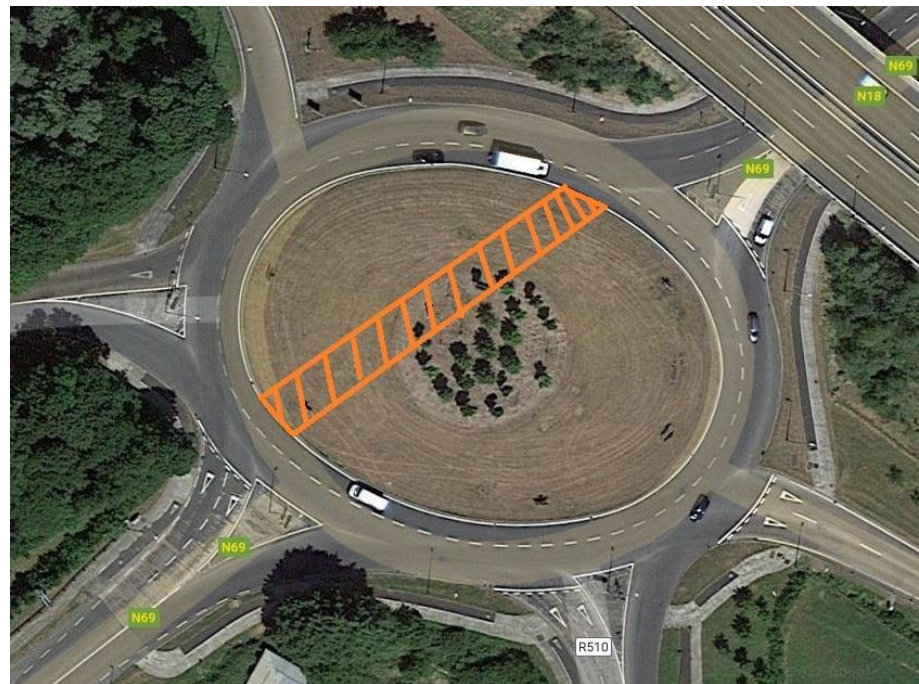
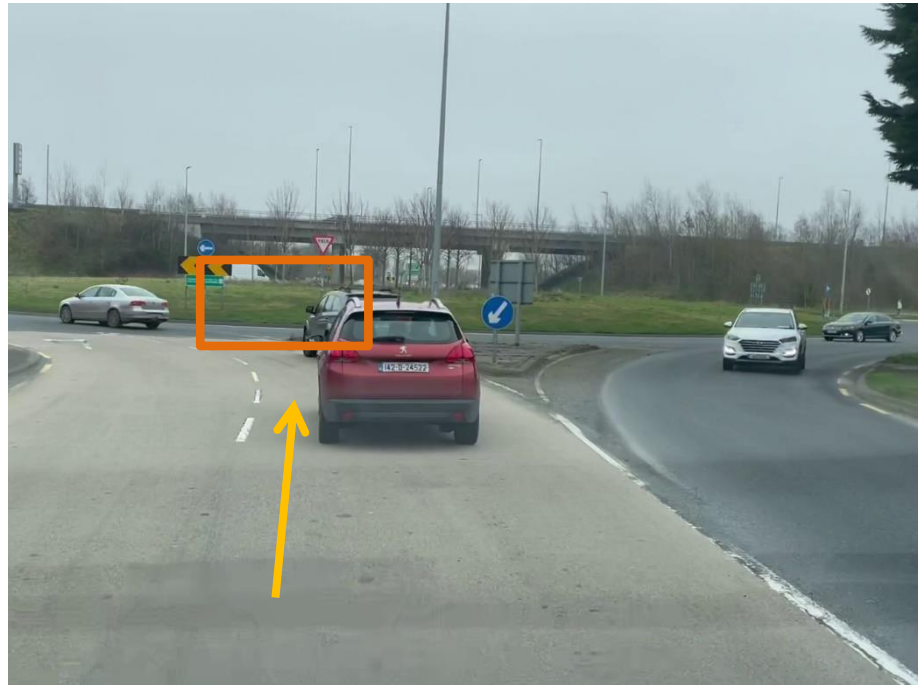


**Node 5. Mungret Interchange – West Roundabout.**

The best option for this roundabout is a 'cut-through' track through the centre island either on north or south side. Again here it alleviates the need to remove critical road signs and street lighting.



**Node 6. Mungret Interchange – East Roundabout.**

The roundabout has sufficient dimension but will require substantial enabling works for blade transport.

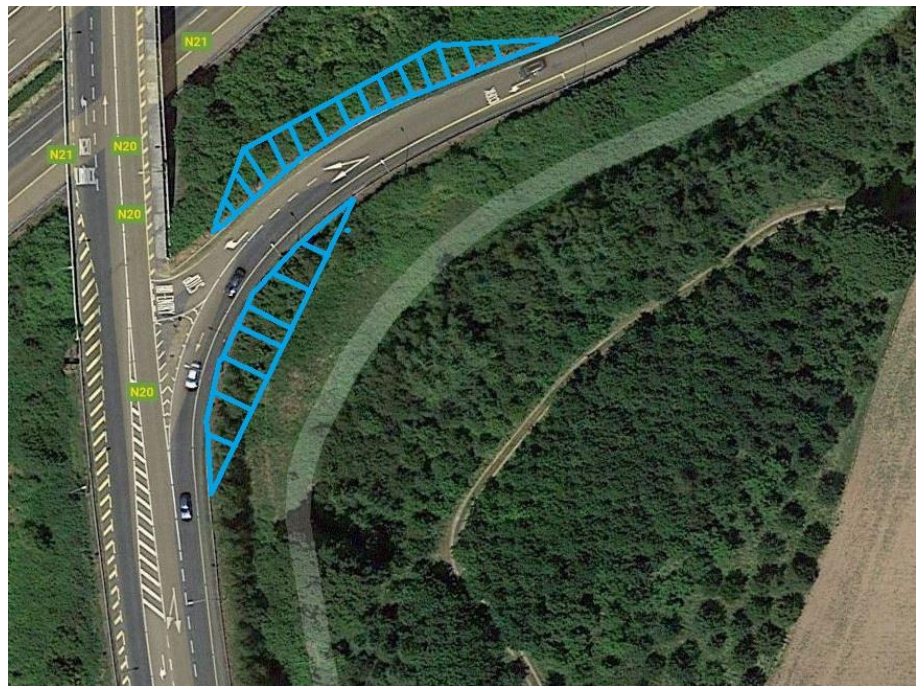
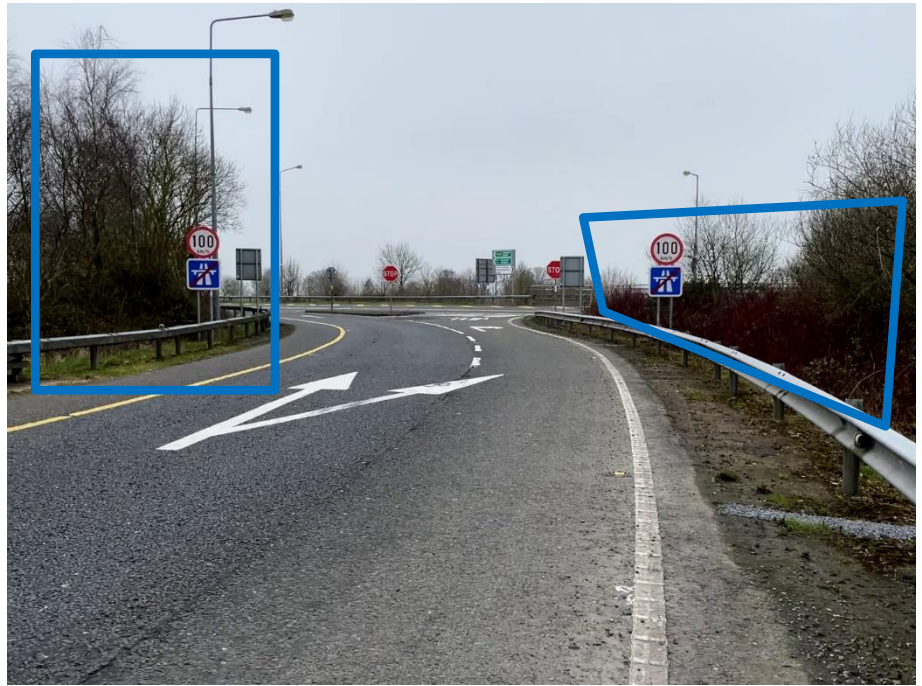
The required area could be made up of load bearing and oversail but such determination can only be made when trailer type and overhang are decided.





**Node 7. M20- N20 off ramp southbound**

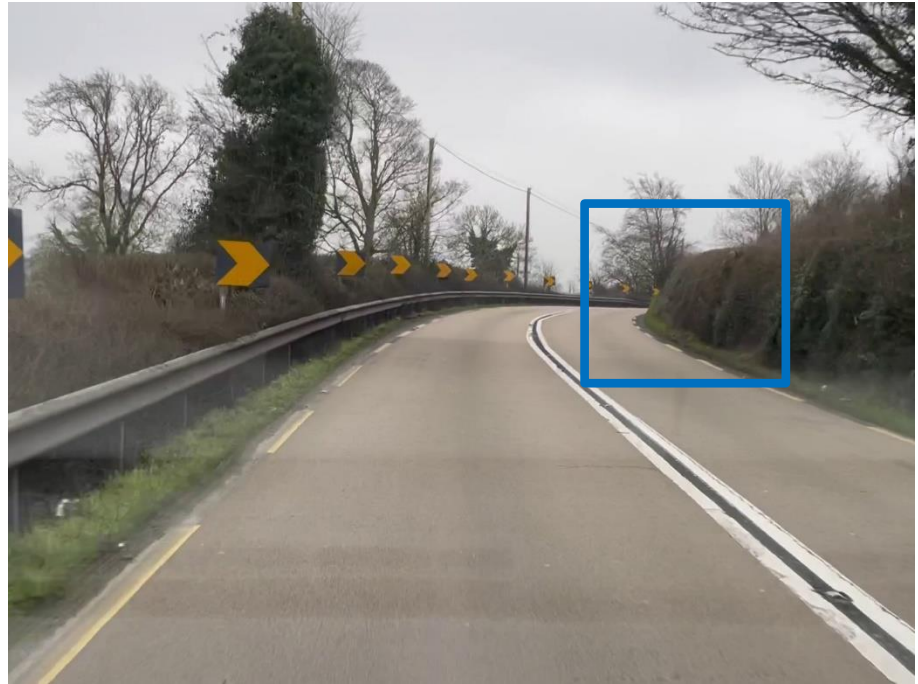
The junction does not have sufficient clearances and will require removal of signs and street lamp on left side and scrub clearance on left and right for mid and rear oversails.



**Node 8. N20 Right Curve.  
Ballymacrory**

**52.496368 -8.706154**

This right curve does not have sufficient dimension for 73m blade length. Enabling works on left or right or both for oversail only will be required.

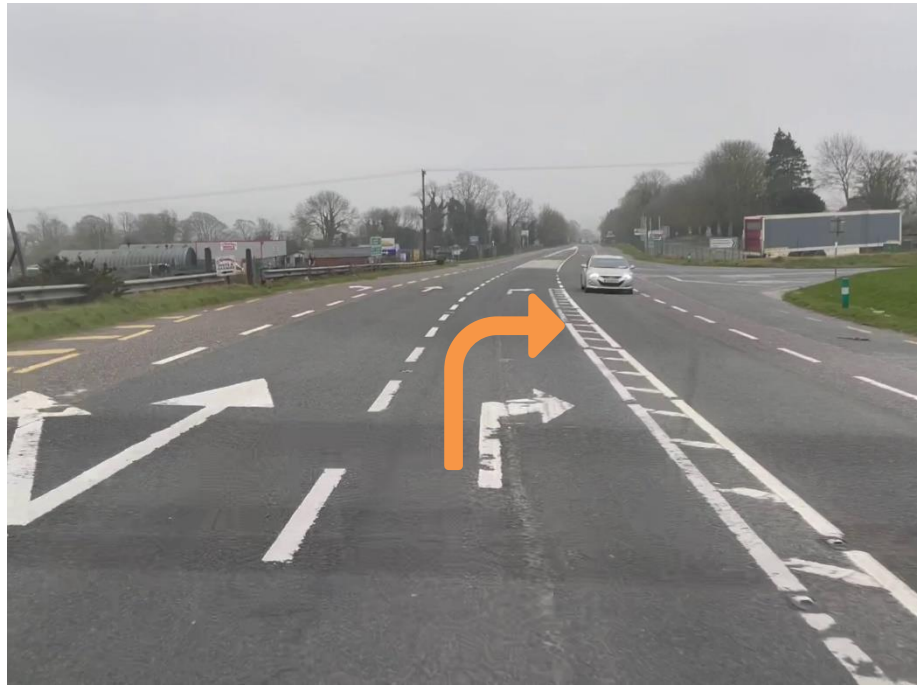




**Node 9. N20 – L1322  
Junction, Ballyhea**

This junction will require load bearing enabling works on the L1322

Road sign to be removed.

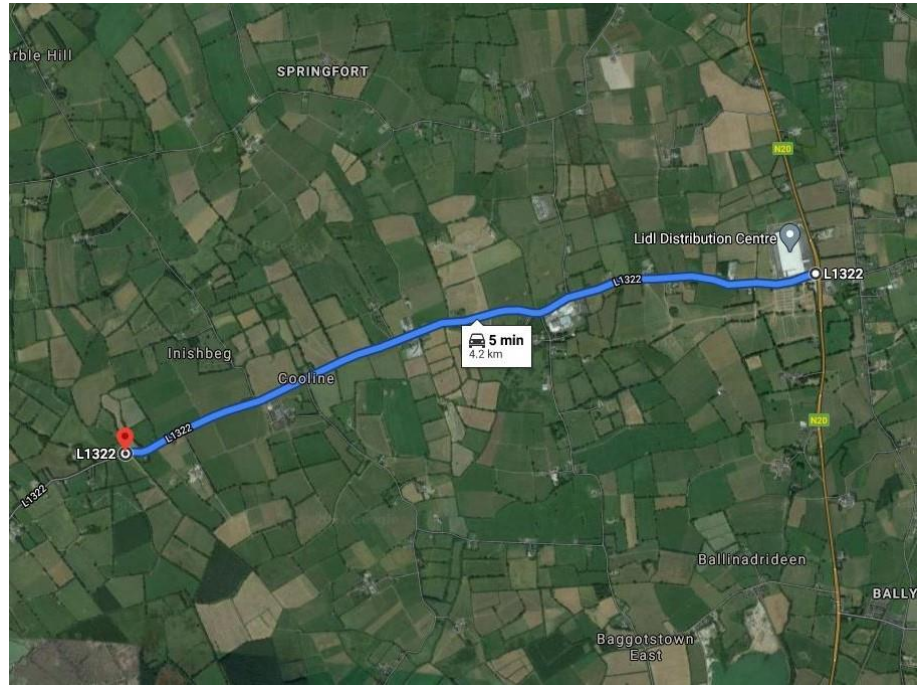






### Node 10. L1322

The L1322 from the N20 junction to site entrance will require upgrading and widening. Third party land take will be required at various points to facilitate blade transport. A number of areas have weak verges with poor drainage and will need to be upgraded during widening process.



### Node 10.1. L1322

Enabling works on right for mid oversail. Possible third party land take.



**Node 10.2. L1322**

Enabling works on left for mid oversail. Third party land take required. Possible additional option for rear oversail on right.



**Node 10.3. L1322**

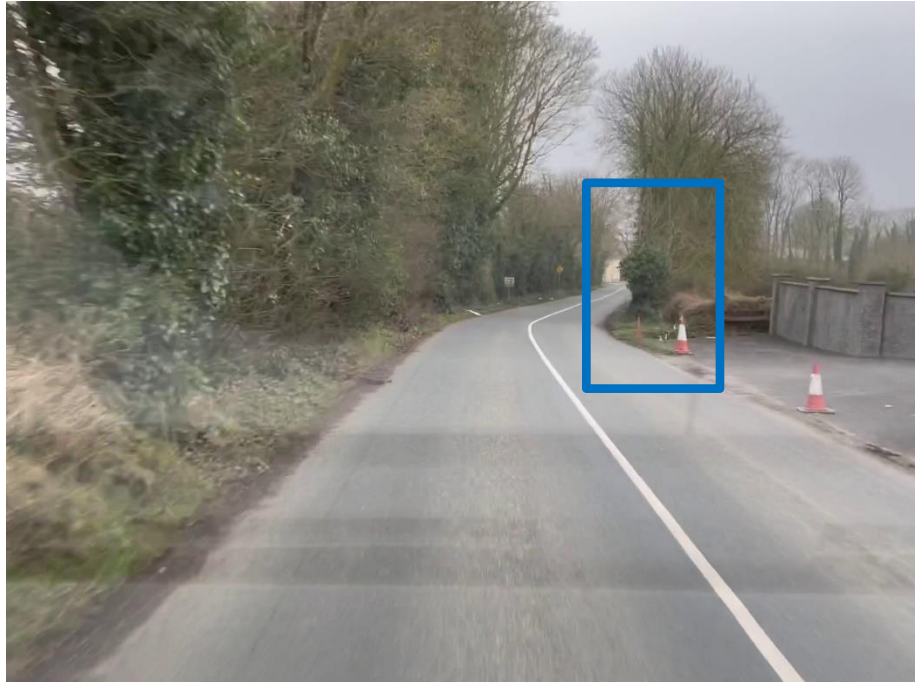
Enabling works on left for mid oversail. Third party land take required





**Node 10.4. L1322**

Enabling works on right for mid oversail. Possible third party land take.



**Node 10.5. L1322**

Enabling works on right for mid oversail. Walls of water pump enclosure should be reduced.



**Node 10.6. L1322**

Enabling works on right for mid oversail. Possible third party land take.



**Node 10.7. L1322**

Enabling works on left for mid oversail with option for rear oversail on right. Third party land take required.





**Node 10.8. L1322**

Enabling works on right for mid oversail. Possible third party land take.



**Node 10.9. L1322**

Enabling works on right, left or both for mid and rear oversail. Possible third party land take.



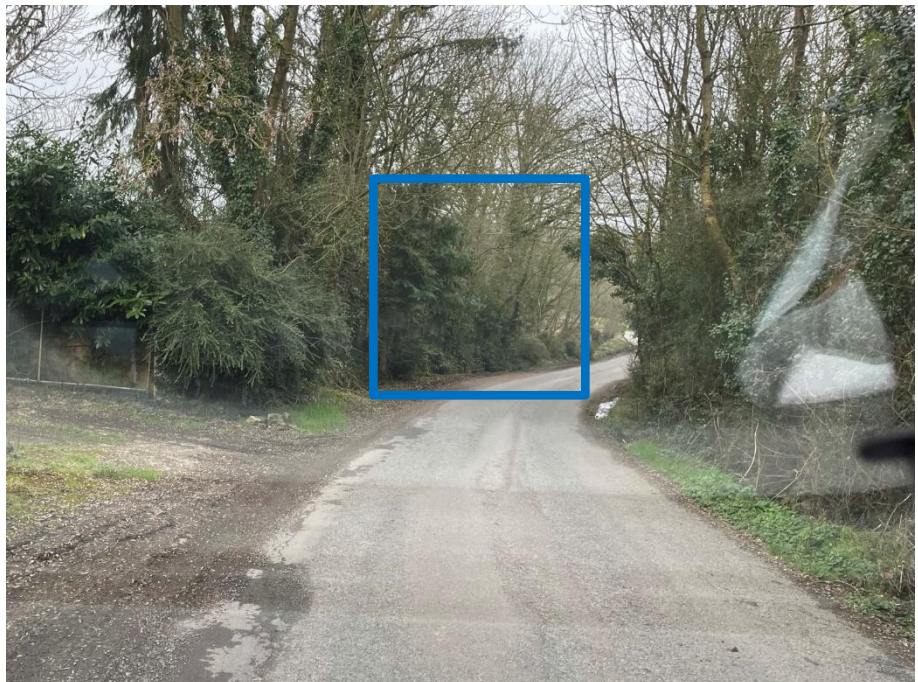
**Node 10.10. L1322**

Enabling works on right for mid oversail.




**Node 10.11. L1322**

Enabling works at site entrance.





|   |   |
|---|---|
| Other Route Options   | No other route options were considered in this survey.  |
| <b>Conclusions</b>  | <p>The route options shown are the only available for each entrance</p> <p>Bridge and other structure capacities have not been assessed.</p> <p>Tree canopy and overhead cables have not been surveyed as part of this survey</p> <p>A trial run should be carried out prior to delivery to verify works carried out.</p> <p>An early test run is recommended to verify passage of blades through node 3.</p> |
|  | Edwin Sunderland 15/03/21   |

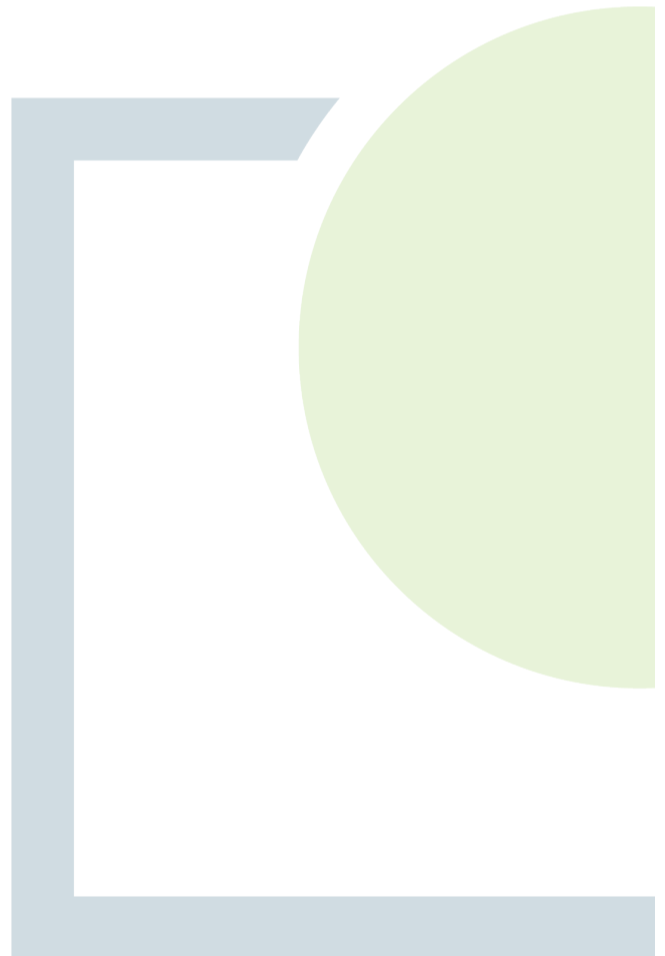


**FEHILY  
TIMONEY**

CONSULTANTS IN ENGINEERING,  
ENVIRONMENTAL SCIENCE & PLANNING

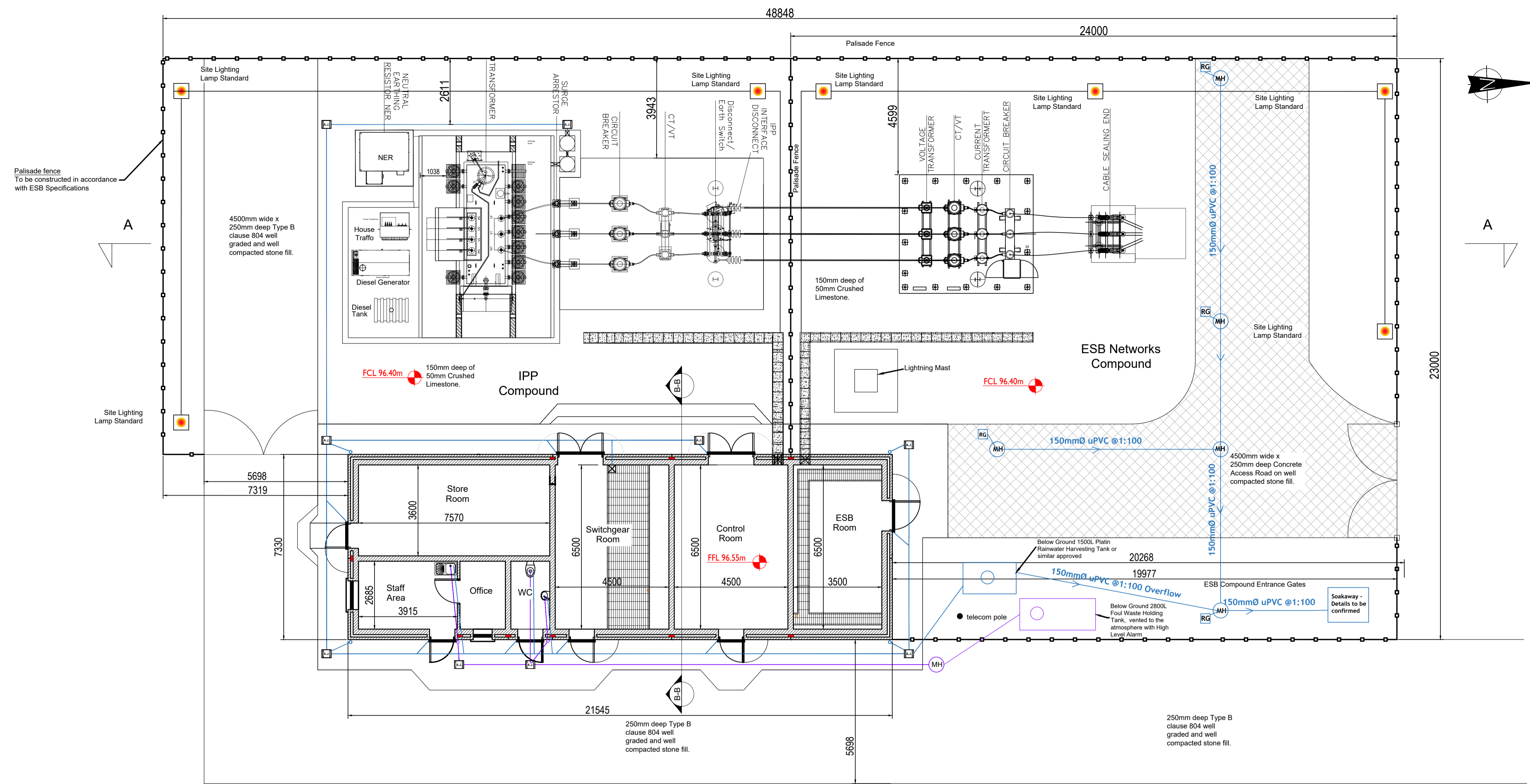
## **APPENDIX 2**

Referenced Drawings





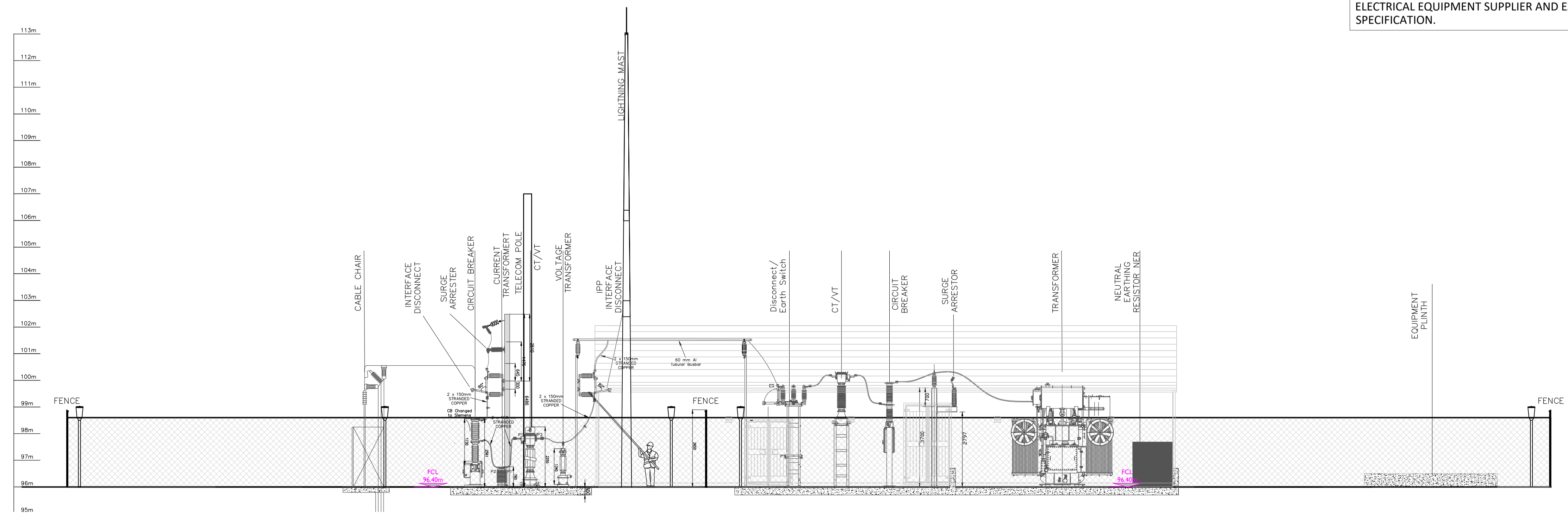




**Solar Farm-Substation Compound Layout**

SCALE 1:100

PLEASE NOTE THAT THE SUBSTATION LAYOUT AND SUBSTATION COMPONENTS ILLUSTRATED ON THIS DRAWING ARE INDICATIVE ONLY. THE FULL SPECIFICATION AND DETAIL WILL BE DETERMINED FROM THE ELECTRICAL EQUIPMENT SUPPLIER AND ESB FUNCTIONAL SPECIFICATION.



**Section A-A Through Substation Compound**

SCALE 1:100

PROJECT

**Annagh Wind Farm  
38kV Substation**

CLIENT



CONSULTANTS

NOTES: -

- Configuration of substation equipment and infrastructure is subject to detailed design and ESB design approval.
- The proposed substation layout should be used for planning purposes only.
- This drawing is to be read in conjunction with relevant drawings, specifications and reports.
- Dimensions are in millimeters, unless noted otherwise.
- Drawings are not to be scaled use figured dimensions only.

LEGEND: -

- Planning Boundary shown thus
- Surface water drainage shown thus
- Foul drainage shown thus
- Lamp Standard shown thus
- Proposed Levels Shown thus (Planning)
- Proposed Levels Shown thus (Elevation and Sections)
- Concrete Access Road shown thus

ISSUE/REVISION

| NO  | DATE     | DESCRIPTION         |
|-----|----------|---------------------|
| P01 | 20.10.21 | Issued For Planning |
| P00 | 30.06.21 | Issued for Planning |
| I/R | DATE     | DESCRIPTION         |

PROJECT NUMBER

05-813

SHEET TITLE

38kV Substation Compound  
Layout & Section

SHEET NUMBER

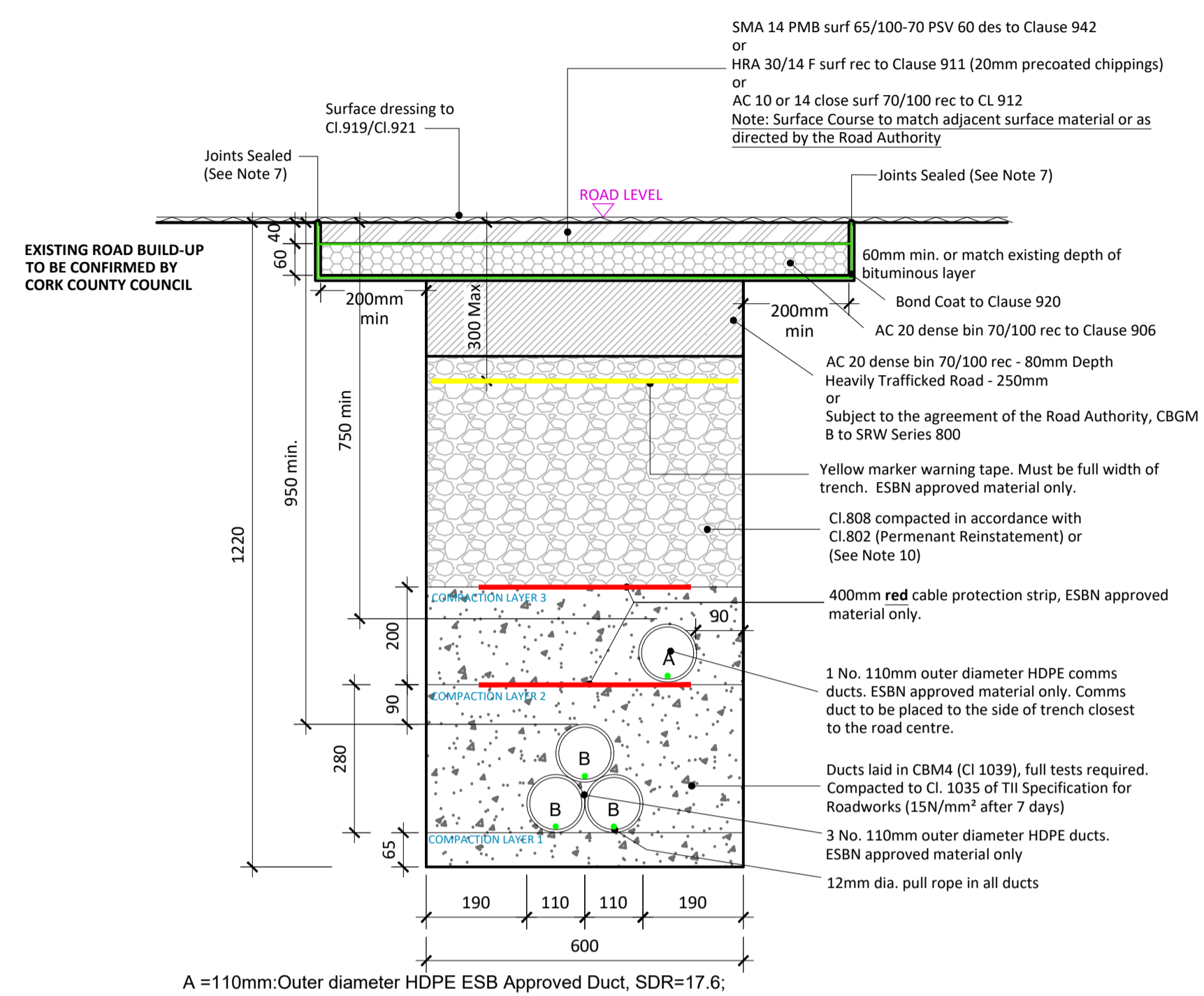
05813-DR-017





### Permanent Reinstatement

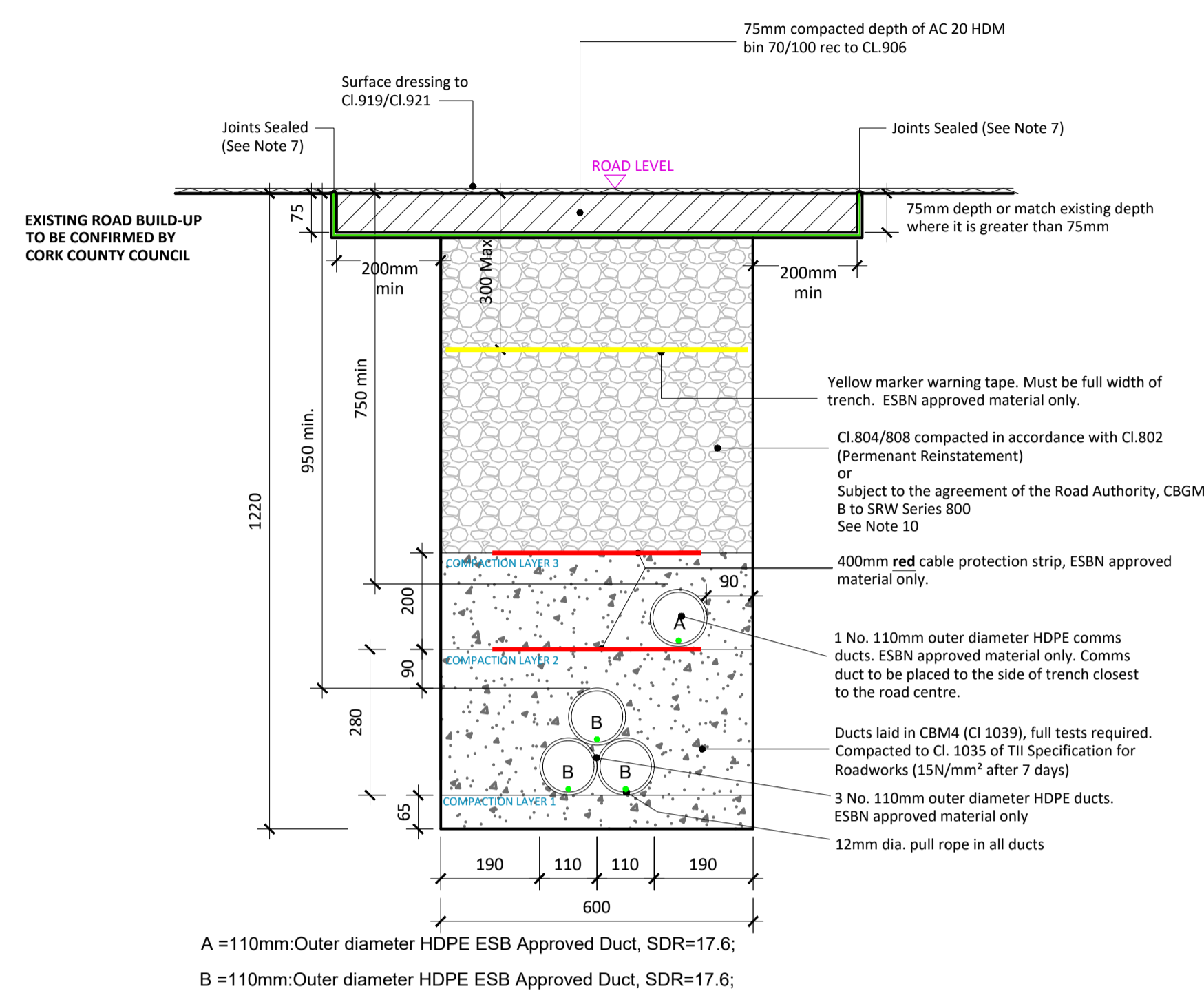
Reinstatement details based on Guidelines for Managing Openings in Public Roads - SD4



**Typical Section Through Permanent Reinstatement of Longitudinal Opening in Roadway**

SCALE 1:10

Reinstatement details based on Guidelines for Managing Openings in Public Roads - SD5



**Typical Section Through Permanent Reinstatement of Longitudinal Opening in Dressed Rural Unbound Roadway**

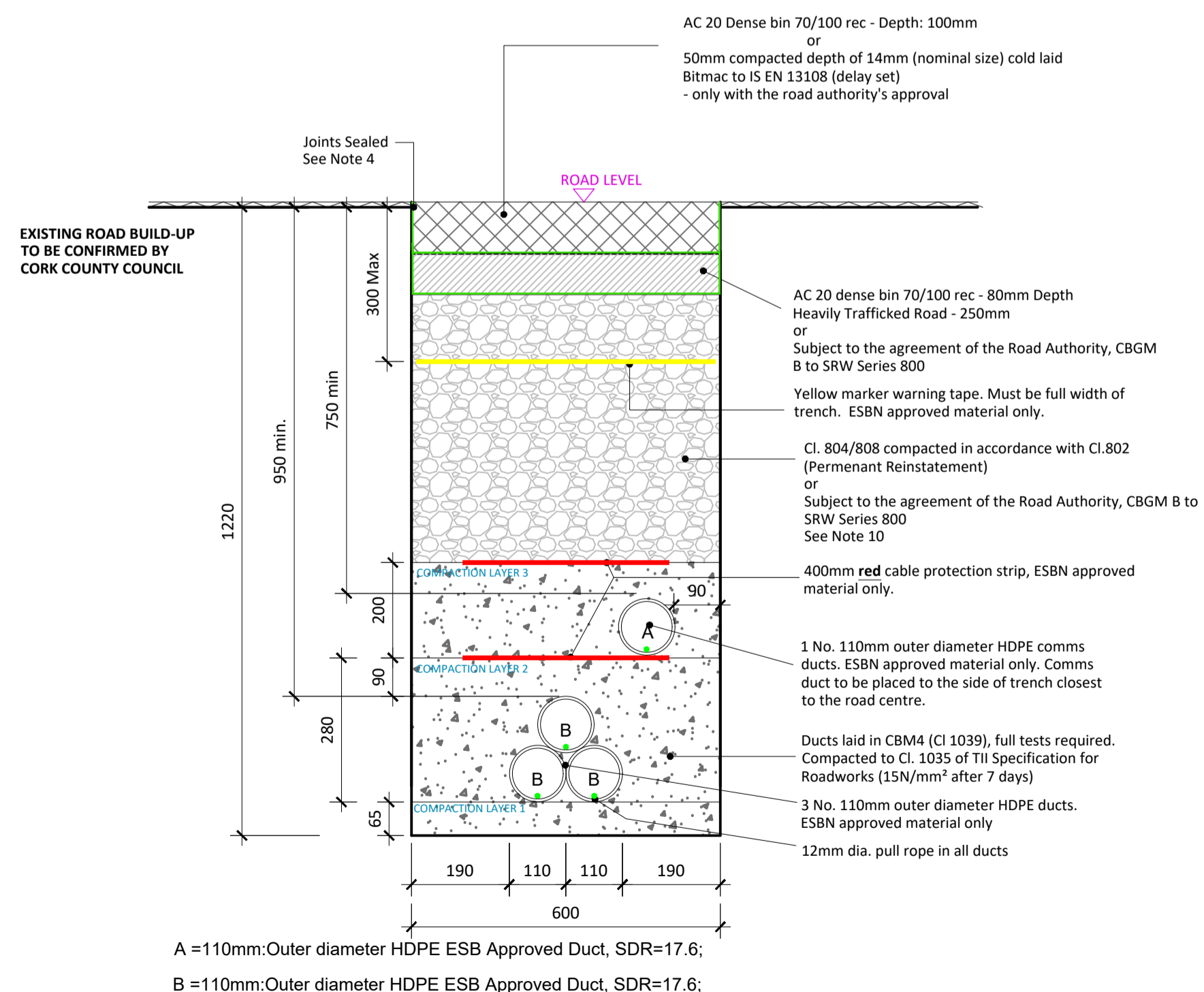
SCALE 1:10

**ALL REINSTATEMENT WORKS ARE TO BE IN ACCORDANCE WITH LOCAL AREA ENGINEERS REQUIREMENTS AND GUIDELINES FOR MANAGING OPENINGS IN PUBLIC ROADS**

- Note:
- Refer to Guidelines for managing Openings in Public Roads (Purple Book - April 2017), Chapter 6 'Specifications' for guidance on Duct type / colour and Marker Tape type / colour.
  - All bound edges shall be saw cut to expose the full vertical thickness of each layer prior to excavation. All edges shall be essentially straight, smooth and vertical.
  - Where a temporary surface has been used, material shall be planed out to the depth specified in this drawing. The new permanent surface shall be machined laid and mechanically compacted with a vibrating roller.
  - Where the trimmed edge of excavation is within 400mm\* of a joint / edge, ironwork or other reinstatement, this trimmed edge shall be extended to include same and the area of reinstatement shall be extended accordingly (\* increase to 800mm where this is pre-existing practice).
  - Any damaged area adjacent to the opening and resulting from the excavation operation shall be included within the area to be reinstated.
  - Clause 808 or Cement Bound Granular Material surface to be sprayed per clause 920 prior to application of Asphalt Concrete Layer.
  - Joint sealer shall be a hot 50 pen bitumen binder or cold thixotropic bitumen 50-70 pen to be applied to all vertical cuts in accordance with B.S.594987 prior to application of bituminous materials.
  - For roads without asphalt concrete surface (e.g. may be CI.804 with double surface dressing), the road authority may at its discretion permit the temporary reinstatement surface of asphalt concrete to be regulated in lieu of excavation and reinstatement; and subsequently surface dressed.
  - On highly trafficked roads services must have a minimum cover of 750mm.
  - Where required by the Road authority the trench may be reinstated with a Cement Bound Granular Material.

