Ballyeagh Embankment

Embankment Repair

Screening for Appropriate Assessment & Natura Impact Statement

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Prepared For:

Office of Public Works

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1. INTRODUCTION

Delichon Ecology have been commissioned by the Office of Public Works (OPW) to carry out a Screening for Appropriate Assessment (AA) and Natura Impact Statement (NIS) for proposed embankment refurbishment and repair at Ballyeagh, Ballybunion, Co. Kerry. The location of the proposed works are presented in Figure 1-1 while site access and extent of the works area is shown in Figure 1-2. The method statement for the proposed works is presented in Appendix A.

This Screening for Appropriate Assessment & Natura Impact Statement (NIS) has been prepared to provide the competent authority, the OPW, with the relevant scientific information to conduct the Appropriate Assessment (AA). This information will allow OPW to determine, in view of best scientific knowledge, if the proposed project, individually or in combination with other plans and projects is likely to have a significant effect on European sites and, where necessary, to ascertain whether or not the proposed project would adversely affect the integrity of a European site(s).

1.1 Project Description

The site is located in the townland of Ballyeagh approx. 1.1km from the R551. Access is via a local road of local road. The proposed work includes the securing of Rock Armour of an existing E1 Embankment between chainage 400 and 800 meters. The works will involve installing Geotextile along the base of the embankment and layering rock armour to re-establish the berm to protect the embankment. Approximately 400m of Rock Armour is required given that there is some timber post panelling in place and assuming it is structurally sound, will remain.

The method statement prepared for the proposed works is presented in Appendix A.

1.2 Works Plan

1.2.1 Site Preparation

The works area shall be fenced off to provide safety and security, if required.

Livestock fencing shall be installed given the location of the works nearby agricultural land, if required.

No works shall begin before the site works area is fully fenced off and secure.

1.2.2 Works Plan

The Foreman, Site Supervisor and excavator operators shall walk the site in advance of any works proceeding to assess ground conditions, determine suitability of the area for the placement of machinery, location of any services, such as overhead/underground power-lines etc. There was also no evidence of underground services or overhead power lines observed in the vicinity of the works area.

Typical duration of Rock Armour works will be in the region of 5 weeks (15 – 18 man weeks). This will depend on site location, existing ground conditions and accessibility. Flow conditions in the channel.

On all occasions, the excavator operator must be satisfied with the ground conditions upon which he intends to work from.

When the excavator operator decides to position the excavator adjacent to the riverbank, he must ensure the embankment and works areas is stable, wide enough and has sufficient bearing capacity to accommodate the machine.

Discussion must take place between the excavator operator and the operatives working in the vicinity of the plant Operatives must not enter the danger zone of the excavator unnecessarily. Excavator operator is to liaise with the appointed slinger/signaller at all times.

1.2.3 De-watering of Works Area/Excavations

Given the coastal nature of the works footprint and associated tidal regimes, the works will not be completed when the works area is subject to tidal flooding.

1.3 Works Methodology

Construction will be undertaken in accordance with the following sequence of works.

1.3.1 Site Management

Prior to works beginning, a site compound shall be established with designated areas for:

- Welfare Facilities;
- Vehicle Parking;
- Plant Storage;
- Equipment Storage; and
- Materials Storage.

1.3.2 Setting up work site

There is an existing entranceway and gates off the local road. Install compound and turning pad using geogrid and 3" down material compacted every 200mm. See Figure 1.2 for proposed locations.

1.3.3 Import of material

Large rock will be imported by lorry from local quarry (yet to be sourced) along the local public road delivered to our turning pad. Once the material is on site a Dumper, (wheel or tracked depending on ground conditions) will transport to the final location.

1.3.4 Placement of Terram and Rock Armour

Terram will be placed and pinned along the front of the Embankment. The imported large rock to be placed along the Geogrid (By a 360 Excavator) to reform the berm approx. 400m in length. This will prevent more of the Embankment being eroded away.

1.3.5 Covering imported rock

The rock armour should be covered with soil and grass seed to give more stability to the embankment. This will allow estuarine slit to layer over the imported rock. All topsoil introduced to site will be certified free of invasive alien plant species. Topsoil and grass seed mix will be procured from a licenced supplier, source site will be tested and assessed for presence of invasives prior to importing.

1.3.6 Reinstatement

On completion of works the turning pad and compound to be removed, the surrounding area shall be reinstated to a condition similar to, or better than the pre-works situation. All construction waste will be removed and disposed of off site.

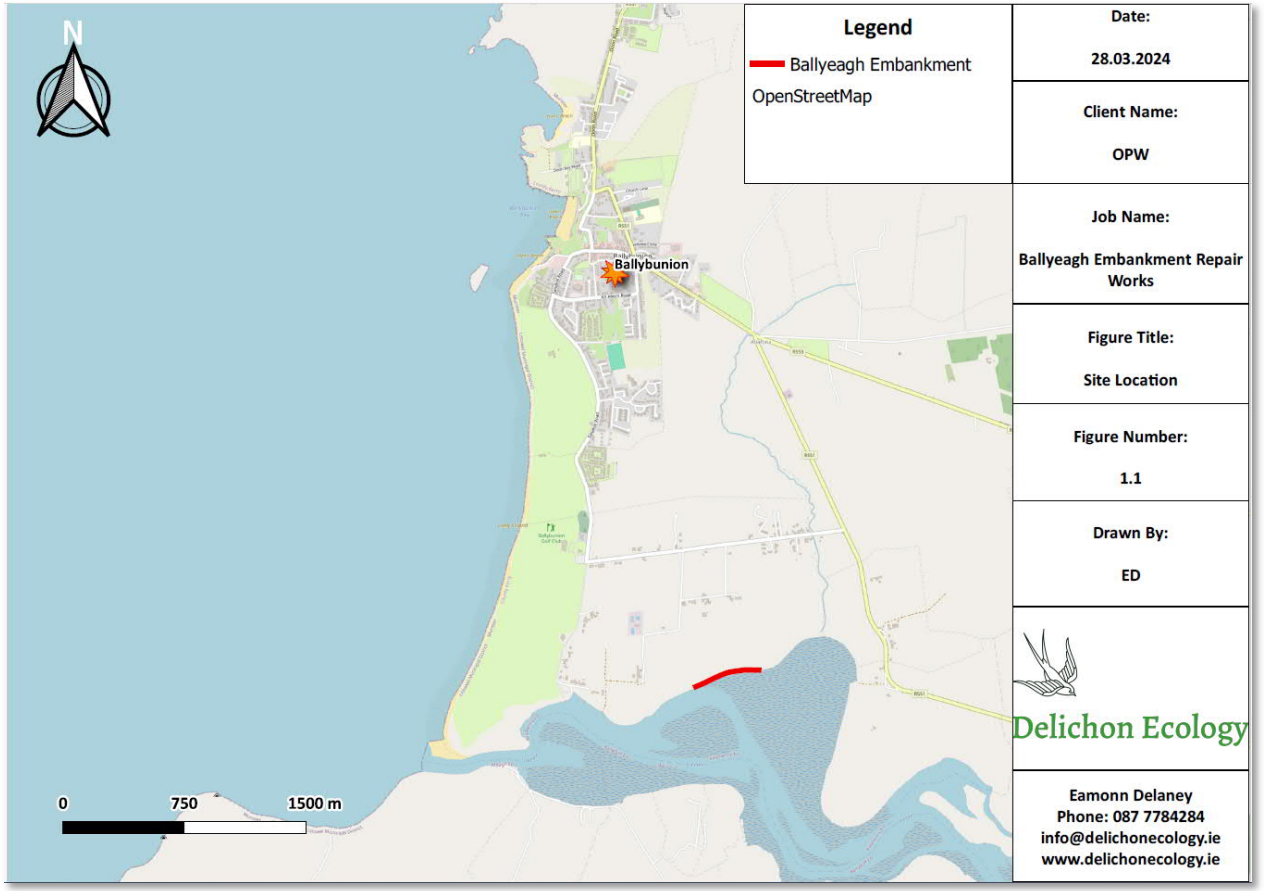

Figure 1-1: Location of Proposed Works

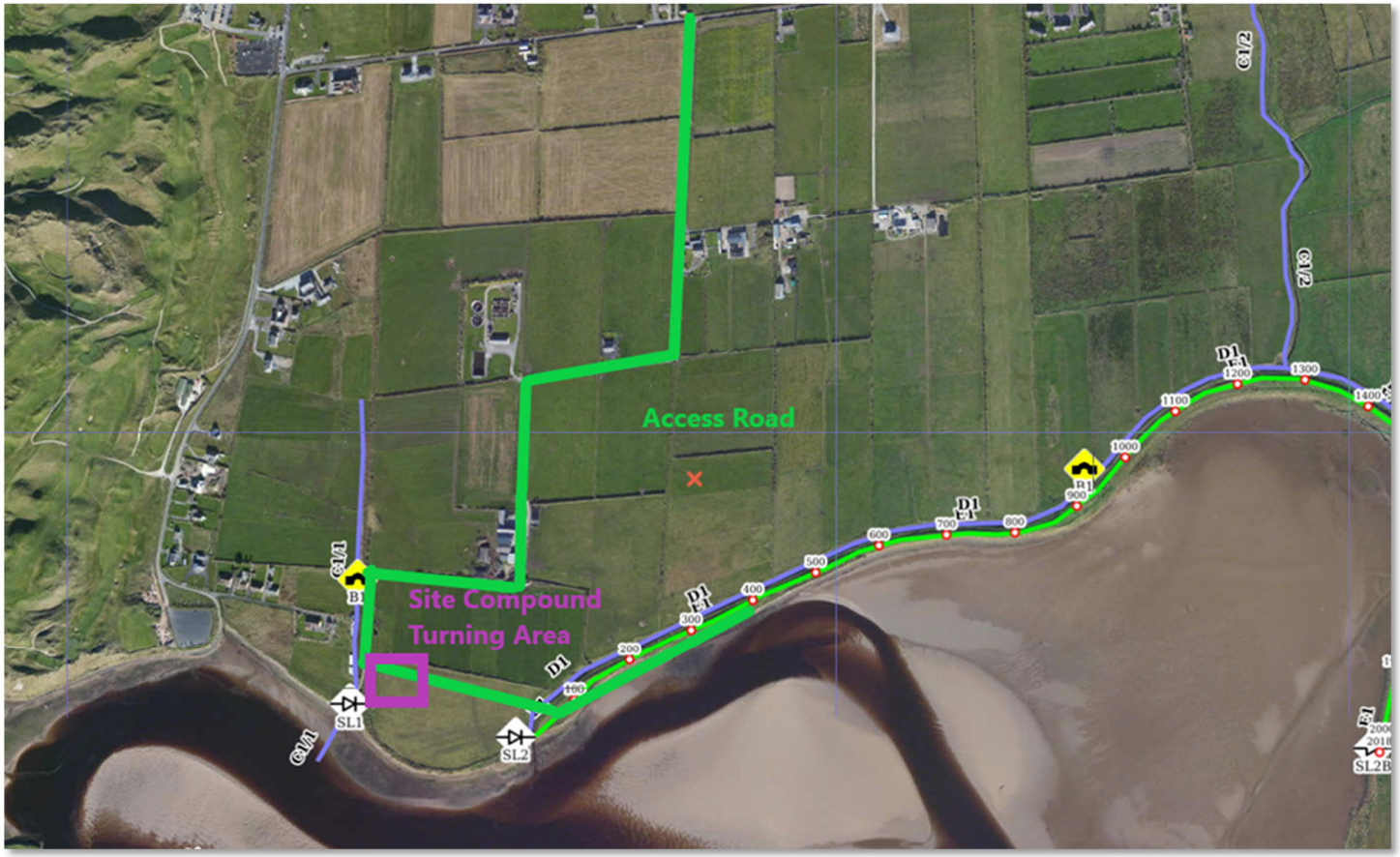

Figure 1-2: Proposed site layout and access.

2 METHODOLOGY

The Department of the Environment, Heritage and Local Government guidelines (DEHLG, 2009, rev. 2010) 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. 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).

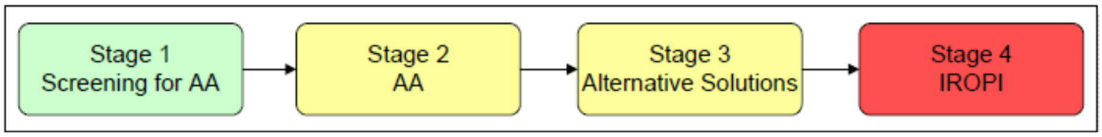

Figure 2-1: Four Stages of Appropriate Assessment

2.1.1 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.

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.

2.1.2 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 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.

The information required in a Natura Impact Statement, is outlined in Regulation 42(5) (a) of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011) as amended, as follows:

A Natura Impact Statement shall, in addition to addressing the issues referred to in the interpretation contained in Regulation 2(1), include such information or data as the public authority considers necessary, and specifies in a notice given under paragraph (3), to enable it to ascertain if the plan or project will affect the integrity of the site.

Where appropriate, a Natura Impact Statement shall include, in addition—

i. the alternative solutions that have been considered and the reasons why they have not been adopted,

ii. the imperative reasons of overriding public interest that are being relied upon to indicate that the plan or project should proceed notwithstanding that it may adversely affect the integrity of a European site,

iii. the compensatory measures that are being proposed.

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.

2.1.3 Guidance

This Screening for AA and NIS report has been prepared with regard to the relevant provisions of the EU Council Directive 92/43/EEC and Ireland's EU (Birds and Natural Habitats) Regulations 2011 (as amended).

The methodology followed for this assessment has had regard to the following guidance and legislation:

- DoEHLG (2009, rev. 2010) Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government;
- DoEHLG Circular NPWS 1/10 & PSSP 2/10 Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities;
- European Commission (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. European Commission;
- 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 (2021) Assessment of Plans and Projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC;
- EC (2007a) Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission. 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;
- EC (2013) Interpretation Manual of European Union Habitats. Version EUR 28. European Commission;
- Inland Fisheries Ireland (2021a). Guidance Notes for AA Screenings in the Vicinity of Watercourses;
- Inland Fisheries Ireland (2021b). Guidance Notes for Natura Impact Statements (NIS) in the Vicinity of Watercourses;
- Chartered Institute of Ecology and Environmental Management (CIEEM) Version 1.1 (September 2019), Guidelines for Ecological Impact Assessment in the UK and Ireland;
- NPWS (2019). The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments. Unpublished NPWS report;
- NPWS (2019). The Status of EU Protected Habitats and Species in Ireland. Volume 3: Species Assessments. Unpublished NPWS report;
- Office of the Planning Regulator (OPR) (2021) Practice Note PN01 - Appropriate Assessment Screening for Development Management.
- Brew, T., Gilligan, N. (2019) Environmental Guidance: Drainage Maintenance and Construction. Series of Ecological Assessments on Arterial Drainage Maintenance No 13. Environment Section. Office of Public Works, Trim, Co. Meath, Ireland;
- Office of Public Works (OPW) (2011) The Office of Public Works Arterial Drainage Maintenance Service Environmental Management Protocols & Standard Operating Procedures;
- The European Communities (Birds and Natural Habitats) Regulations 2011 as amended;
- The Planning and Development Act 2000 as amended;
- The Planning and Development Regulations 2001 as amended; and
- Recent Irish and European case law on the Habitats Directive.

2.1.4 Information Consulted for this Report

This assessment has been informed by the following sources of data:

- Information on the location, nature and design of the proposed project as provided by the client;
- Department of Housing, Planning, Community and Local Government (DHPCLG) online land-use mapping (www.myplan.ie/en/index.html);
- Office of Public Works (OPW) National Flood Hazard Mapping website (www.floodmaps.ie);
- Review of the National Biodiversity Data Centre (NBDC) webmapper https://maps.biodiversityireland.ie/Map

- Geological Survey of Ireland - National Draft Bedrock Aquifer map;
- Geological Survey of Ireland - Groundwater Database (www.gsi.ie);
- Environmental Protection Agency (EPA) geoportal mapping tool (https://gis.epa.ie/EPAMaps/);
- National Parks and Wildlife Service protected site and species information and data (https://www.npws.ie/protected-sites);
- Spatial data in respect of Article 17 reporting, available online at https://www.npws.ie/maps-and-data/habitat-and-species-data/article-17.
- Spatial data in respect of Article 12 reporting, available online at https://www.npws.ie/maps-and-data/habitat-and-species-data/article-12-data.
- National Biodiversity Data Centre (www.biodiversityireland.ie); and
- Ordnance Survey of Ireland mapping and aerial photography (www.osi.ie).

3 EUROPEAN SITES

3.1 European Sites within the Project Zone of Influence

This stage of the screening for AA process describes European Sites within the Zone of Influence (ZoI) of the proposed project.

Section 3.2.3 of the Guidance for Planning Authorities (DoEHLG, 2010) states that the approach to Appropriate Assessment screening can be different for different plans and projects depending on the scale of the plan, project or programme and the likely associated effects. The overriding criteria determining whether a European Site will be impacted and potentially consequently effected by a proposal is the distance between proposal and a European Site and whether there are pathways for effect linking the proposal to European Sites.

Both UK (Scott Wilson et al., 2006) and Irish guidance (DoEHLG, 2010) outline that a distance of 15km may suffice as a likely Zone of Impact (ZoI) in the case of plans on European Sites and may be sufficient to cover the geographic extent over which significant ecological effects are likely to occur. However for certain projects, the DoEHLG (2010) guidance recognises that the likely ZoI could be 'much less than 15km, and in some cases less that 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'.

