOWNLOAD/Groundwater/Reports/GWB/BallinaGWB.pdf

Table 4-4: Groundwater bodies present within the Moy and Killala Bay WFD Catchment

Name	Code	Distance from Scheme Area	European sites within the Moy and Killala Bay WFD Catchment that intersect the groundwater body
Aghagower	IE_WE_G_0021	36.08km	None
Ballina	IE_WE_G_0035	Within Scheme Area	Killala Bay/ Moy Estuary SAC River Moy SAC Killala Bay/ Moy Estuary SPA Bellacorick Bog Complex SAC Lough Conn and Lough Cullin SPA
Ballina Gravels Group 1	IE_WE_G_0113	Within Scheme Area	River Moy SAC
Ballina Gravels Group 2	IE_WE_G_0116	5.84km	Lough Hoe Bog SAC
Ballygawley	IE_WE_G_0039	26.81km	None
Ballyhean	IE_WE_G_0022	30.44km	None
Ballymote	IE_WE_G_0037	27.2km	None
Bellacorick-Killala	IE_WE_G_0041	2.11km	Killala Bay/ Moy Estuary SAC Killala Bay/ Moy Estuary SPA Bellacorick Bog Complex SAC
Belmullet	IE_WE_G_0057	15.29km	Killala Bay/ Moy Estuary SPA Lackan Saltmarsh and Kilcummin Head SAC Bellacorick Bog Complex SAC Owenduff/ Nephin Complex SAC
Beltra Lough North	IE_WE_G_0025	9km	River Moy SAC Lough Conn and Lough Cullin SPA
Beltra Lough South	IE_WE_G_0024	16.87km	None
Clare-Corrib	IE_WE_G_0020	42.49km	None
Clifden Castlebar	IE_WE_G_0017	20.14km	None
Collooney	IE_WE_G_0048	10.04km	Ox Mountains Bogs SAC
Cong-Robe	IE_WE_G_0019	36.21km	None
Corrib Gravels	IE_WE_G_0063	40.27km	River Moy SAC
Crossmolina Gravels	IE_WE_G_0107	8.3km	River Moy SAC
Curlew Mountains	IE_WE_G_073	29.39km	None
Deel	IE_WE_G_0031	13.36km	River Moy SAC Bellacorick Bog Complex SAC Owenduff/ Nephin Complex SAC
Easky East	IE_WE_G_0050	10.68km	Ox Mountains Bogs SAC
Easky West	IE_WE_G_0049	8.56km	None
Foxford	IE_WE_G_0034	0.34km	Killala Bay/ Moy Estuary SAC River Moy SAC Killala Bay/ Moy Estuary SPA Lough Conn and Lough Cullin SPA Lough Hoe Bog SAC Lough Nabrickkeagh Bog SAC Ox Mountains Bogs SAC
Gorteen	IE_WE_G_0028	32.88km	None
GWDTE-Turloughmore Sligo (SAC000637)	IE_WE_G_0104	26.87km	None
Gweestion-Moy Gravels Group 1,	IE_WE_G_0112	31.33km	River Moy SAC
Gweestion-Moy Gravels Group 2	IE_WE_G_0115	34.88km	River Moy SAC
Kilkelly Charlestown	IE_WE_G_0032	19.22km	River Moy SAC Balla Turlough SAC
Killala North	IE_WE_G_0046	12.99km	Killala Bay/ Moy Estuary SPA Lackan Saltmarsh and Kilcummin Head SAC
Killala South	IE_WE_G_0047	5.69km	Killala Bay/ Moy Estuary SAC Killala Bay/ Moy Estuary SPA Lackan Saltmarsh and Kilcummin Head SAC
Laherdaun	IE_WE_G_0030	10.11km	River Moy SAC Bellacorick Bog Complex SAC Lough Conn and Lough Cullin SPA

Name	Code	Distance from Scheme Area	European sites within the Moy and Killala Bay WFD Catchment that intersect the groundwater body
			Owenduff/ Nephin Complex SAC
Lavagh-Ballintougher	IE_WE_G_0038	28.33km	None
Malranny	IE_WE_G_0027	16.14km	Owenduff/ Nephin Complex SAC
Swinford	IE_WE_G_0033	16.66km	River Moy SAC Balla Turlough SAC Ballinafad SAC
Swinford Gravels	IE_WE_G_0033	19.88km	None
Tobercurry	IE_WE_G_0029	24.42km	None

4.3 Surface Water

The ZoI is the WFD Catchment number 34, Moy & Killala Bay. This catchment includes all streams entering the tidal water in Killala Bay between Benwee Head in Co. Mayo and Lenadoon Point, Co. Sligo, and the area drained by the River Moy draining a total area of 2,345km². Castlebar is the largest urban area in the catchment. The other main urban centres are Ballina, Swinford, Crossmolina, Foxford, Tubbercurry, Kiltimagh, and Enniscrone.

The River Moy (EU waterbody Code: IE_WE_34M021100) is a significant watercourse which navigates through the scheme area of Ballina town. The EPA Surface Water Quality database indicates that the River Moy has a "*Moderate*" status (Q3-4)[22] and is '*Not at Risk'*.

The River Moy joins with the Moy Estuary within Ballina town. The Moy Estuary is classified as having a '*Moderate*' water status and is '*At Risk*' of not achieving the WFD objectives. The Farrannoo, Quignalecka, Bunree, Brusna, Quignamanger and Knockanelo all flow directly into the Moy Estuary. The Brusna has a *Good* (Q4) water status and the Knockanelo has a *Moderate* (Q3-4) water status. They are both '*Not at Risk'* of achieving their WFD objectives. The four other watercourses are currently under review.

The Garrankeel, Ballina, Belleek, Ardoughan and Knocklehaugh are also located within the scheme area. Knocklehaugh is directly connected to the River Moy and the three other watercourses are directly connected to the Moy Estuary. Ardoughan and Belleek both have '*Moderate*' water status (Q3-4) and are '*Not at Risk'* of achieving their WFD objectives. The three other watercourses are currently under review.

Ardnaree and Tullyegan both flow directly into the River Moy. Ardnaree has a '*Moderate*' water status (Q3-4) and is '*Not at Risk'* of achieving its WFD objectives. Ardnaree is currently under review.

There is an Urban Wastewater Treatment Plant (UWWTP), Ballina WWTP (Site ID: D00160) located in the north of Ballina town. Bachelor's Walk Pumping Station discharges to this UWWTP via a rising main.

Surface watercourses and waterbodies located within the scheme area are outlined in **Table 4-5** and illustrated in **Figure 4-2** below. The River/ Transitional Waterbody WFD Status 2013-2018 is illustrated in **Figure 4-3** below.

[22] https://gis.epa.ie/EPAMaps/ (Accessed on 20/4/20)

Table 4-5: Surface Watercourses and Waterbodies within the Scheme Area

Local/ EPA Name	EU_CD	River/ Transitional Waterbody WFD Status 2013-2018	WFD Risk Score	EPA Q-value 2018 (macroinvertebrate quality)	Monitoring Location
Moy Estuary	IE_WE_420_0300	*Moderate*	At Risk	-	Arran Bridge (RHS), Upstream of Ballina WWTP at jetty MY010 – Moy Estuary nr Ballina WWTP Outfall Upstream of Ballina WWTP MY015 – Ballina Treatment Outfall Downstream of Ballina WWTP MY020 – Ice House, Crocketstown MY030 – Crocketts Quay
River Moy	IE_WE_34M021100	*Moderate*	Not at Risk	Q3-4 - Moderate	1km u/s Ardnaree Bridge (LHS)
Brusna River	IE_WE_34G010200	*Good*	Not at Risk	Q4 – Good	Bunree Bridge
Tullyegan	IE_WE_34T830920	-	Review	-	-
Garrankeel	IE_WE_34R010200	-	Review	-	-
Quignalecka	IE_WE_34R010200	-	Review	-	-
Ballina	IE_WE_34R010200	-	Review	-	-
Ardoughan	IE_WE_34M021100	*Moderate*	Not at Risk	Q3-4 - Moderate	1km u/s Ardnaree Bridge (LHS)
Knockanelo	IE_WE_34M021100	*Moderate*	Not at Risk	Q3-4 - Moderate	1km u/s Ardnaree Bridge (LHS)
Ardnaree	IE_WE_34M021100	*Moderate*	Not at Risk	Q3-4 - Moderate	1km u/s Ardnaree Bridge (LHS)
Knocklehaugh	IE_WE_34T830920	-	Review	-	-
Bunree	IE_WE_34D310990	-	Review	-	-
Belleek	IE_WE_34M021100	*Moderate*	Not at Risk	Q3-4 - Moderate	1km u/s Ardnaree Bridge (LHS)
Quignamanger	IE_WE_34D310990	-	Review		-
Farrannoo	IE_WE_34R010200	-	Review	-	-

Stormwater gullies on Bachelors Walk and Clare Street/Howley Terrace (N59 Sligo Road) discharge to the combined sewer system and Ballina wastewater treatment plant via a Pumping Station on Bachelor's Walk. However, during rainfall events greater than 2 to 3 hr duration, the storm overflow tank at the pumping station overflows and discharges directly to the River. The stormwater gullies on Cathedral Road and Ridgepool Road discharge directly to the River Moy.

Therefore, the GI works may result in potential silt laden runoff to enter the River Moy via stormwater gullies and discharges from the Storm Overflow tank. The Suspended Solids (SS) Waste Assimilative Capacity (WAC) calculations for the River Moy are provided in **Table 4-7**. The SS background levels for the River Moy are obtained from the WFD Water Quality Monitoring between 2018 and 2019 from the monitoring location at Upper (Ardnaree) Bridge (Station ID RS34M021100) and provided in **Table 4-6**.[23]

The River Moy is a Designated Salmonid Waters under European Communities (Quality of Salmonid Waters) Regulations 1988 S.I. No. 293/1988. The designation covers the River Moy and many of its tributaries and terminates at Upper Bridge in Ballina. The limit level of SS in salmonid waters is 25 mg/l, however water quality limit levels are not set out in the conservation objectives documents for the SAC. The mean level of SS in the River is 7.8mg/l and the median level is 5mg/l.

The reasonable worst case scenario calculations based on the maximum assumed concentration of sediment arising from a works area of 50m^2 is 5,000 mg/l, resulting in approximately 5.79% increase in suspended solids over a time period of 2-4 hours. Therefore, this impact is deemed to be short-term and will not disrupt the factors such as water quality that help to maintain the favourable conditions of the site. Therefore, the potential impacts are deemed to be short term and not significant.

Table 4-6: WFD Suspended Solids Monitoring Results in Ballina between (18/01/2018 and 03/12/2019)

Sample Date	Suspended Solids (mg/l)
18/01/2018	19
05/02/2018	2
15/03/2018	5
30/04/2018	5
16/05/2018	2
05/07/2018	2
12/07/2018	2
30/08/2018	2
13/09/2018	4
16/10/2018	6
08/11/2018	7
04/12/2018	9
15/01/2019	6
18/02/2019	8
13/03/2019	36
30/04/2019	4
07/05/2019	2
10/06/2019	2
08/07/2019	2
19/08/2019	18
02/09/2019	10
15/10/2019	23
03/12/2019	4
Mean	**7.8**
Median	**5**

[23] https://www.catchments.ie/data/#/waterbody/IE_WE_34M021100?_k=pjyur1

Table 4-7: Suspended Solids Waste Assimilative Capacity

Rainfall Event*	Contributing Area	Flow Rate	Assumed concentration in run off	River Moy Flow Rate (m3/s)		SS Background level (mg/l)*	Resultant SS concentration		% Increase	
mm	**m^2**	**m^3/s**	**mg/l**	**95%**	**50%**		**95%**	**50%**	**95%**	**50%**
13.3	50	0.000369	1000	6.37813	39.8119	5	5.06	5.01	1.15	0.18
13.3	50	0.000369	2000	6.37813	39.8119	5	5.12	5.02	2.31	0.37
13.3	50	0.000369	5000	6.37813	39.8119	5	5.29	5.05	5.79	0.93

* 30- minute duration, 1 in 5 year return period

Assumptions:

1. Rainfall event of 13.3mm in 30 minutes (1 in 5 year),
2. Contributing Area - 50m^2,
3. SS content of runoff -1,000 - 5,000 mg/l assumed,
4. River Moy Flow data from EPA Water Maps.

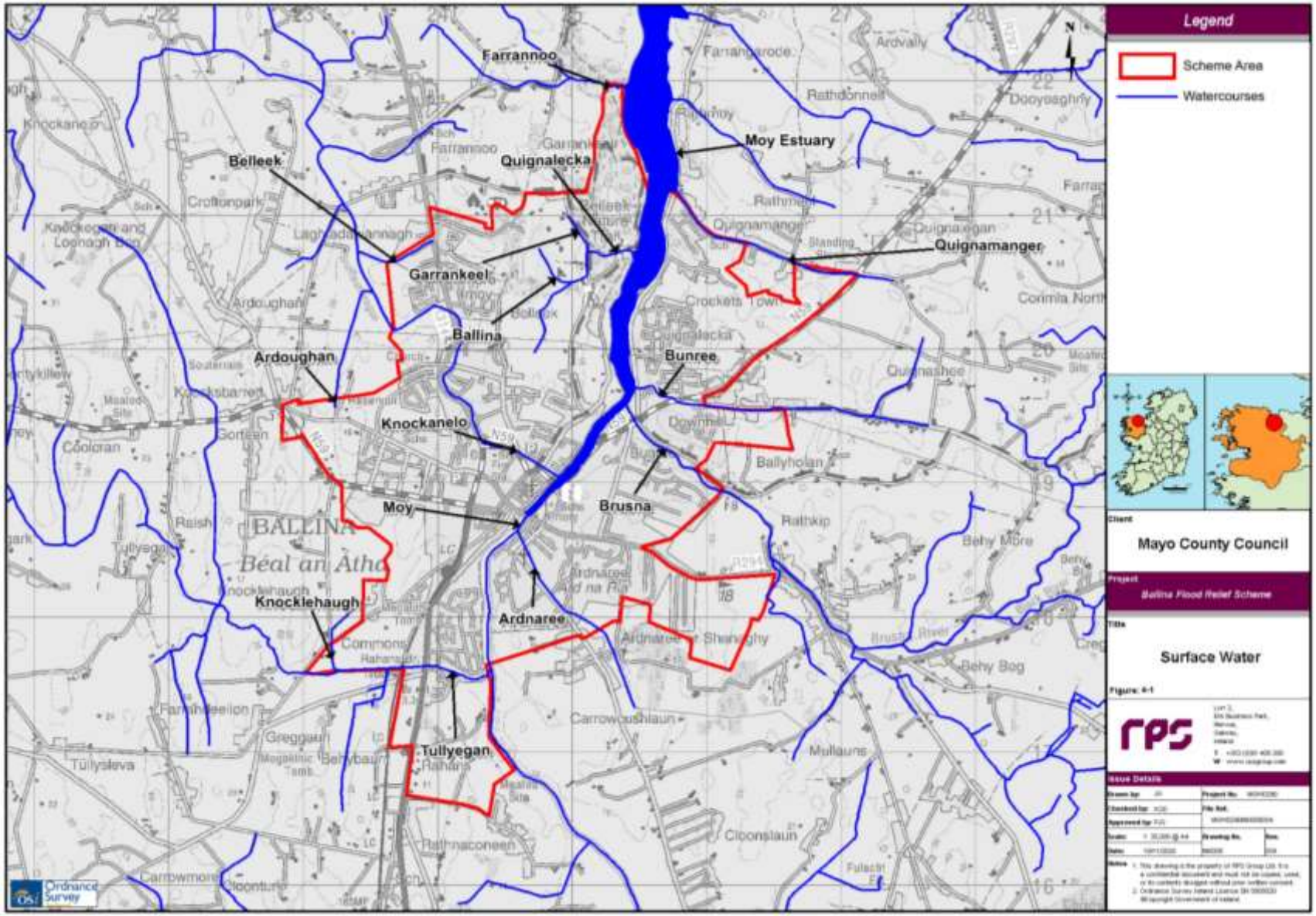


Figure 4-2: Surface Water

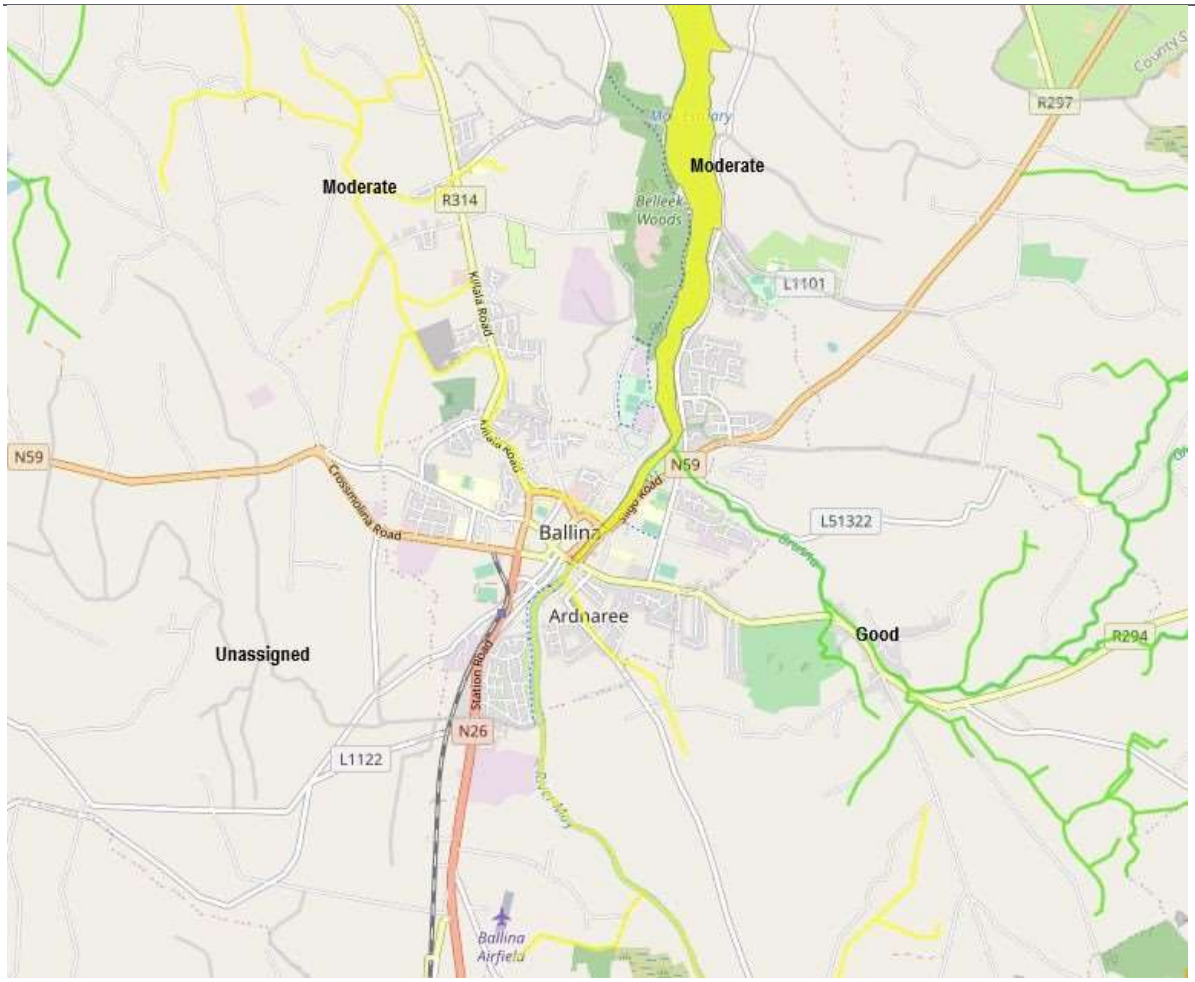


Figure 4-3: WFD Status Classification of watercourses [24]

4.4 Flooding

A search of the Office of Public Works website Past Floods Database on www.floodinfo.ie was carried out to obtain information on the flood history of the scheme area. The OPW indicative flood maps were used to identify areas that had the potential for significant flooding within the scheme area and to identify areas where hazards of flooding are likely due to historical flooding of those areas. The OSI Historical[25] Mapping dataset was also consulted to investigate whether any areas are liable to flooding.

As visible in **Figure 4-4** and **Figure 4-5**, Ballina town has undergone numerous flood events of various degrees of severity.

The River Moy historically overflowed its banks at two locations in Ballina town. **Table 4-8** describes historical flood events within Ballina.

Table 4-8: Historical Flood Events within Ballina.