### Temporary Reinstatement

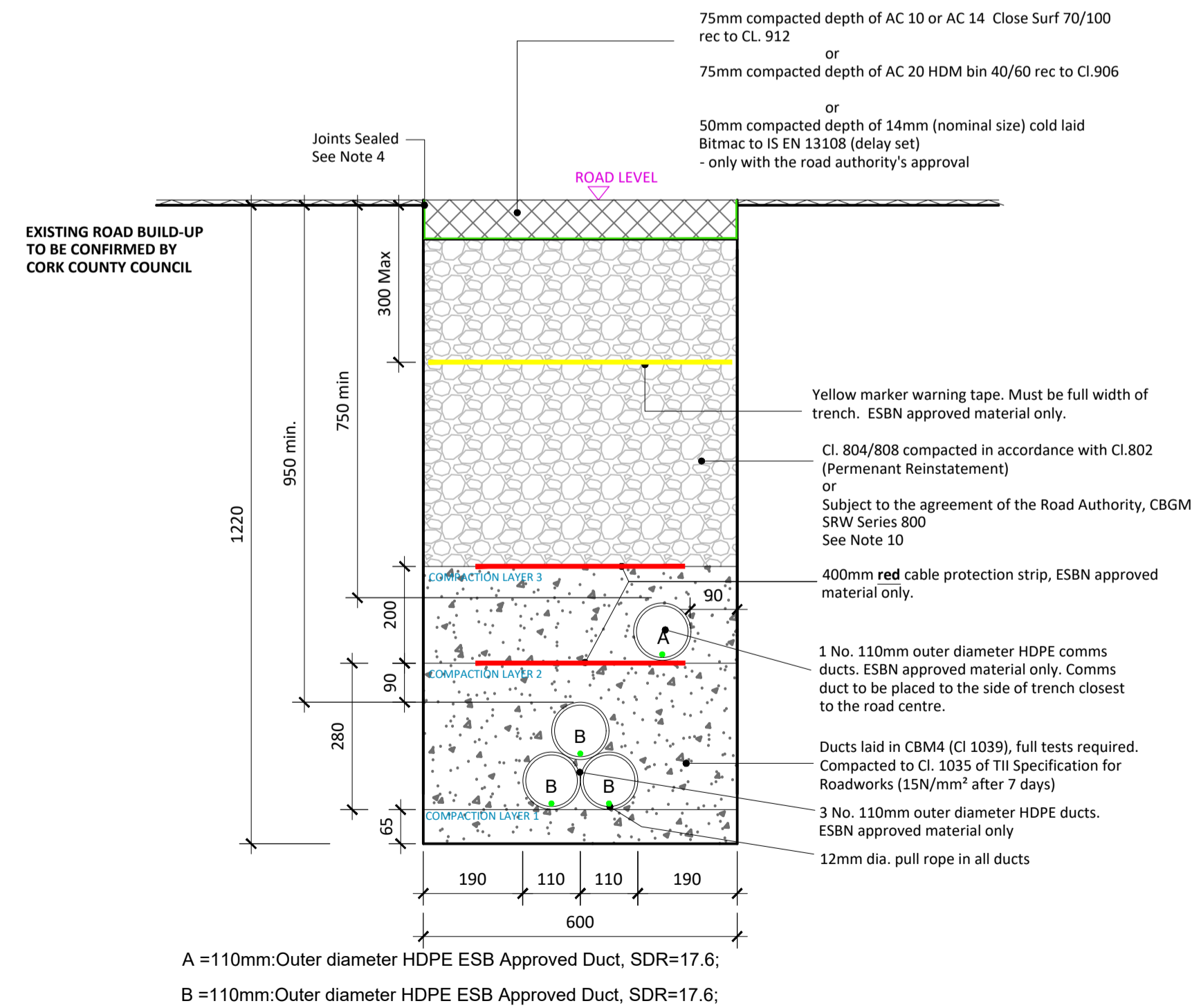
Reinstatement details based on Guidelines for Managing Openings in Public Roads - SD1



**Typical Section Through Temporary Reinstatement of Longitudinal Opening in Roadway**

SCALE 1:10

Reinstatement details based on Guidelines for Managing Openings in Public Roads - SD2



**Typical Section Through Temporary Reinstatement of Longitudinal Opening in Dressed Rural Unbound Roadway**

SCALE 1:10

**ALL REINSTATEMENT WORKS ARE TO BE IN ACCORDANCE WITH LOCAL AREA ENGINEERS REQUIREMENTS AND GUIDELINES FOR MANAGING OPENINGS IN PUBLIC ROADS**

- Note:
- Refer to 'Guidelines for managing Openings in Public Roads (Purple Book - April 2017)', Chapter 6 'Specifications' for guidance on Duct type / colour and Marker Tape type / colour.
  - All bound edges shall be saw cut to expose the full vertical thickness of each layer prior to excavation. All edges shall be essentially straight, smooth and vertical.
  - Clause 808 surface to be sprayed per clause 920 prior to application of Asphalt Concrete Layer.
  - Joint sealer shall be a hot 50 pen bitumen binder or cold thixotropic bitumen 50-70 pen to be applied to all vertical cuts in accordance with B.S. 594987 prior to application of bituminous materials.
  - Licence holder must maintain temporary reinstatement to a safe and acceptable standard.
  - Any damaged area adjacent to the opening and resulting from the excavation operation shall be included within the area to be reinstated.
  - Temporary Road Surface warning signs must be used in accordance with the Traffic Signs Manual (Chaper 8 - Temporary Traffic Measures and Signs for Roadworks).
  - Refer to detail Permanent Reinstatement of Road for advice on permanent reinstatement - all permanent reinstatement shall be carried out when adequate settlement has occurred as determined by the Road Authority.

**PROJECT**

**Annagh Wind Farm  
38kV Grid Connection**

**CLIENT**



**CONSULTANTS**

**NOTES:**

- This design is subject to ESB approval and should be used for planning purposes only.
- This drawing is to be read in conjunction with relevant drawings, specifications and reports.
- Dimensions are in millimeters, unless noted otherwise. Drawings are not to be scaled use figured dimensions only.
- Existing road build up and reinstatement requirements to be confirmed with Cork Co.Co.
- Geogrid may be implemented along the cable trench route where deemed necessary by the contractor or as required by Cork County Council.

**LEGEND:**

**ISSUE/REVISION**

| NO  | DATE     | DESCRIPTION         |
|-----|----------|---------------------|
| P00 | 30.06.21 | Issued For Planning |
| I/R | DATE     | DESCRIPTION         |

**PROJECT NUMBER**

05-813

**SHEET TITLE**

Ducting Through Regional / Local Roadways

**SHEET NUMBER**

05813-DR-005





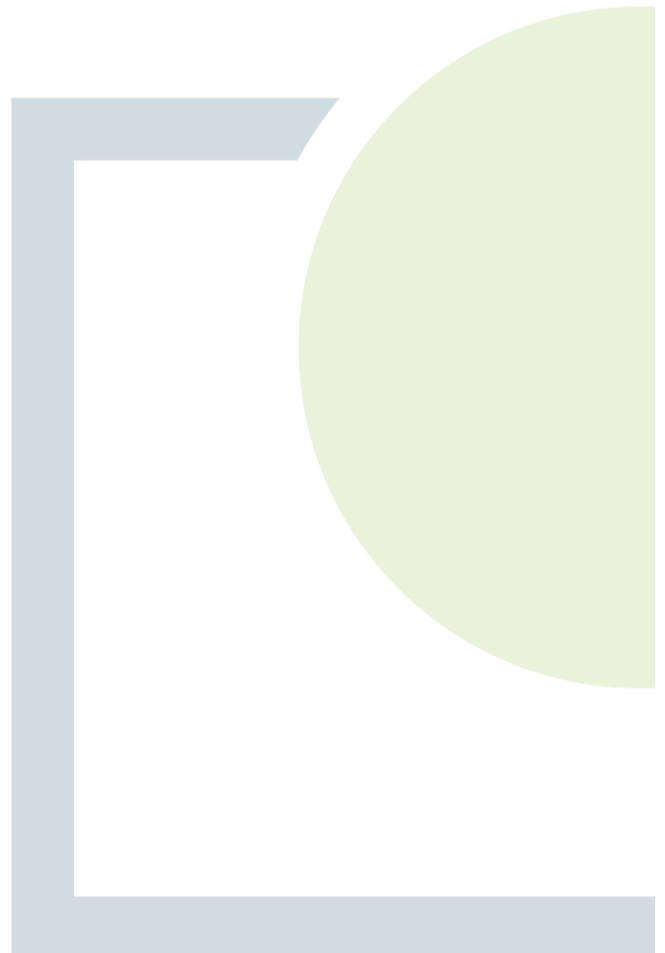


**FEHILY  
TIMONEY**

CONSULTANTS IN ENGINEERING,  
ENVIRONMENTAL SCIENCE & PLANNING

## **APPENDIX 3**

Summary of Standard  
Specification for ESB  
Networks 38kV Ducting







## Networks Ducting/Cabling (Minimum Standards)

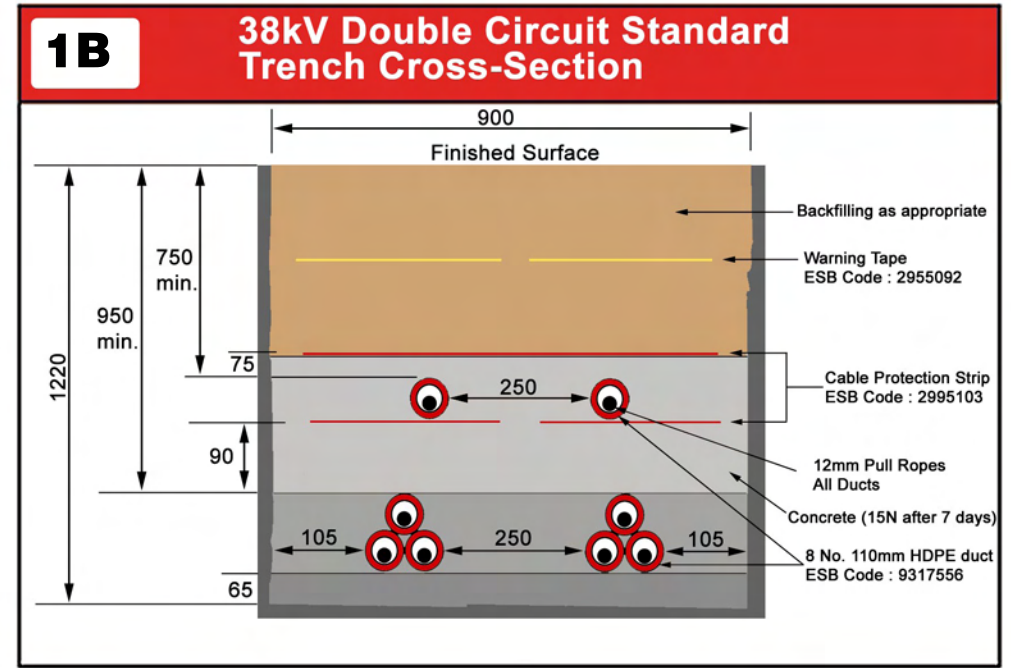
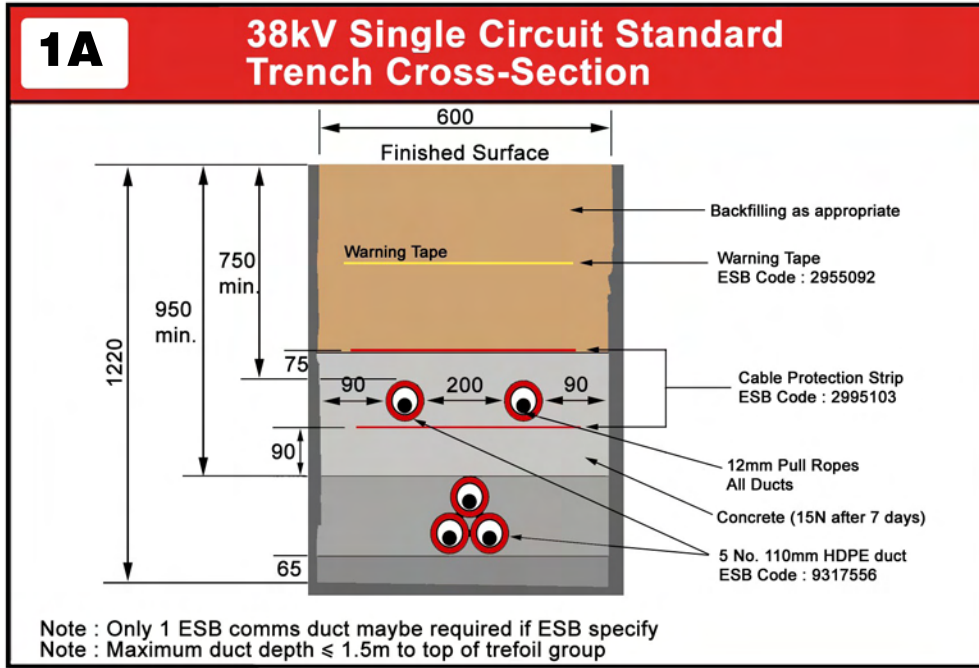
Note 1 : ESB Networks reserves the right not to accept ducting which does not conform to these standards and dimensions

Note 2 : Refer to ESB Networks for Specific job Specification. These instructions do not apply to LV/MV/110kV/220kV cable

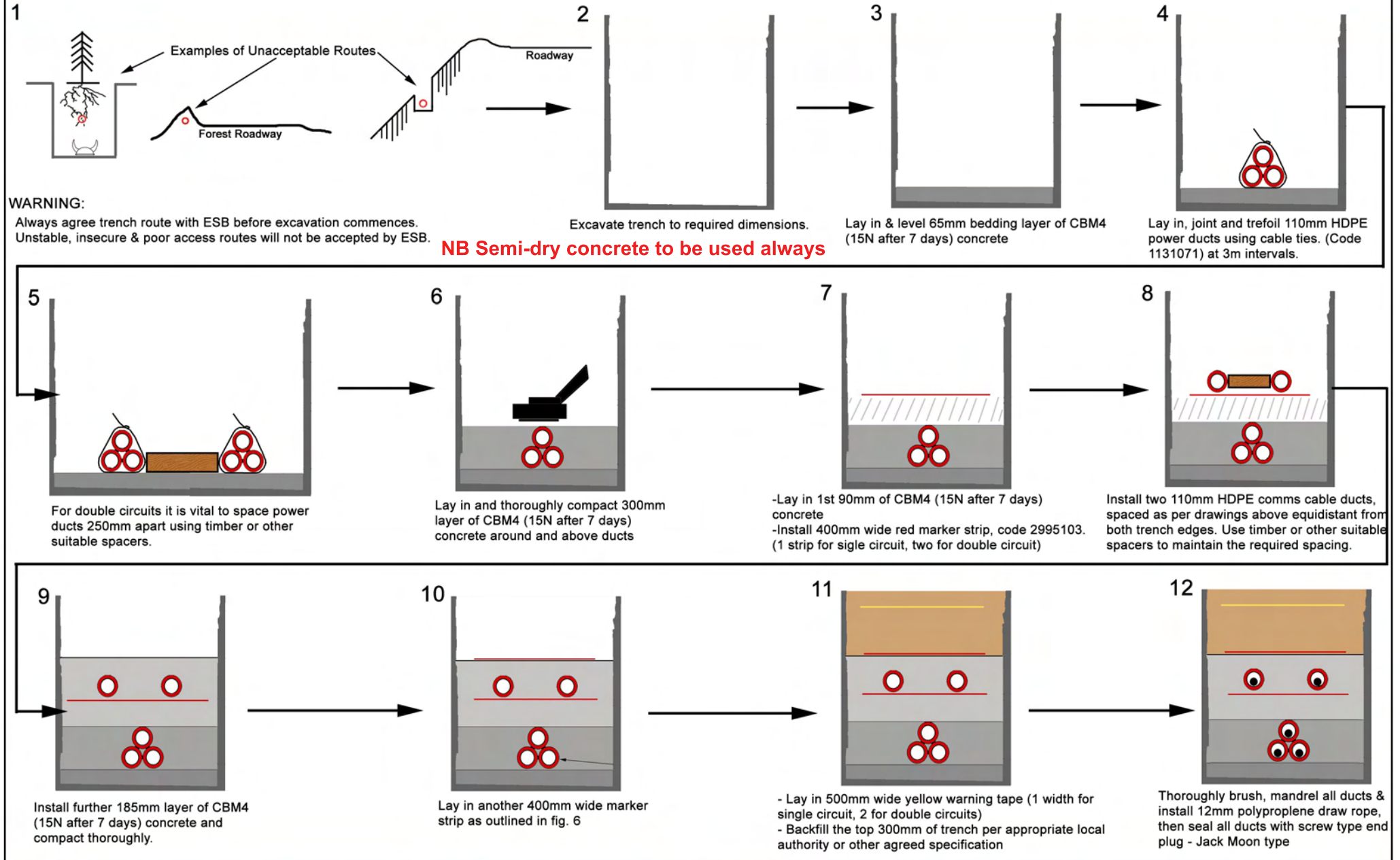
Note 3 : All materials (ducts, marker tapes/strips, duct surrounds, mandrels and brushes) must be ESB approved materials



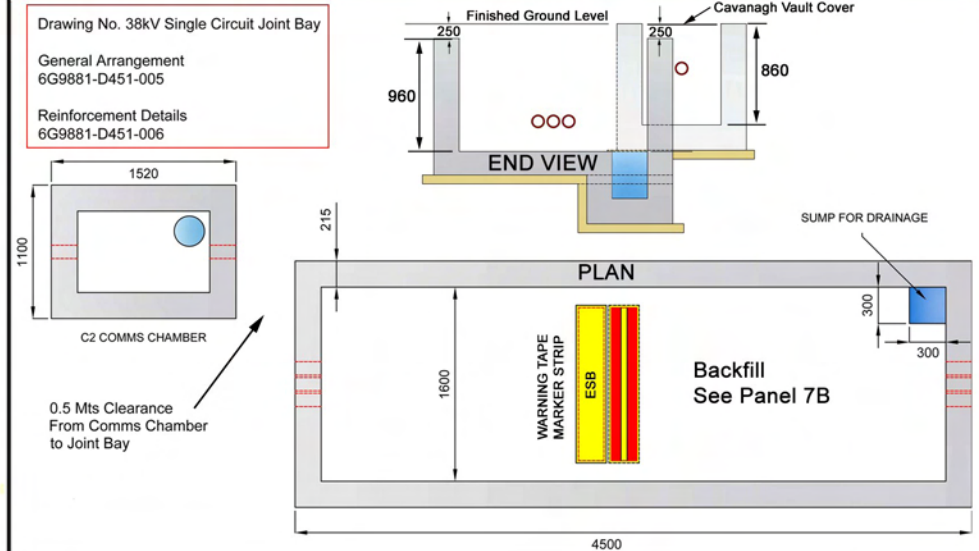
Rev 0: Date 08-09  
Approved:



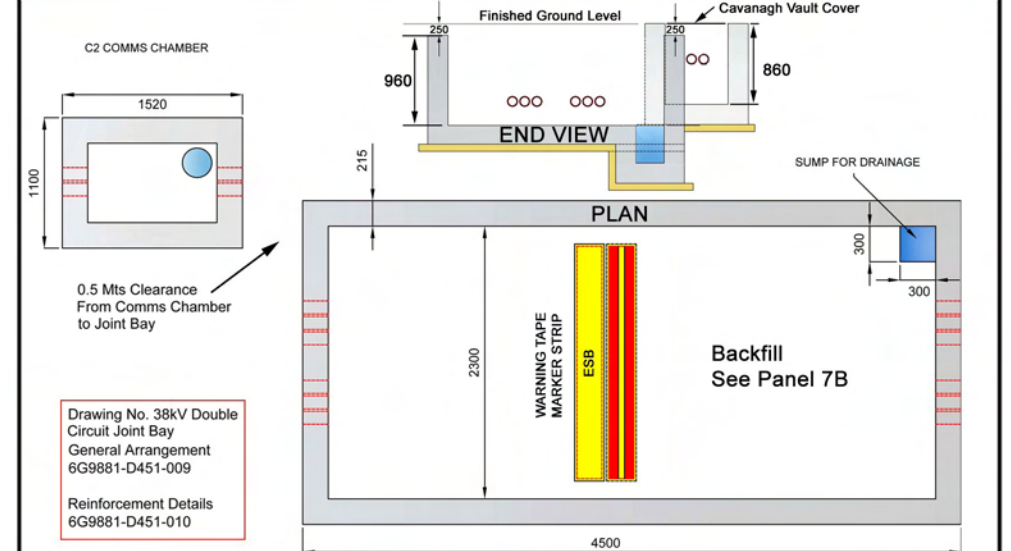
### 1C Trench Installation Sequence



### 2A 38kV Single Circuit Joint Bay



### 2B 38kV Double Circuit Joint Bay





## Networks Ducting/Cabling (Minimum Standards)

Note 1 : ESB Networks reserves the right not to accept ducting which does not conform to these standards and dimensions

Note 2 : Refer to ESB Networks for Specific job Specification. These instructions do not apply to LV/MV/110kV/220kV cable

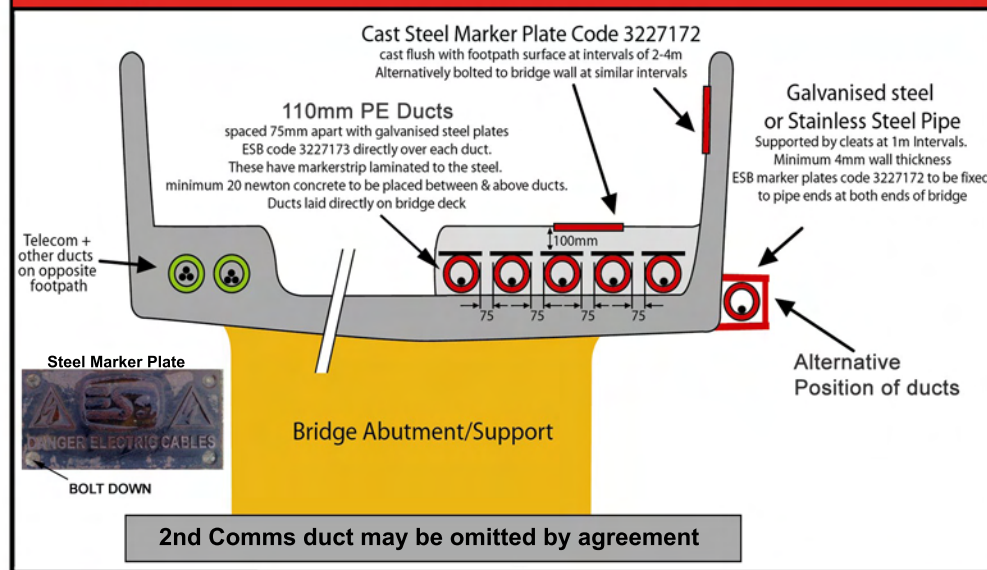
Note 3 : All materials (ducts, marker tapes/strips, duct surrounds, mandrels and brushes) must be ESB approved materials



Rev 0: Date 08-09

Approved:

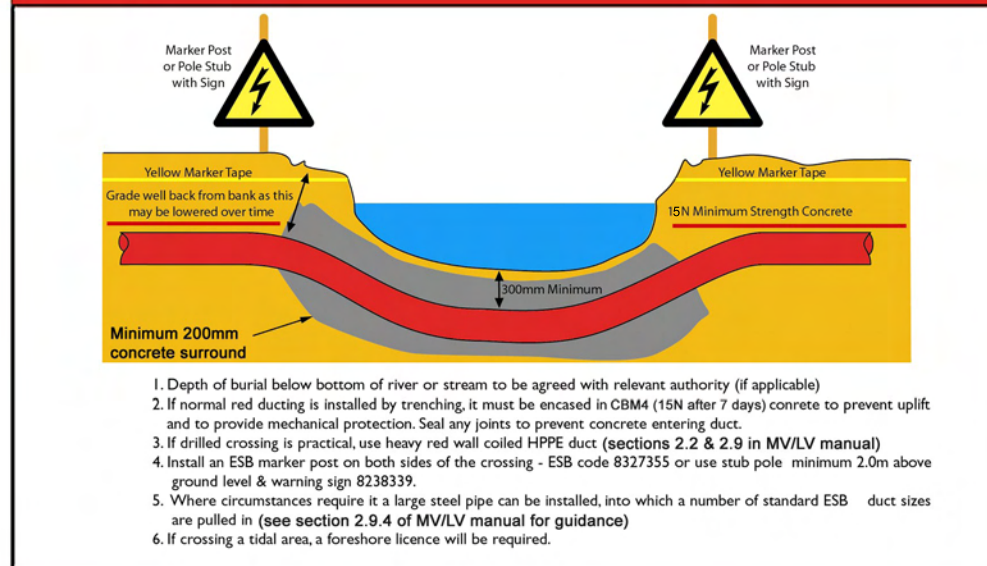
### 5A Bridge Crossings: Restricted Footpath Designs



### 5B Bridge Crossings: Restricted Footpath Designs

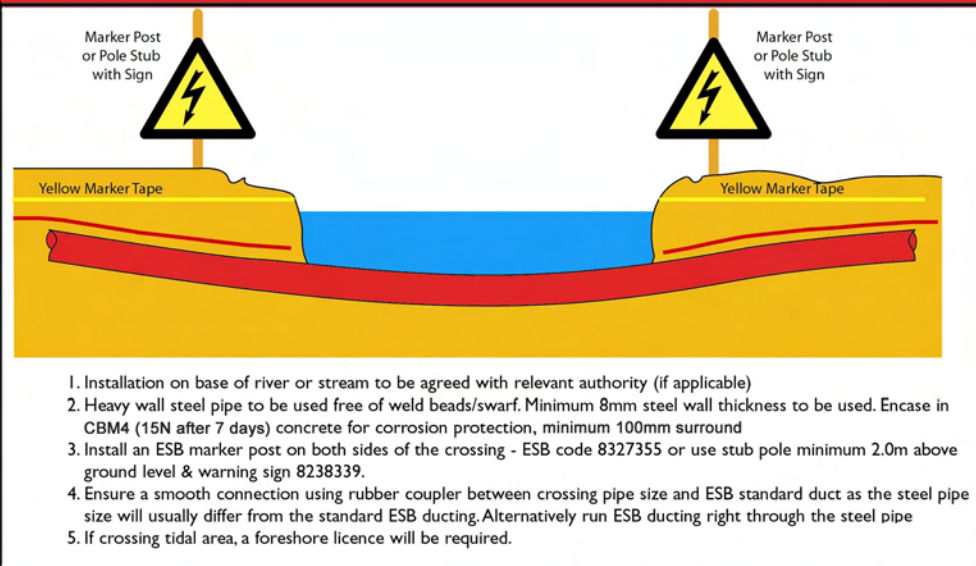
1. The design must be agreed with the bridge authority. Position in footpath is preferred.
2. Minimum cover over ducts on footpath 100mm.
3. Where duct cover is > 300mm, marker strip & surface marker plates can be used.
4. Red ducting is not suitable for cable run external to bridges.
5. Where possible galvanised steel/stainless steel piping should be used, all joints must be free of weld burrs on inside. Alternatively heavy duty 10mm wall thickness black HDPE material with cast steel marker plates attached must be used to permanently warn of presence of electric cable.

### 6A River/Stream Crossings: Standard Where Burial/Drilling IS Possible



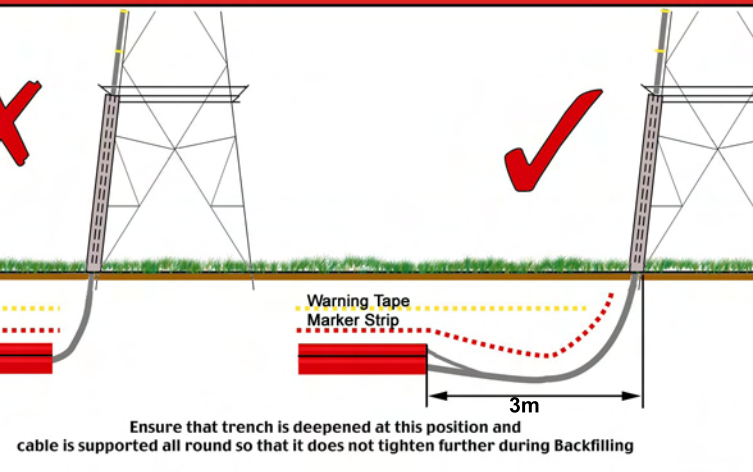
1. Depth of burial below bottom of river or stream to be agreed with relevant authority (if applicable)
2. If normal red ducting is installed by trenching, it must be encased in CBM4 (15N after 7 days) concrete to prevent uplift and to provide mechanical protection. Seal any joints to prevent concrete entering duct.
3. If drilled crossing is practical, use heavy red wall coiled HPPE duct (sections 2.2 & 2.9 in MV/LV manual)
4. Install an ESB marker post on both sides of the crossing - ESB code 8327355 or use stub pole minimum 2.0m above ground level & warning sign 8238339.
5. Where circumstances require it a large steel pipe can be installed, into which a number of standard ESB duct sizes are pulled in (see section 2.9.4 of MV/LV manual for guidance)
6. If crossing a tidal area, a foreshore licence will be required.

### 6B River/Stream Crossings: Standard Where Burial/Drilling IS NOT Possible



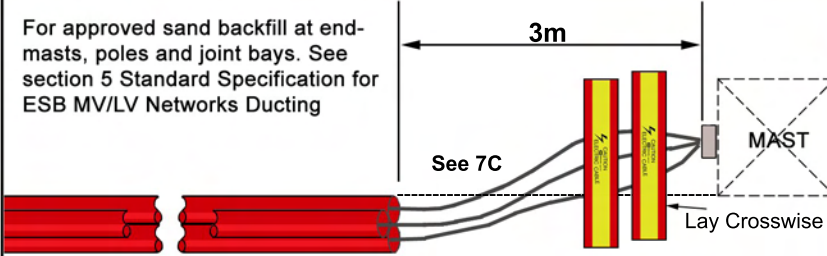
1. Installation on base of river or stream to be agreed with relevant authority (if applicable)
2. Heavy wall steel pipe to be used free of weld beads/swarf. Minimum 8mm steel wall thickness to be used. Encase in CBM4 (15N after 7 days) concrete for corrosion protection, minimum 100mm surround
3. Install an ESB marker post on both sides of the crossing - ESB code 8327355 or use stub pole minimum 2.0m above ground level & warning sign 8238339.
4. Ensure a smooth connection using rubber coupler between crossing pipe size and ESB standard duct as the steel pipe size will usually differ from the standard ESB ducting. Alternatively run ESB ducting right through the steel pipe
5. If crossing tidal area, a foreshore licence will be required.

### 7A Cable End Mast Position



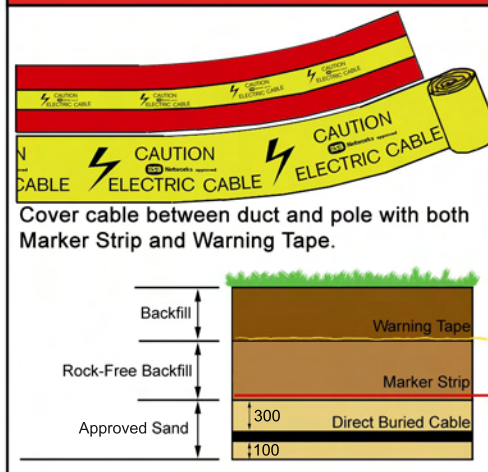
Ensure that trench is deepened at this position and cable is supported all round so that it does not tighten further during Backfilling

### 7B Cable End Mast Position



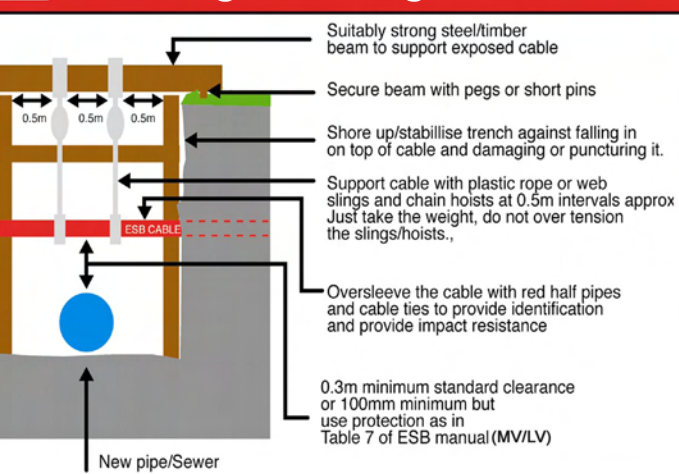
Offset trefoil to line up with edge of mast for ease of cable pulling. Never install ducting right up to mast or 3-pole base with long radius bend attached. Both marker strip and warning tape to be used between duct and mast (laying the marker strip crosswise as shown above).

### 7C Cable End Mast - Marker Strip/Tape

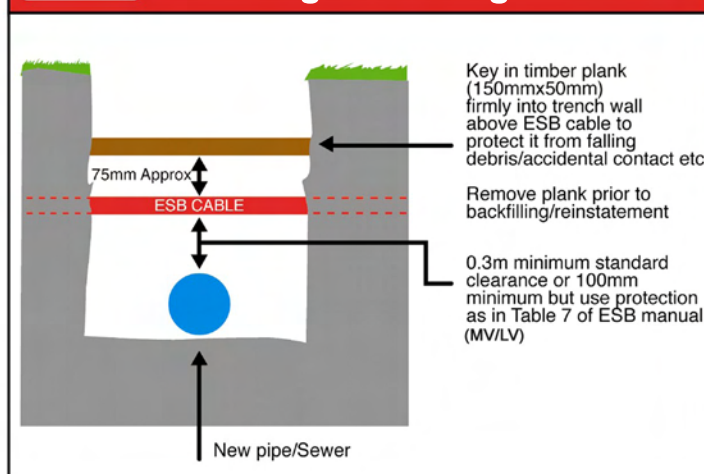


Cover cable between duct and pole with both Marker Strip and Warning Tape.

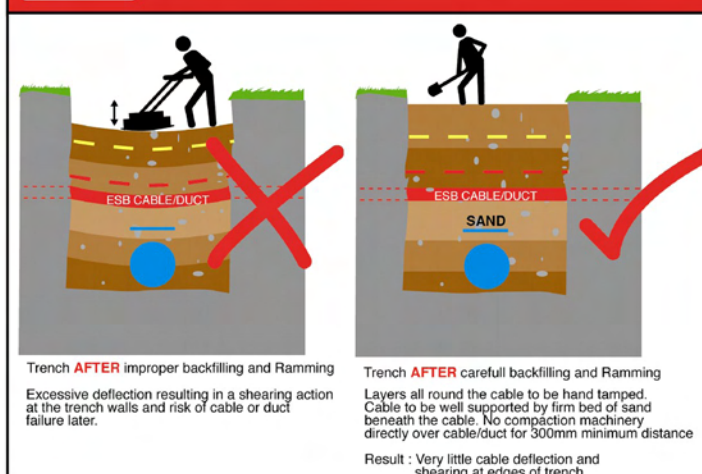
### 8A Supporting ESB Cables/Ducts During Trenching Works



### 8B Supporting ESB Cables/Ducts During Trenching Works



### 9 Avoidance of Cable Damage Due to Improper Backfilling at Cable Crossings



Trench AFTER improper backfilling and Ramming  
Excessive deflection resulting in a shearing action at the trench walls and risk of cable or duct failure later.

Trench AFTER careful backfilling and Ramming  
Layers all round the cable to be hand tamped. Cable to be well supported by firm bed of sand beneath the cable. No compaction machinery directly over cable/duct for 300mm minimum distance  
Result: Very little cable deflection and shearing at edges of trench



## Networks Ducting/Cabling (Minimum Standards)

Note 1 : ESB Networks reserves the right not to accept ducting which does not conform to these standards and dimensions  
 Note 2 : Refer to ESB Networks for Specific job Specification. These instructions do not apply to LV/MV/110kV/220kV cable  
 Note 3 : All materials (ducts, marker tapes/strips, duct surrounds, mandrels and brushes) must be ESB approved materials

**ESB Networks**  
 Rev 0: Date 08-09  
 Approved:

### 3A End Mast Termination

For existing 9m masts increase steel work height by 1.3m at mast top

12m Mast (For all new works)

Anti-Climbing Guard

EARTH GRID

Cable Assembly Drawing Number : D205778

### 3B Triple Pole Structure

Made up anti-climbing guard

Cable Steel Work Code: 1286697

7m Min Dimension to Bare Metal Use 12m Pole

### 3C Station Termination

To Cubicle

If Cable run <50m install lightning arrestors.

Assess need for mesh screen guard (Code: 3175003)

Drg. No A3205856

Clearances : Phase to:  
 - Phase 500mm outdoor  
 - Earth 500mm outdoor

### 3D Earth Grids

10m PLAN

10m

3m approx.

1.5m

1.5m

12 Rod Earth Grid For 3-Pole Structure

12 Rod Earth Grid For Mast Structure

Warning Tape

500

300

Earth Grid resistances <10 Ohms. If ground is known to be high resistance, plan ahead and put additional earthwire into cable trench.

Drg. No. A4D 205343  
 PE424-D901-911-001-000

### 4A Obligation of Duct Installer to minimise the number and severity of duct bends

The duct installer must minimise the number and severity of preformed bends in ground with obstructions and other utility service crossings by opening ground 15m ahead of backfilled duct, wherever practical to do so. This safety obligation, which may require use of steel plating, allows the duct installer to pick the least bendy duct route through utility crossings and obstructions. Otherwise, numerous sharp unrecorded duct route deviations will be present making cable installation considerably more difficult and less safe for the cable installer.

Backfilled Duct

Obstructions

Digger

Dig 15m Ahead of duct to uncover obstructions

### 4B Standard for Brushing, Mandrelling, Roping and End-Capping of 38kV ducts

All Ducts must be:

- Thoroughly brushed and mandrelled to prove ducts against debris /excessive deflection
- Roped using 12mm polypropylene rope with certified safe breaking load of 1.5 tons – all rope joints to be properly spliced and PVC taped over. Approved Supplier Silver Strand Bunclana Donegal, ph (074) 9382503 - 500m drum lengths available to minimise splicing/coil handling
- Sealed using endcaps against grit and water getting into them
- NB: Replace mandrels once mandrel wear indicators or grooves are worn down
- Replace brushes once brush diameter falls 5mm below dimensions in table below
- Approved endcaps, both disposable and reusable types, are available from suppliers of approved ESB ducting
- Approved ESB Mandrel and brush suppliers :

Brandon Agencies, Rathnew, Co Wicklow: Phone 0404 20500 (Brushes & Mandrels)  
 IS Varian, Greenhills industrial Estate, Walkinstown, Dublin 12 Phone: 01-4501150 (Brushes Only)  
 Clydesdale UK Phone 086 172 6665 (Brushes & Mandrels)  
 Tynagh Network Systems, Loughrea, Co Galway. Phone: 091 842206 (Brushes & Mandrels)

110mm HDPE Duct Size

|               |               |               |
|---------------|---------------|---------------|
| 85mm          | 250mm         | 250mm         |
| Mandrel       | Brush         | Sponge        |
| Code: 9317546 | Code: 8783255 | Code: 8783252 |

### 4C Approved ESB Ducting for 38kV Cables

- Use only solid wall high impact resistance ESB approved HDPE red ducting to IS 370 colour standard and ESB specification 16113 (6.3mm minimum wall thickness) Discoloured or unidentified ducting not acceptable. All duct material must be approved by ESB Networks.
- Lightweight flexible corrugated twinwall ducting is not acceptable to ESB irrespective of manufacturer
- Current approved HDPE Duct and duct bend manufacturers are: Lynplast (bend fittings only), Uponor-Radius Systems, Wavin, Quality Plastics

### 4D Specification for Duct Jointing for 38kV Cables

Mallet or Hammer

Timber block to protect end of duct from damage

Long Coupler

Fully jointed Duct Marks

All ducts to be securely jointed by tapping against timber board on each duct until the black depth insertion mark is reached

Always smear duct lubricant on coupler rubber ring

### 4E Repair of Existing Ducts

Use only approved slip couplers from approved manufacturers in section 4C

Damaged Duct Section

Slip Coupler

Slip Coupler

Repair length

- Cut out damaged section of duct and ensure all cut surfaces are square and free from sharp edges
- Slide, position and centre the repair couplers on the centering marks

### 4F Sealing of Ducts

All ducts to be permanently sealed at both ends of duct run  
 Ducts to be temporarily sealed during installation using endcaps provided with each bale

Endcap Plain End

ESB Code 110mm: 9317569



**10A 38kV Railway Crossing Details**

ESB Signpost

3m

Drilling pits outside CIE property line

Formal licence for crossing and approval required from CIE. Accurately record crossing location & erect marker posts.

**10B Directional Drill/Thrust Bore Duct Bore Details**

DESIGN 1

Minimum internal bore size = 325mm for 5 ducts

=290mm for 4 ducts where approved by ESB

5 no. 110mm diameter HDPE ducts

Spacer

Alternatively use 2 x 37mm HDPE ducts for comms cables with C2 chamber on each side of the crossing to permit pulling along entire route. (See 10C)

Completed interstitial space to be bentonited thoroughly to maintain cable rating. Accurately record crossing location & erect marker posts.

**10C Directional Drill/Thrust Bore Duct Bore Details**

ALTERNATIVE DESIGN

ESB Signpost

3m

Cable joint pit

Install 1 no. 200mm SDR 17.6 duct with 3 no. short length cables pulled into this pipe along with 2 x 37mm comms ducts. Full cable joint bays are required on either side of crossing along with C2 chambers for this design. This method is used where it is not practical to install large diameter pipe -eg. risk of ground upheaval or presence of obstructions. Completed interstitial space to be thoroughly bentonited to maintain cable rating. Accurately record crossing location & erect marker posts.

**10D Double Circuit Bore Crossing**

Standard Design

3m min

-Both Bentonited

Separate drilling for each circuit crossing

Alternative

HDPE or steel thrust bore pipe Diameter ID= 400mm

Bentonite

6 no. 110mm Power ducts + 2 no. 110mm comms ducts

2 no. sets of 110mm HDPE ducts - 8 ducts in total. All crossings to be accurately recorded and signposts erected given impracticality of marker tape. If both circuits = 40MVA then use 630 Cu cable

**12 Minimum Standard Clearances to Other Services**

Normal Services

300

600

Large Pipelines High Pressure Pipes

Clearances less than the above at pinch points and crossings requires placement of additional mechanical protection (concrete slab/brick) and agreement of ESB

ESB ducts must never be laid over other services on parallel runs, except with the written prior agreement of the other utilities and ESB

Other services must never be laid directly over ESB ducts on parallel runs

**13 Combined MV & 38kV Cable Runs**

38kV Trench

1.1m to 1.25m Depending on Location

Yellow Marker Tape

Pilot Cables

Concrete Surround

MV/LV Cables

Yellow Marker Tape

Red Marker Strip

150mm

150mm

Additional MV/LV Ducts as Required

300mm Strict Minimum Separation

Where it is impractical to avoid such trench runs, the separation of 300mm should be strictly controlled and monitored to minimise derating (See MV/LV manual page 180)

**14 Sealing and Protection of 38kV Cables Once They Exit Ducts**

Duct

Ducts to be thoroughly using ESB approved water sealant and 4hr fire rating approved for firestop. NB - All joint bay duct entries to be thoroughly sealed to prevent sand washout and subsidence.