Recent guidance from Office of the Planning Regulator (2021) indicates that the zone of influence for a proposal is the geographical area over which it could affect the receiving environment in a way that could have significant effects on the Qualifying Interests of a European Site. This guidance indicates that the zone of influence should be established on a case-by-case basis using the Source-Pathway-Receptor framework. Using the Source » Pathway » Receptor approach and having regard for the location, the nature of the works, and the small size and scale of the works, it is considered for the purpose of this assessment that the likely ZoI on European Sites is the zone immediately around the proposed works and ancillary works, in addition to any sites with a hydrological connection downstream of the works and/or with an ecological connection, where distance would be dependent on the qualifying interests of the site. To that end the following sites are located within the Source» Pathway » Receptor zone of influence of the proposed works

- Lower River Shannon SAC (002165); and
- Kerry Head SPA (004189).

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).

Where it is evident that there is no connectivity between the proposed work and receptors (i.e. European Sites and/ or features for which the sites are designated), the receptors are excluded from the AA process. Similarly, where connectivity exists between the proposed work and receptors but is

deemed not to result in likely significant effects to the receptor, the receptor can be screened out (i.e. likely significant effects to receptors excluded; receptor not considered further in AA process).

In contrast to the above, where it is not possible to exclude likely significant effects on the basis of best scientific knowledge, a more detailed scientific assessment of the proposed works is required which focuses on the European Sites likely to be affected and the relevant designated feature in question.

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 features (habitats and/ or species) for which SACs and SPAs are designated. The Qualifying Interests (QI) and Special Conservation Interests (SCIs) for protected sites have been obtained through a review of the Conservation Objectives documents available from the NPWS website www.npws.ie.

Figure 3-1 shows the European sites within the Zone of Influence of the proposed works. Table 3-1 itemises the features of qualifying interest and details on the distance and connectivity of European Sites within the zone of influence of the proposed works.

Table 3-1: European Sites within the zone of influence of the proposed works

Site Code	Site Name	Features of Qualifying Interest (SAC) / Special Conservation Interest (SPA)	Distance from Study Area	Connectivity
002165	Lower River Shannon SAC	1029 Freshwater Pearl Mussel Margaritifera margaritifera 1095 Sea Lamprey Petromyzon marinus 1096 Brook Lamprey Lampetra planeri 1099 River Lamprey Lampetra fluviatilis 1106 Atlantic Salmon Salmo salar (only in fresh water) 1110 Sandbanks which are slightly covered by sea water all the time 1130 Estuaries 1140 Mudflats and sandflats not covered by seawater at low tide 1150 *Coastal lagoons 1160 Large shallow inlets and bays 1170 Reefs 1220 Perennial vegetation of stony banks 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts 1310 Salicornia and other annuals colonizing mud and sand 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) 1349 Bottlenose Dolphin Tursiops truncatus 1355 Otter Lutra lutra 1410 Mediterranean salt meadows (Juncetalia maritimi)	The proposed works adjoin and overlap with the footprint of this European Site.	Potential for direct and indirect connectivity due to the proximity of the works with this European Site.

Site Code	Site Name	Features of Qualifying Interest (SAC) / Special Conservation Interest (SPA)	Distance from Study Area	Connectivity
		3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation 6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) 91E0 *Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)		
004189	Kerry Head SPA	A009 Fulmar Fulmarus glacialis A346 Chough Pyrrhocorax pyrrhocorax	4.4km downstream via the Cashen River Estuary	Potential for indirect connectivity due to the remote hydrological connectivity via the Cashen River Estuary

The proposed works are partially located within the bounds of Lower River Shannon SAC. As a result these is the potential for direct and indirect connectivity. Given the overlap and potential indirect interconnectivity with this European Site, potential impacts and consequent effects are considered further in the below text. There is the remote potential for indirect connectivity to Kerry Head SPA, located 4.4km downstream via the Cashen Estuary watercourse.

Finally, the proposed works support remote and extremely tenuous connectivity with European Sites within the lower sections of the River Shannon catchment; the Kerry Head Shoal SAC (ca. 22km downstream) and the Loop Head SPA (ca. 20km downstream). Given the nature and scale of the proposed works, the attenuation capacity of the large estuarine waterbody of the Shannon Estuary and the remote and extremely tenuous connectivity between the proposed works and these European Sites, potential for impacts and consequent likely significant effects are not possible.

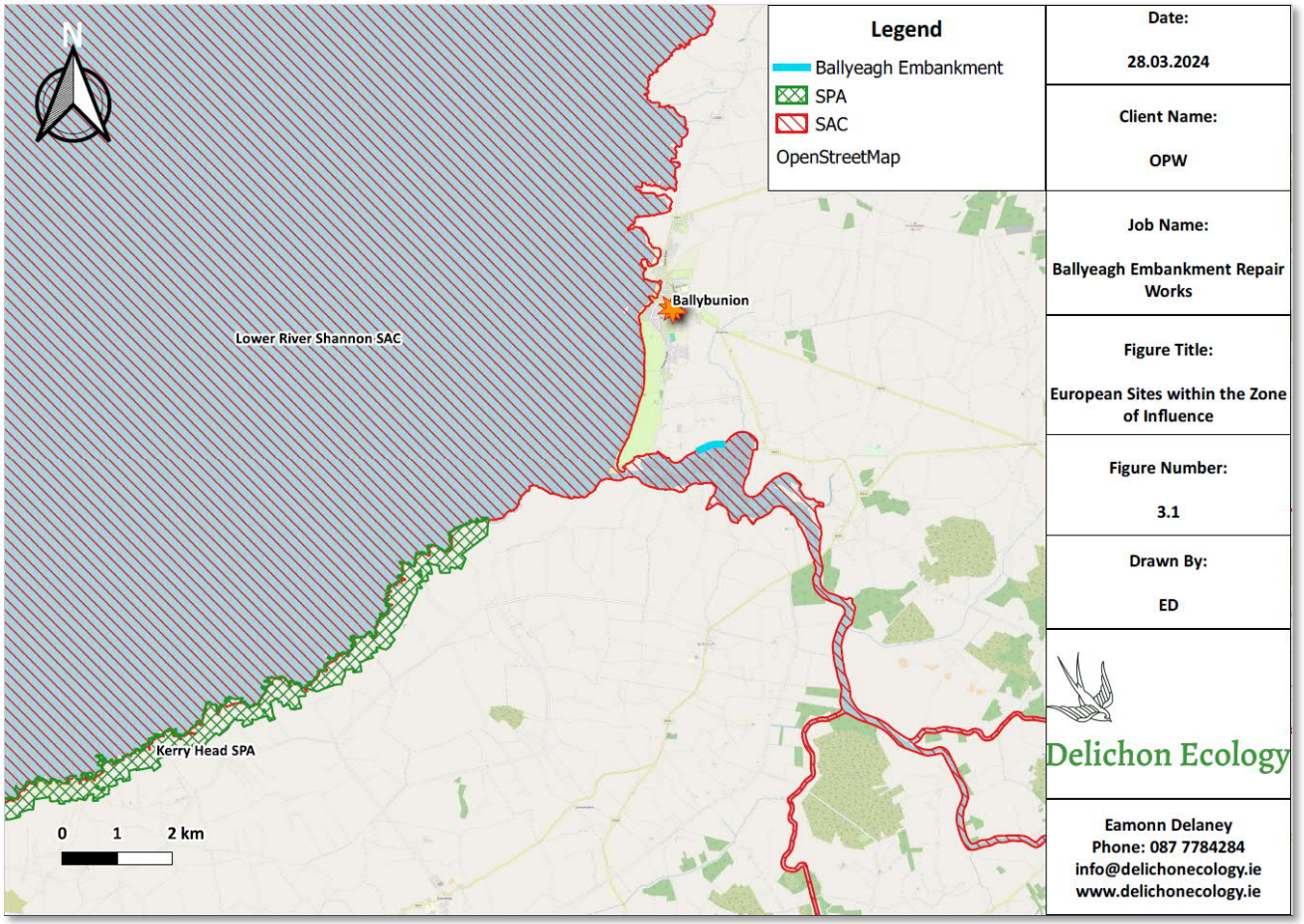

Figure 3-1: European Sites within the zone of influence of the proposed works

3.1.1 European Site Descriptions

Site descriptions for European Sites within the project ZoI are presented below.

3.1.1.1 Lower River Shannon SAC (Site Code: 002165)

This very large site stretches along the Shannon valley from Killaloe in Co. Clare to Loop Head/ Kerry Head, a distance of some 120 km. The site thus encompasses the Shannon, Feale, Mulkear and Fergus estuaries, the freshwater lower reaches of the River Shannon (between Killaloe and Limerick), the freshwater stretches of much of the Feale and Mulkear catchments and the marine area between Loop Head and Kerry Head. This site is of great ecological interest as it contains a high number of habitats and species listed on Annexes I and II of the E.U. Habitats Directive, including the priority habitats lagoon and alluvial woodland, the only known resident population of Bottle-nosed Dolphin in Ireland and all three Irish lamprey species. A good number of Red Data Book species are also present, perhaps most notably the thriving populations of Triangular Club-rush (NPWS, 2013)[1].

3.1.1.2 Kerry Head SPA (Site Code: 004189)

Kerry Head SPA is situated on the south side of the mouth of the River Shannon in north Co. Kerry. It encompasses the sea cliffs from just west of Ballyheigue, around the end of Kerry Head to the west and north-eastwards as far as Kilmore. The site includes the sea cliffs and land adjacent to the cliff edge. The high water mark forms the seaward boundary. Most of the site is underlain by Devonian siltstones, sandstones and mudstones; a small section of the site has rocks of Carboniferous age. Kerry Head SPA is one of the most important sites in the country for Chough. It also supports a population of Fulmar of national importance. The presence of Chough and Peregrine, both species that are listed on Annex I of the E.U. Birds Directive, is of particular significance (NPWS, 2015)[2].

3.1.2 Conservation Objectives of European Sites

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;
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and

[1] https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY002165.pdf
[2] https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY004189.pdf

- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

The integrity of a European site (referred to in Article 6.3 of the EU Habitats Directive) is determined based on the conservation objectives and of the site. The Qualifying Interests (QI) and Special Conservation Interests (SCI) are obtained through a review of the most recently published (web-published or otherwise) Conservation Objective supporting documents and Site-Specific Conservation Objectives documents (where available) for the European site.

3.1.2.1 Conservation Objectives of European Sites within the proposed development's Zone of Influence

The Qualifying habitats and species of Interest for those European Sites within the project ZoI are listed in Table 3-1. Further details on Conservation Objectives for these European Sites are provided below.

Lower River Shannon SAC

The Site-Specific Conservation Objectives for the Lower River Shannon SAC are provided in the Conservation Objectives document available on the NPWS website, as follows;

https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf

Kerry Head SPA

The generic conservation objectives for Kerry Head SPA are provided in the Conservation Objectives document available on the NPWS website, as follows;

https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004189.pdf

4 EXISTING ENVIRONMENT

4.1 Features of Ecological Interest within the Study Area

4.1.1 Habitats

Site walkover surveys of the proposed embankment works were undertaken on March 29th 2024.

Habitats along the proposed embankment footprint and its terrestrial margins primarily support grazed and locally poached, trampled and semi-improved improved agricultural grassland (GA1)[3]. The proposed embankment works are fringed by improved agricultural grassland (GA1) to the north which will support access to the works area, which in turn are fringed by a drainage channel (FW4) which flows east to west toward the Cashen River estuary. A habitat map of the proposed embankment footprint and environs is presented in Figure 4.1.

Improved agricultural grassland comprises the field entrance, access routes and the embankment footprint and the embankment's dry slope immediately north. Plant species composition of these habitats include perennial rye grass (Lolium perenne), sweet vernal grass (Anthoxanthum odoratum), cock's foot (Dactylis glomerata), creeping bent (Agrostis stolonifera), Yorkshire fog (Holcus lanatus), creeping thistle (Cirsium arvense), white clover (Trifolium repens), hedge bindweed (Calystegia sepium), field horsetail (Equisetum arvense), dandelion (Taraxacum agg.) and creeping buttercup (Ranunculus repens). Parts of the estuarine side of the embankment support localised gorse scrub (WS1) that has established behind in-situ timber post panelling.

A water filled drainage channel is located to the north of the embankment, channelling water east to west / south-west toward the Cashen Estuary and takes water during higher tidal cycles. This channel is invariably fringed by common reed (Phragmites australis).

The embankment is adjoined to the south and partially overlaps the estuarine areas of the Cashen River estuary. These areas support a line of shingle and gravel shores (LS1) that are exposed at low tide and that are adjoined further down the shoreline by mud and sand exposed at low tide. The shingle and gravel shores comprise rounded cobbles and gravels and support occasional sea beat (Beta maritima), sea milkwort (Glaux maritima), sea thrift (Armeria maritima) and green algae.

4.1.2 Fauna

No signs of otter breeding sites (couches) or ongoing usage was identified during the site walkover survey. This may reflect poor quality holting opportunities along the embankment corridor (typically open banks with localised grazing / trampling by livestock and ongoing tidal inundations) (Mason & Macdonald, 2009)[4]. Nonetheless, the adjoining expansive estuarine areas provide suitable foraging and commuting activity for otter and it is likely that otter use the fringes of the embankment areas for foraging, commuting or habitat refuge. Mink prints were identified on the margins of the back drain located immediately north of the eastern extent of the proposed embankment repair works.

Avifauna identified within the proposed embankment and adjoining habitats during the site walkover surveys are presented in Table 4.1 below. This represents a typical range of avian fauna associated

[3] Alphanumeric codes following 'A Guide to Habitats in Ireland' (Fossitt, 2000)
[4] Mason, C. F., & Macdonald, S. M. (2009). Otters: ecology and conservation. Cambridge University Press.

with the open expansive improved grassland to the north and those adjoining estuarine areas of the Cashen River Estuary to the south.

Table 4-1: Avifauna within the study area and environs

Species[5]	Comment
Redshank Tringa totanus	Foraging within the adjoining estuarine and saltmarsh areas to the west, north-west and north of the study area.
Curlew Numenius arquata	Foraging within the adjoining estuarine and saltmarsh areas to the west, north-west and north of the study area.
Meadow Pipit Anthus pratensis	Foraging along the embankment margins.
Little egret Egretta garzetta	Foraging along the embankment margins.
Herring Gull Larus argentatus	Foraging on the adjoining estuarine areas.
Brent Goose Branta bernicla	Flock of 140 birds flying into estuary to feed / roost at turning tide; i.e. low to high.
Black-headed Gull Larus ridibundus	Foraging within the adjoining estuarine and saltmarsh areas to the west, north-west and north of the study area.
Grey Heron Ardea cinerea	Foraging on the adjoining estuarine areas.
Goldfinch Carduelis carduelis	Foraging along the embankment margins.
Wren Troglodytes troglodytes	Foraging on hedgerows on improved grassland to the north of the embankment.
Blackbird Turdus merula	Foraging on hedgerows on improved grassland to the north of the embankment. .

[5]Conservation status assigned by 'traffic light' system of colour coding, in accordance with the Birds of Conservation Concern in Ireland (Gilbert et al., 2021). Gilbert G, Stanbury A and Lewis L (2021), "Birds of Conservation Concern in Ireland 2020 –2026". Irish Birds 9: 523—544.
Red-listed species are of high conservation concern in Ireland, Amber-listed species are considered of medium conservation concern, while Green-listed species are not of conservation concern in Ireland at present.

4.1.3 Photos

Photos of the study area is presented below.

Image 4-1: Footprint of eroded embankment looking west

Image 4-2: Fringing shingle and gravel shores (LS1) habitat along the Cashen River Estuary

Image 4-3: In-situ grassland at the crest of the embankment

Image 4-4: Back drain fringing the embankment infrastructure

Figure 4-5: Eroded embankment looking east

Figure 4-6: Adjoining Cashen River Estuary

4.2 Geology, Hydrology and Hydrogeology

The Geological Survey of Ireland (GSI) online database was consulted for available edaphic, geological and hydrological information of the site and its environs. The underlying bedrock of the study area is underlain by Waulsortian Limestones comprising Massive unbedded lime-mudstone. The groundwater vulnerability of the area surrounding the proposed works is primarily classified as "Moderate" with adjoining sections of "Low" vulnerability. There are no karst features within the study area or its immediate surrounds. Bedrock aquifer maps published on the GSI website provide a detailed classification of bedrock aquifer types and indicate the bedrock aquifer beneath the site is classified as 'Rkd Regionally Important Aquifer - Karstified (diffuse)'.

The study site is located within the 'Ballybunion' GroundWater Body (GWB) (IE_SH_G_027). This GroundWater Body's Water Framework Directive (WFD) status was classified as 'Good' in 2016-2021 while this groundwater body risk is classified as 'At Risk' of not meetings its Water Framework Directive objectives.