Flood Event	Flood Type	Flood Source
Ballina – Bachelors Walk	Recurring	Coastal/ Estuarine Waters
Ballina – Clare Street	Recurring	Coastal/ Estuarine Waters
Moynallty Ballina	Dated Flood – 01/11/1989	Coastal/ Estuarine Waters

[24] https://gis.epa.ie/EPAMaps/
[25] https://www.osi.ie/products/professional-mapping/historical-mapping/ (Accessed 30/11/20)

Flood Event	Flood Type	Flood Source
Flooding in Ballina	Dated Flood - 18/12/13 and 03/01/14	---
Ballina – Humbert Street Rare Event	Undated Flood	River
Ballina – River Moy – Barret Street	Undated Flood	River
River Moy Quignamanger	Undated Flood	River

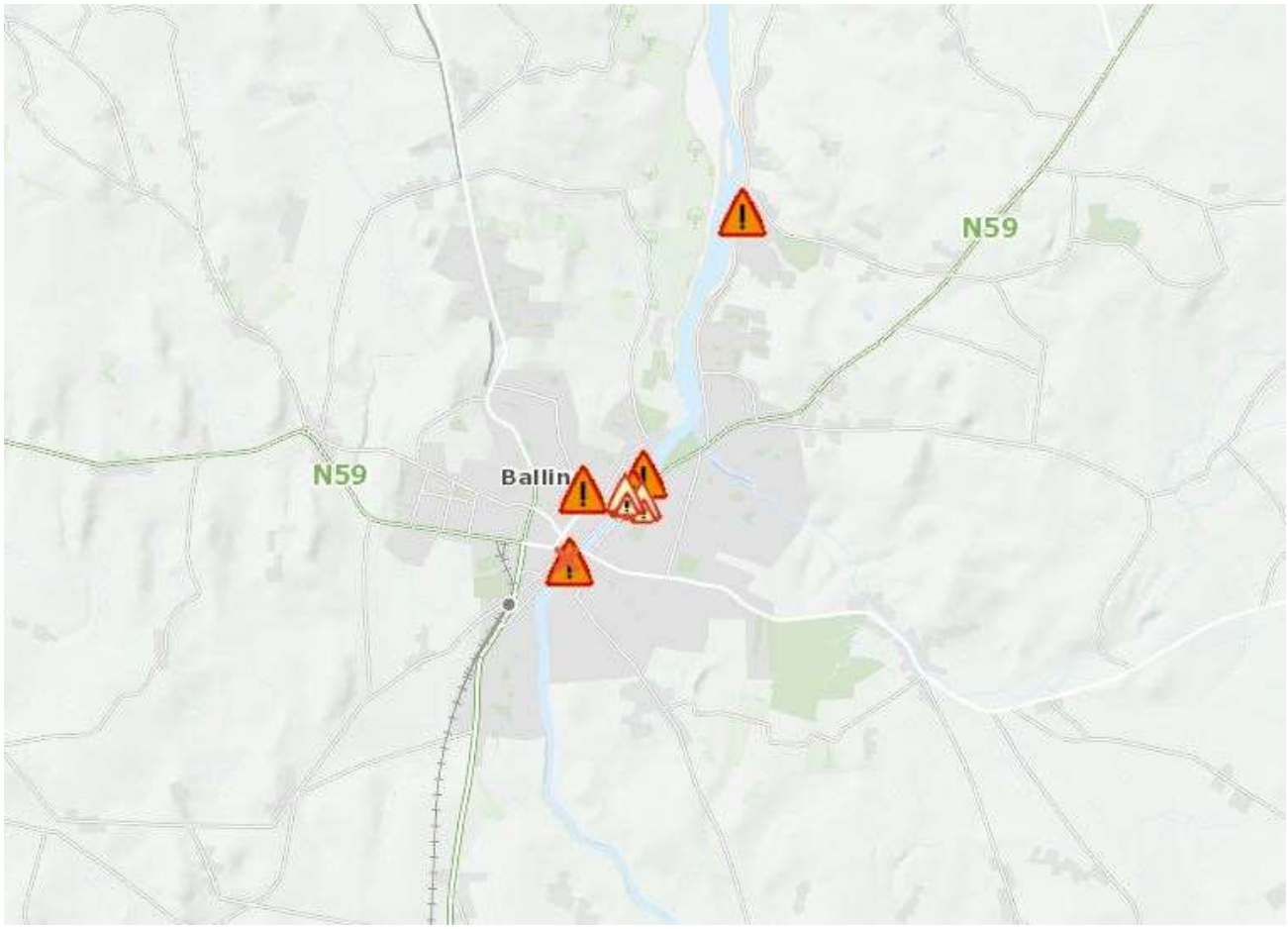


Figure 4-4: Historical Flood Events within the scheme area (Source: https://www.floodinfo.ie/map/floodmaps/[27])

The Office of Public Works flood maps were searched on www.floodinfo.ie to identify predictive flood risk areas. The CFRAM maps from this website can be found in **Appendix C**.

[26] Accessed on 09/06/20. Hazard icons indicate flood events.
[27] Accessed on 09/06/20. Hazard icons indicate flood events.

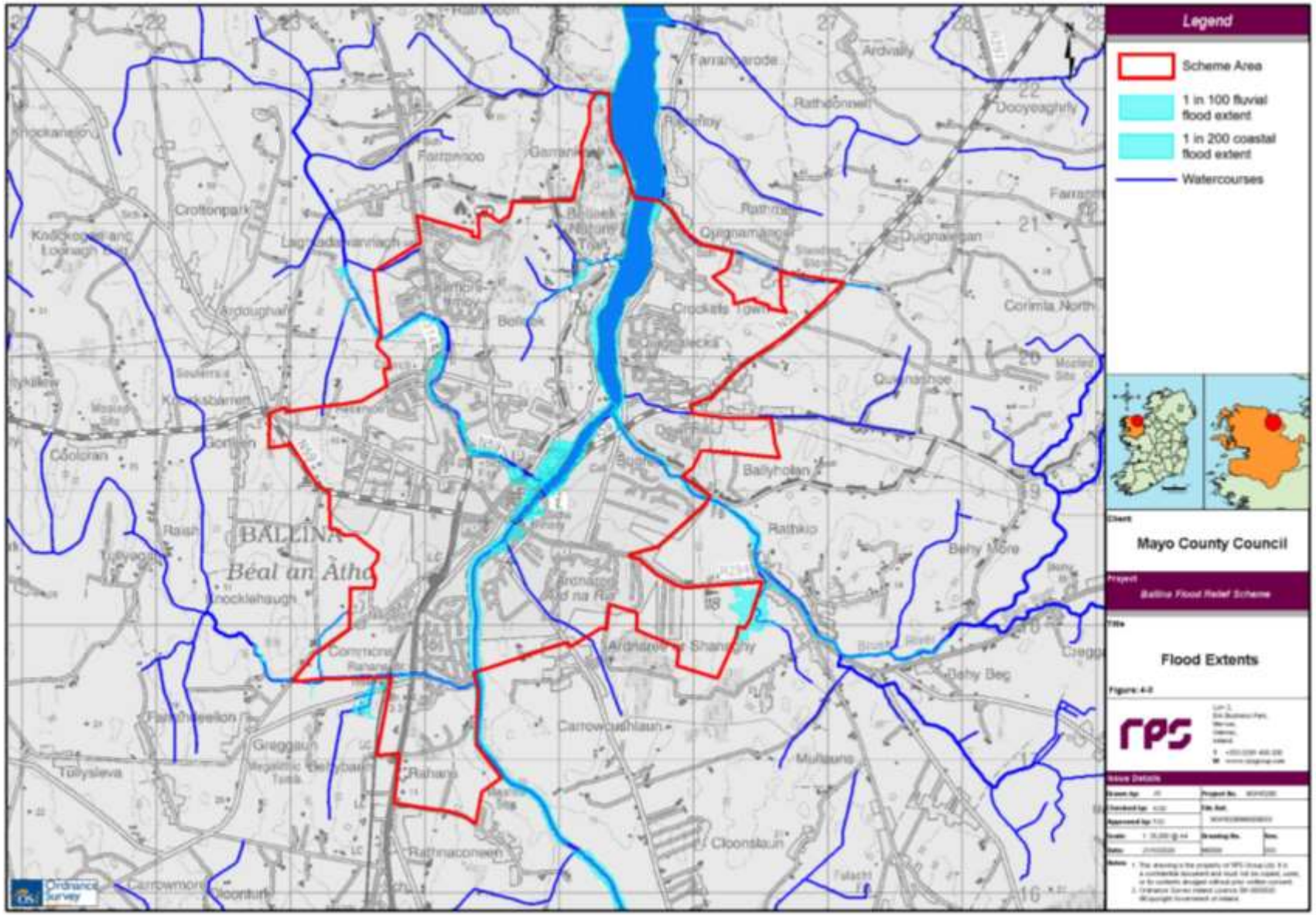


Figure 4-5: Flood Risk Area

4.5 Soils, Geology and Hydrology

The Geological Survey of Ireland (GSI) online database (www.gsi.ie) was consulted for available edaphic, geological and hydrological information of the site and its environs.

The bedrock geology map for the scheme area is provided in**Figure 4-6.** The scheme area is comprised entirely of Ballina Limestone Formation, detailed in **Table 4-9** below.

Table 4-9: Bedrock Geology Formations occurring within the Scheme Area.

Bedrock Geology	Description	Lithological Description	System	Series
Ballina Limestone Formation (Upper)	Grey limestone, thin shale	Dark grey fine-grained limestones with subordinate interbedded calcareous shale. Its coral fauna is characterised by *caniniids* and *phaceloid lithostrotionids*. The incoming of *cerioid lithostrotionids* in the upper part marks the distinction between the lower and upper	Carboniferous	Dinantian

There are no karst features within the scheme area or within a 5km ZoI of the scheme area.

There is one mineral site location within the scheme area and a further three within 5km of the scheme area; these are detailed in **Table 4-10**below[28].

Table 4-10: Mineral Site Locations

Mineral Location Number	Mineral Type	Mineral	Grid Reference	Townland	Distance from scheme area	Description	Notes
1214	SAGR	Sand and gravel	131700, 321800	Carha	4.73km north east	Non-metallic	Composed of angular blocks, striated blocks or morainic origin, fine sand and mixed sands and gravels. Several pits had been open in 1973 for mixed sands and gravels. Overlies Ballina Limestone Formation.
2444	CLBR	Clay, brick	124250, 319050	Ballina	Within scheme area	Non-metallic	Brick field noted in old 6 inch map
1216	SAGR	Sand and gravel	128300, 317800	Behybeg	1.88km east	Non-metallic	Esker deposit rests on boulder clay consisting of a sandy matrix with heavily striated limestone blocks as well as granite, amphibotite and pale sandstone. Overlies Ballina limestone Formation 9Upper).
1347	CLBR	Clay, Brick	119320, 320200	Ballymanagh	3.56km west	---	3 brickfields-inactive. Heavy loam clay free from boulders – little plasticity notes in near surface clays. Yellow strong bricks made in past. Reserves almost unlimited. Bedrock in Ballina Limestone.

[28] https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=ebaf90ff2d554522b438ff313b0c197a&scale=0 Accessed: 20th April 2020.

Groundwater vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease at which groundwater may be contaminated by human activities.

The scheme area is dominated by high groundwater vulnerability and there is an area of moderate in the south east. There are patches of extreme and rock at or near surface or karst scattered throughout the scheme area.

The entirety of the scheme area is located within a Regionally Important Aquifer-Karstified (RK). This groundwater vulnerability distribution is illustrated in **Figure 4-7.**

The scheme area is dominated by made ground and deep well drained mineral derived from mainly basic parent materials (BminDW); see**Figure 4-8.** The other soil types present within the scheme area include;

- Deep poorly drained mineral derived from mainly calcareous parent materials (BminPD);
- Mineral Alluvium (AlluvMIN);
- Shallow well drained mineral derived from mainly calcareous parent materials (BminSW);
- Shallow poorly drained mineral soil derived from mainly basic parent materials (BminSP);
- Poorly drained mineral soils with peaty topsoil derived from mainly calcareous parent materials (BminSPPT); and
- Cutaway peats (Cut).

Made ground dominates the centre of the scheme area and BminDW dominates the edges of the scheme area. BminPD is located in patches throughout the scheme area. AlluvMIN is located to the north and south of the scheme area, with sections of BminSW in the east and west. Small sections of BminSP occur in the east of the scheme area. Two small patches of BminSPPT are located in the north east of the scheme area.

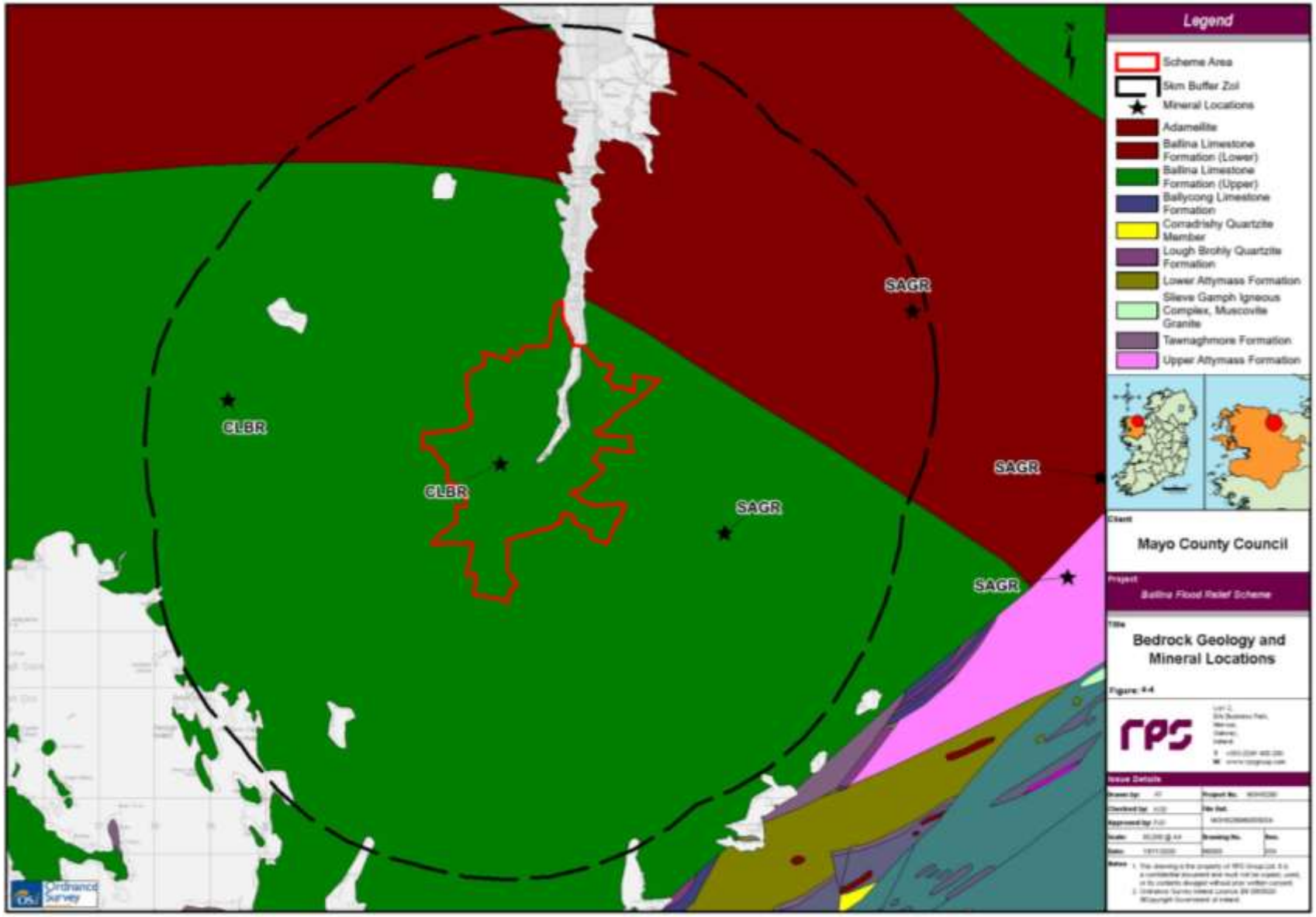


Figure 4-6: Bedrock Geology and Mineral Locations

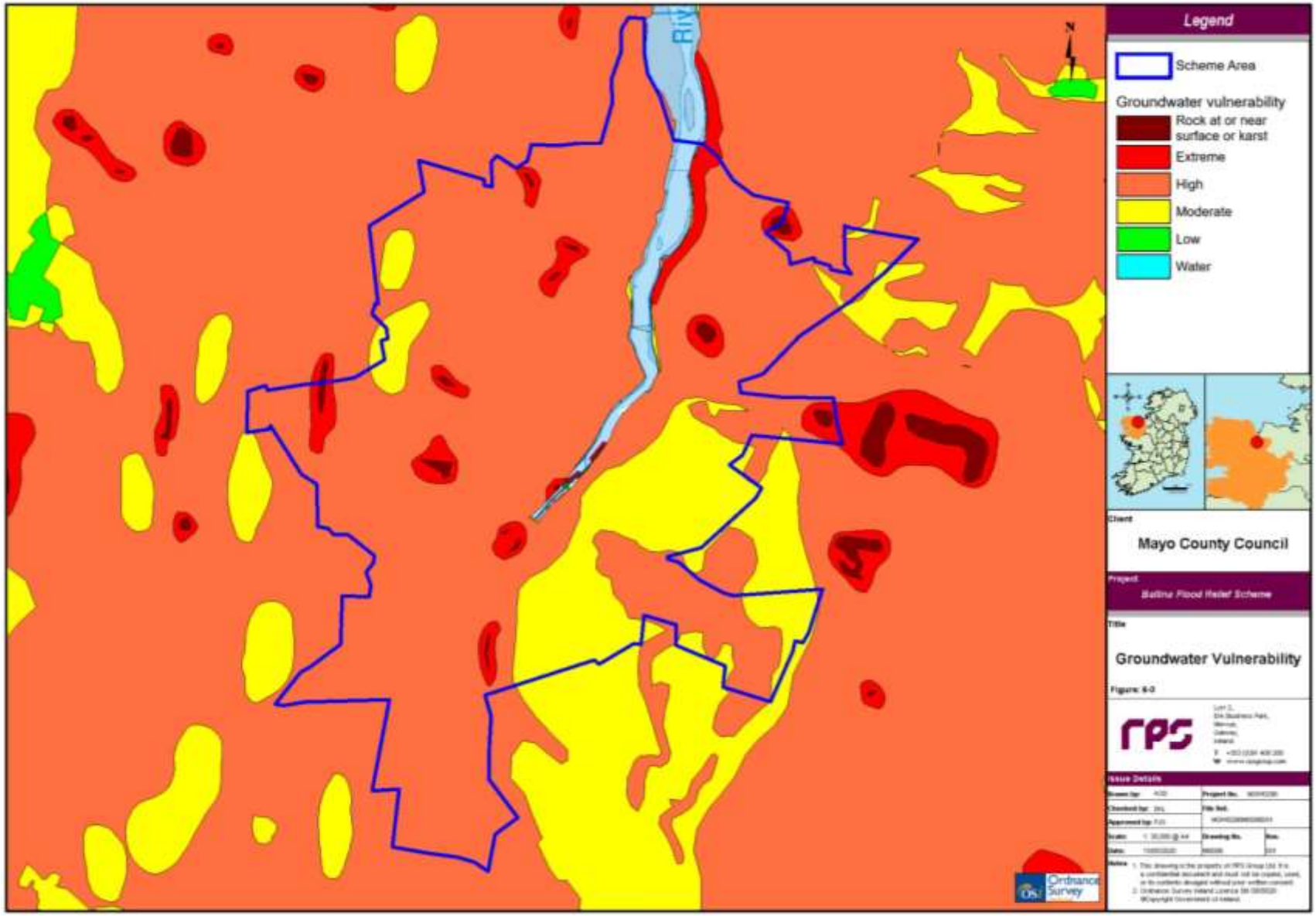


Figure 4-7: Groundwater Vulnerability

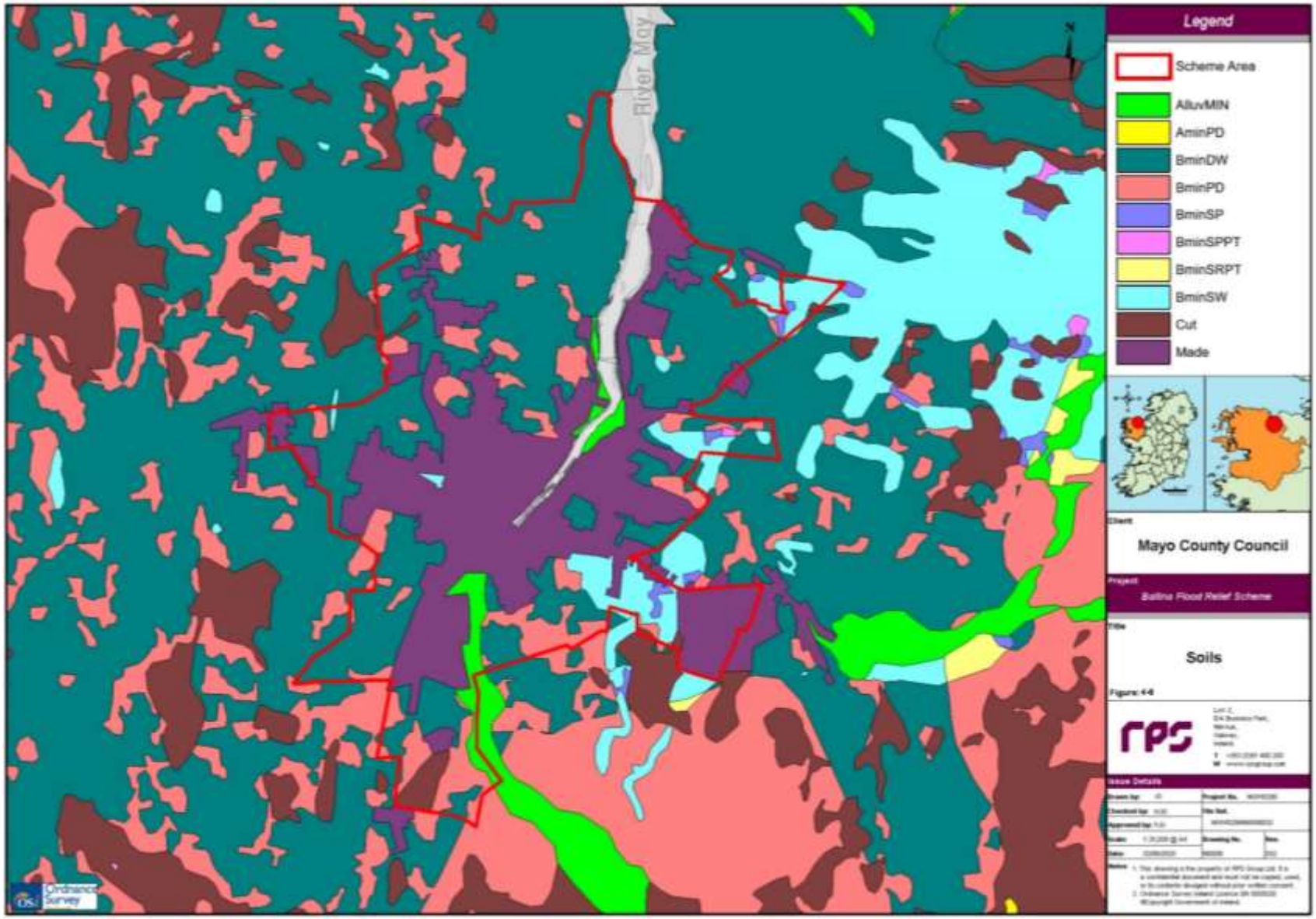


Figure 4-8: Soils

5 APPROPRIATE ASSESSMENT SCREENING

5.1 Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the European Sites

This Screening for AA report comprises an assessment of the likely significant effects of the GI works of the Ballina Flood Relief Scheme. GI works are required to inform option selection and design for the project.