Sandbags or other durable support for cable as it exits ducts to prevent damage to cable sheath

**15 Duct Crossovers Are Not Allowed**

1, 2, 3, 1, 2, 3

Be especially careful when going from flat to trefoil formation in vicinity of services

Eliminate this possibility by marking ducts 1, 2, 3 etc before & after flattening to avoid an obstruction.

NB. If using double circuit, tape mark power ducts 1 to 6

**16 Crossing Dumps/Contaminated Ground**

Thoroughly seal all joints with adhesive water-tight duct jointing compound and pressure test for airtightness. Gasketed couplers alone are inadequate. Fusion welded couplers are also acceptable but require red over-taping.

NB. Avoid whenever possible due to: Subsidence, methane gas & severe thermal derating risks. Seek advice from ug networks section to ensure rating of cable is adequate (derating of 50% can occur) NB. Waste oils and chemicals can also seriously damage cables

Seal all duct joints with duct adhesive compound or use continuous duct lengths & seal all duct ends in joint bays. Alternatively weld pipes.

Concrete is continued up to 300mm of final surface to offset derating (CBM4 - 15N after 7 days)





# FEHILY TIMONEY

CONSULTANTS IN ENGINEERING,  
ENVIRONMENTAL SCIENCE & PLANNING

[www.fehilytimoney.ie](http://www.fehilytimoney.ie)

---

**CORK OFFICE**

Core House  
Pouladuff Road,  
Cork, T12 D773,  
Ireland  
**+353 21 496 4133**

**Dublin Office**

J5 Plaza,  
North Park Business Park,  
North Road, Dublin 11, D11 PXT0,  
Ireland  
**+353 1 658 3500**

**Carlow Office**

Unit 6, Bagenalstown Industrial  
Park, Royal Oak Road,  
Muine Bheag,  
Co. Carlow, R21 XW81,  
Ireland  
**+353 59 972 3800**





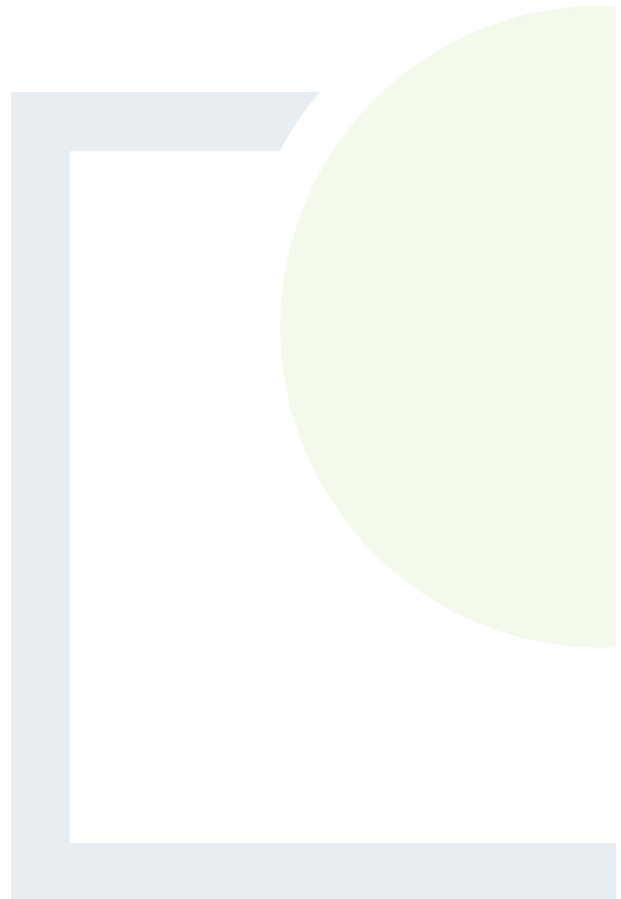


**FEHILY  
TIMONEY**

**CONSULTANTS IN ENGINEERING,  
ENVIRONMENTAL SCIENCE  
& PLANNING**

## **APPENDIX 3.2**

Schedule of Environmental  
Commitments & Mitigation  
Measures





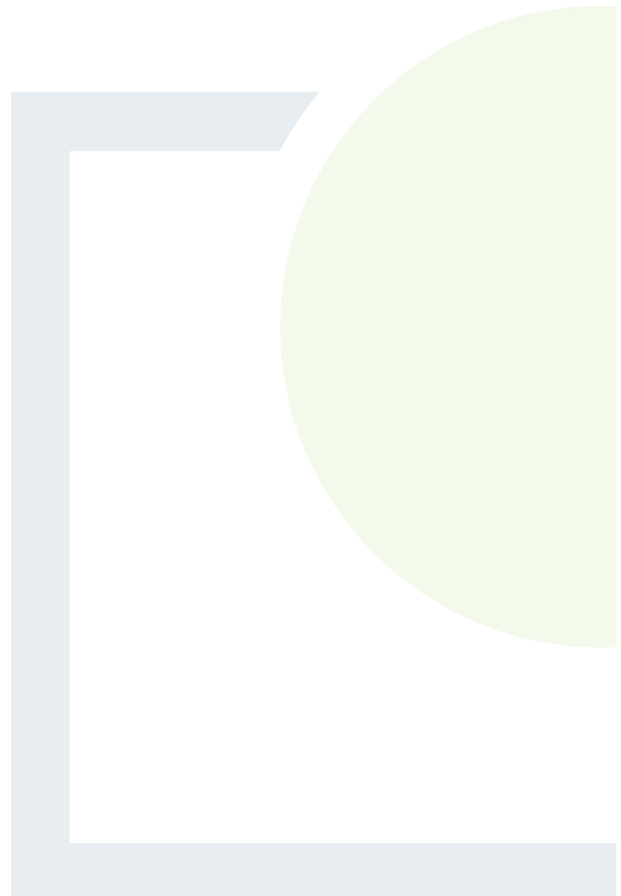


**FEHILY  
TIMONEY**

**CONSULTANTS IN ENGINEERING,  
ENVIRONMENTAL SCIENCE  
& PLANNING**

## **APPENDIX 3.3**

Appropriate Assessment of  
Replant Lands at Emlagh,  
Co. Clare







**Appropriate Assessment**  
**Screening Report**  
**for Proposed afforestation project CN88795**  
**located at Emlagh, Co. Clare**



**Compiled by: Dr. Karina Dingerkus, Giorria Environmental Services**

**Completion date: 23<sup>rd</sup> August 2021**





## Contents

|  |    |
|--|----|
| Section 1: GENERAL DETAILS.....                          | 3  |
| 1.1    The Appropriate Assessment Process .....          | 5  |
| 1.2    Appropriate Assessment Stages .....               | 8  |
| 1.3    Methods.....                                      | 9  |
| Section 2: DESCRIPTION OF PROJECT AREA & OPERATION ..... | 10 |
| Section 3: INDIVIDUAL EFFECT ON EUROPEAN SITES.....      | 13 |
| 3.1    Assessment of Likely Effects.....                 | 21 |
| 3.2    Direct, indirect or secondary impacts.....        | 21 |
| Section 4: IN-COMBINATION EFFECT .....                   | 44 |
| Section 5: DECLARATION.....                              | 49 |
| References & Bibliography .....                          | 50 |
| APPENDICES.....  | 54 |
| Biodiversity Map .....                                   | 54 |
| Habitat Map .....  | 55 |
| Biodiversity Records.....                                | 56 |



## Section 1: GENERAL DETAILS

| Details of Author(s)   |   |
|--|---|
| Name   | Dr. Karina DIngerkus  |
| Address  | Ardacarha, Bohola. Claremorris. Co Mayo, F12 VW94   |
| Company name <i>(If relevant)</i>  | Giorria Environmental Services  |
| Tel. no.   | 0863620928  |
| E-mail   | karina@giorria.com  |
| Details of relevant qualifications / affiliations / years of experience (Provide additional details on separate a sheet) | <i>PhD. 1997</i> The Ecology and Distribution of the Irish hare in Northern Ireland, Queen's University, Belfast. Has over 27 years experience as working ecologist for local authorities, wildlife charities and consultancies. Established Giorria Environmental Services, an ecological consultancy based in County Mayo in 2005. Has been completing Appropriate Assessments for over 12 years for private and public clients. Has been contract to the Coillte NIS project since 2020. |
| Describe scope of contribution in preparing this AA Pre-Screening Report   | Ecological assesment  |

| Details of Author(s)   |  |
|--|--|
| Name   | Ciaran Ryan  |
| Address  | Lahard, Beaufort, Killarney, Co. Kerry   |
| Company name <i>(If relevant)</i>  | (Kerry Ecological Services – sole trader)  |
| Tel. no.   | 064-6624577; 085-7168019   |
| E-mail   | Ciaranryan5@hotmail.com  |
| Details of relevant qualifications / affiliations / years of experience (Provide additional details on separate a sheet) | B.Sc. Analytical Science; M.Sc. (Environmental Science)<br>Over 25 years' experience in ecological survey (including SAC & SPA designations), SAC & SPA Management Plans, Commonage Framework Plans, SAC Appeals, Natura 2000 site assessments and reports (NIS) and general environmental consultancy. I am an accredited Native Woodland Scheme ecologist. |



|  |            |
|--|------------|
| Describe scope of contribution in preparing this AA Pre-Screening Report | Ecological |
|--|------------|

| <b>Details of Author(s)</b>  |   |
|--|---|
| Name   | Éamonn Ó Curraoin   |
| Address  | Ballybroder, Loughrea, Co. Galway. H62F432  |
| Company name ( <i>If relevant</i> )  | The Forestry Company  |
| Tel. no.   | 087-2472302   |
| E-mail   | eamonn@theforestrycompany.ie  |
| For each author:<br>Provide details of his / her relevant qualifications / affiliations / years of experience<br><br>Describe the scope of his / her contribution in preparing this NIS. | B. Agriculture. Sc. (Forestry) MSIF AIFC ACA<br>34 years experience in forest management<br>NW Course completed in 2006<br><br>Forestry |

| Project location & general details* |                              |                            |
|-------------------------------------|------------------------------|----------------------------|
| County: Clare                       |                              | Nearest village: Moyasta   |
| Townland: Emlagh                    |                              | 6 inch OS Map number: CE56 |
| Proposed activity (tick):           | Afforestation                | <input type="checkbox"/>   |
|                                     | Forest road construction     | <input type="checkbox"/>   |
|                                     | Thinning (incl. CCF)         | <input type="checkbox"/>   |
|                                     | Clearfell & Reforestation    | <input type="checkbox"/>   |
|                                     | Clearfell & No Reforestation | <input type="checkbox"/>   |
|                                     | Aerial fertilisation         | <input type="checkbox"/>   |
|                                     | Other (specify)              | <input type="checkbox"/>   |
| Project area (hectares):            |                              | 14.58 hectares             |

|  |   |                              |
|--|---|------------------------------|
| Indicate (tick) the nature of the application: | Application for forestry licence only             | <input type="checkbox"/>     |
|  | Application for forestry licence & scheme support | Yes <input type="checkbox"/> |

## 1.1 The Appropriate Assessment Process

Natura 2000 is a European network of important ecological sites. The EU Habitats Directive (92/43/EEC) placed an obligation on Member States of the EU to establish the Natura 2000 network. The network is made up of Special Protection Areas (SPAs), established under the EU Birds Directive (2009/147/EC), and Special Area of Conservation, (SACs), established under the Habitats Directive itself.

An AA is required of the implications for the European site concerned in view of the site's conservation objectives of any plan or project not directly connected with or necessary to the management of that site but likely to have a significant effect thereon, either individually or in combination with any other plans or projects.

The assessment procedure is based on a four-stage approach, where the outcome at each successive stage determines whether a further stage in the process is required.

The purpose of the screening stage is to determine, on the basis of a preliminary assessment and objective criteria, whether a plan or project, alone or in-combination with other plans or projects, could have significant effects on a Natura 2000 site in view of the site's conservation objectives. There is no necessity to establish such an effect; it is merely necessary for the competent authority to determine that there may be such an effect. The need to apply the precautionary principle in making any key decisions in relation to the tests of AA has been confirmed by the case law of the Court of Justice of the European Union (CJEU). Plans or projects that have no appreciable effect on a European site may be excluded.

### **An Appropriate Assessment:**

(i) must identify, in the light of the best scientific knowledge in the field, all aspects of the project which can, by itself or in-combination with other plans or projects, affect the conservation objectives of the European site;

(ii) must contain complete, precise and definitive findings and conclusions and may not have lacunae or gaps; and

(iii) may only include a determination that the proposed development will not adversely affect the integrity of any relevant European site where the competent authority decides (on the basis of complete, precise and definitive findings and conclusions) that no reasonable scientific doubt remains as to the absence of the identified potential effects. If adverse impacts can be satisfactorily avoided or successfully mitigated at this stage, so that no reasonable doubt remains as to the absence of the identified potential effects, then the process is complete.

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 three and, if necessary, stage four.

Stage Three of the potential process arises where adverse effects on the integrity of a European site cannot be excluded and examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the European site.

Stage Four is the derogation process of Article 6(4), which examines whether there are imperative reasons of overriding public interest [IROPI] for allowing a project to proceed where adverse effects on the integrity of a European site have been predicted. Compensatory measures must be proposed and assessed as part of this stage and the EU Commission must be informed of the compensatory measures.

Several guidance documents on the appropriate assessment process have been referred to during the preparation of this AA Screening report. These are:

- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (NPWS 2009, Revised February 2010)

- Circular NPW 1/10 & PSSP 2/10 (March 2010)
- EU Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC (2007)
- 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 (Nov. 2001 – published 2002)
- Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (2000).
- Office of the Planning Regulator (2021). Appropriate Assessment Screening for Development Management. OPR Practice Note PN01.

Screening for appropriate assessment is the first stage of the AA process (Stage One), in which the possibility of there being a significant effect on a European site is considered. Plans or projects that have no appreciable effect on a European site are thereby excluded, or screened out, at this stage of the process. Where screening concludes that there is the potential for significant effects, then it is necessary to carry out an AA (Stage Two) for the purposes of Article 6(3), and a Natura Impact Statement (NIS) is produced.

The guidance for Appropriate Assessment (NPWS, 2009, revised February 2010) states:

*“AA is an impact assessment process that fits within the decision-making framework and tests of Articles 6(3) and 6(4) and, for the purposes of this guidance, it comprises two main elements. Firstly, a Natura Impact Statement – i.e. a statement of the likely and possible impacts of the plan or project on a Natura 2000 site (abbreviated in the following guidance to “NIS”) must be prepared. This comprises a comprehensive ecological impact assessment of a plan or project; it examines the direct and indirect impacts that the plan or project might have on its own or in combination with other plans and projects, on one or more Natura 2000 sites in view of the sites’ conservation objectives. Secondly, the competent authority carries out the AA, based on the NIS and any other information it may consider necessary. The AA process encompasses all of the processes covered by Article 6(3) of the Habitats Directive, i.e. the screening process, the NIS, the AA by the competent authority, and the record of decisions made by the competent authority at each stage of the process, up to the point at which Article 6(4) may come into play following a determination that a plan or project may adversely affect the integrity of a Natura 2000 site”.*



## **1.2 Appropriate Assessment Stages**

The European Commission's Guidance promotes a four-stage process to complete the Appropriate Assessment.

Stage 1 – Screening Process

Stage 2 – Appropriate Assessment

Stage 3 – Assessment of alternative Solutions

Stage 4 – Assessment where no alternative solutions exist and where adverse impacts remain.

Stage 1 and 2 deal with the main requirements of assessment under Article 6.3. Stage 3 may be part of Article 6.3 or a necessary precursor to Stage 4.

Screening determines whether appropriate assessment is necessary by examining:

1. Whether a plan or project can be excluded from AA requirements because it is directly connected with or necessary to the management of the site, and
2. The potential effects of a project or plan, either alone or in combination with other projects or plans, on a Natura 2000 site in view of its conservation objectives and considering whether these effects will be significant.

Screening involves the following:

1. Description of plan or project, and local site or plan area characteristics.
2. Identification of relevant Natura 2000 sites, and compilation of information on qualifying interests and conservation objectives.
3. Assessment of likely effects – direct, indirect on the basis of available information as a desk study and/or field survey and/or primary research as necessary.
4. Screening statement and conclusion.

## 1.3 Methods

### Zone of influence

The Zone of Influence of a project may be defined as area(s) over which ecological features may be affected by the biophysical changes caused by the proposed project and associated activities (CIEEM 2016). The zone of influence can extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries.

The NPWS (2010) recommends that: *“the distance should 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.”* Generally, all European sites within 15km of the proposed project (NPWS 2010) are examined. In some circumstances it may be necessary to go beyond this distance (e.g. hydrologically connect site).

Recent guidance from Office of the Planning Regulator (2021) indicates that the zone of influence of a proposed development 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 Natura 2000 Site. It indicates that this should be established on a case-by-case basis using the Source-Pathway-Receptor framework.

### Desk-top study

A desk study was carried out to gather information available on Natura 2000 sites in the vicinity of the proposed project. The Environmental Protection Agency Appropriate Assessment GeoTool application was used to gather data about SACs and SPAs from the National Parks and Wildlife Service (NPWS). The Environmental Sensitivity Mapping tool (ESM tool) was also consulted (<https://airomaps.geohive.ie/ESM/>). The NPWS and National Biodiversity Data Centre online databases were consulted concerning designated conservation areas in the vicinity of the proposed development and protected species. The Clare County Council website online planning access ([www.eplanning.ie/ClareCC/searchtypes](http://www.eplanning.ie/ClareCC/searchtypes)), An Bord Pleanála (<https://www.pleanala.ie/en-ie/home>) and the EIA portal (<https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=d7d5a3d48f104ecbb206e7e5f84b71f1>) were consulted for information on other plans or projects in the area, which may result in an in-combination impact when considered with the proposed development. Other databases consulted include:

- Information on other plans or projects in the projects Zone of Influence from [www.myplan.ie](http://www.myplan.ie)
- Information on soils, geology and hydrogeology in the projects Zone of Influence [www.gsi.ie](http://www.gsi.ie)
- National Biodiversity Action Plan 2017–2021 (Department of Culture, Heritage and the Gaeltacht, 2017)
- Clare County Development Plan 2017-2023
- National Biodiversity database maps <https://maps.biodiversityireland.ie/>
- Environmental Protection Agency - <https://gis.epa.ie/EPAMaps/>

## Section 2: DESCRIPTION OF PROJECT AREA & OPERATION

### Site description - Site visit 20/5/2021

A multidisciplinary walkover survey was conducted on the 20/05/2021 following NRA (2009) guidelines (Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes) by ecologist Cieran Ryan. All habitats were identifiable (Smith, G.F., O'Donoghue, P., O'Hora, K., & Delaney E. 2011). The walkover surveys were designed to detect the presence, or likely presence, of a range of protected species. The survey included a search of all potentially suitable habitat for protected species that are likely to occur in the vicinity of the project. Habitats were identified in accordance with the Heritage Council's 'Guide to Habitats in Ireland' (Fossitt, 2000). Plant nomenclature for vascular plants follows 'New Flora of the British Isles' (Stace, 2010). During the multidisciplinary surveys, a search for Invasive Alien Species (IAS) listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015) was also conducted.

The site is located in the townland of Emlagh, 2.8 km from the village of Moyasta in Co. Clare. The site (size 14.58 ha) lies at an elevation of < 40m sloping gently from west to east. The soil is mostly peaty gley and surface water gley (acid, deep, poorly drained mineral) based on Namurian shale, sandstone, siltstone and coal bedrock. There are no major seepage areas or wet depressions. The land is currently used for cattle grazing and comprises of 20 small fields with an average size of 0.7 ha (range 1.2 ha to 0.38 ha).

The principal habitat present is wet grassland (GS4) dominated by Soft Rush (*Juncus effusus* – c.75+ %) with Creeping Buttercup (*Ranunculus repens*), Meadow Buttercup (*Ranunculus acris*), Meadowsweet (*Filipendula ulmaria*), Silverweed (*Potentilla anserina*), Ribwort Plantain (*Plantago lanceolata*), Dandelion (*Taraxacum officinale* agg.), Common Sorrel (*Rumex acetosa*), Dock (*Rumex* sp.), Horsetail (*Equisitum palustre*), Knapweed (*Centaurea nigra*), Thistle (*Cirsium vulgare*), typical grasses (e.g. *Holcus lantus*, *Anthoxanthum odoratum*, *Agrostis capillaris*, *Festuca rubra*), occasional orchid (*Orchis mascula*) and some invading Bramble (*Rubus fruticosus*) and Common Gorse (*Ulex europaeus*). There is a small area of peaty wet grassland (GS4) to the north-east where Purple Moorgrass (*Molinia caerulea*), Carnation Sedge (*Carex panicea*) and Marsh Thistle (*Cirsium palustre*) are evident, along with typical wet grassland species, notably Jointed/Sharp-flowered Rush (*Juncus articulatus/acutiflorus*), Meadowsweet and Cuckooflower (*Cardamine pratensis*). It should be noted that the heathy wet grassland habitat does not consist of any EU Annex I habitat.

There is one natural watercourse (FW2) present on site flowing along the north-eastern boundary (length along boundary 240 m). This is approximately 0.5m deep (down a 1m bank), slow flowing in a southerly direction and with a silt and gravel substrate. It is little vegetated except along its banks where some Bramble, Willow (*Salix* sp.), Gorse, rush and Nettle (*Urtica dioica*) occur. It flows south eastward, discharging into Poulnasherry Bay (Lower River Shannon SAC), near Moyasta up to 3 km downstream. Drainage channels (FW4) present are approximately 1m deep, 1m wide but with little water flow, being clogged with vegetation and silt. They discharge/filter into the on-site natural watercourse.

WFD River Moyasta forms a hydrological link from the project site to SAC and SPA. Moyasta\_10 is currently classed as under review / unassigned status.

Sparse, low-growing hedgerows (WL1) of mostly Bramble and scattered Willow and Common Gorse occur on low banks along field boundaries, with occasional Hawthorn (*Crataegus monogyna*).

There were no Annex I habitats recorded within the project site boundary and no protected species were recorded during the site visit. Notable species recorded within Q96 10 km grid include Badger, Otter, Hare, Stoat, Pine Marten, bat species, Peregrine, Hen Harrier, Merlin, Barnacle Goose, Brent Goose, Greenland White-fronted Goose, Greylag Goose, Whooper Swan, Golden Plover, Kingfisher, Curlew, Lapwing, Snipe, Chough, Marsh Fritillary and Narrow mouthed Whorl Snail. However, this grid extends to the coast around Doonbeg and White Strand. Within the 2km grid encompassing the site lands, the only notable species recorded are Badger, Hare, Stoat, and bats. None of these species are known to regularly utilise the site lands. There are no large trees present suitable for roosting bats, although the scattered, low hedgerow may provide some foraging habitat. The wet grassland habitat present is not species-rich and is common locally and nationally.

It is considered desirable that the small area of peaty wet grassland to the north-east of the site be retained, connecting with the nearby aquatic buffer either by open habitat or native trees. This area is somewhat distinctive from surrounding Soft Rush dominated wet grassland habitat. It will also serve to provide an open habitat that can be utilised by native fauna. A Habitat Map is attached.

The project site lies approximately 1.7 km upstream distance of Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA. Tullagher Lough and Bog SAC lies over 1.3 km north of project site. Kilkee Reefs SAC lies over 5 km north-west of project site. Both Carrowmore Dunes SAC and Mid-Clare Coast SPA lies over 6 km north of project site. All other European sites lies over 10km from the site with Carrowmore Point to Spanish Point and Islands SAC to the north and Ilaunonearaun SPA to the south-west of project site.

Surrounding land use includes forestry to the north. Improved pasture to the south, east and west. Access will from a minor road which comes off the N67.

#### **Summary of habitats on site**

Wet grassland (GS4)

Natural watercourse (FW2)

Drainage channels (FW4)

Hedgerows (WL1)

No Annex I habitats recorded within the project site boundary.



## **Proposed Operations**

Work on this site will comprise of planting 85 % Sitka spruce and 15% native broadleaves.

### Site Preparation and planting

Mounding: Small mounds are excavated and placed at 2 metre intervals. The drains that are formed by removing the mounds are spaced at 12 metre intervals, giving 2500 mounds (trees) per hectare.

Mounding will be completed by a tracked excavator. The excavator will create small mounds of soil. The mound loosens any compacted soil, as well as raising the planting position of the young trees which reduces the impact of competing vegetation.

Trees will be sourced from a recognised forest nursery. Planting will occur manually. A slit will be made in the centre of each mound with a spade and the roots of the young tree placed in the opening. The loose soil will then be backed filled with the spade and firmed in, making sure that the tree is straight. The tree will be firmed in by foot. Care will be taken to ensure trees are planted to the correct depth (i.e. root collar) and all roots are placed fully into the soil. Where possible trees will be planted between November and March during their dormant season.

All setbacks along aquatic zone, relevant water courses, roads and dwelling house will be measured and marked by machine operator prior to work commencing.

### Fencing

The perimeter of the site will be fenced with stock fencing consisting of NSAI stakes and strainers and high tensile barbed wire.

### Fertiliser

Due to inherent levels of fertility, no fertiliser application is required to promote the establishment and growth of the newly planted trees.

### Management

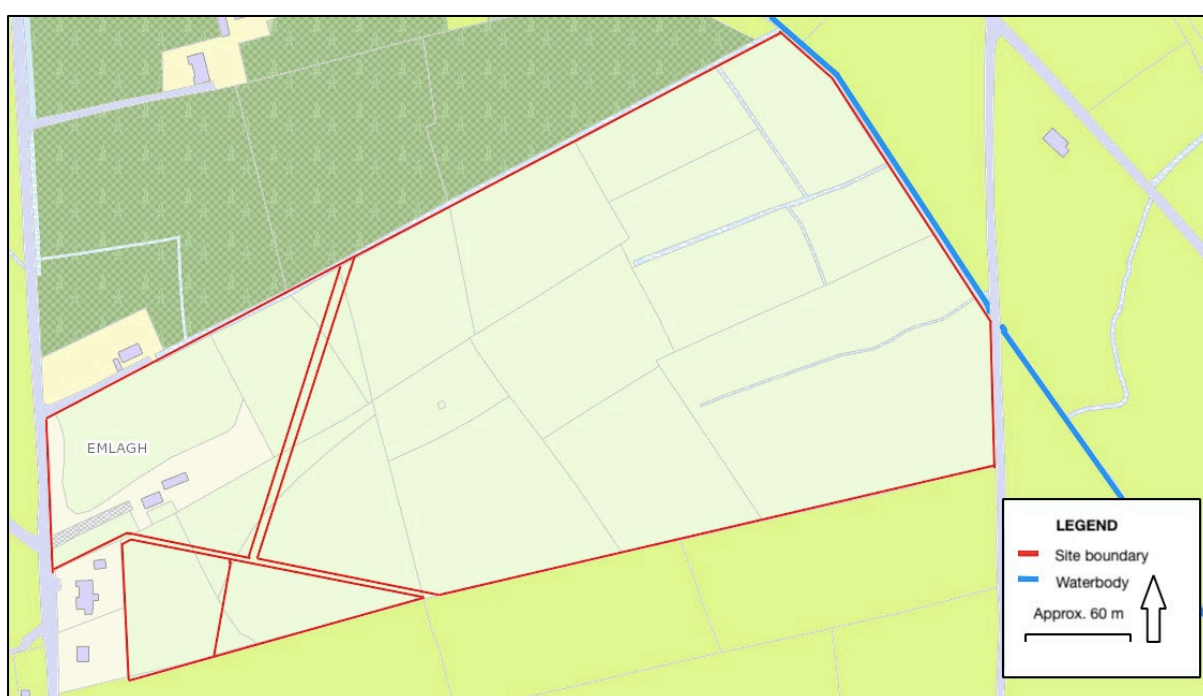
Regular site visits and monitoring will occur. Management will involve carrying out vegetation control, checking for browsing or frost damage, carry out broadleaf shaping and checking drains, firebreaks and fence-lines. Manual maintenance will occur annually. Maintenance will involve trampling by stamping on weeds around the trees. Where necessary spot spraying with Glyphosate will occur in year 2 where dense vegetation is impeding tree growth.

Beating Up: Replacement of failures in Year 2 and 3.

### Section 3: INDIVIDUAL EFFECT ON EUROPEAN SITES

The aim of this section of the report is to identify any significant impacts of the proposed development on all relevant Natura 2000 sites. This report covers Stage 1 screening for appropriate assessment and has been prepared in accordance with the current guidance (NPWS 2009, revised February 2010 and Office of the Planning Regulator 2021).

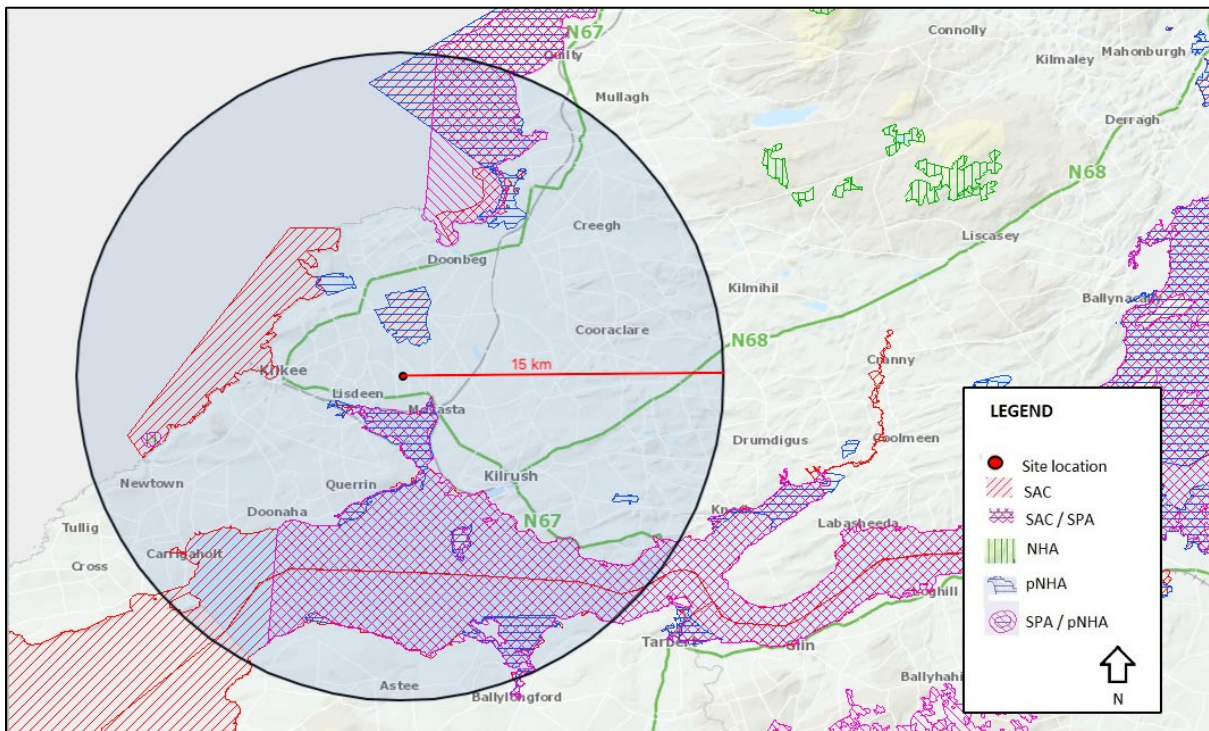
The proposed project involves afforestation of agricultural grassland area at Emagh, Moyasta, Co. Clare (see photograph 1). The proposed area is approximately 14.48 hectares.



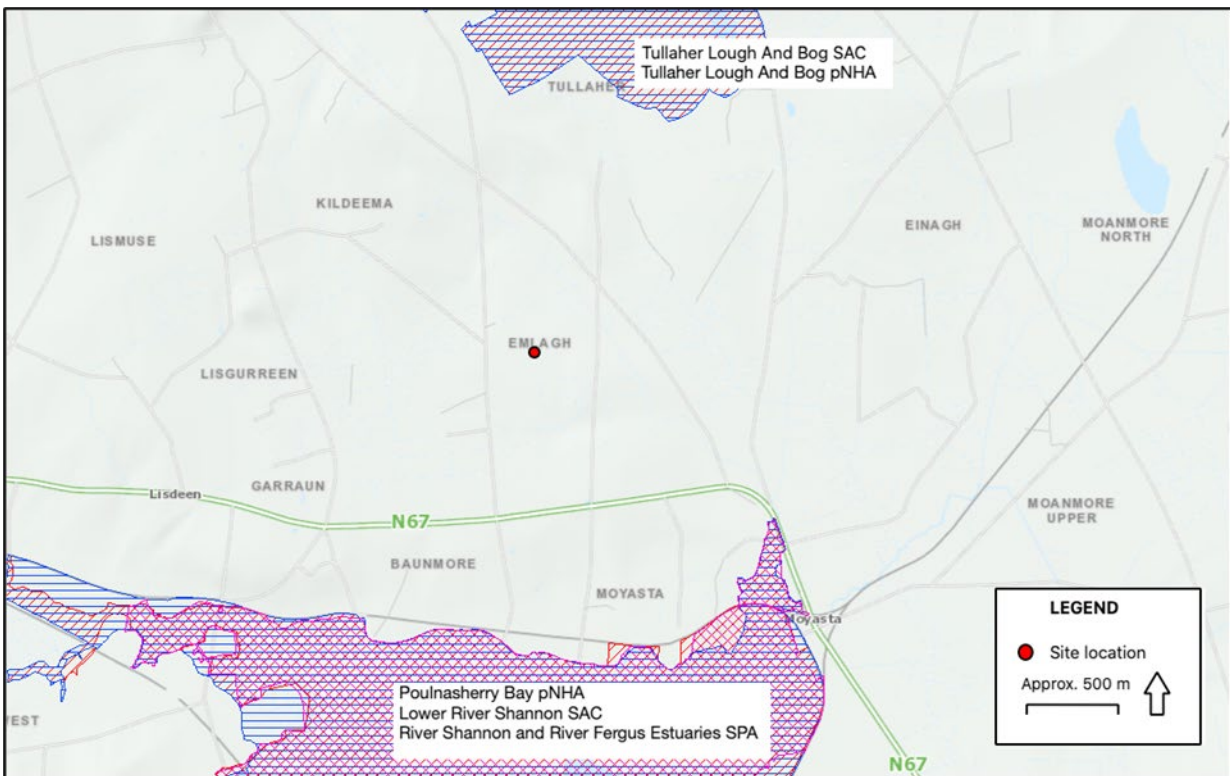
**Diagram 1: Site location at Emagh, Co Clare**

Due to the scale and nature of the proposed project the zone of influence is highly unlikely to extend to 15 km. However, in order to ensure no impact on Natura 2000 sites occurring within 15 km of the project site or any hydrologically linked beyond 15km, all were considered for the initial assessment.

The closest Natura 2000 sites are Tullaher Lough and Bog SAC, River Shannon and River Fergus Estuaries SPA and the Lower River Shannon SAC. The proposed project is situated within 1337.11 m of the Tullaher Lough and Bog SAC, 1770.16 m of River Shannon and River Fergus Estuaries SPA and 1766.93 m of Lower River Shannon SAC. Six other Natura 2000 sites fall within a 15km radius of the site. See Table 1 below for details.



**Map 1 Showing Natura 2000 sites within 15km radius of site**  
 (Map source: <http://dahg.maps.arcgis.com/apps/webappviewer>)



**Map 2. Showing Natura 2000 sites in close proximity to development site**  
 (Map source - <https://www.npws.ie/maps-and-data>)

**Table 1: Individual Effect on European Sites**

| <p>List all European Site(s) within 15 km of the project area, &amp; European Site(s) beyond 15 km but where potential pathway with the project may exist*</p> <p>Include the site name &amp; code, &amp; also the link to the relevant webpage for this protected site, at <a href="http://www.npws.ie/t">www.npws.ie/t</a></p> <p>The AA tool publicly available on the EPA website will assist in identifying these European Sites – for guidance, see Appendix 4 of the NIS Guidance &amp; Template†.</p> | <p>For each European Site(s), list the Qualifying Interests (QIs) (if SAC) and the Special Conservation Interests (SCIs) (if SPA), for which the site is designated.</p>   | <p>Based on potential sources &amp; pathways, the nature of the receptor*, &amp; excluding any mitigation measure†, is there a possibility of the project <u>itself</u> (i.e. 'alone') having a significant effect, on this European Site(s)?</p> | <p>Describe the evidence / rationale for this position.</p> <p>Where relevant, detail the evidence / rationale in relation to individual QIs / SCIs.</p>  |
|---|--|---|---|
| <p>Tullagher Lough and Bog SAC (site code: 002343)</p> <p><a href="http://www.npws.ie/sites/default/files/protected/sites/conservation_objectives/CO002343.pdf">http://www.npws.ie/sites/default/files/protected/sites/conservation_objectives/CO002343.pdf</a></p> <p>Distance: 1316.24 m</p>  | <p><b>Habitats</b></p> <p>7110 Active raised bogs*</p> <p>7120 Degraded raised bogs still capable of natural regeneration</p> <p>7140 Transition mires and quaking bogs</p> <p>7150 Depressions on peat substrates of the Rhynchosporion</p> | <p>No</p>   | <p>Due to distance from project site to SAC being over 1.3 km, no direct hydrological connection, terrestrial nature of the habitats, the size and nature of the proposed project and the forestry operations being contained within the project site boundary there is no possibility for significant effects on this SAC and it's QIs</p> |
| <p>Lower River Shannon SAC (site code: 002165)</p> <p><a href="http://www.npws.ie/sites/default/files/protected/sites/conservation_objectives/CO002165.pdf">http://www.npws.ie/sites/default/files/protected/sites/conservation_objectives/CO002165.pdf</a></p> <p>Distance: 1768.70 m</p>  | <p><b>Habitats</b></p> <p>1110 Sandbanks which are slightly covered by sea water all the time</p> <p>1130 Estuaries</p> <p>1140 Mudflats and sandflats not covered by seawater at low tide</p> <p>1150 Coastal lagoons*</p>                  | <p>Yes</p>  | <p>Possible effect as there is hydrological link to this SAC. Site lies approximately 327 m from Emlagh 27 River (EPA code: IE_SH_27M040900), which forms hydrological link to Lower River Shannon SAC.</p> <p>Downstream distance of approximately 1.7 km to SAC.</p>  |



|  |   |  |  |
|--|---|--|--|
|  | <p>1160 Large shallow inlets and bays</p> <p>1170 Reefs</p> <p>1220 Perennial vegetation of stony banks</p> <p>1230 Vegetated sea cliffs of the Atlantic and Baltic coasts</p> <p>1310 Salicornia and other annuals colonising mud and sand</p> <p>1330 Atlantic salt meadows (<i>GlaucoPuccinellietalia maritimae</i>)</p> <p>1410 Mediterranean salt meadows (<i>Juncetalia maritimi</i>)</p> <p>3260 Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation</p> <p>6410 <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>)</p> <p>91E0 Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>)*</p> <p><b>Species</b></p> <p>1029 Freshwater Pearl Mussel (<i>Margaritifera margaritifera</i>)</p> <p>1099 River Lamprey (<i>Lampetra fluviatilis</i>)</p> <p>1349 Common Bottlenose Dolphin (<i>Tursiops truncatus</i>)</p> <p>1355 Otter (<i>Lutra lutra</i>)</p> <p>1096 Brook Lamprey (<i>Lampetra planeri</i>)</p> |  |  |
|--|---|--|--|

|   |  |            |   |
|---|--|------------|---|
| <p>Kilkee Reefs SAC (site code: 002264)<br/> <a href="http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002264.pdf">http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002264.pdf</a><br/> Distance: 5160.88 m</p>     | <p>1095 Sea Lamprey (<i>Petromyzon marinus</i>)<br/> 1106 Salmon (<i>Salmo salar</i>)</p> <p><b>Habitats</b><br/> 1160 Large shallow inlets and bays<br/> 1170 Reefs<br/> 8330 Submerged or partially submerged sea caves</p>  | <p>No</p>  | <p>Due to distance from project site to SAC being over 5 km, the size and nature of the proposed project and the forestry operations being contained within the project site boundary and with no direct hydrological connection there is no possibility for significant effects on this SAC and it's QIs. There is a potential indirect connection through the sea. However, the assimilation capacity of the sea means there is no possibility for significant effects on this SAC and it's QIs.</p>  |
| <p>Carrowmore Dunes SAC (site code: 002250)<br/> <a href="http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002250.pdf">http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002250.pdf</a><br/> Distance: 6318.43 m</p> | <p><b>Habitats</b><br/> 1170 Reefs<br/> 2110 Embryonic shifting dunes<br/> 2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes)<br/> 2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)*</p> <p><b>Species</b><br/> 1014 Narrow-mouthed Whorl Snail (<i>Vertigo angustior</i>)</p> | <p>Yes</p> | <p>Due to distance from project site to SAC being over 6 km, no direct hydrological connection, the size and nature of the proposed project and the forestry operations being contained within the project site boundary there is no possibility for significant effects on this SAC and it's QIs. There is no possibility for impact on Narrow-mouth Whorl snail due to the unsuitability of the project site for this species (Moorkens &amp; Killeen 2011). There is a potential indirect connection through the sea. However, the assimilation capacity of the sea means there is</p> |

|   |   |            |   |
|---|---|------------|---|
| <p>Carrowmore Point to Spanish Point and Islands SAC (site code: 001021)</p> <p><a href="http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001021.pdf">http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO001021.pdf</a></p> <p>Distance: 10272.82 m</p> | <p><b>Habitats</b></p> <p>1150 Coastal lagoons*</p> <p>1170 Reefs</p> <p>1220 Perennial vegetation of stony banks</p> <p>7220 Petrifying springs with tufa formation (Cratoneurion)*</p>  | <p>No</p>  | <p>no possibility for significant effects on this SAC and it's QJs.</p> <p>Due to distance from project site to SAC being over 10 km, no direct hydrological connection, the size and nature of the proposed project and the forestry operations being contained within the project site boundary there is no possibility for significant effects on this SAC and it's QJs. There is a potential indirect connection through the sea. However, the assimilation capacity of the sea means there is no possibility for significant effects on this SAC and it's QJs.</p> |
| <p>River Shannon and River Fergus Estuaries SPA (site code: 004077)</p> <p><a href="http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p> <p>Distance: 1772.01 m</p>       | <p><b>Birds</b></p> <p>A179 Black-headed Gull (<i>Chroicocephalus ridibundus</i>)</p> <p>A141 Grey Plover (<i>Pluvialis squatarola</i>)</p> <p>A038 Whooper Swan (<i>Cygnus cygnus</i>)</p> <p>A140 Golden Plover (<i>Pluvialis apricaria</i>)</p> <p>A048 Shelduck (<i>Tadorna tadorna</i>)</p> <p>A157 Bar-tailed Godwit (<i>Limosa lapponica</i>)</p> <p>A046 Light-bellied Brent Goose (<i>Branta bernicla hrota</i>)</p> <p>A137 Ringed Plover (<i>Charadrius hiaticula</i>)</p> <p>A156 Black-tailed Godwit (<i>Limosa limosa</i>)</p> <p>A160 Curlew (<i>Numenius arquata</i>)</p> | <p>Yes</p> | <p>Possible effect as there is a hydrological link to this SAC. Site lies approximately 327 m from Emlagh 27 River (EPA code: IE_SH_27M040900), which forms hydrological link to River Shannon and River Fergus Estuaries SPA.</p> <p>Downstream distance of approximately 1.7 km to SPA.</p>   |

|  |  |           |  |
|--|--|-----------|--|
|  | <p>A164 Greenshank (<i>Tringa nebularia</i>)<br/> A050 Wigeon (<i>Anas penelope</i>)<br/> A162 Redshank (<i>Tringa totanus</i>)<br/> A142 Lapwing (<i>Vanellus vanellus</i>)<br/> A017 Cormorant (<i>Phalacrocorax carbo</i>)<br/> A056 Shoveler (<i>Anas clypeata</i>)<br/> A052 Teal (<i>Anas crecca</i>)<br/> A143 Knot (<i>Calidris canutus</i>)<br/> A062 Scaup (<i>Aythya marila</i>)<br/> A054 Pintail (<i>Anas acuta</i>)<br/> A149 Dunlin (<i>Calidris alpina</i>)<br/> <b>Habitats</b><br/> Wetlands</p> |           |  |
| <p>Mid-Clare Coast SPA (site code: 004182)<br/> <a href="http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004182.pdf">http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004182.pdf</a><br/> <br/> Distance: 6174.10 m</p> | <p><b>Birds</b><br/> A017 Cormorant (<i>Phalacrocorax carbo</i>)<br/> A045 Barnacle Goose (<i>Branta leucopsis</i>)<br/> A169 Turnstone (<i>Arenaria interpres</i>)<br/> A148 Purple Sandpiper (<i>Calidris maritima</i>)<br/> A137 Ringed Plover (<i>Charadrius hiaticula</i>)<br/> A149 Dunlin (<i>Calidris alpina</i>)<br/> A144 Sanderling (<i>Calidris alba</i>)<br/> <b>Habitats</b><br/> Wetlands</p>   | <p>No</p> | <p>Due to distance from project site to SPA being over 6km, no direct hydrological connection, the size and nature of the proposed project, the unsuitability of the area for waders, geese and cormorants who generally use on coastal sites and large bodies of water (Balmer <i>et al</i> 2013), and the forestry operations being contained within the project site boundary there is no possibility for significant effects on this SPA and it's QIs. There is a potential indirect connection through the sea. However, the assimilation capacity of the sea means there is no possibility for significant effects on this SAC and it's QIs.</p> |
| <p>Illaunonearaun SPA (site code: 004114)</p>  | <p><b>Birds</b></p>  | <p>No</p> | <p>Due to distance from project site to SPA being over 11 km, no direct hydrological connection, the size</p>  |



|  |  |  |
|--|--|--|
| <p><a href="http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004114.pdf">http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004114.pdf</a></p> <p>Distance: 11632.11 m</p> | <p>A045 Barnacle Goose (<i>Branta leucopsis</i>)</p> | <p>and nature of the proposed project, the unsuitability of the site for barnacle goose who feed on coastal grassland and seashores (Balmer <i>et al</i> 2013), and the forestry operations being contained within the project site boundary there is no possibility for significant effects on this SPA and it's QJs. There is a potential indirect connection through the sea. However, the assimilation capacity of the sea means there is no possibility for significant effects on this SAC and it's QJs.</p> |
|--|--|--|

### **3.1 Assessment of Likely Effects**

The proposed afforestation is not directly connected with or necessary to the management of a Natura 2000 site. In light of this the site must be subject to AA screening for its implications for the Natura 2000 sites in view of the site's conservation objectives. The assessment is based on a preliminary assessment using available information and data (e.g. NPWS data, water quality data etc.), supplemented with local site information and ecological surveys. A multidisciplinary walkover survey was conducted on the 20/05/2021 following NRA (2009) guidelines (Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes) by ecologist Cieran Ryan. All habitats were identifiable (Smith, G.F., O'Donoghue, P., O'Hora, K., & Delaney E. 2011). The walkover surveys were designed to detect the presence, or likely presence, of a range of protected species. The survey included a search of all potentially suitable habitat for protected species that are likely to occur in the vicinity of the project area. Habitats were identified in accordance with the Heritage Council's 'Guide to Habitats in Ireland' (Fossitt, 2000). Plant nomenclature for vascular plants follows 'New Flora of the British Isles' (Stace, 2010). During the multidisciplinary surveys, a search for Invasive Alien Species (IAS) listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015) was also conducted.