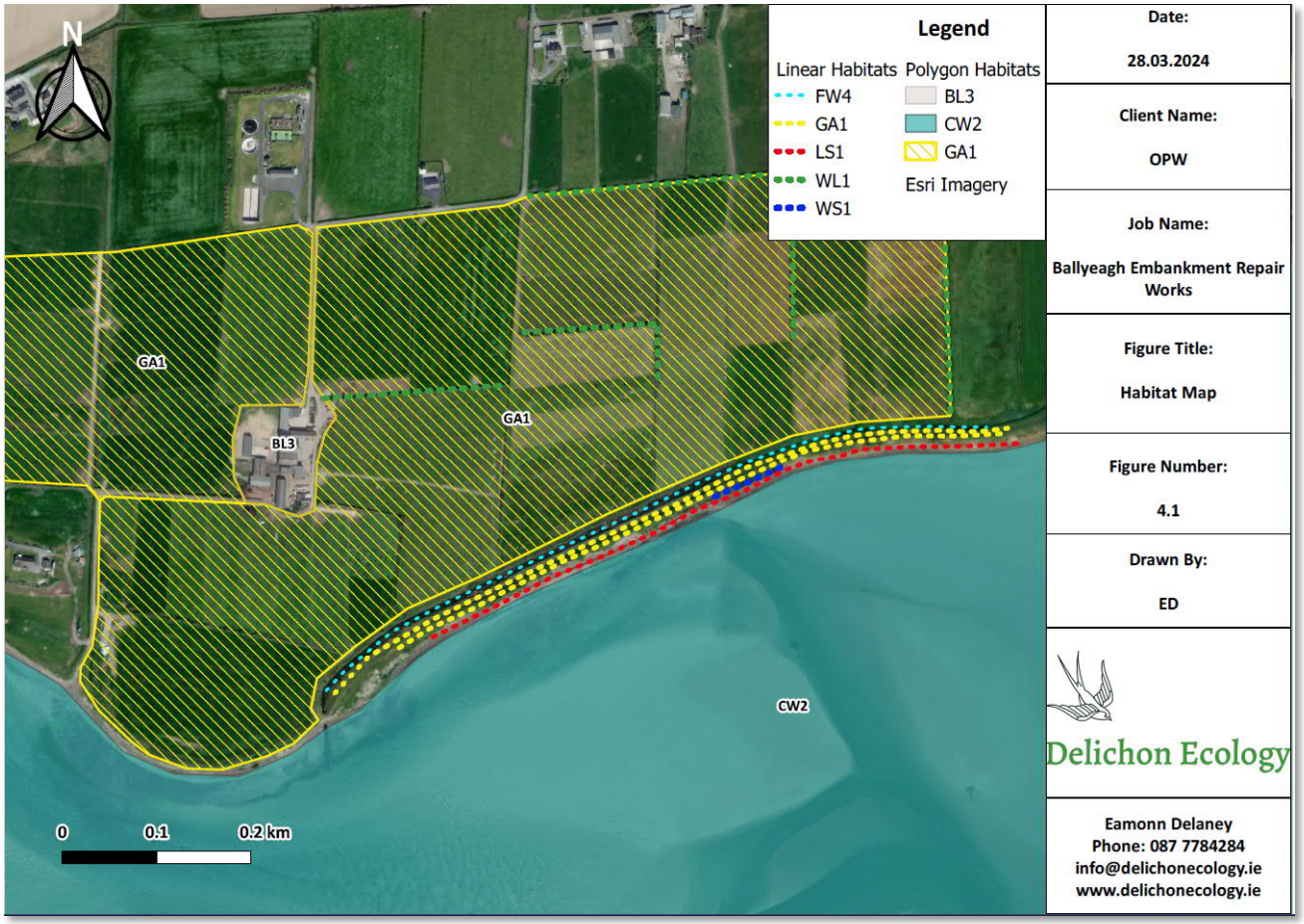

Figure 4-1: Habitat Map of the proposed embankment repair works and surrounding area

5 STAGE 1 - SCREENING FOR APPROPRIATE ASSESSMENT

This section provides the information required for the competent authority (OPW) to undertake a Screening for AA and determine in view of best scientific knowledge, whether the proposed works, individually or in combination with other plans and projects, is likely to have a significant effect on the European site. Specifically, it aims to:

Provide information on, and assess the potential for the proposed works to significantly impact on European sites; and

Determine whether the activities proposed, alone or in combination with other projects, are likely to have significant effects on European sites in view of their Conservation Objectives.

This screening assessment provides information to address the following elements:

1. Description of the plan or project, and local site or plan area characteristics. The description covers the full scope of the proposed plan or project (i.e. deconstruction phase and operational phase).

2. Description of the receiving environment setting of the proposed plan or project and its surrounds.

3. Identification of relevant European sites within the projects the potential zone of influence. A preliminary assessment to determine connectivity between the proposed works and receptors (i.e. European sites and/ or features for which the sites are designated). Where connectivity exists, the receptors in question are brought forward in the screening assessment process.

4. For receptors that exhibit potential connectivity to the proposed work a screening assessment is undertaken to establish whether the plan or project is likely to have a direct, indirect or cumulative effect on receptors based on a consideration of likely impacts (i.e. an assessment of significance of effect).

5. Screening statement with conclusions on whether or not an AA is necessary for the relevant Qualifying Feature of Interest.

Table 5-1 presents Screening Assessment Criteria considering the proposed works.

Table 5-1: Screening Assessment Criteria

Screening Assessment Criteria Screening Questions	Impacts
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.	The proposed works adjoin, overlap and are partially located within the Lower River Shannon SAC, representing potential direct and indirect connectivity to this European Site. The proposed works are located 4.4km upstream of Kerry Head SPA and support remote, indirect and tenuous hydrological

Screening Assessment Criteria Screening Questions	Impacts
	connectivity with this European Site via the Cashen River Estuary. Given this connectivity (and viable source-pathway-receptor dynamic) between the proposed works and these European Sites, there is the potential for impacts possibly contributing toward negative effects, through vectors such as the operation of machinery and personnel, in the absence of best practice measures during the works.
Likely direct, indirect or secondary impacts of the project on the European Sites:	
• Size and Scale	The size and scale of the proposed works are small scale and localised when compared with the surrounding environment and the size of European Sites within the project Zone of Influence.
• Land Take	The proposed works adjoin, overlap and are located within the Lower River Shannon SAC. The proposed works are unlikely to require or contribute land-take within this European Site as it is proposed to replace, upgrade and further reinforce existing built embankments.
• Distance from European Sites or Key Features of the Site	The proposed works adjoin, overlap and are located within the Lower River Shannon SAC, representing potential direct and indirect connectivity to this European Site. The proposed works are located 4.4km upstream of Kerry Head SPA and support remote, indirect hydrological connectivity via the Cashen River Estuary. Given this connectivity (and viable source-pathway-receptor dynamic) between the proposed works and these European Sites, there is the potential for impacts possibly contributing toward negative effects, through vectors such as the operation of machinery and personnel, in the absence of best practice measures during the works.
• Resource Requirements	The proposed works will require the use of standard construction methods, including tracked machinery and hand-held tools, large boulders and aggregates. The works will be localised and controlled to the works footprint.

Screening Assessment Criteria Screening Questions	Impacts
• Emissions	Depending on the time of construction, there may be dust and water borne (silt laden waters, wet cement, hydrocarbons) emissions as a result of the proposed works. There will be no operational phase emissions as a result of the proposed accommodation works.
• Excavation Requirements	The will be no excavation requirements within habitats of qualifying interest for the Lower River Shannon SAC as it will be required to place rock armour on existing embankment infrastructure. There will be no excavation requirements during the project's operational phase.
• Transport Requirements	Transport requirements as part of the proposed works will utilise the existing local access roads, and adjacent pastoral lands. Transport of works machinery and personnel will occur on an ad-hoc basis.
• Duration of construction, operation and decommissioning	Duration of the proposed works will be short term and temporary; i.e. 5 weeks.
• Cumulative impact with other plans and projects in the area	As part of the AA, in addition to the proposed works, other relevant projects and plans in the area must also be considered at this stage. These plans and projects are considered further in this respect in Table 5-2 below.

Table 5-2: In-combination Effects associated with the proposed works

Programmes, Plans and Projects	Key Policies/Issues/Objectives Directly Related to the Conservation of the Natura 2000 Network	Potential for In-combination Effects
Kerry County Development Plan 2022 - 2028	KCDP 11-1 Ensure that the requirements of relevant EU and national legislation, are complied with by the Council in undertaking its functions, including the requirements of the EU Birds and Habitats Directives. KCDP 11-2 Maintain the nature conservation value and integrity of Special Areas of Conservation, Special Protection Areas, Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs). This shall include any other sites that may be designated at national level during the lifetime of the plan in co-operation with relevant state agencies.	The Kerry County Development Plan 2022-2028 provides objectives outlined for the protection of the natural environmental and its component European Sites. In addition, a Natura Impact Statement was prepared for this County Development Plan which provided the following conclusions: Policies and objectives contained within the plan will either not lead to development, are intended to protect conserve or enhance the natural environment, will positively steer development and pressure away from Natura 2000 sites and associated sensitive areas, positively make provision to ensure that implementation will not have a significant or adverse effect on the integrity of a Natura 2000 site, and or have been formulated using a caveat or conditional approach requiring, where necessary, a case by case Environmental Assessment / Habitats Directive Assessment. Therefore, there is no viable or realistic pathway for adverse impact on the integrity of European 2000 sites.

Programmes, Plans and Projects	Key Policies/Issues/Objectives Directly Related to the Conservation of the Natura 2000 Network	Potential for In-combination Effects
		In addition, it is noted that all AA recommendations made during the plan making process have been incorporated into the CDP, as adopted.
Draft River Basin Management Plan for Ireland 2022 – 2027	The Third Cycle Draft River Basin Management Plan 2022-2027 Consultation Report has been published. This report presents a summary of the issues raised in the submissions reviewed from the public consultation on the draft River Basin Management Plan for Ireland 2022-2027. The 3rd cycle of River Basin Management Plan (RBMP) for the period of 2022-2027 is currently being prepared by Department of Housing, Local Government and Heritage (DHLGH) in line with the EU Water Framework Directive (WFD) (2000/60/EC). Key issues raised as part of the consultation process within the ten most prominent themes are as follows. - Water Quality / Pollution - Agricultural Practices - Public Engagement and Awareness - Local Authority - Level of ambition - Sewage Pollution - Department / Agency - Co-ordination - Funding - Forestry - Peat - Shellfish waters / aquaculture	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.

Programmes, Plans and Projects	Key Policies/Issues/Objectives Directly Related to the Conservation of the Natura 2000 Network	Potential for In-combination Effects
	- Other Following review of the submissions, the DHLGH will commence a review and where necessary update the draft RBMP with a view to finalisation and publication in Q3/Q4 of 2022. The SEA and AA processes will continue in parallel until finalisation and will be completed prior to adoption of the 3rd cycle plan.	
Inland Fisheries Ireland Corporate Plan 2021 -2025	IFI's Corporate Plan details the Inland Fisheries Ireland's, Vision, Mission and Values across seven strategic objectives for the period 2021 to 2025. Under each of the seven objectives a series of actions required to achieve the objectives are described, with the intended outcomes outlined. The strategic objectives outline where Inland Fisheries Ireland will focus their efforts between 2021 and 2025. Inland Fisheries Ireland will secure stakeholder feedback on the implementation of the Strategy mid-2023.	The implementation and compliance with key environmental issues and objectives of this corporate plan will result in positive in-combination effects to European sites. The implementation of this corporate plan will have a positive impact for biodiversity of inland fisheries and ecosystems. It will not contribute to in-combination or cumulative negative impacts with the proposed development.
EPA Licenced Facilities	There are no EPA licenced facilities within the proposed works area or in the receiving hydrological environment of the Cashen Estuary of the downstream receiving environment of the Lower River Shannon estuary.	EPA licenced facilities are subject to conditions and parameters associated with licencing requirements, restricting the release of polluted or contaminated materials to the receiving or surrounding environment. Therefore, these facilities will not contribute towards significant negative effects to European Sites.
Local Planning Applications	A search of Kerry County Council's online planning enquiry database[6] was undertaken to identify other projects and plans consented within the past five	Adherence to the policies and objectives of the Kerry County Development Plan 2022-2028

[6] https://kerry.maps.arcgis.com/apps/webappviewer/index.html?id=33565bc13600476c8c4bae1eadb8c22d

Programmes, Plans and Projects	Key Policies/Issues/Objectives Directly Related to the Conservation of the Natura 2000 Network	Potential for In-combination Effects
	years that are proximal or within the proposed development area. A small number of applications for dwellings, dwelling extensions, holiday homes agricultural developments (including slatted sheds) and associated structures with granted planning permission were noted. These small-scale projects are not likely to cause effects to European sites when considered in combination with the current proposal under examination, either during the construction or operational phase. There is therefore no potential for significant in-combination effects of these developments with proposed development.	ensure that 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.

5.1.1 Conclusion of Cumulative Impact Assessment

Provided adherence to the overarching policies and objectives of the plans and programmes and best practice and mitigation measures are implemented 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 works.

Screening Assessment Criteria is further assessed in Table 5-3 below.

Table 5-3: Screening Assessment Criteria

Screening Assessment Criteria Screening Questions	
Describe any likely changes to the site arising as a result of the following	
Reduction of Habitat	The proposed works adjoin, overlap and are located within the Lower River Shannon SAC, representing potential direct and indirect connectivity to this European Site. Reduction to habitats of qualifying interest for European Sites through direct impacts, such as removal or disturbance is unlikely due to the nature of the works which requires the replacement of existing embankment infrastructure. The proposed works are located 4.4km upstream of Kerry Head SPA and support potential remote, indirect hydrological connectivity via the Cashen River Estuary. There will be no reduction of habitat associated with this SPA as it comprises sea cliffs, which are not located within the direct or indirect tidal regime of the Cashen River Estuary and therefore will not be subject to any potential pollutant sources from the proposed embankment works. Given the proposed works proximity to the Lower River Shannon SAC, there is the risk of indirect effects through run-off and the release of pollutants into the surrounding environment in the absence of adequate best practice construction measures.
Disturbance to Key Species	Given the proposed works proximity and intersection / overlap with the boundary of the Lower River Shannon, there is the potential for direct and indirect disturbance to feeding and foraging otter utilising the nearby areas of the Cashen Estuary. It should however be noted that the proposed works are localised and targeted to existing embankment infrastructure and will be short term in duration, therefore greatly reducing potential disturbance impact magnitude. The proposed works are located 4.4km upstream of Kerry Head SPA and support potential remote, indirect hydrological connectivity via the Cashen River Estuary. There will be no reduction of habitat of this SPA as it comprises sea cliffs, which are not located within the direct or indirect tidal regime of the Cashen River Estuary and therefore will not be subject to pollutant streams from the proposed embankment works. Furthermore, the proposed works footprint does not support optimal feeding, foraging or breeding habitat for the SCI species for this

Screening Assessment Criteria Screening Questions	
	European Site; Chough and Fulmar. Therefore, the ex-situ disturbance of Chough or Fulmar as a result of the proposed embankment works are not likely.
Habitat or Species Fragmentation	The proposed works are located within the footprint of the Lower River Shannon SAC. The proposed works require the upgrade and repair of an existing embankment on the margins of the Cashen Estuary. Therefore the proposed works will not contribute habitat fragmentation to this European Site. The proposed works may however contribute towards species fragmentation, should construction works contribute to disturbance or displacement effects to foraging, feeding or commuting faunal species associated with Lower River Shannon SAC; i.e. Otter. It should be noted however, that the proposed works are small scale, localised and will occur for a shortened duration and will be completed with a 5 week time period.
Reduction in Species Diversity	Disturbance and displacement effects are not likely as the proposed works are small scale, localised and will occur for a shortened duration and will be completed with a 5 week time period.
Changes in Key Indicators of Conservation Value	Changes to key indicators of conservation value of European Sites within the project Zone of Influence are highly unlikely. However, it is considered that the proposed works may contribute towards localised effects to the receiving and surrounding environment, such as disturbance of adjoining, non-target habitats and the release of unattenuated water or particulate matter to adjoining areas of European Sites within the project Zone of Influence that may support habitats and species of Qualifying Interest. In addition construction phase elements of the project (in particular potential overland flow of construction stage pollutants to the receiving environment or spread of invasive plant species) may have the remote potential to contribute towards negative effects that may interfere with the structure and function of European sites within the project ZoI.
Climate Change	The proposed works will not result in significant negative effects contributing to climate change that could in turn affect the conservation objectives of those European Sites within the project ZoI. The proposed works are localised and will not contribute significant emissions of additional greenhouse gases to the receiving and surrounding environment.
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;	The proposed works may have the remote potential to provide contributory effects to European sites within the project Zone of Influence. This is due to the location of the proposed works within the Lower River Shannon SAC. It should be noted however, that the proposed works require the repair of existing embankment infrastructure. In addition the works are small scale, localised and will occur for a shortened duration and will be completed with a 5 week time period.

Screening Assessment Criteria Screening Questions	
Provide Indicators of Significance as a result of the identification of effects set out above in terms of;	
Loss	There is the potential for indirect habitat loss or deterioration of the adjacent areas of this European site from the effects of run-off or discharge into the aquatic environment through impacts such as increased siltation, nutrient release and/or contamination, particularly during the project construction phase. It should be noted that the proposed works are located on existing embankment infrastructure and most of the works will be completed on top of the existing embankment which support improved grassland, which is not a habitat of qualifying interest for the Lower River Shannon SAC.
Fragmentation	The proposed works overlap and are partially located within the footprint of the Lower River Shannon SAC. The proposed works require the upgrade of an embankment and will not contribute fragmentation to habitats of qualifying interest to this European Site. The proposed works may however contribute towards species fragmentation, should construction works contribute to disturbance or displacement effects to foraging, feeding or commuting faunal species associated with the Lower River Shannon SAC; i.e. Otter. It should be noted however, that the proposed works are small scale, localised, temporary and will occur for a shortened duration and will be completed with a 5 week time period.
Disruption	The proposed works may result in localised disruption and disturbance of lands within the Lower River Shannon SAC. However, the proposed works are small scale in nature and targeted to existing embankment infrastructure. There is the potential for indirect habitat loss or disruption of downstream European sites from the effects of run-off or discharge into the aquatic environment through impacts such as increased siltation, nutrient release and/or contamination, particularly during the project construction phase.
Disturbance	
Changes to Key Elements of the Site	Changes to key elements of European Sites within the project Zone of Influence are highly unlikely. However, it is considered that the proposed works may contribute towards localised effects to the receiving and surrounding environment, such as disturbance of adjoining, non-target habitats and the release of unattenuated particulate matter to adjoining areas of European Sites within the project Zone of Influence that may support habitats and species of Qualifying Interest. In addition construction phase elements of the project (in particular potential overland flow of construction stage pollutants to the receiving environment or spread of invasive plant species) may have the remote potential to contribute towards negative effects that may interfere with the structure and function of European sites within the project ZoI.