The GI works will be undertaken using various ground investigation methods including borehole cable percussion, borehole rotary core, window sampler, slit trenches and hand auger.

The duration of fieldwork is expected to take approximately thirty days.

Machinery will access using existing road infrastructure and access points to fields. No new watercourse crossing will be required as part of the proposed works.

The works are considered to be minor and short duration, existing roads will be used to access and egress to access the GI locations.

Each method may require water and/or drilling fluids to aid drilling. In addition, where standpipes are required, the wells are purged of three well volumes which will be poured-off within the vicinity of the investigation location and the bentonite pellets are used as a seal.

Therefore, the potential impacts arising from the proposed works include the following:

- Noise disturbance from the plant and site personnel;
- Visual impacts;
- Air pollution from releasing dust and vehicle emissions;
- Vibration from drilling equipment; and
- Water pollution as a result of silted water runoff to neighbouring watercourses from GI works and rutted soil.

Several watercourses designated as European sites or tributaries of same, intersect the scheme area. The GI locations which are in proximity to watercourses or conduits to European sites (namely the River Moy SAC, Killala Bay/Moy Estuary SAC, Killala Bay/ Moy Estuary SPA and Lackan Saltmarsh and Kilcummin Head SAC) were scrutinised to identify whether there was a risk of likely significant effects to European sites.

None of the habitats listed as QI for the River Moy SAC are located in proximity to the proposed works. The QI habitat Estuaries [1130] Killala Bay/ Moy Estuary SAC, commences at Lower Bridge and is proximal to the works on Bachelors Walk and the Sligo Road. However, from Lower Bridge to Belleek the estuary does not support the typical estuarine habitat of Mudflats and sandflats not covered by seawater at low tide [1140] and estuarine muddy or fine sand subcommunities. In addition, silt deposition is not identified as a threat or pressure to the conservation objectives these habitat types. The effects from air pollution and dust emissions will be highly localised on the qualifying interests of designated sites is thought to be minimal.

The movement of plant and vehicles may cause disturbance to wildlife through noise pollution and vibration. Temporary disturbance of fauna, potentially causing them to abandon their habitat, can result from the increased noise and human activity levels associated with heavy machinery and the GI works. Vibration may also cause disturbance to aquatic species and habitats. However, due to the short duration, and nature and scale of the works, the effects from noise and vibration pollution on the qualifying interests of designated sites is thought to be short term and not significant.

Each GI site was checked for its proximity to European sites and potential pathways to European sites via Overland flow to rivers/streams/drains. Stormwater gullies on Bachelors Walk and Clare Street/Howley Terrace (N59 Sligo Road) discharge to the combined sewer system and Ballina wastewater treatment plant via a Pumping Station on Bachelor's Walk. However, during rainfall events greater than 2 to 3 hr duration the storm overflow tank at the pumping station overflows and discharges directly to the River. The stormwater gullies on Cathedral Road and Ridgepool Road discharge directly to the River Moy.

Therefore, the GI works may result in potential silt laden runoff to enter the River Moy via stormwater gullies and discharges from the Storm Overflow tank. The reasonable worst case scenario calculations based on the maximum assumed concentration of sediment arising from a works area of 50m^2 is 5,000 mg/l, resulting in approximately 5.79% increase in suspended solids over a time period of 2-4 hours. Therefore, this impact is deemed to be short-term and will not disrupt the factors such as water quality that help to maintain the favourable conditions of the site. Therefore, the potential impacts are deemed to be short term and not significant.

Consequently, the proposed works assessed in this report are not anticipated to result in likely significant effects to the proximal European sites.

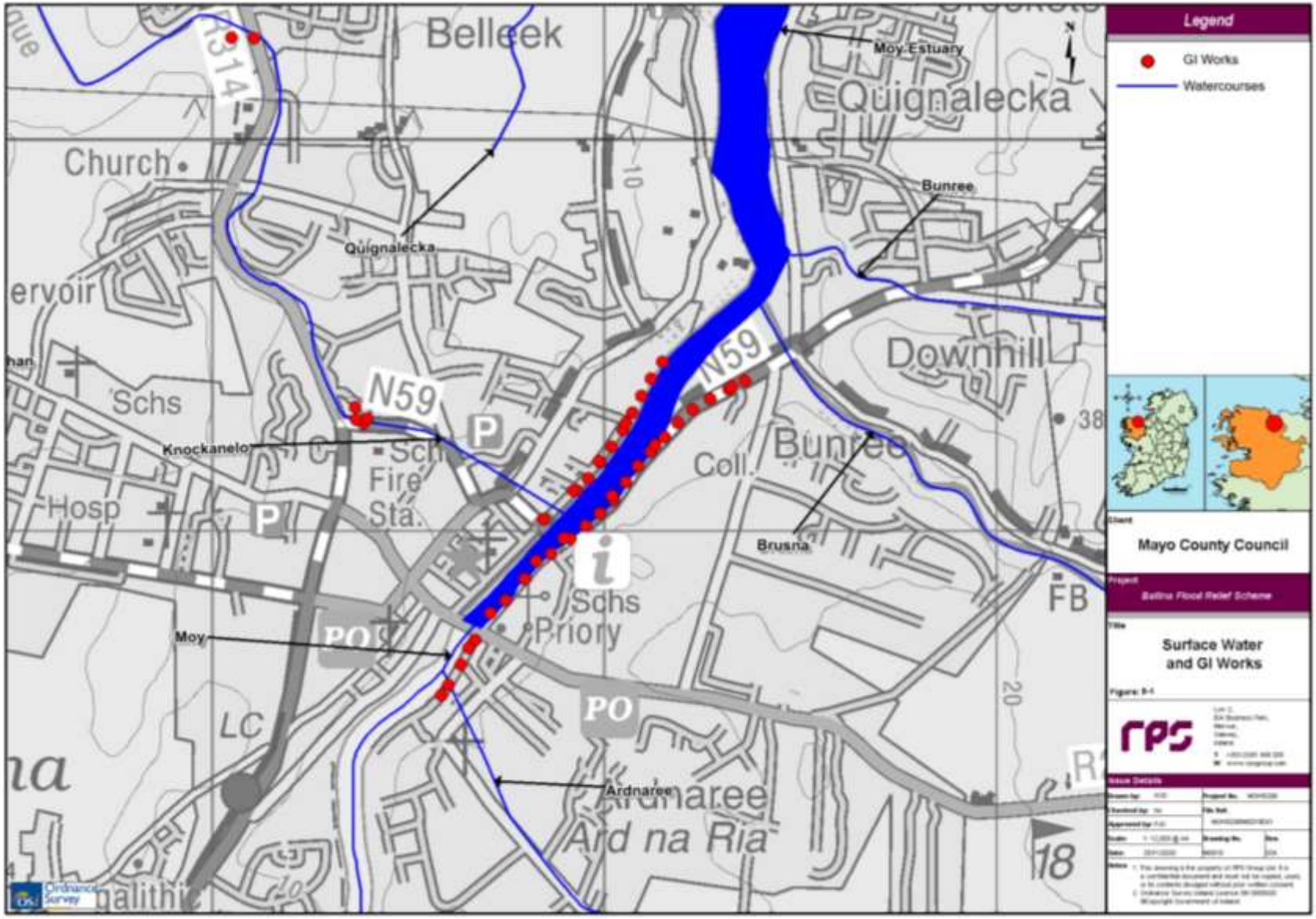


Figure 5-1: Surface Water and GI Works

Table 5-1: Potential Impacts to the Qualifying Interests of European Sites

Site Name & Code	Qualifying Interest (QI) Habitats and Species	Connectivity to GI Works	Direct Impacts	Indirect Impacts
River Moy SAC	**Habitats** Active raised bogs* [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the *Rhynchosporion* [7150] Alkaline fens [7230] 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]	Yes – Connectivity to GI works via watercourses in the scheme area.	No GI works are proposed within the boundary of the SAC. **No Direct Impact.**	No significant impacts to the QI habitats are expected. **No Indirect Impact**.
	Species White-clawed Crayfish (*Austropotamobius pallipes*) [1092] Sea Lamprey *Petromyzon marinus* [1095] Brook Lamprey (*Lampetra planeri*) [1096] Salmon *Salmo salar* [1106] Otter *Lutra lutra* [1355]	Yes – Connectivity to GI works via watercourses in the scheme area.	No instream works are proposed as part of the GI works. **No Direct Impact.**	Indirect impacts affecting the aquatic QI species may potentially arise as a result of impacts affecting water quality, primary sediments and silts entering the watercourse resulting in an increase in suspended solids which can result in mortality, smothering of spawning grounds and reduced food supply i.e. where impacts may result in reduced macroinvertebrate and fisheries production. There is potential for connectivity to the River Moy via run-off into stormwater gullies and stormwater overflows that are directly connected to the River Moy. However, the reasonable worst case scenario calculations based on the maximum assumed concentration of sediment arising from a works area of 50m^2 is 5,000mg/l, resulting in approximately 5.79% increase in suspended solids over a time period of 2-4 hours. Therefore, this impact is deemed to be short-term and will not disrupt the factors such as water quality that help to maintain the favourable conditions of the site. Therefore, the potential impacts are deemed to be short term and not significant.

Site Name & Code	Qualifying Interest (QI) Habitats and Species	Connectivity to GI Works	Direct Impacts	Indirect Impacts
				No Indirect Impact.
Killala Bay/ Moy Estuary SAC	**Habitats** Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Annual vegetation of drift lines [1210] Salicornia and other annuals colonizing mud and sand [1310] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes') [2120] *Fixed coastal dunes with herbaceous vegetation ('grey dunes') [2130] Humid dune slacks [2190]	Yes – Connectivity to GI works via watercourses in the scheme area.	No GI works are proposed within the boundary of the SAC. No Direct Impact.	Indirect impacts to aquatic QI habitats from pollutants entering watercourses to Moy Estuary. There is potential for connectivity to the Moy Estuary via run-off into gullies that are directly connected to the River Moy. However, the reasonable worst case scenario calculations based on the maximum assumed concentration of sediment arising from a works area of 50m^2 is 5,000 mg/l, resulting in approximately 5.79% increase in suspended solids over a time period of 2-4 hours. Therefore, this impact is deemed to be short-term and will not disrupt the factors such as water quality that help to maintain the favourable conditions of the site. Therefore, the potential impacts are deemed to be short term and not significant. **No Indirect Impact.**
	Species Narrow-mouthed Whorl Snail (*Vertigo angustior*) [1014] Sea Lamprey (*Petromyzon marinus*) [1095] Harbour Seal (*Phoca vitulina*) [1365]	Yes – Connectivity to GI works via watercourses in the scheme area.	No instream works are proposed as part of the GI works. **No Direct Impact.**	Potential run-off of pollutants to the Moy Estuary during the GI works may have impacts to water quality and in turn QI species. There is potential for connectivity to the Moy Estuary via run-off into gullies that are directly connected to the River Moy. However, the reasonable worst case scenario calculations based on the maximum assumed concentration of sediment arising from a works area of 50m^2 is 5,000 mg/l, resulting in approximately 5.79% increase in suspended solids over a time period of 2-4 hours. Therefore, this impact is deemed to be short-term and will not disrupt the factors such as water quality that help to maintain the favourable conditions of the site. Therefore, the potential impacts are deemed to be short term and not significant. **No Indirect Impact**.
Killala Bay/ Moy Estuary SPA	**Species** Ringed Plover (*Charadrius hiaticula)* [A137] Golden Plover (*Pluvialis apricaria)* [A140]	Yes – Connectivity to GI works via watercourses in the scheme area.	No instream works are proposed as part of the GI works.	Potential impact to wintering birds during the GI works due to noise and visual disturbance from GI plant and personnel on site. However, the

Site Name & Code	Qualifying Interest (QI) Habitats and Species	Connectivity to GI Works	Direct Impacts	Indirect Impacts
	Grey Plover (*Pluvialis squatarola)* [A141] Sanderling (*Calidris alba)* [A144] Dunlin (*Calidris alpina alpina)* [A149] Bar-tailed Godwit (*Limosa lapponica)* [A157] Curlew (*Numenius arquata)* [A160] Redshank (*Tringa totanus)* [A162]		**No Direct Impact.**	nature of the works are small, isolated and temporary and are unlikely to cause significant effect to SCI species. **No Indirect Impact**.
	Habitats Wetlands [A999]	Yes – Connectivity to GI works via watercourses in the scheme area.	No GI works are proposed within the boundary of the SPA. **No Direct Impact.**	Indirect impacts to aquatic QI habitats from pollutants entering watercourses to Moy Estuary. There is potential for connectivity to the Moy Estuary via run-off into gullies that are directly connected to the River Moy. However, the reasonable worst case scenario calculations based on the maximum assumed concentration of sediment arising from a works area of 50m^2 is 5,000 mg/l, resulting in approximately 5.79% increase in suspended solids over a time period of 2-4 hours. Therefore, this impact is deemed to be short-term and will not disrupt the factors such as water quality that help to maintain the favourable conditions of the site. Therefore, the potential impacts are deemed to be short term and not significant. **No Indirect Impact**.
Lackan Saltmarsh and Kilcummin Head SAC	**Habitats** Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes)* [2130]	Yes – Connectivity to GI works via watercourses in the scheme area.	No GI works are proposed within the boundary of the SAC. **No Direct Impact.**	Due to the distance of the QI habitats of this SAC from GI works and the small, isolated and temporary nature of the works, significant effects are unlikely. **No Indirect Impact**.

5.2 Describe any Likely Direct, Indirect or Secondary Impacts of the Project on the European Sites

The proposed GI works will not be undertaken within any European Sites including the River Moy SAC, Killala Bay/Moy Estuary SAC, Killala Bay/ Moy Estuary SPA and Lackan Saltmarsh and Kilcummin Head SAC.

The potential impacts arising from the proposed GI works are outlined in **Table 5-2**. The potential for likely direct, indirect or secondary impacts of the project on the European Sites is discussed in **Table 5-3.**

Due to the short term nature and scale of the works, the proposed GI work will not result in significant effect to European sites.

Table 5-2: Potential Impact from the Proposed GI Works

Criteria	Discussion
Size and Scale	No GI works are proposed within the boundaries of European sites. In addition, the works are temporary and small in scale and will not result in significant negative effects to proximal European sites.
Land Take	There will be no land-take from European Sites as part of the proposed GI works.
Distance from European Sites or Key Features of the Site	The proposed GI works are not located within the footprint of any European Sites being assessed. The overall scheme area footprint for the Ballina Flood Relief Scheme intersects or has some indirect hydrological connectivity at varying distances to the River Moy SAC, Killala Bay/Moy Estuary SAC, Killala Bay/ Moy Estuary SPA and Lackan Saltmarsh and Kilcummin Head SAC see **Table 3-1.** Due to the nature of the proposed GI works, there is no source-pathway-receptors from the specific GI locations to outlined European sites, therefore no potential to indirect significant negative effects to proximal European sites.
Resources Requirements	Fuel will be consumed by plant equipment and limited potential for water to be required for various practices detailed as part of the methodology. There will be no impacts to the European sites in this regard.
Emissions	The proposed GI works may result in emissions to the receiving environment. However, due to the nature and location of the proposed GI works discharges will be either attenuated or treated, there will be no untreated discharges to the River Moy.
Excavation Requirements	Temporary excavations are required as part of the proposed works methodology. This involves discrete and isolated works for each defined location. All excavated materials will be backfilled following completion of the works at each location. There will be no excavations within European sites. Therefore, there will be no impact to European Sites in this regard.
Transport Requirements	Access and egress to site will be via existing infrastructure and field access. Given the small scale and temporary nature of the works, no significant negative effects will occur to European Sites in this regard.
Duration of construction, operation and decommissioning	The duration of fieldwork is expected to take thirty days. Therefore, potential impacts will be temporary and localised. Therefore, the GI works will not result in significant negative effects to proximal European sites.

Table 5-3: Likely direct, indirect or secondary impacts of the project on the European Sites

Site Name & Code	Qualifying Interest (QI)/Special Conservation Interest (SCI) Habitats and Species	Direct Impacts	Indirect Impacts
River Moy SAC	**Habitats**		
	Active raised bogs* [7110]	No GI works are proposed within the boundary of the SAC. **No Direct Impact.**	The QI habitats of the River Moy SAC are located upstream of Ballina, therefore there will be no impact to these habitats as a result of the GI works. **No Indirect Impact.**
	Degraded raised bogs still capable of natural regeneration [7120]		
	Depressions on peat substrates of the Rhynchosporion [7150]		
	Alkaline fens [7230]		
	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]		
	Species		
	White-clawed Crayfish (*Austropotamobius pallipes*) [1092]	No instream works are proposed as part of the GI works, therefore no direct impacts are anticipated. **No Direct Impact.**	The general distribution of white-clawed crayfish in the SAC is in the upper tributaries of the River Moy and the rivers which feed Loughs Conn and Cullin. The species is absent from the main River Moy. **No Indirect Impact.**
	Sea Lamprey *Petromyzon marinus* [1095]	No instream works are proposed as part of the GI works, therefore no direct impacts on lamprey habitat or barriers to migration is anticipated. **No Direct Impact.**	Sea lamprey is associated with the areas near Ballina where the River Moy main channel becomes tidal, downstream of Lower Bridge. Brook Lamprey may be found throughout the system. Potential impacts from suspended sediment due to runoff can have severe negative impacts on all life stages of fish. However, given the nature and scale of the works and the minimal temporary impact on water quality there will be **No Indirect Impact**.
	Brook Lamprey *Lampetra planer* [1096]		
	Salmon *Salmo salar* [1106]	No instream works are proposed as part of the GI works, therefore no direct impacts or barriers to migrating salmon to spawning grounds are anticipated. **No Direct Impact.**	Potential impacts from suspended sediment due to runoff from the GI works can have severe negative impacts on all life stages of fish e.g. suspended sediment can settle on spawning areas, infill the intra-gravel voids and smother the eggs and alevins (newly hatched fish) in the gravel. However, given the nature and scale of the works and the minimal temporary impact on water quality there will be **No Indirect Impact**.