In order, to determine, on the basis of a preliminary assessment and objective criteria, whether a plan or project, alone and in-combination with other plans or projects, could have significant effects on a Natura 2000 site in view of the site's conservation objectives.

### **3.2 Direct, indirect or secondary impacts**

The screening analysis below considers each qualifying interest of Tullaher Lough and Bog SAC, Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA and lists the potential pathway and potential threat source and whether it is likely to have a significant effect on the qualifying habitats or species of special conservation interest.

**Table 2: Lower River Shannon SAC – Screening analysis (using source-pathway-receptor model) to identify SAC qualifying habitats and any “Likely Significant Effects” of impacts on Natura 2000 site, based on current project proposals.**

| Qualifying Interests (QI) and code ( <i>Potential receptors</i> )   | Conservation objectives   | Pathway / Comment      | Source of potential threats  | Likelihood of significance   |
|---|---|------------------------|--|--|
| 1029 Freshwater Pearl Mussel ( <i>Margaritifera margaritifera</i> ) | To restore the favourable conservation condition of Freshwater Pearl Mussel in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a> | Surface water pathway. | Species is very sensitive to water quality and sediment or pollution run-off | This conservation objective applies to the freshwater pearl mussel population in the Cloon River, Co. Clare only. The Cloon population is confined to the main channel and is distributed from Croany Bridge to approx. 1.5km upstream of Clonderalaw Bridge (Ross, 2008; DEHLG, 2010) (National Parks and Wildlife Service 2012)<br>There is no potential for significant effects due to the freshwater pearl mussel population in the Cloon River being over 22 km from the proposed forestry site and being situated in a different river sub-catchment. The forestry site is situated in sub-catchment Wood-SC_010, while the pearl mussel site in Cloon River is situated in sub-catchment Cloon (Clare)SC_010. The area between these catchments includes the large Shannon Estuary and the pearl mussel populations are upstream along the Cloon River. |
| 1095 Sea Lamprey <i>Petromyzon marinus</i>                          | To restore the favourable conservation condition of Sea Lamprey in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at   | Surface water pathway. | Water pollution  | Records of Sea lamprey 23 km from site (National Biodiversity Data Centre records). Probably under recorded (Kelly & King, 2001).  |

|   |  |   |                                |   |
|---|--|---|--------------------------------|---|
| 1096 Brook Lamprey ( <i>Lampetra planeri</i> )                      | <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a><br>To maintain the favourable conservation condition of Brook Lamprey in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at<br><a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a> | Surface water pathway.  | Water pollution                | Potential for significant effects cannot be excluded.<br>Records of Brook lamprey 65 km from site (National Biodiversity Data Centre records). Probably under recorded (Kelly & King, 2001).<br><br>Potential for significant effects cannot be excluded.   |
| 1110 Sandbanks which are slightly covered by sea water all the time | To maintain the favourable conservation condition of Sandbanks which are slightly covered by sea water all the time in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at<br><a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a>   | Surface water pathway.  | Water pollution                | Mapped sandbanks are located approximately 8km from project site (National Parks and Wildlife Service 2012). However, examination of aerial photographs suggest habitat could lie within 1.7 km of site.<br><br>Potential for significant effects cannot be excluded if sediment or pollution run-off occurs. |
| 1106 Atlantic Salmon <i>Salmo salar</i> (only in fresh water)       | To restore the favourable conservation condition of Salmon in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at<br><a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a>  | Surface water pathway.<br><br>No hydrological connection from project site to SAC | Water pollution                | Salmon are widespread in the River Shannon system (National Parks and Wildlife Service 2012).<br><br>Potential for significant effects cannot be excluded if sediment or pollution run-off occurs.  |
| 1099 River Lamprey  | To maintain the favourable conservation condition of River Lamprey in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at:<br><a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a>   | Surface water pathway.  | Water pollution, sedimentation | Records of River lamprey 64 km from site (National Biodiversity Data Centre records). Probably under recorded (Kelly & King, 2001).   |

|   |   |                        |                               |   |
|---|---|------------------------|-------------------------------|---|
|   |   |                        |                               | Potential for significant effects cannot be excluded if sediment or pollution run-off occurs.   |
| 1130 Estuaries  | To maintain the favourable conservation condition of Estuaries in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a>  | Surface water pathway. | Sediment or pollution run-off | Mapped estuaries are located approximately 8.7 km south-east of project site (National Parks and Wildlife Service 2012). However, examination of aerial photographs suggest habitat could lie within 1.7 km of site.<br><br>Potential for significant effects cannot be excluded if sediment or pollution run-off occurs. |
| 1140 Mudflats and sandflats not covered by seawater at low tide | To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a> | Surface water pathway. | Sediment or pollution run-off | Estuaries are located approximately 1.8 km from project site (National Parks and Wildlife Service 2012).<br><br>Potential for significant effects cannot be excluded if sediment or pollution run-off occurs.   |



|  |  |                        |                               |   |
|--|--|------------------------|-------------------------------|---|
| 1150 *Coastal lagoons                    | To restore the favourable conservation condition of Coastal lagoons in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a>                      | Surface water pathway. | Sediment or pollution run-off | Four coastal lagoons within SAC. The closest two are Scattery lagoon located approximately 7.7 km from project site and Clooneen Pool approximately 15.57 km (National Parks and Wildlife Service 2012). Due to distance from site, and the assimilation capacity of the sea, there is no potential for significant effects |
| 1160 Large shallow inlets and bays       | To maintain the favourable conservation condition of Large shallow inlets and bays in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a>       | Surface water pathway. | Sediment or pollution run-off | Habitat is located 1.8 km from project site (National Parks and Wildlife Service 2012).<br><br>Potential for significant effects cannot be excluded if sediment or pollution run-off occurs.  |
| 1170 Reefs                               | To maintain the favourable conservation condition of Reefs in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a>                               | Surface water pathway. | Sediment or pollution run-off | Closest reef is located 1.89 km from project site (National Parks and Wildlife Service 2012).<br><br>Potential for significant effect cannot be excluded  |
| 1220 Perennial vegetation of stony banks | To maintain the favourable conservation condition of Perennial vegetation of stony banks in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a> | Land air pathway       | Removal of material           | Closest perennial vegetation is Ballymacrin Bay, which is approximately 11.2 km away. Bunaclogga Bay lies within 13 km (National Parks and Wildlife Service 2012).<br>. Due to coastal and terrestrial nature of this habitat there is no potential for significant effects   |

|   |  |                        |   |  |
|---|--|------------------------|---|--|
| 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts             | To maintain the favourable conservation condition of Vegetated sea cliffs in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a>  | Land air pathway.      | Invasive species                                  | Nine sub-sites were identified (National Parks and Wildlife Service 2012). Lisheenrony is the closest sea cliff located approximately 10.5 km from site. Adjacent are the Moyarta cliffs which are 12.2 km away. Due to coastal and terrestrial nature of this habitat there is no potential for significant effects                   |
| 1310 Salicornia and other annuals colonizing mud and sand               | To maintain the favourable conservation condition of Salicornia and other annuals colonizing mud and sand in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a>              | Surface water pathway. | Sediment or pollution run-off                     | Habitat recorded at five of the ten sub-sites surveyed and mapped, further un-surveyed areas maybe present within the site (National Parks and Wildlife Service 2012).<br><br>Potential for significant effect cannot be excluded if sediment or pollution run-off occurs.   |
| 1330 Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritimae</i> ) | To restore the favourable conservation condition of Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritimae</i> ) in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a> | Land air pathway       | Invasive species, terrestrial trampling           | Ten sub-sites that supported Atlantic salt meadow were mapped, the closest has been mapped approximately 2 km away (National Parks and Wildlife Service 2012).<br><br>Due to coastal and terrestrial nature of this habitat and site works being contained within project site boundary, There is no potential for significant effects |
| 1349 Bottlenose Dolphin ( <i>Tursiops truncatus</i> )                   | To maintain the favourable conservation condition of Bottlenose Dolphin in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at  | Surface water pathway. | Sediment or pollution run-off<br><br>Disturbance. | Records of Bottlenose Dolphin approximately 7km from project site (National Biodiversity Data Centre records).   |

|  |   |   |   |
|--|---|---|---|
|  | <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a>   | Land/Air pathway - Disturbance                                | <p>Due to the marine nature of this species which spends its time at sea there will be no disturbance impacts. Due to the size and scale of the proposed project and the assimilation capacity of the sea there is <b>no potential for significant effects</b>.</p> <p>Recordings of otter approximately 2km away (National Biodiversity Data Centre records).</p> <p>Potential for significant effect cannot be excluded</p>   |
| 1355 Otter ( <i>Lutra lutra</i> )  | <p>To restore the favourable conservation condition of Otter in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at</p> <p><a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a></p>   | <p>Water pollution.</p> <p>Land/Air pathway - Disturbance</p> | <p>Disturbance, destruction of holts</p> <p>Invasive species, terrestrial trampling</p>   |
| 1410 Mediterranean salt meadows ( <i>Juncetalia maritimi</i> )   | <p>To restore the favourable conservation condition of Mediterranean salt meadows (<i>Juncetalia maritimi</i>) in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at</p> <p><a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a></p> | Land / air pathway  | <p>Eight sub-sites that support Mediterranean salt meadow were mapped (National Parks and Wildlife Service 2012). The closest site is located approximately 14 km from project site.</p> <p>Due to terrestrial nature of this habitat, project works being contained within site boundary, the size and scale of the proposed project and terrestrial separation distance of more than 1.7 km, there is <b>no potential for significant effects</b>.</p> <p>The full distributions of this habitat and its sub-types in this site are currently unknown. Review of the available data had identified three high conservation elements (sub-types) in the site, namely: 1. <i>Groenlandia densa</i> (L.) Fourr.,</p> |
| 3260 Water courses of plain to montane levels with the Ranunculus fluitantis and Callitriche-Batrachion vegetation | <p>To maintain the favourable conservation condition of Water courses of plain to montane levels with the Ranunculus fluitantis and Callitriche-Batrachion vegetation in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at</p>   | Surface water pathway.  | <p>Sediment or pollution run-off</p>  |

|   |  |                           |                                    |   |
|---|--|---------------------------|------------------------------------|---|
| <p>6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinia caeruleae</i>)</p>  | <p><a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a></p>   | <p>Land / air pathway</p> | <p>Over grazing, burning</p>       | <p>Opposite-leaved Pondweed 2. <i>Schoenoplectus triquetra</i> (L.) Palla, Triangular Club-rush 3. Bryophyte-rich streams and rivers. The first two sub-types are associated with tidal reaches of rivers, while the latter sub-type is found in fast-flowing stretches of unmodified streams and rivers. (NPWS, 2012a). There is therefore potential for sub-types of this habitat to lie downstream of project site. Potential for significant effects cannot be excluded if water quality is impacted by project.</p> <p>Full extent of habitat within SAC has not been mapped.</p> <p>Due to terrestrial nature of this habitat, project works being contained within site boundary, the size and scale of the proposed project and terrestrial separation distance of more than 1.7 km, there is <u>no potential for significant effects</u></p> |
| <p>91E0 * Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>)</p> | <p>To restore the favourable conservation condition of Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a></p> | <p>Land/Air pathway</p>   | <p>Invasive species, pollution</p> | <p>Five surveyed sites. Located approximately 52 km away (National Parks and Wildlife Service 2012).</p> <p>Due to a terrestrial separation distance of more than 50km, project works being contained within site boundary, the size and scale of the proposed project, there is <u>no potential for significant effects</u></p>  |

**Table 3: River Shannon and River Fergus Estuaries SPA – Screening analysis (using source-pathway-receptor model) to identify SAC qualifying habitats and any “Likely Significant Effects” of impacts on Natura 2000 site, based on current project proposals.**

| Qualifying Interests (QI) and code<br>(Potential receptors) | Conservation objectives   | Pathway / Comment  | Source of potential threats   | Likelihood of significance  |
|---|---|--|---|---|
| A017<br>Cormorant <i>Phalacrocorax carbo</i>                | To maintain the favourable conservation condition of Cormorant in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/pro- tected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/pro- tected-sites/conservation_objectives/CO004077.pdf</a> | Surface water pathway.<br>Land/Air pathway – Disturbance | Sediment or pollution run-off from proposed works to nearby drain and from there to coast<br><br>Noise during works | SPA designated for breeding and over wintering. Cormorants. No records of breeding with 10 km <sup>2</sup> of site, however there are records of wintering species within 10 km <sup>2</sup> of site (National Biodiversity Data Centre records).<br><br>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten & Henkensj 1997). Due to distance of SPA to project site (over 1.7 km) there is no potential for significant direct effects due to disturbance during proposed works.<br><br>Potential for significant indirect effects cannot be excluded if water quality is impacted, due to hydrological connection from project site to SPA. |



|  |  |  |  |  |
|--|--|--|--|--|
| <p>A038 Whooper Swan <i>Cygnus cygnus</i></p>                      | <p>To maintain the favourable conservation condition of Whooper Swan in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p>              | <p>Surface water pathway.<br/>Land/Air pathway – Disturbance</p> | <p>Sediment or pollution run-off from proposed works to nearby drain and from there to coast<br/><br/>Noise during works</p> | <p>SPA designated for over wintering of Whooper swans. Records of wintering species within 10 km<sup>2</sup> of site (National Biodiversity Data Centre records).<br/><br/>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km) there is no potential for significant direct effects due to disturbance during proposed works.<br/><br/>Potential for significant indirect effects cannot be excluded, due to hydrological connection from project site to SPA.</p> |
| <p>A046 Light-bellied Brent Goose <i>Branta bernicla hrota</i></p> | <p>To maintain the favourable conservation condition of Light-bellied Brent Goose in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p> | <p>Surface water pathway.<br/>Land/Air pathway – Disturbance</p> | <p>Sediment or pollution run-off from proposed works to nearby drain and from there to coast<br/><br/>Noise during works</p> | <p>SPA designated for over wintering of Light bellied Brent geese. Records of wintering species within 1.6 km of site (National Biodiversity Data Centre records).<br/><br/>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts</p>  |

|   |   |  |  |   |
|---|---|--|--|---|
| <p>A048 Shelduck <i>Tadorna tadorna</i></p> | <p>To maintain the favourable conservation condition of Shelduck in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p> | <p>Surface water pathway.<br/>Land/Air pathway – Disturbance</p> | <p>Sediment or pollution run-off from proposed works to nearby drain and from there to coast<br/><br/>Noise during works</p> | <p>if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km) there is no potential for significant direct effects due to disturbance during proposed works.<br/><br/>Potential significant indirect effects cannot be excluded if water quality is impacted, due to hydrological connection from project site to SPA.<br/><br/>SPA designated for over wintering of Shelduck. Records of wintering species within 3 km of site (National Biodiversity Data Centre records).<br/><br/>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km) there is no potential for significant direct effects due to disturbance during proposed works.<br/><br/>Potential significant indirect effects cannot be excluded if water quality</p> |
|---|---|--|--|---|

|                                  |  |  |   |   |
|----------------------------------|--|--|---|---|
| A050 Wigeon <i>Anas penelope</i> | To maintain the favourable conservation condition of Wigeon in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a> | Surface water pathway.<br>Land/Air pathway – Disturbance | Sediment or pollution run-off from proposed works to nearby drain and from there to coast<br><br>Noise during works | is impacted, due to hydrological connection from project site to SPA.<br>SPA designated for over wintering of Wigeon. Records of wintering species within 2.5 km of site (National Biodiversity Data Centre records).<br><br>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten & Henkensj 1997). Due to distance of SPA to project site (over 1.7 km) there is no potential for significant direct effects due to disturbance during proposed works.<br><br>Potential significant indirect effects cannot be excluded if water quality is impacted, due to hydrological connection from project site to SPA. |
| A052 Teal <i>Anas crecca</i>     | To maintain the favourable conservation condition of Teal in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a>   | Surface water pathway.<br>Land/Air pathway – Disturbance | Sediment or pollution run-off from proposed works to nearby drain and from there to coast<br><br>Noise during works | SPA designated for over wintering of Teal. Records of wintering species within 2 km of site (National Biodiversity Data Centre records).<br><br>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds  |

|                                       |  |   |  |  |
|---------------------------------------|--|---|--|--|
| <p>A054 Pintail <i>Anas acuta</i></p> | <p>To maintain the favourable conservation condition of Pintail in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-conservation_objectives/CO004077.pdf</a></p> | <p>Surface water pathway – Land/Air pathway – Disturbance</p> | <p>Sediment or pollution run-off from proposed works to nearby drain and from there to coast</p> <p>Noise during works</p> | <p>can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km) there is no potential for significant direct effects due to disturbance during proposed works.</p> <p>Potential significant indirect effects cannot be excluded if water quality is impacted, due to hydrological connection from project site to SPA.</p> <p>SPA designated for over wintering of Pintail. Records of wintering species within 10 km<sup>2</sup> of site (National Biodiversity Data Centre records).</p> <p>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km) there is no potential for significant direct effects due to disturbance during proposed works.</p> |
|---------------------------------------|--|---|--|--|

|                                    |  |  |   |  |
|------------------------------------|--|--|---|--|
| A056 Shoveler <i>Anas clypeata</i> | To maintain the favourable conservation condition of Shoveler in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a> | Surface water pathway.<br>Land/Air pathway – Disturbance | Sediment or pollution run-off from proposed works to nearby drain and from there to coast<br><br>Noise during works | Potential significant indirect effects cannot be excluded if water quality is impacted, due to hydrological connection from project site to SPA.<br><br>SPA designated for over wintering of Shoveler. Records of wintering species within 10 km <sup>2</sup> of site.<br><br>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten & Henkensj 1997). Due to distance of SPA to project site (over 1.7 km) there is no potential for significant direct effects due to disturbance during proposed works.<br><br>Potential significant indirect effects cannot be excluded if water quality is impacted, due to hydrological connection from project site to SPA. |
| A062 Scaup <i>Aythya marila</i>    | To maintain the favourable conservation condition of Scaup in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a>    | Surface water pathway.<br>Land/Air pathway – Disturbance | Sediment or pollution run-off from proposed works to nearby drain and from there to coast<br><br>Noise during works | SPA designated for over wintering of Scaup. Records of wintering species within 10 km <sup>2</sup> of site (National Biodiversity Data Centre records).<br><br>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds  |



|   |  |  |  |  |
|---|--|--|--|--|
| <p>A137 Ringed Plover <i>Charadrius hiaticula</i></p> | <p>To maintain the favourable conservation condition of Ringed Plover in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-conservation_objectives/CO004077.pdf</a></p> | <p>Surface water pathway.<br/>Land/Air pathway – Disturbance</p> | <p>Sediment or pollution run-off from proposed works to nearby drain and from there to coast<br/><br/>Noise during works</p> | <p>can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km) there is no potential for significant direct effects due to disturbance during proposed works.<br/><br/>Potential significant indirect effects cannot be excluded if water quality is impacted, due to hydrological connection from project site to SPA.<br/><br/>SPA designated for over wintering of Ringed Plover. Records of wintering species within 10 km<sup>2</sup> of site (National Biodiversity Data Centre records).<br/><br/>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km) there is no potential for significant direct effects due to disturbance during proposed works.</p> |
|---|--|--|--|--|

|  |  |  |  |  |
|--|--|--|--|--|
| <p>A140 Golden Plover <i>Pluvialis apricaria</i></p> | <p>To maintain the favourable conservation condition of Golden Plover in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-conservation_objectives/CO004077.pdf</a></p> | <p>Surface water pathway.<br/>Land/Air pathway – Disturbance</p> | <p>Sediment or pollution run-off from proposed works to nearby drain and from there to coast<br/><br/>Noise during works</p> | <p>Potential significant indirect effects cannot be excluded if water quality is impacted, due to hydrological connection from project site to SPA.<br/>SPA designated for breeding of Golden Plover. Records of wintering species within 10 km<sup>2</sup> of site (National Biodiversity Data Centre records).<br/><br/>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km) there is no potential for significant direct effects due to disturbance during proposed works.<br/><br/>Potential significant indirect effects cannot be excluded if water quality is impacted, due to hydrological connection from project site to SPA.</p> |
| <p>A141 Grey Plover <i>Pluvialis squatarola</i></p>  | <p>To maintain the favourable conservation condition of Grey Plover in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-conservation_objectives/CO004077.pdf</a></p>   | <p>Surface water pathway.<br/>Land/Air pathway – Disturbance</p> | <p>Sediment or pollution run-off from proposed works to nearby drain and from there to coast<br/><br/>Noise during works</p> | <p>SPA designated for wintering of Grey Plover. Records of wintering species within 10 km<sup>2</sup> of site (National Biodiversity Data Centre records).<br/><br/>Birds can be impacted by human or noise disturbance particularly if</p>  |

|                                       |  |   |  |   |
|---------------------------------------|--|---|--|---|
| A142 Lapwing <i>Vanellus vanellus</i> | <p><a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p>   | <p>Surface water pathway – Land/Air pathway – Disturbance</p> | <p>Sediment or pollution run-off from proposed works to nearby drain and from there to coast</p> <p>Noise during works</p> | <p>disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km) there is no potential for significant direct effects due to disturbance during proposed works.</p> <p>Potential significant indirect effects cannot be excluded if water quality is impacted, due to hydrological connection from project site to SPA.</p>         |
|                                       | <p>To maintain the favourable conservation condition of Lapwing in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p> |   |  | <p>SPA designated for wintering of Lapwing. Records of wintering species within 5 km of site (National Biodiversity Data Centre records).</p> <p>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km) there is no potential for significant direct</p> |

|                                    |  |   |   |  |
|------------------------------------|--|---|---|--|
| A143 Knot <i>Calidris canutus</i>  | To maintain the favourable conservation condition of Knot in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a> | Surface water pathway.<br>Land/Air pathway –<br>Disturbance | Sediment or pollution run-off from proposed works to nearby drain and from there to coast<br><br>Noise during works | effects due to disturbance during proposed works.<br><br>Potential significant indirect effects cannot be excluded if water quality is impacted, due to hydrological connection from project site to SPA.<br><br>SPA designated for wintering of Knot. Records of wintering species within 10 km <sup>2</sup> of site (National Biodiversity Data Centre records).<br><br>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten & Henkensj 1997). Due to distance of SPA to project site (over 1.7 km) there is no potential for significant direct effects due to disturbance during proposed works.<br><br>Potential significant indirect effects cannot be excluded if water quality is impacted, due to hydrological connection from project site to SPA. |
| A149 Dunlin <i>Calidris alpina</i> | To maintain the favourable conservation condition of Dunlin in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at   | Surface water pathway.<br>Land/Air pathway –<br>Disturbance | Sediment or pollution run-off from proposed works to nearby drain and from there to coast                           | SPA designated for breeding Dunlin. Records of breeding species within 2 km of site (National Biodiversity Data Centre records).   |

|  |  |  |   |
|--|--|--|---|
|  | <p><a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p>   |  | <p>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km) there is no potential for significant direct effects due to disturbance during proposed works.</p> <p>Potential significant indirect effects cannot be excluded if water quality is impacted, due to hydrological connection from project site to SPA.</p> |
| <p>A156 Black-tailed Godwit <i>Limosa limosa</i></p> | <p>To maintain the favourable conservation condition of Black-tailed Godwit in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p> | <p>Sediment or pollution run-off from proposed works to nearby drain and from there to coast</p> <p>Noise during works</p> <p>Surface water pathway – Land/Air pathway – Disturbance</p> | <p>SPA designated for over wintering of Black – tailed Godwit. Records of wintering species within 10 km<sup>2</sup> of site (National Biodiversity Data Centre records).</p> <p>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km) there is no</p>  |



|  |   |  |   |   |
|--|---|--|---|---|
| A157 Bar-tailed Godwit <i>Limosa lapponica</i> | To maintain the favourable conservation condition of Bar-tailed Godwit in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a> | Surface water pathway.<br>Land/Air pathway – Disturbance | Sediment or pollution run-off from proposed works to nearby drain and from there to coast<br><br>Noise during works | potential for significant direct effects due to disturbance during proposed works.<br><br>Potential significant indirect effects cannot be excluded if water quality is impacted, due to hydrological connection from project site to SPA.<br><br>SPA designated for over wintering of Bar – tailed Godwit. Records of wintering species within 10 km <sup>2</sup> of site (National Biodiversity Data Centre records).<br><br>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten & Henkensj 1997). Due to distance of SPA to project site (over 1.7 km) there is no potential for significant direct effects due to disturbance during proposed works.<br><br>Potential significant indirect effects cannot be excluded if water quality is impacted, due to hydrological connection from project site to SPA. |
| A160 Curlew <i>Numenius arquata</i>            | To maintain the favourable conservation condition of Curlew in the River Shannon and River Fergus Estuaries SPA, which is   | Surface water pathway.                                   | Sediment or pollution run-off from proposed works to nearby drain and from there to coast                           | SPA designated for wintering Curlew. Records of wintering species   |

|  |   |   |  |   |
|--|---|---|--|---|
| <p>A164 Greenshank <i>Tringa nebularia</i></p> | <p>defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p>   | <p>Land/Air pathway – Disturbance</p>                         | <p>Noise during works</p>  | <p>within 10 km<sup>2</sup> of site (National Biodiversity Data Centre records).<br/>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km) there is no potential for significant direct effects due to disturbance during proposed works.<br/><br/>Potential significant indirect effects cannot be excluded if water quality is impacted, due to hydrological connection from project site to SPA.</p> |
| <p>A164 Greenshank <i>Tringa nebularia</i></p> | <p>To maintain the favourable conservation condition of Greenshank in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p> | <p>Surface water pathway – Land/Air pathway – Disturbance</p> | <p>Sediment or pollution run-off from proposed works to nearby drain and from there to coast<br/><br/>Noise during works</p> | <p>SPA designated for over wintering of Greenshank. Records over wintering within 5 km of site (National Biodiversity Data Centre records).<br/><br/>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj</p>  |

|   |   |  |  |   |
|---|---|--|--|---|
| <p>A162 Redshank <i>Tringa totanus</i></p>            | <p>To maintain the favourable conservation condition of Redshank in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p> | <p>Surface water pathway.<br/>Land/Air pathway – Disturbance</p> | <p>Sediment or pollution run-off from proposed works to nearby drain and from there to coast<br/><br/>Noise during works</p> | <p>1997). Due to distance of SPA to project site (over 1.7 km) there is no potential for significant direct effects due to disturbance during proposed works.<br/><br/>Potential significant indirect effects cannot be excluded if water quality is impacted, due to hydrological connection from project site to SPA.<br/><br/>SPA designated for over wintering of Redshank. Records over wintering within 3 km of site (National Biodiversity Data Centre records).<br/><br/>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km) there is no potential for significant direct effects due to disturbance during proposed works.<br/><br/>Potential significant indirect effects cannot be excluded if water quality is impacted, due to hydrological connection from project site to SPA.</p> |
| <p>A179 Black-headed Gull <i>Larus ridibundus</i></p> | <p>To maintain the favourable conservation condition of Black-headed Gull in the River</p>  | <p>Surface water pathway.</p>                                    | <p>Sediment or pollution run-off from proposed</p>   | <p>SPA designated for breeding of Black headed Gull. Records of over</p>  |

|               |   |                                |   |  |
|---------------|---|--------------------------------|---|--|
| A999 Wetlands | <p>Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p>  | Land/Air pathway – Disturbance | <p>works to nearby drain and from there to coast</p> <p>Noise during works</p>            | <p>wintering within 10 km<sup>2</sup> of site (National Biodiversity Data Centre records).</p> <p>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km) there is no potential for significant direct effects due to disturbance during proposed works.</p> <p>Potential significant indirect effects cannot be excluded if water quality is impacted, due to hydrological connection from project site to SPA.</p> <p>Direct hydrological connection from project site to SPA. Site lies approximately 327 m from Emlagh 27 River (EPA code: IE_SH_27M040900), which forms hydrological link to River Shannon and River Fergus Estuaries SPA.</p> <p>Potential significant effects cannot be excluded if water quality is impacted, due to hydrological connection from project site to SPA.</p> |
|               | <p>To maintain the favourable conservation condition of the wetland habitat in the River Shannon and River Fergus Estuaries SPA as a resource for the regularly-occurring migratory waterbirds that utilise it. This is defined by the following attribute and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p> | Surface water pathway          | Sediment or pollution run-off from proposed works to nearby drain and from there to coast |  |

## Section 4: IN-COMBINATION EFFECT

The purpose of the screening stage is to determine, on the basis of a preliminary assessment and objective criteria, whether a plan or project, alone and in-combination with other plans or projects, could have significant effects on a Natura 2000 site in view of the site's conservation objectives.

A review of plans and projects was undertaken. This review focuses on the potential for cumulative in-combination effects on the European Sites where potential for adverse effects has been identified in the preceding sections of this report. This included a review of online Planning Registers, development plans, forestry applications and other available information.

Where the potential for significant effects on European Sites has been identified in the preceding sections of this report, there is potential for the proposed afforestation project to result in in-combination effect. Where no pathway for effect on a particular European Site was identified, there is no potential for effects to occur because of the current proposed afforestation project when considered on its own. Therefore, it cannot contribute to any in-combination effects on that site when considered in combination with other plans and projects and no further assessment is required.

### **4.1 Review of other Plans**

The potential for the proposed afforestation project to contribute to a cumulative impact on European Sites was considered for the following plans:

- Water Framework Directive (WFD)
- County Development Plan
- Shannon River Basin District Management Plan

This project lies in a rural landscape in the townland Emlagh, Co. Clare in the WFD Sub-Catchment WOOD\_SC\_010. Two out of four river water bodies within this sub-catchment are AT RISK: Wood\_010 due to Poor biological status and; Wood\_020 due to poor biological status and elevated phosphate and ammonia concentrations. Moyasta\_010 and Termon East\_010 are under REVIEW due to their unassigned status. Agriculture was identified as a significant pressure within Wood\_010 and Wood\_020. In addition, forestry (notably clearfelling), a golf course and urban run-off were also highlighted as significant pressures within Wood\_020. Further local catchment assessments are required for REVIEW water bodies so as to determine whether any issues exist.

WFD River Moyasta\_10 forms a hydrological link from the project site to SAC and SPA. While agriculture has been highlighted as a significant pressure for Moyasta\_10, forestry and notably clearfelling has been highlighted as pressure for Wood\_020 only. The project area overlapping the sub-basin measures 14.48 ha. When planted this area will equate to 0.33 % of the sub-basin.

Further details on the sub-catchment assessment can be found here: [https://catchments.ie/wp-content/files/subcatchmentassessments/27\\_4%20Wood\\_SC\\_010%20Subcatchment%20Assessment%20WFD%20Cycle%202.pdf](https://catchments.ie/wp-content/files/subcatchmentassessments/27_4%20Wood_SC_010%20Subcatchment%20Assessment%20WFD%20Cycle%202.pdf)

The county development plan and the Shannon River Basin District Management Plan were also reviewed. See Table 4 below.



**Table 4: Other Plans**

| Plan   | Possible impacts from plans   | Is there a risk of significant in combination effects from the plans  |
|--|-------------------------------|---|
| Clare county development plan 2017 - 2023              | No negative impacts envisaged | <p>AA concluded not possible to rule out significant effects so NIS was required and carried out.</p> <p>Upon implementation of mitigation measures no adverse effects on European Sites are predicted.</p> <p><a href="https://www.clarecoco.ie/services/planning/publications/clare-county-development-plan-2017-2023-aa-concluding-statement-24220.pdf">https://www.clarecoco.ie/services/planning/publications/clare-county-development-plan-2017-2023-aa-concluding-statement-24220.pdf</a></p> <p>Note: Emlagh noted as rural area under pressure</p> |
| Shannon River Basin District Management Plan 2018-2021 | No negative impacts envisaged | <p>River Basin Management Plan 2018-2021</p> <p>Possible effects predicted but with the implementation of mitigation measures the RBMP will not adversely affect the integrity of any European site.</p> <p><a href="https://assets.gov.ie/131983/0c065785-ce94-4f61-b1c3-2bbe10a4761b.pdf">https://assets.gov.ie/131983/0c065785-ce94-4f61-b1c3-2bbe10a4761b.pdf</a></p>   |

In reviewing the above plans and the best objective information, no effects were identified as a result of the proposed plans that could act in combination with the proposed project to cause potential significant effects. No projects or plans with the potential for significant in-combination effects with the proposed development were identified.

#### **4.2 Review of other Projects**

Planning applications occurring within the townlands of the Moyasta-010 River sub-basin with hydrological connection to the Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA were searched for possible in-combination impacts using Clare County Council planning search facility ([www.eplanning.ie/ClareCC/searchtypes](http://www.eplanning.ie/ClareCC/searchtypes)). See Table 6 below for details. Townlands included: Lisgurreen, Garraun Emlagh, Baunmore, Kilkee, Kilrush, Moanmore North and South and Upper and Lower, and town of Moyasta. This search criteria was used as these sites are hydrologically linked to same Natura 2000 sites as project site and could act in combination with the proposed project to cause potential potential significant effects on these sites.

No plans or projects were found for the area within the EIA portal which was searched on the 10<sup>th</sup> August 2021 ([housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=d7d5a3d48f104ecbb206e7e5f84b71f1](http://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=d7d5a3d48f104ecbb206e7e5f84b71f1)).

**Table 5: Planning application near proposed development site** (Data source: [www.clarecoco.ie/services/planning/applications/view/planning-lists/](http://www.clarecoco.ie/services/planning/applications/view/planning-lists/), date of search 3<sup>rd</sup> September 2021, Search townlands of Lisgurreen, Garraun Emlagh, Baunmore, Kilkee, Kilrush, Moanmore North and South and Upper and Lower, and town of Moyasta for 2020-2021)

| Clare County Council Planning Application Number                   | Description  | Is there a risk of significant impact or in combination effects from the plans   |
|--|--|--|
| 2039<br>Tullaher,<br>Moyasta,<br>Co. Clare                         | Construction of a forest action road entrance with all ancillary site works.   | There is unlikely to be any significant impacts or 'in combination' effect on the SACs and SPAs as Planners Report - concluded the proposed development, by itself or in combination with other development in the vicinity, would not be likely to have a significant effect on European site(s).             |
| 20448<br>Einagh,<br>Moyasta,<br>Co. Clare                          | Construct a new dwelling house, private garage, site entrance, sewage treatment system and all with all ancillary site works.  | Permission granted and no AA requested.  |
| 21685<br>San Clemente,<br>Lisdeen,<br>Kilkee,<br>Co.Clare          | Retain existing conservatory extension at the western side of the dwelling, retention of front porch and private garage.   | No AA issues arise, therefore the proposed dwelling by itself or in combination with other development in the vicinity, would not be likely to have a significant effect on European sites.  |
| 20164<br>At Einagh,<br>Kilrush,<br>Co. Clare                       | Construction of extension and alternatives to existing house dwelling.   | There is no potential for there to be any significant impacts or 'in combination' effect on the SACs and SPAs as Planners Report - concluded the proposed development, by itself or in combination with other development in the vicinity, would not be likely to have a significant effect on European sites. |
| 20146<br>The Old School House,<br>Corbally,<br>Kilkee,<br>Co.Clare | Construct a link corridor between house and out building at the old school house, which will also act as a wind break.   | No AA issues arise, therefore the proposed dwelling by itself or in combination with other development in the vicinity, would not be likely to have a significant effect on European sites.  |
| 21257<br>Tarmon West,<br>Kilkee,<br>Co.Clare                       | Design changes to the house including but not limited to floor plans, elevations and fenestration, personal home office space 23 m <sup>2</sup> and basement space 14m <sup>2</sup> and access driveway along with all ancillary site works and landscaping. | No AA issues arise, therefore the proposed dwelling by itself or in combination with other development in the vicinity, would not be likely to have a significant effect on European sites.  |

|   |  |  |
|---|--|--|
| 21247<br>Carrowncalla<br>South,<br>Kilrush ,<br>Co. Clare | Extended the proposal of P15-848 for the construction of a cubicle house, slatted tank, milking parlour and plant, office space and all ancillary site works | Extension to previous AA received on 22 <sup>nd</sup> March 2021, for additional 5 years. The authority is satisfied once the development will be completed within a reasonable time.  |
| 2027<br>Carrowncalla<br>South,<br>Kilrush,<br>Co. Clare   | Demolition of derelict shed, and construction of new proposed shed along with all ancillary site works.  | No AA issues arise, therefore the proposed dwelling by itself or in combination with other development in the vicinity, would not be likely to have a significant effect on European sites.  |
| 20352<br>Ballyurra,<br>Kilrush,<br>Co. Clare              | Retain existing dwelling house, and permission to construct extension to the side rear of the existing dwelling house, along with all ancillary site works.  | There is no potential for there to be any significant impacts or 'in combination' effect on the SACs and SPAs as Planners Report - concluded the proposed development, by itself or in combination with other development in the vicinity, would not be likely to have a significant effect on European sites. |
| 20596<br>Leadmore East,<br>Kilrush,<br>Co. Clare          | Retention of change of use of the existing linked private garage to residential en-suite along with all ancillary site works.                                | No AA issues arise, therefore the proposed dwelling by itself or in combination with other development in the vicinity, would not be likely to have a significant effect on European site(s).  |

This same search criteria were used in search of An Bord Pleanála Planning Appeals as for planning applications in Table 5 above.

**Table 6: An Bord Pleanála Planning Appeals near proposed development site**

(Data source: <https://www.pleanala.ie/en-ie/home/>, date of search 3<sup>rd</sup> September 2021, Search townlands of Lisgurreen, Garraun Emlagh, Baunmore, Moanmore North and South and Upper and Lower, and town of Moyasta for 2016-2021)

| <b>Application Number</b>   | <b>Description</b>   | <b>Is there a risk of significant impact or in combination effects from the plans</b>  |
|---|--|--|
| 300375: Moyasta, Kilrush, Co. Clare (P17/705)<br>Clare County Council | Retain existing cattle crush and plinths, construction of extension to livestock slatted house to accommodate calf pens and all ancillary site works | Having regard to the nature and scale of the proposed development and the development it is proposed to retain and to the nature of the receiving environment and proximity to the River Shannon and River Fergus Estuaries Special Protection Areas (Site Code 004077) and the Lower River Shannon Special Area of Conservation (Site Code 002165), no Appropriate Assessment issues arise and it is not considered that the proposed development would be likely to have a significant effect individually or in combination with other plans or projects on the European sites. |

In reviewing the above projects and the best objective information, no cumulative effects were identified as a result of the proposed projects that could cause significant effects. No projects or plans with the potential for significant in-combination effects with the proposed development were identified.

Forest application occurring within and having a hydrological link with the Moyasta-010 river sub basin were examined for possible in-combination impacts. See Table 6 below.