Screening Assessment Criteria Screening Questions	
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 are not known	It is considered that the works have the remote potential to provide contributory effects to European sites within the project Zone of Influence. Such impacts may include disturbance and fragmentation of species of qualifying interest associated with nearby European Sites or indirect deterioration / disturbance of nearby water dependent habitats and species of European Sites within the project Zone of Influence. The proposed works may however contribute towards species fragmentation, should construction works contribute towards disturbance or displacement effects to foraging, feeding or commuting faunal species associated with the Lower River Shannon SAC; i.e. Otter. It should be noted however, that the proposed works are small scale, localised and will occur for a shortened duration and will be completed with a 5 week time period. The proposed works are located 4.4km upstream of Kerry Head SPA and support potential remote, indirect hydrological connectivity via the Cashen River Estuary. There will be no reduction of habitat of this SPA as it comprises sea cliffs, which are not located within the direct or indirect tidal regime of the Cashen River Estuary and therefore will not be subject to pollutant streams from the proposed embankment works. Furthermore, the proposed works footprint does not support optimal feeding, foraging or breeding habitat for the SCI species for this European Site; Chough and Fulmar. Therefore, the ex-situ disturbance of Chough or Fulmar as a result of the proposed embankment works are not likely.

An Impact Assessment of Features of Qualifying Interest for those European Sites within the project Zone of Influence is presented in Table 5-4 below.

Table 5-4: Impact Assessment of Features of Qualifying Interest within the project Zone of Influence.

Features of Qualifying Interest	Likely Distribution[7] / Suitability of proposed works footprint to support Features of Qualifying Interest	Within the proposed works ZoI	Potential Impact Source	Description of Pathway	Potential Effect to Receptors
Lower River Shannon SAC (002165)					
1029 Freshwater Pearl Mussel Margaritifera margaritifera 1095 Sea Lamprey Petromyzon marinus 1096 Brook Lamprey Lampetra planeri 1099 River Lamprey Lampetra fluviatilis 1106 Atlantic Salmon Salmo salar (only in fresh water) 1110 Sandbanks which are slightly covered by sea water all the time 1130 Estuaries 1140 Mudflats and sandflats not covered by seawater at low tide 1150 *Coastal lagoons	There are no features of qualifying interest for the Lower River Shannon within the project footprint. The following features of qualifying interest are located within the areas immediately adjoining the site on the Cashen River Estuary or areas further downstream: 1130 Estuaries 1140 Mudflats and sandflats not covered by seawater at low tide	The following features of qualifying interest are located within or are potentially located within the immediate environs of the proposed works. 1130 Estuaries 1140 Mudflats and sandflats not covered by seawater at low tide 1355 Otter Lutra lutra The following features of qualifying interest are located within the upstream and downstream estuarine environment of the	Use of excavators and other machinery. Use of hydrocarbons, aggregates and biodegradable oils. Introduction and transmission of invasive plant species. Transmission of silt laden water from the works area to the surrounding area and the adjoining areas of the Cashen Estuary.	Air Noise Visual Overland flow	Direct and indirect disturbance of habitats and species within the SAC during the works period. Potential for indirect disturbance and habitat degradation through run-off of potential pollutant sources to nearby / proximal areas of the SAC

[7] Distribution analysis is informed from a site walkover survey of the proposed works area and, in addition to distribution data presented in the Conservation Objectives supporting documents for these European Sites.

Features of Qualifying Interest	Likely Distribution[7] / Suitability of proposed works footprint to support Features of Qualifying Interest	Within the proposed works ZoI	Potential Impact Source	Description of Pathway	Potential Effect to Receptors
1160 Large shallow inlets and bays 1170 Reefs 1220 Perennial vegetation of stony banks 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts 1310 Salicornia and other annuals colonizing mud and sand 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) 1349 Bottlenose Dolphin Tursiops truncatus 1355 Otter Lutra lutra 1410 Mediterranean salt meadows (Juncetalia maritimi) 3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	The following features of qualifying interest are likely to occur within or utilise the open waters of the Cashen River Estuary and the Lower River Shannon Estuary upstream and downstream of the proposed works: 1095 Sea Lamprey Petromyzon marinus 1096 Brook Lamprey Lampetra planeri 1099 River Lamprey Lampetra fluviatilis 1106 Atlantic Salmon Salmo salar (only in fresh water) 1160 Large shallow inlets and bays 1170 Reefs	Cashen Estuary and the immediate downstream areas of the Mouth of the Shannon coastal waterbody. 1095 Sea Lamprey Petromyzon marinus 1096 Brook Lamprey Lampetra planeri 1099 River Lamprey Lampetra fluviatilis 1106 Atlantic Salmon Salmo salar (only in fresh water) 1160 Large shallow inlets and bays 1170 Reefs 1310 Salicornia and other annuals colonizing mud and sand 1330 Atlantic salt meadows (Glauco-			supporting habitats corresponding with these Annex I qualifying habitats.

Features of Qualifying Interest	Likely Distribution[7] / Suitability of proposed works footprint to support Features of Qualifying Interest	Within the proposed works ZoI	Potential Impact Source	Description of Pathway	Potential Effect to Receptors
6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) 91E0 *Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	1310 Salicornia and other annuals colonizing mud and sand 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) 1349 Bottlenose Dolphin Tursiops truncatus 1355 Otter Lutra lutra 1410 Mediterranean salt meadows (Juncetalia maritimi)	Puccinellietalia maritimae) 1349 Bottlenose Dolphin Tursiops truncatus 1410 Mediterranean salt meadows (Juncetalia maritimi)			
Kerry Head SPA (004189)					
A009 Fulmar Fulmarus glacialis A346 Chough Pyrrhocorax pyrrhocorax	The SCI species for this SPA are not likely to utilise the proposed works footprint or its immediate environs.	The proposed works are located 4.4km upstream of Kerry Head SPA and supports potential remote, indirect hydrological connectivity via the Cashen River Estuary. There will be no reduction of habitat of	Use of excavators and other machinery. Use of hydrocarbons and aggregates. Introduction and transmission of invasive plant species. Transmission of silt laden water from the	Overland flow into the Cashen River Estuary.	Run-off of potential pollutant sources to receiving environment with subsequent deterioration to downstream water dependent

Features of Qualifying Interest	Likely Distribution[7] / Suitability of proposed works footprint to support Features of Qualifying Interest	Within the proposed works ZoI	Potential Impact Source	Description of Pathway	Potential Effect to Receptors
		this SPA as it comprises sea cliffs, which are not located within the direct or indirect tidal regime of the Cashen River Estuary and therefore will not be subject to pollutant streams from the proposed embankment works. Furthermore, the proposed works footprint does not support optimal feeding, foraging or breeding habitat for the SCI species for this European Site; Chough and Fulmar. Therefore, the ex-situ disturbance of Chough or Fulmar as a result of the proposed embankment works are not likely.	works area to the surrounding area and downstream.		SCI species utilising the downstream sections of the Cashen Estuary or the Lower Shannon Estuary.

Following the analysis presented in Table 5-4 above, it is considered that certain features of qualifying Interest for the Lower River Shannon SAC should be considered for further analysis, given that the proposed works are located within and adjoin the SAC.

The features of Interest for the Lower River Shannon SAC that warrant further consideration due to their potential occurrence with the works zone of influence are as follows:

- 1095 Sea Lamprey Petromyzon marinus;
- 1096 Brook Lamprey Lampetra planeri;
- 1099 River Lamprey Lampetra fluviatilis;
- 1106 Atlantic Salmon Salmo salar (only in fresh water);
- 1160 Large shallow inlets and bays;
- 1170 Reefs;
- 1130 Estuaries;
- 1140 Mudflats and sandflats not covered by seawater at low tide;
- 1310 Salicornia and other annuals colonizing mud and sand;
- 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae);
- 1349 Bottlenose Dolphin Tursiops truncatus;
- 1355 Otter Lutra lutra; and
- 1410 Mediterranean salt meadows (Juncetalia maritimi).

The remaining species and habitats of qualifying interest for the Lower River Shannon SAC are located outside of the proposed development footprint and associated zone of influence. They include either terrestrial species / habitats associated with upstream sections of the SAC;

- 1029 Freshwater Pearl Mussel Margaritifera margaritifera;
- 3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation;
- 6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae); and
- 91E0 *Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae).

There is no connectivity between the proposed works and these terrestrial habitats and species as they occur within the Lower River Shannon SAC and therefore this is no risk of impact and consequent effect.

The following coastal and lower estuarine Annex I habitats are located toward the westernmost and downstream sections of the Lower River Shannon SAC and outside of the proposed works zone of influence;

- 1110 Sandbanks which are slightly covered by sea water all the time;
- 1160 Large shallow inlets and bays;
- 1170 Reefs;
- 1220 Perennial vegetation of stony banks; and
- 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts.

Similarly, the priority Annex I habitat *Coastal lagoons (1150) is located in the upstream sections of the Lower River Shannon SAC. The nearest location for this habitat occurs at Cloonconeen Pool, >12km north of the proposed works. There is no direct connectivity between the proposed works and this area. These estuarine, mudflats and brackish habitats are accustomed to routine fluctuations in sediment levels following or during ongoing tidal cycles and the release of particulate matter or sediments during the proposed works will not effect these habitats.

Given the nature, scale and location of the proposed works and the remote connectivity to these estuarine and coastal habitats, there is no potential for likely significant effects.

5.2 Screening for AA Conclusion

This screening for AA identifies and assesses likely significant effects which are likely to occur as a result of the proposed embankment repair works. The screening identified two European sites within the potential source – pathway – receptor zone of influence of the proposed works.

The proposed works have the potential to provide contributory effects to European sites within the project Zone of Influence; i.e. Lower River Shannon SAC and Kerry Head SPA. In particular, the proposed works have the potential to contribute indirect impacts to water dependent habitats and species within the in-situ and adjoining areas of the Lower River Shannon SAC and the downstream areas of the Kerry Head SPA.

Therefore, it cannot be concluded, that the proposed project, individually or in combination with other plans or projects, will not have a significant effect on a European site, without the implementation of best practice measures. Therefore Stage 2 Appropriate Assessment is required.

A Natura Impact Statement (NIS) has been prepared in Section 6, to provide scientific examination of the project to enable completion of an AA by the competent authority. The NIS will examine potential effects to European Sites screened in as part of this Screening for Appropriate Assessment; i.e. the Lower River Shannon SAC and Kerry Head SPA.

6 STAGE 2 – NATURA IMPACT STATEMENT

This section of the report provides the necessary information to inform AA to be completed by the competent authority, OPW. This NIS provides the relevant scientific information to enable the competent authority in carrying out its AA to determine whether or not the proposed works would adversely affect the integrity of European sites.

The NIS assesses whether or not the proposed works would adversely affect the integrity of European Sites within the project ZoI, for which effects could not be excluded during the Screening for AA (see Section 5 for details). The European Sites are as follows:

- Lower River Shannon SAC (Site Code: 002165); and
- Kerry Head SPA (Site Code: 004189).

6.1 Impact Assessment

The impact assessment presented in the following sections outlines potential impacts and effects in the absence of mitigation measures being implemented.

6.1.1 Characterising Impacts

The methodology for the assessment of impacts is derived from the Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites (EC, 2021). When describing changes/activities and impacts on ecosystem structure and function, the types of impacts that are commonly presented include the following:

- Direct loss: reduction of habitat coverage as a result of its physical destruction (e.g. due to its removal or to the deposition of construction materials or sediments); loss of breeding, foraging, resting areas for species.
- Degradation: deterioration of habitat quality, leading to a reduced abundance of characteristic species or an altered community structure (species composition). This can be caused by changes in abiotic conditions (e.g. water levels or an increase in suspended sediments, pollutants or dust deposition); deterioration of breeding, foraging, resting areas for species.
- Disturbance: a change in existing environmental conditions (e.g. increased noise or light pollution, a greater frequentation of people and vehicles). Disturbance may cause, inter alia, the displacement of species individuals, changes in species behaviour, or the risk of morbidity or mortality.
- Fragmentation: leading to an alteration of distribution patches of relevant habitats and species, e.g. through the creation physical or ecological barriers in areas that are physically of functionally connected, or splitting them into smaller more isolated units.
- Other indirect effects: indirect change to the quality of the environment (resulting for example from a change in availability of nutrients and light, or an increase in the vulnerability of the site to other new threats such as invasive alien species, human and animal penetration).

Impacts that could potentially occur through the implementation of the project can be categorised under a number of impact categories as outlined in the EC 2021 document as follows:

- Area of the habitat or habitat of the species permanently lost (e.g. by clearing of vegetation or removal of suitable breeding/nesting sites) assessed against the habitat area on the site, at regional, national and biogeographical level (percentage of habitat area lost) and against the target set in the site-specific conservation objective (which may include a target for restoration);

- Area of the habitat or habitat of the species affected (e.g. by pollution, noise, deterioration of other ecological conditions) assessed against percentage of the habitat area on the site, at regional, national and biogeographical level (percentage of habitat area affected) and against the target set in the site-specific conservation objective (which may include a target for restoration);

Size of resident and migratory species populations affected, assessed against the local, regional, national and international populations (percentage of population affected) and against the target set in the site-specific conservation objective (which may include a target for an increase in population size within the site);

Scale of impact (e.g. by pollution, noise, deterioration of other ecological conditions) on the quality of the habitat or habitat of the species or the survival of species affected, in view of their ecological requirements in the site as defined in the site-specific conservation objective (which may include a target for restoration).

Meaning of 'Adversely Affect the Integrity of the Site'

The concept of the 'integrity of the site' is explained in the EU publication Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, as follows;

'It is clear from the context and from the purpose of the directive that the 'integrity of the site' relates to the site's conservation objectives. For example, it is possible that a plan or project will adversely affect the integrity of a site only in a visual sense or only habitat types or species other than those listed in Annex I or Annex II. In such cases, the effects do not amount to an adverse effect for purposes of Article 6(3), provided that the coherence of the network is not affected. On the other hand, the expression 'integrity of the site' shows that focus is here on the specific site. Thus, it is not allowed to destroy a site or part of it on the basis that the conservation status of the habitat types and species it hosts will anyway remain favourable within the European territory of the Member State.

As regards the connotation or meaning of 'integrity', this can be considered as a quality or condition of being whole or complete. In a dynamic ecological context, it can also be considered as having the sense of resilience and ability to evolve in ways that are favourable to conservation. The 'integrity of the site' has been usefully defined as 'the coherence of the site's ecological structure and function, across its whole area, or the habitats, complex of habitats and/or populations of species for which the site is or will be classified'.

A site can be described as having a high degree of integrity where the inherent potential for meeting site conservation objectives is realised, the capacity for self-repair and self-renewal under dynamic conditions is maintained, and a minimum of external management support is required. When looking at the 'integrity of the site', it is therefore important to take into account a range of factors, including the possibility of effects manifesting themselves in the short, medium and long-term.

6.1.2 Potential for Direct Impacts

Direct impacts refer to habitat loss or fragmentation arising from land-take requirements for development purposes. The proposed works are located within, adjoin and overlap with the Lower River Shannon SAC and could result in the direct loss or disturbance to this European Site.

6.1.3 Potential for Indirect Impacts

Indirect impacts refer to those which can arise through proximal or remote connectivity, for example by means of a watercourse, via overland flow of surfacewater, via groundwater, via air (e.g. dust) or via other emissions from a project site (e.g. noise and light). Indirect and secondary impacts do not have a straight-line

route between cause and effect. It is potentially more challenging to ensure that all the possible indirect impacts of the project – in combination with other plans and projects - have been established. These can arise, for example, when a development alters the hydrology of a catchment area, which in turn affects the movement of groundwater to a site and the qualifying interests that rely on the maintenance of water levels. Deterioration in water quality can occur as an indirect consequence of development, which in turn changes the aquatic environment and reduces its capacity to support certain plants and animals. The introduction of invasive species can also be defined as an indirect impact. Disturbance to fauna can arise directly through the loss of habitat (e.g. displacement of foraging or commuting mammals and avifauna) or indirectly through noise, vibration and increased activity associated with construction activities or the operational processes of a proposed development.

6.1.4 Possible source-pathway-receptor and zone of influence

Potential effects associated with the proposed development to the Qualifying Habitats and Species of European Sites within the project Zone of Influence are described in Table 6-1 as follows:

Table 6-1: Source – Pathway and Zone of Influence for the proposed project

Source of Potential Effect	Description of Pathway	Potential Zone of Influence of the Effect
Construction Phase		
Noise, vibration; Human presence; and Movements of vehicles associated with construction activities.	Terrestrial - contact (direct contact with construction personnel or machinery during site works), air (through its ability to transmit noise effects), visibility (on site presence of construction personnel)	The Zone of Influence varies by the affected habitat and reliant species. This can be assessed within 500m of the proposed development footprint for wintering birds (see Madsen, 1985; Smit & Visser, 1993; and Rees et al., 2005). However, distance can be significantly lower (e.g. 150 m for otter underground sites (NRA, 2006), or higher for other species.
Earthworks / stripping of overburden (e.g. Digging); Over-pumping of silt laden waters Stockpiling of construction materials (sand, aggregates etc.) Use of contaminants (e.g. hydrocarbons, lubricants).	Hydrological pathways; i.e. overland flow, drainage channels and watercourses which provide connectivity between the proposed works and the nearby areas of the Lower River Shannon SAC. Surface water runoff; and Accidental spills.	The Zone of Influence of the potential effects associated with this source is related with the nature of the potential contaminant (e.g. silt, hydrocarbons). The worst case Zone of Influence is considered to be the whole length of the aquatic pathway (i.e. from the proposed development site to the adjoining areas of the Lower River Shannon SAC.
Operational Phase		

Source of Potential Effect	Description of Pathway	Potential Zone of Influence of the Effect
Movement of People and vehicles associated within maintenance works; Maintenance of the embankment	Terrestrial - contact (direct contact with operational personnel or machinery during site works), air (through its ability to transmit noise effects), visibility (on site presence of construction personnel)	Such effects are not likely to be significant due to the nature and scale of the operational works and the intermittent, temporary and short duration of any potential maintenance works.
Use of contaminants (e.g. hydrocarbons, lubricants).	Hydrological pathways; i.e. overland flow, drainage channels and watercourses which provide connectivity between the proposed works and the nearby areas of the Lower River Shannon SAC.	The Zone of Influence of the potential effects associated with this source is related with the nature of the potential contaminant (e.g. silt, hydrocarbons). The worst case Zone of Influence is considered to be the whole length of the aquatic pathway (i.e. from the proposed development site to the in-situ areas of the Lower River Shannon SAC.