Site Name & Code	Qualifying Interest (QI)/Special Conservation Interest (SCI) Habitats and Species	Direct Impacts	Indirect Impacts
	Otter Lutra lutra [1355]	No instream works are proposed as part of the GI Works and there will be no impacts river or the riparian habitat on the River Moy within Ballina. **No Direct Impact.**	Indirect impacts affecting otter may potentially arise as a result of reduced food supply i.e. where impacts affecting water quality may result in reduced macroinvertebrate and fisheries production. The otter is dependent on fish stocks, which are ultimately dependent on water quality. However, given the nature and scale of the works and the minimal temporary impact on water quality there will be **No Indirect Impact**.
Killala Bay/ Moy Estuary SAC	**Habitats**		
	Estuaries [1130]	The QI habitat Estuaries [1130] is the only QI habitat in proximity to the proposed GI works. No GI works are proposed within the boundary of the SAC	The nature and scale of the works will result in a minimal temporary impact on water quality there will be **No Indirect Impact** to the QI habitats.
	Mudflats and sandflats not covered by seawater at low tide [1140]		
	Annual vegetation of drift lines [1210]		
	Salicornia and other annuals colonizing mud and sand [1310]		
	Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]		
	Embryonic shifting dunes [2110]		
	Shifting dunes along the shoreline with Ammophila arenaria ('white dunes') [2120]		
	*Fixed coastal dunes with herbaceous vegetation ('grey dunes') [2130]		
	Humid dune slacks [2190]		
	Species		
	Narrow-mouthed Whorl Snail (Vertigo angustior) [1014]	*Vertigo angustior* is found in terrestrial habitats downstream of the proposed works. **No Direct or Indirect Impacts.**	
	Sea Lamprey (Petromyzon marinus) [1095]	No instream works are proposed as part of the GI works, therefore no direct impacts on lamprey habitat or barriers to migration is anticipated. **No Direct Impact.**	Sea lamprey is associated with the areas near Ballina where the River Moy main channel becomes tidal, downstream of Lower Bridge. Brook Lamprey may be found throughout the system. Potential impacts from suspended sediment due to runoff can have severe negative impacts on all life stages of fish. However, given the nature and scale of the works and the minimal temporary impact on water quality there will be **No Indirect Impact**.
	Harbour Seal (Phoca vitulina) [1365]	Harbour Seal haul out, breeding and moult sites are further out in the estuary. **No Direct impacts**	Indirect impacts affecting harbour seal may potentially arise as a result of reduced food supply i.e. where impacts affecting water quality may result in reduced macroinvertebrate and fisheries production. Seals are dependent on fish stocks, which are ultimately dependent on water quality. However, given the nature and scale of the works and the minimal temporary

Site Name & Code	Qualifying Interest (QI)/Special Conservation Interest (SCI) Habitats and Species	Direct Impacts	Indirect Impacts
			impact on water quality there will **No Indirect Impact**.
Killala Bay/ Moy Estuary SPA (004036)	**Species** Ringed Plover (*Charadrius hiaticula)* [A137] Golden Plover (*Pluvialis apricaria)* [A140] Grey Plover (*Pluvialis squatarola)* [A141] Sanderling (*Calidris alba)* [A144] Dunlin (*Calidris alpina alpina)* [A149] Bar-tailed Godwit (*Limosa lapponica)* [A157] Curlew (*Numenius arquata)* [A160] Redshank (*Tringa totanus)* [A162] **Habitats** Wetlands [A999]	No instream works are proposed as part of the GI works. **No Direct Impact.**	Potential impact to wintering birds during the GI works due to noise and visual disturbance from GI plant and personnel on site. However, the nature of the works are small, isolated and temporary and are unlikely to cause significant effect to SCI species. **No Indirect Impact**.
Lackan Saltmarsh and Kilcummin Head SAC (000516)	**Habitats** Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes)* [2130]	The QI habitats are downstream of the proposed GI works. **No Direct Impact**	The nature and scale of the works will result in a minimal temporary impact on water quality there will be **No Indirect Impact** to the QI habitats.

5.2.1 Cumulative impacts with other plans and projects in the area

As part of the screening for an AA, in addition to the proposed works, other relevant projects and plans in the region must also be considered at this stage. These plans and projects are considered further in this respect in Cumulative Impacts associated with the proposed works, see **Table 5-4** below.

Table 5-4: Cumulative Impacts Associated with the Ballina Flood Relief Scheme GI Works

PLANS AND PROJECTS	KEY POLICIES/ISSUES/OBJECTIVES DIRECTLY RELATED TO THE CONSERVATION OF THE NATURA 2000 NETWORK	IMPACT ASSESSMENT
Land Use and Spatial Plans		
Proposed Mayo County Development Plan 2021-2027	Mayo County Development Plan review process was paused until after the Regional Spatial & Economic Strategy (RSES) was published. The Mayo County Development Plan 2021-2027 was not available at the time of writing this report	Any future development of the Ballina Flood Relief Scheme will be cognisant of the strategies, policies and objectives set out in the Mayo County Development Plan 2021 – 2027 for the protection of the natural environment and compliance with European and National legislation
Mayo County Development Plan 2014-2020	**Chapter 4 – Environment, Heritage and Amenity Strategy** **Water Quality** **WQ-01** - It is an objective of the Council to implement the Western River Basin District Management Plan "Water Matters" 2009-2015 to ensure the protection, restoration and sustainable use of all waters in the County, including rivers, lakes, ground water, coastal and transitional waters, and to restrict development likely to lead to deterioration in water quality or quantity. **Heritage** **GH-01** - It is an objective of the council to implement the County Mayo Heritage Plan and Biodiversity Plan in conjunction with The Heritage Council, Heritage Forum, relevant stakeholders and the community. **Natural Heritage** **NH-01** - It is an objective of the Council to protect, enhance, conserve and, where appropriate restore: a) Candidate Special Areas of Conservation, Special Areas of Conservation, Special Protection Areas, Natural Heritage Areas and proposed National Heritage Areas, Statutory Nature Reserves, Ramsar Sites and Biogenetic Reserves, including those listed in the Environmental Report documenting the Strategic Environmental Assessment of this plan and any modifications or additional areas that may be so designated during the lifetime of the plan. b) Natural habitats and plant and animal species identified under the Habitats Directive, Birds Directive, Wildlife Act and the Flora Protection Order, or any other relevant legislation that may be implemented during the lifetime of the plan. c) Features of natural interest and amenity, which provide a unique habitat for wildlife including ecological networks (including ecological corridors and stepping stones), riparian zones, hedgerows, stonewalls and shelterbelts. d) Bogs, fens and turloughs listed in the Environmental Report documenting the Strategic Environmental Assessment of this plan. e) Features of geological interest as listed in the Audit of County Geological Sites (Mayo County Council).	A number of strategies, policies and objectives are set out in the Mayo County Development Plan 2014 – 2020 for the protection of the natural environment. There are a number of Natural Heritage objectives that identify the requirement of proposed developments to take cognisance of the various national and international legislation ensuring that plans and projects put mechanisms in place to avoid any significant negative impacts occurring to qualifying interests (habitats and species) of designated sites. Specifically, Designated Sites – NH01-NH09. The water quality policy WQ-01 outlines the need to protect watercourses and to implement the Western River Basin District Management Plan. The heritage policy outlines the need to implement both the County Mayo Heritage Plan and Biodiversity Plan.

f) The conservation value of disused railway lines, waterways, walkways etc. notwithstanding that some of these items (e.g. disused rail lines) may be developed at some future date as part of the County's infrastructure where it can be demonstrated that the development will not have significant adverse effects on the environment including the integrity of the Natura 2000 network.
g) Surface waters, aquatic and wetland habitats and freshwater and water- dependent species through the implementation of all appropriate and relevant Directives and transposed legislation.
h) Trees or groups of trees protected under Tree Preservation Orders listed in the Environmental Report documenting the Strategic Environmental Assessment of this plan , as well as trees and woodlands of particular amenity and nature conservation value, or which make a valuable contribution to the character of the landscape, a settlement or its setting.
i) Sites of local conservation importance including those identified in the Local Biodiversity Action Plan.

NH-02 - It is an objective of the Council to ensure that the unique ecological, scenic, recreational and environmental character of Ballycroy National Park is protected and enhanced, and to prohibit any development, which would impair its character. Environment, Heritage & Amenity Strategy 49

NH-03 - It is an objective of the Council to implement Article 6(3) and 6(4) of the EU Habitats Directive, by screening all plans and projects for appropriate assessment and to ensure those with potential to have significant effects on the integrity of Natura 2000 or European Sites (cSACs, SPAs), whether directly (in situ), indirectly (ex-situ) or in combination with other plans or projects, are subject to an appropriate assessment and the preparation of an NIR or NIS in order to inform decision making.

NH-04 - It is an objective of the Council to fully integrate wildlife and biodiversity considerations into all areas of the Council's roles and responsibilities and into all its works and operations.

NH-05 - It is an objective of the Council to increase awareness of the importance of the natural heritage of the County and to promote education, knowledge and pride in our natural heritage.

NH-06 - It is an objective of the Council to support the implementation of the National Biodiversity Plan.

NH-07 - It is an objective of the Council to promote best practice in the control of invasive species in the carrying out of both local authority and private development.

NH-08 - It is an objective of the Council to assist in the control of native and non-native invasive or harmful species which represent a serious threat to our environment, freshwater systems and lakes.

NH-09 - It is an objective of the Council to utilise appropriate opportunities to enhance and create wildlife habitats where they arise.

PLANS AND PROJECTS	KEY POLICIES/ISSUES/OBJECTIVES DIRECTLY RELATED TO THE CONSERVATION OF THE NATURA 2000 NETWORK	IMPACT ASSESSMENT
Ballina and Environs Development Plan 2009-2015 (*to be revised following the publication of the RSES*)	It is a policy of Ballina Town Council and Mayo County Council to ensure that all plans and projects which would, either individually or in combination with other plans and projects, have a significant impact on a Natura 2000 site, will be subject to Habitats Directive Screening, and if required, Appropriate Assessment, to determine if the proposed development is environmentally sustainable and to ensure it will not affect the integrity of the site or its habitats or the conservation objectives of the site.	Adherence to the policies and objectives of the Ballina and Environs Development Plan 2009-2015 ensure that local planning applications and subsequent grant of planning will comply with the requirements of relevant EU Directives and environmental considerations, there is no potential for adverse in-combination effects on European Sites.
River Basin Management Plan for Ireland 2018-2021	The objectives of the RBMP are to • Prevent deterioration; • Restore good status; • Reduce chemical pollution; and • Achieve water related protected areas objectives	The implementation of the RBMP seeks compliance with the environmental objectives set under the plan, which will be documented for each water body. This includes compliance with the European Communities (Surface Waters) Regulations S.I. No. 272 of 2009 (as amended). The implementation of the RBMP and achievement or maintenance of environmental objectives which will be set for the receiving water bodies will have a positive impact on water dependent habitats and species within European sites.
Inland Fisheries Ireland Corporate Plan 2016-2020	High Level Objectives: **Objective 1 – Fish:** To ensure that Ireland's fish populations are managed and protected to ensure their conservation status remains favourable. That they provide a basis for a sustainable world class recreation angling product, and that pristine aquatic habitats are also enjoyed for other recreational uses. **Objective 2 - Habitats:** To develop and improve fish habitats and ensure that the conditions required for fish populations to thrive are sustained and protected. **Objective 3 – Stakeholders:** To grow the number of anglers and ensure the needs of IFI's other key stakeholders are being met in a sustainable conservation focused manner. **Objective 4 – Our People:** We will invest in our people to achieve operational excellence and become one of the best places to work. **Objective 5 – Corporate Management:** IFI will promote a culture of value for money and continual evaluation of its performance in a measurable, transparent and accountable manner.	Implementation and compliance with the objectives of the IFI corporate plan will result in net positive in-combination effects to European sites.
Major Accident Emergency Plans		
Seveso II Sites	There are no Seveso II Sites in the vicinity of the proposed GI Works.	No Impact
Other Plans and Projects		
Office of Public Works Arterial Drainage Maintenance Works – Moy Arterial Drainage Scheme Natura Impact Statement April 2016	The Natura Impact Statement (NIS) for the Moy Arterial Drainage Scheme outlines potential direct and indirect impacts of proposed drainage maintenance works in the Moy Arterial drainage Scheme to Balla Turlough SAC, Ballinafad SAC, Killala Bay/Moy Estuary SAC, River Moy SAC, Killala Bay/ Moy Estuary SPA and Lough Conn and Lough Cullin SPA. The NIS outlines a number of mitigation measures to offset any impacts.	Compliance with the mitigation measures outlined in the NIS will result in no impacts to European sites.
Local Planning Applications	Given the large geographical span that the Ballina Flood Relief Scheme covers as part of this project, it is not appropriate to include an exhaustive list of submitted planning applications.	Adherence to the policies and objectives of the Mayo County Development Plan 2014-2020 ensure that

PLANS AND PROJECTS	KEY POLICIES/ISSUES/OBJECTIVES DIRECTLY RELATED TO THE CONSERVATION OF THE NATURA 2000 NETWORK	IMPACT ASSESSMENT
	Cognisance will be given to any local planning applications associated with the proposed GI works and compliance with planning policies and objectives within the County Development plan will be adhered to.	local planning applications and subsequent grant of planning comply with the core strategy of proper planning and sustainability and with the requirements of relevant EU Directives and environmental considerations, there is no potential for adverse in-combination effects on European Sites.

5.2.2 Conclusion of cumulative and in-combination impacts assessment

The proposed development footprint is located where, given the nature and extent of the proposed works, there is no potential for connectivity to the proximal European sites or potential vector pathways that would result in negative impacts occurring as a result of the proposed development.

Provided adherence to the overarching policies and objectives of the national, regional, county and local land use plans and programmes and adherence to planning conditions for individual projects, there is no potential for the mentioned plans and projects to have a cumulative impact to European sites, in combination with the proposed development.

5.3 Describe any likely changes to the site arising as a result of the following:

Table 5-5: Risk of Likely Effects on European Sites

Site Name	Reduction of Habitat Area	Disturbance to Key Species	Habitat or Species Fragmentation	Reduction in Species Density	Changes in Key Indicators of Conservation Value (Water Quality, etc.)	Climate Change
River Moy SAC Killala Bay/Moy Estuary SAC Killala Bay/ Moy Estuary SPA Lackan Saltmarsh and Kilcummin Head SAC	None. There will be no loss of any Annex I habitats for which the European site has been designated.	None. Due to the nature and scale of the works which are small, isolated and temporary, they are unlikely to cause significant effects to the QI and SCI species of European sites.	None. Due to the nature and scale of the GI works there will be no significant effects to QI habitats and species, or SCI of European sites.	None. Due to the nature and scale of the GI works there will be no significant effects to QI habitats and species, or SCI of European sites.	There is potential for impacts to water quality , however the impacts are likely to be short term, temporary and not significant, as a result no impacts to European sites.	None. There will be no significant effects to the European sites in this regard.

5.4 Describe any likely impacts on the European Sites as a whole in terms of interference with key relationships that define the structure and function of the site:

Given the nature of the proposed works and the lack of source-pathway-receptor connectivity between the proposed works and the European site network, it is unlikely that potential negative impacts will occur European Sites.

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

5.5.1 Loss

The magnitude, intensity and integrity of loss in this respect will be negligible in this case as works are localised to the footprint of the GI locations and the scheme area. No loss will occur to the European Site network.

5.5.2 Fragmentation

The magnitude, intensity and integrity of fragmentation in this respect will be negligible in this case as works are localised to the footprint of the GI locations and the scheme area. No loss will occur to the European Site network.

5.5.3 Disruption

The magnitude and intensity of disruption in this respect will be negligible in this case as works are localised to the footprint of the GI locations and the scheme area. There is no potential for disruption of European sites associated with the proposed works activity.

5.5.4 Disturbance

There will be no disturbance to European Sites as a result of the proposed works due to the lack of source-pathway-receptor connectivity between the works and the identified sites or the areas for which their QI's may occur.

5.5.5 Change to key elements of the site

The proposed ground investigation works will not present changes in key indicators of conservation value to the European site network.

5.5.6 Describe from the above those elements of the project or plan, or combination of elements, where the above impacts are likely to be significant or where the scale or magnitude of impacts is not known

There will be no likely direct or indirect significant effects to the identified European Sites or the wider European Site network as a result of the proposed ground investigation works.

There will be no in-combination effects with other plans and projects identified for the region and scheme area as detailed in **Table 5-4.**

6 CONCLUSION

The Screening for AA Report has examined potential likely significant effects as a result of the ground investigation works for the Ballina Flood Relief Scheme to European sites.

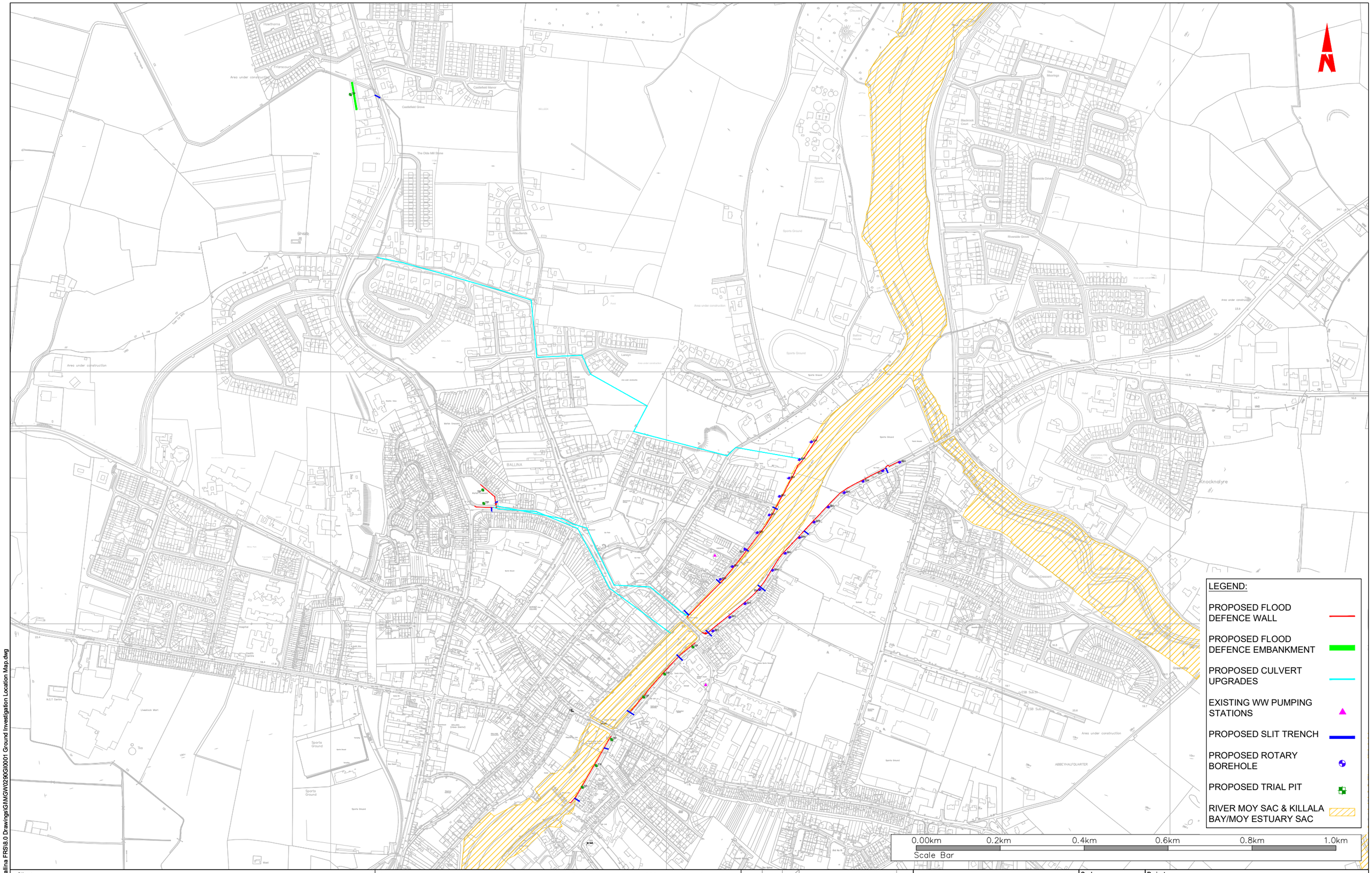
Proximal European sites were identified within the ZoI of the scheme area (see **Table**), of which four were carried forward for further assessment including the River Moy SAC (Site Code: 002298), Killala Bay/Moy Estuary SAC (Site Code: 000458), Killala Bay/ Moy Estuary SPA (Site Code: 004036) and Lackan Saltmarsh and Kilcummin Head SAC (Site Code: 000516).