**Table 6: Forestry applications**

(Data source: forestry-maps.apps.rhos.agriculture.gov.ie/) Search conducted on the 10/8/2021)

| Application number and address                   | Size of application (ha) | Date approved    | Type of application                  | Assessment   |
|--|--------------------------|------------------|--------------------------------------|--|
| CN83355<br>Moyasta,<br>Clare                     | 10.46                    | 3/4/2019         | Afforestation<br>- planted           | Plot lies approximately 700 m south of current project site. Stream along northern boundary of application CN83355 is part of the Moyasta_10 WFD system.         |
| CN87378<br>Lisgurreen,<br>Emlagh,<br>Clare       | 12.17                    | Decision pending | Afforestation                        | Plot lies approximately 600 m west of current project site. Stream along eastern boundary of application CN87378 is part of the Moyasta_10 WFD system.           |
| CN88624<br>Lisgurreen,<br>Clare                  | 7.5                      | Decision Pending | Afforestation                        | Plot lies approximately 780 m west of current project site. Stream lying 225m to the east of application CN88624 is part of the Moyasta_10 WFD system.           |
| CN82783<br>Lisgurreen,<br>Clare                  | 9.36                     | Decision Pending | Afforestation                        | Plot lies approximately 900 m west of current project site. Stream lying 250 m to the east of application CN82783 is part of the Moyasta_10 WFD system.          |
| TFL00440819<br>Kildeema,<br>Lisgurreen,<br>Clare | 7.39                     | 10/6/2021        | Private<br>Clearfell and<br>Thinning | Plot lies approximately 750 m north-west of current project site. Stream along eastern boundary of application TFL00440819 is part of the Moyasta_10 WFD system. |

The total area to be afforested equates to 29.03 ha, with 10.46 ha recently planted, and 3.39 ha classed as clearfell and thinning. If the pending afforestation projects were to be carried out at the same time as the proposed project, it is possible that cumulative impacts of sedimentation could arise. In-combination effects can occur where a project results in individually insignificant effects that, when considered in-combination with impacts of other proposed or permitted plans and projects, can result in significant effects.

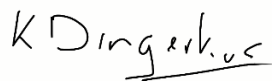
In reviewing the above forestry projects potential cumulative effects were identified as a result of the proposed projects that could cause significant effects on water quality.

## Section 5: DECLARATION

Based on the information contained in this Screening Report, it was not considered possible to rule out the potential for significant effects of the proposed project on the conservation objectives of the following European sites, whether alone or in-combination with other plans or projects

- Lower River Shannon SAC (002165)
- River Shannon and River Fergus Estuaries SPA (004077)

Signed:

Handwritten signature of Karina Dingerkus in black ink, with a horizontal line under the name.

Karina Dingerkus (Ecologist)

Dated: 23/8/2021



## References & Bibliography

animaldiversity.org website. University of Michigan, Museum of Zoology.

Arroyo, Beatriz; Leckie, Fiona; Amar, Arju; McCluskie, Aly & Redpath, Steve (2014). Ranging behaviour of Hen Harriers breeding in Special Protection Areas in Scotland. *Bird Study*, 61:1, 48-55, DOI: 10.1080/00063657.2013.874976. To link to this article:

<https://doi.org/10.1080/00063657.2013.874976>.

Bibby, C.J., Burgess, N.D., Hill, D.A. & Mustow, S.H. (2000). *Bird Census Techniques*. BTO, RSPB, Bird International, Ecoscope Applied Ecologists. 2nd addition.

Birdlife International (2012). *Anser albifrons* (on-line) IUCN Red List of Threatened Species.

[www.iucnredlist.org/details/22679881/0](http://www.iucnredlist.org/details/22679881/0) (sourced in animaldiversity.org)

Birdwatchireland.ie database

Cross, J. (1997). Potential natural vegetation of Ireland. GIS: H. Weber, Federal Agency for Nature Conservation, Bonn 1998.

Cross, J., Perrin P. & Little D. (2010). The classification of native woodlands in Ireland and its application to native woodland management. *Woodlands of Ireland, Native Woodland Information Note no. 6*.

Cross, J.R. & Collins K.D. (2017). *Management guidelines for Ireland's Native Woodlands*. NPWS, Forest Service. [www.agriculture.gov.ie](http://www.agriculture.gov.ie)

Department of Agriculture, Food and the Marine (2000). *Forest Harvesting & the Environment Guidelines*. DAFM, Johnstown Castle Estate, Co. Wexford.

Department of Agriculture, Food and the Marine (2015). *Forestry Standards Manual. Appendix 20 (NIS) & 21 (Hen Harrier)*. Department of Agriculture, Food and the Marine (2015). *Aerial Fertilisation Requirements*, DAFM, Johnstown Castle Estate, Co. Wexford.

Department of Agriculture, Food and the Marine (2015). *Forestry Standards Manual*. DAFM, Johnstown Castle Estate, Co. Wexford. [www.agriculture.gov.ie](http://www.agriculture.gov.ie)

Department of Agriculture, Food and the Marine (2016). *Environmental Requirements for Afforestation*. December DAFM, Johnstown Castle Estate, Co. Wexford. [www.agriculture.gov.ie](http://www.agriculture.gov.ie)

Department of Agriculture, Food and the Marine (2019). *Appropriate Assessment Procedure: Guidance Note & iFORIS SOP for DAFM Forestry Inspectors (v.05Nov19)*. [www.agriculture.gov.ie](http://www.agriculture.gov.ie)

Department of Agriculture, Food and the Marine (2019). *Felling & Reforestation Standards. v.Oct2019*, DAFM. See Forest Service Circular 14 / 2019, [www.agriculture.gov.ie/forests-service/grants-and-premium-schemes/2014-2020/schemecirculars/2019-circulars/](http://www.agriculture.gov.ie/forests-service/grants-and-premium-schemes/2014-2020/schemecirculars/2019-circulars/)

Department of the Environment, Heritage & Local Government (DoEHLG) (2010). *Appropriate Assessment of Plans & Projects in Ireland. Guidance for Planning Authorities*. [www.npws.ie/sites/default/files/publications/pdf/NPWS\\_2009\\_AA\\_Guidance.pdf](http://www.npws.ie/sites/default/files/publications/pdf/NPWS_2009_AA_Guidance.pdf)

European Communities. (2002). *Assessment of Plans & Projects Significantly Affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3)&(4) of the Habitats Directive 92/43/EEC*. Office for Official Publications of the European Communities, Luxembourg.

European Commission (2003). *Interpretation manual of EU habitats*. EUR25 European Commission, DG Environment.

European Commission (2018). Commission notice: Managing Natura 2000 sites. The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.  
[www.ec.europa.eu/environment/nature/natura2000/management/guidance\\_en.htm](http://www.ec.europa.eu/environment/nature/natura2000/management/guidance_en.htm)

Felix, J. (1986). *The illustrated book of birds*. Artia Prague.

Forest Service, Dept. of the Marine and Natural Resources (2000). Code of Best Forest Practice-Ireland.  
[www.agriculture.gov.ie](http://www.agriculture.gov.ie)

Forest Service, Dept. of the Marine and Natural Resources (2000). Forestry and water quality guidelines. Draft document. [www.agriculture.gov.ie](http://www.agriculture.gov.ie)

Forest Service, Dept. of the Marine and Natural Resources (2000). *Forestry biodiversity guidelines*.  
[www.agriculture.gov.ie](http://www.agriculture.gov.ie)

Forest Service, Dept. of the Marine and Natural Resources (2008). *Native Woodland Manual: procedures, standards and decisions support for NWS*. [www.agriculture.gov.ie](http://www.agriculture.gov.ie)

Forest Service, Dept. of the Marine and Natural Resources (2010 cf.). *Forestry and Freshwater Pearl Mussel requirements – site assessment and mitigation measures*. [www.agriculture.gov.ie](http://www.agriculture.gov.ie)

Forest Service, Dept. of the Marine and Natural Resources (2019). *Annex I Habitat Table (version 18 Dec 2019)*. [www.agriculture.gov.ie](http://www.agriculture.gov.ie)

Forest Service, Dept. of the Marine and Natural Resources (2020). *Bird Foraging Table (v.06Jan20)*.  
[www.agriculture.gov.ie](http://www.agriculture.gov.ie)

Fossitt, J.A. (2000). *A Guide to Habitats in Ireland*. The Heritage Council, Kilkenny.1.

Foulkes N., Fuller, J., Little, D., McCourt, S and Murphy, P. (2013). *Hedgerow appraisal system – Best practice guidance on hedgerow survey, data collation and appraisal*. Woodlands of Ireland, Dublin. Unpublished report (pdf).

Gardiner M.J. and Radford, T. (1980). *General Soil Map of Ireland*. National Soil Survey, An Foras Taluntais, Dublin. Geological Survey of Ireland website: [www.gsi.ie](http://www.gsi.ie)

Irish Wildlife (Winter 2006). *Crayfish*. Irish Wildlife Trust magazine – article by Tim Clabbon.

Irwin, S., Wilson, M., O' Donoghue B., O' Mahony, B., Kelly, T. & O' Halloran, J. (2012). *Optimum scenarios for Hen Harrier conservation in Ireland*. Planforbio prepared for Dept. of Agriculture.

Hockin, D., Ounsted, M., Gorman, M., Hill, D., Keller, V., Barker M. A. (1992) Examination of the effects of disturbance on birds with reference to its importance in ecological assessments. *Journal of Environmental Management* Volume 36, Issue 4, December 1992, Pages 253-286

Holloway, S. (1997). Winter Distribution and Disturbance of Wildfowl and Waders on Findhorn Bay. BTO Research Report No. 179. British Trust for Ornithology

Horgan, T., Keane, M., McCarthy, R., Lally, M. & Thompson, D. (2003). *A guide to forest tree species selection and silviculture in Ireland*. COFORD, National Council for Forest Research and Development, Belfield, Dublin

Institute of Ecology and Environmental Management (IEEM, 2006). *Guidelines for Ecological Impact Assessment in the United Kingdom*.

Institute of Ecology and Environmental Management (2011). *Ecological report writing*. IEEM, Technical Guidance Series 9.

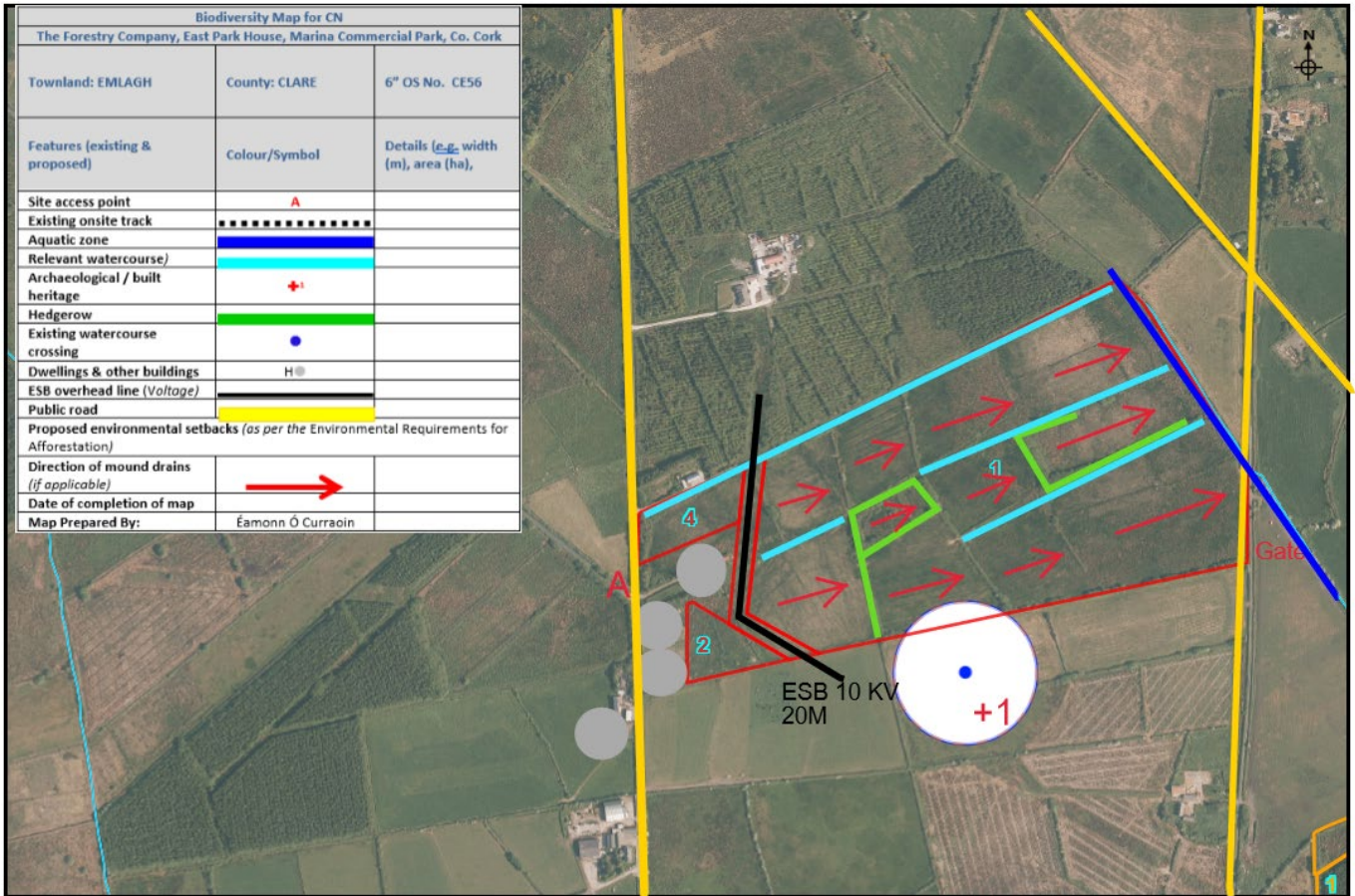
Institute of Ecology and Environmental Management (2012). *Guidelines for preliminary ecological appraisal*. IEEM, Technical Guidance Series.

- Joyce, P.M (1998). *Growing Broadleaves- Silvicultural Guidelines for Ash, Sycamore, Wild Cherry, Beech and Oak in Ireland*. Coford, Dublin.
- Kelly, F. and King, J.J. 2001. A review of the ecology and distribution of three lamprey species, *Lampetra fluviatilis* (L.), *Lampetra planeri* (Bloch) and *Petromyzon marinus* (L.): a context for conservation and biodiversity considerations in Ireland. *Biology and Environment: Proceedings of the Royal Irish Academy*, 101B: 165-185.
- King, J.J., Hanna, G. & Wightman, G.D. (2008). *Ecological Impact Assessment of the effects of statutory arterial drainage maintenance activities on three Lamprey species*. Series of ecological assessments on arterial drainage maintenance no. 9. Environment Section, OPW, Headford, Galway.
- King, J.J., Lordan, M. & Wightman, G.D. (2008). *Ecological Impact Assessment of the effects of statutory arterial drainage maintenance activities on White-clawed Crayfish*. Series of ecological assessments on arterial drainage maintenance no. 10. Environment Section, OPW, Headford, Galway.
- Kurz, I. & Costello, M.J. (1996). *Current knowledge on the distribution of Lampreys and some other freshwater fish species listed in the Habitats Directive, in Ireland*. Environmental Sciences Unit, Trinity College, Dublin.
- Marnell, F. (undated). *Threatened Irish Wildlife – Lampreys*. NPWS leaflet.
- National Parks and Wildlife Service (NPWS). [www.npws.ie](http://www.npws.ie). NPWS database e.g. Site Synopsis; Conservation Objectives; Sub-Basin Management Plans (Freshwater Pearl Mussel – SEA Scoping Document); Natura 2000 data.
- Moorkens, E.A. and Killeen, I.J. 2011. Monitoring and Condition Assessment of Populations of *Vertigo geyeri*, *Vertigo angustior* and *Vertigo moulinsiana* in Ireland. *Irish Wildlife Manuals*, No.55. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
- National Parks and Wildlife Service (2010). *Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities* (Revised February 2010)
- National Parks and Wildlife Service (2012). *Conservation Objectives: Lower River Shannon SAC 002165. Version 1.0*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.).
- National Parks and Wildlife Service (2015). *Hen Harrier Conservation and the Forestry Sector in Ireland. Version 3.2 31/3/15*, NPWS.
- National Rivers Authority (NRA, undated). *Guidance for the control of invasive plants near watercourses*. Publ. Code HO-9/94-20k-C-AKVI (University of Loughborough, UK).
- National Roads Authority (NRA, 2006). *Guidelines for assessment of ecological impacts of national road schemes*. NRA, Ireland.
- National Roads Authority (NRA, 2009). *Guidelines for assessment of ecological impacts of national road schemes*. NRA, Ireland
- Maarten, P & Henkensj, R. H. G (1997). Possible Impacts of Disturbance to Waterbirds: Individuals, Carrying Capacity and Populations. *Wildfowl* 48: 225-236
- O' Connor, W. (2007). *A survey of juvenile Lamprey populations in the Corrib and Suir catchments*. *Irish Wildlife Manuals* no. 26. NPWS, Dept. of Environment.
- O' Donoghue, B. (2008). *Hen Harriers and the farmed landscape*. NPWS internal document.
- O' Donoghue, B. (2012). *Duhallow Hen Harrier, Circus cyaneus – from stronghold to just holding on*. *Ir. Birds* 9: 349-356.
- O' Donoghue, B. G. and Carey J.G.J. (2020). *Curlew Conservation Programme annual report 2020*. National Parks and Wildlife Service, Killarney.

- Phillips, R. (1994). *Grasses, ferns, mosses and lichens of Great Britain and Ireland*. Macmillan, London.
- Picozzi, P. (1978). *Dispersion, breeding and prey of the hen harrier Circus cyaneus in glen Dye Kincardinashire*. Ibis 120. 498-509.
- Richardson, P. (2000). *Distribution atlas of bats in Britain and Ireland 1980-1999*. The Bat Conservation Trust, London.
- Rose, F. (1981). *The Wildflower Key; British Isles - N.W. Europe*. Penguin Group.
- Ryan, T., Phillips, H., Ramsay, J. & Dempsey, J. (2004). *Forest Road Manual. Guidelines for the design, construction & management of forest roads*. COFORD, Dublin.
- Scottish Natural Heritage (2016). *Assessing connectivity with Special Protection Areas (SPAs) – guidance*. Version 3 – June, 2016, SNH.
- Scarton, Francesco. (2018). *Disturbance of Non-Breeding Waders by Pedestrians and Boats in a Mediterranean Lagoon*. Ardeola. 65. 209-220. 10.13157/arla.65.2.2018.ra1.
- Smal, C.M. (1995). *The Badger and Habitat Survey of Ireland*. The Stationery Office, Dawson St., Dublin 2.
- Smith, G., O' Donoghue, P., O' Hora, K. & Delaney, E. (2011). *Best Practice Guidance for Habitat Survey and Mapping*. Heritage Council report.
- Webb, D.A, Parnell, J. and Doogue, D. (1996). *An Irish Flora*. Dundalgon Press Ltd., Dundalk.
- Wilde, A. (1993). *Threatened mammal, birds, amphibians and fish in Ireland*

# APPENDICES

## Biodiversity Map



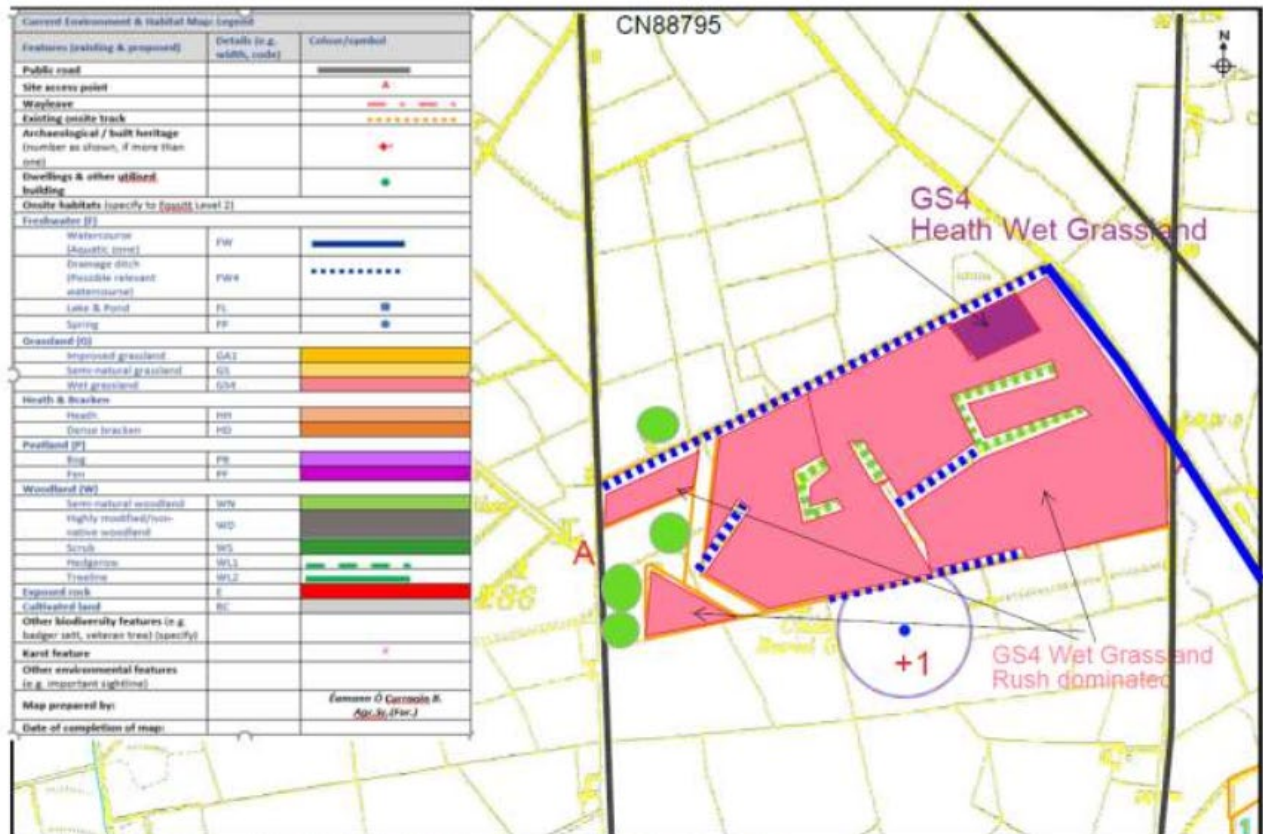
Ordnance Survey Ireland Licence No. EN 0076413. Copyright Ordnance Survey Ireland/Government of Ireland  
 Unauthorized reproduction is not permitted. This map is for Forest Service related use only.

Contract: **Emlagh**

Scale 1:5000



# Habitat Map



Ordnance Survey Ireland Licence No. EN 0076413. Copyright Ordnance Survey Ireland/Government of Ireland  
Unauthorized reproduction is not permitted. This map is for Forest Service related use only.

Contract: **Emlagh**  
CN88795

Scale 1:5000

## Biodiversity Records

Table Showing Biodiversity records in the vicinity of the site

| Species  | Date of record | Approximate Distance from site | Grid Reference | Data set  |
|--|----------------|--------------------------------|----------------|---|
| Common Bottlenose Dolphin ( <i>Tursiops truncatus</i> )    | 14/06/2014     | 7 km                           | Q863621        | IWDG Casual Cetacean Sightings                    |
| Otter ( <i>Lutra lutra</i> )                               | 02/05/2017     | 3.5km                          | Q986547        | Mammals of Ireland 2016-2025                      |
| Dunlin ( <i>Calidris alpina</i> )                          | 17/12/2005     | 2 km                           | Q9358          | Clare Biological Records Centre Dataset 2004-2007 |
| Black-headed Gull ( <i>Larus ridibundus</i> )              | 2007 - 2011    | Within 10 km square            | Q95            | Bird Atlas 2007 - 2011                            |
| Grey Plover ( <i>Pluvialis squatarola</i> )                | 2007 - 2011    | Within 10 km square            | Q95            | Bird Atlas 2007 - 2011                            |
| Whooper Swan ( <i>Cygnus cygnus</i> )                      | 2007 - 2011    | Within 10 km square            | Q95            | Bird Atlas 2007 - 2011                            |
| Golden Plover ( <i>Pluvialis apricaria</i> )               | 2007 - 2011    | Within 10 km square            | Q95            | Bird Atlas 2007 - 2011                            |
| Shelduck ( <i>Tadorna tadorna</i> )                        | 17/12/2005     | 3 km                           | Q9357          | Clare Biological Records Centre Dataset 2004-2007 |
| Bar-tailed Godwit ( <i>Limosa lapponica</i> )              | 2007 - 2011    | Within 10 km square            | Q95            | Bird Atlas 2007 - 2011                            |
| Light-bellied Brent Goose ( <i>Branta bernicla hrota</i> ) | 04/04/2006     | 1.6 km                         | Q949571        | Clare Biological Records Centre Dataset 2004-2007 |
| Ringed Plover ( <i>Charadrius hiaticula</i> )              | 2007 - 2011    | Within 10 km square            | Q95            | Bird Atlas 2007 - 2011                            |
| Black-tailed Godwit ( <i>Limosa limosa</i> )               | 2007 - 2011    | Within 10 km square            | Q95            | Bird Atlas 2007 - 2011                            |
| Curlew ( <i>Numenius arquata</i> )                         | 2007 - 2011    | Within 10 km square            | Q95            | Bird Atlas 2007 - 2011                            |
| Greenshank ( <i>Tringa nebularia</i> )                     | 2007 - 2011    | 5 km                           | Q95H           | Bird Atlas 2007 - 2011                            |

|  |             |                     |       |   |
|--|-------------|---------------------|-------|---|
| Wigeon ( <i>Anas penelope</i> )          | 17/12/2005  | 2.5 km              | Q9557 | Clare Biological Records Centre Dataset 2004-2007 |
| Redshank ( <i>Tringa totanus</i> )       | 2007 - 2011 | 3 km                | Q95N  | Bird Atlas 2007 - 2011                            |
| Lapwing ( <i>Vanellus vanellus</i> )     | 2007 - 2011 | 5 km                | Q95H  | Bird Atlas 2007 - 2011                            |
| Cormorant ( <i>Phalacrocorax carbo</i> ) | 2007 - 2011 | Within 10 km square | Q95   | Bird Atlas 2007 - 2011                            |
| Shoveler ( <i>Anas clypeata</i> )        | 2007 - 2011 | Within 10 km square | Q95   | Bird Atlas 2007 - 2011                            |
| Teal ( <i>Anas crecca</i> )              | 2007 - 2011 | 2 km                | Q96K  | Bird Atlas 2007 - 2011                            |
| Knot ( <i>Calidris canutus</i> )         | 2007 - 2011 | Within 10 km square | Q95   | Bird Atlas 2007 - 2011                            |
| Scaup ( <i>Aythya marila</i> )           | 2007 - 2011 | Within 10 km square | Q95   | Bird Atlas 2007 - 2011                            |
| Pintail ( <i>Anas acuta</i> )            | 2007 - 2011 | Within 10 km square | Q95   | Bird Atlas 2007 - 2011                            |

end



**Natura Impact Statement**  
**for Proposed afforestation project CN88795**  
**located at Emlagh, Co. Clare**



**Compiled by: Dr. Karina Dingerkus, Giorria Environmental Services**

**Completion date: 23<sup>rd</sup> August 2021**





## Contents

|   |    |
|---|----|
| SECTION 1: GENERAL DETAILS .....  | 3  |
| Introduction.....   | 6  |
| Summary of Article 6(3) Appropriate Assessment Screening Report .....   | 6  |
| SECTION 2: SCREENED-IN EUROPEAN SITES – POTENTIAL IMPACTS & PROPOSED MITIGATION.....                          | 11 |
| 2.1 Conservation Objectives of Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA. .... | 11 |
| 2.2 Measures to Mitigate Potential Adverse Impacts .....  | 50 |
| 2.2.1 <i>Disturbance</i> .....  | 50 |
| 2.2.2 <i>Species impact</i> .....   | 51 |
| 2.2.3 <i>Water Quality</i> .....  | 51 |
| SECTION 3: IN-COMBINATION EFFECT.....   | 53 |
| SECTION 4: CONCLUSION .....   | 59 |
| SECTION 5: COLLATED MITIGATION MEASURES.....  | 60 |
| SECTION 6: AUTHOR DECLARATION .....   | 62 |
| REFERENCES.....   | 63 |
| Appendix 1: MAPS.....   | 66 |
| Appendix 2: SUPPORTING DOCUMENTS.....   | 70 |
| Appendix 3: ECOLOGICAL SURVEYS & INVESTIGATIONS .....   | 80 |
| Appendix 4: Relevant guidance documents .....   | 84 |
| Appendix 5: Mitigation measures implementation and monitoring.....  | 93 |



## SECTION 1: GENERAL DETAILS

| <b>Details of Author(s)</b>  |  |
|--|--|
| Name   | Dr. Karina DIngerkus   |
| Address  | Ardacarha, Bohola, Calremorris, Co. Mayo, F12 VW94   |
| Company name (If relevant)   | Giorria Environmental Services   |
| Tel. no.   | 0863620928   |
| E-mail   | karina@giorria.com   |
| For each author:<br>Provide details of his / her relevant qualifications / affiliations / years of experience<br><br>Describe the scope of his / her contribution in preparing this NIS. | <i>PhD. 1997</i> The Ecology and Distribution of the Irish hare in Northern Ireland, Queen's University, Belfast. Has over 27 years experience as working ecologist for local authorities, wildlife charities and consultancies. Established Giorria Environmental Services, an ecological consultancy based in County Mayo in 2005. Has been completing Appropriate Assessments for over 12 years for private and public clients. Has been contract to the Coillte NIS project since 2020.<br><br>Ecological assessment |

| <b><u>Details of Author(s)</u></b>  |   |
|---|---|
| <u>Name</u>   | <u>Ciaran Ryan</u>  |
| <u>Address</u>  | <u>Lahard, Beaufort, Killarney, Co. Kerry</u>   |
| <u>Company name (If relevant)</u>   | <u>(Kerry Ecological Services – sole trader)</u>  |
| <u>Tel. no.</u>   | <u>064-6624577; 085-7168019</u>   |
| <u>E-mail</u>   | <u><a href="mailto:Ciaranryan5@hotmail.com">Ciaranryan5@hotmail.com</a></u>   |
| <u>Details of relevant qualifications / affiliations / years of experience (Provide additional details on separate sheet)</u> | <u>B.Sc. Analytical Science; M.Sc. (Environmental Science)</u><br><u>Over 25 years experience in ecological survey (including SAC &amp; SPA designations), SAC &amp; SPA</u><br><u>Management Plans, Commonage Framework Plans, SAC Appeals, Natura 2000 site assessments</u><br><u>and reports (NIS) and general environmental consultancy. I am an accredited Native Woodland</u> |

|   |                          |
|---|--------------------------|
|   | <u>Scheme ecologist.</u> |
| <u>Describe scope of contribution in preparing this AA Pre-Screening Report</u> | <u>Ecological</u>        |

| Project location & general details* |                              |                                     |
|-------------------------------------|------------------------------|-------------------------------------|
| County: Clare                       |                              | Nearest village: Moyasta            |
| Townland: Emlagh                    |                              | 6 inch OS Map number: CE56          |
| Proposed activity (tick):           | Afforestation                | <input checked="" type="checkbox"/> |
|                                     | Forest road construction     | <input type="checkbox"/>            |
|                                     | Thinning (incl. CCF)         | <input type="checkbox"/>            |
|                                     | Clearfell & Reforestation    | <input type="checkbox"/>            |
|                                     | Clearfell & No Reforestation | <input type="checkbox"/>            |
|                                     | Aerial fertilisation         | <input type="checkbox"/>            |
|                                     | Other (specify)              | <input type="checkbox"/>            |
| Project area (hectares):            |                              | 14.58 hectares                      |

|  |   |   |
|--|---|---|
| Indicate (tick) the nature of the application: | Application for forestry licence only             | <input type="checkbox"/>                |
|  | Application for forestry licence & scheme support | Yes <input checked="" type="checkbox"/> |

|                                  |  |   |
|----------------------------------|--|---|
| Indicate the origin of this NIS: | NIS was sought by the FS-DAFM <i>via</i> a NIS Request Letter.                                     | <input type="checkbox"/>                |
|                                  | NIS submitted with the licence / scheme application, based on the results of a screening exercise. | Yes <input checked="" type="checkbox"/> |
|                                  | Other (describe):  | <input type="checkbox"/>                |



## **Introduction**

Giorria Environmental Services has been commissioned to prepare a Natura Impact Statement to allow the competent authority to conduct an Appropriate Assessment of the proposed afforestation at Emlagh, Co Clare.

An Appropriate Assessment Screening Report has been prepared for the proposed afforestation project. This Article 6(3) Appropriate Assessment Screening Report has identified the European Sites for which the proposed development has the potential to result in significant effects and the pathways by which those effects may occur. It has also identified the qualifying interests / special conservation interests that have the potential to be affected by the proposed development.

The report was prepared in accordance with the following guidance documents:

- Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (NPWS 2009, Revised February 2010)
- Circular NPW 1/10 & PSSP 2/10 (March 2010)
- EU Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC (2007)
- 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 (Nov. 2001 – published 2002)
- Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (2000).
- Office of the Planning Regulator (2021). Appropriate Assessment Screening for Development Management. OPR Practice Note PN01.

The impact of a project or plan alone and in combination with other projects or plans on the integrity of the Natura 2000 sites is considered with respect to the conservation objectives of the site and to its structure and function.

## **Summary of Article 6(3) Appropriate Assessment Screening Report**

The Stage 1 Screening concluded that there was potential for the Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA to be affected by the project (see Appropriate Assessment Screening Report), due to the potential for sediment run off and pollution from the site into the adjacent waterbody that is hydrologically connected to the Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA. Therefore, it is necessary to prepare a Natura Impact Statement that describes mitigation measures to prevent sediment run-off and pollution.

### **Description of the Project Area (i.e. site of proposed works) Site visit 20/5/2021**

A multidisciplinary walkover survey was conducted on the 20/05/2021 following NRA (2009) guidelines (Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes) by ecologist Cieran Ryan. All habitats were identifiable (Smith, G.F., O'Donoghue, P., O'Hora, K., & Delaney E. 2011). The walkover surveys were designed to detect the presence, or likely presence, of a range of protected species. The survey included a search of all potentially suitable habitat for protected species that are likely to occur in the vicinity of the project area. Habitats were identified in accordance with the Heritage Council's 'Guide to Habitats in Ireland' (Fossitt, 2000). Plant nomenclature for vascular plants follows 'New Flora of the British Isles' (Stace, 2010). During the multidisciplinary surveys, a search for Invasive Alien Species (IAS) listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015) was also conducted.

The site is located in the townland of Emlagh, 2.8 km from the village of Moyasta in Co. Clare. The site (size 14.58 ha) lies at an elevation of < 40m sloping gently from west to east. The soil is mostly peaty gley and surface water gley (acid, deep, poorly drained mineral) based on Namurian shale, sandstone, siltstone and coal bedrock. There are no major seepage areas or wet depressions. The land is currently used for cattle grazing and comprises of 20 small fields with an average size of 0.7 ha (range 1.2 ha to 0.38 ha).

The principal habitat present is wet grassland (GS4) dominated by Soft Rush (*Juncus effusus* – c.75+ %) with Creeping Buttercup (*Ranunculus repens*), Meadow Buttercup (*Ranunculus acris*), Meadowsweet (*Filipendula ulmaria*), Silverweed (*Potentilla anserina*), Ribwort Plantain (*Plantago lanceolata*), Dandelion (*Taraxacum officinale* agg.), Common Sorrel (*Rumex acetosa*), Dock (*Rumex* sp.), Horsetail (*Equisitum palustre*), Knapweed (*Centaurea nigra*), Thistle (*Cirsium vulgare*), typical grasses (e.g. *Holcus lantus*, *Anthoxanthum odoratum*, *Agrostis capillaris*, *Festuca rubra*), occasional orchid (*Orchis mascula*) and some invading Bramble (*Rubus fruticosus*) and Common Gorse (*Ulex europaeus*). There is a small area of peaty wet grassland (GS4) to the north-east where Purple Moorgrass (*Molinia caerulea*), Carnation Sedge (*Carex panicea*) and Marsh Thistle (*Cirsium palustre*) are evident, along with typical wet grassland species, notably Jointed/Sharp-flowered Rush (*Juncus articulatus/acutiflorus*), Meadowsweet and Cuckooflower (*Cardamine pratensis*). It should be noted that the heathy wet grassland habitat does not comply with any EU Annex I habitat.

There is one natural watercourse (FW2) present on site flowing along the north-eastern boundary (length along boundary 240 m). This is approximately 0.5m deep (down a 1m bank), slow flowing in a southerly direction and with a silt and gravel substrate. It is little vegetated except along its banks where some Bramble, Willow (*Salix* sp.), Gorse, rush and Nettle (*Urtica dioica*) occur. It flows south eastward, discharging into Poulmasherry Bay (Lower River Shannon SAC), near Moyasta up to 3 km downstream. Drainage channels (FW4) present are approximately 1m deep, 1m wide but with little water flow, being clogged with vegetation and silt. They discharge/filter into the on-site natural watercourse.

WFD River Moyasta forms a hydrological link from the project site to SAC and SPA. Moyasta\_10 is currently classed as under review / unassigned status.

Sparse, low-growing hedgerows (WL1) of mostly Bramble and scattered Willow and Common Gorse occur on low banks along field boundaries, with occasional Hawthorn (*Crataegus monogyna*).

There were no Annex I habitats recorded within the project site boundary and no protected species were recorded during the site visit. Notable species recorded within Q96 10 km grid include Badger,

Otter, Hare, Stoat, Pine Marten, bat species, Peregrine, Hen Harrier, Merlin, Barnacle Goose, Brent Goose, Greenland White-fronted Goose, Greylag Goose, Whooper Swan, Golden Plover, Kingfisher, Curlew, Lapwing, Snipe, Chough, Marsh Fritillary and Narrow mouthed Whorl Snail. However, this grid extends to the coast around Doonbeg and White Strand. Within the 2km grid encompassing the site lands, the only notable species recorded are Badger, Hare, Stoat, and bats. None of these species are known to regularly utilise the site lands. There are no large trees present suitable for roosting bats, although the scattered, low hedgerow may provide some foraging habitat. The wet grassland habitat present is not species-rich and is common locally and nationally.

It is considered desirable that the small area of peaty wet grassland to the north-east of the site be retained, connecting with the nearby aquatic buffer either by open habitat or native trees. This area is somewhat distinctive from surrounding Soft Rush dominated wet grassland habitat. It will also serve to provide an open habitat that can be utilised by native fauna. A Habitat Map is attached.

The project site lies approximately 1.7 km upstream distance of Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA. Tullaher Lough and Bog SAC lies over 1.3 km north of project site. Kilkee Reefs SAC lies over 5 km north-west of project site. Both Carrowmore Dunes SAC and Mid-Clare Coast SPA lies over 6 km north of project site. All other European site lies over 10km from the site with Carrowmore Point to Spanish Point and Islands SAC to the north and Ilaunonearaun SPA to the south-west of project site.

Surrounding land use includes forestry to the north. Improved pasture to the south, east and west. Access will from a minor road which comes off the N67.

### **Summary of habitats on site**

Wet grassland (GS4)

Natural watercourse (FW2)

Drainage channels (FW4)

Hedgerows (WL1)

No Annex I habitats recorded within the project site boundary.

### **Proposed Operations**

Afforestation and any subsequent harvesting will follow best practice Forest Service policies, strategic guidance documents, as well as Coillte guidance documents, including the documents listed below. This will ensure that newly planted trees remain viable, and afforestation provides minimal potential impacts to the receiving environment.

- Land Types for Afforestation (2016)
- Environmental Requirements for Afforestation (2016)
- Forest Operations & Water Protection Guidelines (2009)

- Methodology for Clear Felling Harvesting Operations (2009)
- Forestry and Water Quality Guidelines (2000)
- Forestry and the Landscape Guidelines (2000)
- Forestry and Archaeology Guidelines (2000)
- Forestry Biodiversity Guidelines (2000)
- Forestry Protection Guidelines (2002)
- Forestry Harvesting and Environmental Guidelines (2000)

Planting will be carried out in accordance with the 'Forestry Schemes Manual' (Forest Service, 2011), which gives guidance on ground cultivation, stocking and spacing, plant handling, planting dates, fencing, fire, and weed control.

Work on this site will comprise of planting 100% native broadleaves.

#### Site Preparation and planting

Mounding: Small mounds are excavated and placed at 2 metre intervals. The drains that are formed by removing the mounds are spaced at 12 metre intervals, giving 2500 mounds (trees) per hectare.

Mounding will be completed by a tracked excavator. The excavator will create small mounds of soil. The mound loosens any compacted soil, as well as raising the planting position of the young trees which reduces the impact of competing vegetation.

Silt traps constructed at end of mound drains at 50 m intervals.

Trees will be sourced from a recognised forest nursery. Planting will occur manually. A slit will be made in the centre of each mound with a spade and the roots of the young tree placed in the opening. The loose soil will then be backed filled with the spade and firmed in, making sure that the tree is straight. The tree will be firmed in by foot. Care will be taken to ensure trees are planted to the correct depth (i.e. root collar) and all roots are placed fully into the soil. Where possible trees will be planted between November and March during their dormant season.

All setbacks along aquatic zone, relevant water courses, roads and dwelling house will be measured and marked by machine operator prior to work commencing.

#### Fencing

The perimeter of the site will be fenced with stock fencing consisting of NSAI stakes and strainers and high tensile barbed wire.

#### Fertiliser

Due to inherent levels of fertility, no fertiliser application is required to promote the establishment and growth of the newly planted trees.

#### Management

Regular site visits and monitoring will occur. Management will involve carrying out vegetation control, checking for browsing or frost damage, carry out broadleaf shaping and checking

drains, firebreaks and fence-lines. Manual maintenance will occur annually. Maintenance will involve trampling by stamping on weeds around the trees. Where necessary spot spraying with Glyphosate will occur in year 2 where dense vegetation is impeding tree growth.

Beating Up: Replacement of failures in Year 2 and 3.

## **SECTION 2: SCREENED-IN EUROPEAN SITES – POTENTIAL IMPACTS & PROPOSED MITIGATION**

### **2.1 Conservation Objectives of Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA.**

#### **Article 2 of the Habitats Directive**

1. The aim of this Directive shall be to contribute towards ensuring biodiversity through the conservation of natural habitats and of wild fauna and flora in the European territory of the Member States to which the Treaty applies.
2. Measures taken pursuant to this Directive shall be designed to maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest.

According to the EU Habitats Directive, favourable conservation status of a habitat is achieved when:

- Its natural range, and area it covers within that range, is stable or increasing.
- 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.
- 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.
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

The weblink to the Conservation Objectives of Lower River Shannon SAC (002165) are listed in Table 1 below.

The weblink to the Conservation Objectives of River Shannon and River Fergus Estuaries SPA (004077) are listed in Table 2 below.