6.1.5 Potential Impacts from the Proposed Development to the Features of Qualifying Interest of European Sites within the Project Zone of Influence

Potential impacts sources, pathways and consequent effects associated with the proposed works to those features of Qualifying Interest of Lower River Shannon SAC and Kerry Head SPA are considered in greater detail in Table 6.2 below.

Table 6-2 Impact Assessment on Features of Qualifying Interest for European Sites

Attribute/Measure/Target	Potential Impact of Proposed works
Lower River Shannon SAC	
1095 Sea Lamprey Petromyzon marinus	
- Distribution: extent of anadromy - % of river accessible - Greater than 75% of main stem length of rivers accessible from estuary	The proposed works will be restricted to the existing embankment, dry slope area and improved grassland areas at Ballyeagh. The works areas and their immediate environs primarily support localised shingle and gravel shores habitat, where the existing embankment has been eroded with remaining areas of improved grassland. Access to the works area will be via local access roads, farm tracks and improved grassland. The rock armour will be placed on areas of eroded embankment, which supports shingle and gravel shores habitat type with areas of remnant embankment comprising improved agricultural grassland. Habitats within the works footprint and environs do not support suitable habitat for this species, an anadromous species using terrestrial and marine watercourses. The proposed works may result in the localised release of sediments to the surrounding environment. However, the nearby estuarine area and associated mudflats, sandflats and their associated species are accustomed to routine fluctuations in sediment levels following or during ongoing tidal cycles. In addition, the proposed works will not impact the distribution and accessibility for this species or impact the availability of juvenile habitat, which is located with freshwater catchments, upstream of the works area.
- Population structure of juveniles - Number of age/size groups - At least three age/size groups present	
- Juvenile density in - fine sediment - Juveniles/m² Juvenile density at least 1/m²	
- Extent and - distribution of - spawning habitat - m² and occurrence No decline in extent and - distribution of spawning bed	
- Availability of juvenile habitat - Number of positive sites in 3rd order channels (and greater), downstream of spawning areas - More than 50% of sample sites positive	
1096 Brook Lamprey Lampetra planeri	
- Distribution - % of river accessible - Access to all water courses down to first order streams	The proposed works will be restricted to the existing embankment, dry slope area and improved grassland areas at Ballyeagh. The works areas and their immediate environs primarily support localised shingle and gravel shores habitat, where the existing embankment has been eroded with remaining areas of improved grassland. Access to the works area will be via local access roads, farm tracks and improved grassland. The rock armour will be placed on areas of eroded embankment, which supports shingle and gravel shores habitat type with areas of remnant embankment comprising improved agricultural grassland. Habitats within the works footprint
- Population structure of juveniles - Number of age/size groups - At least three age/size groups of brook/river lamprey present	
- Juvenile density in fine sediment - Juveniles/m²	

Attribute/Measure/Target	Potential Impact of Proposed works
- Mean catchment juvenile density of brook/river lamprey at least 2/m²	and environs do not support suitable habitat for this species, an anadromous species using terrestrial and marine watercourses. The proposed works may result in the localised release of sediments to the surrounding environment. However, the nearby estuarine area and associated mudflats, sandflats and their associated species are accustomed to routine fluctuations in sediment levels following or during ongoing tidal cycles. In addition, the proposed works will not impact the distribution and accessibility for this species or impact the availability of juvenile habitat, which is located with freshwater catchments, upstream of the works area.
- Extent and distribution of spawning habitat - m² and occurrence - No decline in extent and distribution of spawning beds	
- Availability of juvenile habitat - Number of positive sites in 2nd order channels (and greater), downstream of spawning areas - More than 50% of sample sites positive	
1099 River Lamprey Lampetra fluviatilis	
- Distribution - % of river accessible - Access to all water courses down to first order streams	The proposed works will be restricted to the existing embankment, dry slope area and improved grassland areas at Ballyeagh. The works areas and their immediate environs primarily support localised shingle and gravel shores habitat, where the existing embankment has been eroded with remaining areas of improved grassland. Access to the works area will be via local access roads, farm tracks and improved grassland. The rock armour will be placed on areas of eroded embankment, which supports shingle and gravel shores habitat type with areas of remnant embankment comprising improved agricultural grassland. Habitats within the works footprint and environs do not support suitable habitat for this species, an anadromous species using terrestrial and marine watercourses. The proposed works may result in the localised release of sediments to the surrounding environment. However, the nearby estuarine area and associated mudflats, sandflats and their associated species are accustomed to routine fluctuations in sediment levels following or during ongoing tidal cycles. In addition, the proposed works will not impact the distribution and accessibility for this species or impact the availability of juvenile habitat, which is located with freshwater catchments, upstream of the works area.
- Population structure of juveniles - Number of age/size groups - At least three age/size groups of river/brook lamprey present	
- Juvenile density in fine sediment - Juveniles/m² - Mean catchment juvenile density of river/brook lamprey at least 2/m²	
- Extent and distribution of spawning habitat - m² and occurrence - No decline in extent and distribution of spawning beds	
- Availability of juvenile habitat - Number of positive sites in 2nd order channels (and greater), downstream of spawning areas - More than 50% of sample sites positive	
1106 Atlantic Salmon Salmo salar (only in fresh water)	
- Distribution: extent of anadromy - % of river accessible	The proposed works will be restricted to the existing embankment, dry slope area and improved grassland areas at Ballyeagh. The works areas and their immediate environs primarily support

Attribute/Measure/Target	Potential Impact of Proposed works
- 100% of river channels down to second order accessible from estuary	localised shingle and gravel shores habitat, where the existing embankment has been eroded with remaining improved grassland. The access routes support improved grassland. Access to the works area will be via local access roads, farm tracks and improved grassland. The rock armour will be placed on areas of eroded embankment, which supports shingle and gravel shores habitat type with areas of remnant embankment comprising improved agricultural grassland. Habitats within the works footprint and environs do not support suitable habitat for this species, an anadromous species using terrestrial and marine watercourses. The proposed works may result in the localised release of sediments to the surrounding environment. However, the nearby estuarine area and associated mudflats, sandflats and their associated species are accustomed to routine fluctuations in sediment levels following or during ongoing tidal cycles. Furthermore, the proposed works will not reduce the availability or quality of spawning habitat or water quality, which is located within freshwater catchments, upstream of the works area.
- Adult spawning fish - Number Conservation Limit (CL) for each system consistently exceeded	
- Salmon fry abundance - Number of fry/5 minutes electrofishing - Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 min sampling	
- Out-migrating smolt abundance - Number - No significant decline	
- Number and distribution of redds - Number and occurrence - No decline in number and distribution of spawning redds due to anthropogenic causes	
- Water quality - EPA Q value - At least Q4 at all sites sampled by EPA	
1170 Reefs	
- Habitat distribution - Occurrence - The distribution of Reefs is stable, subject to natural processes.	The proposed works will be restricted to the existing embankment, dry slope area and improved grassland areas at Ballyeagh. The proposed works will be restricted to the existing embankment, dry slope area and improved grassland areas at Ballyeagh. The works areas and their immediate environs primarily support localised shingle and gravel shores habitat, where the existing embankment has been eroded and with areas remaining improved grassland. The access routes support improved grassland. There will be no loss or land take of this habitat as a result of the proposed embankment repair works. The proposed works may result in the localised release of sediments to the surrounding environment. However, the nearby mudflat, sandflat and estuarine habitats and their associated species are accustomed to the routine fluctuations in sediment levels following or during ongoing tidal cycles. Any such release of sediments will be readily assimilated into this estuarine
- Habitat area - Hectares - The permanent habitat area is stable, subject to natural processes.	
- Community distribution - Hectares - Conserve the following reef community types in a natural condition: Fucoid-dominated intertidal reef community	

Attribute/Measure/Target	Potential Impact of Proposed works
complex; Mixed subtidal reef community complex; Faunal turf-dominated subtidal reef community; Anemone-dominated subtidal reef community; and Laminaria-dominated community complex.	environment, its component habitats and downstream habitats of qualifying interest including this Annex I habitat which is accustomed to ongoing accretion and erosion of mobilised sediment and particulate matter. Given the localised nature of the works and their location on existing embankment infrastructure, the proposed works are not likely to impact the habitat distribution, habitat area or community distribution of this Annex I habitat.
Estuaries (1130)	
- Habitat area - Hectares - The permanent habitat area is stable or increasing, subject to natural processes.	The proposed works will be restricted to the existing embankment, dry slope area and improved grassland areas at Ballyeagh. The works areas and their immediate environs primarily support localised shingle and gravel shores habitat, where the existing embankment has been eroded and remaining improved grassland. The access routes support improved grassland. This Annex I habitat does not occur within the embankment repair footprint or its immediate environs. There will be no loss or land take of this habitat as a result of the proposed embankment repair works. The proposed works may result in the localised release of sediments to the surrounding environment. However, the nearby mudflat, sandflat and estuarine habitats and their associated species are accustomed to the routine fluctuations in sediment levels following or during ongoing tidal cycles. Any such release of sediments will be readily assimilated into this estuarine environment, its component habitats and downstream habitats of qualifying interest including this Annex I habitat which are accustomed to ongoing accretion and erosion of mobilised sediment and particulate matter. Given the localised nature of the works and their location on existing embankment infrastructure, the proposed works are not likely to impact the habitat distribution, habitat area or community distribution of this Annex I habitat.
- Community distribution - Hectares - Conserve the following community types in a natural condition: Intertidal sand to mixed sediment with polychaetes, molluscs and crustaceans community complex; Estuarine subtidal muddy sand to mixed sediment with gammarids community complex; Subtidal sand to mixed sediment with Nucula nucleus community complex; Subtidal sand to mixed sediment with Nephtys spp. community complex; Fucoid-dominated intertidal reef community complex; Faunal turf-dominated subtidal reef community; and Anemone-dominated subtidal reef community.	
1140 Mudflats and sandflats not covered by seawater at low tide	
- Habitat area - Hectares - The permanent habitat area is stable or increasing, subject to natural processes.	The proposed works will be restricted to the existing embankment, dry slope area and improved grassland areas at Ballyeagh. The works areas and their immediate environs primarily support localised shingle and gravel shores habitat, where the existing embankment has been eroded and remaining improved grassland. The access routes support improved grassland. This Annex I habitat is associated with the nearby areas of the Cashen Estuary, but is not located within the
- Habitat area was estimated using OSi data as 8,808ha	

Attribute/Measure/Target	Potential Impact of Proposed works
- Community distribution - Hectares - Conserve the following community types in a natural condition: Intertidal sand with Scolelepis squamata and Pontocrates spp. community; and Intertidal sand to mixed sediment with polychaetes, molluscs and crustaceans community complex.	project footprint. There will be no loss or land take of this habitat as a result of the proposed embankment repair works. The proposed works may result in the localised release of sediments to the surrounding environment. However, the nearby mudflat, sandflat and estuarine habitats and their associated species are accustomed to the routine fluctuations in sediment levels following or during ongoing tidal cycles. Any such release of sediments will be readily assimilated into this estuarine environment, its component habitats and downstream habitats of qualifying interest including this Annex I habitat which are accustomed to ongoing accretion and erosion of mobilised sediment and particulate matter. Given the localised nature of the works and their location on existing embankment infrastructure, the proposed works are not likely to impact the habitat distribution, habitat area or community distribution of this Annex I habitat.
1310 Salicornia and other annuals colonizing mud and sand	
- Habitat area - Hectares Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Carrigafoyle - 0.005ha; Inishdea, Owenshere - 0.003ha; Knock - 0.029ha; Querin - 0.185ha; Rinevilla Bay - 0.001ha	The proposed works will be restricted to the existing embankment, dry slope area and improved grassland areas at Ballyeagh. The works areas and their immediate environs primarily support localised shingle and gravel shores habitat, where the existing embankment has been eroded and remaining improved grassland. The access routes support improved grassland. This Annex I habitat does not occur within the embankment repair footprint or its immediate environs. There will be no loss or land take of this habitat as a result of the proposed embankment repair works. The proposed works may result in the localised release of sediments to the surrounding environment. However, the nearby mudflat, sandflat and estuarine habitats and their associated species are accustomed to the routine fluctuations in sediment levels following or during ongoing tidal cycles. Any such release of sediments will be readily assimilated into this estuarine environment, its component habitats and downstream habitats of qualifying interest including this Annex I habitat which are accustomed to ongoing accretion and erosion of mobilised sediment and particulate matter.
- Habitat distribution - Occurrence No decline, or change in habitat distribution, subject to natural processes	
- Physical structure: sediment supply - Presence/ absence of physical barriers Maintain natural circulation of sediments and organic matter, without any physical obstructions	
- Physical structure: creeks and pans - Occurrence	

Attribute/Measure/Target	Potential Impact of Proposed works
Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession	Given the localised nature of the works and their location on existing embankment infrastructure, the proposed works are not likely to impact the habitat distribution, physical structure, or vegetation structure / composition of this Annex I habitat.
- Physical structure: flooding regime - Hectares flooded; frequency - Maintain natural tidal regime	
- Vegetation structure: zonation - Occurrence - Maintain the range of coastal habitats including transitional - zones, subject to natural processes including erosion and succession	
- Vegetation structure: vegetation height - Centimeters - Maintain structural variation within sward	
- Vegetation structure: vegetation cover - Percentage cover at a representative sample of monitoring stops - Maintain more than 90% of area outside creeks vegetated	
- Vegetation composition: typical species and sub-communities - Percentage cover - Maintain the presence of species-poor communities with typical species listed in Saltmarsh Monitoring Project (McCorry and Ryle, 2009)	
- Vegetation structure: negative indicator species- - Spartina anglica - Hectares - No significant expansion of common cordgrass (Spartina anglica), with an annual spread of less than 1%	
1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	
- Habitat area - Hectares - Area stable or increasing, subject to natural processes, including erosion and succession. For sub-sites mapped:	The proposed works will be restricted to the existing embankment, dry slope area and improved grassland areas at Ballyeagh. The works areas and their immediate environs primarily support localised shingle and gravel shores habitat, where the existing embankment has been eroded and remaining improved grassland. The access routes support improved grassland. This Annex I

Attribute/Measure/Target	Potential Impact of Proposed works
Carrigafoyle- 6.774ha; Barrigone, Aughinish- 10.288ha; Beagh 0.517ha; Bunratty- 26.939ha; Shepperton, Fergus Estuary 37.925ha; Inishdea, Owenshere- 18.127ha; Killadysert, Inishcorker- 2.604ha; Knock- 0.576ha; Querin 3.726ha; Rinevilla Bay- 11.883ha	habitat does not occur within the embankment repair footprint or its immediate environs. There will be no loss or land take of this habitat as a result of the proposed embankment repair works. The proposed works may result in the localised release of sediments to the surrounding environment. However, the nearby mudflat, sandflat and estuarine habitats and their associated species are accustomed to the routine fluctuations in sediment levels following or during ongoing tidal cycles. Any such release of sediments will be readily assimilated into this estuarine environment, its component habitats and downstream habitats of qualifying interest including this Annex I habitat which are accustomed to ongoing accretion and erosion of mobilised sediment and particulate matter. Given the localised nature of the works and their location on existing embankment infrastructure, the proposed works are not likely to impact the habitat distribution, physical structure, or vegetation structure / composition of this Annex I habitat.
- Habitat distribution - Occurrence - No decline or change in habitat distribution, subject to natural processes	
- Physical structure: sediment supply - Presence/ absence of physical barriers - Maintain natural circulation of sediments and organic matter, without any physical obstructions	
- Physical structure: creeks and pans - Occurrence - Maintain creek and pan structure, subject to natural processes, including erosion and succession	
- Physical structure: flooding regime - Hectares flooded; frequency - Maintain natural tidal regime	
- Vegetation structure: zonation - Occurrence - Maintain the range of coastal habitats including transitional zones, subject to natura processes including erosion and succession	
- Vegetation structure: vegetation height - Centimetres - Maintain structural variation within sward	
- Vegetation structure: vegetation cover - Percentage cover at a representative sample of monitoring stops	

Attribute/Measure/Target	Potential Impact of Proposed works
- Maintain more than 90% of the saltmarsh area vegetated	
- Vegetation composition: typical species and sub-communities - Percentage cover at a representative sample of monitoring stops - Maintain range of sub- communities with typical species listed in Saltmarsh Monitoring Project (McCorry and Ryle, 2009)	
- Vegetation structure: negative indicator species Spartina anglica - Hectares - No significant expansion of common cordgrass (Spartina anglica), with an annual spread of less than 1%	
1349 Bottlenose Dolphin Tursiops truncatus	
- Access to suitable habitat - Number of artificial barriers - Species range within the site should not be restricted by artificial barriers to site use.	The proposed works will be restricted to the existing embankment, dry slope area and improved grassland areas at Ballyeagh. The works areas and their immediate environs primarily support localised shingle and gravel shores habitat, where the existing embankment has been eroded and remaining improved grassland. The access routes support improved grassland. The proposed works areas footprint and the adjoining and downstream areas of the Cashen River Estuary do not provide suitable habitat for this species, which is predominantly associated with open coastal waterbodies. There will be no loss or land take of supporting habitat for this species, nor will the proposed works result in disturbance or disruption of feeding, commuting or breeding regimes for this species. The proposed works may result in the localised release of in-situ sediments to the surrounding environment. However, the nearby mudflat, sandflat and estuarine habitats and their associated species are accustomed to the routine fluctuations in sediment levels following or during ongoing tidal cycles. Any such release of sediments will be readily assimilated into this estuarine environment, its component habitats and downstream species of qualifying interest which are accustomed to ongoing accretion and erosion of mobilised sediment and particulate matter. Any such release of sediments will be readily assimilated into this estuarine environment and its component habitats which are formed through ongoing accretion and erosion of sediment and particulate matter. In addition, the proposed works and any consequent impacts will not restrict access to suitable bottlenose dolphin habitat or restrict the use of these habitats by bottlenose
- Habitat use: critical areas - Location and hectares - Critical areas, representing habitat used preferentially by bottlenose dolphin, should be maintained in a natural condition.	