There is potential for connectivity to the River Moy and Moy Estuary via run-off into stormwater gullies that are directly connected to the River Moy. However, due to the nature and scale of the works, potential impacts are likely to be short term, temporary and not significant.

Therefore, it can be **excluded**, on the basis of objective information, that the proposed GI Works for the Ballina Flood Relief Scheme, Mayo, individually or in combination with other plans or projects, will have a significant effect on a European Site. Therefore, no further assessment is required.

Appendix A

GI Locations Drawings



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Client

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Mayo County Council

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Rev	Date	Drn Chk	Amendment / Issue	App
P03	24.11.20	RMcA/ UM	LEGEND UPDATES	PJG
P02	20.10.20	RMcA/ UM	GI LOCATION UPDATES	PJG
P01	17.07.20	RMcA/ UM	FOR REVIEW & COMMENT	PJG

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Model File Identifier: N/A

Scale: 1:4000 @ A1, 1:8000 @ A3

Created on: 17 JULY 2020

Sheets: 01 of 03

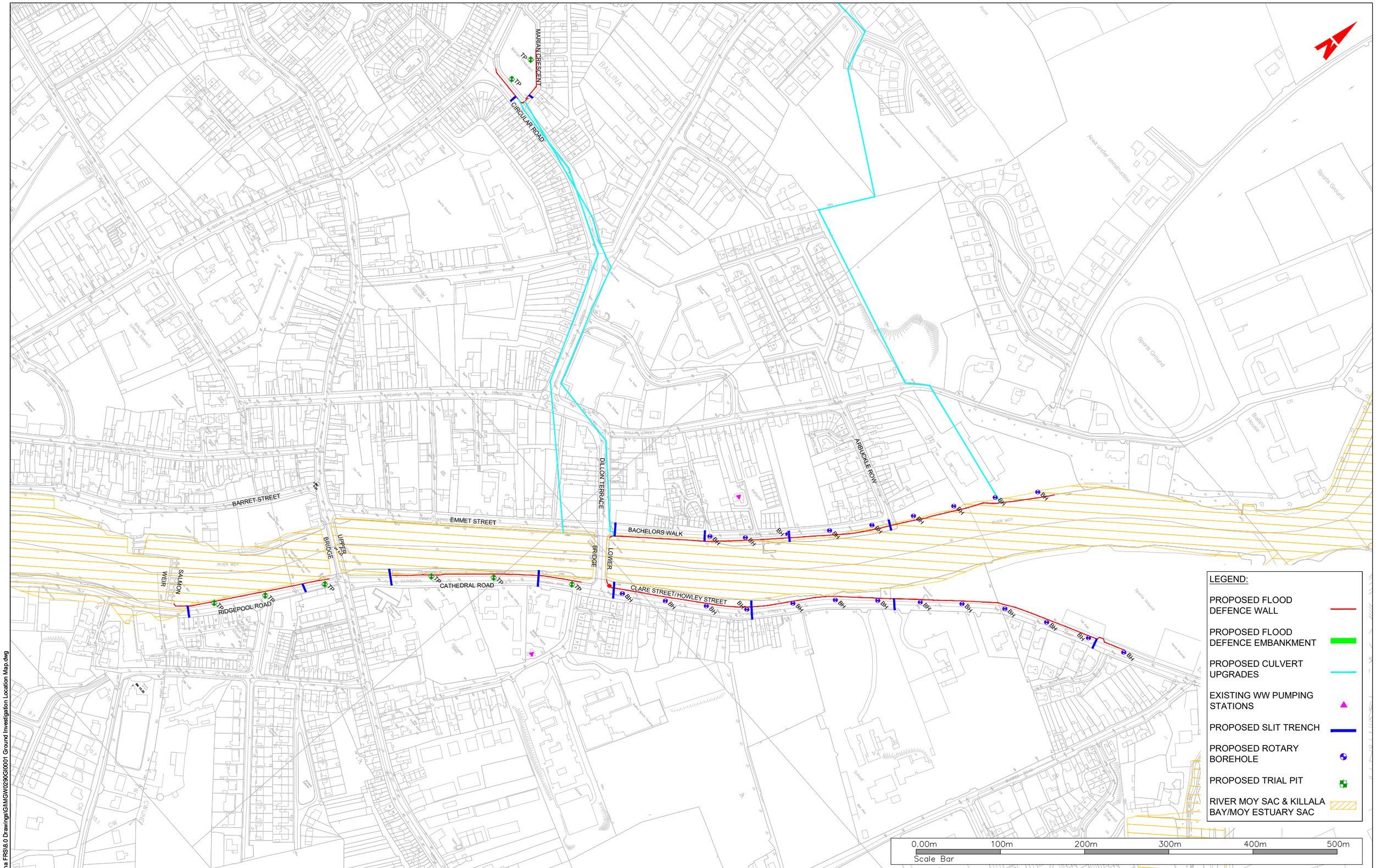
Project: BALLINA FLOOD RELIEF SCHEME

Title: GROUND INVESTIGATION LOCATION MAP

File Identifier: MGW0290GI0001-01

Status: S3

Rev: P03



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Rev	Date	Drn Chk	Amendment / Issue	App
P03	24.11.20	RMcL LM	LEGEND UPDATES	PJG
P02	20.10.20	RMcL LM	GI LOCATION UPDATES	PJG
P01	17.07.20	RMcL LM	FOR REVIEW & COMMENT	PJG

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Model File Identifier: N/A

Scale: 1:2000 @ A1, 1:4000 @ A3

Created on: 17 JULY 2020

Sheets: 02 of 03

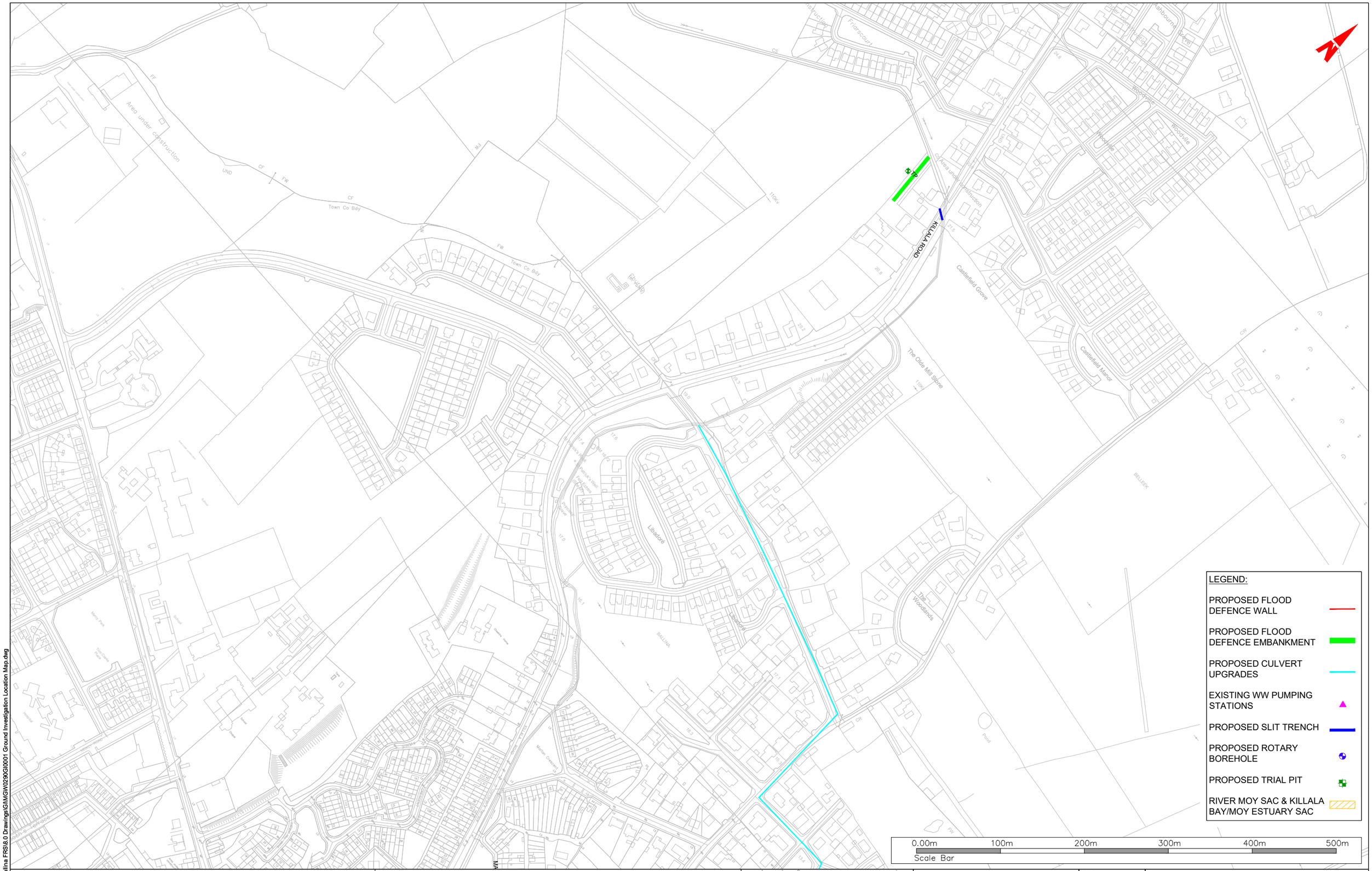
Project: BALLINA FLOOD RELIEF SCHEME

Title: GROUND INVESTIGATION LOCATION MAP

File Identifier: MGW0290GI0001-02

Status: S3

Rev: P03



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Rev	Date	Drn Chk	Amendment / Issue	App
P03	24.11.20	KMcL UM	LEGEND UPDATES	PJG
P02	20.10.20	KMcL UM	GI LOCATION UPDATES	PJG
P01	17.07.20	KMcL UM	FOR REVIEW & COMMENT	PJG

rps

Model File Identifier N/A

Scale 1:2000 @ A1, 1:4000 @ A3

Created on 17 JULY 2020

Sheets 03 of 03

Project BALLINA FLOOD RELIEF SCHEME

Title GROUND INVESTIGATION LOCATION MAP

File Identifier MGW0290GI0001-03

Status S3

Rev P03

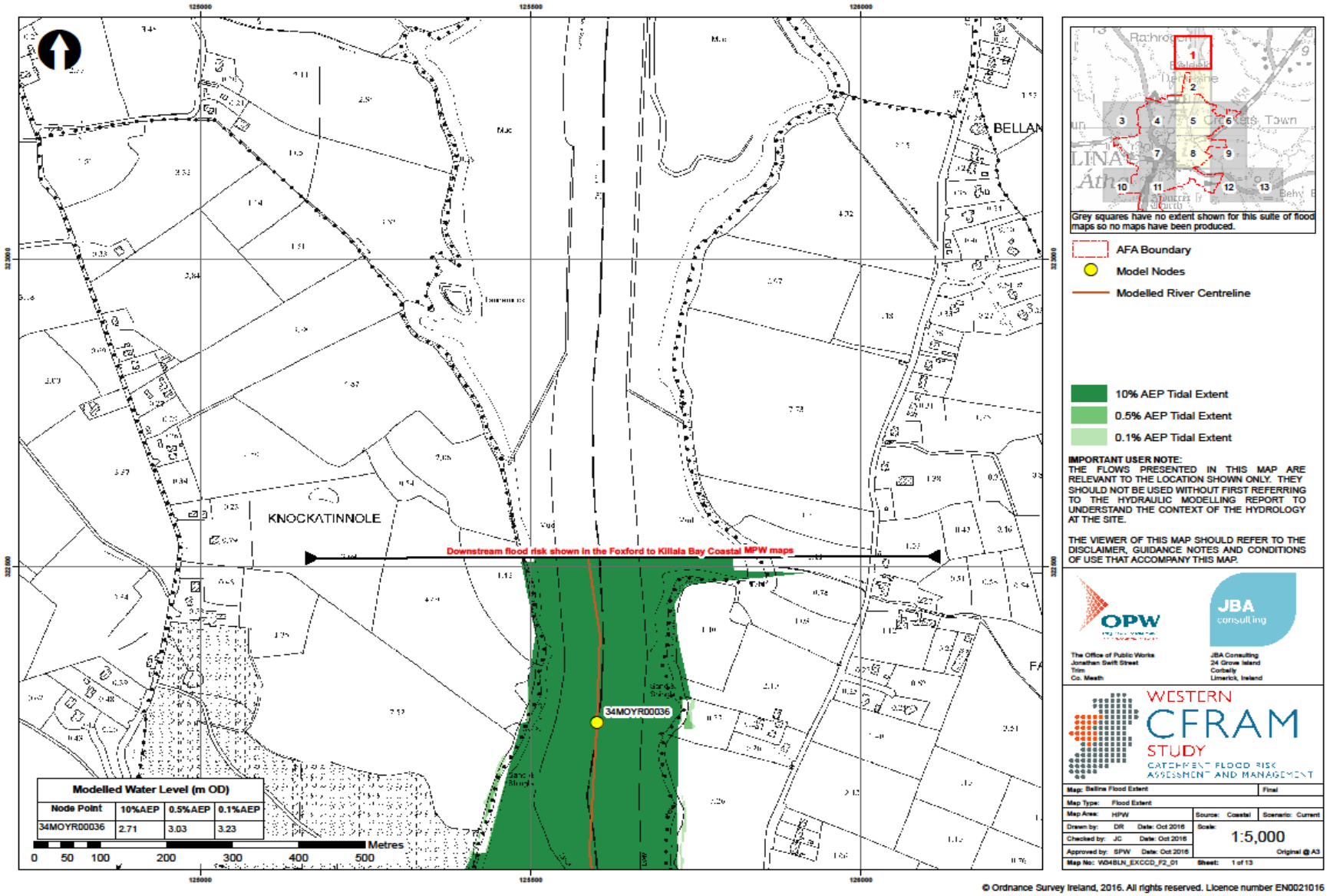
Appendix B

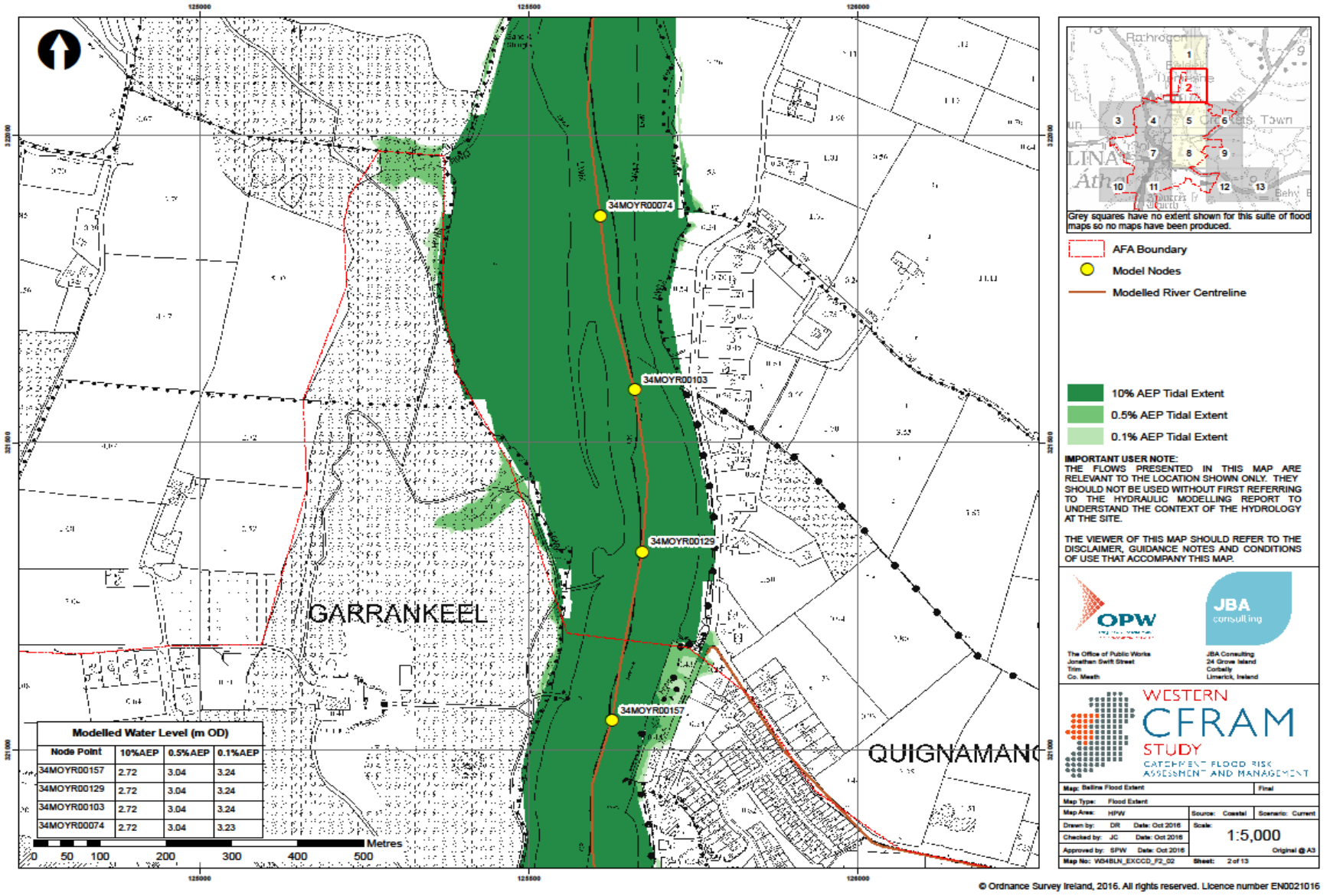
GI Works Grid Co-Ordinates

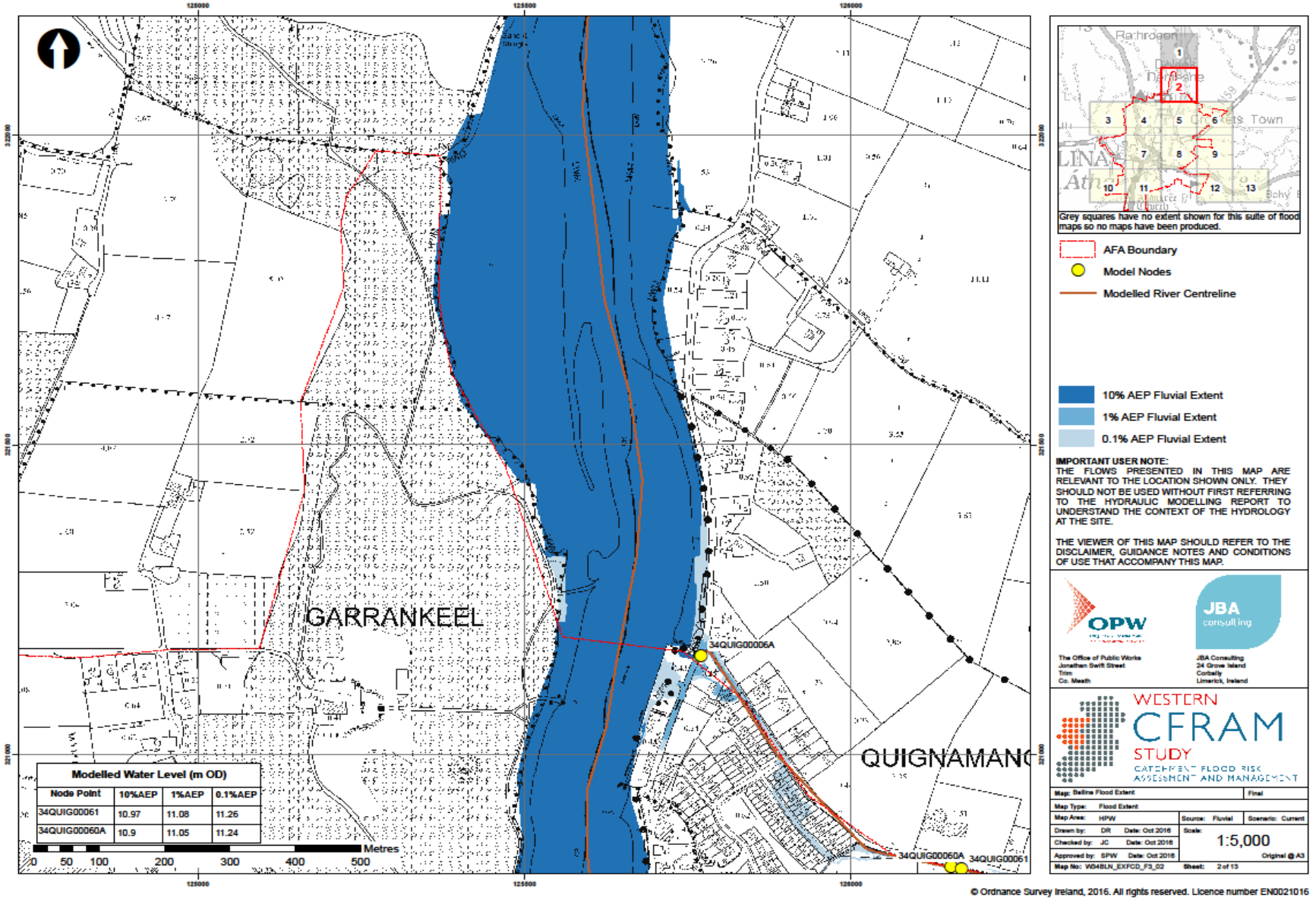
Type	GI_ID	ITM Easting (m)	ITM Northing (m)
Rotary Borehole	BH_01	524878.14	818991.86
Rotary Borehole	BH_02	524918.32	819024.47
Rotary Borehole	BH_03	524954.97	819057.11
Rotary Borehole	BH_04	524989.79	819090.56
Rotary Borehole	BH_05	525020.41	819136.47
Rotary Borehole	BH_06	525050.63	819176.97
Rotary Borehole	BH_07	525084.36	819214.45
Rotary Borehole	BH_08	525119.17	819251.12
Rotary Borehole	BH_09	525153.19	819287.03
Rotary Borehole	BH_10	525191.19	819321.55
Rotary Borehole	BH_11	525236.01	819348.26
Rotary Borehole	BH_12	525282.73	819373.38
Rotary Borehole	BH_13	525323.23	819393.62
Rotary Borehole	BH_14	524895.62	819114.66
Rotary Borehole	BH_15	524924.46	819145.51
Rotary Borehole	BH_16	524954.55	819186.11
Rotary Borehole	BH_17	524984.07	819226.17
Rotary Borehole	BH_18	525012.44	819268.30
Rotary Borehole	BH_19	525036.78	819312.57
Rotary Borehole	BH_20	525059.59	819356.25
Rotary Borehole	BH_21	525084.26	819400.01
Rotary Borehole	BH_22	525112.77	819442.28
Trial Pit	TP_01	524566.94	818619.97
Trial Pit	TP_02	524600.23	818671.40
Trial Pit	TP_03	524636.86	818733.53
Trial Pit	TP_04	524713.34	818834.71
Trial Pit	TP_05	524763.11	818889.46
Trial Pit	TP_06	524830.47	818953.97
Trial Pit	TP_07	524332.37	819295.62
Trial Pit	TP_08	524329.82	819327.71
Trial Pit	TP_09	524014.41	820269.40
Slit Trench	ST_01	524548.79	818593.82
Slit Trench	ST_02	524619.00	818713.83
Slit Trench	ST_03	524673.73	818802.82
Slit Trench	ST_04	524792.08	818935.62
Slit Trench	ST_05	524861.62	818993.64
Slit Trench	ST_06	524985.41	819101.30
Slit Trench	ST_07	525095.31	819230.50
Slit Trench	ST_08	525290.18	819380.07
Slit Trench	ST_09	524809.66	819041.22
Slit Trench	ST_10	524886.53	819115.00
Slit Trench	ST_11	524952.54	819189.36
Slit Trench	ST_12	525020.89	819287.35