SCREENED-IN EUROPEAN SITES – POTENTIAL IMPACTS AND PROPOSED MITIGATION

Table 1: Screened-in European Sites – Lower River Shannon SAC - Potential Impacts and Proposed Mitigation

| Lower River Shannon SAC (site code: 002165)   |  |   |   |
|---|--|---|---|
| <p>List each of the Qualifying Interest(s) (if SAC) / Special Conservation Interest(s) (if SPA) for this European Site. Assign each QI / SCI its own row.</p> | <p>Set out components of the Conservation Objectives (relevant information including attributes, conservation status &amp; locations) for this European Site relevant to this project.</p>   | <p>Considering the QI / SCI &amp; the Conservation Objective(s), and supporting habitats and species(*), is it likely that the project will have an adverse effect on this QI / SCI &amp; the achievement of the corresponding Conservation Objective?<br/><br/>If 'yes', describe the nature, severity, mechanism &amp; timeline of the adverse effect.</p>  | <p>If the potential for an adverse effect on this QI / SCI exists, detail the necessary mitigation to avoid, reduce or prevent this potential, and describe the mechanism through which this is achieved.</p> |
| <p>1110 Sandbanks which are slightly covered by sea water all the time</p>  | <p>To maintain the favourable conservation condition of Sandbanks which are slightly covered by sea water all the time in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a></p> | <p>Examination of aerial maps indicates that potential habitat lies 1.7 km downstream of project site. Potential indirect effects <b>cannot</b> be excluded if mitigation measures to eliminate sediment or pollution run-off are not implemented.<br/><br/>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could</li> </ul> | <p>To protect this aquatic habitat, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below.</p>   |

|  |  |   |   |
|--|--|---|---|
|  |  | <p>lead to oxygen depletion in the water.</p> <ul style="list-style-type: none"> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul>   |   |
| <p>1130 Estuaries</p>  | <p>To maintain the favourable conservation condition of Estuaries in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a></p>  | <p>Examination of aerial maps/photography indicates that potential estuarine habitat lies 1.7 km downstream of project site. Potential indirect effects <b>cannot be excluded</b> if mitigation measures to eliminate sediment or pollution run-off are not implemented.</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul> | <p>To protect this aquatic habitat, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below.</p> |
| <p>1140 Mudflats and sandflats not covered by seawater at low tide</p> | <p>To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a></p> | <p>Habitat has not been mapped in detail. However, observation of aerial maps indicates that potential mudflats and sandflats not covered by seawater at low tide habitat lies 1.7 km downstream of project site. Potential indirect effects <b>cannot</b></p>  | <p>To protect this aquatic habitat, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below.</p> |

|                                    |   |   |   |
|------------------------------------|---|---|---|
|                                    |   | <p><u>be excluded</u> if mitigation measures to eliminate sediment or pollution run-off are not implemented.</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul> |   |
| 1150 Coastal lagoons*              | <p>To restore the favourable conservation condition of Coastal lagoons in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a></p>                | <p>Four coastal lagoons within SAC. The closest two are Scatterly lagoon located approximately 7.7 km from project site and Cloononeen Pool approximately 15.57 km National Parks and Wildlife Service 2012). Due to distance from site, and the assimilation capacity of the sea, there is no possibility of significant effects <u>cannot be excluded</u>.</p>  | Not required  |
| 1160 Large shallow inlets and bays | <p>To maintain the favourable conservation condition of Large shallow inlets and bays in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a></p> | <p>Habitat is located 1.8 km from project site (National Parks and Wildlife Service 2012). Potential indirect significant effects <u>cannot be excluded</u> if mitigation measures to eliminate sediment or pollution run-off are not implemented.</p> <p>Threats include:</p>  | <p>To protect this aquatic habitat, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below.</p> |

|  |   |  |   |
|--|---|--|---|
|  |   | <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul>   |   |
| 1170 Reefs                               | <p>To maintain the favourable conservation condition of Reefs in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a></p> | <p>Closest reef is located 1.89 km from project site (National Parks and Wildlife Service 2012).</p> <p>Potential indirect significant effects <b>cannot be excluded</b> if mitigation measures to eliminate sediment or pollution run-off are not implemented.</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul> | <p>To protect this aquatic habitat, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below.</p> |
| 1220 Perennial vegetation of stony banks | <p>To maintain the favourable conservation condition of Perennial vegetation of stony banks in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at</p>   | <p>Closest perennial vegetation is Ballymacrinan Bay, which is approximately 11.2 km away. Bunaclogga Bay lies approximately</p>   | <p>None required</p>  |

|  |  |   |   |
|--|--|---|---|
| <p>1230 Vegetated sea cliffs of the Atlantic and Baltic coasts</p> | <p><a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a></p>   | <p>13 km (National Parks and Wildlife Service 2012). Due to distance from site, the fact that work will only occur within site boundary, and the terrestrial nature of this coastal habitat there will be no significant effect on this QI and so no mitigation is required.</p>  |   |
| <p>1230 Vegetated sea cliffs of the Atlantic and Baltic coasts</p> | <p>To maintain the favourable conservation condition of Vegetated sea cliffs in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a></p>                                 | <p>Nine sub-sites were identified (National Parks and Wildlife Service 2012). Lisheenrony is the closest sea cliff located approximately 10.5 km from site. Adjacent are the Moyarta cliffs which are 12.2 km away.</p> <p>Due to coastal and terrestrial nature of this habitat and site works being contained within project site boundary there will be no significant effect on this QI and so no mitigation is required.</p> | <p>None required</p>  |
| <p>1310 Salicornia and other annuals colonising mud and sand</p>   | <p>To maintain the favourable conservation condition of Salicornia and other annuals colonizing mud and sand in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a></p> | <p>Habitat recorded at five of the ten sub-sites surveyed and mapped, further un-surveyed areas maybe present within the site (National Parks and Wildlife Service 2012).</p> <p>Examination of aerial maps/photography indicates that potential habitat lies 1.7 km downstream of project site. Potential indirect significant effects cannot be excluded if mitigation measures to eliminate</p>                                | <p>To protect this aquatic habitat, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below.</p> |

|  |  |   |                      |
|--|--|---|----------------------|
|  |  | <p>sediment or pollution run-off are not implemented.</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul>  |                      |
| <p>1330 Atlantic salt meadows (GlaucoPuccinellietalia maritimae)</p> | <p>To restore the favourable conservation condition of Atlantic salt meadows (Glauco-Puccinellietalia maritimae) in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a></p> | <p>Ten sub-sites that supported Atlantic salt meadow are mapped for this SAC, the closest has been approx. 2 km away (National Parks and Wildlife Service 2012).</p> <p>Due to coastal and terrestrial nature of this habitat and site works being contained within project site boundary, the size and scale of the proposed project and terrestrial separation distance of 2 km, there will be no potential for significant effect on this QI and so no mitigation is required.</p> | <p>None required</p> |
| <p>1410 Mediterranean salt meadows (Juncetalia maritimi)</p>         | <p>To maintain the favourable conservation condition of Bottlenose Dolphin in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at</p>   | <p>Eight sub-sites that support Mediterranean salt meadow were mapped (National Parks and Wildlife Service 2012). The closest</p>   | <p>None required</p> |



|   |   |   |   |
|---|---|---|---|
| <p>3260 Water courses of plain to montane levels with the Ranunculus fluitantis and Callitriche-Batrachion vegetation</p> | <p><a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a></p>  | <p>site is located approximately 14 km from project site.</p> <p>Due to coastal and terrestrial nature of this habitat and site works being contained within project site boundary, the size and scale of the proposed project and terrestrial separation distance of more than 1.7 km, there will be no potential for significant effects on this QI and so no mitigation is required.</p>   |   |
| <p>3260 Water courses of plain to montane levels with the Ranunculus fluitantis and Callitriche-Batrachion vegetation</p> | <p>To maintain the favourable conservation condition of Water courses of plain to montane levels with the Ranunculus fluitantis and Callitriche-Batrachion vegetation in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a></p> | <p>The full distributions of this habitat and its sub-types in this site are currently unknown. Review of the available data had identified three high conservation elements (sub-types) in the site, namely: 1. <i>Groenlandia densa</i> (L.) Fourr., Opposite-leaved Pondweed 2. <i>Schoenoplectus triquetus</i> (L.) Palla, Triangular Club-rush 3. Bryophyte-rich streams and rivers. The first two sub-types are associated with tidal reaches of rivers, while the latter sub-type is found in fast-flowing stretches of unmodified streams and rivers. (NPWS, 2012a). There is therefore potential for sub-types of this habitat to lie downstream of project site. Potential indirect significant effects cannot be</p> | <p>To protect this aquatic habitat, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below.</p> |

|  |  |   |                      |
|--|--|---|----------------------|
| <p>6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)</p> |  | <p>excluded if water quality is impacted by project.</p> <p>Potential indirect impact if mitigation measures to eliminate sediment or pollution run-off are not implemented.</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul> |                      |
|  | <p>To maintain the favourable conservation condition of Molinia meadows on calcareous, peaty or clayey-silt laden soils (Molinion caeruleae) in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a></p> | <p>Full extent of habitat within SAC has not been mapped.</p> <p>Due to terrestrial nature of this habitat, project works being contained within site boundary, the size and scale of the proposed project and terrestrial separation distance of more than 1.7 km, there is no potential for significant effect on this QI and so no mitigation is required.</p>   | <p>None required</p> |

|   |   |  |                      |
|---|---|--|----------------------|
| <p>91E0 Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae)*</p> | <p>To restore the favourable conservation condition of Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae) in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a></p> | <p>Five surveyed sites mapped within SAC. Located approximately 52 km away (National Parks and Wildlife Service 2012).</p> <p>Due to a terrestrial separation distance of more than 50km, project works being contained within site boundary, the size and scale of the proposed project, there is no potential for <u>significant effects</u> on this QI and so no mitigation is required.</p>  | <p>None required</p> |
| <p>1029 Freshwater Pearl Mussel (<i>Margaritifera margaritifera</i>)</p>  | <p>To restore the favourable conservation condition of Freshwater Pearl Mussel in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a></p>  | <p>This conservation objective applies to the freshwater pearl mussel population in the Cloon River, Co. Clare only. The Cloon population is confined to the main channel and is distributed from Croany Bridge to approx. 1.5km upstream of Clonderalaw Bridge (Ross, 2008; DEHLG, 2010) (National Parks and Wildlife Service 2012)</p> <p>The freshwater pearl mussel population in the Cloon River is over 22 km from the proposed forestry site and is situated in a different river sub-catchment. Forestry site is situated in sub-catchment Wood-SC_010, while the pearl mussel site in Cloon River is situated in sub-catchment Cloon (Clare)SC_010. The area between these catchments</p> | <p>None required</p> |

|   |   |  |   |
|---|---|--|---|
| <p>1099 River Lamprey (<i>Lampetra fluviatilis</i>)</p> | <p>To maintain the favourable conservation condition of River Lamprey in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at:<br/> <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a></p> | <p>includes the large Shannon Estuary and the pearl mussel populations are upstream along the Cloon River. Due to distance from project site and no direct hydrological connectivity there will be no potential for significant effects on this QI and so no mitigation is required.</p> <p>Records of River lamprey 64 km from site (National Biodiversity Data Centre records). Probably under recorded (Kelly &amp; King, 2001).</p> <p>Potential habitat for this species lies downstream of project site. Potential indirect significant effects cannot be excluded if mitigation measures to eliminate sediment or pollution run-off are not implemented.</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul> | <p>To protect this aquatic habitat, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below.</p> |
|---|---|--|---|

|   |  |   |  |
|---|--|---|--|
| <p>1349 Common Bottlenose Dolphin (<i>Tursiops truncatus</i>)</p> | <p>To maintain the favourable conservation condition of Bottlenose Dolphin in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a></p> | <p>Records of Bottlenose Dolphin approximately 7 km from project site (National Biodiversity Data Centre records).</p> <p>Due to the marine nature of this species which spends its time at sea there will be no disturbance impacts. Due to the size and scale of the proposed project and the assimilation capacity of the sea there is no potential for significant effect on this QI and so no mitigation is required.</p>  | <p>None required</p>   |
| <p>1355 Otter (<i>Lutra lutra</i>)</p>                            | <p>To restore the favourable conservation condition of Otter in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a></p>               | <p>Recordings of otter approximately 2 km away (National Biodiversity Data Centre records - Mammals of Ireland 2016-2025). Potential indirect significant effects cannot be excluded on prey species if mitigation measures to eliminate sediment or pollution run-off are not implemented.</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>● Release of sediment to receiving waters.</li> <li>● Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> </ul> | <p>To protect this aquatic species, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below.</p> <p>In addition, bankside habitat needs to be protected. See proposed mitigations in section 2.2 below.</p> |

|   |   |  |   |
|---|---|--|---|
| <p>1096 Brook Lamprey (<i>Lampetra planeri</i>)</p> | <p>To maintain the favourable conservation condition of Brook Lamprey in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a></p> | <ul style="list-style-type: none"> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul> <p>Bank side habitat (potential lie up sites) needs to be protected.</p> <p>Records of Brook lamprey 65 km from site (National Biodiversity Data Centre records). Probably under recorded (Kelly &amp; King, 2001).</p> <p>Potential habitat for this species lies downstream of project site. Potential indirect significant effects cannot be excluded if mitigation measures to eliminate sediment or pollution run-off are not implemented.</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul> | <p>To protect this aquatic habitat, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below.</p> |
| <p>1095 Sea Lamprey (<i>Petromyzon marinus</i>)</p> | <p>To restore the favourable conservation condition of Sea Lamprey in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at</p>  | <p>Records of Sea lamprey 23 km from site (National Biodiversity Data Centre records). Probably under recorded (Kelly &amp; King, 2001).</p>   | <p>To protect this aquatic habitat, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving</p>  |



|   |   |  |   |
|---|---|--|---|
| <p>1106 Salmon (<i>Salmo salar</i>)</p> | <p><a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a></p>  | <p>Potential habitat for this species lies downstream of project site. Potential indirect significant effects cannot be excluded if mitigation measures to eliminate sediment or pollution run-off are not implemented.</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul> | <p>waters. See proposed mitigations in section 2.2 below.</p>   |
| <p>1106 Salmon (<i>Salmo salar</i>)</p> | <p>To restore the favourable conservation condition of Salmon in the Lower River Shannon SAC, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a></p> | <p>Salmon are widespread in the River Shannon system (National Parks and Wildlife Service 2012).</p> <p>Potential habitat for this species lies downstream of project site. Potential indirect significant effects cannot be excluded if mitigation measures to eliminate sediment or pollution run-off are not implemented.</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> </ul>  | <p>To protect this aquatic species, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below.</p> |

|  |  |   |  |
|--|--|---|--|
|  |  | <ul style="list-style-type: none"><li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li><li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li></ul> |  |
|--|--|---|--|

Table 2: Screened-in European Sites – River Shannon and River Fergus SPA - Potential Impacts and Proposed Mitigation

| <b>River Shannon and River Fergus SPA (site code: 004077)</b>   |   |   |  |
|---|---|---|--|
| List each of the Qualifying Interest(s) (if SAC) / Special Conservation Interest(s) (if SPA) for this European Site.<br><br>Assign each QI / SCI its own row. | Set out components of the Conservation Objectives (relevant information including attributes, conservation status & locations) for this European Site relevant to this project.   | Considering the QI / SCI & the Conservation Objective(s), and supporting habitats and species(*), is it likely that the project will have an adverse effect on this QI / SCI & the achievement of the corresponding Conservation Objective?<br><br>If 'yes', describe the nature, severity, mechanism & timeline of the adverse effect.   | If the potential for an adverse effect on this QI / SCI exists, detail the necessary mitigation to avoid, reduce or prevent this potential, and describe the mechanism through which this is achieved.       |
| A017 Cormorant<br><i>Phalacrocorax carbo</i>  | To maintain the favourable conservation condition of Cormorant in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a> | SPA designated for breeding and wintering Cormorants. No records of breeding with 10 km <sup>2</sup> of site, however there are records of wintering species within 10 km <sup>2</sup> of site (National Biodiversity Data Centre records). Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten & Henkensj 1997) Due to distance of SPA to project site (over 1.7 km), and the unsuitability for the project site for cormorant, a seabird | To protect this water dependent species, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below. |

|   |   |   |   |
|---|---|---|---|
|   |   | <p>that will use lakes and larger waterbodies, there is no potential for significant direct effects due to disturbance during proposed works.</p> <p>Potential indirect significant effects cannot be excluded if water quality is impacted as project area is hydrologically connected to SPA</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul> |   |
| <p>A038 Whooper Swan<br/><i>Cygnus cygnus</i></p> | <p>To maintain the favourable conservation condition of Whooper Swan in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p> | <p>SPA designated for wintering Whooper swan. Records of wintering species within 10 km<sup>2</sup> of site (National Biodiversity Data Centre records).</p> <p>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site</p>   | <p>To protect this water dependent species, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.1 below.</p> |

|  |  |   |   |
|--|--|---|---|
| <p>A046 Light-bellied Brent Goose <i>Branta bernicla hrota</i></p> | <p>To maintain the favourable conservation condition of Light-bellied Brent Goose in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p> | <p>(over 1.7 km), and the unsuitability of the project site for this winter visitor that will use freshwater and brackish lakes and feed on grassland varying from traditional callows to intensive pasture and at times arable, there is no potential for significant direct effects due to disturbance during proposed works.</p> <p>Potential indirect significant effects cannot be excluded if water quality is impacted as project area is hydrologically connected to SPA</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul> |   |
|  |  | <p>SPA designated for wintering of Light-bellied Brent geese. Records of wintering species within 1.6 km of site (National Biodiversity Data Centre records).</p> <p>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance</p>   | <p>To protect this water dependent species, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below.</p> |

|   |   |   |   |
|---|---|---|---|
| <p>A048 Shelduck <i>Tadorna tadorna</i></p> | <p>To maintain the favourable conservation condition of Shelduck in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protection/sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protection/sites/conservation_objectives/CO004077.pdf</a></p> | <p>incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km), and the unsuitability of the project site for this primarily coastal species, there is no potential for significant direct effects due to disturbance during proposed works.</p> <p>Potential indirect significant effects cannot be excluded if water quality is impacted as project area is hydrologically connected to SPA</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul> |   |
|   |   | <p>SPA designated for over wintering Shelduck. Records of wintering species within 3 km of site (National Biodiversity Data Centre records).</p> <p>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience</p>   | <p>To protect this water dependent species, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below.</p> |



|   |   |  |   |
|---|---|--|---|
| <p>A050 Wigeon <i>Anas penelope</i></p> | <p>To maintain the favourable conservation condition of Wigeon in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/proTECTED-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/proTECTED-sites/conservation_objectives/CO004077.pdf</a></p> | <p>disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997) Due to distance of SPA to project site (over 1.7 km), the unsuitability of the project site for this species which primarily winters on the coast in sheltered estuaries and tidal mudflats, there is no potential for significant direct effects due to disturbance during proposed works.</p> <p>Potential indirect significant effects cannot be excluded if water quality is impacted as project area is hydrologically connected to SPA</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul> |   |
|   |   | <p>SPA designated for over wintering wigeon. Records of wintering species within 2.5 km of site</p> <p>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour.</p>   | <p>To protect this water dependent species, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below.</p> |

|                              |   |   |  |
|------------------------------|---|---|--|
|                              |   | <p>Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km), and the unsuitability of the project site for this species which is found on coastal (estuaries, brackish lagoons, and bays) and inland (lakes, callows, rivers, turloughs) wetland locations, there is no potential for significant direct effects due to disturbance during proposed works.</p> <p>Potential indirect significant effects cannot be excluded if water quality is impacted as project area is hydrologically connected to SPA</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul> <p>SPA designated for over wintering Teal. Records of wintering species within 2 km</p> |  |
| A052 Teal <i>Anas crecca</i> | To maintain the favourable conservation condition of Teal in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets |   | To protect this water dependent species, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals |

|  |   |   |  |
|--|---|---|--|
|  | <p>at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p> | <p>of site (National Biodiversity Data Centre records).</p> <p>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km) and the unsuitability of the project site for this species which occur both coastal and inland locations including coastal lagoons and estuaries and inland marshes, lakes, ponds and turloughs, there is no potential for significant direct effects due to disturbance during proposed works.</p> <p>Potential indirect significant effects cannot be excluded if water quality is impacted as project area is hydrologically connected to SPA</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> </ul> | <p>to receiving waters. See proposed mitigations in section 2.2 below.</p> |
|--|---|---|--|

|                                       |  |  |   |
|---------------------------------------|--|--|---|
| <p>A054 Pintail <i>Anas acuta</i></p> | <p>To maintain the favourable conservation condition of Pintail in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protection/sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protection/sites/conservation_objectives/CO004077.pdf</a></p> | <ul style="list-style-type: none"> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul> <p>SPA designated for over wintering Pintail. Records of wintering species within 10 km<sup>2</sup> of site (National Biodiversity Data Centre records).</p> <p>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km) and the unsuitability of the project site for this species which occurs in coastal/estuarine locations or inland on lakes or callows, there is no potential for significant direct effects due to disturbance during proposed works.</p> <p>Potential indirect significant effects cannot be excluded if water quality is impacted as project area is hydrologically connected to SPA</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> </ul> | <p>To protect this water dependent species, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below.</p> |
|---------------------------------------|--|--|---|

|   |   |  |   |   |
|---|---|--|---|---|
| <p>A056 Shoveler <i>Anas clypeata</i></p> | <p>To maintain the favourable conservation condition of Shoveler in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p> | <ul style="list-style-type: none"> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul> | <p>SPA designated for over wintering Shoveler. Records of wintering species within 10 km<sup>2</sup> of site.</p> <p>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km), and the unsuitability of the project site for this species, which is found in coastal and inland wetlands, there is no potential for significant direct effects due to disturbance during proposed works.</p> <p>Potential indirect significant effects cannot be excluded if water quality is impacted as project area is hydrologically connected to SPA.</p> <p>Threats include:</p> | <p>To protect this water dependent species, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below.</p> |
|---|---|--|---|---|

|  |  |  |   |
|--|--|--|---|
| <p>A062 Scaup <i>Aythya marila</i></p> | <p>To maintain the favourable conservation condition of Scaup in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p> | <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul>   | <p>To protect this water dependent species, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below.</p> |
|  |  | <p>SPA designated for over wintering Scaup. Records of wintering species within 10 km<sup>2</sup> of site (National Biodiversity Data Centre records).</p> <p>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km) and the unsuitability of the project site for this bird which winters on coastal estuaries and bays, on brackish lagoons and in shallow marine waters, there is no potential for significant direct effects due to disturbance during proposed works.</p> <p>Potential indirect significant effects cannot be excluded if water quality is</p> |   |

|   |  |  |   |
|---|--|--|---|
| <p>A137 Ringed Plover <i>Charadrius hiaticula</i></p> | <p>To maintain the favourable conservation condition of Ringed Plover in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p> | <p>impacted as project area is hydrologically connected to SPA</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul>  |   |
|   |  | <p>SPA designated for over wintering Ringed Plover. Records of wintering species within 10 km<sup>2</sup> of site (National Biodiversity Data Centre records).</p> <p>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km) and the unsuitability of the project site to be used by this coastal wader, there is no potential for significant direct effects due to disturbance during proposed works.</p> | <p>To protect this water dependent species, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below.</p> |



|  |  |   |   |
|--|--|---|---|
| <p>A140 Golden Plover <i>Pluvialis apricaria</i></p> | <p>To maintain the favourable conservation condition of Golden Plover in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p> | <p>Potential indirect significant effects cannot be excluded if water quality is impacted as project area is hydrologically connected to SPA</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul>   |   |
|  |  | <p>SPA designated for over wintering Golden Plover. Records of wintering species within 10 km<sup>2</sup> of site (National Biodiversity Data Centre records).</p> <p>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km), and the unsuitability of the site for Golden plover, who will feed on inland improved agricultural fields (but not rough, rushy pasture as is within project site) and usually feed on coastal</p> | <p>To protect this water dependent species, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below.</p> |

|   |  |  |   |
|---|--|--|---|
|   |  | <p>habitats there is no potential for significant direct effects due to disturbance during proposed works.</p> <p>Potential indirect significant effects cannot be excluded if water quality is impacted as project area is hydrologically connected to SPA</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul> |   |
| <p>A141 Grey Plover <i>Pluvialis squatarola</i></p> | <p>To maintain the favourable conservation condition of Grey Plover in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p> | <p>SPA designated for over wintering Grey Plover. Records of wintering species within 10 km<sup>2</sup> of site (National Biodiversity Data Centre records).</p> <p>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km), and the unsuitability of the</p>  | <p>To protect this water dependent species, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below.</p> |

|  |  |   |  |
|--|--|---|--|
|  |  | <p>project site for this exclusively coastal species, there is no potential for significant direct effect due to disturbance during proposed works.</p> <p>Potential indirect significant effects cannot be excluded if water quality is impacted as project area is hydrologically connected to SPA</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul> |  |
| <p>A142 Lapwing <i>Vanellus vanellus</i></p> | <p>To maintain the favourable conservation condition of Lapwing in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p> | <p>SPA designated for over wintering Lapwing. Records of wintering species within 5 km of site (National Biodiversity Data Centre records).</p> <p>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Lapwing tend to feed at night.</p>  | <p>To protect this water dependent species, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below. As a precaution no work shall be carried out at night during the winter.</p> |

|  |   |   |   |
|--|---|---|---|
|  |   | <p>Due to distance of SPA to project site (over 1.7 km) there is no potential for significant direct effect due to disturbance during the proposed works.</p> <p>Potential indirect significant effects cannot be excluded if water quality is impacted as project area is hydrologically connected to SPA</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul> |   |
| <p>A143 Knot <i>Calidris canutus</i></p> | <p>To maintain the favourable conservation condition of Knot in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p> | <p>SPA designated for over wintering Knot. Records of wintering species within 10 km<sup>2</sup> of site (National Biodiversity Data Centre records).</p> <p>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997).</p> <p>Due to distance of SPA to project site</p>   | <p>To protect this water dependent species, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below.</p> |

|   |   |  |   |
|---|---|--|---|
| <p>A149 Dunlin <i>Calidris alpina</i></p> | <p>To maintain the favourable conservation condition of Dunlin in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p> | <p>(over 1.7 km) and the unsuitability of the project site for this coastal wader, there is no potential for significant direct effect due to disturbance during proposed works.</p> <p>Potential indirect significant effects cannot be excluded if water quality is impacted as project area is hydrologically connected to SPA</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul> |   |
|   |   | <p>SPA designated for over wintering Dunlin. Records of breeding species within 2 km of site (National Biodiversity Data Centre records).</p> <p>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997).</p>  | <p>To protect this water dependent species, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below.</p> |

|  |  |   |   |
|--|--|---|---|
|  |  | <p>Due to distance of SPA to project site (over 1.7 km), the unsuitability of the project site for this species, which is a coastal wader, there is no potential for significant direct effect due to disturbance during the proposed works.</p> <p>Potential indirect significant effects cannot be excluded if water quality is impacted as project area is hydrologically connected to SPA.</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul> |   |
| <p>A156 Black-tailed Godwit <i>Limosa limosa</i></p> | <p>To maintain the favourable conservation condition of Black-tailed Godwit in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p> | <p>SPA designated for over wintering Black-tailed Godwit. Records of wintering species within 10 km<sup>2</sup> of site (National Biodiversity Data Centre records).</p> <p>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997;</p>  | <p>To protect this water dependent species, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below.</p> |

|   |  |   |   |
|---|--|---|---|
| <p>A157 Bar-tailed Godwit <i>Limosa lapponica</i></p> | <p>To maintain the favourable conservation condition of Bar-tailed Godwit in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p> | <p>Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km), the unsuitability of the project site for this species which winters along coastal (particularly estuaries) and inland wetlands there is no potential for significant direct effect due to disturbance during the proposed works.</p> <p>Potential indirect significant effects cannot be excluded if water quality is impacted as project area is hydrologically connected to SPA.</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul> |   |
|   |  | <p>SPA designated for over wintering Bar-tailed Godwit. Records of wintering species within 10 km<sup>2</sup> of site (National Biodiversity Data Centre records).</p> <p>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance</p>  | <p>To protect this water dependent species, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below.</p> |



|  |   |  |  |   |
|--|---|--|--|---|
| <p>A160 Curlew <i>Numenius arquata</i></p> | <p>To maintain the favourable conservation condition of Curlew in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p> | <p>incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km), the unsuitability of the project site for this wader, which is coastal and generally found near estuaries, there is no potential for significant direct effect due to disturbance during proposed works.</p> <p>Potential indirect significant effects cannot be excluded if water quality is impacted as project area is hydrologically connected to SPA</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul> <p>SPA designated for over wintering Curlew. Records of wintering species within 10 km<sup>2</sup> of site (National Biodiversity Data Centre records).</p> <p>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour.</p> |  | <p>To protect this water dependent species, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below.</p> |
|--|---|--|--|---|

|  |   |  |  |   |
|--|---|--|--|---|
| <p>A164<br/>Greenshank <i>Tringa nebularia</i></p> | <p>To maintain the favourable conservation condition of Greenshank in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/prot">https://www.npws.ie/sites/default/files/prot</a></p> | <p>Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km), the unsuitability of the project side for this wader which uses both coastal and inland wetlands, there is no potential for significant direct effects due to disturbance during proposed works.</p> <p>Potential indirect significant effects cannot be excluded if water quality is impacted as project area is hydrologically connected to SPA.</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul> <p>SPA designated for over wintering Greenshank. Records over wintering within 5 km of site (National Biodiversity Data Centre records).</p> |  | <p>To protect this water dependent species, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below.</p> |
|--|---|--|--|---|

|  |   |   |   |
|--|---|---|---|
| <p>A162 Redshank <i>Tringa totanus</i></p> | <p><a href="#">ected-sites/conservation_objectives/CO004077.pdf</a></p> | <p>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km), and the unsuitability of the project site for this coastal wader, there is no potential for significant direct effect due to disturbance during proposed works.</p> <p>Potential indirect significant effects cannot be excluded if water quality is impacted as project area is hydrologically connected to SPA.</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul> <p>SPA designated for over wintering Redshank. Records over wintering within</p> | <p>To protect this water dependent species, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals</p> |
|--|---|---|---|

|  |   |  |  |
|--|---|--|--|
|  | <p>targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p> | <p>3 km of site (National Biodiversity Data Centre records).</p> <p>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km), and the unsuitability of the project site for this mainly coastal wader (though it will use lakes and large rivers), there is no potential for significant direct effect due to disturbance during proposed works.</p> <p>Potential indirect significant effects cannot be excluded if water quality is impacted as project area is hydrologically connected to SPA.</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul> | <p>to receiving waters. See proposed mitigations in section 2.2 below.</p> |
|--|---|--|--|

|   |  |  |   |
|---|--|--|---|
| <p>A179 Black-headed Gull <i>Larus ridibundus</i></p> | <p>To maintain the favourable conservation condition of Black-headed Gull in the River Shannon and River Fergus Estuaries SPA, which is defined by the following list of attributes and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a></p> | <p>SPA designated for over wintering Black-headed Gull. Records of over wintering within 10 km<sup>2</sup> of site (National Biodiversity Data Centre records).</p> <p>Birds can be impacted by human or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten &amp; Henkensj 1997). Due to distance of SPA to project site (over 1.7 km), and the unsuitability of the project area for this coastal species that will feed on arable fields, there is no potential for significant direct effect due to disturbance during the proposed works.</p> <p>Potential indirect significant effects cannot be excluded if water quality is impacted as project area is hydrologically connected to SPA</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> </ul> | <p>To protect this water dependent species, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below.</p> |
|---|--|--|---|

|               |  |  |  |
|---------------|--|--|--|
| A999 Wetlands | To maintain the favourable conservation condition of the wetland habitat in the River Shannon and River Fergus Estuaries SPA as a resource for the regularly-occurring migratory waterbirds that utilise it. This is defined by the following attribute and targets at <a href="https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf">https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004077.pdf</a> | <ul style="list-style-type: none"> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul> <p>Direct hydrological connection from project site to SPA. Site lies approximately 327 m from Emlagh 27 River (EPA code: IE_SH_27M040900), which forms hydrological link to River Shannon and River Fergus Estuaries SPA.</p> <p>Potential indirect significant effects cannot be excluded if water quality is impacted as project area is hydrologically connected to SPA</p> <p>Threats include:</p> <ul style="list-style-type: none"> <li>• Release of sediment to receiving waters.</li> <li>• Release of levels of nutrients into the water, which could lead to oxygen depletion in the water.</li> <li>• Release of chemicals (pesticides, fuels, hydraulic oils) into watercourses.</li> </ul> | To protect this aquatic habitat, mitigation measures are required to ensure no release of silt/sediment, nutrients, or chemicals to receiving waters. See proposed mitigations in section 2.2 below. |
|---------------|--|--|--|

## 2.2 Measures to Mitigate Potential Adverse Impacts

Mitigation refers to *measures taken to avoid or reduce negative impacts and effects* (CIEEM 2018).

The evaluation of likely significant impacts of the proposed afforestation 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 afforestation. 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 forestry work practices on site (e.g. Environmental Requirements for Afforestation and Forestry Standards Manual).
- Working in accordance with relevant legislation, for example, (Wildlife Acts 1976 to 2021 and European Communities (Birds and Natural Habitats) Regulations 2011-2021).
- Contractors shall ensure adequate site supervision and security.
- Contract workers shall be briefed to ensure that environmental issues are taken into consideration and that guidelines and codes of practice are followed.

See also Appendix 5 for how mitigation measures will be implemented and monitored.

### 2.2.1 Disturbance

Birds can be impacted by human activity or noise disturbance particularly if disturbance impacts on foraging or nesting behaviour. Generally, birds can experience disturbance impacts if disturbance incident occurs within 500m of foraging, nesting, or roosting areas (Holloway 1997; Scarton 2018; Maarten & Henkensj 1997). Noise during the afforestation phase shall not impact shorebirds adversely due to the distance to the SPA and SAC and the scale of development, so no mitigation is proposed. Once complete and any maintenance activities associated with the project will cause no disturbance to the protected birds of qualifying species.

In addition, the project site does not provide suitable habitat for the birds of special conservation interest, with the exception of lapwing who could potentially use the site for foraging. Lapwing however forage at night (BirdWatch Ireland). As a precautionary measure it is recommended that no works will be carried out at night. Once trees are established there will be a small loss of potential foraging habitat to these birds. However, as the size of the area is relatively small (just over 14 ha) and as fields themselves are small in size and are rushy, they are not ideally suited to lapwing who prefer open fields (Snow & Perrines, 1998) where they can easily detect approaching predators. There is also other potential foraging habitat just south of the site, which is more suited as field sizes are larger and are not dominated by rushes.

Otters do not tolerate disturbance at or near holts that are in active use (NRA, 2008). No otter holts were recorded during field survey. Potential commuting and foraging habitat for otter was recorded within the project site but which lies outside of the SAC. Otters are highly mobile species and are crepuscular in nature (Hayden, & Harrington, 2000) and are unlikely to be adversely impacted by the proposed works.



Based on the above review of scientific literature (Table 2) and the prescribed mitigation measures in section 2.2 the potential for adverse impact on the integrity of the bird and otter populations associated with Lower River Shannon SAC and the River Shannon and River Fergus SPA as a result of the proposed project can be excluded.

### *2.2.2 Species impact*

Potential lie-up sites for otters will also need to be protected. There will be no cleaning of vegetation from any section of such watercourses within 20 m of the aquatic zone (order 1 - Emlagh Stream 27). There will be no woody weed removal within 20 m of an aquatic zone or 10m of a relevant watercourse. On a precautionary basis works shall not be carried out during hours of darkness to avoid any potential disturbance of lapwing that may use the site for feeding. See also 2.2.1 above. No direct species impacts are predicted if water quality is not impacted. Water quality is dealt with in 2.2.3 below.

### *2.2.3 Water Quality*

Mitigation measures will ensure to eliminate both the discharge of polluting materials (e.g. fuel or oil from vehicles; concrete etc.) and the mobilisation of silts and sediments into the watercourses. Pollution may occur following accidents that result in spillage of fuel or other materials. Strict pollution prevention measures must be implemented during forestry works to avoid siltation or discharge of pollutants.

#### **Exclusion zones for machinery**

- Exclusion zones for machinery must ensure that machines do not traverse within 5m of watercourses on site during forestry operations.
- With respect to exclusion zones, measures outlined in Section 3.5 of the Environmental Requirements for Afforestation (December 2016), will be adhered to (See Appendix 4 and [www.iai.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf](http://www.iai.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf)).

#### **Silt and sediment control**

- Silt traps will be deployed to control movement of silt and sediment, as outlined in Section 4.3 of Environmental Requirements for Afforestation (December 2016). Silt traps will be constructed at end of mound drains at 50 m intervals (see Appendix 4).
- Silt traps will be maintained throughout all planting works, ensuring that they are clear of sediment build-up.

#### **Drainage and cultivation**

- All drains must protect aquatic zones (order 1 - Emlagh Stream 27) from any sediment and nutrients contained in water draining off the site as outlined in section 3.7.1 of Environmental Requirements for Afforestation (December 2016) (See [www.iai.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf](http://www.iai.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf)).

- Drains will be maintained throughout all planting works, ensuring that they are clear of sediment build-up and are not severely eroded.
- There will be no vegetation removal within 20 m of a drainage ditch.

### **Afforestation**

- A setback area of 5m will be applied along the relevant watercourses present in the project area (there are three that run west-east into the Emlagh Stream 27), as specified in Section 4.4 of the Environmental Requirements for Afforestation (December 2016) (See [www.iai.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf](http://www.iai.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf)).

### **Setbacks**

- A 5-metre-wide (minimum) setback will be applied along relevant watercourses (as defined in Circular 12/2017) located within or adjoining the site. This setback is to remain undisturbed during establishment and throughout the forest rotation. This will be applied and maintained as per details set out in Tables 5 and 6 of the Environmental Requirements for Afforestation (DAFM, 2016) (See [www.iai.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf](http://www.iai.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf)).
- A setback of 10 m from the aquatic zone, Emlagh stream which runs along the eastern boundary of the site for 240 m will be applied.
- There shall be no mounding or machine work within 10m of Aquatic Zone
- There shall be no mounding or machine work within 5 m of Relevant Water Course (RWC).

### **Chemical use**

- Chemical use will be kept to an absolute minimum, depending on site requirements; chemicals will only be applied in dry weather.
- Chemicals shall not be applied within 20m of the aquatic zone or within watercourses setbacks or other sensitive areas.

## SECTION 3: IN-COMBINATION EFFECT

A review of plans and projects was undertaken. This review focuses on the potential for cumulative in-combination effects on the European Sites where potential for adverse effects has been identified in the preceding sections of this report. This included a review of online Planning Registers, development plans, forestry applications and other available information.

### 4.1 Review of other Plans

The potential for the proposed afforestation project to contribute to a cumulative impact on European Sites was considered for the following plans:

- Water Framework Directive (WFD)
- County Development Plan
- Shannon River Basin District Management Plan

This project lies in a rural landscape in the townland Emlagh, Co. Clare in the WFD Sub-Catchment WOOD\_SC\_010. Two out of four river water bodies within this sub-catchment are AT RISK: Wood\_010 due to Poor biological status and; Wood\_020 due to poor biological status and elevated phosphate and ammonia concentrations. Moyasta\_010 and Termon East\_010 are under REVIEW due to their unassigned status. Agriculture was identified as a significant pressure within Wood\_010 and Wood\_020. In addition, forestry (notably clearfelling), a golf course and urban runoff were also highlighted as significant pressures within Wood\_020. Further local catchment assessments are required for REVIEW water bodies so as to determine whether any issues exist.

WFD River Moyasta\_10 forms a hydrological link from the project site to SAC and SPA. While agriculture has been highlighted as a significant pressure for Moyasta\_10, forestry and notably clearfelling has been highlighted as pressure for Wood\_020 only.

Further details on the sub-catchment assessment can be found here: [https://catchments.ie/wp-content/files/subcatchmentassessments/27\\_4%20Wood\\_SC\\_010%20Subcatchment%20Assessment%20WFD%20Cycle%202.pdf](https://catchments.ie/wp-content/files/subcatchmentassessments/27_4%20Wood_SC_010%20Subcatchment%20Assessment%20WFD%20Cycle%202.pdf)

The county development plan and the Shannon River Basin District Management Plan were also reviewed. See Table 4 below.

**Table 3: Other Plans**

| Plan                                      | Possible impacts from plans   | Is there a risk of significant in combination effects from the plans   |
|---|-------------------------------|--|
| Clare county development plan 2017 - 2023 | No negative impacts envisaged | AA concluded not possible to rule out impacts so NIS was required and carried out.<br><br>Upon implementation of mitigation measures no adverse effects on European Sites are predicted. |

|  |                               |  |
|--|-------------------------------|--|
|  |                               | <a href="https://www.clarecoco.ie/services/planning/publications/clare-county-development-plan-2017-2023-aa-concluding-statement-24220.pdf">https://www.clarecoco.ie/services/planning/publications/clare-county-development-plan-2017-2023-aa-concluding-statement-24220.pdf</a><br><br>Note: Emlagh noted as rural area under pressure                       |
| Shannon River Basin District Management Plan | No negative impacts envisaged | River Basin Management Plan 2018-2021<br><br>Possible impacts predicted but with the implementation of mitigation measures the RBMP will not adversely affect the integrity of any European site.<br><a href="https://assets.gov.ie/131983/0c065785-ce94-4f61-b1c3-2bbe10a4761b.pdf">https://assets.gov.ie/131983/0c065785-ce94-4f61-b1c3-2bbe10a4761b.pdf</a> |

In reviewing the above plans and the best objective information, no cumulative effects were identified as a result of the proposed project plans that could cause significant effects in combination with the proposed project. No aspects of the proposed development have been identified which can, by itself or in-combination with other plans or projects, affect the conservation objectives of any European site.

#### **4.2 Review of other Projects**

Planning applications occurring within the townlands of the Moyasta-010 River sub-basin with hydrological connection to the Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA were searched for possible in-combination impacts using Clare County Council planning search facility ([www.eplanning.ie/ClareCC/searchtypes](http://www.eplanning.ie/ClareCC/searchtypes)). See Table 6 below for details. Townlands included: Lisgurreen, Garraun Emlagh, Baunmore, Kilkee, Kilrush, Moanmore North and South and Upper and Lower, and town of Moyasta. This search criteria was used as these sites are hydrologically linked to same Natura 2000 sites as project site and could have potential cumulative effects on these sites.

No plans or projects were found for the area within the EIA portal which was searched on the 10<sup>th</sup> August 2021 ([housinggov.ie/maps.arcgis.com/apps/webappviewer/index.html?id=d7d5a3d48f104ecbb206e7e5f84b71f1](http://housinggov.ie/maps.arcgis.com/apps/webappviewer/index.html?id=d7d5a3d48f104ecbb206e7e5f84b71f1)).