Attribute/Measure/Target	Potential Impact of Proposed works
	dolphin, which is associated with the coastal waterbody Mouth of the Shannon (IE_SH_060_0000), located >4km downstream.
Disturbance - Level of impact - Human activities should occur at levels that do not adversely affect the bottlenose dolphin population at the site	The proposed works are unlikely to result in the disturbance to bottlenose dolphin. These species are not likely to utilise the adjoining areas of the Cashen River Estuary which comprises a narrow stretch of transitional water in addition to extensive mudflat and sandflat habitat complexes. Therefore, proximal or ongoing disturbance impacts to this species are not likely.
1355 Otter Lutra lutra	
- Distribution - Percentage positive survey sites - No significant decline	The proposed works will be restricted to the existing embankment, dry slope area and improved grassland areas at Ballyeagh. The works areas and their immediate environs primarily support localised shingle and gravel shores habitat, where the existing embankment has been eroded and remaining improved grassland. The access routes support improved grassland. The site walkover survey did not identify otter breeding sites within the existing embankment infrastructure or evidence of ongoing foraging or commuting within the study area or surrounding environs. The proposed works, may result in the localised release of in-situ sediments to the surrounding environment. These works will not involve habitat removal or replacement, rather the consolidation of existing infrastructure. The proposed works may contribute towards localised disturbance of otter foraging and commuting within the nearby estuarine sections of the Cashen River which may have a localised, temporary impact on otter activity.
- Extent of terrestrial habitat - Hectares - No significant decline. Area mapped and calculated as 596.8ha above high water mark (HWM); 958.9ha along river banks/ around ponds	The proposed works are located along an existing estuarine embankment, which primarily supports improved grassland and localised areas of shingle and gravel shores where the embankment has been eroded. The proposed works seek to refurbish and repair an existing embankment. Therefore there will be no decline or loss of terrestrial otter habitat within the Lower River Shannon SAC.
- Extent of marine habitat - Hectares - No significant decline. Area mapped and calculated as 4,461.6ha	The proposed works are located along an existing estuarine embankment, which primarily supports improved grassland and localised areas of shingle and gravel shores where the embankment has been eroded. There will be no decline, loss or disturbance of marine otter habitat within the Lower River Shannon SAC as a result of the proposed works.
- Extent of freshwater (river) habitat - Kilometres - No significant decline. Length mapped and calculated as 500.1km	The proposed works are located along an existing estuarine embankment which primarily supports improved grassland and localised areas of shingle and gravel shores where the embankment has been eroded. The works are fringed to the north by a back / drain channel. No works are proposed on the back drain / channel or its riparian fringes. There will be no decline,

Attribute/Measure/Target	Potential Impact of Proposed works
- Extent of freshwater (lake/lagoon) habitat - Hectares - No significant decline. - Area mapped and calculated as 125.6ha	loss or disturbance of otter freshwater habitat within the Lower River Shannon SAC as a result of the proposed works.
- Couching sites and holts - Number - No significant decline	No signs of otter breeding sites (couches) or ongoing usage was identified within the proposed works area during the site walkover survey. This may reflect poor quality holting opportunities along the embankment corridor (typically open banks with widespread grazing / trampling by livestock) (Mason & Macdonald, 2009). Furthermore, the proposed embankment area and surrounding environs are trampled and grazed by livestock and trampled by ongoing tidal inundations, making breeding and holting opportunities highly unsuitable. Therefore the proposed works are not likely to result in the decline of otter breeding sites.
- Fish biomass available - Kilograms - No significant decline	The proposed works are located along an existing estuarine embankment which primarily supports improved grassland and localised areas of shingle and gravel shores where the embankment has been eroded. These works will not involve habitat removal or replacement, rather the consolidation of existing infrastructure. The proposed works may result in the localised release of sediments to the surrounding environment. However, the nearby saltmarsh and estuarine habitats and their associated species are accustomed to the routine fluctuations in sediment levels following or during ongoing tidal cycles. Any such release of sediments will be readily assimilated into this estuarine environment and its component habitats which are formed through ongoing accretion and erosion of sediment and particulate matter. Such impacts and consequent are not likely to result in the decline of available fish biomass within the Lower River Shannon SAC.
- Barriers to connectivity - Number - No significant increase.	The proposed works may contribute towards localised disturbance of otter foraging and commuting within the nearby estuarine sections of the Lower River Shannon SAC which may have a localised, temporary impact on otter movements adjacent to the proposed works areas. It should however be noted that the proposed works are localised and targeted and will be short term in duration and therefore greatly reducing potential disturbance impact magnitude
1410 Mediterranean salt meadows (Juncetalia maritimi)	
- Habitat area - Hectares - Area increasing, subject to natural processes, including erosion and succession. For sub-sites mapped: Carrigafoyle -	The proposed works will be restricted to the existing embankment, dry slope area and improved grassland areas at Ballyeagh. The works areas, associated access routes and their immediate environs primarily support localised shingle and gravel shores habitat, where the existing embankment has been eroded and remaining improved grassland. The access routes support

Attribute/Measure/Target	Potential Impact of Proposed works
4.193ha; Barrigone, Aughinish- 2.407ha; Bunratty- 0.865ha; Inishdea, Owenshere- 11.609ha; Killadysert, Inishcorker- 0.705ha; Knock- 0.143ha, Querin - 0.008ha; Rinevilla Bay 2.449ha.	improved grassland. This Annex I habitat does not occur within the embankment repair footprint or its immediate environs. There will be no loss or land take of this habitat as a result of the proposed embankment repair works. The proposed works may result in the localised release of sediments to the surrounding environment. However, the nearby mudflat, sandflat and estuarine habitats and their associated species are accustomed to the routine fluctuations in sediment levels following or during ongoing tidal cycles. Any such release of sediments will be readily assimilated into this estuarine environment, its component habitats and downstream habitats of qualifying interest including this Annex I habitat which are accustomed to ongoing accretion and erosion of mobilised sediment and particulate matter. Given the localised nature of the works and their location on existing embankment infrastructure, the proposed works are not likely to impact the habitat distribution, physical structure, or vegetation structure / composition of this Annex I habitat.
- Habitat distribution - Occurrence - No decline, or change in habitat distribution, subject to natural processes.	
- Physical structure: sediment supply - Presence/absence of physical barriers - Maintain natural circulation of sediments and organic matter, without any physical obstructions	
- Physical structure: creeks and pans - Occurrence - Maintain/restore creek and pan structure, subject to natural processes, including erosion and succession	
- Physical structure: flooding regime - Hectares flooded; frequency - Maintain natural tidal regime	
- Vegetation structure: zonation - Occurrence - Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession	
- Vegetation structure: vegetation height - Centimetres - Maintain structural variation within sward	
- Vegetation structure: vegetation cover - Percentage cover at a representative sample of monitoring stops - Maintain more than 90% of area outside creeks vegetated	
- Vegetation composition: typical species	

Attribute/Measure/Target	Potential Impact of Proposed works
- Percentage cover - Maintain range of sub- communities with typical species listed in Saltmarsh Monitoring Project (McCorry and Ryle, 2009)	
- Vegetation structure: negative indicator species - Spartina anglica - Hectares - No significant expansion of common cordgrass (Spartina anglica), with an annual spread of less than 1%	
Kerry Head SPA[8]	
A017 Chough Pyrrhocorax pyrrhocorax	
- Population - Numbers Long term population stable or increasing	The nearby estuarine areas of the Lower River Shannon SAC and the Cashen River Estuary do not support suitable breeding habitat for Chough. Chough breeding colonies are usually sited on nests in caves or crevices along coasts, or less frequently, in old buildings.. The proposed works will be restricted to the existing embankment, dry slope area and improved grassland areas at Ballyeagh. The works areas, associated access routes and their immediate environs primarily support expansive improved grassland and more localised shingle and gravel shores habitat, where the existing embankment has been eroded. The access routes support improved grassland. To that end, the proposed works do not support viable breeding habitats for these species and are not located in proximity to and are unlikely to impact, directly or indirectly breeding requirements for Chough. The proposed works will be restricted to the existing embankment, dry slope area and improved grassland areas at Ballyeagh. The works areas, associated access routes and their immediate environs primarily support localised shingle and gravel shores habitat, where the existing embankment has been eroded and with remaining areas of improved grassland. The access routes also support improved grassland. The proposed works seek to refurbish and repair existing embankment infrastructure. These works will not involve habitat removal or replacement, rather the consolidation of existing infrastructure. There will be no removal or replacement of suitable foraging or roosting habitat for the SCI species of this SPA; i.e. Chough which forages on short
- Distribution - Numbers of birds an range of areas used No significant decrease in the numbers or range of areas used	

[8] There is no Site specific Conservation Objectives supporting document available for this European Site. Therefore specific attributes, measures and targets was yielded from the nearby Castlemaine Harbour SPA 004029 for Chough while specific attributes, measures and targets was yielded for Fulmar from the Beara Peninsula SPA 004155

Attribute/Measure/Target	Potential Impact of Proposed works
	turf and coastal grassland habitat such as sand dunes and machairs. To that end, the proposed works footprint and immediate environs do not support optimal foraging habitat for the SCI species for Kerry Head SPA. The proposed works will be scheduled during spring / summer and will not contribute towards localised disturbance or displacement to the over-wintering SCI species of this SPA.
Fulmar Fulmarus glacialis	
- Breeding - population size - Number of Apparently - Occupied Sites (AOS) - No significant decline	The nearby estuarine areas of the Lower River Shannon SAC and the Cashen River Estuary do not support suitable breeding habitat for Fulmar. Fulmar mainly breeds on sea cliffs, but will nest on level ground, on buildings and in burrows and crevasses. The proposed works will be restricted to the existing embankment, dry slope area and improved grassland areas at Ballyeagh. The works areas, associated access routes and their immediate environs primarily support expansive improved grassland and more localised shingle and gravel shores habitat, where the existing embankment has been eroded. The access routes support improved grassland. To that end, the proposed works do not support viable breeding habitats for these species and are not located in proximity to and are unlikely to impact, directly or indirectly breeding requirements for Fulmar. These works will not involve habitat removal or replacement, rather the consolidation of existing infrastructure. There will be no removal or replacement of suitable foraging or roosting habitat for the SCI species of this SPA; i.e. Fulmar which is a seabird foraging at sea. To that end, the proposed works footprint and immediate environs do not support optimal foraging habitat for the SCI species for Kerry Head SPA. The proposed works will be scheduled during spring / summer 2024 and will not contribute towards localised disturbance or displacement to the over-wintering SCI species of this SPA.
- Productivity rate - Number of fledged young per AOS Sufficient to maintain population	
- Distribution: Extent of AOS within the colony - Numbers of AOS occurring in each subsite of the island - No significant change in coverage	
- Prey biomass available - Kilogrammes - No significant decline	
- Disturbance at the breeding site - Level of impact - Disturbance occurs at levels that do not significantly impact on fulmar at the breeding site	
- Disturbance at marine areas immediately adjacent to the colony - Level of impact	

Attribute/Measure/Target	Potential Impact of Proposed works
- Disturbance occurs at levels that do not significantly impact on breeding fulmar	
- Barriers to connectivity - Number; location; shape; area (hectares) - No significant increase	

The assessment completed in Table 6.2 demonstrates that the proposed embankment repair works are unlikely to contribute impacts and consequent effects to the Annex I habitats within the project zone of influence. This is due to the localised scale of the proposed works and the nature of these receiving habitats which are associated with estuarine / coastal environments that experience routine fluctuations and regimes of sediment accretion and mobilisation during tidal cycles. Localised and temporary and short term disturbance effects may be realised to the mobile species of qualifying interest using the nearby estuarine sections of the Cashen River may be realised. It should however by noted that the proposed works are localised and targeted to existing infrastructure and will be short term in duration and therefore greatly reducing potential disturbance impact magnitude.

6.2 Best Practice Design & Mitigation Measures

The best practice design and mitigation measures outlined below will be implemented to ensure that any impacts on the receiving environment, will be avoided during the project's construction phase. They will also ensure that all potential pollutant sources will be retained to the works footprint and will not enter the surrounding environment and those European Sites within the project Zone of Influence.

All works carried out during this project will be undertaken in accordance with OPW's Environmental Management Protocols & Standard Operating Procedures. (Refer to "OPW Environmental Guidance: Drainage Maintenance & Construction 2019"). Environmental Drainage Maintenance (EDM) Guidelines will be followed at all times. Furthermore, the proposed works practices will follow those measures and sequencing outlined in Section 1.2 and Section 1.3.

Mitigation refers to measures taken to avoid or reduce negative impacts and effects (CIEEM, 2018)[9].

The evaluation of likely significant impacts of the proposed development includes recommendations for specific measures to avoid and reduce any negative impacts of a project (i.e. mitigation measures). These measures are considered necessary to minimise environmental impacts associated with the proposed development. Avoiding and/or minimising negative impacts is best achieved through consideration of potential impacts of the proposed project from the initial stages.

To minimise environmental impacts, it is important in the first instance that the following general principles are taken on board:

- Implementation of good OPW work practices on site, in accordance with works methods outlined in the accompanying Method Statement (Appendix A).
- Working in accordance with relevant legislation, including that relating to invasive species.
- Operatives should ensure adequate site supervision and security.
- Operatives should be briefed to ensure that environmental issues are taken into consideration and that guidelines and codes of practice are followed.

6.2.1 Site Compound

A construction works compound with designated areas for the storage of building materials (sand, cement, additives, etc.), plant machinery and for delivery of materials and fuel shall be provided during the works. The proposed location of the site compound are presented in Figure 1.2.

The works compound will be located on improved agricultural grassland areas on the terrestrial landward side of the proposed works. Only where required, the works compound area shall be temporarily resurfaced by placing a geotextile membrane onto the existing surface onto which a 200mm hardcore surface shall be placed. The mobile site compound will be located at least 50m from the foreshore area.

The following elements and designations shall be contained within the construction works compound locations:-

- Diesel generator;
- Temporary site office – Portakabin or similar;
- Employee Parking;

[9] CIEEM (2018). The Guidelines for Ecological Impact Assessment in the UK and Ireland

- Portaloo' type toilet facilities with suitable welfare and washing facilities. This will be positioned in the construction works compound. Any wastewaters generated from the construction works compound shall be discharged to self-contained storage tanks and shall be removed via a licenced contractor to a suitable wastewater disposal facility. No wastewaters generated within the works compound shall discharge to surface watercourses or to ground;
- Bunded re-fuelling area. It is not proposed to store any fuel, oils or chemicals within the construction works compound area or any other area within the site. Where re-fuelling of plant or machinery is required fuel will be delivered to site via a standard commercial fuel vehicle or a mobile fuel browser. Re-fuelling shall only be undertaken within the designated bunded refuelling area;
- Potable water supply to site office and welfare facilities.
- A water tanker to supply water used for other purposes;
- Designated areas for gravel, subsoil, topsoil and sand stockpiling; and
- Contractor lock-up facility.

6.2.2 Proposed Works Monitoring

The OPW will appoint an Environmental Officer from a member of their own ground staff or technical staff to oversee the appropriate implementation of the following mitigation measures. The OPW Environmental Guidance (Brew and Gilligan, 2019) will be strictly adhered to during these works. Ground staff and technical staff will set out all management works protocols in advance of their commencement and will maintain ongoing correspondence with landowners. They will ensure the successful implementation of all mitigation measures included in this NIS and will have the authority to stop works or temporarily halt or delay ongoing works where further consideration or on-site improvements of management measures may be necessary.

6.2.2.1 Ecological Clerk of Works

The works will be supervised and monitored by suitably qualified ecologist(s) to carry out the role as Ecological Clerk of Works (ECoW). The duration of frequency of monitoring will be informed by the nature, scale and locations of the proposed works. Monitoring frequency and duration will be greatest at project set up. The ECoW will be on site for the duration of the works and will monitor all works practices. The ECoW will be fully appraised of all of the mitigation measures included in this NIS, and the reasons why they are to be applied. The appointed ECoW will be a member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and will have at least 5 years experience. The appointed Ecologist will have the authority to stop works or temporarily halt or delay ongoing works where further consideration or on-site improvements of mitigation may be necessary.

The ECoW will report to the Environmental Officer. The ECoW(s) appointed to the works will have commensurate experience working in aquatic, semi-aquatic and terrestrial habitats and ecosystems. The role and responsibilities of the ECoW will be stated in the Risk Assessment Method Statement (RAMS) prepared by the contractor and agreed in advance.

The ECoW will also consider potential disturbance effects to sensitive receptors and will inform works scheduling and practices accordingly.

The ECoW will be fully appraised of all of the mitigation measures included in this NIS and the reasons why they are to be applied.

6.2.3 Management of Machinery and associated Materials

The OPW will prepare and securely store all potential pollutants within the site compound.