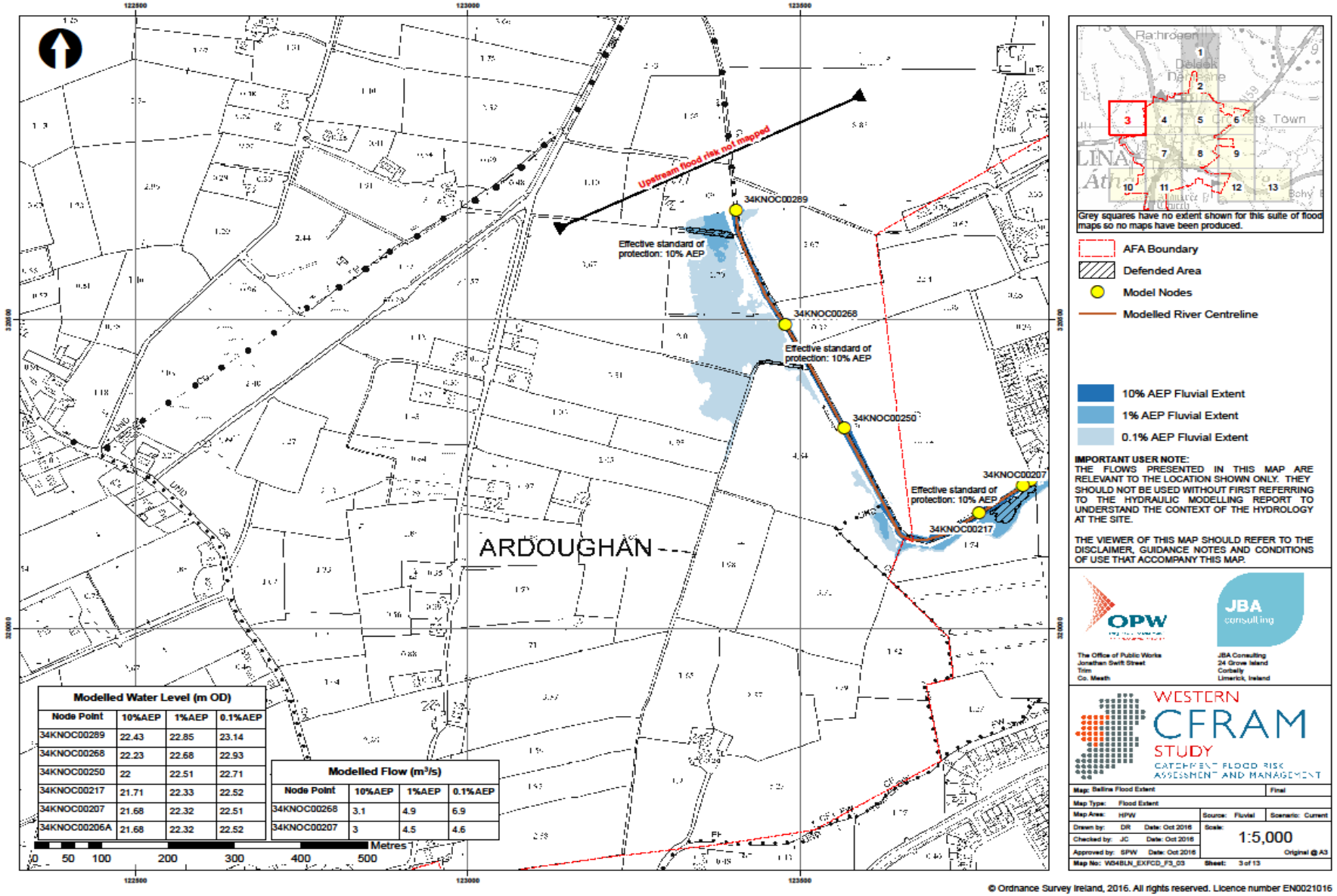
Type	GI_ID	ITM Easting (m)	ITM Northing (m)
Slit Trench	ST_13	524351.00	819285.26
Slit Trench	ST_14	524360.15	819298.56
Slit Trench	ST_15	524072.98	820268.13

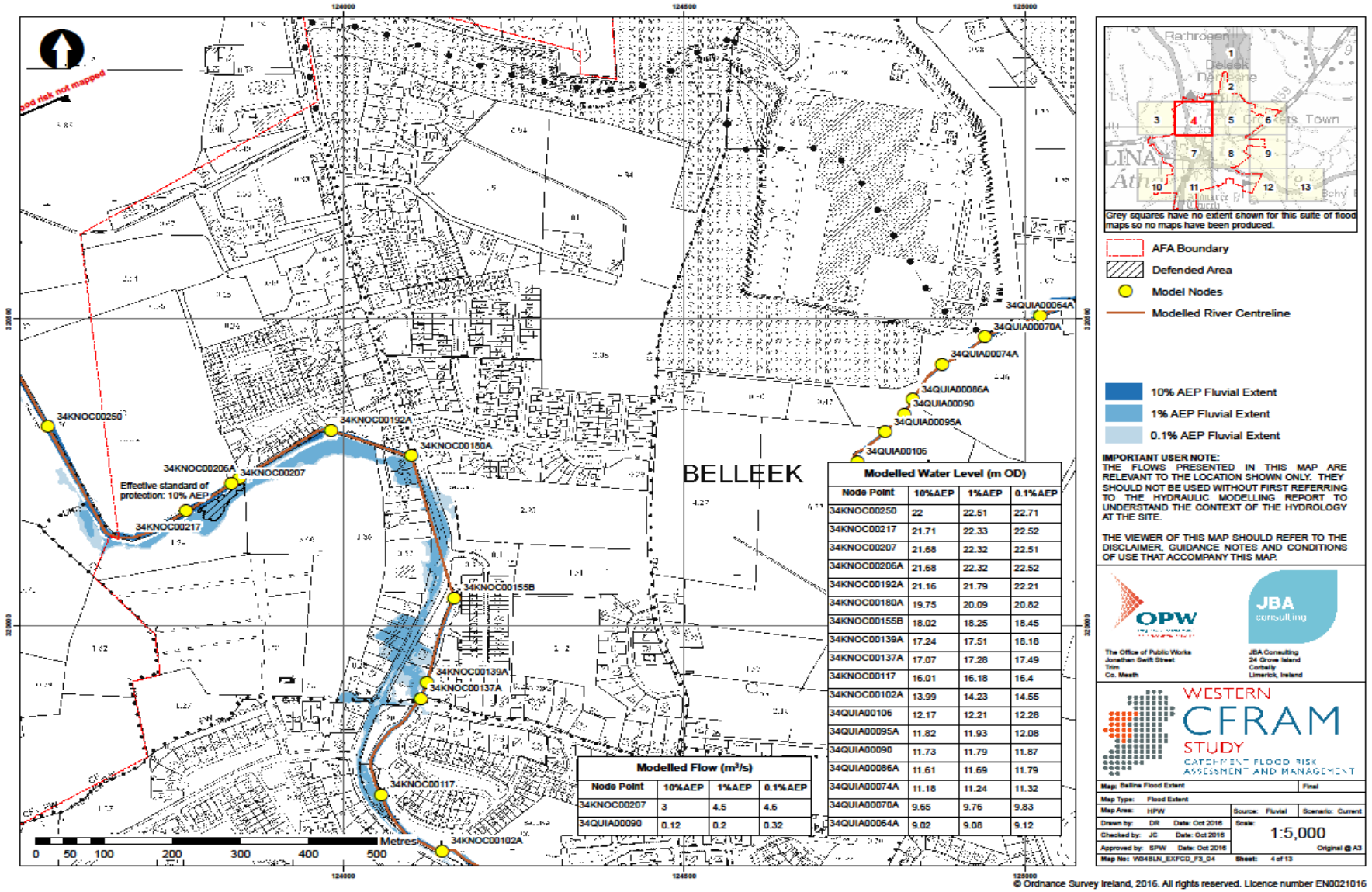
Appendix C – CFRAM Maps









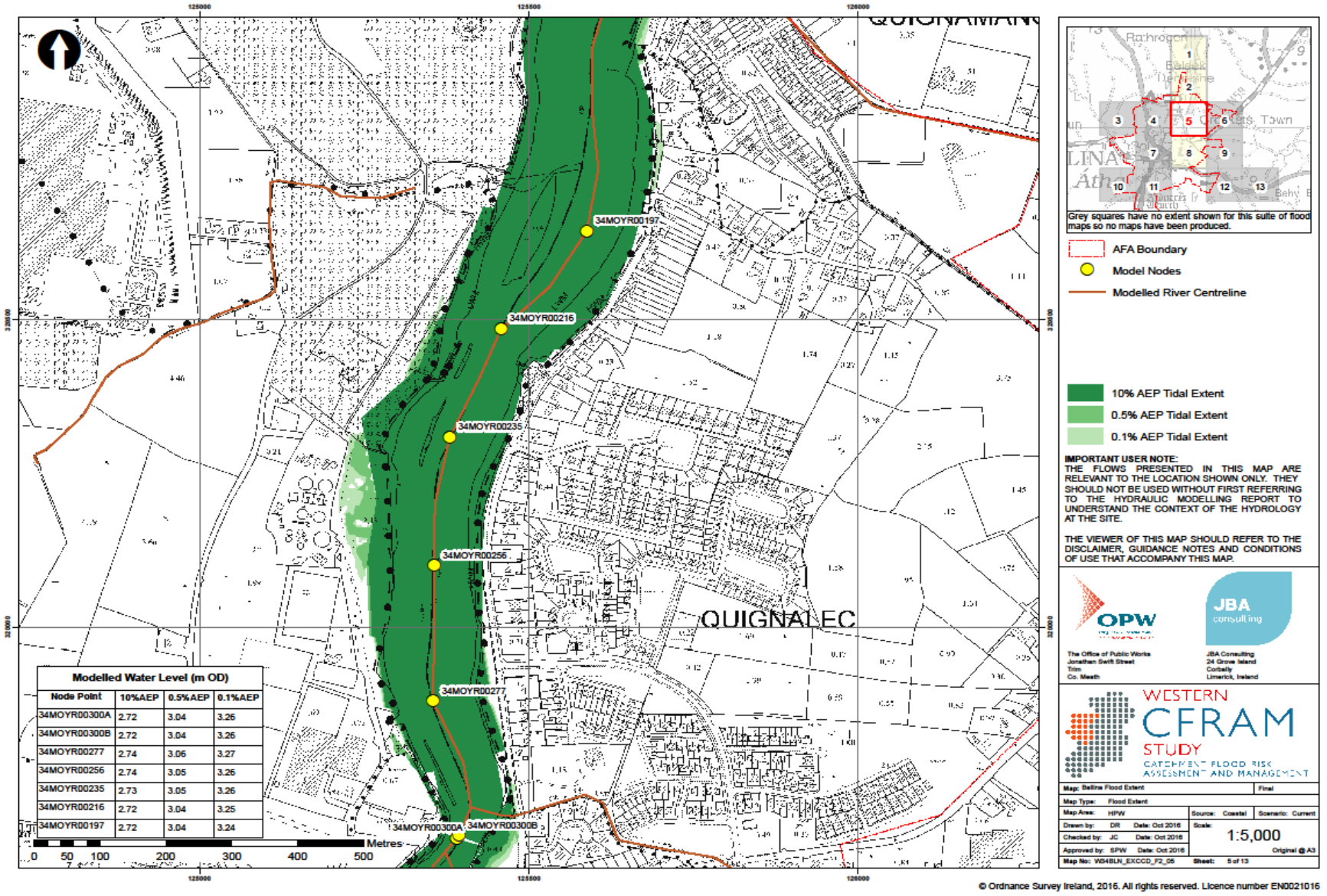


Modelled Water Level (m OD)

Node Point	10%AEP	1%AEP	0.1%AEP
34KNOC00250	22	22.51	22.71
34KNOC00217	21.71	22.33	22.52
34KNOC00207	21.68	22.32	22.51
34KNOC00206A	21.68	22.32	22.52
34KNOC00192A	21.16	21.79	22.21
34KNOC00180A	19.75	20.09	20.82
34KNOC00155B	18.02	18.25	18.45
34KNOC00139A	17.24	17.51	18.18
34KNOC00137A	17.07	17.28	17.49
34KNOC00117	16.01	16.18	16.4
34KNOC00102A	13.99	14.23	14.55
34QUIA00106	12.17	12.21	12.28
34QUIA00095A	11.82	11.93	12.08
34QUIA00090	11.73	11.79	11.87
34QUIA00086A	11.61	11.69	11.79
34QUIA00074A	11.18	11.24	11.32
34QUIA00070A	9.65	9.76	9.83
34QUIA00064A	9.02	9.08	9.12

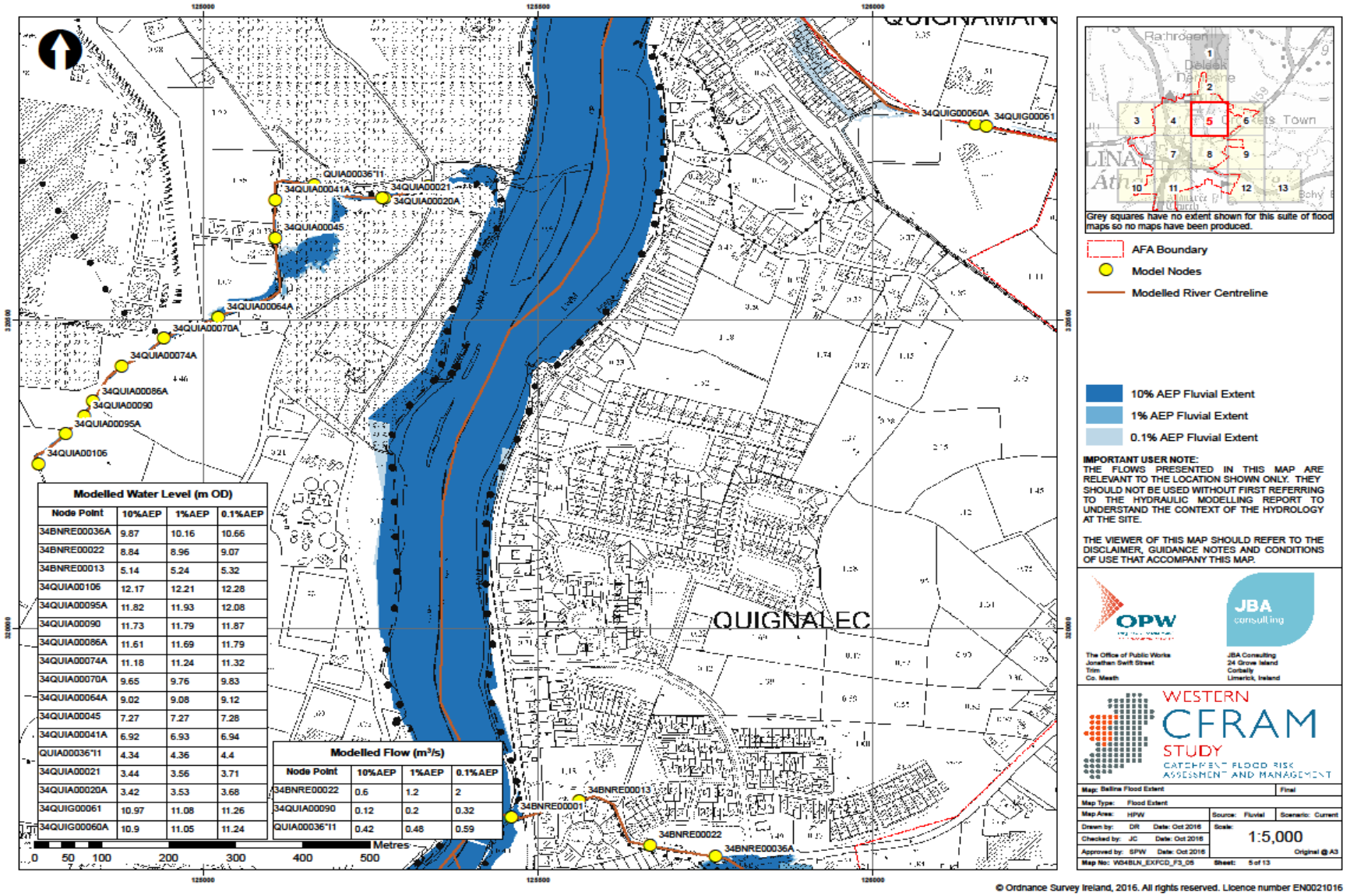
Modelled Flow (m^3/s)

Node Point	10%AEP	1%AEP	0.1%AEP
34KNOC00207	3	4.5	4.6
34QUIA00090	0.12	0.2	0.32



Modelled Water Level (m OD)

Node Point	10%AEP	0.5%AEP	0.1%AEP
34MOYR00300A	2.72	3.04	3.26
34MOYR00300B	2.72	3.04	3.26
34MOYR00277	2.74	3.06	3.27
34MOYR00256	2.74	3.05	3.26
34MOYR00235	2.73	3.05	3.26
34MOYR00216	2.72	3.04	3.25
34MOYR00197	2.72	3.04	3.24



Modelled Water Level (m OD)

Node Point	10%AEP	1%AEP	0.1%AEP
34BNRE00036A	9.87	10.16	10.66
34BNRE00022	8.84	8.96	9.07
34BNRE00013	5.14	5.24	5.32
34QUIA00106	12.17	12.21	12.28
34QUIA00095A	11.82	11.93	12.08
34QUIA00090	11.73	11.79	11.87
34QUIA00086A	11.61	11.69	11.79
34QUIA00074A	11.18	11.24	11.32
34QUIA00070A	9.65	9.76	9.83
34QUIA00064A	9.02	9.08	9.12
34QUIA00045	7.27	7.27	7.28
34QUIA00041A	6.92	6.93	6.94
QUIA00036*11	4.34	4.36	4.4
34QUIA00021	3.44	3.56	3.71
34QUIA00020A	3.42	3.53	3.68
34QUIG00061	10.97	11.08	11.26
34QUIG00060A	10.9	11.05	11.24

Modelled Flow (m^3/s)

Node Point	10%AEP	1%AEP	0.1%AEP
34BNRE00022	0.6	1.2	2
34QUIA00090	0.12	0.2	0.32
QUIA00036*11	0.42	0.48	0.59

Grey squares have no extent shown for this suite of flood maps so no maps have been produced.