**Table 4: Planning application near proposed development site**

(www.clarecoco.ie/services/planning/applications/view/planning-lists/, date of search 3<sup>rd</sup> September 2021, Search townlands of Lisgurreen, Garraun Emlagh, Baunmore, Kilkee, Kilrush, Moanmore North and South and Upper and Lower, and town of Moyasta for 2020-2021)

| Clare County Council Planning Application Number                   | Description  | Is there a risk of significant impact or in combination effects from the plans   |
|--|--|--|
| 2039<br>Tullaher,<br>Moyasta,<br>Co. Clare                         | Construction of a forest action road entrance with all ancillary site works.   | There is unlikely to be any significant impacts or 'in combination' effect on the SACs and SPAs as Planners Report - concluded the proposed development, by itself or in combination with other development in the vicinity, would not be likely to have a significant effect on European site(s).             |
| 20448<br>Einagh,<br>Moyasta,<br>Co. Clare                          | Construct a new dwelling house, private garage, site entrance, sewage treatment system and all with all ancillary site works.  | Permission granted and no AA requested.  |
| 21685<br>San Clemente,<br>Lisdeen,<br>Kilkee,<br>Co.Clare          | Retain existing conservatory extension at the western side of the dwelling, retention of front porch and private garage.   | No AA issues arise, therefore the proposed dwelling by itself or in combination with other development in the vicinity, would not be likely to have a significant effect on European sites.  |
| 20164<br>At Einagh,<br>Kilrush,<br>Co. Clare                       | Construction of extension and alternatives to existing house dwelling.   | There is no potential for there to be any significant impacts or 'in combination' effect on the SACs and SPAs as Planners Report - concluded the proposed development, by itself or in combination with other development in the vicinity, would not be likely to have a significant effect on European sites. |
| 20146<br>The Old School House,<br>Corbally,<br>Kilkee,<br>Co.Clare | Construct a link corridor between house and out building at the old school house, which will also act as a wind break.   | No AA issues arise, therefore the proposed dwelling by itself or in combination with other development in the vicinity, would not be likely to have a significant effect on European sites.  |
| 21257<br>Tarmon West,<br>Kilkee,<br>Co.Clare                       | Design changes to the house including but not limited to floor plans, elevations and fenestration, personal home office space 23 m <sup>2</sup> and basement space 14m | No AA issues arise, therefore the proposed dwelling by itself or in combination with other development in the vicinity, would not be likely to have a significant effect on European sites.  |

|   |  |  |
|---|--|--|
|   | <sup>2</sup> and access driveway along with all ancillary site works and landscaping.  |  |
| 21247<br>Carrowncalla<br>South,<br>Kilrush ,<br>Co. Clare | Extended the proposal of P15-848 for the construction of a cubicle house, slatted tank, milking parlour and plant, office space and all ancillary site works | Extension to previous AA received on 22 <sup>nd</sup> March 2021, for additional 5 years. The authority is satisfied once the development will be completed within a reasonable time.  |
| 2027<br>Carrowncalla<br>South,<br>Kilrush,<br>Co. Clare   | Demolition of derelict shed, and construction of new proposed shed along with all ancillary site works.  | No AA issues arise, therefore the proposed dwelling by itself or in combination with other development in the vicinity, would not be likely to have a significant effect on European sites.  |
| 20352<br>Ballyurra,<br>Kilrush,<br>Co. Clare              | Retain existing dwelling house, and permission to construct extension to the side rear of the existing dwelling house, along with all ancillary site works.  | There is no potential for there to be any significant impacts or 'in combination' effect on the SACs and SPAs as Planners Report - concluded the proposed development, by itself or in combination with other development in the vicinity, would not be likely to have a significant effect on European sites. |
| 20596<br>Leadmore East,<br>Kilrush,<br>Co. Clare          | Retention of change of use of the existing linked private garage to residential en-suite along with all ancillary site works.                                | No AA issues arise, therefore the proposed dwelling by itself or in combination with other development in the vicinity, would not be likely to have a significant effect on European site(s).  |

Planning appeals occurring within the townlands of the Moyasta-010 River sub-basin with hydrological connection to the Lower River Shannon SAC and River Shannon and River Fergus Estuaries SPA were searched and examined for possible in-combination impacts using An Bord Pleanála search facility. See Table 5 below This same search criteria were used in search of An Bord Pleanála Planning Appeals as for planning applications in Table 4 above.

**Table 5: An Bord Pleanála Planning Appeals near proposed development site**

(Data source: <https://www.pleanala.ie/en-ie/home/>, date of search 11<sup>th</sup> August 2021, Search townland of Emlagh and town of Moyasta for 2016-2021)

| Application Number  | Description  | Is there a risk of significant impact or in combination effects from the plans   |
|---|--|--|
| 300375: Moyasta, Kilrush, Co. Clare (P17/705)<br>Clare County Council | Retain existing cattle crush and plinths, construction of extension to livestock slatted house to accommodate calf pens and all ancillary site works | Having regard to the nature and scale of the proposed development and the development it is proposed to retain and to the nature of the receiving environment and proximity to the River Shannon and River Fergus Estuaries Special Protection Areas (Site Code 004077) and the Lower River Shannon Special Area of Conservation (Site Code 002165), no Appropriate Assessment issues arise and it is not considered that the proposed development would be likely to have a significant effect individually or in combination with other plans or projects on the European sites. |

In reviewing the above projects and the best objective information, no cumulative effects were identified as a result of the proposed projects that could cause significant effects. No aspects of the proposed development have been identified which can, by itself or in-combination with other plans or projects, affect the conservation objectives of any European site.

Forest application occurring within and having a hydrological link with the Moyasta-010 river sub basin were examined for possible in-combination impacts. See Table 6 below.

**Table 6: Forestry applications**

(Data source: ([forestry-maps.apps.rhos.agriculture.gov.ie/](https://forestry-maps.apps.rhos.agriculture.gov.ie/)). Search conducted on the 10/8/2021)

| Application number and address | Size of application (ha) | Date approved    | Type of application     | Assessment   |
|--------------------------------|--------------------------|------------------|-------------------------|--|
| CN83355<br>Moyasta, Clare      | 10.46                    | 3/4/2019         | Afforestation - planted | Plot lies approximately 700 m south of current project site. Stream along northern boundary of application CN83355 is part of the Moyasta_10 WFD system. |
| CN87378                        | 12.17                    | Decision pending | Afforestation           | Plot lies approximately 600 m west of current project site. Stream along eastern boundary of application   |

|  |      |                     |                                      |  |
|--|------|---------------------|--------------------------------------|--|
| Lisgurreen,<br>Emlagh,<br>Clare                      |      |                     |                                      | CN87378 is part of the Moyasta_10 WFD system.  |
| CN88624<br><br>Lisgurreen,<br>Clare                  | 7.5  | Decision<br>Pending | Afforestation                        | Plot lies approximately 780 m west of current project site. Stream lying 225m to the east of application CN88624 is part of the Moyasta_10 WFD system.           |
| CN82783<br><br>Lisgurreen,<br>Clare                  | 9.36 | Decision<br>Pending | Afforestation                        | Plot lies approximately 900 m west of current project site. Stream lying 250 m to the east of application CN82783 is part of the Moyasta_10 WFD system.          |
| TFL00440819<br><br>Kildeema,<br>Lisgurreen,<br>Clare | 7.39 | 10/6/2021           | Private<br>Clearfell and<br>Thinning | Plot lies approximately 750 m north-west of current project site. Stream along eastern boundary of application TFL00440819 is part of the Moyasta_10 WFD system. |

The total area to be afforested equates to 29.03 ha, with 10.46 ha recently planted, and 3.39 ha classed as clearfell and thinning. If the pending afforestation projects were to be carried out at the same time as the proposed project, it is possible that cumulative impacts of sedimentation could arise. In-combination effects can occur where a project results in individually insignificant effects that, when considered in-combination with impacts of other proposed or permitted plans and projects, can result in significant effects.

In reviewing the above forestry projects potential cumulative effects were identified as a result of the proposed projects that could cause significant effects on water quality. However, mitigations measures highlighted in this report will ensure any impacts of sedimentation on water quality are eliminated.

No aspects of the proposed development have been identified which can, by itself or in-combination with other plans or projects, affect the conservation objectives of any European site.



## **SECTION 4: CONCLUSION**

For the reasons set out in detail in this NIS, in the light of the best scientific knowledge in the field, all aspects of the proposed project which, by itself, or in combination with other plans or projects, which may affect the relevant European Sites have been considered.

The NIS contains information which the competent authority, may consider in making its own complete, precise and definitive findings and conclusions and upon which it is capable of determining that all reasonable scientific doubt has been removed as to the effects of the proposed project on the integrity of the relevant Natura 2000 sites.

In conclusion, in the light of the conclusions of the assessment which it shall conduct on the implications for the European sites concerned, the competent authority is enabled to ascertain that the proposed project will not adversely affect the integrity of any of the European sites concerned.

## SECTION 5: COLLATED MITIGATION MEASURES

The following collates the various mitigation measures identified above, deemed necessary following the examination of the potential adverse effects of the proposed project on the QIs / SCIs and Conservation Objectives of the various screened-in European Sites, taking into account and in-combination effects (i.e. Sections 2-4 above).

### 1. Exclusion zones for machinery

- Exclusion zones for machinery must ensure that machines do not traverse within 5m of watercourses on site during forestry operations.
- With respect to exclusion zones, measures outlined in Section 3.5 of the Environmental Requirements for Afforestation (December 2016), will be adhered to (See Appendix 4 and [www.iai.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf](http://www.iai.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf)).

### 2. Silt and sediment control

- Silt traps will be deployed to control movement of silt and sediment, as outlined in Section 4.3 of Environmental Requirements for Afforestation (December 2016). Silt traps will be constructed at end of mound drains at 50 m intervals (see Appendix 4).
- Silt traps will be maintained throughout all planting works, ensuring that they are clear of sediment build-up.

### 3. Drainage and cultivation

- All drains must protect aquatic zones (order 1 - Emlagh Stream 27) from any sediment and nutrients contained in water draining off the site as outlined in section 3.7.1 of Environmental Requirements for Afforestation (December 2016) (See [www.iai.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf](http://www.iai.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf)).
- Drains will be maintained throughout all planting works, ensuring that they are clear of sediment build-up and are not severely eroded.
- There will be no vegetation removal within 20 m of a drainage ditch.

### 4. Afforestation

- A setback area of 5m will be applied along the relevant watercourses present in the project area (there are three that run west-east into the Emlagh Stream 27), as specified in Section 4.4 of the Environmental Requirements for Afforestation (December 2016) (See [www.iai.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf](http://www.iai.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf)).

### 5. Setbacks

- A 5-metre-wide (minimum) setback will be applied along relevant watercourses (as defined in Circular 12/2017) located within or adjoining the site. This setback is to remain undisturbed during establishment and throughout the forest rotation. This will be applied and maintained

as per details set out in Tables 5 and 6 of the Environmental Requirements for Afforestation (DAFM, 2016) (See [www.iai.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf](http://www.iai.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf)).

- A setback of 10 m from the aquatic zone, Emlagh stream which runs along the eastern boundary of the site for 240 m will be applied.
- There shall be no mounding or machine work within 10m of Aquatic Zone
- There shall be no mounding or machine work within 5 m of Relevant Water Course (RWC).

## **6. Chemical use**

- Chemical use will be kept to an absolute minimum, depending on site requirements; chemicals will only be applied in dry weather.
- Chemicals shall not be applied within 20m of the aquatic zone or within watercourses setbacks or other sensitive areas.

## **7. Otter**

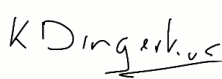
- There will be no cleaning of vegetation from any section of such watercourses within 20 m of the aquatic zone (order 1 - Emlagh Stream 27). There will be no woody weed removal within 20 m of an aquatic zone or 10m of a relevant watercourse.

## **8. Birds**

- No work to be carried out during hours of darkness.

All guidance specified in Section 3.7.3 of the Environmental Requirements for Afforestation (December 2016), will be adhered to (See [www.iai.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf](http://www.iai.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf)).

## SECTION 6: AUTHOR DECLARATION

| <p>It is objectively concluded, in light of the above objective scientific information, that, when the above mitigation measure(s) is / are implemented, the project, individually or in combination with other plans and projects, will not have an adverse effect on the integrity of any of the European Sites listed in Section 2 above, in view of their conservation objectives and in view of best scientific knowledge.</p> |   |                              |
|---|---|------------------------------|
| <p>I declare that this Natura Impact Statement accurately reports on the scientific examination of the project within the context of any relevant European Site(s) and on the findings of that scientific examination.</p>  |   |                              |
| <b>Author name</b>  | <b>Signature</b>  | <b>Date</b>                  |
| 1. Dr. Karina Dingerkus   |  | 23 <sup>rd</sup> August 2021 |
|   |   |                              |

## REFERENCES

- Appropriate Assessment of Plans and Projects in Ireland. Guidance for Planning Authorities. Environment, Heritage and Local Government (2009 - Revised February 2010)
- Appropriate Assessment Pre- screening report, Kerry Ecological services (2021)
- Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. European Commission (Nov. 2001 – published 2002)
- Circular NPW 1/10 & PSSP 2/10 (March 2010)
- CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester.
- DAFM. 2015. Forestry Standards Manual, November 2015. Department of Agriculture, Food & the Marine, Johnstown Castle Estate, Co. Wexford.
- DAFM. 2016. Environmental Requirements for Afforestation, December 2016. Department of Agriculture, Food & the Marine, Johnstown Castle Estate, Co. Wexford.
- DAFM. 2019. Appropriate Assessment Procedure: Guidance Note & iFORIS SOP for DAFM Forestry Inspectors (v.05Nov19) (DAFM, 2019).
- Department of the Environment, Heritage & Local Government (DoEHLG). 2009. Appropriate Assessment of Plans & Projects in Ireland. Guidance for Planning Authorities. Department of Environment, Heritage & Local Government. Available at:  
[www.npws.ie/sites/default/files/publications/pdf/NPWS\\_2009\\_AA\\_Guidance.pdf](http://www.npws.ie/sites/default/files/publications/pdf/NPWS_2009_AA_Guidance.pdf)
- European Commission. 2018. Commission notice: Managing Natura 2000 sites. The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC. Available at:  
[www.ec.europa.eu/environment/nature/natura2000/management/guidance\\_en.htm](http://www.ec.europa.eu/environment/nature/natura2000/management/guidance_en.htm)
- European Communities. 2001. Assessment of Plans & Projects Significantly Affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) & (4) of the Habitats Directive 92/43/EEC. Office for Official Publications of the European Communities, Luxembourg.
- EU Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC (2007)
- Hayden, T. and Harrington, R. (2000). Exploring Irish Mammals. Dúchas The Heritage Service
- Hockin, D., Ounsted, M., Gorman, M., Hill, D., Keller, V., Barker M. A. (1992) Examination of the effects of disturbance on birds with reference to its importance in ecological assessments. Journal of Environmental Management Volume 36, Issue 4, December 1992, Pages 253-286
- Holloway, S. (1997). Winter Distribution and Disturbance of Wildfowl and Waders on Findhorn Bay. BTO Research Report No. 179. British Trust for Ornithology
- Jones, C. D. *et al* (2016) Environmental Research Letters
- Kelly, F. and King, J.J. 2001. A review of the ecology and distribution of three lamprey species, *Lampetra fluviatilis* (L.), *Lampetra planeri* (Bloch) and *Petromyzon marinus* (L.): a context for conservation and biodiversity considerations in Ireland. Biology and Environment: Proceedings of the Royal Irish Academy, 101B: 165-185.

- King, J.J., Hanna, G. & Wightman, G.D. (2008). *Ecological Impact Assessment of the effects of statutory arterial drainage maintenance activities on three Lamprey species*. Series of ecological assessments on arterial drainage maintenance no. 9. Environment Section, OPW, Headford, Galway.
- King, J.J., Lordan, M. & Wightman, G.D. (2008). *Ecological Impact Assessment of the effects of statutory arterial drainage maintenance activities on White-clawed Crayfish*. Series of ecological assessments on arterial drainage maintenance no. 10. Environment Section, OPW, Headford, Galway
- Kurz, I. & Costello, M.J. (1996). *Current knowledge on the distribution of Lampreys and some other freshwater fish species listed in the Habitats Directive, in Ireland*. Environmental Sciences Unit, Trinity College, Dublin.
- Managing Natura 2000 Sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (2000).
- Maarten, P & Henkensj, R. H. G (1997). Possible Impacts of Disturbance to Waterbirds: Individuals, Carrying Capacity and Populations. *Wildfowl* 48: 225-236
- Moorkens, E.A. and Killeen, I.J. 2011. Monitoring and Condition Assessment of Populations of *Vertigo geyeri*, *Vertigo angustior* and *Vertigo moulinsiana* in Ireland. *Irish Wildlife Manuals*, No.55. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
- NPWS (2016) Conservation Objectives: Tullaheer Lough and Bog SAC 002343. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.
- NPWS (2012) Conservation Objectives: Lower River Shannon SAC 002165. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- NPWS (2014) Conservation Objectives: Kilkee Reefs SAC 002264. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- NPWS (2014) Conservation Objectives: Carrowmore Dunes SAC 002250. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- NPWS (2014) Conservation Objectives: Carrowmore Point to Spanish Point and Islands SAC 001021. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- NPWS (2012) Conservation Objectives: River Shannon and River Fergus Estuaries SPA 004077. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- NPWS (2014) Conservation Objectives: Mid-Clare Coast SPA 004182. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.
- National Parks and Wildlife Service (2010). *Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (Revised February 2010)*
- O' Connor, W. (2007). *A survey of juvenile Lamprey populations in the Corrib and Suir catchments*. Irish Wildlife Manuals no. 26. NPWS, Dept. of Environment.
- NRA (2008). *Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes*
- Ryan, T., Phillips, H., Ramsay, J. & Dempsey, J. 2004. *Forest Road Manual. Guidelines for the design, construction & management of forest roads*. COFORD, Dublin.

Scarton, Francesco. (2018). Disturbance of Non-Breeding Waders by Pedestrians and Boats in a Mediterranean Lagoon. *Ardeola*. 65. 209-220. 10.13157/arla.65.2.2018.ra1.

Smal, C.M. (1995). *The Badger and Habitat Survey of Ireland*. The Stationery Office, Dawson St., Dublin 2.

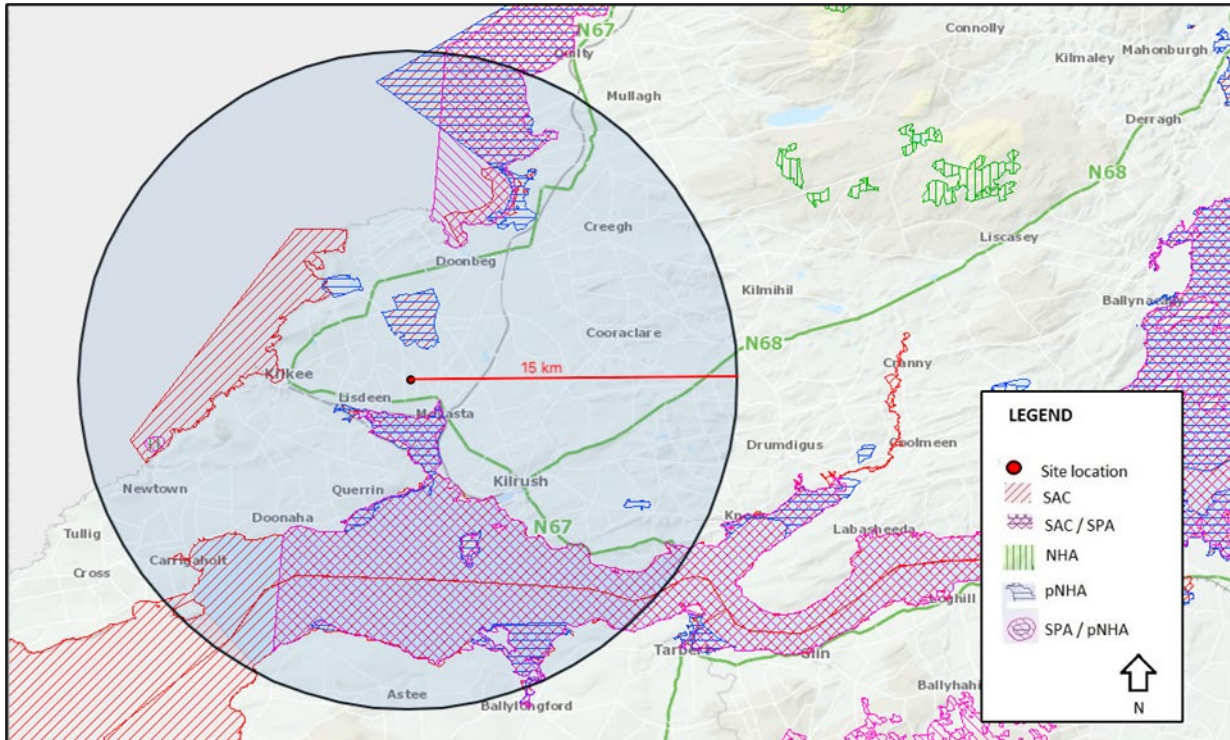
Smith, G., O' Donoghue, P., O' Hora, K. & Delaney, E. (2011). *Best Practice Guidance for Habitat Survey and Mapping*. Heritage Council report.

Snow, D. W. and Perrins, C. M. (Eds.) (1998) *The Bird of the Western Palearctic (Concise edition)*. Oxford University Press.

## Appendix 1: MAPS

### Showing Natura 2000 sites within 15km radius of site

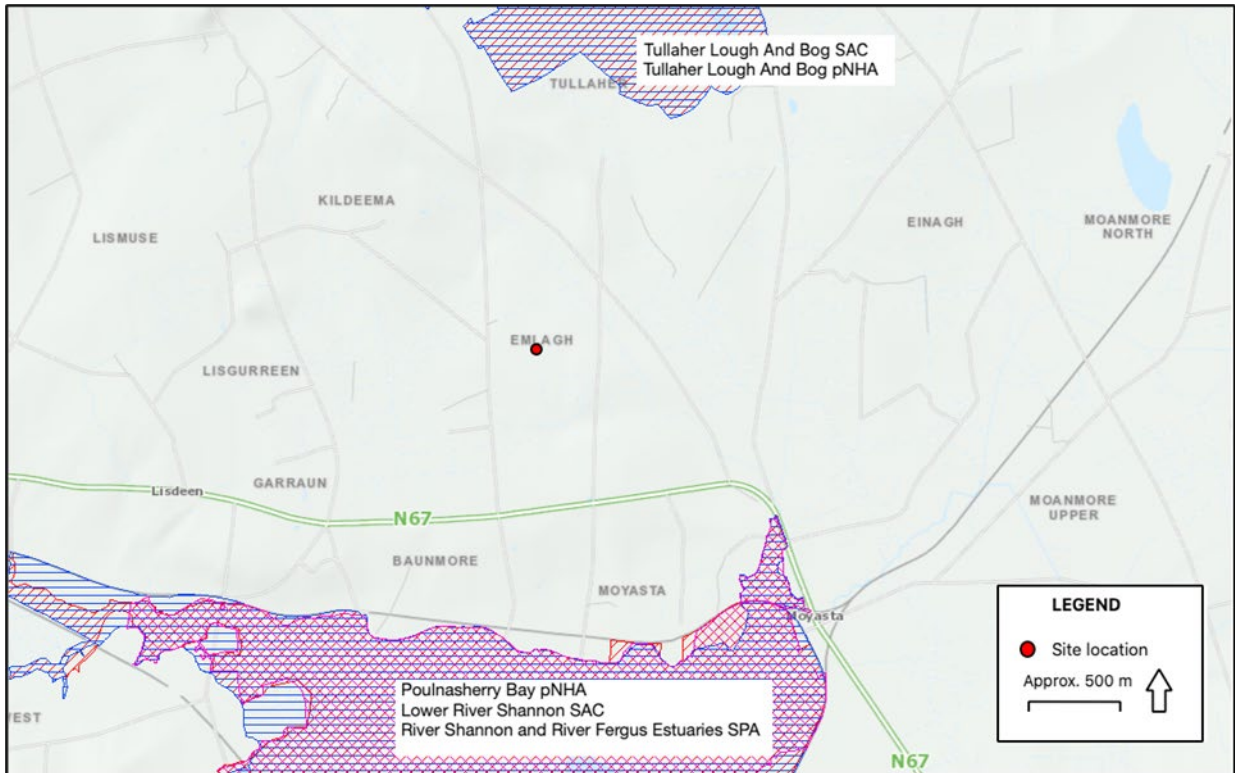
(Map source: <http://dahg.maps.arcgis.com/apps/webappviewer>)



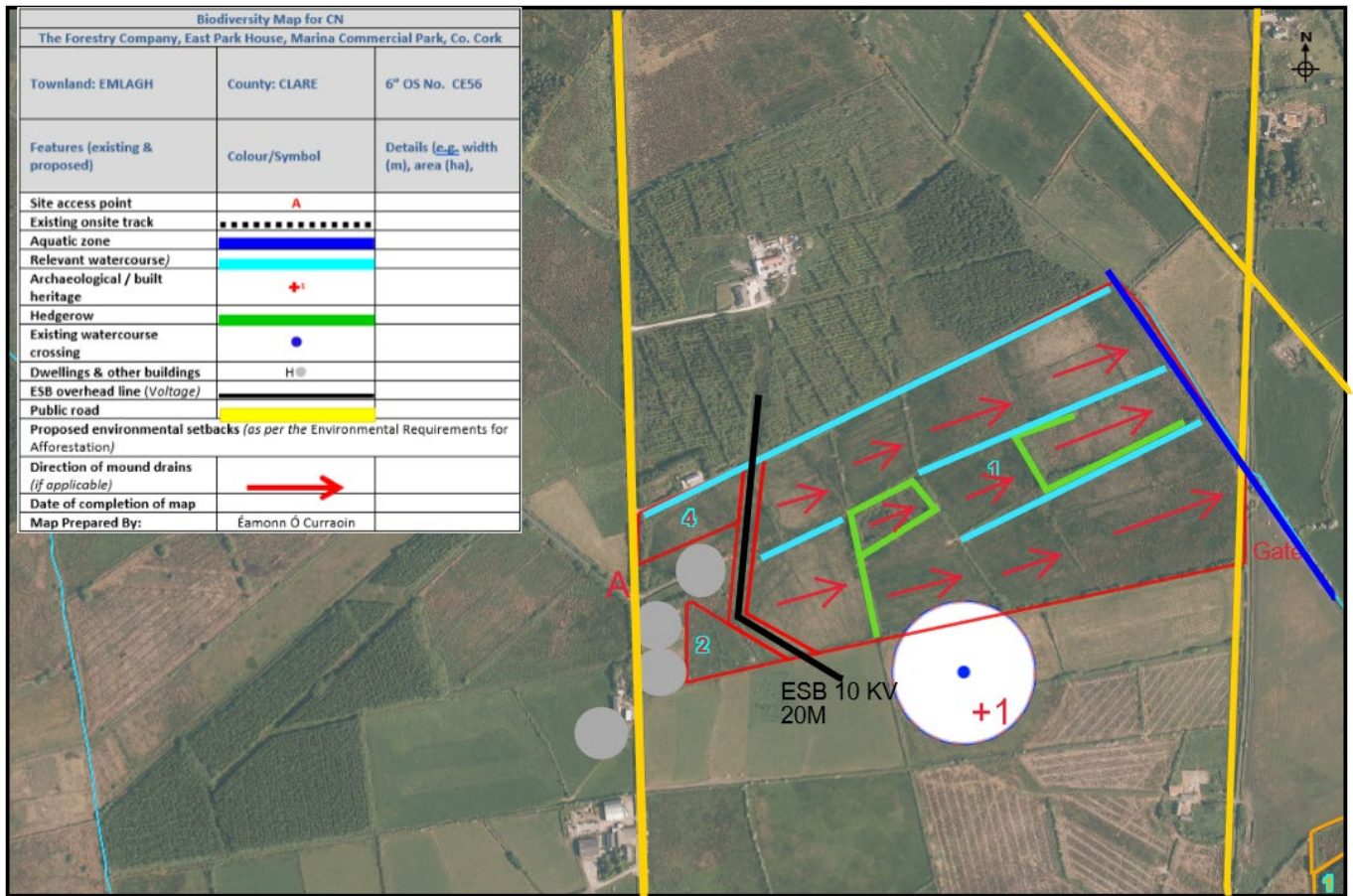
### Showing Natura 2000 sites in close proximity to development site

(Map source - <https://www.npws.ie/maps-and-data>)





# Biodiversity map

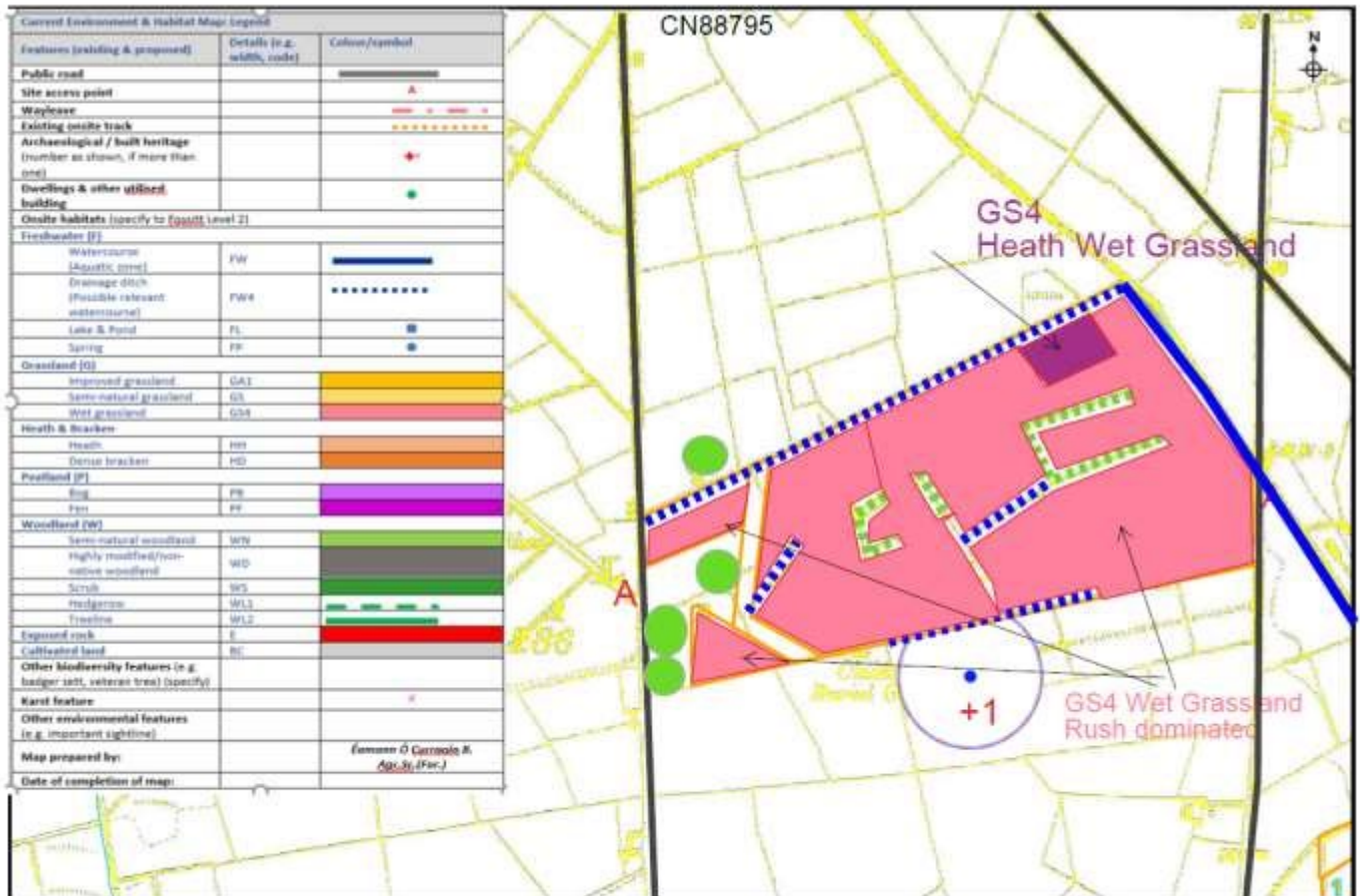


Ordnance Survey Ireland Licence No. EN 0076413. Copyright Ordnance Survey Ireland/Government of Ireland  
 Unauthorized reproduction is not permitted. This map is for Forest Service related use only.

Contract: **Emlagh**

Scale 1:5000

# Habitat Map



Ordnance Survey Ireland Licence No. EN 0076413. Copyright Ordnance Survey Ireland/Government of Ireland  
 Unauthorized reproduction is not permitted. This map is for Forest Service related use only.

Contract: **Emlagh**  
 CN88795

Scale 1:5000

## **Appendix 2: SUPPORTING DOCUMENTS**

## Appendix – Site Synopsis for European Sites

### Site Name: 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. Rivers within the sub-catchment of the Feale include the Galey, Smearlagh, Oolagh, Allaughaun, Owveg, Clydagh, Caher, Breanagh and Glenacarney. Rivers within the sub-catchment of the Mulkear include the Killeenagarraiff, Annagh, Newport, the Dead River, the Bilboa, Glashacloonaraveela, Gortnageragh and Cahernahallia.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (\* = priority; numbers in brackets are Natura 2000 codes):

- [1110] Sandbanks
- [1130] Estuaries
- [1140] Tidal Mudflats and Sandflats
- [1150] Coastal Lagoons\*
- [1160] Large Shallow Inlets and Bays
- [1170] Reefs
- [1220] Perennial Vegetation of Stony Banks
- [1230] Vegetated Sea Cliffs
- [1310] Salicornia Mud
- [1330] Atlantic Salt Meadows
- [1410] Mediterranean Salt Meadows
- [3260] Floating River Vegetation
- [6410] Molinia Meadows
- [91E0] Alluvial Forests\*
- [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*)
- [1349] Bottle-nosed Dolphin (*Tursiops truncatus*)
- [1355] Otter (*Lutra lutra*)

The Shannon and Fergus Rivers flow through Carboniferous limestone as far as Foynes, but west of Foynes Namurian shales and flagstones predominate (except at Kerry Head, which is formed from Old Red Sandstone). The eastern sections of the Feale catchment flow through Namurian rocks and the western stretches through Carboniferous limestone. The Mulkear flows through Lower Palaeozoic rocks in the upper reaches before passing through Namurian rocks, followed by Lower

Carboniferous shales and Carboniferous limestone. The Mulkear River itself, immediately north of Pallas Green, passes through an area of Rhyolites, Tuffs and Agglomerates. The Shannon and Fergus Estuaries form the largest estuarine complex in Ireland. They form a unit stretching from the upper tidal limits of the Shannon and Fergus Rivers to the mouth of the Shannon Estuary (considered to be a line across the narrow strait between Kilcredaun Point and Kilconly Point). Within this main unit there are several tributaries with their own 'sub-estuaries' e.g. the Deel River, Mulkear River, and Maigue River. To the west of Foynes, a number of small estuaries form indentations in the predominantly hard coastline, namely Poulnasherry Bay, Ballylongford Bay, Clonderalaw Bay and the Feale or Cashen River estuary. Both the Fergus and inner Shannon Estuaries feature vast expanses of intertidal mudflats, often fringed with saltmarsh vegetation. The smaller estuaries also feature mudflats, but have their own unique characteristics, e.g. Poulnasherry Bay is stony and unusually rich in species and biotopes. Plant species are typically scarce on the mudflats, although there are some eelgrass (*Zostera spp.*) beds and patches of green algae (e.g. *Ulva sp.* and *Enteromorpha sp.*).

The main macro-invertebrate community which has been noted from the inner Shannon and Fergus estuaries is a *Macoma Scrobicularia-Nereis* community. In the transition zone between mudflats and saltmarsh, specialised colonisers of mud predominate. For example, swards of Common Cord-grass (*Spartina anglica*) frequently occur in the upper parts of the estuaries. Less common are swards of Glasswort (*Salicornia europaea agg.*). In the innermost parts of the estuaries, the tidal channels or creeks are fringed with species such as Common Reed (*Phragmites australis*) and club-rushes (*Scirpus maritimus*, *S. tabernaemontani* and *S. triquetrus*). In addition to the nationally rare Triangular Club-rush (*Scirpus triquetrus*), two scarce species are found in some of these creeks (e.g. *Ballinacurra Creek*): Lesser Bulrush (*Typha angustifolia*) and Summer Snowflake (*Leucosium aestivum*). Saltmarsh vegetation frequently fringes the mudflats. Over twenty areas of estuarine saltmarsh have been identified within the site, the most important of which are around the Fergus estuary and at Ringmoyle Quay.

The dominant type of saltmarsh present is Atlantic salt meadow occurring over mud. Characteristic species occurring include Common Saltmarsh-grass (*Puccinellia maritima*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Sea-milkwort (*Glauca maritima*), Sea Plantain (*Plantago maritima*), Red Fescue (*Festuca rubra*), Creeping Bent (*Agrostis stolonifera*), Saltmarsh Rush (*Juncus gerardi*), Long-bracted Sedge (*Carex extensa*), Lesser Sea-spurrey (*Spergularia marina*) and Sea Arrowgrass (*Triglochin maritima*). Areas of Mediterranean salt meadows, characterised by clumps of Sea Rush (*Juncus maritimus*) occur occasionally. Two scarce species are found on saltmarshes in the vicinity of the Fergus estuary: a type of robust saltmarsh-grass (*Puccinellia foucaudii*), sometimes placed within the species Common Saltmarsh-grass (*P. maritima*) and Hard-grass (*Parapholis strigosa*). Saltmarsh vegetation also occurs around a number of lagoons within the site, two of which have been surveyed as part of a National Inventory of Lagoons. Clooncone Pool (4-5 ha) is a natural sedimentary lagoon impounded by a low cobble barrier. Seawater enters by percolation through the barrier and by overwash. This lagoon represents a type which may be unique to Ireland since the substrate is composed almost entirely of peat.

The adjacent shore features one of the best examples of a drowned forest in Ireland. Aquatic vegetation in the lagoon includes typical species such as Beaked Tasselweed (*Ruppia maritima*) and green algae (*Cladophora sp.*). The fauna is not diverse, but is typical of a high salinity lagoon and includes six lagoon specialists (*Hydrobia ventrosa*, *Cerastoderma glaucum*, *Lekanesphaera hookeri*,



*Palaemonetes varians*, *Sigara stagnalis* and *Enochrus bicolor*). In contrast, Shannon Airport Lagoon (2 ha) is an artificial saline lake with an artificial barrier and sluiced outlet. However, it supports two Red Data Book species of stonewort (*Chara canescens* and *Chara cf. connivens*). Most of the site west of Kilcredaun Point/Kilconly Point is bounded by high rocky sea cliffs. The cliffs in the outer part of the site are sparsely vegetated with lichens, Red Fescue, Sea Beet (*Beta vulgaris subsp. maritima*), Sea Campion (*Silene vulgaris subsp. maritima*), Thrift and plantains (*Plantago spp.*). A rare endemic type of sea lavender, *Limonium recurvum subsp. pseudotranswallianum*, occurs on cliffs near Loop Head. Cliff-top vegetation usually consists of either grassland or maritime heath. The boulder clay cliffs further up the estuary tend to be more densely vegetated, with swards of Red Fescue and species such as Kidney Vetch (*Anthyllis vulneraria*) and Common Bird's-foot-trefoil (*Lotus corniculatus*). The site supports an excellent example of a large shallow inlet and bay. Littoral sediment communities in the mouth of the Shannon Estuary occur in areas that are exposed to wave action and also in areas extremely sheltered from wave action.

Characteristically, exposed sediment communities are composed of coarse sand and have a sparse fauna. Species richness increases as conditions become more sheltered. All shores in the site have a zone of sand hoppers at the top, and below this each of the shores has different characteristic species giving a range of different shore types. The intertidal reefs in the Shannon Estuary are exposed or moderately exposed to wave action and subject to moderate tidal streams. Known sites are steeply sloping and show a good zonation down the shore. Well-developed lichen zones and littoral reef communities offering a high species richness in the sublittoral fringe and strong populations of the Purple Sea Urchin *Paracentrotus lividus* are found. The communities found are tolerant to sand scour and tidal streams. The infralittoral reefs range from sloping platforms with some vertical steps, to ridged bedrock with gullies of sand between the ridges, to ridged bedrock with boulders or a mixture of cobbles, gravel and sand. Kelp is very common to about 18 m. Below this it becomes rare and the community is characterised by coralline crusts and red foliose algae.

Other coastal habitats that occur within the site include stony beaches and bedrock shores (these support a typical zonation of seaweeds such as *Fucus spp.*, *Ascophyllum nodosum* and kelps), shingle beaches (with species such as Sea Beet, Sea Mayweed - *Matricaria maritima*, Sea Campion and Curled Dock - *Rumex crispus*), sandbanks which are slightly covered by sea water at all times (e.g. in the area from Kerry Head to Beal Head) and sand dunes (a small area occurs at Beal Point, where Marram - *Ammophila arenaria* is the dominant species). Freshwater rivers have been included in the site, most notably the Feale and Mulkear catchments, the Shannon from Killaloe to Limerick (along with some of its tributaries, including a short stretch of the Kilmastulla River), the Fergus up as far as Ennis, and the Cloon River. These systems are very different in character: the Shannon is broad, generally slow flowing and naturally eutrophic; the Fergus is smaller and alkaline; while the narrow, fast flowing Cloon is acid in nature. The Feale and Mulkear catchments exhibit all the aspects of a river from source to mouth.

Semi-natural habitats, such as wet grassland, wet woodland and marsh occur by the rivers, but improved grassland is the most common habitat type. One grassland type of particular conservation significance, Molinia meadows, occurs in several parts of the site and the examples at Worldsend on the River Shannon are especially noteworthy. Here are found areas of wet meadow dominated by rushes (*Juncus spp.*) and sedges (*Carex spp.*), and supporting a diverse and species-rich vegetation, including such uncommon species as Blue-eyed Grass (*Sisyrinchium bermudiana*) and Pale Sedge (*C. pallescens*). Floating river vegetation characterised by species of water-crowfoot

(*Ranunculus spp.*), pondweeds (*Potamogeton spp.*) and the moss *Fontinalis antipyretica* are present throughout the major river systems within the site. The rivers contain an interesting bryoflora with *Schistidium alpicola var. alpicola* recorded from in-stream boulders on the Bilboa, new to Co. Limerick. Alluvial woodland occurs on the banks of the Shannon and on islands in the vicinity of the University of Limerick. The woodland is up to 50 m wide on the banks and somewhat wider on the largest island.

The most prominent woodland type is gallery woodland where White Willow (*Salix alba*) dominates the tree layer with occasional Alder (*Alnus glutinosa*). The shrub layer consists of various willow species with Rusty Willow (*Salix cinerea ssp. oleifolia*) and what appear to be hybrids of *S. alba* x *S. viminalis*. The herbaceous layer consists of tall perennial herbs. A fringe of bulrush (*Typha sp.*) occurs on the river side of the woodland. On slightly higher ground above the wet woodland and on the raised embankment remnants of mixed oak-ash-alder woodland occur. These are poorly developed and contain numerous exotic species but locally there are signs that it is invading open grassland. Alder is the principal tree species, with occasional Pedunculate Oak (*Quercus robur*), elm (*Ulmus glabra* and *U. procera*), Hazel (*Corylus avellana*), Hawthorn (*Crataegus monogyna*) and the shrubs Guelder-rose (*Viburnum opulus*) and willows. The ground flora is species rich. While woodland is infrequent within the site, however Cahiracon Wood contains a strip of old oak woodland. Sessile Oak (*Q. petraea*) forms the canopy, with an understorey of Hazel and Holly (*Ilex aquifolium*). Great Wood-rush (*Luzula sylvatica*) dominates the ground flora. Less common species present include Great Horsetail (*Equisetum telmateia*) and Pendulous Sedge (*Carex pendula*).

In the low hills to the south of the Slievefelim Mountains, the Cahernahallia River cuts a valley through the Upper Silurian rocks. For approximately 2 km south of Cappagh Bridge at Knockanavar, the valley sides are wooded. The woodland consists of birch (*Betula spp.*), Hazel, oak, Rowan (*Sorbus aucuparia*), some Ash (*Fraxinus excelsior*) and willow (*Salix spp.*). Most of the valley is not grazed by stock, and as a result the trees are regenerating well. The ground flora features prominent Great wood-rush and Bilberry (*Vaccinium myrtillus*), along with a typical range of woodland herbs. Bracken (*Pteridium aquilinum*) is a feature in areas where there is more light available. The valley sides of the Bilboa and Gortnageragh Rivers, on higher ground north-east of Cappamore, support patches of semi-natural broadleaf woodland dominated by Ash, Hazel, oak and birch. There is a good scrub layer with Hawthorn, willow, Holly and Blackthorn (*Prunus spinosa*) common. The herb layer in these woodlands is often open, with a typically rich mixture of woodland herbs and ferns. Moss species diversity is high. The woodlands are ungrazed. The Hazel is actively coppiced in places.