- All refuelling operations and mechanical repairs should be carried out at least 50m from the nearest aquatic zone on a dry, elevated site. Where this is not possible, on-site refuelling will be undertaken with every precaution taken to avoid spillage including the use, where practicable of bunding, drip trays and absorbent materials.
- Spent oil must be collected and retained for correct off-site disposal.
- Where possible, biodegradable oil should be used as a substitute for mineral oil.
- A spill kit including absorbent material and floating booms will be on site with mechanical equipment at all times. The operators should be familiar with its use.
- Under no circumstances will chemicals, fuels or machine oils be discharged into an aquatic zone.
- Construction plant and equipment shall only be parked over-night within the construction works compound area. Construction plant and equipment shall be checked daily for any visual signs of oil or fuel leakage, as well as wear and tear.
- Waste oils, empty oil containers and other hazardous wastes will be disposed of in accordance with the requirements of the Waste Management Act, 1996.

6.2.4 Movement of Machinery onto and Within Sites

These measures are prescribed to reduce and remove the risk of disturbance to habitats adjoining the works area.

- Access to the works area will be a local access road to the west. A pastoral field located to the west of the embankment will support a turning circle which will be formed using terram lined with 4" stone aggregate (See Figure 1.2).
- Works will be concentrated on the proposed embankment footprint and terrestrial margins. Access to and from the works area within wet or partially waterlogged areas will be achieved using bog mats. The correct surface treatment should be utilised where possible to minimise damage to ground and its constituent habitat. It is considered that the EPDM (Ethylene Propylene Diene Monomer) bog mats are likely to provide the best level of protection by reduction.
- The site monitoring works will ensure that construction machinery and general site works do not cause rutting, lodging or disturbance within the construction area. This will involve a site check by the appointed ECoW, together with the site foreman in advance of the works commencing, to identify and mark areas (with timber posts and flags or barrier tape) where works may lead to localised rutting or disturbance. This will inform the positioning of the surface treatment measures. The ECoW will be present when the surface treatment measures are installed and when operations commence to determine the efficacy, and where required amendments, of all surface treatment measures.
- Any dislodged soil is to be salvaged and reinstated with a digger. This will quickly re-establish and stabilise disturbed areas.

6.2.5 Protection of Soil, Surface Waters and Groundwater During Construction Stage

The following measures will be implemented to protect surface and groundwater during the project construction phase:

- All liquids, solids and powder containers will be clearly labelled and stored in sealable containers;

- All liquid and hazardous material will be stored in a designated and temporarily bunded area with appropriate signage. The temporary bunded area shall be located within the designated storage area located in the southern area of the site;
- There will be no discharge of effluent to groundwater or surface water during the construction phase. All wastewater from the construction facilities will be stored before removal off site for disposal and treatment;
- Spill kits will be provided in areas where liquids are stored and refuelling area;
- OPW personnel will be responsible for ensuring the regular maintenance of construction plant and equipment, to prevent leaks;
- Spill kits will be available to deal with accidental spillages;
- A regular review of weather forecasts for heavy rainfall will be required and the contractor will be required to prepare a contingency plan for before and after such events;
- The delivery point for concrete will be within the bunded designated construction compound area.
- Any compressors or generators used for connecting operations will be fitted with drip trays to collect any potential fuel and oil spills;
- Washing of tools or machinery with wet concrete will take place off-site at an appropriate dedicated wash facility that will pose no threat to surface waters;
- Overburden material shall only be stockpiled within a designated construction works compound area, and at least 50m metres from a watercourse. Separate stockpiles will be designated for different materials; and
- Building materials (sand, aggregates etc) shall only be stockpiled within site compound and laid out to minimise exposure to wind.

6.2.6 Dust Control

To ensure mitigation of the effects of dust nuisance, a series of measures will be implemented. These area outlined below.

- Overburden material shall only be stockpiled within a designated construction works compound area. Separate stockpiles will be designated for different materials;
- All stockpiles on site will be covered with a waterproof cover to prevent mobilisation of the stockpile material. Stockpiled soils and aggregates will not be located within 50m of the drainage channels or other viable hydrological vectors within the proposed development site or its surrounding environs.
- Building materials (sand, etc) shall only be stockpiled within site compound and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods. Stored building materials (except blocks, bricks, etc) will be provided with water-proof covers when not being used.

6.2.7 Invasive Species

- Prior to arrival on site, the contractor's vehicles and equipment will be thoroughly cleaned and then dried using high-pressure steam cleaning, with water >65 °C, in addition to the removal of all vegetative material. Items difficult to soak/spray will be wiped down with a suitable disinfectant (e.g. solution of 1% Virkon® Aquatic);
- Ensure all operatives are familiar with all relevant non-native invasive species. A full list and details can be found on the Inland Fisheries Ireland website http://www.fisheriesireland.ie/Invasive-Species/invasive-species.html#help-us.
- Any aggregate (including the large stones used for embankment reinforcement) imported to site will be subject to assessment, in order to identify any invasive alien species present. All aggregates

imported to site will be certified and supplied by approved quarries. Subject to the identification of invasive alien species present at any of the sites, machinery will be cleaned between infested sites (including footwear and tools).

- Relevant guidelines on aquatic based biosecurity measures can be accessed from the Inland Fisheries Ireland website http://www.fisheriesireland.ie/Invasive-Species/invasive-species.html#help-us
- All construction staff to refer to OPW Environmental Guidance: Drainage Maintenance and construction 2019 re: EP'S 18A and 18B.

6.2.8 Other Legislation

- The works activities shall be carried out in such a manner as to prevent nuisance or pollution of any type, such as water, noise, odour, dust, visual, light, etc.
- The requirements of the Planning Acts, Public Health Acts, Fisheries Acts, Wildlife Acts, etc must be fully complied with.

6.2.9 OPW Standard Operating Procedures

In addition to the above best practice measures, the proposed works will be competed in accordance with the measures outlined in the 'OPW Environmental Guidance: Drainage Maintenance & Construction 2019".

Table 6-3 Mitigation measures to reduce or avoid adverse effects on features of qualifying interest for European Sites within the project Zone of Influence

Potential Impact Source	Features of Qualifying Interest within the Project Zone of Influence	Character of Potential Effect	Mitigation Measures	Residual Effect
Release of particulate matter and aggregates (from open or mounded soil, subsoil and aggregates) during the embankment and sluice replacement works	Aquatic species and water dependent species of qualifying interest: 1095 Sea Lamprey Petromyzon marinus; 1096 Brook Lamprey Lampetra planeri; 1099 River Lamprey Lampetra fluviatilis; 1106 Atlantic Salmon Salmo salar (only in fresh water); 1160 Large shallow inlets and bays; 1170 Reefs; 1130 Estuaries; 1140 Mudflats and sandflats not covered by seawater at low tide; 1310 Salicornia and other annuals colonizing mud and sand; 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae); 1349 Bottlenose Dolphin Tursiops truncatus;	The release of particulate matter and soils and aggregates have the potential to degrade water quality in downstream receiving aquatic environments.	Proposed works practices – works nature and scale Section 1.1.1 Site Compound – Section 6.2.1 Proposed Works Monitoring – Section 6.2.2 Protection of Soil, Surface Waters and Groundwater during construction – Section 6.2.5 Dust Control – Section 6.2.6	Imperceptible

Potential Impact Source	Features of Qualifying Interest within the Project Zone of Influence	Character of Potential Effect	Mitigation Measures	Residual Effect
	1355 Otter Lutra lutra; and 1410 Mediterranean salt meadows (Juncetalia maritimi). (only in fresh water) A009 Fulmar Fulmarus glacialis A346 Chough Pyrrhocorax pyrrhocorax			
Release of other construction phase contaminants – hydrocarbons, wet cement and lubricants	1095 Sea Lamprey Petromyzon marinus; 1096 Brook Lamprey Lampetra planeri; 1099 River Lamprey Lampetra fluviatilis; 1106 Atlantic Salmon Salmo salar (only in fresh water); 1160 Large shallow inlets and bays; 1170 Reefs; 1130 Estuaries; 1140 Mudflats and sandflats not covered by seawater at low tide; 1310 Salicornia and other annuals colonizing mud and sand; 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae);	The release of such contaminants through overland flow run-off has the potential to degrade water quality in downstream receiving aquatic environments, resulting in indirect effects to reliant and symbiont habitats and species.	Proposed works practices – works nature and scale Section 1.1.1 Site Compound – Section 6.2.1 Proposed Works Monitoring – Section 6.2.2 Protection of Soil, Surface Waters and Groundwater during construction – Section 6.2.5 Dust Control – Section 6.2.6	Imperceptible

Potential Impact Source	Features of Qualifying Interest within the Project Zone of Influence	Character of Potential Effect	Mitigation Measures	Residual Effect
	1349 Bottlenose Dolphin Tursiops truncatus; 1355 Otter Lutra lutra; and 1410 Mediterranean salt meadows (Juncetalia maritimi). (only in fresh water) A009 Fulmar Fulmarus glacialis A346 Chough Pyrrhocorax pyrrhocorax			
Rutting / removal of riparian habitat with construction machinery	1140 Mudflats and sandflats not covered by seawater at low tide 1310 Salicornia and other annuals colonizing mud and sand 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) 1355 Otter Lutra lutra	Direct and indirect disturbance of in-situ habitat. Disturbance of foraging habitat for otter.	Proposed works practices – works nature and scale Section 1.1.1 Proposed Works Monitoring – Section 6.2.2 Movement of machinery onto and within sites and within sites Section 6.2.4	Imperceptible
Spread of Invasive Species	All features of qualifying interest will be impacted indirectly through the spread of invasive plant species	Direct disturbance, habitat replacement and loss, degradation of in-situ and adjoining habitat.	Proposed works practices – works nature and scale Section 1.1.1 Proposed works monitoring – Section 6.2.2 Invasive Species – Section 6.2.7	Imperceptible

Potential Impact Source	Features of Qualifying Interest within the Project Zone of Influence	Character of Potential Effect	Mitigation Measures	Residual Effect
			OPW Standard Operating Procedures – Section 6.2.9	
Disturbance of mobile QI species	1355 Otter Lutra lutra	Direct and indirect disturbance / displacement of foraging QI species for the Lower River Shannon SAC.	Proposed works practices – works nature and scale Section 1.1 Proposed works monitoring - Section 6.2.2 OPW Standard Operating Procedures – Section 6.2.9	Imperceptible

6.2.10 Implementation of Mitigation Measures

The Mitigation Measures (Project Design measures, Management Plans, Environmental Emergency Procedures and Best Practice Measures) will be implemented by the Site Manager during the construction stage and the OPW's appointed Environmental Officer. Implementation of the Mitigation Measures will be implemented under the proposed works plan and the OPWs Standard Operating Procedures.

All protection measures have been designed in line with Best Practice and constitute the Best Available techniques following scientific literature and field baseline verification. As such there is a very high degree of confidence in their likely success.

Implementation of the mitigation measures will be the responsibility of OPW and their appointed contractors. The supervision of the works will be carried out by ground staff and technical staff with experience in carrying out works on sensitive watercourses and will have 'stop works' authority.

6.2.11 Degree of confidence in the likely success of the mitigation measure

All protection measures have been designed in line with Best Practice and constitute the Best Available techniques following scientific literature and field baseline verification. As such there is a very high degree of confidence in their likely success.

6.2.12 How any mitigation failure will be addressed

The Mitigation measures prepared specifically for this project have been designed in line with Best Practice and constitute the Best Available techniques following scientific literature and Best Practice. The Mitigation Measures are considered to be robust and proven measures which will avoid adverse effects to European Sites.

On this basis, it can be confidently concluded that failures in the mitigation measures and their prescribed outcomes will be avoided.

The best practice measures and mitigation measures presented in this NIS will ensure potentially adverse effects are identified in a timely manner and appropriate remedial action is taken immediately. The ground staff and technical staff with experience in carrying out works on sensitive habitats will have 'stop works' authority. Where required, they will temporarily stop works should mitigation measures not be complied with or following an unforeseen environmental event. Works will not be allowed to re-commence until the issue is resolved.

6.3 Residual Effects

Provided that the recommended mitigation measures set out in Section 6.2 are implemented in full, it is not expected that significant impacts will result to the qualifying features identified for appraisal in this NIS and thus it is not expected that the proposed works will have an adverse impact on the integrity of European Sites.

The NIS has examined and analysed in the light of the best scientific knowledge with respect to the Lower River Shannon SAC and Kerry Head SPA, the potential impact sources and pathways, how these could impact on the site's conservation objectives and whether the predicated impacts would adversely affect the integrity of the said European sites. There is no other European site at risk of effects from the proposed development.

It has been objectively concluded, following an examination, analysis and evaluation of the relevant information, including the nature of the predicted impact from the proposed development, that the proposed development will not adversely affect (either directly or indirectly) the integrity of the Lower River Shannon SAC and Kerry Head SPA, either alone or in combination with other plans or projects. Potential residual effects are considered to be imperceptible following the implementation of mitigation measures. There is no reasonable scientific doubt in relation to this conclusion.

7 NIS Conclusion

This Natura Impact Statement has been prepared to provide sufficient objective scientific information in support of the proposed development, in order to allow an Appropriate Assessment determination in the context of Article 6(3) of the Habitats Directive. The report has been prepared in order to evaluate the significance of potential effects on European sites from the proposed works, alone and in-combination with other developments.

The AA Screening (see Section 5) found that it could not be excluded, on the basis of objective scientific information that the proposed works, individually or in combination with other plans or projects, would not have a potential contributory effect on a European site without the implementation of best practice measures and standard operating procedures being implemented. Therefore, a NIS (presented in Section 6) was undertaken to ascertain whether the proposed works would have an adverse effect on the integrity of European sites within the project ZoI.

Other relevant projects and plans within the project zone of influence that may give rise to in-combination effects was considered in Section 5 and Table 5.2. This assessment found that the proposed works would not give rise to in-combination or cumulative effects to European Sites.

Best Practice Measures and Standard Operating Procedures for the proposed works (as outlined within Section 6.2) have been identified to ensure that potential disturbance effects and potential pollutant sources are not released from the proposed works to the receiving environment. With the implementation of these measures there will be no risk of adverse effects on these Qualifying Features / Special Conservation Interests of European sites within this project's ZoI. As the proposed works are located within the footprint of the Lower River Shannon SAC, other key measures include the OPWs standard best practice environmental control measures which aim to restrict the works to the project footprint to avoid the removal or disturbance of non-target habitat outside of the works area.

There are no significant effects identified which would adversely affect the Special Conservation Interests or conservation objectives of the SPAs under consideration with regard to the densities, range or conservation status of the waterbird species and their supporting wetland habitats.

There are no significant effects identified which would adversely affect the Qualifying Interests or conservation objectives of the various SACs under consideration with regard to the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected.

The provisions of Article 6 of the 'Habitats' Directive 92/43/EC (2000) defines integrity as the 'coherence of the sites ecological structure and function, across its whole area, or the habitats, complex of habitats and/or population of species for which the site is classified'. It is clear that, given the application of prescribed protective measures for the avoidance of impacts and the implementation of the required mitigation measures, the proposed development will not give rise to adverse effects on the integrity of any of the identified European sites evaluated herein.

It has been concluded that the works individually or in combination with other plans and projects will not adversely affect the integrity of a European site, and there is no reasonable scientific doubt in relation to this conclusion.

APPENDIX A – WORKS METHOD STATEMENT

Scheme:	Feale Arterial Drainage Scheme
Project:	Bank protection & Rock armour E1 400 - 800 Chainage
Site Location:	Ballyeagh, Co.Kerry (52.4873, -9.6643) (Lat, Long)

1 Outline of Proposed Works

This Method Statement refers to proposed works on the OPW's Feale Arterial Drainage Scheme. The proposed work includes the Rock Armour of an existing E1 Embankment between chainage 400 and 800 meters. The works will involve installing Geotextile along the base of the embankment and layering rock armour to re-establish the berm to protect the embankment. Please see figure 4 for details. Approx. 400m of Rock Armour is required given that there is some timber post panelling in place and assuming it is structurally sound, will remain.

The site is located in the townland of Ballyeagh approx. 1.1km from the R551. Access is via a local road of local road. See figures below for information.

Works on site will typically be carried out during standard OPW hours re: 08:00 – 16:30. Embankment E1 is located next to the River Feale/Cashen estuary, which is subject to tidal water. The flow and water levels in the channel will vary depending on recent rainfall patterns and tidal regime and time of year works are being undertaken. It is intended to carry out the works in April 2024 onwards. Inland Fisheries will be contacted prior to any works commencing.

Please Note: This method statement should be read in parallel with the completed OPW Project Risk Assessment Form and all relevant project documentation. TBT Covid-19 Site Safety Induction Shall also be carried out before work commences.

If any issue within this method statement, or during the progression of the works needs clarification, the appropriate supervisor should be contacted immediately.

Site Location

Embankment E1 Ballyeagh, Co. Kerry (Chainage 400 to 800) (52.4873, -9.6643). See figures 1 and 2 for information.