AFA Boundary
Model Nodes
Modelled River Centreline

10% AEP Fluvial Extent
1% AEP Fluvial Extent
0.1% AEP Fluvial Extent

IMPORTANT USER NOTE:
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THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

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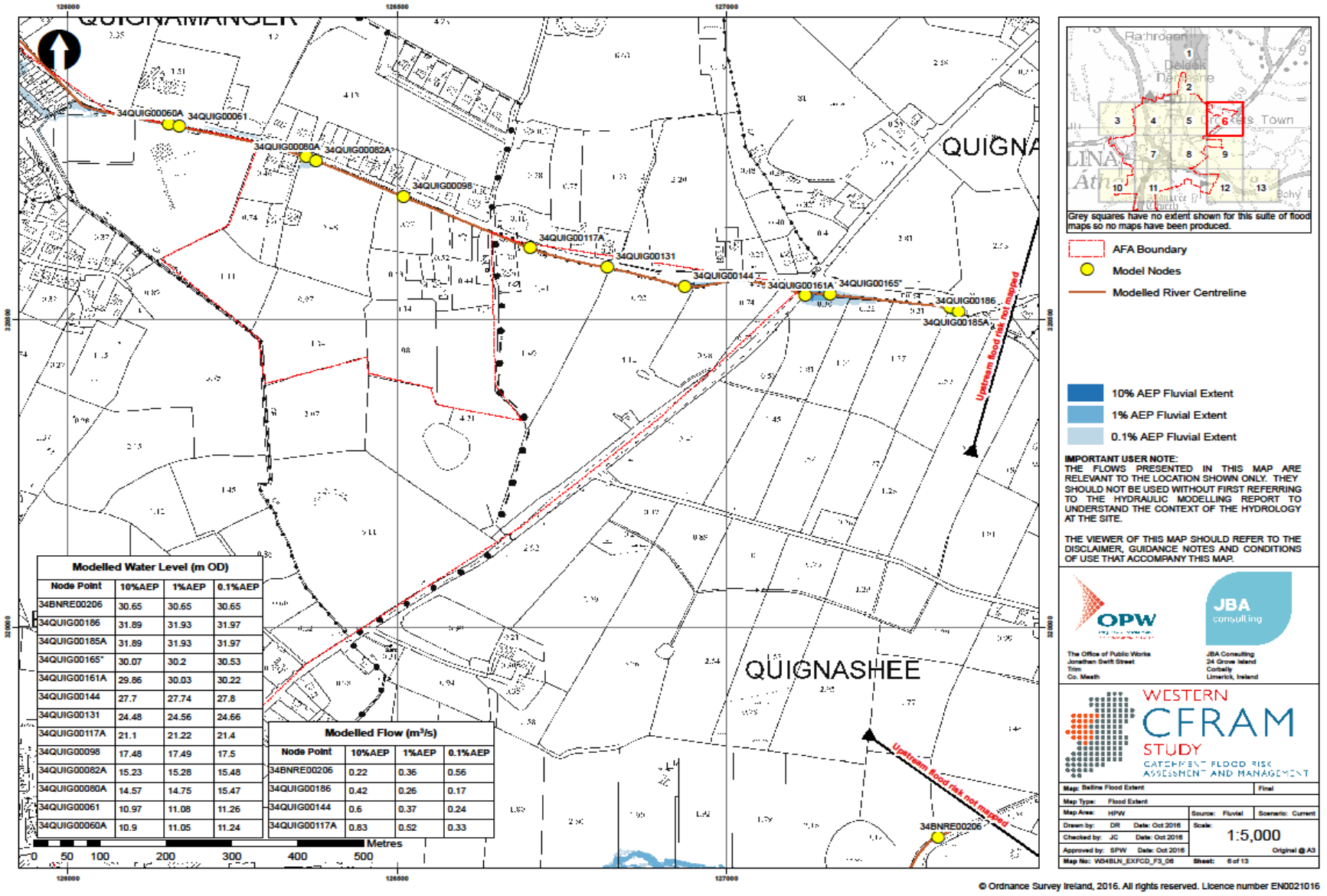
The Office of Public Works
Jonathan Swift Street
Trim
Co. Meath

JBA consulting
JBA Consulting
24 Grove Island
Corbally
Limerick, Ireland

WESTERN CFRAM STUDY
CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT

Map: Ballina Flood Extent			Final
Map Type: Flood Extent			
Map Area: HPW		Source: Fluvial	Scenario: Current
Drawn by: DR	Date: Oct 2016	Scale:	1:5,000
Checked by: JC	Date: Oct 2016		Original @ A3
Approved by: SPW	Date: Oct 2016		
Map No: WS4BLN_EXFCD_F3_05		Sheet: 5 of 13	

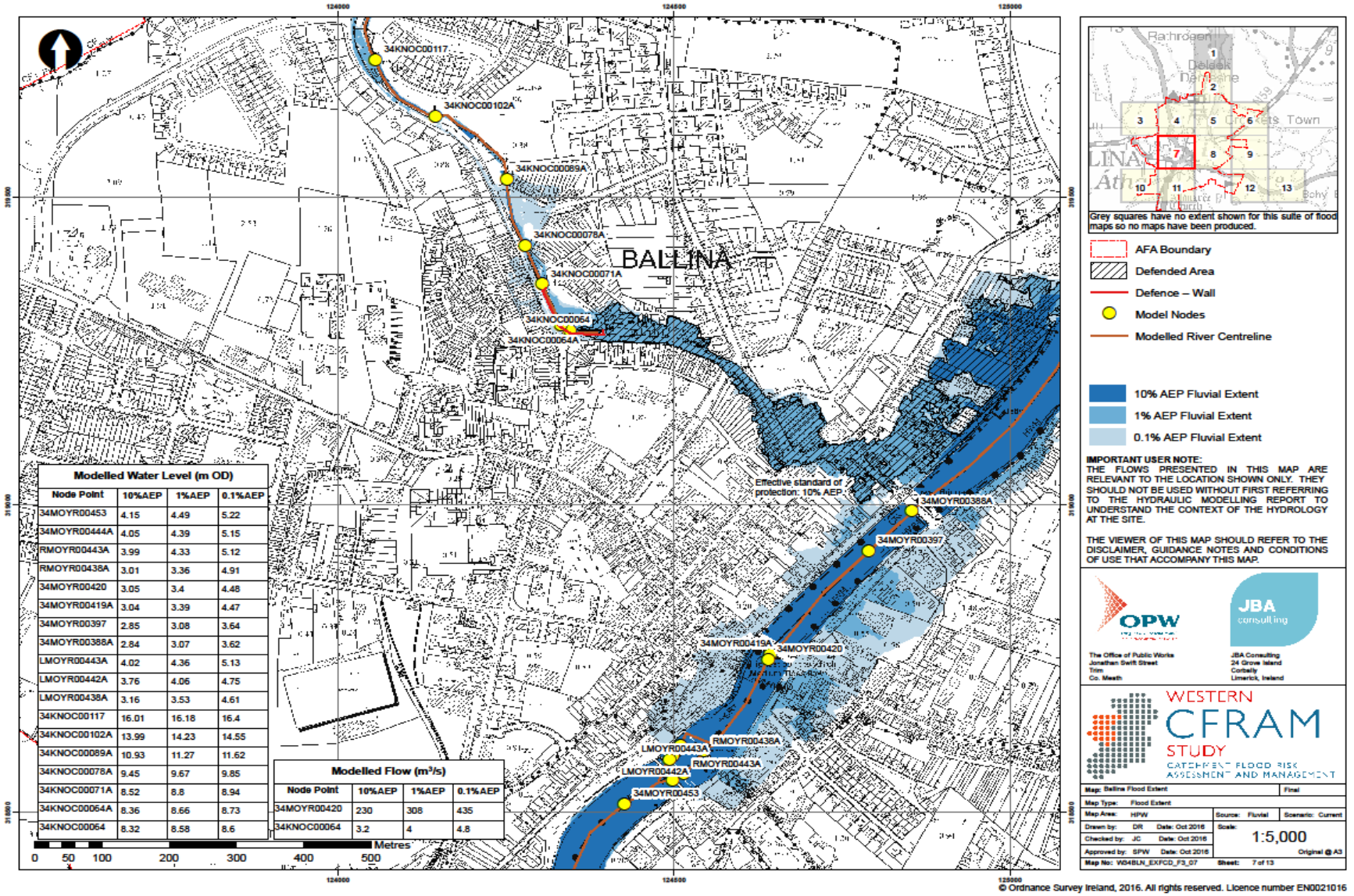


Modelled Water Level (m OD)

Node Point	10%AEP	1%AEP	0.1%AEP
34BNRE00206	30.65	30.65	30.65
34QUIG00186	31.89	31.93	31.97
34QUIG00185A	31.89	31.93	31.97
34QUIG00165*	30.07	30.2	30.53
34QUIG00161A	29.86	30.03	30.22
34QUIG00144	27.7	27.74	27.8
34QUIG00131	24.48	24.56	24.66
34QUIG00117A	21.1	21.22	21.4
34QUIG00098	17.48	17.49	17.5
34QUIG00082A	15.23	15.28	15.48
34QUIG00080A	14.57	14.75	15.47
34QUIG00061	10.97	11.08	11.26
34QUIG00060A	10.9	11.05	11.24

Modelled Flow (m^3/s)

Node Point	10%AEP	1%AEP	0.1%AEP
34BNRE00206	0.22	0.36	0.56
34QUIG00186	0.42	0.26	0.17
34QUIG00144	0.6	0.37	0.24
34QUIG00117A	0.83	0.52	0.33

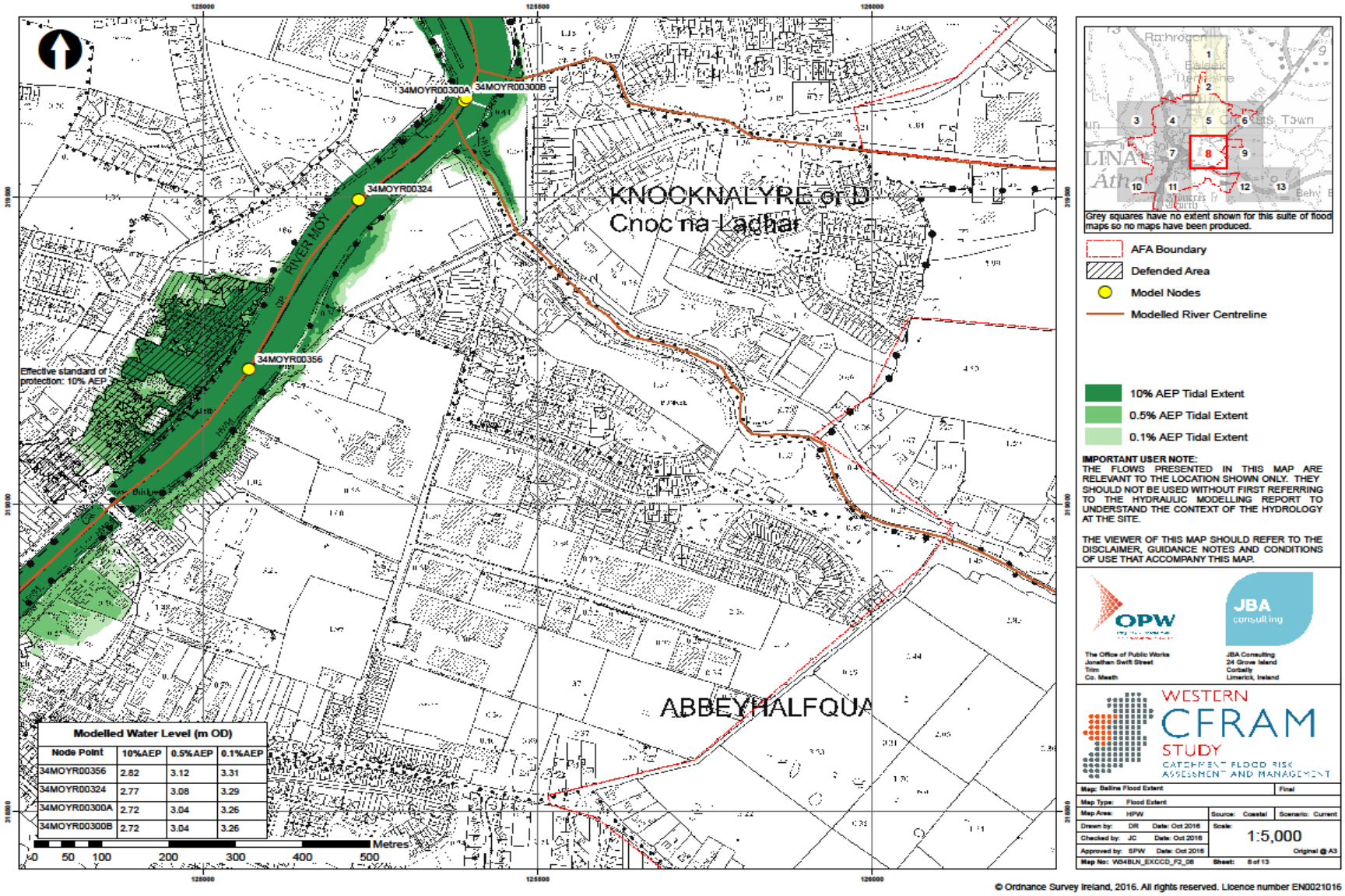


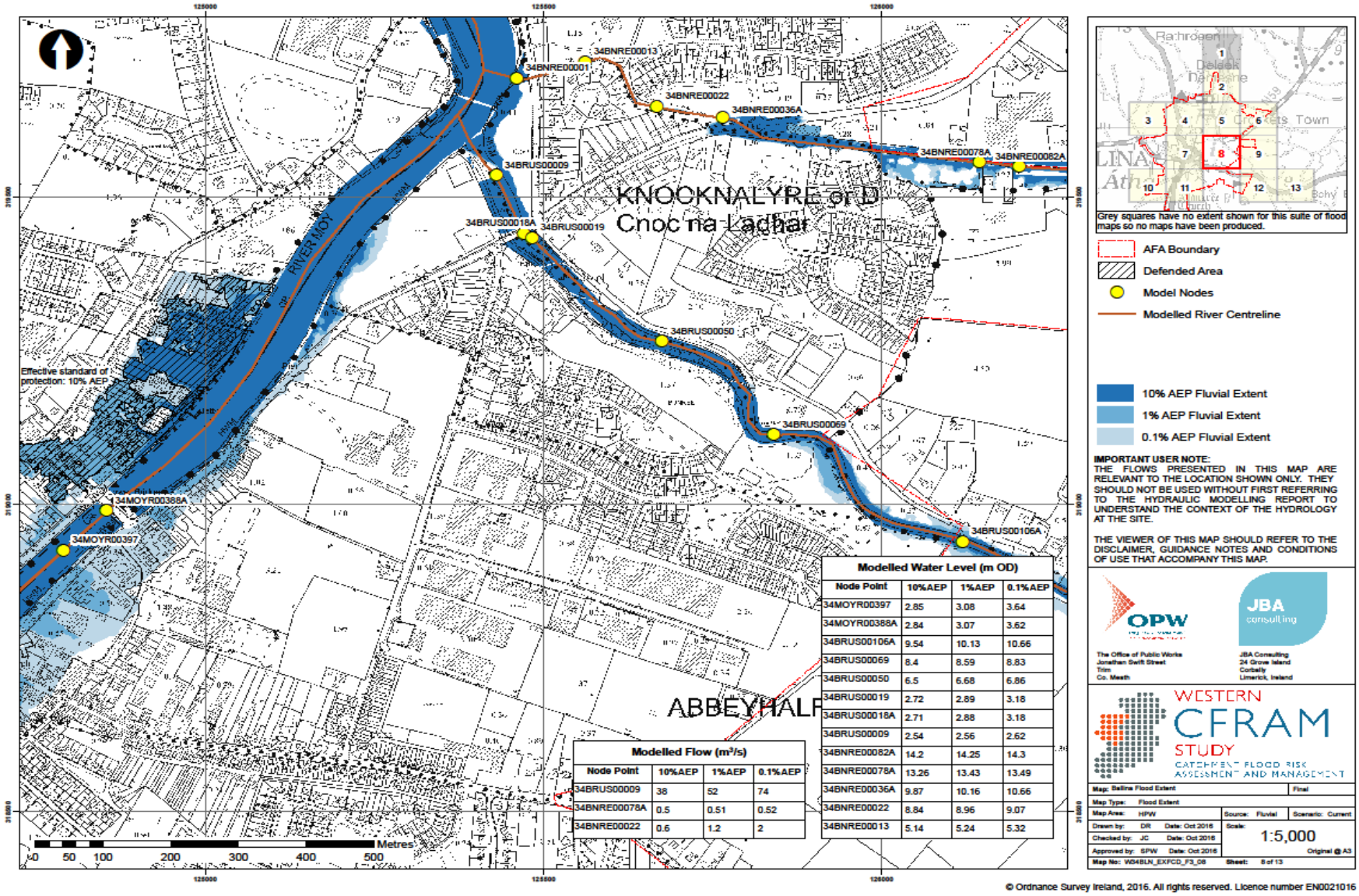
Modelled Water Level (m OD)

Node Point	10%AEP	1%AEP	0.1%AEP
34MOYR00453	4.15	4.49	5.22
34MOYR00444A	4.05	4.39	5.15
RMOYR00443A	3.99	4.33	5.12
RMOYR00438A	3.01	3.36	4.91
34MOYR00420	3.05	3.4	4.48
34MOYR00419A	3.04	3.39	4.47
34MOYR00397	2.85	3.08	3.64
34MOYR00388A	2.84	3.07	3.62
LMOYR00443A	4.02	4.36	5.13
LMOYR00442A	3.76	4.06	4.75
LMOYR00438A	3.16	3.53	4.61
34KNOC00117	16.01	16.18	16.4
34KNOC00102A	13.99	14.23	14.55
34KNOC00089A	10.93	11.27	11.62
34KNOC00078A	9.45	9.67	9.85
34KNOC00071A	8.52	8.8	8.94
34KNOC00064A	8.36	8.66	8.73
34KNOC00064	8.32	8.58	8.6

Modelled Flow (m³/s)