There is a small area of actively regenerating cut-away raised bog at Ballyrorheen. It is situated approximately 5 km north-west of Cappamore in Co. Limerick. The bog contains some wet areas with good cover of bog mosses (*Sphagnum spp.*). Species of particular interest include Cranberry (*Vaccinium oxycoccos*) and White Sedge (*Carex curta*), along with two regionally rare mosses, including the bog moss *S. fimbriatum*. The site is being invaded by Downy Birch (*Betula pubescens*) scrub woodland. Both commercial forestry and the spread of Rhododendron (*Rhododendron ponticum*) has greatly reduced the overall value of the site. A number of plant species that are listed in the Irish Red Data Book occur within the site, and several of these are protected under the Flora (Protection) Order, 1999. These include Triangular Club-rush (*Scirpus triquetrus*), a species which is only found in Ireland only in the Shannon Estuary, where it borders creeks in the inner estuary. Opposite-leaved Pondweed (*Groenlandia densa*) is found in the Shannon where it passes



through Limerick City, while Meadow Barley (*Hordeum secalinum*) is abundant in saltmarshes at Ringmoylan and Mantlehill. Hairy Violet (*Viola hirta*) occurs in the Askeaton/Foynes area. Golden Dock (*Rumex maritimus*) is noted as occurring in the River Fergus estuary.

Finally, Bearded Stonewort (*Chara canescens*), a brackish water specialist, and Convergent Stonewort (*Chara connivens*) are both found in Shannon Airport Lagoon. Overall, the Shannon and Fergus Estuaries support the largest numbers of wintering waterfowl in Ireland. The highest count in 1995-96 was 51,423 while in 1994-95 it was 62,701. Species listed on Annex I of the E.U. Birds Directive which contributed to these totals include: Great Northern Diver (3; 1994/95), Whooper Swan (201; 1995/96), Pale-bellied Brent Goose (246; 1995/96), Golden Plover (11,067; 1994/95) and Bartailed Godwit (476; 1995/96). In the past, three separate flocks of Greenland Whitefronted Goose were regularly found, but none were seen in 1993/94. Other wintering waders and wildfowl present include Greylag Goose (216; 1995/96), Shelduck (1,060; 1995/96), Wigeon (5,976; 1995/96), Teal (2,319; 1995-96), Mallard (528; 1995/96), Pintail (45; 1995/96), Shoveler (84; 1995/96), Tufted Duck (272; 1995/96), Scaup (121; 1995/96), Ringed Plover (240; 1995/96), Grey Plover (750; 1995/96), Lapwing (24,581; 1995/96), Knot (800; 1995/96), Dunlin (20,100; 1995/96), Snipe (719; 1995/96), Black-tailed Godwit (1,062; 1995/96), Curlew (1,504; 1995/96), Redshank (3,228; 1995/96), Greenshank (36; 1995/96) and Turnstone (107; 1995/96). A number of wintering gulls are also present, including Black-headed Gull (2,216; 1995/96), Common Gull (366; 1995/96) and Lesser Black-backed Gull (100; 1994/95).

This is the most important coastal site in Ireland for a number of the waders including Lapwing, Dunlin, Snipe and Redshank. It also provides an important staging ground for species such as Black-tailed Godwit and Greenshank. A number of species listed on Annex I of the E.U. Birds Directive breed within the site. These include Peregrine Falcon (2-3 pairs), Sandwich Tern (34 pairs on Rat Island, 1995), Common Tern (15 pairs: 2 on Sturamus Island and 13 on Rat Island, 1995), Chough (14-41 pairs, 1992) and Kingfisher. Other breeding birds of note include Kittiwake (690 pairs at Loop Head, 1987) and Guillemot (4,010 individuals at Loop Head, 1987). There is a resident population of Bottle-nosed Dolphin in the Shannon Estuary. This is the only known resident population of this E.U. Habitats Directive Annex II species in Ireland. The population is estimated (in 2006) to be  $140 \pm 12$  individuals. Otter, a species also listed on Annex II of this Directive, is commonly found on the site. Five species of fish listed on Annex II of the E.U. Habitats Directive are found within the site. These are Sea Lamprey (*Petromyzon marinus*), Brook Lamprey (*Lampetra planeri*), River Lamprey (*Lampetra fluviatilis*), Twaite Shad (*Allosa fallax fallax*) and Salmon (*Salmo salar*). The three lampreys and Salmon have all been observed spawning in the lower Shannon or its tributaries. The Fergus is important in its lower reaches for spring salmon, while the Mulkear catchment excels as a grilse fishery, though spring fish are caught on the actual Mulkear River. The Feale is important for both types. Twaite Shad is not thought to spawn within the site. There are few other river systems in Ireland which contain all three species of lamprey.

Two additional fish species of note, listed in the Irish Red Data Book, also occur, namely Smelt (*Osmerus eperlanus*) and Pollan (*Coregonus autumnalis pollan*). Only the former has been observed spawning in the Shannon. Freshwater Pearl Mussel (*Margaritifera margaritifera*), a species listed on Annex II of the E.U. Habitats Directive, occurs abundantly in parts of the Cloon River. There is a wide range of land uses within the site. The most common use of the terrestrial parts is grazing by cattle, and some areas have been damaged through over-grazing and poaching. Much of the land adjacent to the rivers and estuaries has been improved or reclaimed and is protected by embankments

(especially along the Fergus estuary). Further, reclamation continues to pose a threat, as do flood relief works (e.g. dredging of rivers). Gravel extraction poses a major threat on the Feale. In the past, cord-grass (*Spartina sp.*) was planted to assist in land reclamation.

This has spread widely, and may oust less vigorous colonisers of mud and may also reduce the area of mudflat available to feeding birds. Domestic and industrial wastes are discharged into the Shannon, but water quality is generally satisfactory, except in the upper estuary where it reflects the sewage load from Limerick City. Analyses for trace metals suggest a relatively clean estuary with no influences of industrial discharges apparent. Further industrial development along the Shannon and water polluting operations are potential threats. Fishing is a main tourist attraction on the Shannon and there are a large number of angler associations, some with a number of beats. Fishing stands and styles have been erected in places. The River Feale is a designated Salmonid Water under the E.U. Freshwater Fish Directive. Other uses of the site include commercial angling, oyster farming, boating (including dolphin-watching trips) and shooting. Some of these may pose threats to the birds and dolphins through disturbance. Specific threats to the dolphins include underwater acoustic disturbance, entanglement in fishing gear and collisions with fast moving craft. 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. A number of species listed on Annex I of the E.U. Birds Directive are also present, either wintering or breeding. Indeed, the Shannon and Fergus Estuaries form the largest estuarine complex in Ireland and support more wintering wildfowl and waders than any other site in the country. Most of the estuarine part of the site has been designated a Special Protection Area (SPA), under the E.U. Birds Directive, primarily to protect the large numbers of migratory birds present in winter.

16.12.2013

## **Site Name: River Shannon and River Fergus Estuaries SPA**

**Site Code: 004077**

The estuaries of the River Shannon and River Fergus form the largest estuarine complex in Ireland. The site comprises the entire estuarine habitat from Limerick City westwards as far as Doonaha in Co. Clare and Dooneen Point in Co. Kerry. The site has vast expanses of intertidal flats which contain a diverse macroinvertebrate community, e.g. *Macoma-Scrobicularia-Nereis*, which provides a rich food resource for the wintering birds. Salt marsh vegetation frequently fringes the mudflats and this provides important high tide roost areas for the wintering birds. Elsewhere in the site the shoreline comprises stony or shingle beaches.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Cormorant, Whooper Swan, Lightbellied Brent Goose, Shelduck, Wigeon, Teal, Pintail, Shoveler, Scaup, Ringed Plover, Golden Plover, Grey Plover, Lapwing, Knot, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Greenshank and Black-headed Gull. It is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

The site is the most important coastal wetland site in the country and regularly supports in excess of 50,000 wintering waterfowl (57,133 - five year mean for the period 1995/96 to 1999/2000), a concentration easily of international importance. The site has internationally important populations of Light-bellied Brent Goose (494), Dunlin (15,131), Black-tailed Godwit (2,035) and Redshank (2,645). A further 17 species have populations of national importance, i.e. Cormorant (245), Whooper Swan (118), Shelduck (1,025), Wigeon (3,761), Teal (2,260), Pintail (62), Shoveler (107), Scaup (102), Ringed Plover (223), Golden Plover (5,664), Grey Plover (558), Lapwing (15,126), Knot (2,015), Bar-tailed Godwit (460), Curlew (2,396), Greenshank (61) and Black-headed Gull (2,681) - figures are five year mean peak counts for the period 1995/96 to 1999/2000. The site is among the most important in the country for several of these species, notably Dunlin (13 % of national total), Lapwing (6% of national total) and Redshank (9% of national total). The site also supports a nationally important breeding population of Cormorant (93 pairs in 2010).

Other species that occur include Mute Swan (103), Mallard (441), Red-breasted Merganser (20), Great Crested Grebe (50), Grey Heron (38), Oystercatcher (551), Turnstone (124) and Common Gull (445) - figures are five year mean peak counts for the period 1995/96 to 1999/2000. Apart from the wintering birds, large numbers of some species also pass through the site whilst on migration in spring and/or autumn. The River Shannon and River Fergus Estuaries SPA is an internationally important site that supports an assemblage of over 20,000 wintering waterbirds. It holds internationally important populations of four species, i.e. Light-bellied Brent Goose, Dunlin, Black-tailed Godwit and Redshank. In addition, there are 17 species that have wintering populations of national importance. The site also supports a nationally important breeding population of Cormorant. Of particular note is that three of the species which occur regularly are listed on Annex I of the E.U. Birds Directive, i.e. Whooper Swan, Golden Plover and Bar-tailed Godwit. Parts of the River Shannon and River Fergus Estuaries SPA are Wildfowl Sanctuaries.

30.5.2015

## Qualifying interests and documented threats to the Natura 2000 sites lying in a 15km radius of the proposed development site

| Site Name and Site Code                                 | Qualifying Interests (* denotes a priority habitat)   | Conservation Objectives  | Documented Threats / Pressures<br>Information primarily based on NPWS Site Synopses, NATURA 2000 – standard data forms and other sources   |
|---|---|--|--|
| <p><b>Lower River Shannon SAC</b><br/><b>002165</b></p> | <p><b>Habitats</b></p> <p>1110 Sandbanks which are slightly covered by sea water all the time</p> <p>1130 Estuaries</p> <p>1140 Mudflats and sandflats not covered by seawater at low tide</p> <p>1150 Coastal lagoons*</p> <p>1160 Large shallow inlets and bays</p> <p>1170 Reefs</p> <p>1220 Perennial vegetation of stony banks</p> <p>1230 Vegetated sea cliffs of the Atlantic and Baltic coasts</p> <p>1310 Salicornia and other annuals colonising mud and sand</p> <p>1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)</p> <p>1410 Mediterranean salt meadows (Juncetalia maritimi)</p> <p>3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation</p> <p>6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)</p> <p>91E0 Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)*</p> <p><b>Species</b></p> <p>1029 Freshwater Pearl Mussel (<i>Margaritifera margaritifera</i>)</p> <p>1099 River Lamprey (<i>Lampetra fluviatilis</i>)</p> <p>1349 Common Bottlenose Dolphin (<i>Tursiops truncatus</i>)</p> | <p><a href="http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf">http://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002165.pdf</a></p> | <ul style="list-style-type: none"> <li>• Removal of beach materials</li> <li>• Marine and Freshwater Aquaculture</li> <li>• Discharges</li> <li>• Landfill, land reclamation and drying out, general</li> <li>• Sea defence or coast protection works, tidal barrages</li> <li>• Nautical sports</li> <li>• Management of aquatic and bank vegetation for drainage purposes</li> <li>• Hunting</li> <li>• Grazing</li> <li>• Sylviculture, forestry</li> <li>• Air pollution, air-borne pollutants</li> <li>• Paths, tracks, cycling tracks</li> <li>• Discharges</li> <li>• Dredging/ removal of limnic sediments</li> <li>• Invasive non-native species</li> <li>• Urbanised areas, human habitation</li> <li>• Fertilisation</li> <li>• Hand cutting of peat</li> </ul> |

|   |  |  |  |
|---|--|--|--|
|   | <p>1355 Otter (<i>Lutra lutra</i>)<br/> 1096 Brook Lamprey (<i>Lampetra planeri</i>)<br/> 1095 Sea Lamprey (<i>Petromyzon marinus</i>)<br/> 1106 Salmon (<i>Salmo salar</i>)</p>   |  |  |
| <p><b>River Shannon and River Fergus Estuaries SPA 004077</b></p> | <p><b>Birds</b><br/> A179 Black-headed Gull (<i>Larus ridibundus</i>)<br/> A141 Grey Plover (<i>Pluvialis squatarola</i>)<br/> A038 Whooper Swan (<i>Cygnus cygnus</i>)<br/> A140 Golden Plover (<i>Pluvialis apricaria</i>)<br/> A048 Shelduck (<i>Tadorna tadorna</i>)<br/> A157 Bar-tailed Godwit (<i>Limosa lapponica</i>)<br/> A046 Light-bellied Brent Goose (<i>Branta bernicla hrota</i>)<br/> A137 Ringed Plover (<i>Charadrius hiaticula</i>)<br/> A156 Black-tailed Godwit (<i>Limosa limosa</i>)<br/> A160 Curlew (<i>Numenius arquata</i>)<br/> A164 Greenshank (<i>Tringa nebularia</i>)<br/> A050 Wigeon (<i>Anas penelope</i>)<br/> A162 Redshank (<i>Tringa totanus</i>)<br/> A142 Lapwing (<i>Vanellus vanellus</i>)<br/> A017 Cormorant (<i>Phalacrocorax carbo</i>)<br/> A056 Shoveler (<i>Anas clypeata</i>)<br/> A052 Teal (<i>Anas crecca</i>)<br/> A143 Knot (<i>Calidris canutus</i>)<br/> A062 Scaup (<i>Aythya marila</i>)<br/> A054 Pintail (<i>Anas acuta</i>)<br/> A149 Dunlin (<i>Calidris alpina</i>)</p> <p><b>Habitats</b><br/> Wetlands</p> | <p><a href="http://www.npws.ie/sites/default/files/protected-sites/conservation_objec-tives/CO004077.pdf">http://www.npws.ie/sites/default/files/protected-sites/conservation_objec-tives/CO004077.pdf</a></p> | <ul style="list-style-type: none"> <li>• Industrial or commercial areas</li> <li>• Fertilisation</li> <li>• Urbanised areas, human habitation</li> <li>• Marine and Freshwater Aquaculture</li> <li>• Shipping lanes</li> <li>• Discharges</li> <li>• Nautical sports</li> </ul> |

## Appendix 3: ECOLOGICAL SURVEYS & INVESTIGATIONS

### Walk over habitat assessment:

The principal habitat present is wet grassland (GS4) dominated by Soft Rush (*Juncus effusus* – c.75+ %) with Creeping Buttercup (*Ranunculus repens*), Meadow Buttercup (*Ranunculus acris*), Meadowsweet (*Filipendula ulmaria*), Silverweed (*Potentilla anserina*), Ribwort Plantain (*Plantago lanceolata*), Dandelion (*Taraxacum officinale* agg.), Common Sorrel (*Rumex acetosa*), Dock (*Rumex* sp.), Horsetail (*Equisitum palustre*), Knapweed (*Centaurea nigra*), Thistle (*Cirsium vulgare*), typical grasses (e.g. *Holcus lantus*, *Anthoxanthum odoratum*, *Agrostis capillaris*, *Festuca rubra*), occasional orchid (*Orchis mascula*) and some invading Bramble (*Rubus fruticosus*) and Common Gorse (*Ulex europaeus*). There is a small area of peaty wet grassland (GS4) to the north-east where Purple Moorgrass (*Molinia caerulea*), Carnation Sedge (*Carex panicea*) and Marsh Thistle (*Cirsium palustre*) are evident, along with typical wet grassland species, notably Jointed/Sharp-flowered Rush (*Juncus articulatus/acutiflorus*), Meadowsweet and Cuckooflower (*Cardamine pratensis*). It should be noted that the heathy wet grassland habitat does not comply with any EU Annex I habitat.

Sparse, low-growing hedgerow (WL1) of mostly Bramble and scattered Willow (*Salix* sp.) and Common Gorse occurs on low banks along field boundaries, with occasional Hawthorn (*Crataegus monogyna*).

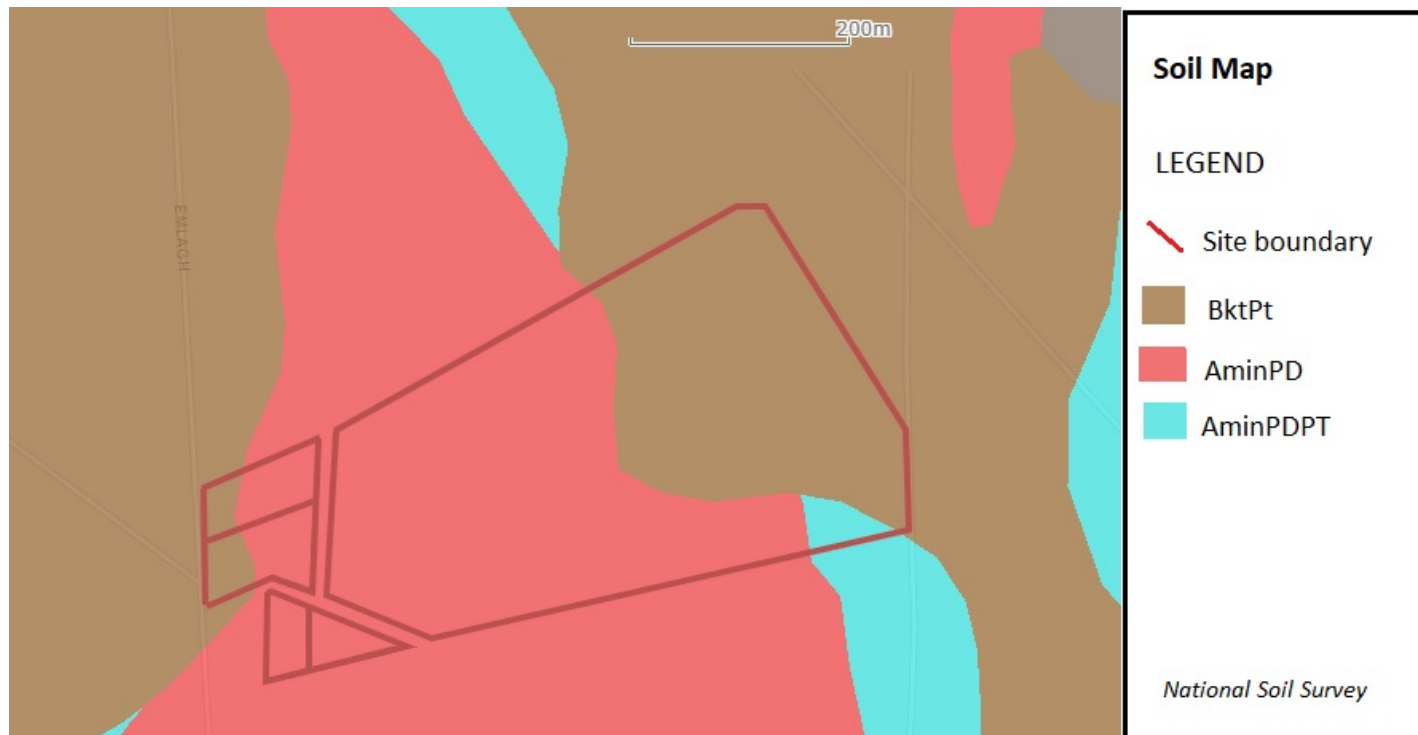
### Hydrological site assessment

There is one natural watercourse (FW2) present on site flowing along the north-eastern boundary (EPA name: Emlagh-27). This order 1 stream is approximately 0.5m deep (down a 1m bank), slow flowing and with a silt and gravel substrate. It is little vegetated except along its banks where Bramble, Willow, Gorse, Rush and Nettle (*Urtica dioica*) occur. It flows south eastward, entering the Lismuse order 2 river before discharging into Poulmasherry Bay (Lower River Shannon SAC), near Moyasta approximately 2 km downstream.

Drainage channels (FW4) present are approximately 1m deep, 1m wide but with little water flow, being clogged with vegetation and silt. They discharge/filter into the on-site natural watercourse.

## Soil and Geological Information

<https://www.gsi.ie/en-ie/data-and-maps/Pages/default.aspx>



Following information is from the Geological Survey Ireland  
<https://www.gsi.ie/en-ie/data-and-maps/Pages/default.aspx>  
 and ESM tool (<https://airomaps.geohive.ie/ESM/>)

|                                   |  |
|-----------------------------------|--|
| <b>Geology</b>                    | 71, Fluvio-deltaic & basinal marine (Turbiditic); Shale, sandstone, siltstone & coal   |
| <b>Aquifer</b>                    | Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones |
| <b>Aquifer vulnerability</b>      | Moderate   |
| <b>Ground water vulnerability</b> | Not at risk  |
| <b>Groundwater Status</b>         | Good   |

## Biodiversity Records

Table Showing Biodiversity records in the vicinity of the project site

| Species  | Date of record | Approximate Distance from site | Grid Reference | Data set  |
|--|----------------|--------------------------------|----------------|---|
| Common Bottlenose Dolphin ( <i>Tursiops truncatus</i> )    | 14/06/2014     | 7 km                           | Q863621        | IWDG Casual Cetacean Sightings                    |
| Otter ( <i>Lutra lutra</i> )                               | 02/05/2017     | 3.5 km                         | Q986547        | Mammals of Ireland 2016-2025                      |
| Dunlin ( <i>Calidris alpina</i> )                          | 17/12/2005     | 2 km                           | Q9358          | Clare Biological Records Centre Dataset 2004-2007 |
| Black-headed Gull ( <i>Larus ridibundus</i> )              | 2007 - 2011    | Within 10 km square            | Q95            | Bird Atlas 2007 - 2011                            |
| Grey Plover ( <i>Pluvialis squatarola</i> )                | 2007 - 2011    | Within 10 km square            | Q95            | Bird Atlas 2007 - 2011                            |
| Whooper Swan ( <i>Cygnus cygnus</i> )                      | 2007 - 2011    | Within 10 km square            | Q95            | Bird Atlas 2007 - 2011                            |
| Golden Plover ( <i>Pluvialis apricaria</i> )               | 2007 - 2011    | Within 10 km square            | Q95            | Bird Atlas 2007 - 2011                            |
| Shelduck ( <i>Tadorna tadorna</i> )                        | 17/12/2005     | 3 km                           | Q9357          | Clare Biological Records Centre Dataset 2004-2007 |
| Bar-tailed Godwit ( <i>Limosa lapponica</i> )              | 2007 - 2011    | Within 10 km square            | Q95            | Bird Atlas 2007 - 2011                            |
| Light-bellied Brent Goose ( <i>Branta bernicla hrota</i> ) | 04/04/2006     | 1.6 km                         | Q949571        | Clare Biological Records Centre Dataset 2004-2007 |
| Ringed Plover ( <i>Charadrius hiaticula</i> )              | 2007 - 2011    | Within 10 km square            | Q95            | Bird Atlas 2007 - 2011                            |
| Black-tailed Godwit ( <i>Limosa limosa</i> )               | 2007 - 2011    | Within 10 km square            | Q95            | Bird Atlas 2007 - 2011                            |



|  |             |                     |       |   |
|--|-------------|---------------------|-------|---|
| Curlew ( <i>Numenius arquata</i> )       | 2007 - 2011 | Within 10 km square | Q95   | Bird Atlas 2007 - 2011                            |
| Greenshank ( <i>Tringa nebularia</i> )   | 2007 - 2011 | 5 km                | Q95H  | Bird Atlas 2007 - 2011                            |
| Wigeon ( <i>Anas penelope</i> )          | 17/12/2005  | 2.5 km              | Q9557 | Clare Biological Records Centre Dataset 2004-2007 |
| Redshank ( <i>Tringa totanus</i> )       | 2007 - 2011 | 3 km                | Q95N  | Bird Atlas 2007 - 2011                            |
| Lapwing ( <i>Vanellus vanellus</i> )     | 2007 - 2011 | 5 km                | Q95H  | Bird Atlas 2007 - 2011                            |
| Cormorant ( <i>Phalacrocorax carbo</i> ) | 2007 - 2011 | Within 10 km square | Q95   | Bird Atlas 2007 - 2011                            |
| Shoveler ( <i>Anas clypeata</i> )        | 2007 - 2011 | Within 10 km square | Q95   | Bird Atlas 2007 - 2011                            |
| Teal ( <i>Anas crecca</i> )              | 2007 - 2011 | 2 km                | Q96K  | Bird Atlas 2007 - 2011                            |
| Knot ( <i>Calidris canutus</i> )         | 2007 - 2011 | Within 10 km square | Q95   | Bird Atlas 2007 - 2011                            |
| Scaup ( <i>Aythya marila</i> )           | 2007 - 2011 | Within 10 km square | Q95   | Bird Atlas 2007 - 2011                            |
| Pintail ( <i>Anas acuta</i> )            | 2007 - 2011 | Within 10 km square | Q95   | Bird Atlas 2007 - 2011                            |

## Appendix 4: Relevant guidance documents

### Extract from: Environmental Requirements for Afforestation - December 2016

Forest Service, Department of Agriculture, Food & the Marine

elements of the archaeological heritage, as appropriate;

- there will be a condition requiring the archaeological consultant to submit a full report on the results of the archaeological monitoring (including any discoveries made and any subsequent archaeological work undertaken) to the Forest Service, the NMS and the National Museum of Ireland; and
- failure to ensure that the archaeological monitoring is undertaken during the course of the carrying out of the specified parts of approved development or to submit the required report on this monitoring before or at latest at Form 2 stage, may be deemed to be:
  - a breach of the statutory approval for afforestation; and / or
  - a breach of the specific environmental conditions attached to the approval for grant aid and may: (i) delay the progress of the Form 2 (Application for 1<sup>st</sup> Grant Instalment); and (ii) be subject to a penalty.

Sanctions may also applied, as set out in the *Terms & Conditions for the Registration of Foresters and Forestry Companies*.

### 3.4 Contingency measures

Ensure that an adequate contingency plan is prepared. This plan must clearly inform operators how to react and who to contact, should an unexpected event arise that may create a risk to the environment, e.g. a period of intense rainfall, an accidental spillage of chemicals, the discovery of an unidentified archaeological site, monument or object. The plan should be readily available onsite and all operators should be made familiar with its content.

The **SUPPORTING DOCUMENT** contains a template contingency plan, to be completed as relevant.

### 3.5 Treatment of setbacks

As set out in Stage 1: Design, the following setbacks, comprising (largely) unplanted and undisturbed open spaces of a defined width, are required to protect different environmental features and sensitivities:

- water setbacks
- retained habitat setbacks
- archaeological setbacks
- public road setbacks
- utilised building setbacks
- landscape setbacks

See Table 5 for setback widths and design details. The treatment of these setbacks during Stage 2: Site Works is set out below.

***The Registered Forester must ensure that all operators are aware of the importance of any environmental setbacks required onsite, their location and extent, and what is and is not permitted within them (as per Table 6 below). An environmental setback must not be used for any forest operation or for any other purpose which could compromise its protective function or which could***

***damage the environmental feature or sensitivity being protected.***

***Under the Forestry Schemes Penalty Schedules, failure to adhere to the required environmental setbacks can incur significant penalties.***

### **3.5.1 Installing environmental setbacks**

It is good forest practice to mark out environmental setbacks *before* operations commence, to avoid incursions. The following guidance applies:

- Mark off the setback using temporary markers, e.g. posts or bamboos with hi-vis tape, securely driven into the soil with approximately 1.5 metres remaining visible above ground.
- Marker spacing will vary depending on setback shape, e.g. 10 metre spacing for setbacks which vary in width; 30 metre spacing for long linear setbacks.
- Linear setbacks (e.g. archaeological sight lines) can be demarcated by markers set along the centre line.
- Also use markers to indicate the position of any additional enhancement planting proposed along the forest edge or within the setback itself (see below).

***Note that specific requirements apply regarding ‘designated’ archaeological sites and monuments and ‘designated’ buildings and structures or parts of structures which form part of the architectural heritage and which are of special interest:***

- Unless the conditions attached to the technical approval specify otherwise, erect a permanent fence comprising two strands of plain wire on the outer edge of the archaeological / built heritage exclusion zone. Adhere to the standard Forest Service fencing specifications, including the use of IS 436 stakes (see the *Forestry Standards Manual*)(\*). Note, where the outer edge of an archaeological monument / built heritage structure or feature is not evident on-the-ground, the advice of the Forest Service Archaeologist or a consultant archaeologist retained by the Applicant or her / his Registered Forester should be sought. (\*This fence must be stock proof, if it represents an external boundary of the plantation.)
- Existing access routes to an archaeological site must be left unplanted and undisturbed, and must be left open for pedestrian access by archaeological officials throughout the rotation. If there is no existing access route, leave an unplanted 4 metre wide route suitable for pedestrian access from the direction of the nearest public road, forest road or track.

### **3.5.2 Subsequent treatment**

Table 6 details what is and is not permitted within the various environmental setbacks.

Table 6 Treatment of environmental setbacks during site works. Note, if setbacks overlap, the more environmentally stringent set of requirements apply.

| Setback type           | Operation                       |                                 |  |                 |  |  |  |
|------------------------|---------------------------------|---------------------------------|--|-----------------|--|--|--|
|                        | Forest edge planting            | Environmental setback planting  | Demarcation fencing with stakes and wire   | Machine traffic | Cultivation / Drainage   | Fertiliser application / Vegetation management   | Temporary onsite storage of fertiliser, fuel, etc. associated with afforestation |
| Water setback          | Encouraged – see Section 3.5.3. | Encouraged – see Section 3.5.4. | Not required   | Exclude         | Exclude.<br>New drains must not enter into or traverse the water setback, or discharge directly into the aquatic zone or into an existing drain (with an exception detailed in Section 3.7.1). | Permitted if required to establish setback planting, based on the following requirements:<br>➤ Fertiliser application limited to the manual application of an appropriate slow-release formulation into the planting pit.<br>➤ Regarding vegetation management, herbicide use is prohibited. Use non-herbicide methods instead, such as trampling, mulches and mats. | Exclude  |
| Habitat setback        | Encouraged – see Section 3.5.3. | Exclude                         | Not required   | Exclude         | Exclude  | Exclude  | Exclude  |
| Archaeological setback | Encouraged – see Section 3.5.3. | Exclude                         | Required for designated archaeological features – see Section 3.5.1 for details. | Exclude         | Exclude  | Exclude  | Exclude  |



| Setback type              | Forest edge planting                                       | Environmental setback planting  | Demarcation fencing with stakes and wire | Machine traffic | Cultivation / Drainage           | Fertiliser application / Vegetation management   | Temporary onsite storage of fertiliser, fuel, etc. associated with afforestation   |
|---------------------------|--|---|--|-----------------|----------------------------------|--|--|
| Public road setback       | Mandatory for roadside conifer plots – see Section 3.5.3.  | Exclude   | Not required                             | Permitted       | Exclude                          | Exclude  | Permitted, subject to safeguards under Section 3.7.5.  |
| Utilised building setback | Mandatory for setbacks from dwellings – see Section 3.5.3. | In relation to setbacks from dwellings, setback planting is encouraged within the 30 m to 60 m zone, if agreed to by the neighbouring dweller. See Section 3.5.4. | Not required                             | Permitted       | Exclude                          | Permitted if required to establish setback planting, based on the following requirements:<br>> Fertiliser application limited to the manual application of an appropriate slow-release formulation into the planting pit.<br>> Regarding vegetation management, herbicide use is prohibited. Use non-herbicide methods instead, such as trampling, mulches and mats. | Permitted, subject to safeguards under Section 3.7.5. However, if within a setback from a dwelling, exclude the preparation and storage of herbicides (and other pesticides, if used). |
| Landscape setback         | Encouraged – see Section 3.5.3.                            | Encouraged – see Section 3.5.4.   | Not required                             | Permitted       | Permitted, for setback planting. | Permitted, for setback planting.   | Permitted, subject to safeguards under Section 3.7.5.  |

### 3.5.3 Forest edge planting

- Forest edge planting comprises the planting of single, small groups and irregular belts of native species (e.g. birch, rowan, oak and Scots pine, as site conditions allow) along the outer edge of conifer GPC plots, typically those adjoining environmental setbacks.
- This measure enhances the landscape and biodiversity value of the forest edge.
- Forest edge planting is mandatory within conifer plots adjoining:
  - utilised building setbacks created for dwellings; and
  - public road setbacks, where the strip 10 metres to 20 metres from the road must be planted with broadleaf trees, to give a minimum two-thirds coverage within this strip.
- Forest edge planting is encouraged in relation to all other environmental setbacks, as site conditions allow - see Table 6.
- Where applied, forest edge planting must not encroach into the environmental setback itself, in order to maintain the necessary setback width. Forest edge planting forms part of the GPC plot.
- Where applied as single trees, ensure that the tree is adequately protected against grazing, using a standard tree shelter or a deer guard, as necessary.
- Where applied as groups, adopt a robust planting design using trees with compatible growth rates, planted with necessary protection against grazing. Group size may vary from 5-10 trees to 50 trees and over, depending on landscape scale. In deer-prone areas, wider spacing and the use of deer guards may be appropriate - specify details on the Certified Species Map.

### 3.5.4 Environmental setback planting

- Environmental setback planting comprises the planting of single, small groups and irregular belts of native species (e.g. birch, rowan, oak and Scots pine, as site conditions allow) *within* an environmental setback.



Forest edge planting, using deer shelters.

- This measure enhances the environmental role of the setback itself, e.g. planting within a landscape setback will create better visual 'tie-in' between the surrounding landscape and the forest edge.
- Apply environmental setback planting as per Table 6 and as site conditions allow.
- Where applied as single trees, ensure that the tree is adequately protected against grazing, using a standard tree shelter or a deer guard, as necessary.
- Where applied as groups, adopt a robust planting design using trees with compatible growth rates, planted with necessary protection against grazing. Group size may vary from 5-10 trees to 50 trees and over, depending on landscape scale. In deer-prone areas, wider spacing and the use of deer guards may be appropriate - specify details on the Certified Species Map.
- Environmental setback planting should not exceed 20% of the area of the setback.
- Note, setback planting may be counter-productive within setbacks likely to be important for deer management, as it may obstruct sight lines.
- The following applies specifically in relation to planting within water setbacks:
  - Strategic planting within water setbacks may help to deliver direct in-stream ecosystem services such as bank stabilisation, cooling / shading, and food drop into the aquatic ecosystem.
  - Pursue water setback planting only where agreed in advance with Inland Fisheries Ireland and (where relevant) NPWS.
  - Limit to single or small groups (5-10 trees) of native riparian species (birch, willow, and occasional alder and pedunculate oak) at strategic points within the water setback.
  - Such trees should be pit-planted and protected from grazing, as necessary.

### 3.6 Treatment of future operational areas

Treat future operational areas (as described in Section 2.5.2) as follows, to enhance their landscape and biodiversity value:

- As per good practice, mark out these areas *before* operations commence (see Section 3.5.1).
- Based on the immediate topography, vary their width to avoid artificially straight lines and to create a naturally undulating forest edge.
- Consider forest edge planting (see Section 3.5.3).



## Section 4

# Ongoing Management

### 4.1 Overview

Stage 3: Ongoing Management spans the period from the completion of initial site works (and payment of the 1<sup>st</sup> grant instalment, if grant-aided) up to Year 15 (i.e. the end of the premium period, if applicable).

During this part of the forest rotation, there are generally no major site inputs required. However, basic environmental measures apply, in addition to any specific conditions attached to the original approval. Other silvicultural requirements also apply during the premium payment period, as set out in the *Forestry Standards Manual* (e.g. the maintenance of stocking levels, fence lines and fire breaks, fertiliser application) all of which must be carried out appropriately to prevent environmental impacts.

Key will be the ongoing monitoring of the site, to ensure compliance with silvicultural and environmental standards, requirements and conditions and also to check that potential threats to the environment do not emerge (particularly in relation to drains and sediment traps) and that various protective measures (principally setbacks) are functioning as intended.

### 4.2 Site inputs

Site inputs during Stage 3 are generally limited to the first 4 years up to submission of the Form 3 (if grant-aided). At this point, the forest should be fully established(\*), with all plots having at least 90% of the original stocking spread evenly throughout the plot, with originally approved species represented proportionately, and with trees free from competing vegetation and free-growing (see the *Forestry Standards Manual*). Such inputs include herbicide application and possible fertiliser application, if nutrient deficiencies arise. Both inputs must adhere to measures set out in Sections 3.7.2 and 3.7.3 of these Requirements. (\*Note, establishment may take longer on some sites.)

Regarding fertiliser application, assess exact requirements through a foliage analysis, following the procedures set out in the *Forestry Standards Manual*.

(Over larger areas, aerial fertilisation may be required. No aerial fertilisation can be undertaken unless an Aerial Fertilisation Licence has been obtained from the Forest Service. Refer to the separate *Aerial Fertilisation Requirements* for details.)

Ensure that any necessary filling-in prior to Form 3 submission reflects the diversity of the original planting, in relation to biodiversity and landscape.

### 4.3 Drains and sediment traps

Check drains and sediment traps regularly up to Year 4 and periodically thereafter, particularly during and after heavy rainfall, in order to assess how effectively they are working.

If sediment traps are filling up, clear out the built-up sediment and dispose of it on level ground several meters away. Where the drainage network and sediment traps are under pressure and signs of failure are evident, additional measures will be required, often in the form of additional sediment



traps. In complex situations, the input of a hydrologist or an engineer may be required. In most cases, drains will stabilise and 'green-up' with colonising vegetation over time.

#### 4.4 Treatment of setbacks

As set out in Stage 1: Design and Stage 2: Site Works, the following setbacks, comprising (largely) unplanted and undisturbed open spaces of a defined width, are required to protect different environmental features and sensitivities:

- water setbacks
- retained habitat setbacks
- archaeological setbacks
- public road setbacks
- utilised building setbacks
- landscape setbacks

The treatment of these setbacks during Stage 3: Ongoing Management is as follows:

1. The intended protective function of these setbacks must be maintained throughout this stage of the forest's development. This generally entails leaving these areas undisturbed and allowing natural ground vegetation to develop. Management may be required in some cases, e.g. to control woody growth within a setback adjoining a dwelling, to retain an important view or to prevent fire risk.
2. Monitor the development of forest edge planting and environmental setback planting (where undertaken) and maintain trees as appropriate (e.g. vegetation management, replacement of mortalities, adjustment and eventual removal of tree shelters) until the trees are established and free of grazing pressure.



*A well-established water setback adjoining a broadleaf plot.*



## Appendix 5: Mitigation measures implementation and monitoring

Table showing: Mitigation Measures Implementation and Monitoring

| Number | Mitigation measure            | How mitigation measure will avoid or reduce adverse effects   | Mitigation measure implementation and level of success   | Monitoring to prevent mitigation failure  |
|--------|-------------------------------|---|--|---|
| 1      | Exclusion zones for machinery | <p>Exclusion zones for machinery will ensure that machines do not traverse close to watercourses on site during forestry operations.</p> <p>With respect to exclusion zones, measures outlined in Section 3.5 of the Environmental Requirements for Afforestation (December 2016), will be adhered to. (See <a href="http://www.iaf.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf">www.iaf.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf</a>).</p>  | <p>All mitigation measures will be included as a contractual obligation on the contractor and will be implemented in full.</p> <p>High probability of success.</p> | <p>Contractor will monitor the implementation of the mitigation measures on an on-going basis throughout afforestation phase.</p> |
| 2      | Silt and sediment control     | <p>Silt traps will be deployed to control movement of silt and sediment, as outlined in Section 4.3 of Environmental Requirements for Afforestation (December 2016) (See <a href="http://www.iaf.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf">www.iaf.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf</a>).</p> <p>Silt traps will be constructed at end of mound drains at 50 m intervals.</p> <p>Silt traps will be maintained throughout all planting works, ensuring that they are clear of sediment build-up.</p> <p>The silt traps will reduce the risk of sediment runoff reaching waterways within the proposed afforestation area.</p> | <p>All mitigation measures will be included as a contractual obligation on the contractor and will be implemented in full.</p> <p>High probability of success.</p> | <p>Contractor will monitor the implementation of the mitigation measures on an on-going basis throughout afforestation phase.</p> |

|   |                          |   |  |  |
|---|--------------------------|---|--|--|
| 3 | Drainage and cultivation | <p>All drains will protect aquatic zones (order 1 - Emlagh Stream 27) from any sediment and nutrients contained in water draining off the site as outlined in Section 3.7.1 of Environmental Requirements for Afforestation (December 2016) (See <a href="http://www.iaai.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf">www.iaai.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf</a>).</p> <p>Drains will be maintained throughout all planting works, ensuring that they are clear of sediment build-up and are not severely eroded.</p> <p>There will be no vegetation removal within 20 m of a drainage ditch. This ensures the area close to a drain act as a filter for sediment before entering a drain.</p> | <p>All mitigation measures will be included as a contractual obligation on the contractor and will be implemented in full.</p> <p>High probability of success.</p> | Contractor will monitor the implementation of the mitigation measures on an on-going basis throughout afforestation phase. |
| 4 | Afforestation            | <p>A setback area of 5m will be applied along the relevant watercourses present in the project area (there are three that run west-east into the Emlagh Stream 27), as specified in Section 4.4 of the Environmental Requirements for Afforestation (December 2016) (See <a href="http://www.iaai.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf">www.iaai.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf</a>).</p>   | <p>All mitigation measures will be included as a contractual obligation on the contractor and will be implemented in full.</p> <p>High probability of success.</p> | Contractor will monitor the implementation of the mitigation measures on an on-going basis throughout afforestation phase. |
| 5 | Setbacks                 | <p>Apply a 5-metre-wide (minimum) setback along relevant watercourses (as defined in Circular 12/2017) located within or adjoining the site. This setback is to remain undisturbed during establishment and throughout the forest rotation. Apply and maintain as per details set out in Tables 5 and 6 of the Environmental Requirements for Afforestation (DAFM, 2016) (See <a href="http://www.iaai.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf">www.iaai.ie/wp-content/uploads/2016/03/EnvReqs-for-Afforestation-Dec16.pdf</a>).</p>  | <p>All mitigation measures will be included as a contractual obligation on the contractor and will be implemented in full.</p> <p>High probability of success.</p> | Contractor will monitor the implementation of the mitigation measures on an on-going basis throughout afforestation phase. |

|   |              |  |  |  |  |
|---|--------------|--|--|--|--|
|   |              | <p>A setback of 10 m from the aquatic zone, Emlagh stream which runs along the eastern boundary of the site for 240 m.</p> <p>There shall be no mounding or machine work within 10 m of Aquatic Zone except for essential fencing purposes.</p> <p>There shall be no mounding or machine work within 5 m of Relevant Water Course (RWC).</p> <p>Chemical use will be kept to an absolute minimum, depending on site requirements; chemicals will only be applied in dry weather.</p> <p>Chemicals shall not be applied within 20 m of the aquatic zone or within watercourses setbacks or other sensitive areas.</p> |  |  |  |
| 6 | Chemical use |  | <p>All mitigation measures will be included as a contractual obligation on the contractor and will be implemented in full.</p> <p>High probability of success.</p> | Contractor will monitor the implementation of the mitigation measures on an on-going basis throughout afforestation phase. |  |
| 7 | Otter        | <p>There will be no cleaning of vegetation from any section of such watercourses within 20 m of the aquatic zone (order 1 - Emlagh Stream 27). There will be no woody weed removal within 20 m of an aquatic zone or 10 m of a relevant watercourse.</p>   | <p>All mitigation measures will be included as a contractual obligation on the contractor and will be implemented in full.</p> <p>High probability of success.</p> | Contractor will monitor the implementation of the mitigation measures on an on-going basis throughout afforestation phase. |  |
| 8 | Birds        | <p>No work to be carried out during hours of darkness.</p>   | <p>All mitigation measures will be included as a contractual obligation on the contractor and will be implemented in full.</p> <p>High probability of success.</p> | Contractor will monitor the implementation of the mitigation measures on an on-going basis throughout afforestation phase. |  |

*end*