Figure 1: Location Map from Google Maps Aerial Imagery

Scheme:	Feale Arterial Drainage Scheme
Project:	Bank protection & Rock armour E1 400 - 800 Chainage
Site Location:	Ballyeagh, Co.Kerry (52.4873, -9.6643) (Lat, Long)

Figure 2: Location Map With OPW Infastrucute Included

Figure 3: E7 Chainage 0m

Scheme:	Feale Arterial Drainage Scheme
Project:	Bank protection & Rock armour E1 400 - 800 Chainage
Site Location:	Ballyeagh, Co.Kerry (52.4873, -9.6643) (Lat, Long)

Figure 4: Proposed works

Scheme:	Feale Arterial Drainage Scheme
Project:	Bank protection & Rock armour E1 400 - 800 Chainage
Site Location:	Ballyeagh, Co.Kerry (52.4873, -9.6643) (Lat, Long)

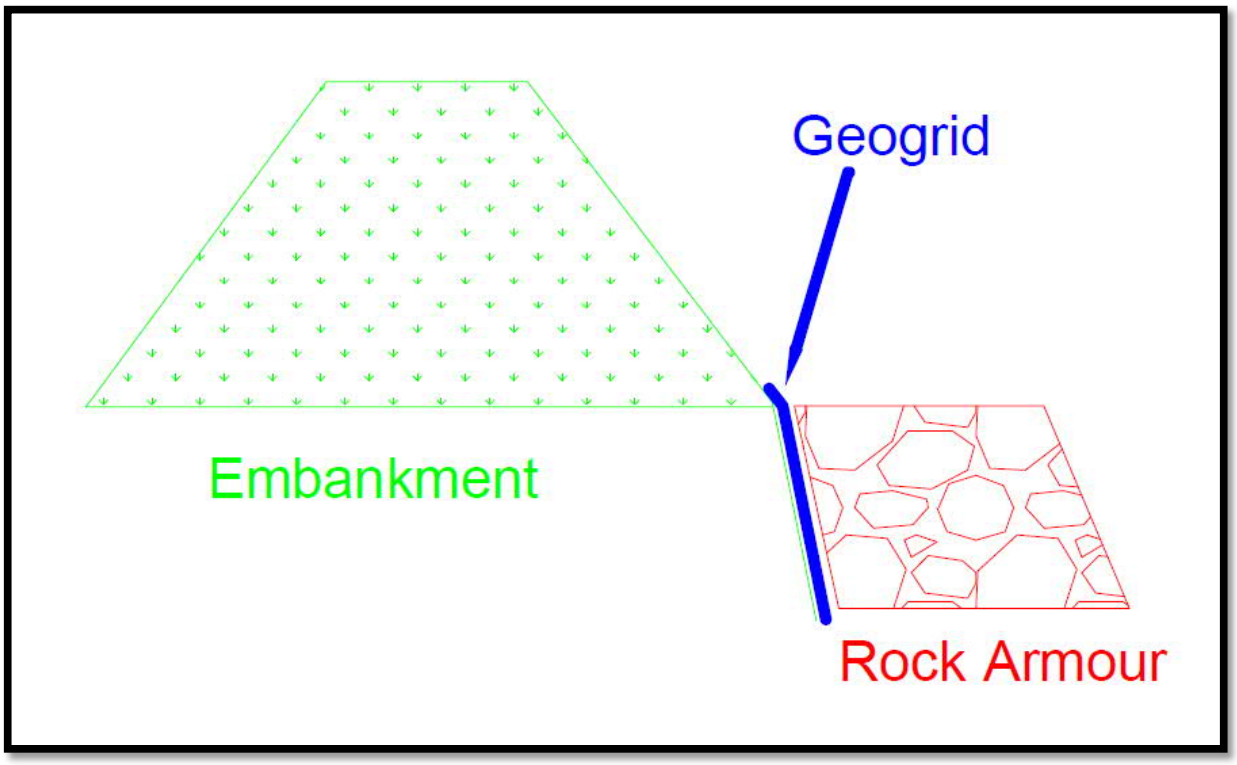

Figure 4: Proposed works

Scheme:	Feale Arterial Drainage Scheme
Project:	Bank protection & Rock armour E1 400 - 800 Chainage
Site Location:	Ballyeagh, Co.Kerry (52.4873, -9.6643) (Lat, Long)

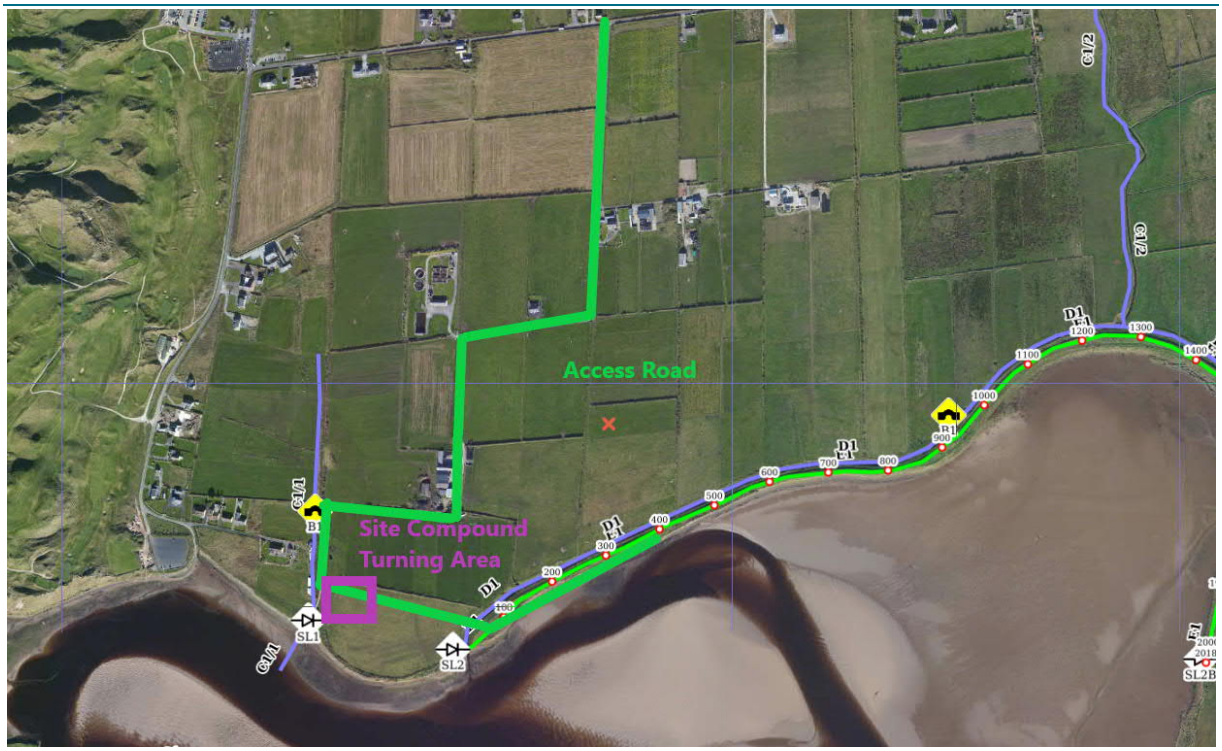

Figure 5: Proposed site layout & site access

2 RESPONSIBILITY FOR CONTROL ON SITE			
Project Foreman:	John Foley	Phone:	087 2242194
Site Supervisor:	Robert Collins	Phone:	087 2996972
Safety Representative:	Anthony Lynch	Phone:	086 3642501
Safety Officer:	Evan Keyes	Phone:	061 227139
Site Engineer:	David Cleary	Phone:	087 7187958

3 EQUIPMENT REQUIRED				
Major Plant	Quantity	Description	OPW	Hired
	2	14T Hydraulic Excavator	✓	
	1	Artic Truck & Low-loader	✓	
	1	Tractor & Trailer	✓	
	1	Site/Track Dumper	✓	
Small Plant/Tools	Quantity	Description	OPW	Hired

Scheme:	Feale Arterial Drainage Scheme
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Other Essential Equipment	Life Rings/Buoys Lifting Chains / Slings			

4 MATERIALS REQUIRED

Quantity	Description	Notes
T.B.C	Rock Armour	As per Design Drawing
T.B.C	Geogrid	As per Design Drawing
T.B.C	Gates and Fencing	As needed
T.B.C	3" down	As needed

5 HEALTH & SAFETY

All site operatives must read, and sign, the specific OPW Project Risk Assessment & Safety Plan relating to this project.

The Foreman will advise of any other relevant Health & Safety issues or procedures which must be followed during the construction works.

All works carried out on this project and site are to be carried out in accordance with the relevant OPW Risk Assessments and Safety Procedures. A copy of these documents will be available in the Site Office. All operatives are to ensure they are familiar with all of these procedures prior to commencing works.

Mechanical plant used on site during these works is restricted to plant approved in advance by OPW Mechanical Engineering staff and may vary depending on requirements.

Should any member of staff observe a Health and Safety issue during the course of this construction project, they must immediately inform their supervisor of their concern.

5.1 Establishment of Health & Safety Controls

The site will be prepared initially to ensure the security and safety of the site. This will include preparation of the access route, installation of fencing, gates, safety barriers & environmental barriers, where required.

A small site compound containing a steel container and eating facilities will be used to service works. Designated areas within the Site Compound will be established for welfare facilities, materials storage, vehicle parking and plant storage.

Scheme:	Feale Arterial Drainage Scheme
Project:	Bank protection & Rock armour E1 400 - 800 Chainage
Site Location:	Ballyeagh, Co.Kerry (52.4873, -9.6643) (Lat, Long)

All health and safety controls identified in the OPW Project Risk Assessment & Safety Plan shall be established BEFORE any construction works commence. This will include signage, fencing, access/egress route, secure access ladders, barriers etc.

All operatives, and visitors to site, are required to wear appropriate PPE at all times. All OPW employees must comply with existing Covid-19 regulations and requirements.

Visitors to site shall inform the Site Foreman/Supervisor of their presence. Operatives working on the site shall escort any visitors to the Site Foreman/Supervisor immediately upon observing a visitor to the site. The site supervisor will deliver a site induction to any visitors upon their arrival to site.

Good housekeeping procedures on the site shall be followed at all times. Materials will be stored tidily in a designated area, as instructed by the Site Foreman.

All potential hazards should be identified and where possible removed or appropriate mitigation measures put in place. All work to be carried out in accordance with appropriate safe working practices.

5.2 Safety Procedures & Risk Assessments

The following Safety Procedures and Risk Assessments, not exclusively, shall be examined and adhered to in the planning and execution of the works.

Risk Assessments

RA19 Portable Power Tools

RA35 Lifting Operations

RA38 Ladder

RA28 Working at Heights

RA29 Working Adjacent to or in Water

RA7 Excavator 360º

RA9 Fuel Bowser Operations

RA 57 Coronavirus (Covid 19)

RA15 Noise

RA32 Fencing Operations

RA23 Tractor Operations

RA14 Site Dumper

RA13 Low-loader Operations

Safety Procedures

- SP09 Personal Protective Equipment (PPE)
- SP10 Lifting Equipment - Lifting Gear
- SP11 Electricity
- SP14 Biological Agents
- SP21 Working at Heights
- SP32 Working Adjacent to Water

COVID-19 Compliance Warden TBT

Scheme:	Feale Arterial Drainage Scheme
Project:	Bank protection & Rock armour E1 400 - 800 Chainage
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COVID-19 Onsite Warden Checklist.

5.3 Working Adjacent to Water

The OPW "Working in or Adjacent to Water" Risk Assessment and SP32 "Working Adjacent to Water" Safety Procedure must be followed by all operatives. Guardrails shall be erected to secure banks above water.

Life-rings shall be erected at intervals not exceeding 50m along the proposed works areas.

Weather forecasts shall be consulted to ensure no potential large rainfall events are due to occur.

5.4 Working alongside Utilities

An examination of the GIS-Demo ESB layer network indicates that there does not appear to be overhead or underground assets in the vicinity of the works area.

A safe system of work shall be adopted at all times in relation to works taking place in the vicinity of overhead and underground power lines should they be observed to be present at this site location.

ESB Networks Code of Practice Avoiding Danger from Overhead Lines and HSA Code of Practice Avoiding Danger from Underground Services documents relating to these hazards shall be consulted prior to works being carried out. Copies of these documents are available in the Site Office. Any controls and mitigation measures identified in these documents shall be put in place and adhered to by all operatives.

A ground survey (CAT & Genny) by a competent operative will be carried out before any excavation takes place.

5.5 Lifting Operations

Any lifting operations required during this project must be conducted with due regard to the OPW Risk Assessment procedure.

The weights of all objects to be lifted shall be ascertained prior to lifting and all lifting appliances shall be recorded with their assigned Safe Working Load.

Lifting operations shall be undertaken in the presence of a trained slinger/signaller, with the driver of the lifting appliance having also completed slinger/signaller training.

All operatives who will be working in the vicinity of lifting operations will be informed of the lifting plan prior to any works commencing.

Ground conditions shall be assessed prior to lifting operations to ensure the lifting appliance has a suitable bearing. If there is a doubt over the ground conditions, timber matting shall be used underneath the lifting appliance.

5.6 Personal Protective Equipment

In addition to the standard PPE, operatives shall be provided with the following equipment for this project:

- Safety Goggles
- Ear Defenders
- Gloves
- Life Jacket (if water deep or fast moving – to be assessed by John Murray)

Scheme:	Feale Arterial Drainage Scheme
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6 Environmental Protection & Mitigation

All works carried out during this project will be undertaken in accordance with OPW's Environmental Management Protocols & Standard Operating Procedures. (Refer to "OPW Environmental Guidance: Drainage Maintenance & Construction 2019"). Environmental Drainage Maintenance (EDM) Guidelines will be followed at all times. . 'It should be noted the works are being carried out within or adjacent to a protected area re: SAC,.

Existing GIS habitat mapping will be analysed in advance of works to identify and flag any known sensitive areas. This information will be made available and briefed to the site team in advance of works.

6.1 Specific Environmental Management Procedures & Controls

Fuelling of machines will be carried out in accordance with OPW Protocols, machines will be kept away from the channel, not less than 50m and fuelled at a safe location with all machines provided with spill kits. The jeep delivering fuel is certified and double bunded. No fuels to be stored on site only in approved vented fuel store with spill trays incorporated.

6.2 Invasive Species

During the site inspection and ecological walkover surveys completed for Appropriate Assessment reporting the presence of invasive species was not observed. The site works area will be rechecked for invasive species before any works commence. Existing GIS maps will also be analysed and all pertinent information will be included in the project file.

The OPW SOP for the management of invasive species will be adhered to and all procedures carried out will be recorded in the Safety File. Care shall be taken to protect against the current Crayfish Plague using appropriate disinfection measures before entering site.

6.3 Biosecurity

All staff to refer to OPW Environmental Guidance: Drainage Maintenance and construction 2019 re: EP'S 18A and 18B.

7 Method of Works

7.1 Site Management

Prior to works beginning, a site compound shall be established with designated areas for:

- Welfare Facilities
- Vehicle Parking
- Plant Storage
- Equipment Storage
- Materials Storage

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The site compound (See Site Layout) will be set back not less than 50m from the working channel.

7.2 Site Preparation

The works area shall be fenced off to provide safety and security, if required.

Livestock fencing shall be installed given the location of the works within agricultural land, if required.

No works shall begin before the site works area is fully fenced off and secure.

7.3 Works Plan

The Foreman, Site Supervisor and excavator operators shall walk the site in advance of any works proceeding to assess ground conditions, determine suitability of the area for the placement of machinery, location of any services, such as overhead/underground power-lines etc. There was also no evidence of underground services or overhead power lines observed in the vicinity of the works area. Also Refer to maps attached to PRA/M.S.

Typical duration of Rock Armour works will be in the region of 5 weeks (15 – 18 man weeks). This will depend on site location, existing ground conditions and accessibility. Flow conditions in the channel.

On all occasions, the excavator operator must be satisfied with the ground conditions upon which he intends to work from.

When the excavator operator decides to position the excavator adjacent to the embankment he must ensure the embankment is stable, wide enough and has sufficient bearing capacity to accommodate the machine.

Discussion must take place between the excavator operator and the operatives working in the vicinity of the plant Operatives must not enter the danger zone of the excavator unnecessarily. Excavator operator is to liaise with the appointed slinger/signaller at all times.

7.4 De-watering of Works Area/Excavations

No dewatering required, works undertaken outside of tidal ingress.

7.5 Demolition of Existing Structure

N/A

7.6 Construction of Rock Armour – Methodology

Construction will be undertaken in accordance with the following design drawing.

- Figure 4

7.6.1 Setting up work site.

There is an existing entranceway and gates off the local road. Install compound and turning pad using geogrid and 3" down material compacted every 200mm.

7.6.2 Import of material

Large rock will be imported by lorry from local quarry (yet to be sourced) along the local public road delivered to our turning pad. Once the material is on site a Dumper, (wheel or tracked depending on ground conditions) will transport to the final location.

7.6.3 Placement of Terram and Rock Armour

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Terram will be placed and pinned along the front of the Embankment. The imported large rock to be placed along the Geogrid (By a 360 Excavator) to reform the berm approx. 400m in length. This will prevent more of the Embankment being eroded away.

7.6.4 Covering imported rock

The rock armour should be covered with soil and grass seed to give more stability to the embankment. This will allow estuarine slit to layer over the imported rock.

7.6.5 Reinstatement

On completion of works the turning pad and compound to be removed, the surrounding area shall be reinstated to a condition similar to, or better than the pre-works situation. All construction waste will be removed and disposed of off site.

8 Completion of Works

Boundaries shall be re-established to the landowner's satisfaction.

A photographic survey of the completed works shall be carried out by the Site Foreman.

Records of any utility diversions and their locations shall be maintained and filed appropriately.

A final inspection of the completed works shall be carried out by the Site Foreman and OPW Engineer to ensure satisfaction with the quality of the works and allow sign-off on OPW Project Risk Assessment / Safety Plan.

Landowner to be asked to fill out Landowner Satisfaction Form while adhering to Covid-19 Protocol.

9 Schedule of Appendices / Documents attached

Main Documentation:

- Site Location Maps
- Design Risk Assessment
- Project Risk Assessment
- OPW Standard Design Drawings:

Statutory Forms:

- TBT Covid-19 Site Safety Induction
- AF3
- AF4
- GA2

OPW Forms:

Incident Report Form

Contractors Rules

Scheme:	Feale Arterial Drainage Scheme
Project:	Bank protection & Rock armour E1 400 - 800 Chainage
Site Location:	Ballyeagh, Co.Kerry (52.4873, -9.6643) (Lat, Long)

– GA3

Project/Site	Ballyeagh, Co.Kerry Rock Armour E1 400 to 800m Chainage	
Checked By	John Foley	Foreman
Approved By	David Cleary	Engineer(s)
Read & Communicated By		Supervisor