Node Point	10%AEP	1%AEP	0.1%AEP
34MOYR00420	230	308	435
34KNOC00064	3.2	4	4.8



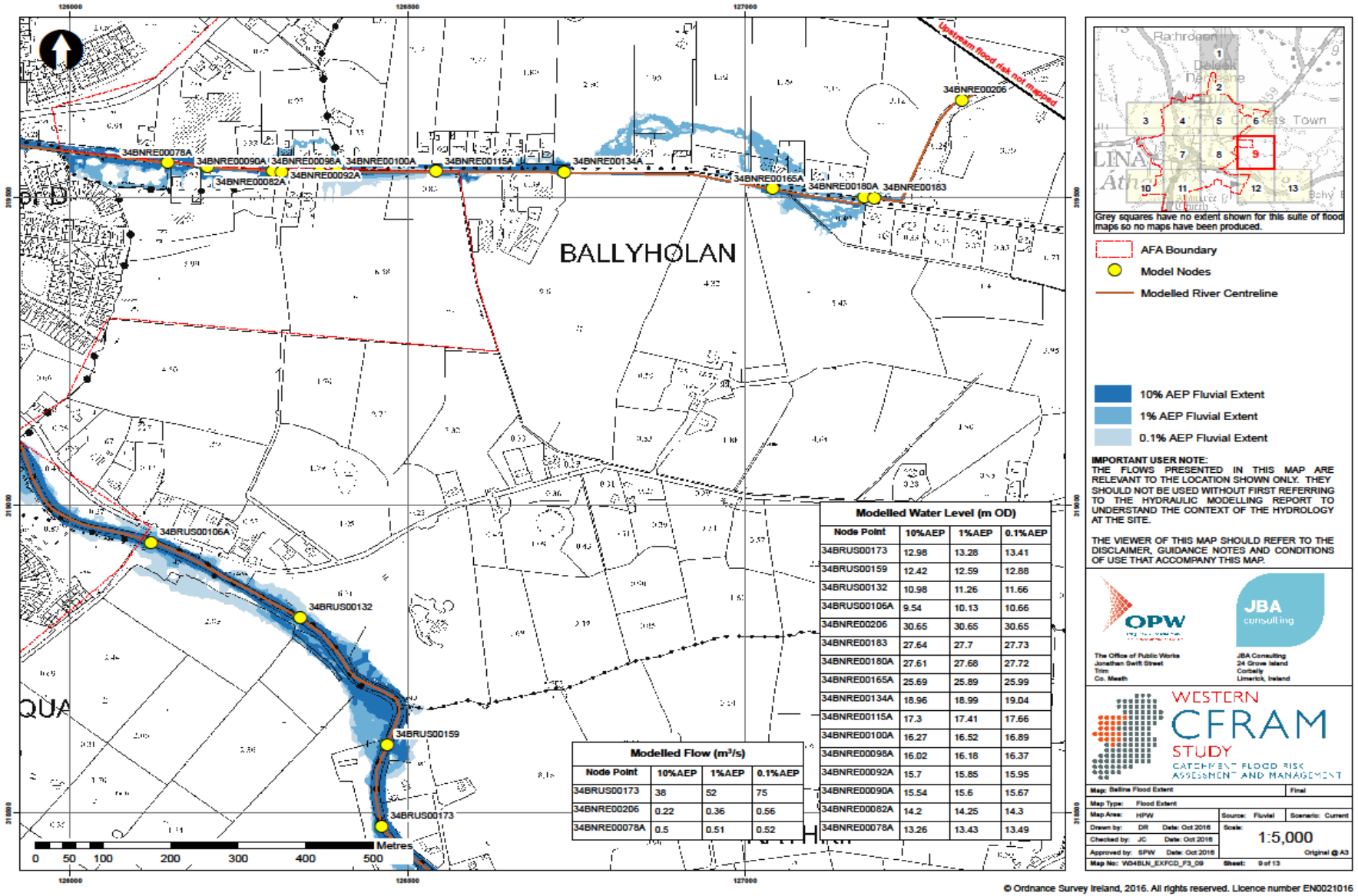


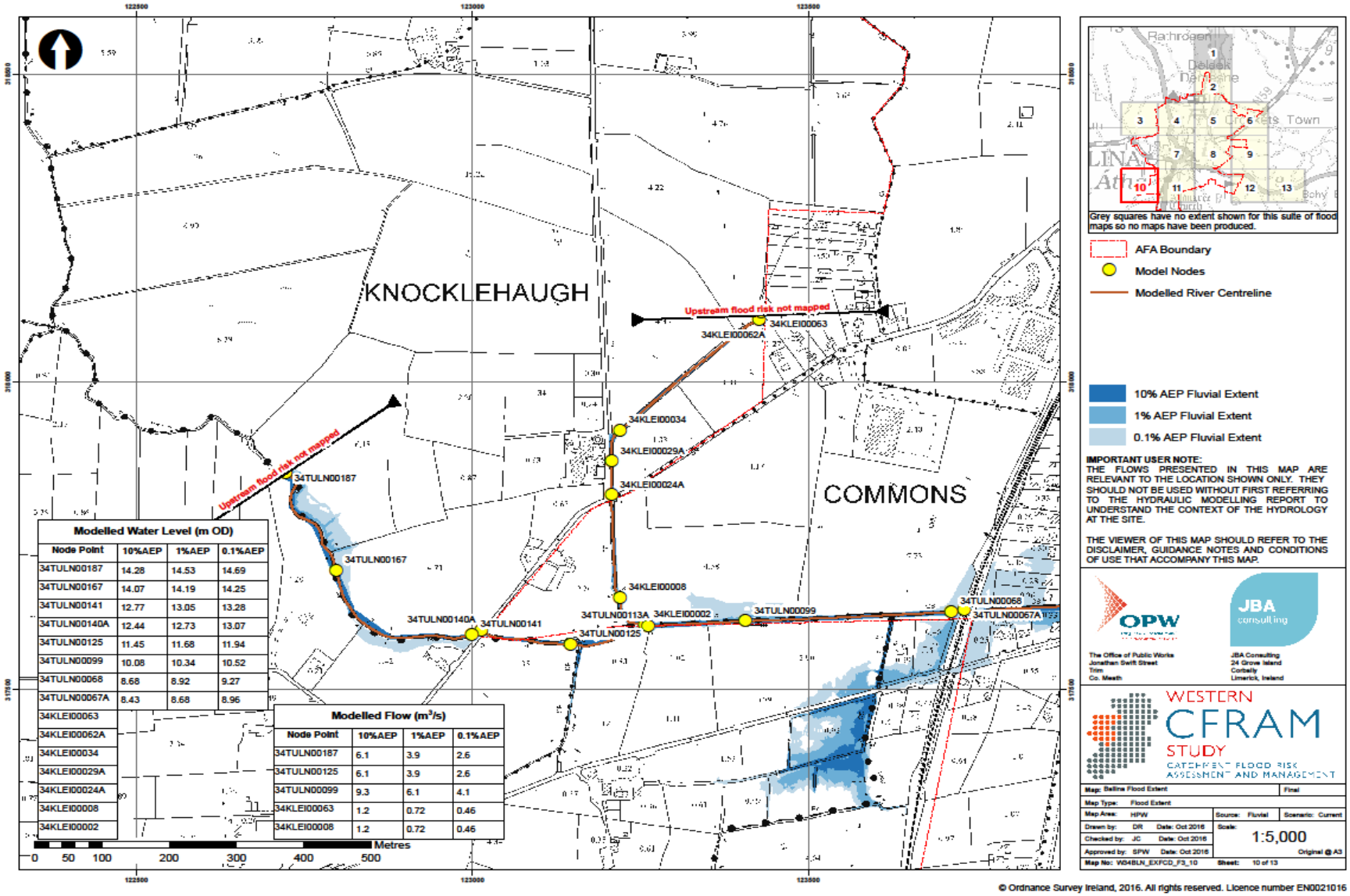
Modelled Flow (m^3/s)

Node Point	10%AEP	1%AEP	0.1%AEP
34BRUS00009	38	52	74
34BNRE00078A	0.5	0.51	0.52
34BNRE00022	0.6	1.2	2

Modelled Water Level (m OD)

Node Point	10%AEP	1%AEP	0.1%AEP
34MOYR00397	2.85	3.08	3.64
34MOYR00388A	2.84	3.07	3.62
34BRUS00106A	9.54	10.13	10.66
34BRUS00069	8.4	8.59	8.83
34BRUS00050	6.5	6.68	6.86
34BRUS00019	2.72	2.89	3.18
34BRUS00018A	2.71	2.88	3.18
34BRUS00009	2.54	2.56	2.62
34BNRE00082A	14.2	14.25	14.3
34BNRE00078A	13.26	13.43	13.49
34BNRE00036A	9.87	10.16	10.66
34BNRE00022	8.84	8.96	9.07
34BNRE00013	5.14	5.24	5.32





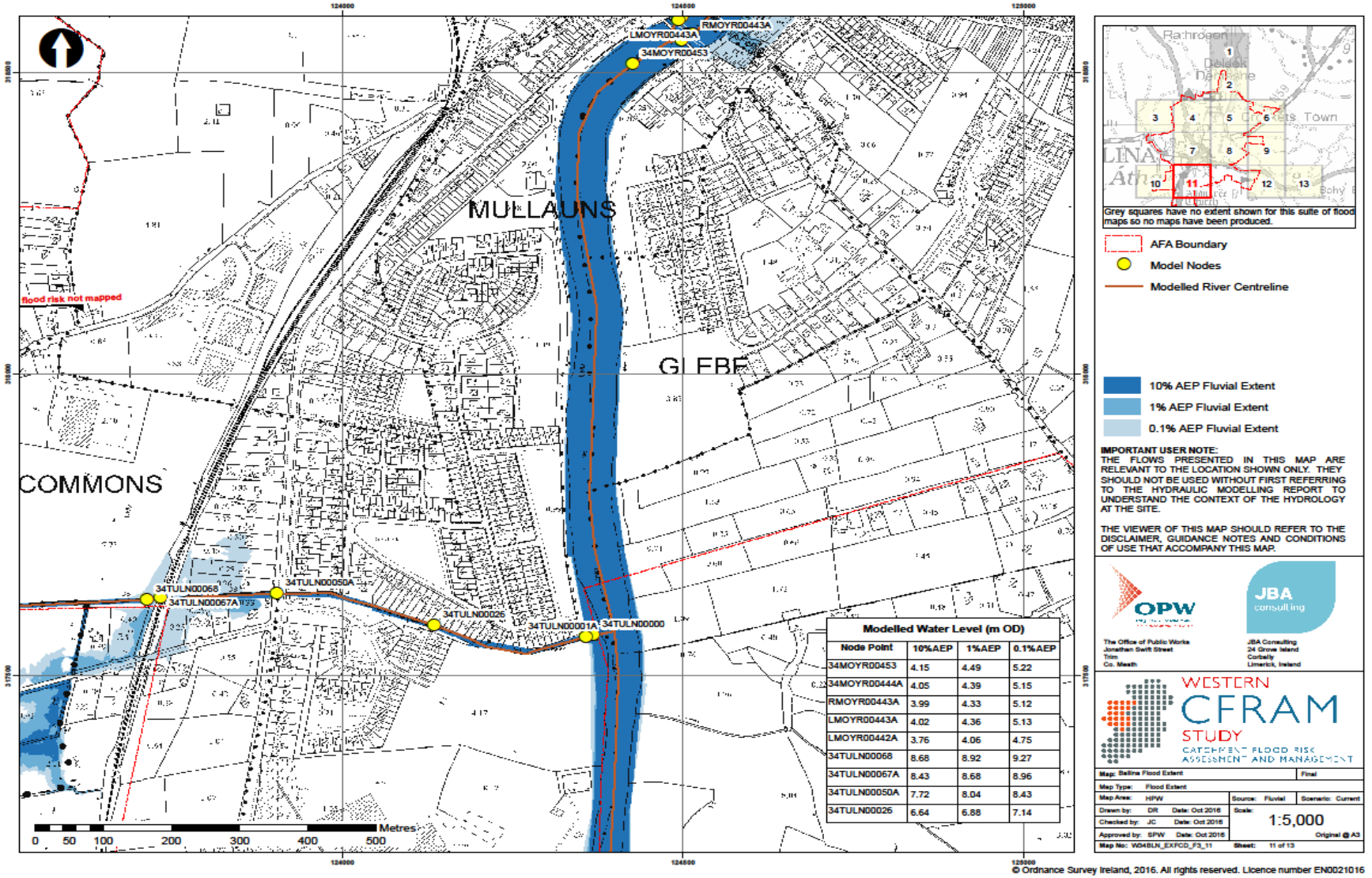
Modelled Water Level (m OD)

Node Point	10%AEP	1%AEP	0.1%AEP
34TULN00187	14.28	14.53	14.69
34TULN00167	14.07	14.19	14.25
34TULN00141	12.77	13.05	13.28
34TULN00140A	12.44	12.73	13.07
34TULN00125	11.45	11.68	11.94
34TULN00099	10.08	10.34	10.52
34TULN00068	8.68	8.92	9.27
34TULN00067A	8.43	8.68	8.96
34KLEI00063			
34KLEI00062A			
34KLEI00034			
34KLEI00029A			
34KLEI00024A			
34KLEI00008			
34KLEI00002			

Modelled Flow (m^3/s)

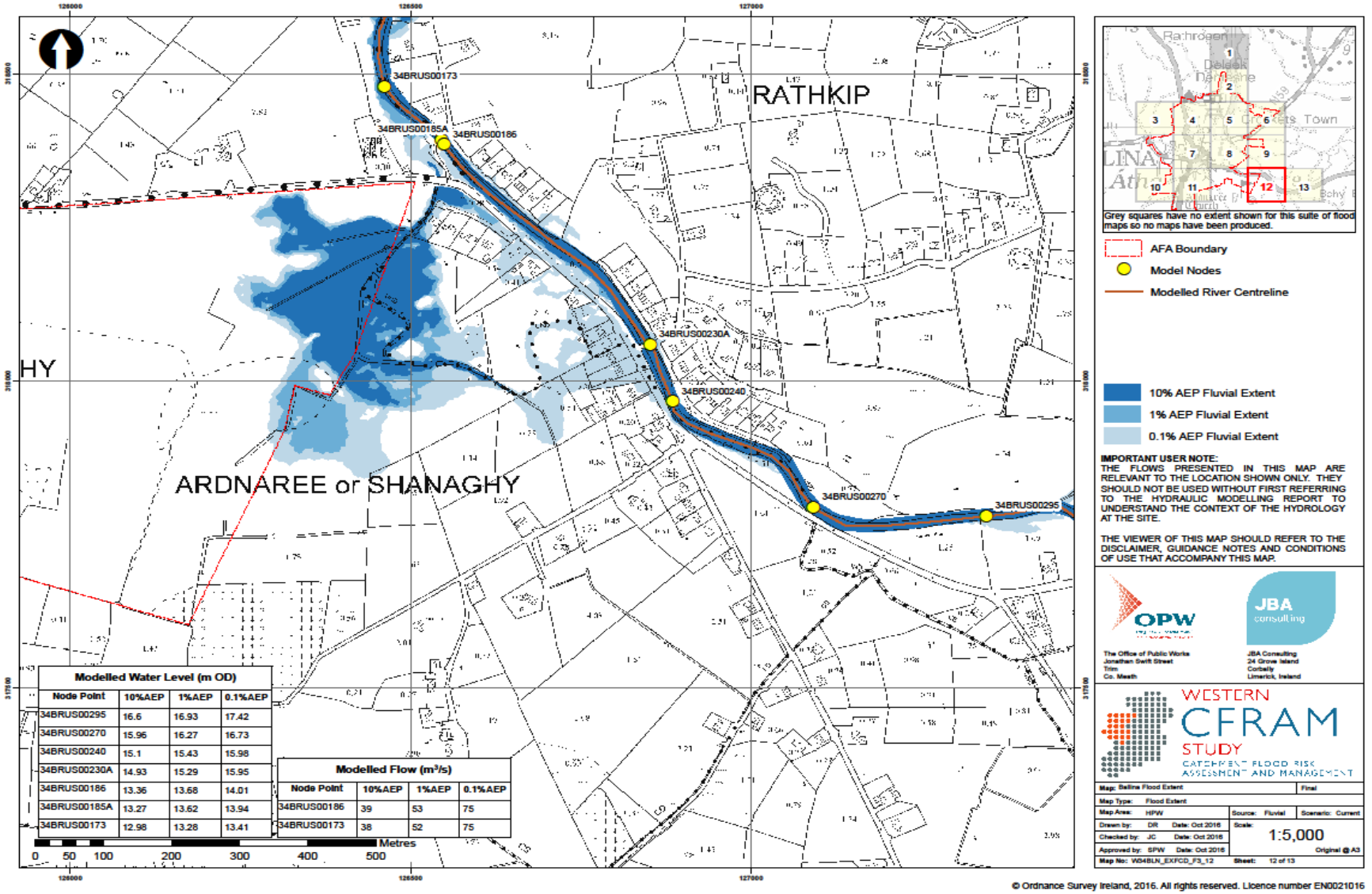
Node Point	10%AEP	1%AEP	0.1%AEP
34TULN00187	6.1	3.9	2.6
34TULN00125	6.1	3.9	2.6
34TULN00099	9.3	6.1	4.1
34KLEI00063	1.2	0.72	0.46
34KLEI00008	1.2	0.72	0.46

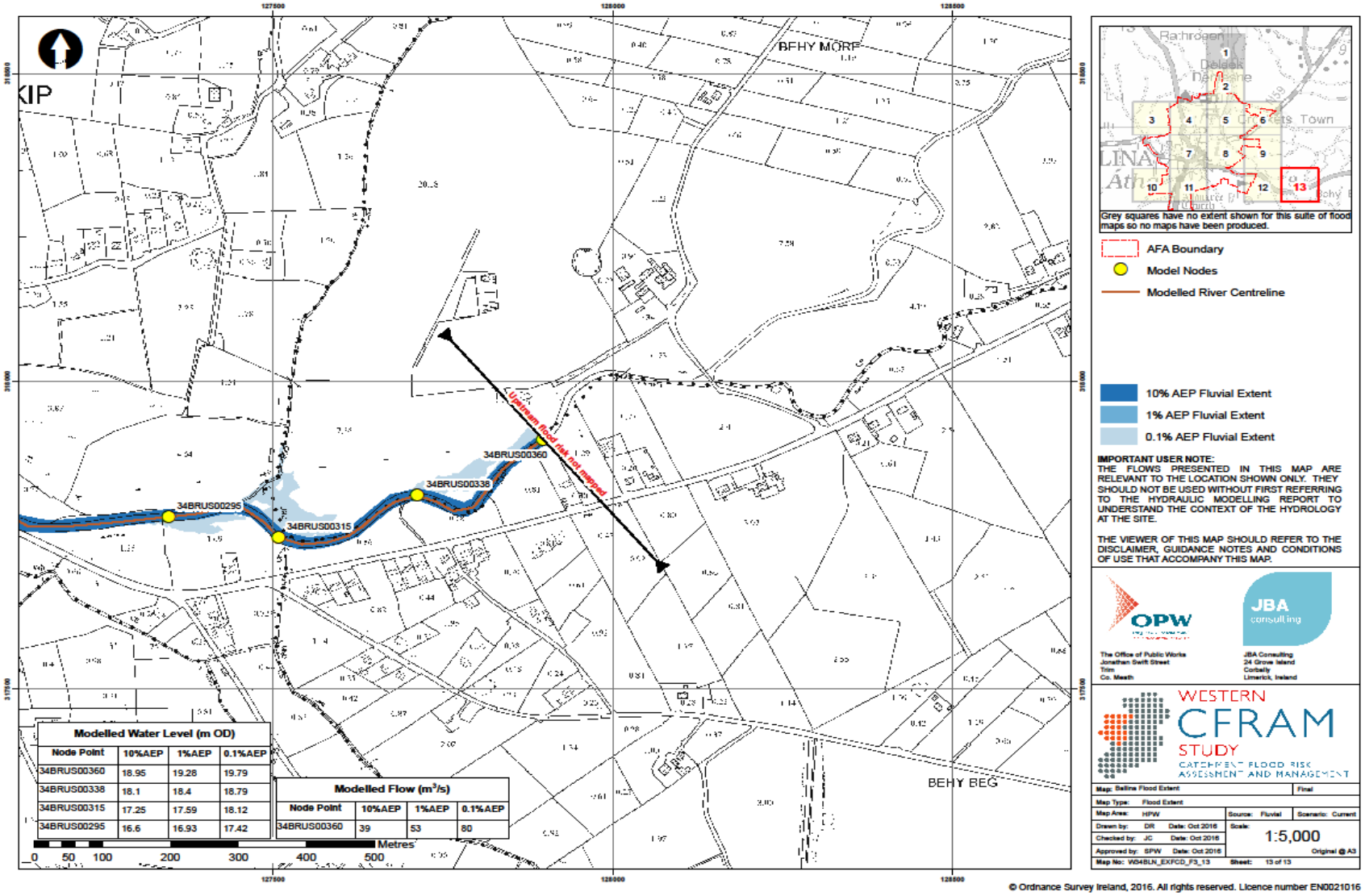
Grey squares have no extent shown for this suite of flood maps so no maps have been produced.



Modelled Water Level (m OD)

Node Point	10%AEP	1%AEP	0.1%AEP
34MOYR00453	4.15	4.49	5.22
34MOYR00444A	4.05	4.39	5.15
RMOYR00443A	3.99	4.33	5.12
LMOYR00443A	4.02	4.36	5.13
LMOYR00442A	3.76	4.06	4.75
34TULN00068	8.68	8.92	9.27
34TULN00067A	8.43	8.68	8.96
34TULN00050A	7.72	8.04	8.43
34TULN00026	6.64	6.88	7.14




BEHY MORE
BEHY BEG
Upstream flood risk not assessed
34BRUS00360
34BRUS00338
34BRUS00315
34BRUS00295
Modelled Water Level (m OD)
Node Point | 10%AEP | 1%AEP | 0.1%AEP
34BRUS00360 | 18.95 | 19.28 | 19.79
34BRUS00338 | 18.1 | 18.4 | 18.79
34BRUS00315 | 17.25 | 17.59 | 18.12
34BRUS00295 | 16.6 | 16.93 | 17.42
Modelled Flow (m³/s)
Node Point | 10%AEP | 1%AEP | 0.1%AEP
34BRUS00360 | 39 | 53 | 80
0 50 100 200 300 400 500
Metres
Grey squares have no extent shown for this suite of flood maps so no maps have been produced.
AFA Boundary
Model Nodes
Modelled River Centreline
10% AEP Fluvial Extent
1% AEP Fluvial Extent
0.1% AEP Fluvial Extent
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JBA consulting
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24 Grove Island
Corbally
Limerick, Ireland
WESTERN CFRAM STUDY
CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT
Map: Ballina Flood Extent
Final
Map Type: Flood Extent
Map Area: HPW
Source: Fluvial
Scenario: Current
Drawn by: DR Date: Oct 2016
Checked by: JC Date: Oct 2016
Approved by: SPW Date: Oct 2016
Scale: 1:5,000
Original @ A3
Map No: WS4BLN_EXFCD_F3_13
Sheet: 13 of 13
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